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‡ Information for this product line is available on the Industrial Controls Catalog website: www.ab.com/catalogs.

NEMA Motor Control

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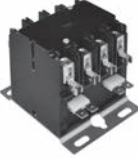
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† Information for this product line is available on the Industrial Controls Catalog website: www.ab.com/catalogs.



Definite-Purpose Contactors

				
Bulletin	400			
Features	<ul style="list-style-type: none"> • Compact size • Feed-through wiring • Class B (130 °C) coil insulation • Double “E” magnet assembly • Snap-on auxiliary contacts • Combination pressure and quick connect terminals • Ability to accept ring terminals • Double-break contacts 			
No. of Poles	1 & 2	3	3	4
FLA Rating	20/25...40	25...40	50...90	20/25...40
Arc Cover	Optional	Standard	Standard	Standard
Termination	<ul style="list-style-type: none"> • 1/4 in. QC, #10-32 screw • Box lugs optional 	<ul style="list-style-type: none"> • 1/4 in. QC, #10-32 screw • Box lugs optional (25...30 A) • Coil screws optional 	<ul style="list-style-type: none"> • Box lug, standard • Option available to accept ring terminals 	<ul style="list-style-type: none"> • 1/4 in. QC, #10-32 screw (25...30 A) • Box lugs (40 A) • Coil screws optional
Certifications	<ul style="list-style-type: none"> • CSA Certified (File No. 221970) • UL Recognized (File No. E3125, Guide No. NLDX2) • CE Marked — SEMKO Certified • CCC 	<ul style="list-style-type: none"> • CSA Certified (File No. 221970) • UL Recognized (File No. E3125, Guide No. NLDX2) • CE Marked — SEMKO Certified • CCC 	<ul style="list-style-type: none"> • CSA Certified (File No. 221970) • UL Recognized (File No. E3125, Guide No. NLDX2) • CE Marked — SEMKO Certified 	<ul style="list-style-type: none"> • CSA Certified (File No. 221970) • UL Recognized (File No. E3125, Guide No. NLDX2) • CE Marked — SEMKO Certified • CCC
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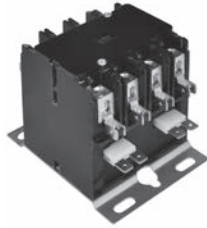
Definite Purpose Contactors

Product Overview/Catalog Number Explanation

1



2-pole



4-pole

Bulletin 400

- Available in the following ranges:
 - 1-Pole: 20/25...40 A, 600V max.
 - 2-Pole: 20/25...40 A, 600V max.
 - 3-Pole: 20/25...90 A, 600V max.
 - 4-Pole: 20/25...40 A, 600V max.

The Allen-Bradley Bulletin 400 Definite Purpose contactors are specifically designed for applications such as air-conditioning, refrigeration, resistive heating, data processing and food service equipment, pumps, and compressors.

Box lugs are standard on 40 A contactors and larger. A maximum of two auxiliary contact blocks (one on each side, four contacts max.) can be field installed.

Features Include:

- UL tested for lighting loads
- Compliant with international standards
- Standard and high fault short-circuit current rating (SCCR)

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Standards Compliance

UL 508
 CSA C22.2 No. 14
 EN/IEC 60947-4-1

Certifications

UL Recognized (File No. E3125, Guide No. NLDX2)
 CSA Certified (File No. 221970)
 CE Marked
 SEMKO Certified
 CCC

Catalog Number Explanation

400 – **DP40** **N** **A** **3** – **K**
a *b* *c* *d* *e*

a

Current Rating	
Code	Full Load Amps [A]
DP25	20/25
DP30	30
DP40	40
DP50	50
DP60	60
DP75	75
DP90	90

b

Enclosure Code	
Code	Enclosure
N	No enclosure/No exceptions

c

Nominal Coil Voltage [V]	
Code	50/60 Hz Frequency
J	24
D	120
A	208/240
F	277
LF	347
B	480

d

Number of Poles	
Code	Description
1	1 pole
2	2 poles
3	3 poles
4	4 poles

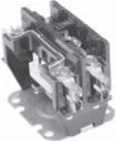











e

Modifications	
Code	Description
B	Box lug with DP25 or DP30 in 2 nd position
D	400-DRA factory attached to DP (20/25...40 A)
E	2 poles with 3-pole base
K	#6-32 screw coil terminal with DP25, DP30, or DP40 in 2 nd position
R	Accept ring terminal for DP40...DP90
S	#10-32 SEMS terminal
T	Coil terminals down
U	Coil terminals on load side (T1/2, T2/4, T3/6) without quick connect (QC) line/load terminals
X	Without quick connect (QC) terminals on line and load

e (cont'd)

Modifications	
3- and 4-Pole 20/25, 30, and 40 A only (Steel Back Plate)	
Code	Description
AB1	Auxiliary contact – 1 N.O./1 N.C. with Quick Connect
A1	Auxiliary contact – SPDT with QC
A2	Auxiliary contact – 2 SPDT with QC
3-Pole 50...90 A only	
Code	Description
AB	Auxiliary contact – 1 N.O./1 N.C. with QC
A	Auxiliary contact – SPDT with QC
4-Pole 20/25, 30, and 40 A only (Molded Back Plate)	
Code	Description
AB5	Auxiliary contact – 1 N.O./1 N.C. with QC
A5	Auxiliary contact – SPDT with QC
AA5	Auxiliary contact – 2 SPDT with QC

Contactors

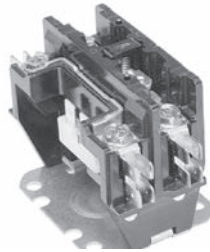
	Number of Poles	FLA Rating [A]	Arc Cover	Standard Termination	Certifications	Page Number		
	1	20...30	Optional	#10-32 screw with 1/4 in. QC		1-6		
		40		Box lug (option available to accept ring terminals)				
	2	20...30		#10-32 screw with 1/4 in. QC				
		40		Box lug (option available to accept ring terminals)				
	3	20...30	Standard	#10-32 screw with 1/4 in. QC		1-7		
		40		Box lug (option available to accept ring terminals)				
		50, 60		Standard	Box lug (option available to accept ring terminals)			
		75, 90		Standard				
	4	20...30	Standard	#10-32 screw with 1/4 in. QC		1-9		
		40		Box lug (option available to accept ring terminals)				

Definite Purpose Contactors

Product Selection

20/25...40 FLA 1- and 2-Pole

1



1-Pole Contactor with Shunt



2-Pole Contactor with Optional Arc Cover

Full Load Amps [A]	Number of Poles	Maximum Continuous Ampere Rating [A]		Line Voltage [V AC]	Locked Rotor Current [A]	Resistive Current Rating [A]	Voltage [V]	Max. Single Phase Hp	Cat. No.
		Tungsten Lamp Loads*	Ballast Lighting Load‡						
20/25*	1	25		240/277	150	35	120	1	400-DP25N⊗1
				480	125	35	240	2	
				600	100	35			
20/25*	2	25		240/277	150	35	120	2	400-DP25N⊗2
				480	125	35	240	3	
				600	100	35			
30*	1	30		240/277	150	40	120	1	400-DP30N⊗1
				480	125	40	240	2	
				600	100	40			
30*	2	30		240/277	150	40	120	2	400-DP30N⊗2
				480	125	40	240	3	
				600	100	40			
40*	1	40		240/277	240	50	120	2	400-DP40N⊗1
				480	160	50	240	3	
				600	120	50			
40*	2	40		240/277	240	50	120	2	400-DP40N⊗2
				480	200	50	240	3	
				600	120	50			

* Coil terminal screws are not available on 1- and 2-pole contactors.

* Max. 250V AC.

‡ Max. 277V AC.

⊗ AC Coil Voltage Code for 1- and 2-Pole Contactors

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

Example: **Cat. No. 400-DP25N⊗1** becomes **Cat. No. 400-DP25NJ1**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

[V]	24	120	208/240	277	480
Code	J	D	A	F	B

Coil Technical Data

Nominal AC Coil Voltage [V]	20/25...40 A One-Pole Contactors					20/25...40 A Two-Pole Contactors				
	24	120	208/240	277	480	24	120	208/240	277	480
Maximum Pickup Volts	18	88	177	221	384	18	88	177	221	384
Drop-Out Volts Range	6...15	20...70	40...140	50...165	150...270	6...15	20...70	40...140	50...165	150...270
Nominal Inrush VA	50 Hz	31	31	31	31	33	33	33	33	33
	60 Hz	28	28	28	28	30	30	30	30	30
Nominal Sealed VA	50 Hz	6	6	6	6	8	8	8	8	8
	60 Hz	5	5	5	5	6.5	6.5	6.5	6.5	6.5
Nominal DC Resistance (Ω)	18	420	1800	2500	3050	11	237	1000	1600	3050

Arc Cover

Description	Cat. No.
20/25 and 30 A – 1-Pole	400-C1
20/25 and 30 A – 2-Pole	400-C2
40 A – 1 and 2 Pole	Standard

20/25...40 FLA 3-Pole



30 FLA Contactor 3-Pole with optional Coil Terminal Screws

Full Load Amps [A]	Number of Poles	Maximum Continuous Ampere Rating [A]		Line Voltage [V AC]	Locked Rotor Current [A]	Resistive Current Rating [A]	Voltage [V]	Max. Horsepower		Cat. No.
		Tungsten Lamp Loads*	Ballast Lighting Load†					Single Phase	Three Phase	
20/25	3	25		240/277 480 600	150 125 100	35 35 35	110/120	2	—	400-DP25N®3
							200/208	—	7.5	
							240/277	5	10	
							480	—	15	
							600	—	20	
30	3	30		240/277 480 600	180 150 120	40 40 40	110/120	2	—	400-DP30N®3
							200/208	—	10	
							240/277	5	10	
							480	—	15	
							600	—	20	
40*	3	40		240/277 480 600	240 200 120	50 50 50	110/120	3	—	400-DP40N®3
							200/208	—	10	
							240/277	7.5	10	
							480	—	20	
							600	—	20	

* To use ring terminals on 40 FLA and larger power connections add the suffix **R** to the catalog number.

Example: **Cat. No. 400-DP40N®3** becomes **Cat. No. 400-DP40N®3-R**.

® Max. 250V AC.

† Max. 277V AC.

⊗ **AC Coil Voltage Code**

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

Example: **Cat. No. 400-DP25N®3** becomes **Cat. No. 400-DP25NJ3**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

[V]	24	120	208/240	277	347	480
Code	J	D	A	F	LF	B

Coil Technical Data

Nominal Coil Voltage	24	120	208/240	277	347	480
Maximum Pickup Voltage [V]	18	88	177	220	277	384
Drop-Out Voltage [V]	6...15	20...70	40...140	50...185	85...225	150...270
Nominal Inrush VA	50 Hz	65	65	65	65	65
	60 Hz	60	60	60	60	60
Nominal Sealed VA	50 Hz	7.5	7.5	7.5	7.5	7.5
	60 Hz	6	6	6	6	6
Nominal DC Resistance (Ω)	7	180	720	900	1330	2425

Auxiliary Contacts

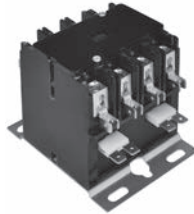
Description	Cat. No.
1 N.O./1 N.C. w/QCs§	400-AB1
SPDT w/QCs*	400-A1
2-SPDT w/QCs*	400-A2

§ Contact rating single-circuit N.O. or N.C.:

[V]	120	240	480	600	
Current [A]	Break	3.0	1.5	0.75	0.6
	Make	30	15	7.5	6
	Continuous	10	10	10	10

* Contact rating SPDT:
 10 A, 1/3 Hp, 125 or 250V AC;
 1/2 A, 125V DC;
 1/4 A, 250V DC;
 4 A 120V AC on lamp load

20/25...40 FLA 4-Pole



4-Pole

Full Load Amps [A]	Number of Poles	Maximum Continuous Ampere Rating [A]		Line Voltage [V AC]	Locked Rotor Current [A]	Resistive Current Rating [A]	Voltage [V]	Maximum Horsepower		Cat. No.
		Tungsten Lamp Loads*	Ballast Lighting Load‡					Single Phase	Three Phase	
20/25	4	25		240/277 480 600	150 125 100	35 35 35	110/120	2	—	400-DP25N*4
							200/208	—	7.5	
							240/277	5	10	
							480	—	15	
							600	—	20	
30	4	30		240/277 480 600	180 150 120	40 40 40	110/120	2	—	400-DP30N*4
							200/208	—	10	
							240/277	5	10	
							480	—	15	
							600	—	20	
40	4	40		240/277 480 600	240 200 120	50 50 50	110/120	3	—	400-DP40N*4
							200/208	—	10	
							240/277	7.5	10	
							480	—	20	
							600	—	20	

* Max. 250V AC.

‡ Max. 277V AC.

⊗ **AC Coil Voltage Code**

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

Example: **Cat. No. 400-DP25N*4** becomes **Cat. No. 400-DP25NJ4**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

[V]	24	120	208/240	277	347	480
Code	J	D	A	F	LF	B

Coil Technical Data

Nominal AC Coil Voltage [V]	24	120	208/240	277	347	480
Maximum Pickup Voltage [V]	18	88	177	220	277	384
Drop-Out Voltage [V]	6...15	20...70	40...140	65...185	85...225	150...270
Nominal Inrush VA	50 Hz	62	62	62	62	62
	60 Hz	60	60	60	60	60
Nominal Sealed VA	50 Hz	9	9	9	9	9
	60 Hz	7	7	7	7	7
Nominal DC Resistance (Ω)	6	150	600	750	1205	2195

Auxiliary Contacts – Series B Contactors

Description	Steel Back Plate Cat. No.
1 N.O./1 N.C. w/QCs§	400-AB1
SPDT w/QCs*	400-A1
2-SPDT w/QCs*	400-A2

§ Contact rating single-circuit N.O. or N.C.:



[V]	120	240	480	600	
Current [A]	Break	3.0	1.5	0.75	0.6
	Make	30	15	7.5	6
	Continuous	10	10	10	10

* Contact rating SPDT:
 10 A, 1/3 Hp, 125 or 250V AC;
 1/2 A, 125V DC;
 1/4 A, 250V DC;
 4 A 120V AC on lamp load

Definite Purpose Contactors

Accessories/Modifications

Accessories

	Description	For Use With	Cat. No.
	Mechanical Interlock Kit	20/25...40 A 3-pole	400-MK1
	DIN Rail Adapter	20/25...40 A 1...4-pole	400-DRA

Modifications

Description	Suffix Code
Box lug with DP25 or DP30 in second position	B
Molded coil (not available with 1 or 2 in fifth position)	C
Factory-installed DIN Rail adapter (20...40 A)	D
2-pole with 3-pole base	E
#6-32 screw coil terminal with DP25, DP30, or DP40 in second position (3- & 4-pole only)	K
Ring terminal for DP40...DP90	R
#10-32 SEMS terminals with DP25, DP30, or DP40 in second position	S
Coil terminals down	T
Coil terminals on load side (T1/2, T2/4, T3/6) without quick connect (QC) line/load terminals	U
Without QC terminals on line and load	X

20/25...40 FLA 1- and 2-Pole

Line and Load Terminals	#10-32 screw or box lug	
Wire Size	#10-32 screw	#16...8 AWG (stranding must be split for #8 wire)
	Box Lug	#14...4 AWG
Mechanical Life	1 000 000 operations	
Electrical Life	250 000 operations	
Recommended Tightening Torque	#10-32 screw	25 lb•in
	Box lug	40 lb•in
Quick Connects	Power terminals	Dual 0.250 QC (2)
	Coil terminals	1-Pole: Quad 0.250 QC 2-Pole: Dual or Quad 0.250 QC
Arc Cover	Optional	
Insulation System	130 °C Class B	
Temperature Range	-40...+65 °C (-40...+150 °F)	
Mounting Position	Vertical	All positions
	Horizontal	Base down only
Weight	1-Pole	0.5 lb
	2-Pole	0.6 lb

20/25...40 FLA 3-Pole

Line and Load Terminals	#10-32 screw or box lug	
Wire Size	#10-32 screw	#16...8 AWG (stranding must be split for #8 wire)
	Box Lug	#14...4 AWG
Mechanical Life	1 000 000 operations	
Electrical Life	250 000 operations	
Recommended Tightening Torque	#10-32 screw	25 lb•in
	Box lug	40 lb•in
Quick Connects	Power terminals	Dual 0.250 QC (2)
	Coil terminals	Quad 0.250 QC
Arc Cover	Standard	
Insulation System	130 °C Class B	
Temperature Range	-40...+65 °C (-40...+150 °F)	
Mounting Position	Vertical	All positions
	Horizontal	Base down only
Weight	1 lb	

50...60 FLA 3-Pole

Line and Load Terminals	Box lug	
Wire Size	#14...2 AWG	
Mechanical Life	500 000 operations	
Electrical Life	250 000 operations	
Recommended Tightening Torque	50 lb•in	
Quick Connects	Power terminals	Dual 0.250 QC (2)
	Coil terminals	#6-32 screw and 0.250 QC (2)
Arc Cover	Standard	
Insulation System	130 °C Class B	
Temperature Range	-40...+65 °C (-40...+150 °F)	
Mounting Position	Vertical	All positions
	Horizontal	Base down only
Weight	2 lb	

75...90 FLA 3-Pole

Line and Load Terminals	Box lug	
Wire Size	#14...1/0 AWG	
Mechanical Life	500 000 operations	
Electrical Life	100 000 operations	
Recommended Tightening Torque	50 lb•in	
Quick Connects	Power terminals	Dual 0.250 QC
	Coil terminals	#6-32 screw and 0.250 QC (2)
Arc Cover	Standard	
Insulation System	130 °C Class B	
Temperature Range	-40...+65 °C (-40...+150 °F)	
Mounting Position	Vertical	All Positions
	Horizontal	Base down only
Weight	4 lb	

20/25...40 FLA 4-Pole

Line and Load Terminals	#10-32 screw or box lug	
Wire Size	#10-32 screw	#16...8 AWG (stranding must be split for #8 wire)
	Box lug	#14...4 AWG
Mechanical Life	1 000 000 operations	
Electrical Life	250 000 operations	
Recommended Tightening Torque	#10-32 screw	25 lb•in
	Box lug	40 lb•in
Quick Connects	Power terminals	Dual 0.250 QC
	Coil terminals	Dual 0.250 QC (2)
Arc Cover	Standard	
Insulation System	130 °C Class B	
Temperature Range	-40...+65 °C (-40...+150 °F)	
Mounting Position	Vertical	All positions
	Horizontal	Base down only
Weight	1.5 lb	

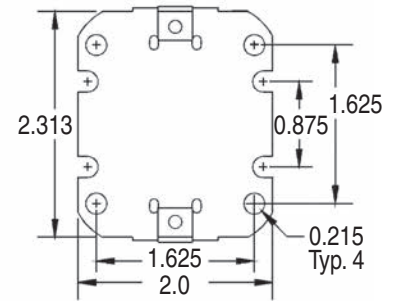
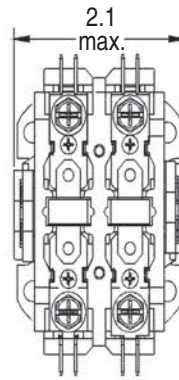
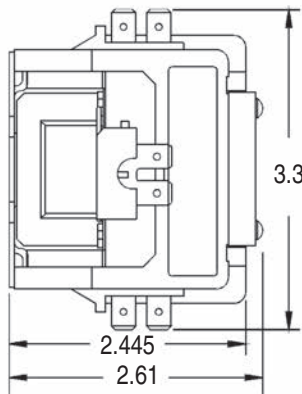
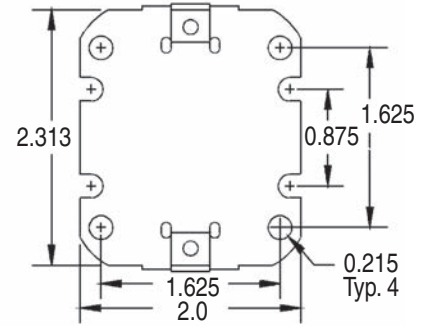
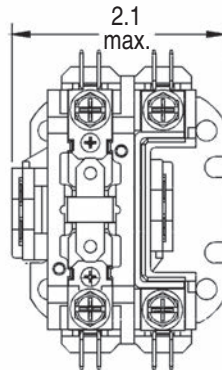
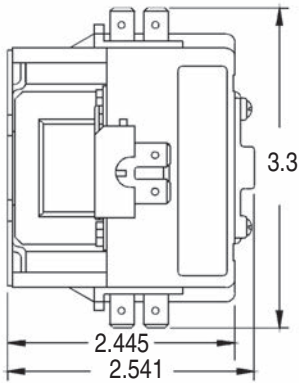
Definite Purpose Contactors

Approximate Dimensions

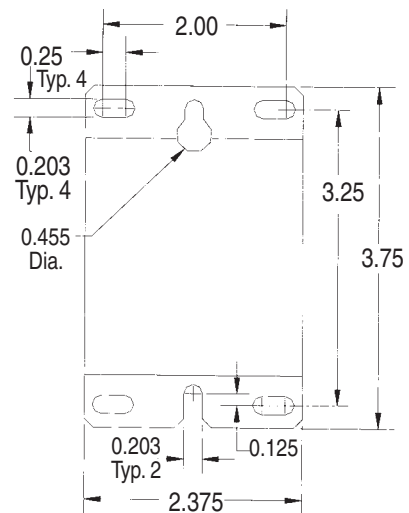
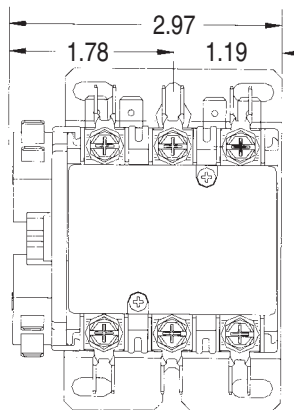
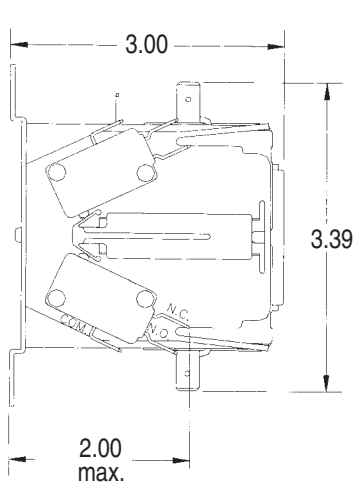
Dimensions shown in inches. Dimensions are not intended to be used for manufacturing purposes.

20/25...40 FLA 1- and 2-Pole

1

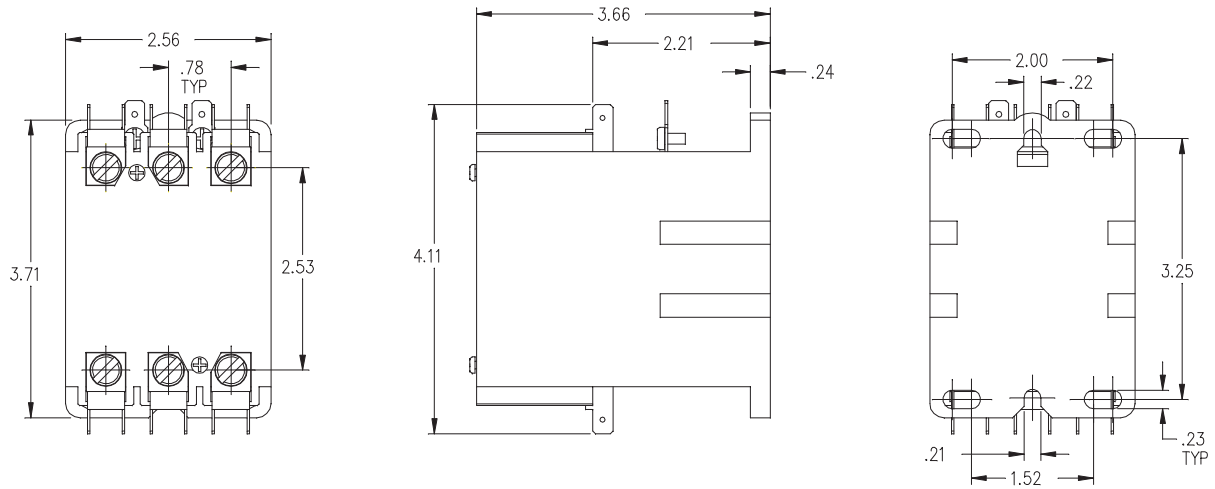


20/25...40 FLA 3-Pole

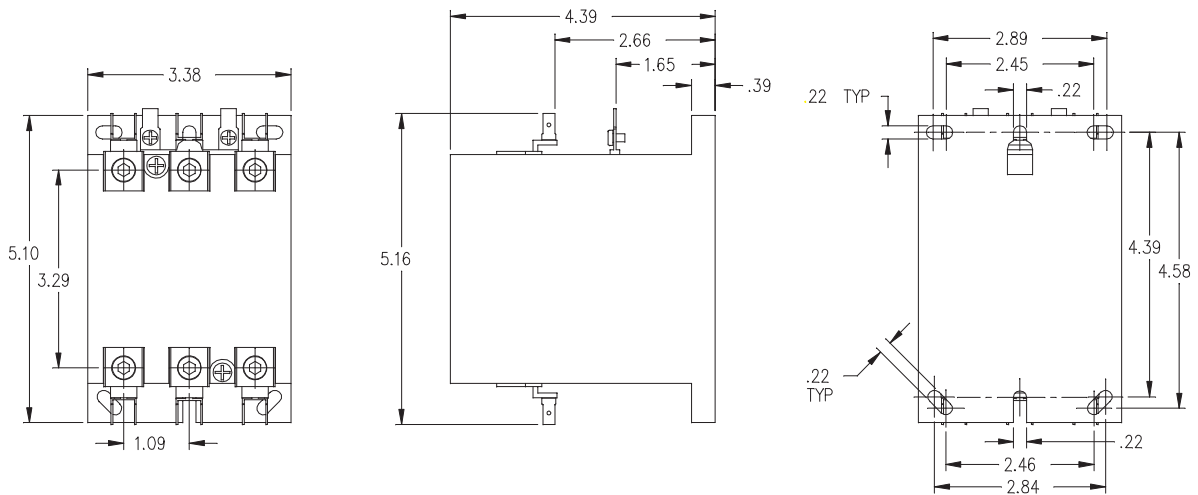


Dimensions shown in inches. Dimensions are not intended to be used for manufacturing purposes.

50 and 60 FLA 3-Pole



75 and 90 FLA 3-Pole



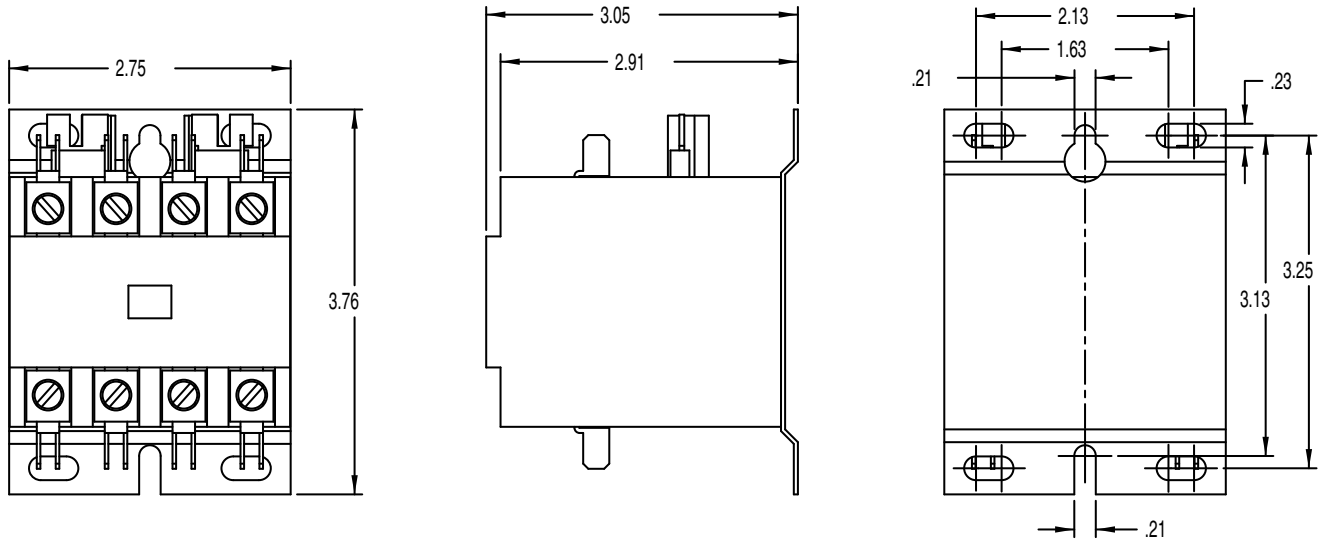
Definite Purpose Contactors

Approximate Dimensions

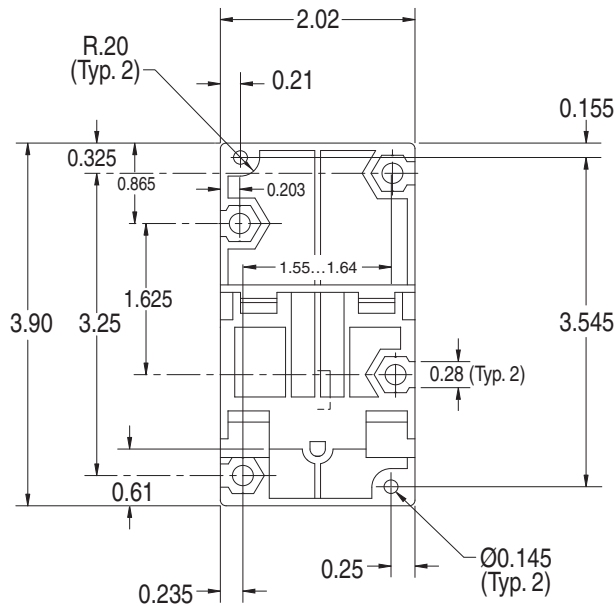
Dimensions shown in inches. Dimensions are not intended to be used for manufacturing purposes.

20/25...40 FLA 4-Pole

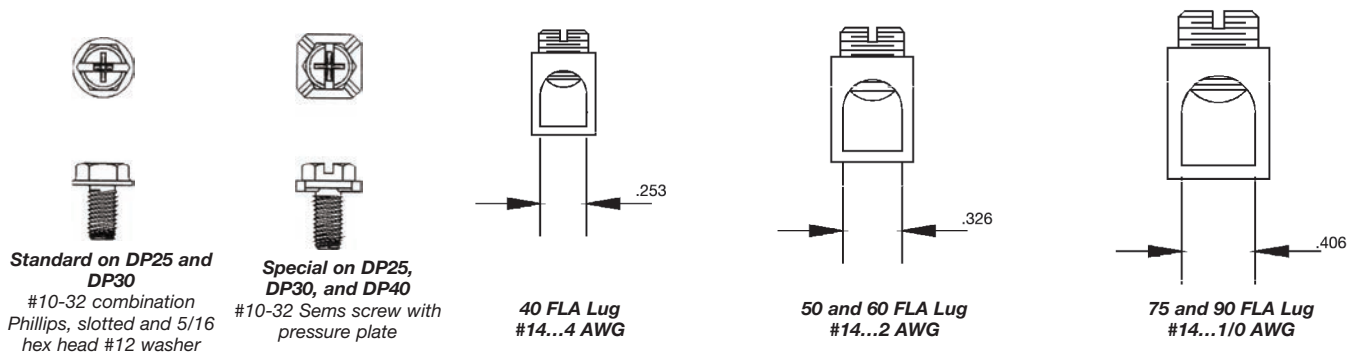
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DIN Rail Adaptors



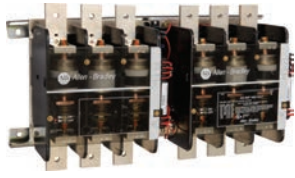


Terminations



Vacuum Contactors and Starters

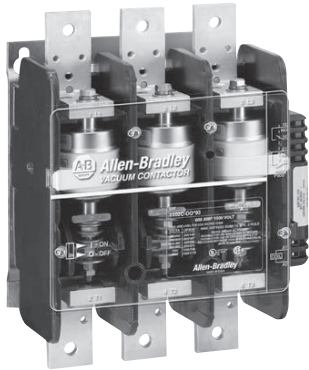
1

Bulletin	1102C	1109	1104C
			
Features	<ul style="list-style-type: none"> Up to 1500V AC maximum Space-saving design Contacts sealed from harsh contamination – improved performance Improved arc extinguishing above 600V – reduced contact erosion for higher voltages Minimal mechanical movement minimizes downtime DC magnet assembly reduces power consumption 	<ul style="list-style-type: none"> Up to 1500V AC maximum Effective arc extinguishing above 600V Compact size Contacts sealed from harsh contamination – improved performance Minimal mechanical movement minimizes downtime DC magnet assembly reduces power consumption Overload protection 	<ul style="list-style-type: none"> 1500V AC maximum Effective arc extinguishing above 600V Contacts sealed from harsh contamination – improved performance Minimal mechanical movement minimizes downtime DC magnet assembly reduces power consumption Mechanical and electrical interface
Typical Industry Applications	<ul style="list-style-type: none"> Mining Foundries-metal processing Chemical Petroleum Cement Cranes & Hoists Pumps Other harsh environments where voltages above 600V are used 	<ul style="list-style-type: none"> Mining Foundries-metal processing Chemical Petroleum Cement Cranes & Hoists Pumps Other harsh environments where voltages above 600V are used 	<ul style="list-style-type: none"> Mining Foundries-metal processing Chemical Petroleum Cement Cranes & Hoists Pumps Other harsh environments where voltages above 600V are used
Horsepower Ratings Motor Voltage	<ul style="list-style-type: none"> 200...1500V 50...1200 Hp 	<ul style="list-style-type: none"> 200...1500V 50...1200 Hp 	<ul style="list-style-type: none"> 200...1500V 60...1200 Hp
Capacitor Switching	<ul style="list-style-type: none"> 240...1500V 62...1250 kVAR 	—	—
Transformer Primary Switching	<ul style="list-style-type: none"> 240...1500V 55...2076 kVA 	—	—
Continuous Current Rating [A]	200...600 A	200...600 A	200...600 A
Certifications	cULus Listed (File No. E3125 Guide No. NLDX / NLDX7)	cULus Listed (File No. E3125 Guide No. NLDX / NLDX7)	cULus Listed (File No. E3125 Guide No. NLDX / NLDX7)
Product Selection	Page 1-16	Page 1-17	Page 1-18

Non-Reversing Vacuum Contactors

Product Overview/Catalog Number Explanation/Product Selection

1



Bulletin 1102C

- Voltage: 1500V AC maximum
- Current ratings: 200, 400, and 600 A
- Space-saving design
- Line and load terminals up front for ease of wiring
- Visual ON/OFF indicator
- Snap-on side mount auxiliary contacts
- Typical industry applications include:
 - Mining
 - Chemical
 - Cement
 - Pumps
 - Foundries-metal processing
 - Petroleum
 - Cranes & Hoists
 - Other harsh environments where voltages above 600V are used

The Bulletin 1102C open type contactor is designed for use up to 1500V. Vacuum contactors are particularly well-suited for mining, pumping, and other applications where voltages above 600V are used. The Bulletin 1102C line uses vacuum bottles to enclose the power-switching contacts within the contactor. The use of vacuum technology results in particularly effective arc extinguishing above 600V and results in a very compact, long-lasting contactor.

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Product Selection..... this page
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 Approximate Dimensions..... 1-20

Standards Compliance

UL 508
 CSA 22.2 No. 14
 EN60947-4 (1000V)

Certifications

cULus Listed (File No. E3125; Guide No. NLDX, NLDX7)

Configuration of a Basic Vacuum Contactor

The information below is for reference purposes. Not all combinations will produce a valid cat. no. Refer to the tables on the following pages for product selection.

1102C – B O D 93
 a b c d

a

Continuous Current Rating [A]	
Code	Description
B	200
C	400
D	600

c

Control Voltage		
Code	Voltage	Frequency
A	230...240V AC	60 Hz
B	460...480V AC	60 Hz
D	120V AC	60 Hz
N	380...415V AC	60 Hz
G	125V DC	—
H	250V DC	—

d

Options	
Code	Description
93	3-pole contactor

b

NEMA Enclosure Type	
Code	Type
O	Open type — no enclosure

Product Selection

3-Phase, 1500V Maximum, 60 Hz

Capacitor Switching* [kVAR]					Transformer Primary Switching* [kVA]					Continuous Current Rating [A]	Cat. No. ‡
240V	440V	575V	1000V	1500V	240V	440V	575V	1000V	1500V		
62	114	156	260	390	55	152	207	346	519	200	1102C-BO®93
124	228	312	520	780	110	304	414	692	1038	400	1102C-CO®93
200	366	500	830	1250	249	450	620	1384	2076	600	1102C-DO®93

Motor Switching Ratings														Cat. No. ‡
200V / 208V		220V / 240V		380V / 415V		440V / 480V		550V / 600V		1000V		1500V		
[Hp]	[kW]	[Hp]	[kW]	[Hp]	[kW]	[Hp]	[kW]	[Hp]	[kW]	[Hp]	[kW]	[Hp]	[kW]	
60	45	75	56	100	75	150	112	200	150	300	224	500	373	1102C-BO®93
125	93	150	112	200	150	300	224	400	298	700	522	1000	746	1102C-CO®93
200	149	200	149	350	261	400	298	600	447	1000	746	1200	895	1102C-DO®93

⊗ Control Voltage Code

The cat. no. is incomplete. To complete the cat. no., select a control voltage code from the table below and insert into the cat. no.
 Example: **Cat. No. 1102C-BO®93** becomes **Cat. No. 1102C-BOD93**.

		[V]	120	125	240	250	380...415	440...480
AC	50/60 Hz	D	—	A	—	N	B	
DC	—	—	G	—	H	—	—	

* Inrush current should be less than 1000% of IEC AC3 operational current.

* For use on transformers having an inrush not more than 20 times the rated full load current **irrespective** of secondary load. Ratings do not apply to transformers used in resistive welder service.

‡ Terminal lugs not included — see Accessories on page 1-19.

NEMA Non-Reversing Vacuum Contactors

Product Overview/Catalog Number Explanation/Product Selection



Bulletin 1109

- Voltage: 1500V AC maximum
- Current ratings: 200, 400, and 600 A
- Overload protection
 - Time-proven eutectic or solid-state overload protection with current transformers
 - Solid-state E1 Plus with wide 5:1 adjustment range
- Line and load terminals up front for ease of wiring
- Visual ON/OFF indicator
- Snap-on side-mount auxiliary contacts
 - Mining
 - Foundries-metal processing
 - Chemical
 - Petroleum
 - Cement
 - Cranes & Hoists
 - Pumps
 - Other harsh environments where voltages above 600V are used

The Bulletin 1109 open-type starter is designed for use up to 1500V. Vacuum starters are particularly well-suited in mining, pumping, and other harsh environments where voltages above 600V are used. The Bulletin 1109 line uses vacuum bottles to enclose the power-switching contacts within the starter. The use of vacuum technology results in particularly effective arc extinguishing above 600V and results in a very compact, long-lasting starter.

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Standards Compliance

UL 508
 CSA 22.2 No. 14
 EN60947-4 (1000V)

Certifications

cULus Listed (File No. E3125; Guide No. NLDX, NLDX7)



Configuration of a Basic Vacuum Starter

The information below is for reference purposes. Not all combinations will produce a valid cat. no. Refer to the tables on the following pages for product selection.

1109 – B O D – EEJ
 a b c d

a

Continuous Current Rating [A]	
Code	Description
B	200
C	400
D	600

b

NEMA Enclosure Type	
Code	Type
O	Open type — no enclosure

c

Control Voltage		
Code	Voltage	Frequency
A	230...240V AC	60 Hz
B	460...480V AC	60 Hz
D	120V AC	60 Hz
G	125V DC	—
H	250V DC	—
N	380...415V AC	60 Hz

d

Overload Relay Code			
Code	Description	Current Range [A]	Starter Size
Blank	Eutectic alloy	Heater elements	200, 400, 600
EEJ	E1 Plus solid-state	40...200	200
EEW		80...400	400
EEM		120...600	600

Product Selection

3-Phase, 200...1500V, 60 Hz

Motor Switching Ratings													Continuous Current Rating [A]	Cat. No.
200...208V		220...240V		440...480V		550...600V		1000V		1500V				
[Hp]	[kW]	[Hp]	[kW]	[Hp]	[kW]	[Hp]	[kW]	[Hp]	[kW]	[Hp]	[kW]			
50	37	75	56	150	112	200	149	300	224	500	373	200	1109-BO[⊗]-[⊕]	
125	93	150	112	300	224	350	261	700	522	850	634	400	1109-CO[⊗]-[⊕]	
200	149	200	149	400	298	600	447	1000	746	1200	895	600	1109-DO[⊗]-[⊕]	

The cat. no. is incomplete. To complete the cat. no., select a control voltage code from the table below and insert into the cat. no. Example: **Cat. No. 1109-BO[⊗]** becomes **Cat. No. 1109-BOD**.

	[V]	120	125	240	250	380...415	440...480
AC	50/60 Hz	D	—	A	—	N	B

⊕ Overload Relay Code

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete. Select an overload relay code from below to complete the cat. no. Example: **Cat. No. 1109-BOD-[⊕]** becomes **Cat. No. 1109-BOD-EEJ**.

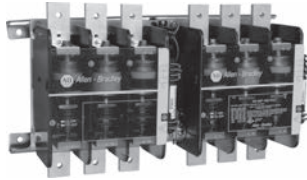
Solid-State Overload Relay for 3-Phase Applications: Automatic/Manual Reset, Class 10, 15, 20, or 30

Size	Full Load Current Adjustment Range [A]	Automatic/Manual Reset
		Overload Relay Code
200	40...200	EEJ
400	80...400	EEW
600	120...600	EEM

Reversing Vacuum Contactors

Product Overview/Catalog Number Explanation/Product Selection

1



Bulletin 1104C

- Voltage: 1500V AC maximum
- Current ratings: 200, 400, and 600 A
- Visual ON/OFF indicator
- Line and load terminals up front for ease of wiring
- Mechanical and electrical interlock
- Horizontal construction for easy panel mounting
- Snap-on side mount auxiliary contacts
- Typical industry applications include:
 - Mining
 - Chemical
 - Cement
 - Pumps
 - Foundries-metal processing
 - Petroleum
 - Cranes & Hoists
 - Other harsh environments where voltages above 600V are used

The Bulletin 1104C reversing contactor consists of two Bulletin 1102C vacuum contactors mounted horizontally on a common base. Contactors are mechanically and electrically interlocked to avoid both contactors being closed simultaneously. Vacuum contactors are particularly well-suited for mining, pumping, and other applications where voltages above 600V are used.

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Standards Compliance

UL 508
 CSA C22.2, No. 14

Certifications

cULus Listed (File No. E3125; Guide No. NLDX, NLDX7)

Configuration of a Basic Vacuum Contactor

The information below is for reference purposes. Not all combinations will produce a valid cat. no. Refer to the tables on the following pages for product selection.

1104C –
 a b c

a

Continuous Current Rating [A]	
Code	Description
B	200
C	400
D	600

b

NEMA Enclosure Type	
Code	Type
O	Open type — No enclosure

c

Control Voltage		
Code	Voltage	Frequency
A	230...240V AC	60 Hz
D	120V AC	60 Hz
G	125V DC	—

Product Selection

3-Phase, 1500V Maximum, 60 Hz

Motor Switching Ratings														Cont. Current Rating [A]	Cat. No. ‡
240...208V		220...240V		380...415V		440...480V		550...600V		1000V		1500V			
[Hp]	[kW]	[Hp]	[kW]	[Hp]	[kW]	[Hp]	[kW]	[Hp]	[kW]	[Hp]	[kW]	[Hp]	[kW]		
60	45	75	56	100	75	150	112	200	150	300	224	500	375	200	1104C-BO ⊗
125	93	150	112	200	149	300	224	400	298	700	522	1000	746	400	1104C-CO ⊗
200	149	200	149	350	261	400	298	600	447	1000	746	1200	895	600	1104C-DO ⊗

⊗ Control Voltage Code

The cat. no. is incomplete. To complete the cat. no., select a control voltage code from the table below and insert into the cat. no. Example: **Cat. No. 1104C-BO**⊗93 becomes **Cat. No. 1104C-BOD93**.

	[V]	120	125	240
AC	50/60 Hz	D	—	A
DC	—	—	G	—

‡ Terminal lugs not included — see Accessories on page 1-19.

Accessories

Auxiliary Contacts

Contactors are supplied with one normally open and one normally closed auxiliary contact (A600 rating) as standard. Additional auxiliary contacts, two normally open and two normally closed, can be added in the field.

Description	Cat. No.
Auxiliary Contact (10 A @ 600V)	1195C-N3
Auxiliary Contact (10 mA @ 5V DC)	1195C-N4

Lug Kit (3 per kit)

Continuous Current Rating [A]	Wire Size	Cat. No.
200	2/0...250 MCM	1195C-LK1
400	(2) #6...300 MCM	1195C-LK2
600	(2) #2...600 MCM	1195C-LK3

Control Module

Side-mounted module for DC input voltage

Continuous Current Rating [A]	Input Voltage	Cat. No.
200/400/600	125V DC	1195C-N5
	250V DC	1195C-N6

Control Pak

Side-mounted module for DC coil power

Continuous Current Rating [A]	Input Voltage	Cat. No.
200	110/120V AC	1102C-CP2D
	220/240V AC	1102C-CP2A
	380/415V AC	1102C-CP2N
	440/480V AC	1102C-CP2B
400/600	110/120V AC	1102C-CP46D
	220/240V AC	1102C-CP46A
	380/415V AC	1102C-CP46N
	440/480V AC	1102C-CP46B

Coil Kit

Contains DC coil mounted in the sheet metal frame assembly that attaches to the contactor mounting plate

Continuous Current Rating [A]	Input Voltage	Control Pak Voltage	Cat. No.
200	108V DC	110/120V AC	1102C-PK2D
		220/240V AC	1102C-PK2A
		380/415V AC	1102C-PK2N
		440/480V AC	1102C-PK2B
	125V DC	—	1102C-PK2G
	250V DC	—	1102C-PK2H
400	108V DC	110/120V AC	1102C-PK4D
		220/240V AC	1102C-PK4A
		380/415V AC	1102C-PK4N
		440/480V AC	1102C-PK4B
	125V DC	—	1102C-PK4G
	250V DC	—	1102C-PK4H
600	108V DC	110/120V AC	1102C-PK6D
		220/240V AC	1102C-PK6A
		380/415V AC	1102C-PK6N
		440/480V AC	1102C-PK6B
	125V DC	—	1102C-PK6G
	250V DC	—	1102C-PK6H

Vacuum Interrupter Phase Assembly Kit

Replacement for one vacuum interrupter phase

Current Rating of Interrupter [A]	Cat. No.
200 A Vacuum Interrupter Phase Assembly	1102C-VB2
400 A Vacuum Interrupter Phase Assembly	1102C-VB4
600 A Vacuum Interrupter Phase Assembly	1102C-VB6



Vacuum Contactors

Specifications/Approximate Dimensions

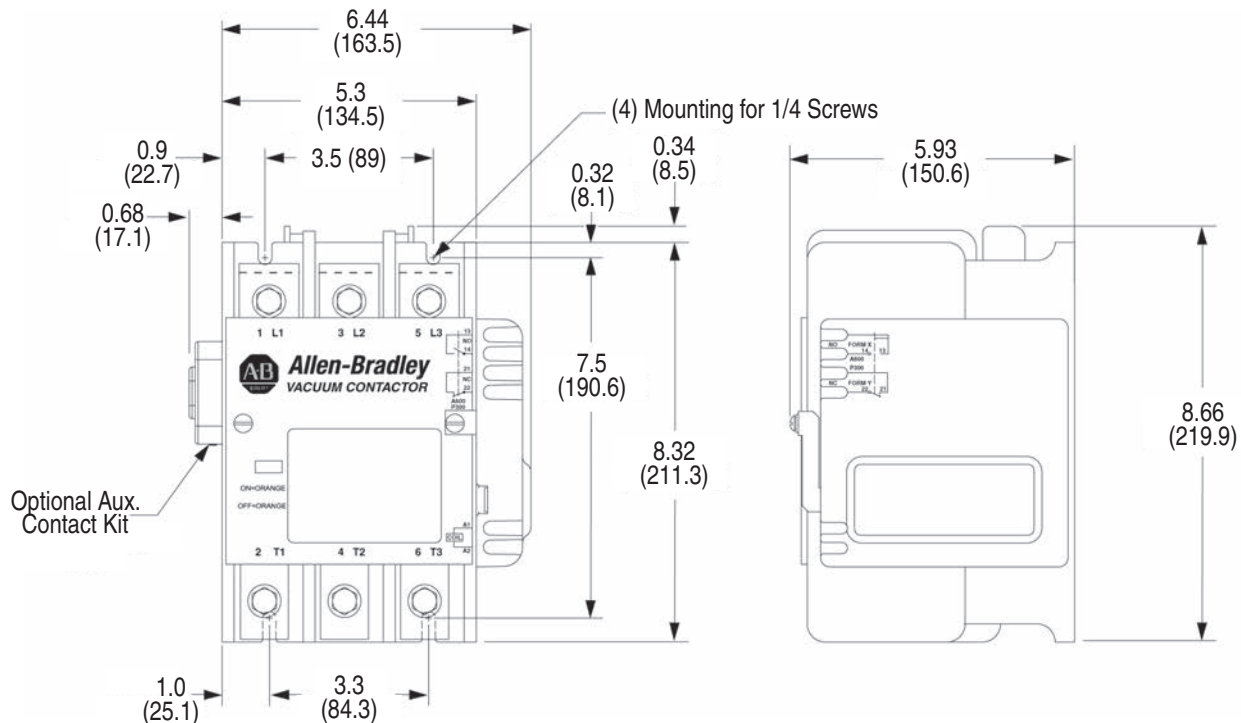
Specifications

	200 A	400 A	600 A
Standards	EN 60947-4 1000V UL 508 CSA 22.2 1500V	EN 60947-4 1000V UL 508 CSA 22.2 1500V	EN 60947-4 1000V UL 508 CSA 22.2 1500V
Power Ratings			
Insul. & Operating Voltage	200...1500V	200...1500V	200...1500V
Rated Frequency	50...400 Hz	50...400 Hz	50...400 Hz
Making Current Capacity	1600 A	3200 A	4800 A
Breaking Current Capacity	1600 A	3200 A	4800 A
Dielectric Strength	6Kv - 1 Min. Interrupter GAP	6Kv - 1 Min. Interrupter GAP	6Kv - 1 Min. Interrupter GAP
Interrupting Current (Max.)	2.2 kA	4.6 kA	6 kA
Short Circuit Withstand (Max.)	10 kA symmetrical amps @ 1500V AC	18 kA symmetrical amps @ 1500V AC	30 kA symmetrical amps @ 1500V AC
Mechanical Life	1 200 000	1 000 000	750 000
Elect. Life AC3 Duty	500 000	500 000	250 000
Switching Frequency (Mechanical)	1102C, 1109 1104C 1000/hr (max.) 1.5/s (full cycle)	1000/hr (max.) 1.5/s (full cycle)	1000/hr (max.) 1.5/s (full cycle)
Withstand current for 3 sec [kA]	3.2	6.0	6.5
Chop Current Max.	0.9 A	0.9 A	0.9 A
Control Ratings			
Coil Voltage Operation	-15% +10%	-15% +10%	-15% +10%
Inrush Power VA	1200VA	1100VA	1600VA
Sealed Power VA	12VA	12VA	14VA
Opening Time [ms]	150...165	95...150	120...195
Closing Time [ms]	13...18	30...40	30...40
Pick-Up Voltage	80% Cold 85% Hot	80% Cold 85% Hot	80% Cold 85% Hot
Drop-Out Voltage	50% or less	50% or less	50% or less
Application Ratings			
Mounting Installation	All planes	All planes	All planes
Altitude	6600 ft (2000 m)	6600 ft (2000 m)	6600 ft (2000 m)
Ambient Storage	-65...+160 °F (-54...71 °C)	-65...+160 °F (-54...71 °C)	-65...+160 °F (-54...71 °C)
Operating Temperature	-40...+135 °F (-40...57 °C)	-40...+135 °F (-40...57 °C)	-40...+135 °F (-40...57 °C)
Vibration/Shock	40 Hz: 2 G/50 G	40 Hz: 2 G/50 G	40 Hz: 2 G/50 G

Approximate Dimensions

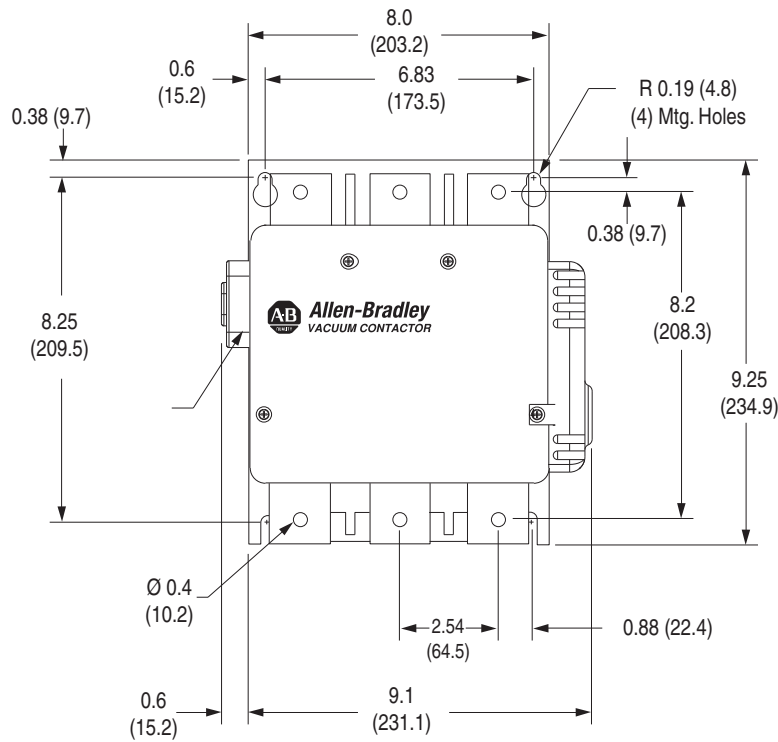
Dimensions are shown in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Bulletin 1102C (200 A)

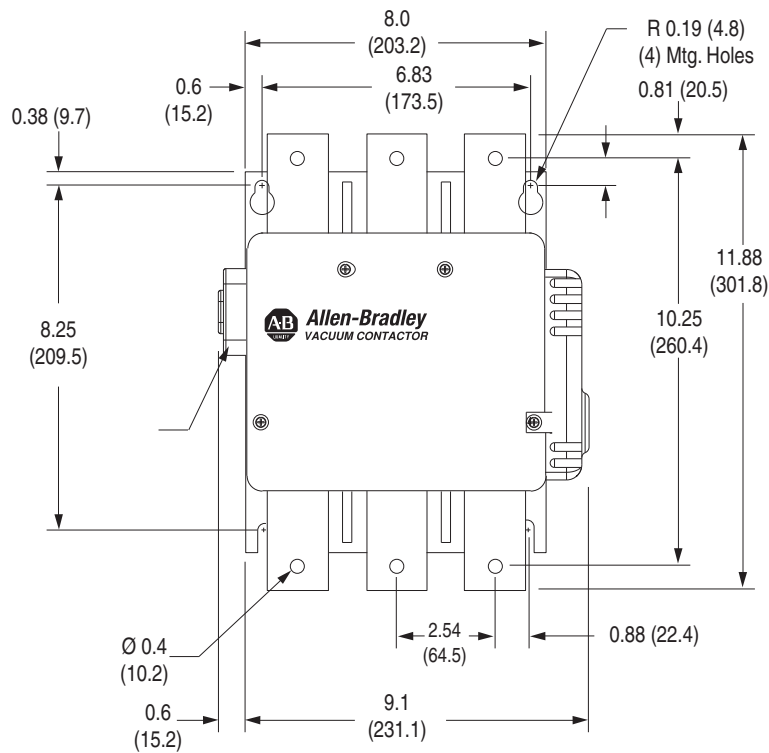
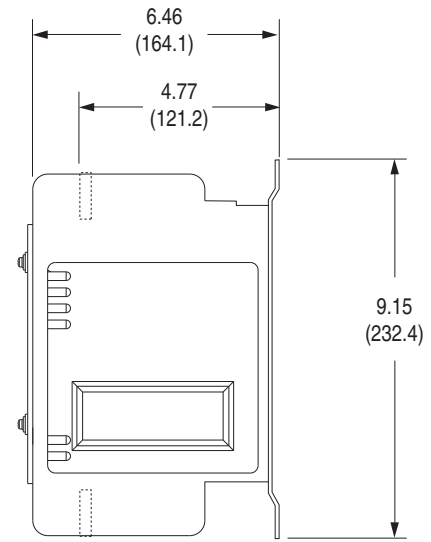


Dimensions are shown in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

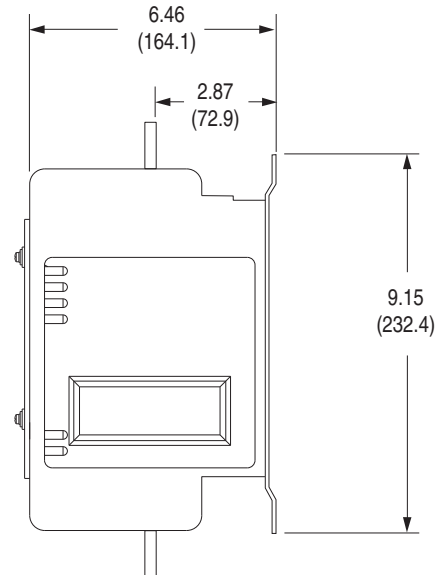
Bulletin 1102C (400 A and 600 A)



400 A



600 A



Vacuum Contactors

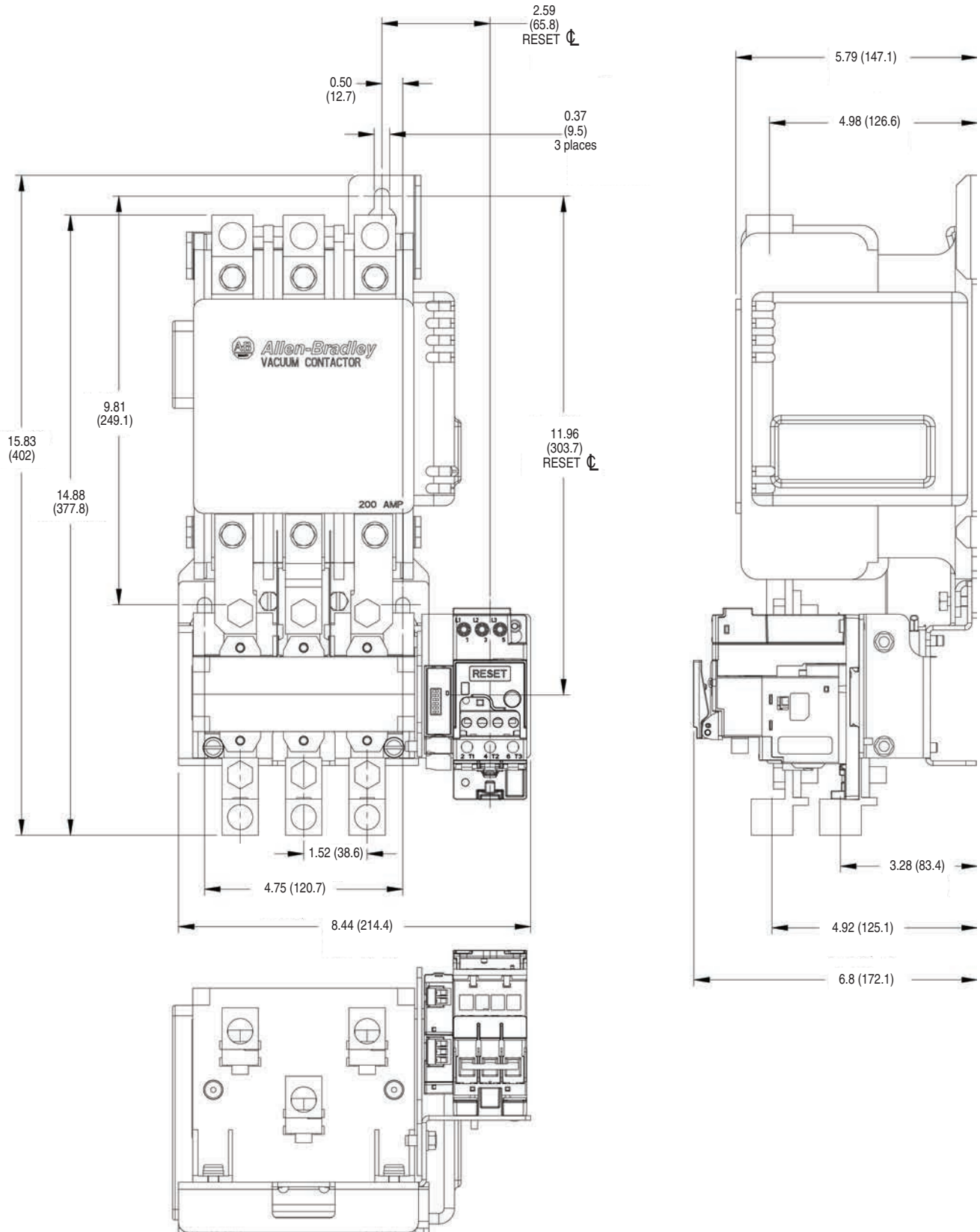
Approximate Dimensions

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

Bulletin 1109 (200 A)

With E1 Plus Overload

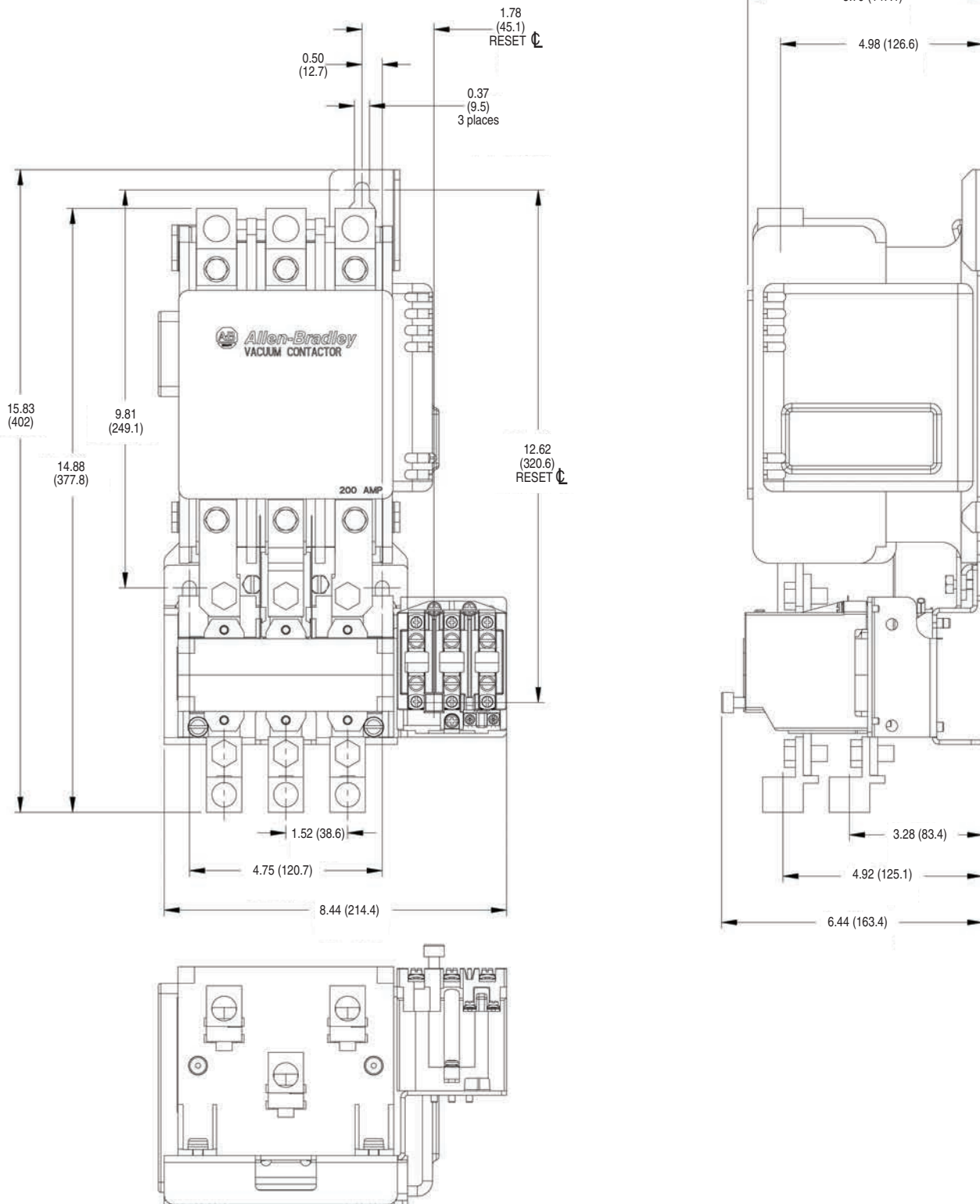
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Dimensions are shown in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Bulletin 1109 (200 A)
 With Eutectic Overload

1



Vacuum Contactors

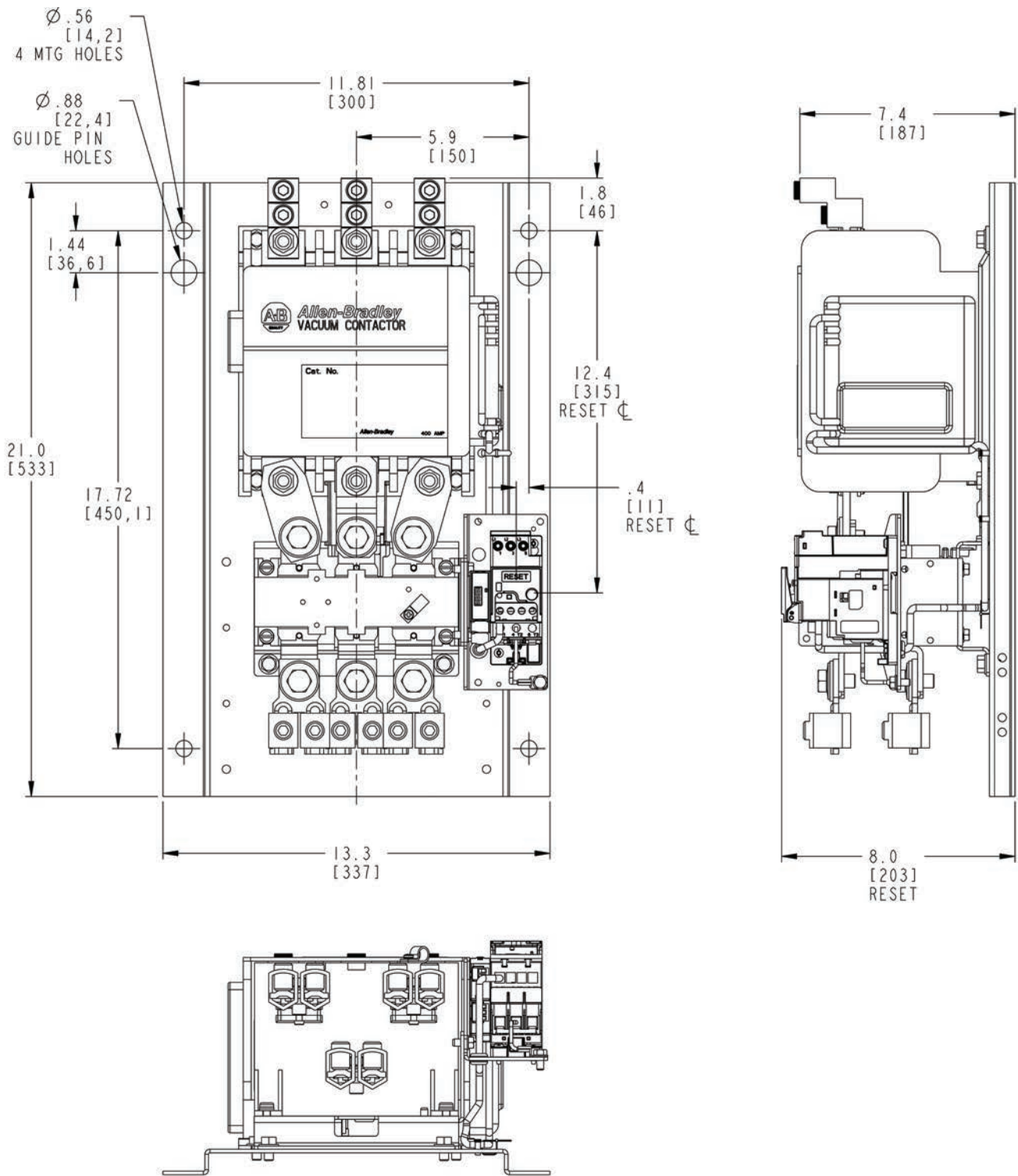
Approximate Dimensions

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

Bulletin 1109 (400 A)

With E1 Plus Overload

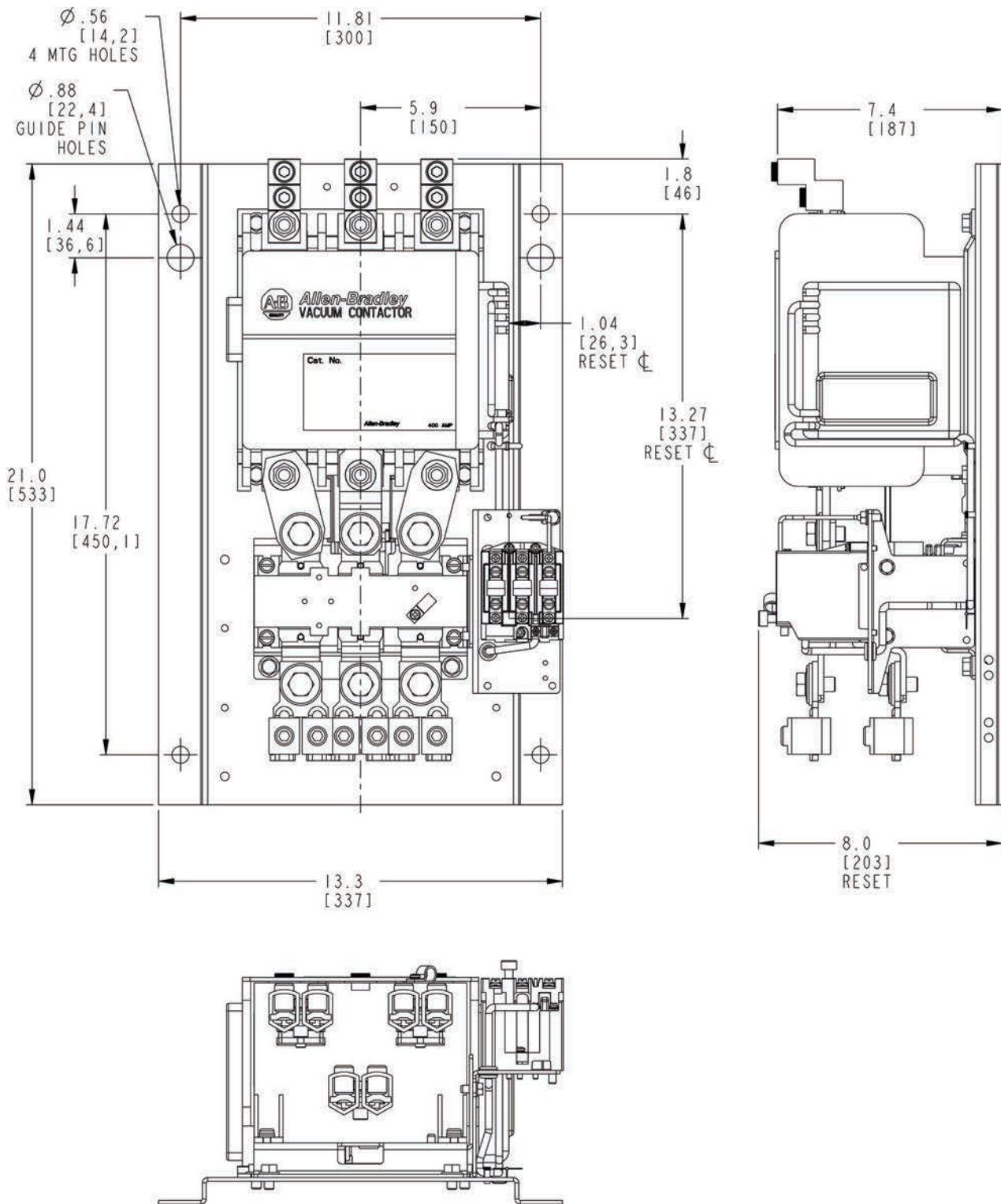
1



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

Bulletin 1109 (400 A)

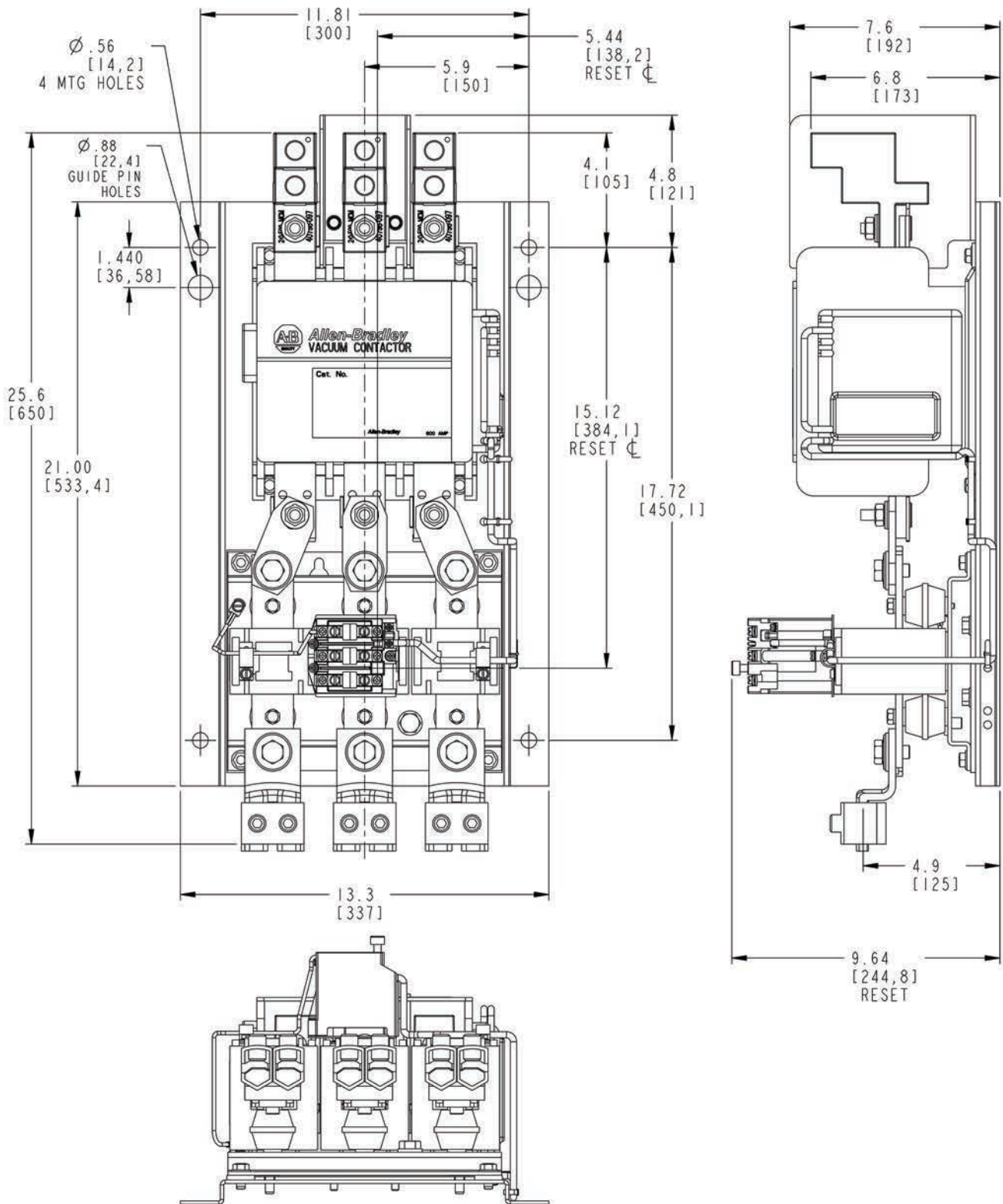
With Eutectic Overload



1

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

Bulletin 1109 (600 A)
 With Eutectic Overload



1

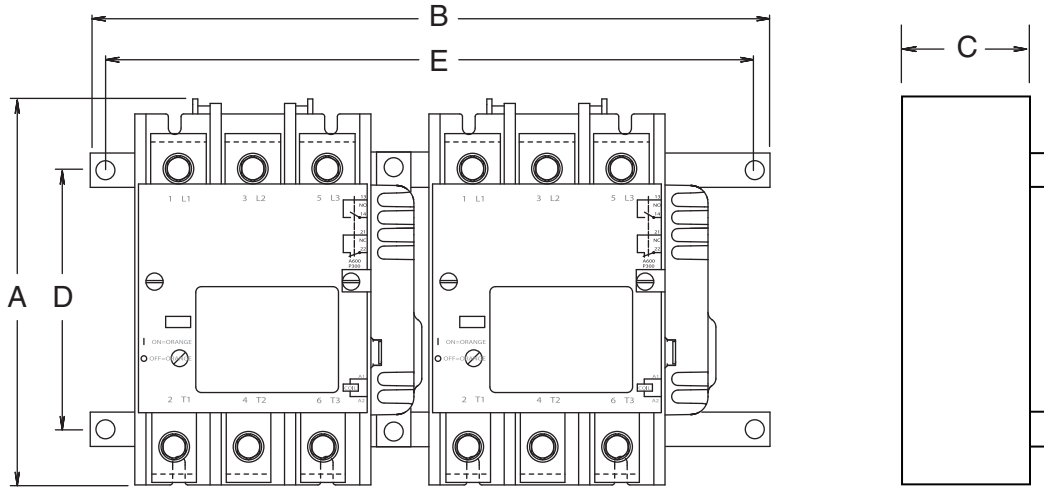
Vacuum Contactors

Approximate Dimensions

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



Bulletin 1104C (200, 400, 600 A)

1




Contactor Size [A]	A Height	B Width	C Depth	D Mounting Height	E Mounting Width
200	8.375 (213)	14 (358)	6.5 (202)	7 (210)	13 (322)
400	9.25 (235)	21 (533)	7.10 (232)	7.85 (272)	19.5 (495)
600	12 (305)	21 (533)	7.10 (232)	10.82 (280)	19.5 (495)



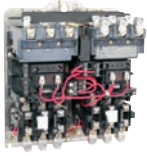
NEMA AC Contactors

		
Bulletin	500	500F
Description	Top-wired contactor	Feed-through contactor
NEMA Size	00...9	0...5
Continuous Ampere Rating [A]	9...2250	18...270
Availability	NEMA size 0...4, open type Modular kits and components NEMA size 00, 5...9, open type Factory assembled NEMA size 00...9, enclosed Factory assembled	NEMA size 0...4, open type Modular kits and components NEMA size 5, open type Factory assembled NEMA size 0...5, enclosed Factory assembled
Enclosures (NEMA Type)	1, 3R/4/12, 4/4X, 7, and 9	—
Standards	<ul style="list-style-type: none"> NEMA/EEMAC ICS2 (Industrial Controls and Systems) UL 508 CSA C22.2, No. 14 ABS 4/5.115 USCG 46 CFR 111.70 IEEE 45 	<ul style="list-style-type: none"> NEMA/EEMAC ICS2 (Industrial Controls and Systems) UL 508 CSA C22.2, No. 14 ABS 4/5.115 USCG 46 CFR 111.70 IEEE 45
Certifications	<ul style="list-style-type: none"> UL Listed (File No. E3125; Guide No. NLDX) (File No. E10314; Guide No. NPKR) CSA Certified (LR1234) CE Marked (Per EN 60947) American Bureau of Shipping (ABS) 	<ul style="list-style-type: none"> UL Listed (File No. E3125; Guide No. NLDX) (File No. E10314; Guide No. NPKR) CSA Certified (LR1234) CE Marked (Per EN 60947) American Bureau of Shipping (ABS)
Product Selection	Page 1-31	Page 1-36

NEMA Compact AC Contactors and Starters

	
Bulletin	300, 305, 309
Features	<ul style="list-style-type: none"> Modular line of NEMA contactors & starters Space saving design Electronic & conventional coils DIN Rail mountable Common accessories Guarded terminals
NEMA Size	0...5
DIN Rail Mountable	✓
Certifications	cULus Listed (File No. E41850, Guide No. NLDX, NLDX7) CE Marked (per EN60947-4-1)
Product Selection	Page 1-60

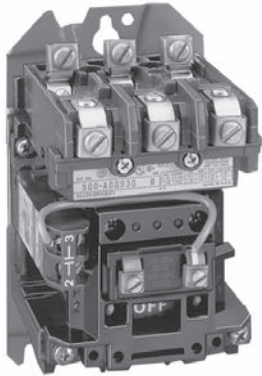
NEMA Starters

			
Bulletin	505	509	520
Description	Reversing starters	Non-reversing starters	Multi-speed starters
	3-Phase 600V, 3-Pole Overload Protection		
NEMA Size	00...8	00...9	0...7
Continuous Ampere Rating	9...1215 A	9...2250 A	18...810 A
Availability	All sizes Factory assembled	NEMA size 0...4, open type Modular kits and components NEMA size 00, 5...9, open type Factory assembled NEMA size 00...9, enclosed Factory assembled	All sizes Factory assembled
Enclosure Type	1, 3R/4/12, 4/4X, 7, and 9	1, 3R/4/12, 4/4X, 7, and 9	1, 3R/4/12, 4/4X, 7, and 9
Standards	<ul style="list-style-type: none"> NEMA/EEMAC ICS 2 (Industrial Controls and Systems) UL 508 CSA C22.2, No. 14 ABS 4/5.115 USCG 46 CFR 111.70 	<ul style="list-style-type: none"> NEMA/EEMAC ICS 2 (Industrial Controls and Systems) UL 508 CSA C22.2, No. 14 ABS 4/5.115 USCG 46 CFR 111.70 	<ul style="list-style-type: none"> NEMA/EEMAC ICS (Industrial Controls and Systems) UL 508 CSA C22.2, No. 14 ABS 4/5.115
Certifications	<ul style="list-style-type: none"> UL Listed (File No. E3125; Guide No. NLDX) CSA Certified (File LR 1234) CE Marked (per EN 60947-4-1) American Bureau of Shipping (ABS) Hazardous Location: UL Listed (File No. E10314), CSA Certified (File No. LR 11924) 	<ul style="list-style-type: none"> UL Listed (File No. E3125; Guide No. NLDX) CSA Certified (File LR 1234) Hazardous Location: UL Listed (File No. E10314), CSA Certified (File No. LR 11924) 	<ul style="list-style-type: none"> UL Listed (File No. E3125; Guide No. NLDX) CSA Certified (File LR 1234) Hazardous Location: UL Listed (File No. E10314), CSA Certified (File No. LR 11924)
Product Selection	Page 1-39	Page 1-46	Page 1-53

NEMA Top-Wired AC Contactors

Product Overview/Cat. No. Explanation

1



*Size 0, 3-Pole,
Open Type without
Enclosure
Top Wiring Construction*

Bulletin 500 Open Type Top-Wired Contactor

- All power connections are at the top of the contactor for wiring convenience
- Contactor can be field wired for single- or three-phase applications

NEMA sizes 0...4 (open type)

- Available as components or a modular kit for faster delivery
- Product selection can be done via two options:
 - Ordering a complete kit
 - Ordering individual components
- Top-wired contactor includes a 120V AC coil, (1) N.O. auxiliary contact, top-wiring kit, and load-side terminal shield, as standard

NEMA sizes 00, 5...9 (open type)

- Available as factory assembled

NEMA sizes 00...9 (enclosed)

- Available as factory assembled

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 Modifications 1-106
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 Coil Data 1-129
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 Approximate Dimensions 1-133
 Renewal Parts 1-157

Standards Compliance

NEMA/EEMAC ICS 2
 UL 508
 CSA C22.2 No.14
 ABS 4/5.115 — American Bureau of Shipping
 UCSG 46 CFR 111.70
 IEEE 45
 EN/IEC 60947-4-1
 CE Marked

Certifications

- CSA Certified (LR1234)
- UL Listed (File No. E3125, Guide No. NLDX)
- Hazardous Location:
 UL Listed (File No. E10314)
 CSA Certified (LR11924)

Catalog Number Explanation

Example Cat. No.

500 – **B** **A** **D** – **930** – **1**
a *b* *c* *d* *e* *f*

a

Bulletin No.	
Bulletin No.	Description
500	Top-wired contactor
500DC	Top-wired contactor (DC voltage)

b

NEMA Size	
Code	Description
T	00
A	0
B	1
C	2
D	3
E	4
F	5
G	6
H	7
J	8
K	9

c

NEMA Enclosure Type	
Code	Type
A	Type 1
C	Type 4X (stainless steel)
E	Type 7 & 9 bolted
H	Type 3R, 7 & 9 bolted
J	Type 12
O	No enclosure

d

Nominal Coil Voltage		
Code	Voltage	Frequency
A	220V 240V	50 Hz 60 Hz
B	440V 480V	50 Hz 60 Hz
C	550V 600V	50 Hz 60 Hz
D	110V 120V	50 Hz 60 Hz
F	277V	60 Hz
H	200...208V	60 Hz
I	415V	50 Hz
J	24V	50/60 Hz
N	380V	50 Hz
VL	24V DC	—
VG	125...250V DC	—

e

Number of Poles	
Code	Voltage Description
930	Three Power Poles and (1) N.O. Auxiliary Contact
940	Four Power Poles and (1) N.O. Auxiliary Contact
950	Five Power Poles and (1) N.O. Auxiliary Contact

f

Factory Installed Modifications/Options	
For detailed information, see Modifications on page 1-107.	

or

Options	
Code	Description
17	Surge Suppressor for 120 or 240V AC Coil
90	(1) N.O. Auxiliary Contact*
91	(1) N.C. Auxiliary Contact*

* Up to (6) combinations of auxiliary contacts can be selected. Example: Code 90011 indicates (2) N.O. and (2) N.C. contacts.

NEMA Top-Wired AC Contactors

Product Selection — Open Type Modular Kit

Product Selection of NEMA size 0...4 Modular Kits



1

Base Contactor
Includes a 120V AC coil and (1) N.O. auxiliary contactor as standard.

NEMA Size	Continuous Ampere Rating [A]	Max. Horsepower Rating Full Load Current Must Not Exceed "Continuous Ampere Rating"						600V AC Maximum • 60 Hz		
		1-Phase Motor Voltage		3-Phase Motor Voltage				3 Power Poles	4 Power Poles	5 Power Poles
		115V	230V	200V	230V	50 Hz 380...415V	460...575V	Cat. No.	Cat. No.	Cat. No.
00	9	1/3	1	1.5	1.5	2	2	*	*	—
0	18	1	2	3	3	5	5	500-AO®930	500-AO®940	500-AO®950
1	27	2	3	7.5	7.5	10	10	500-BO®930	500-BO®940	500-BO®950
2	45	3	7.5	10	15	25	25	500-CO®930	500-CO®940	500-CO®950
3	90	7.5	15	25	30	50	50	500-DO®930	500-DO®940	500-DO®950
4	135	—	—	40	50	75	100	500-EO®930	500-EO®940	500-EO®950
5	270	—	—	75	100	150	200	*	*	—
6	540	—	—	150	200	300	400	*	—	—
7	810	—	—	—	300	600	600	*	—	—
8	1215	—	—	—	450	900	900	*	—	—
9	2250	—	—	—	800	1600	1600	*	—	—

* See page 1-33 for NEMA size 00, 5...9 open type contactors and NEMA size 00...9 enclosed contactors.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 500-AO®940** becomes **Cat. No. 500-AOD940**.

[V]	24	110	120	125	208	220	240	250	277	380	415	440	480	550	600
AC, 50 Hz	J	D	—	—	—	A	—	—	—	N	I	B	—	C	—
AC, 60 Hz	J	—	D	—	H	—	A	—	F	—	—	—	B	—	C
DC➤	VL	—	—	VG	—	—	—	VG	—	—	—	—	—	—	—

➤ DC voltage code is only available for NEMA sizes 0...3. When ordering a DC voltage code (VL or VG), add "DC" to the catalog number. Example: 500DC-BOVL930.

Note: The base contactor includes a 120V AC coil as standard. For all other voltages, a second coil will be included in the modular kit for field swap out.

Options for Modular Kit

Options	
Code	Description
17	Surge Suppressor for 120 or 240V AC Coil
90	(1) N.O. Auxiliary Contact*
91	(1) N.C. Auxiliary Contact*

* Up to (6) combinations of auxiliary contacts can be selected. Example: Code 90011 indicates (2) N.O. and (2) N.C. contacts.

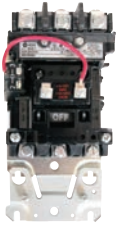
Example: **Cat. No. 500-COD930-17-90** includes a NEMA size 2, 3-pole, contactor with a 120V AC coil, surge suppressor, and (1) N.O. auxiliary contact.

NEMA Top-Wired AC Contactors

Product Selection — Open Type Components

Product Selection of NEMA sizes 0...4 by Components

1



Base Contactor



Coil



Auxiliary Contact Contactor



Surge Suppressor



Power Pole



Top Wire Kit



Load -Side Terminal Shield

Base Contactor

NEMA Size	Continuous Ampere Rating [A]	Cat. No.
0	18	500F-AOD930
1	27	500F-BOD930
2	45	500F-COD930
3	90	500F-DOD930
4	135	500F-EOD930

Coils

Description	NEMA Size			
	0...1	2	3	4
	Cat. No.	Cat. No.	Cat. No.	Cat. No.
24V 50/60 Hz	CB013	CC013	CD013	CE013
110V 50 Hz, 120V 60 Hz	CB236	CC236	CD236	CE236
208V 60 Hz	CB249	CC249	CD249	CE249
220V 50 Hz, 240V 60 Hz	CB254	CC254	CD254	CE254
277V 60 Hz	CB260	CC260	CD260	CE260
380V 50 Hz	CB354	CC354	CD354	CE354
415V 50 Hz	CB357	CC357	CD357	CE357
440V 50 Hz, 480V 60 Hz	CB273	CC273	CD273	CE273
550V 50 Hz, 600V 60 Hz	CB278	CC278	CD278	CE278
24V DC	599-B24DC	599-C24DC	599-D24DC	—
125...250V DC	599-B250DC	599-C250DC	599-D250DC	—

Note: The base contactor includes a 120V AC coil as standard. For all other voltages, select an alternate component coil for field installation.

Surge Suppressor

Description	NEMA Size	Cat. No.
12...120V AC	0...5	599-K04
240...264V AC Varistor		599-KA04

Power Pole Adders

Description	NEMA Size	Cat. No.
1 N.O.	0...1	599-P01A
1 N.O.	2	599-P2A
1 N.O.	3	599-P3A
1 N.O.	4	599-P4A

Top Wiring Kit

NEMA Size	Cat. No.
0...1	599-TW01
2	599-TW2
3	599-TW3
4	599-TW4

Terminal Shield Kit

NEMA Size	Cat. No.
0...2	599-TS02
3,4	599-TS34

Auxiliary Contact — Contactors

Description	NEMA Size	Cat. No.
1 N.O.	0...5	595-A
2 N.O.	0...5	595-AA
1 N.C.	0...5	595-B
2 N.C.	0...5	595-BB
1 N.O. and N.C.	0...5	595-AB



NEMA Top-Wired AC Contactors

Product Selection — Factory Assembled Open Type and Enclosed

Product Selection of NEMA sizes 00...9 as Factory Assembled

NEMA Size	Continuous Ampere Rating [A]	Max. Horsepower Rating Full Load Current Must Not Exceed "Continuous Ampere Rating"				Open Type Without Enclosure	Type 1 General Purpose Enclosure	Type 3R/4/12 Rainproof, Dusttight Industrial Use Enclosure	Type 4/4X Watertight, Corrosion-Resistant Enclosures Stainless Steel*
		Motor Voltage							
		200V	230V	50 Hz 380...415V	460...575V	Cat. No.	Cat. No.	Cat. No.	Cat. No.
3-Phase • 3 Power Poles • 600V AC Maximum • 60 Hz									
00	9	1-1/2	1-1/2	2	2	500-TO®930	500-TA®930	—	—
0	18	3	3	5	5	♣	500-AA®930	500-AJ®930	500-AC®930
1	27	7.5	7.5	10	10	♣	500-BA®930	500-BJ®930	500-BC®930
2	45	10	15	25	25	♣	500-CA®930	500-CJ®930	500-CC®930
3	90	25	30	50	50	♣	500-DA®930	500-DJ®930	500-DC®930
4	135	40	50	75	100	♣	500-EA®930	500-EJ®930	500-EC®930
5	270	75	100	150	200	500-FO®930	500-FA®930	500-FJ®930	500-FC®930
6‡§	540	150	200	300	400	500-GO®930	500-GA®930	500-GJ®930	500-GC®930
7‡	810	—	300	600	600	500-HO®930	500-HA®930	500-HJ®930	500-HC®930
8‡	1215	—	450	900	900	500-JO®930	500-JA®930	—	—
9‡	2250	—	800	1600	1600	500-KO®930	500-KA®930	—	—

* Fiberglass-reinforced polyester hubs are included with each starter at no additional charge.

⊛ On size 7 and larger, the auxiliary contact is located on the interposing relay.

‡ Does not include line and load lugs, see page 1-112 for kits.

§ Size 6 has feed through wiring.

♣ See page 1-31 for NEMA size 0...4 open type contactors.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 500-AO®940** becomes **Cat. No. 500-AOD940**.

[V]	24	110	120	125	208	220	240	250	277	380	415	440	480	550	600
AC, 50 Hz	J	D	—	—	—	A	—	—	—	N	I	B	—	C	—
AC, 60 Hz	J	—	D	—	H	—	A	—	F	—	—	—	B	—	C
DC➤	VL	—	—	VG	—	—	—	VG	—	—	—	—	—	—	—

➤ When ordering a DC voltage code, add **DC** to the catalog number. Example: **Cat. No. 500DC-BOVL930**.



NEMA Top-Wired AC Contactors

Product Selection — Factory Assembled Open Type and Enclosed

Product Selection of NEMA sizes 00...5 as Factory Assembled

1

NEMA Size	Continuous Ampere Rating (A)	Max. Horsepower Rating Full Load Current Must Not Exceed "Continuous Ampere Rating"				Open Type Without Enclosure	Type 1 General Purpose Enclosure	Type 3R/4/12 Rainproof, Dusttight, Industrial Use Enclosure	Type 4/4X Watertight, Corrosion- Resistant Enclosures Stainless Steel*
		Motor Voltage							
		200V	230V	50 Hz 380... 415V	460... 575V				
3-Phase • 4 Power Poles • 600V AC Maximum • 60 Hz									
00	9	1.5	1.5	2	2	—	—	—	—
0	18	3	3	5	5	♣	500-AA®940	500-AJ®940	500-AC®940
1	27	7.5	7.5	10	10	♣	500-BA®940	500-BJ®940	500-BC®940
2	45	10	15	25	25	♣	500-CA®940	500-CJ®940	500-CC®940
3	90	25	30	50	50	♣	500-DA®940	500-DJ®940	500-DC®940
4	135	40	50	75	100	♣	500-EA®940	500-EJ®940	500-EC®940
5	270	75	100	150	200	500-FO®940	500-FA®940	500-FJ®940	500-FC®940
3-Phase • 5 Power Poles • 600V AC Maximum • 60 Hz									
NEMA Size	Continuous Ampere Rating [A]	200V	230V	50 Hz	460... 575V	♣	♣	♣	♣
				380... 415V					
0	18	3	3	5	5	♣	500-AA®950	500-AJ®950	500-AC®950
1	27	7.5	7.5	10	10	♣	500-BA®950	500-BJ®950	500-BC®950
2	45	10	15	25	25	♣	500-CA®950	500-CJ®950	500-CC®950
3	90	25	30	50	50	♣	500-DA®950	500-DJ®950	500-DC®950
4	135	40	50	75	100	♣	500-EA®950	500-EJ®950	500-EC®950

- * Fiberglass-reinforced polyester hubs are included with each starter.
- ♣ On size 7 and larger, the auxiliary contact is located on the control relay.
- ♣ See page 1-31 for NEMA size 0...4 open type contactors.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 500-AO®940** becomes **Cat. No. 500-AOD940**.

[V]	24	110	120	125	208	220	240	250	277	380	415	440	480	550	600
AC, 50 Hz	J	D	—	—	—	A	—	—	—	N	I	B	—	C	—
AC, 60 Hz	J	—	D	—	H	—	A	—	F	—	—	—	B	—	C
DC➤	VL	—	—	VG	—	—	—	VG	—	—	—	—	—	—	—

➤ When ordering a DC voltage code, add "DC" to the catalog number. Example: **Cat. No. 500DC-BOVL930**.

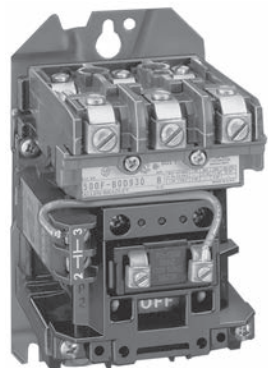
Special Purpose Enclosures

Description		Hazardous Locations — Bolted Enclosures*	
Contactor		Type 7 & 9 Class I, Groups C & D Class II, Groups E, F, & G — Divisions 1 & 2 —	Type 3R, 7 & 9 Class I, Groups C & D Class II, Groups E, F, & G — Divisions 1 & 2 —
Size	Poles	Available	Available
0	3		
1	3		
2	3		
3	3		
4	3		
5	3		



NEMA Feed-Through AC Contactors

Product Overview/Cat. No. Explanation



**Size 1, 3-Pole
Open Type without Enclosure
Feed-Through Construction
with Auxiliary Contact**

Bulletin 500F Open Type Feed-Through Contactor

- Feed-through construction
- Contactor can be field wired for single- or three-phase applications

NEMA sizes 0...4 (open type)

- Available as components or a modular kit for faster delivery
- Product selection can be done via two options:
 - Ordering a complete kit
 - Ordering individual components
- Feed-through contactor includes a 120V AC coil and (1) N.O. auxiliary contact, as standard

NEMA size 5 (open type)

- Available as factory assembled

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Standards Compliance

NEMA/EEMAC ICS 2
 UL 508
 CSA C22.2 No.14
 ABS 4/5.115 — American Bureau of Shipping
 UCSG 46 CFR 111.70
 IEEE 45
 EN/IEC 60947-4-1

Certifications

CE Marked
 CSA Certified (LR1234)
 UL Listed (File No. E3125, Guide No. NLDX)

Catalog Number Explanation

For flexibility, devices may be ordered in a convenient modular kit or as individual components.

A modular kit includes:

- Base contactor
- Selectable options
- Selectable coil voltage

Modular Kit Example Cat. No.

500F – B O D – 930 – 17
a b c d e f

a

Bulletin No.	
Bulletin No.	Description
500F	Feed-through contactor
500FC	Feed-through contactor (DC voltage)

b

NEMA Size	
Code	Description
A	0
B	1
C	2
D	3
E	4

c

NEMA Enclosure Type	
Code	Type
O	No enclosure

d

Nominal Coil Voltage		
Code	Voltage	Frequency
A	220V 240V	50 Hz 60 Hz
B	440V 480V	50 Hz 60 Hz
C	550V 600V	50 Hz 60 Hz
D	110V 120V	50 Hz 60 Hz
F	277V	60 Hz
H	200...208V	60 Hz
I	415V	50 Hz
J	24V	50/60 Hz
N	380V	50 Hz
VL	24V DC	—
VG	125...250V DC	—

e

Number of Poles	
Code	Voltage Description
930	Three Power Poles and (1) N.O. Auxiliary Contact

f

Options	
Code	Voltage Description
17	Surge Suppressor for 120 or 240V AC Coil
90	(1) N.O. Auxiliary Contact*
91	(1) N.C. Auxiliary Contact*

* Up to (6) combinations of auxiliary contacts can be selected. Example: Code 90011 indicates (2) N.O. and (2) N.C. contacts.

NEMA Feed-Through AC Contactors

Product Selection — Modular Kit

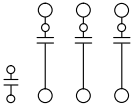
Product Selection of NEMA sizes 0...4 by Modular Kits



1

Base Contactor

Includes a 120V AC coil and (1) N.O. auxiliary contactor as standard.

NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed "Continuous Ampere Rating"						 3 Power Poles • 600V AC Maximum • 60 Hz	
		1-Phase Motor Voltage		3-Phase Motor Voltage				Cat. No.	
		115V	230V	200V	230V	50 Hz 380...415V	460...575V		
0	18	—	3	3	3	5	5	500F-AO[⊗]930	
1	27	—	7.5	7.5	7.5	10	10	500F-BO[⊗]930	
2	45	—	15	10	15	25	25	500F-CO[⊗]930	
3	90	—	30	25	30	50	50	500F-DO [⊗] 930	
4	135	—	50	40	50	75	100	500F-EO[⊗]930	
5	270	—	—	75	100	150	200	♣	

♣ See page 1-38 for NEMA size 5 contactors.

⊗ Coil Voltage Code

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

Example: **Cat. No. 500F-AO[⊗]930** becomes **Cat. No. 500F-AOD930**. For other voltages, please consult your local Rockwell Automation sales office or Allen-Bradley distributor.

[V]	24	110	120	125	208	220	240	250	277	380	415	440	480	550	600
AC, 50 Hz	J	D	—	—	—	A	—	—	—	N	I	B	—	C	—
AC, 60 Hz	J	—	D	—	H	—	A	—	F	—	—	—	B	—	C
DC	VL	—	—	VG	—	—	—	VG	—	—	—	—	—	—	—

➤ DC voltage code is only available for NEMA sizes 0...3. When ordering a DC voltage code (VL or VG), add "C" to the catalog number. Example: **Cat. No. 500FC-BOVL930**.

Note: The base contactor includes a 120V AC coil as standard. For all other voltages, a second coil will be included in the modular kit for field swap out.

Options for Modular Kit

Options	
Code	Description
17	Surge Suppressor for 120 or 240V AC Coil
90	(1) N.O. Auxiliary Contact*
91	(1) N.C. Auxiliary Contact*

* Up to (6) combinations of auxiliary contacts can be selected. Example: Code 90011 indicates (2) N.O. and (2) N.C. contacts.

Example: **Cat. No. 500F-COD930-17-90** includes a NEMA size 2, 3-pole, contactor with a 120V AC coil, surge suppressor, and (1) N.O. auxiliary contact.



Product Selection of NEMA size 0...4 by Components



Base Contactor



Coil



Auxiliary Contact Contactor



Surge Suppressor

1

Base Contactor

NEMA Size	Continuous Ampere Rating [A]	Cat. No.
0	18	500F-AOD930
1	27	500F-BOD930
2	45	500F-COD930
3	90	500F-DOD930
4	135	500F-EOD930

Auxiliary Contact — Contactors

Description	NEMA Size	Cat. No.
1 N.O.	0...5	595-A
2 N.O.	0...5	595-AA
1 N.C.	0...5	595-B
2 N.C.	0...5	595-BB
1 N.O. and N.C.	0...5	595-AB

Coils

Description	NEMA Size			
	0...1	2	3	4
	Cat. No.	Cat. No.	Cat. No.	Cat. No.
24V 50/60 Hz	CB013	CC013	CD013	CE013
110V 50 Hz, 120V 60 Hz	CB236	CC236	CD236	CE236
208V 60 Hz	CB249	CC249	CD249	CE249
220V 50 Hz, 240V 60 Hz	CB254	CC254	CD254	CE254
277V 60 Hz	CB260	CC260	CD260	CE260
380V 50 Hz	CB354	CC354	CD354	CE354
415V 50 Hz	CB357	CC357	CD357	CE357
440V 50 Hz, 480V 60 Hz	CB273	CC273	CD273	CE273
550V 50 Hz, 600V 60 Hz	CB278	CC278	CD278	CE278
24V DC	599-B24DC	599-C24DC	599-D24DC	—
125...250V DC	599-B250DC	599-C250DC	599-D250DC	—

Surge Suppressor

Description	NEMA Size	Cat. No.
12...120V AC	0...5	599-K04
240...264V AC Varistor		599-KA04

Note: The base contactor includes a 120V AC coil as standard. For all other voltages, select an alternate component coil for field installation.

NEMA Feed-Through AC Contactors

Product Selection — Factory Assembled

Product Selection of NEMA sizes 0...5 as Factory Assembled



1

2 Power Poles • 600V AC Maximum • 60 Hz

NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed "Continuous Ampere Rating"		Open Type Without Enclosure	
		Motor Voltage		Without Auxiliary Contact	With One N.O. Auxiliary Contact
		115V	230V		
		1-Phase		Cat. No.	Cat. No.
0	18	1	2	✱	✱
1	27	2	3	✱	✱
2	45	3	7.5	—	✱
3	90	7.5	15	—	✱
4	135	—	—	—	✱
5	270	—	—	—	500F-FO [®] 920

3 Power Poles • 600V AC Maximum • 60 Hz

NEMA Size	Continuous Ampere Rating [A]	200V	230V	50 Hz			
				380...415V	460...575V		
		3-Phase					
0	18	3	3	5	5	✱	✱
1	27	7.5	7.5	10	10	✱	✱
2	45	10	15	25	25	—	✱
3	90	25	30	50	50	—	✱
4	135	40	50	75	100	—	✱
5	270	75	100	150	200	—	500F-FO [®] 930

✱ See page 1-36 for NEMA size 0...4 contactors.

⊗ Coil Voltage Code

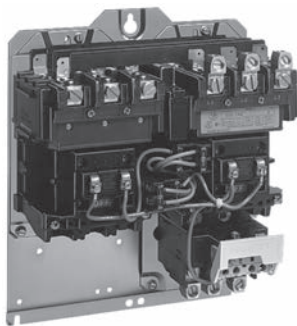
The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no.

Example: **Cat. No. 500F-AO[®]930** becomes **Cat. No. 500F-AOD930**. For other voltages, please consult your local Rockwell Automation sales office or Allen-Bradley distributor.

[V]	24	110	120	125	208	220	240	250	277	380	415	440	480	550	600
AC, 50 Hz	J	D	—	—	—	A	—	—	—	N	I	B	—	C	—
AC, 60 Hz	J	—	D	—	H	—	A	—	F	—	—	—	B	—	C
DC	VL	—	—	VG	—	—	—	VG	—	—	—	—	—	—	—

➤ When ordering a DC voltage code (VL or VG), add "C" to the catalog number. Example: **Cat. No. 500FC-BOVL930**.





Bulletin 505
 Size 2, with Solid-State
 Overload
 Open Type without Enclosure

Bulletin 505

- NEMA sizes 00...8
- Exceptional electrical life
- Dependable coil operation
- Eutectic alloy overload relays: Class 10, 20, or 30
- Solid-state overload relays: Class 10, 15, 20, or 30
- Vertically arranged available — Bulletin 505V sizes 0...5
- Enclosure ratings — NEMA Type 1, 3R/4/12, 4/4X stainless steel, and 7 & 9 hazardous location
- 3-phase and single-phase available

Bulletin 505 reversing starters are most commonly used for full voltage starting and reversing of polyphase squirrel cage motors. Size 00...8 starters are electrically and mechanically interlocked to avoid both contactors being closed simultaneously. Bulletin 505V vertically arranged starters are available in Sizes 0...5 in the open type without enclosure construction only. Bulletin 505 reversing starters are available with Bulletin 592 eutectic alloy overload relays as standard and Bulletin 592 solid-state overloads are optional for additional flexibility in motor protection.

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Standards Compliance

NEMA/EEMAC ICS 2
 UL 508
 CSA C22.2 No.14
 ABS 4/5.115 — American Bureau of Shipping
 UCSG 46 CFR 111.70
 IEEE 45
 EN/IEC 60947-4-1
 CE Marked

Certifications

CSA Certified (LR1234)
 UL Listed (File No. E3125, Guide No. NLDX)
 Hazardous Location: UL Listed (File No. E10314, CSA Certified (LR11924)

Catalog Number Explanation

Example Cat. No.

505 - B - A - D - 1
a b c d

a

NEMA Size	
Code	Description
T	00
A	0
B	1
C	2
D	3
E	4
F	5
G	6
H	7
J	8

b

NEMA Enclosure Type	
Code	Type
A	Type 1
C	Type 4X (stainless steel)
H	Type 3R, 7 & 9 bolted
J	Type 3R/4/12
O	No enclosure

c

Nominal Coil Voltage		
Code	Voltage	Frequency
A	220V	50 Hz
	240V	60 Hz
B	440V	50 Hz
	480V	60 Hz
C	550V	50 Hz
	600V	60 Hz
D	110V	50 Hz
	120V	60 Hz
F	277V	60 Hz
H	200...208V	60 Hz
I	415V	50 Hz
J	24V	50/60 Hz
N	380V	50 Hz

Note: All enclosed non-combination starters are supplied with external reset as standard, except for starters with E3 overload relay.

d

Factory Installed Modifications/Options
For detailed information, see Modifications on page 1-106.

NEMA Reversing Starters

Product Selection

3-Phase • 600V AC Maximum • 60 Hz • with 3-Pole Overload Protection

NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed "Continuous Ampere Rating"				Open Type Without Enclosure Cat. No.*⊗	Type 1 General Purpose Enclosure Surface Mounting Cat. No.*	Type 3R/4/12, Rainproof, Dusttight Industrial Use Enclosure Cat. No.*	Type 4/4X Watertight, Corrosion-Resistant Enclosures Stainless Steel Cat. No.*‡
		Motor Voltage							
		200V	230V	50 Hz 380...415V	460...575V				
00	9	1.5	1.5	2	2	505-TO⊗-⊗	505-TA⊗-⊗	—	—
0	18	3	3	5	5	505-AO⊗-⊗	505-AA⊗-⊗	505-AJ⊗-⊗	505-AC⊗-⊗
1	27	7.5	7.5	10	10	505-BO⊗-⊗	505-BA⊗-⊗	505-BJ⊗-⊗	505-BC⊗-⊗
2	45	10	15	25	25	505-CO⊗-⊗	505-CA⊗-⊗	505-CJ⊗-⊗	505-CC⊗-⊗
3	90	25	30	50	50	505-DO⊗-⊗	505-DA⊗-⊗	505-DJ⊗-⊗	505-DC⊗-⊗
4	135	40	50	75	100	505-EO⊗-⊗	505-EA⊗-⊗	505-EJ⊗-⊗	505-EC⊗-⊗
5	270	75	100	150	200	505-FO⊗-⊗	505-FA⊗-⊗	505-FJ⊗-⊗	505-FC⊗-⊗
6§♣	540	150	200	300	400	505-GO⊗-⊗	505-GA⊗-⊗	505-GJ⊗-⊗	505-GC⊗-⊗
7§	810	—	300	600	600	505-HO⊗-⊗	505-HA⊗-⊗	505-HJ⊗-⊗	505-HC⊗-⊗
8§	1215	—	450	900	900	505-JO⊗-⊗	505-JA⊗-⊗	505-JJ⊗-⊗	—

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 505-AA⊗-⊗** becomes **Cat. No. 505-AAD-⊗**. For other voltages, please consult your local Rockwell Automation sales office or Allen-Bradley distributor.

[V]		24➤	110V	120	200... 208	220	240	277	380	415	440	480	550	600
Common Control	AC, 50 Hz	—	—	—	—	A	—	—	N	I	B	—	C	—
	AC, 60 Hz	—	—	—	H	—	A	—	—	—	—	B	—	C
Transformer Control⌘	AC, 60 Hz	—	—	—	H	—	A	—	—	—	—	B	—	C
Separate Control (without transformer)	AC, 50 Hz	J	D	—	—	—	—	—	—	—	—	—	—	—
	AC, 60 Hz	J	—	D	—	—	—	F	—	—	—	—	—	—

⊛ Overload Relay Code

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete. Select an overload relay code from page 1-159 to complete the cat. no. Example: **Cat. No. 505-AAD-⊗** becomes **Cat. No. 505-AAD-A2E**.

* **Omission of Overload Relays** — Bulletin 505 reversing starters are available without overload protection. Cat. nos. for all starters without overload protection will be the listed cat. no. with the No. 23 added. Example: **Cat. No. 505-AOD-⊗** would be **Cat. No. 505-AOD-23**.

⊗ **Vertically Arranged** — Full voltage reversing starters, sizes 0...5, open type without enclosure can be supplied in a vertically arranged construction. To order, change the bulletin number in the listed cat. no. from **505** to **505V**. Example: **Cat. No. 505V-AOD-A2E** with solid-state overload relay and **Cat. No. 505V-AOD** with eutectic alloy overload relay.

‡ Fiberglass reinforced polyester hubs are included with each starter.

§ Does not include line and load lugs. See page 1-118 for kits.

♣ Price includes control circuit transformer. This applies to NEMA size 6 enclosed, only.

➤ Only available on sizes 00...5. When using 24V coils on size 4 or 5, an interposing relay may be required. See coil VA values on page 1-129.

⌘ When selecting a factory installed control circuit transformer (see Modifications on page 1-106), use the common control coil voltage code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 505-BAB-6P** will have a transformer with a 480V primary/120V secondary voltage and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second coil voltage code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 505-BABJ-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.



Heater Elements — Starters with eutectic alloy overload relay require 3 heater elements. See page 1-167 for heater element selection tables.

3-Phase • 600V AC Maximum • 60 Hz • With 3-Pole Overload Protection							
NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed “Continuous Ampere Rating”				Hazardous Locations	
		Motor Voltage				Unilock Enclosures	Bolted Enclosures
		200V	230V	50 Hz		Type 3R, 7 & 9 Class I, Groups C & D Class II, Groups E, F & G — Divisions 1 & 2 —	Type 3R, 7 & 9 Class I, Groups C & D Class II, Groups E, F & G — Divisions 1 & 2 —
				380...415V	460...575V		
0	18	3	3	5	5	505-AU⊗-⊕	505-AH⊗-⊕
1	27	7-1/2	7-1/2	10	10	505-BU⊗-⊕	505-BH⊗-⊕
2	45	10	15	25	25	—	505-CH⊗-⊕
3	90	25	30	50	50	—	505-DH⊗-⊕
4	135	40	50	75	100	—	505-EH⊗-⊕

⊗ **Coil Voltage Code**

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 505-AU⊗-⊕** becomes **Cat. No. 505-AUD-⊕**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

[V]		24➤	110V	120	200... 208	220	240	277	380	415	440	480	550	600
Common Control	AC, 50 Hz	—	—	—	—	A	—	—	N	I	B	—	C	—
	AC, 60 Hz	—	—	—	H	—	A	—	—	—	—	B	—	C
Transformer Control⊗	AC, 60 Hz	—	—	—	H	—	A	—	—	—	—	B	—	C
Separate Control (without transformer)	AC, 50 Hz	J	D	—	—	—	—	—	—	—	—	—	—	—
	AC, 60 Hz	J	—	D	—	—	—	F	—	—	—	—	—	—

⊕ **Overload Relay Code**

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete. Select an overload relay code from page 1-159 to complete the cat. no. Example: **Cat. No. 505-AUD-⊕** becomes **Cat. No. 505-AUD-A2E**.

* **Omission of Overload Relays** — Bulletin 505 reversing starters are available without overload protection. Cat. nos. for all starters without overload protection will be the listed cat. no. with the No. **23** added. Example: **Cat. No. 505-AUD-⊕** would be **Cat. No. 505-AUD-23**.

⊗ For NEMA Type 3R application it is **necessary** that a drain or breather and drain be **added**. See Factory Modifications or Accessories.

† Includes drain and cover gasket.

➤ Only available on sizes 00...5. When using 24V coils on size 4 or 5, an interposing relay may be required. See coil VA values on page 1-129.

⊗ When selecting a factory-installed control circuit transformer (see Modifications on page 1-106), use the common control coil voltage code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 505-BUB-6P** will have a transformer with a 480V primary/120V secondary voltage and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second coil voltage code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 505-BUBJ-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.

NEMA Reversing Starters

Product Selection

Heater Elements — Starters with eutectic alloy overload relays require one heater element. See page 1-167 for heater element selection tables.

1-Phase • 2-Pole • 277V AC Maximum • 60 Hz • With 1-Pole Eutectic Overload Protection

NEMA Size	Continuous Ampere Rating [A]	No. of Poles	Type Of Motor	Maximum Horsepower Rating (Each Motor) Full load current of each motor must not exceed "Continuous Ampere Rating"		Open Type Without Enclosure Cat. No.*	Type 1 General Purpose Enclosure Cat. No.*	Type 3R/4/12 Rainproof, Dusttight Industrial Use Enclosure Cat. No.*	Type 4/4X Watertight, Corrosion-Resistant Enclosure Stainless Steel Cat. No.*	Hazardous Location Enclosures Type 3R, 7 & 9 Class I, Groups C & D Class II, Groups E, F & G Division 1 & 2 Cat. No.*
				Motor Voltage						
				115V	230V					
00	9	2	3 Lead Repulsion Induction	1/3	1	505-TO-101	505-TA-101	Use Size 0 Starter		
			3 Lead Split Phase			505-TO-102	505-TA-102			
		3	4 Lead Repulsion Induction			505-TO-103	505-TA-103			
			4 Lead Split Phase			505-TO-104	505-TA-104			
0	18	2	3 Lead Repulsion Induction	1	2	505-AO-101	505-AA-101	505-AJ-101	505-AC-101	505-AH-101
			3 Lead Split Phase			505-AO-102	505-AA-102	505-AJ-102	505-AC-102	505-AH-102
		3	4 Lead Repulsion Induction			505-AO-103	505-AA-103	505-AJ-103	505-AC-103	505-AH-103
			4 Lead Split Phase			505-AO-104	505-AA-104	505-AJ-104	505-AC-104	505-AH-104
		4	4 Lead Split Phase (Break all lines)			505-AO-105	505-AA-105	505-AJ-105	505-AC-105	—
			—			—	—	—	—	—
1	27	2	3 Lead Repulsion Induction	2	3	505-BO-101	505-BA-101	505-BJ-101	505-BC-101	505-BH-101
			3 Lead Split Phase			505-BO-102	505-BA-102	505-BJ-102	505-BC-102	505-BH-102
		3	4 Lead Repulsion Induction			505-BO-103	505-BA-103	505-BJ-103	505-BC-103	505-BH-103
			4 Lead Split Phase			505-BO-104	505-BA-104	505-BJ-104	505-BC-104	505-BH-104
		4	4 Lead Split Phase (Break all lines)			505-BO-105	505-BA-105	505-BJ-105	505-BC-105	—
			—			—	—	—	—	—

⊗ Coil Voltage Code

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

Example: **Cat. No. 505-AAX-101** becomes **Cat. No. 505-AAXD-101**. For other voltages, please consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[M]	24‡	110	120	200...208	220	240	277
Common Control§	AC, 50 Hz	—	XD	—	—	XA	—	—
	AC, 60 Hz	—	—	XD	XH	—	XA	XF
Separate Control (without transformer)	AC, 50 Hz	—	XWD	—	—	XWA	—	—
	AC, 60 Hz	XWJ	—	XWD	XWH	—	XWA	XWF

* **Ordering Information** — All 1-phase reversing starter orders **must be** accompanied with a circuit diagram of the motor.

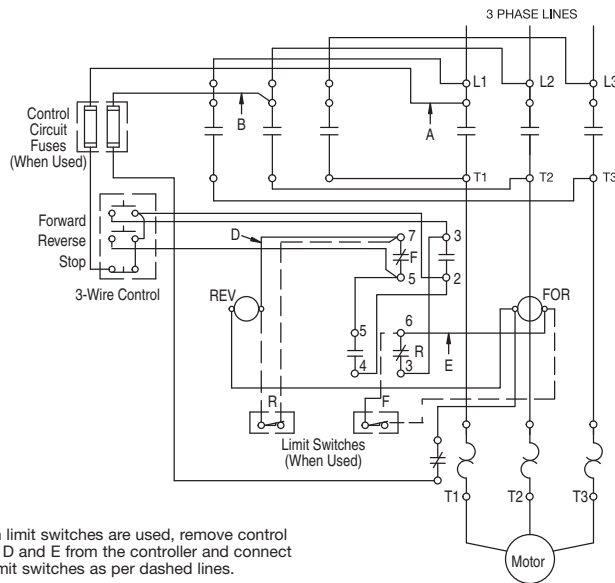
⊗ **Omission of Overload Relays** — Bulletin 505 reversing starters are available without overload protection. Cat. nos. for all starters without overload protection will be the listed cat. no. with the No. 23 added. Example: **Cat. No. 505-AOXD-101** would be **Cat. No. 505-AOXD-23-101**.

‡ Only available on sizes 00...5. When using 24V coils on size 4 or 5, an interposing relay may be required. See coil VA values on page 1-129.

§ When selecting a factory-installed control circuit transformer (see Modifications on page 1-106), use the common control coil voltage code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 505-BAXA-6P-101** will have a transformer with a 240V primary/120V secondary voltage and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second coil voltage code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 505-BAXAJ-6P-101** will have a transformer with a 240V primary/24V secondary and a 24V starter coil.

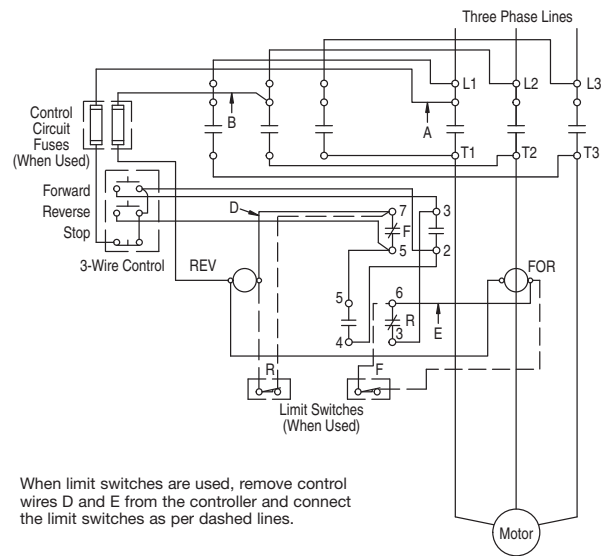


Typical Wiring Diagrams



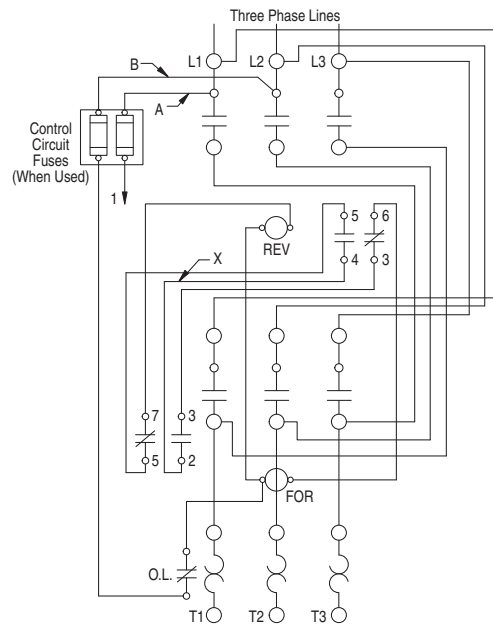
When limit switches are used, remove control wires D and E from the controller and connect the limit switches as per dashed lines.

Bulletin 505
3Ø — 3-Pole
Reversing Starter with Eutectic Alloy Overload Relay
and Solid-State Overload Relays



When limit switches are used, remove control wires D and E from the controller and connect the limit switches as per dashed lines.

Bulletin 505
3Ø — 3-Pole
Reversing Starter without Overload Relay



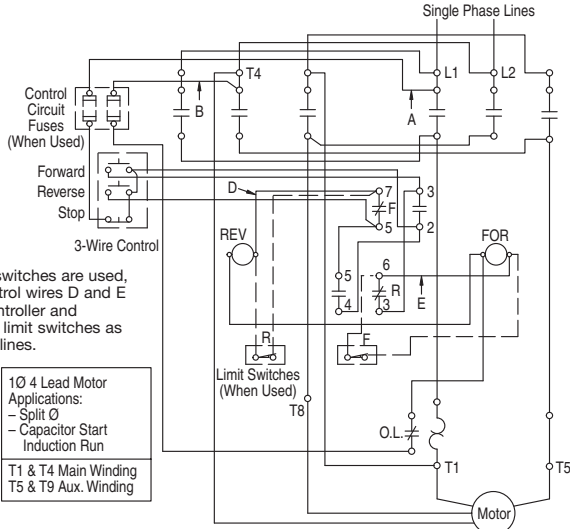
Bulletin 505V
3Ø — 3-Pole
Vertical Reversing Starter with Eutectic Alloy Overload Relay,
With Solid-State Overload Relays

Separate Control Circuit — When the controller coils are to operate on a voltage other than line voltage, check coil rating for compatibility and change coils if necessary. Disconnect wires A and B from lines L1 and L2. Connect wires A and B to the separate control source. Refer to local Electrical Code for control circuit disconnection requirements.

NEMA Reversing Starters

Typical Wiring Diagrams (See Applicable Codes and Laws)

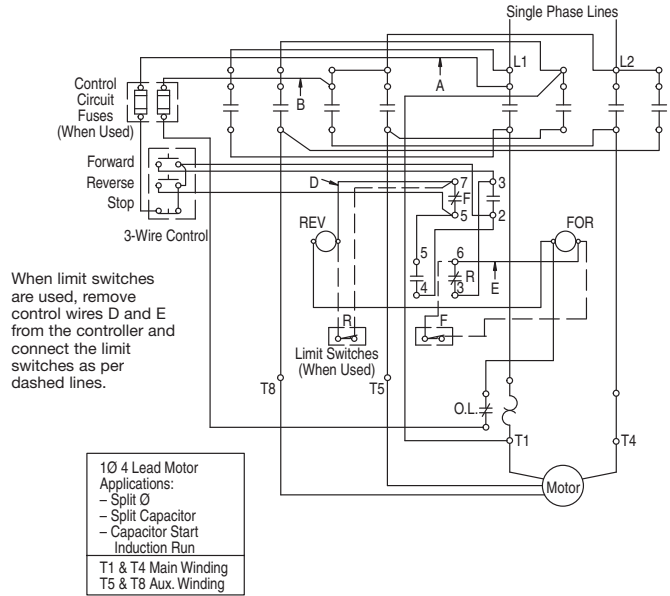
1



When limit switches are used, remove control wires D and E from the controller and connect the limit switches as per dashed lines.

10 4 Lead Motor Applications:
 - Split 0
 - Capacitor Start
 Induction Run
 T1 & T4 Main Winding
 T5 & T9 Aux. Winding

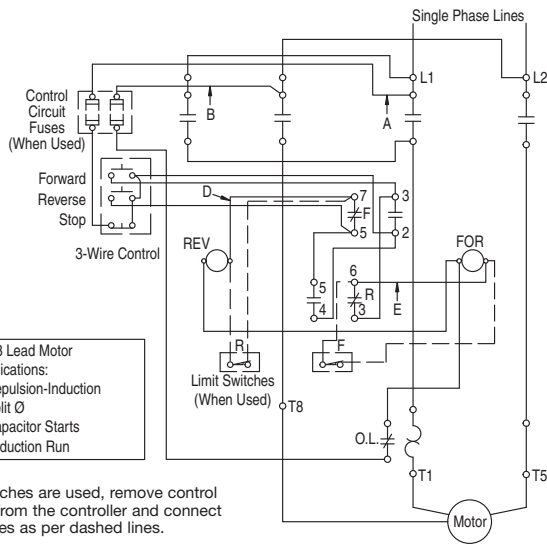
Bulletin 505
10 — 3-Pole (Suffix 104)
Reversing Starter with
Eutectic Alloy Overload Relay



When limit switches are used, remove control wires D and E from the controller and connect the limit switches as per dashed lines.

10 4 Lead Motor Applications:
 - Split 0
 - Split Capacitor
 - Capacitor Start
 Induction Run
 T1 & T4 Main Winding
 T5 & T8 Aux. Winding

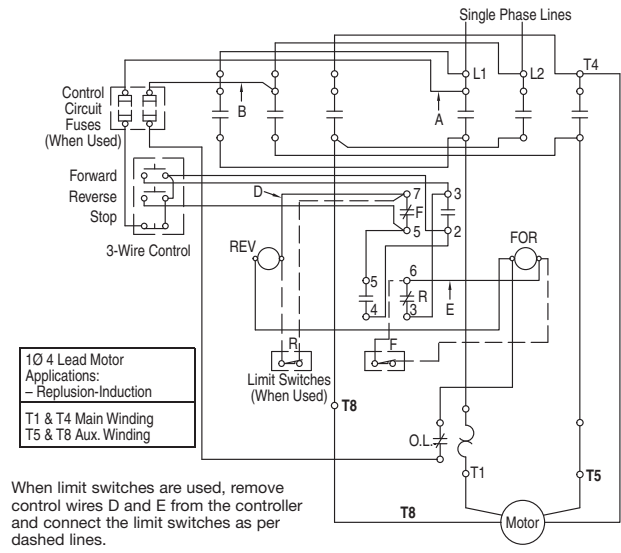
Bulletin 505
10 — 4-Pole (Suffix 105)
Reversing Starter with
Eutectic Alloy Overload Relay



When limit switches are used, remove control wires D and E from the controller and connect the limit switches as per dashed lines.

10 3 Lead Motor Applications:
 - Repulsion-Induction
 - Split 0
 - Capacitor Starts
 Induction Run

Bulletin 505
10 — 2-Pole (Suffix 101 and 102)
Reversing Starter with
Eutectic Alloy Overload Relay



When limit switches are used, remove control wires D and E from the controller and connect the limit switches as per dashed lines.

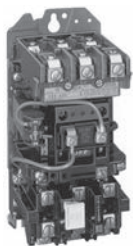
10 4 Lead Motor Applications:
 - Repulsion-Induction
 T1 & T4 Main Winding
 T5 & T8 Aux. Winding

Bulletin 505
10 — 3-Pole (Suffix 103)
Reversing Starter with
Eutectic Alloy Overload Relay

Separate Control Circuit — When the controller coils are to operate on a voltage other than line voltage, check coil rating for compatibility and change coils if necessary. Disconnect wires A and B from lines L1 and L2. Connect wires A and B to the separate control source. Refer to local Electrical Code for control circuit disconnection requirements.

NEMA Non-Reversing Starters

Product Overview/Cat. No. Explanation



**Bulletin 509, Size 1
with Eutectic Alloy
Overload Relay
Open Type without Enclosure**

Bulletin 509 Open Type Full Voltage Starter

- Feed-through construction
- Starter can be field wired for single- or three-phase applications

NEMA sizes 0...4

- Available as components or as a modular kit for faster delivery
- Product selection can be done via two options:
 - Ordering a complete kit
 - Ordering individual components
- Starter includes a 120V AC coil and (1) N.O. auxiliary contact, as standard

NEMA sizes 00, 5...9

- Available as factory assembled

NEMA sizes 00...9 (Enclosed)

- Available as factory assembled

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 Modifications 1-106
 Accessories 1-111
 Specifications 1-126
 Approximate Dimensions 1-133
 Heater Element Selection 1-167

Standards Compliance

NEMA/EEMAC ICS 2
 UL 508
 CSA C22.2 No.14
 ABS 4/5.115 — American Bureau of Shipping
 UCSG 46 CFR 111.70
 EN/IEC 60947-4-1
 CE Marked

Certifications

CSA Certified (LR1234)
 UL Listed (File No. E3125, Guide No. NLDX)
 Hazardous Location: UL Listed (File No. E10314), CSA Certified (LR 11924)

Catalog Number Explanation Example Cat. No.

509 – B O D – A2E – 17

a b c d e f

a

Bulletin No.	
Bulletin No.	Description
509	Top-wired contactor
509DC	Top-wired contactor (DC voltage)

b

NEMA Size	
Code	Description
T	00
A	0
B	1
C	2
D	3
E	4
F	5
G	6
H	7
J	8
K	9

c

NEMA Enclosure Type	
Code	Type
A	Type 1
C	Type 4X (stainless steel)
H	Type 3R, 7 & 9 bolted
J	Type 3R/4/12
O	No enclosure

d

Nominal Coil Voltage		
Code	Voltage	Frequency
A	220V 240V	50 Hz 60 Hz
B	440V 480V	50 Hz 60 Hz
C	550V 600V	50 Hz 60 Hz
D	110V 120V	50 Hz 60 Hz
F	277V	60 Hz
H	200...208V	60 Hz
I	415V	50 Hz
J	24V	50/60 Hz
N	380V	50 Hz
VL	24V DC	—
VG	125...250V DC	—

e

Eutectic Overload Relay	
Code	Description
blank	Eutectic Alloy

E1 Plus Solid-State Overload Relay		
Code	NEMA Size	Full Load Current Adjustment Range [A]
3-Phase		
A2C	0,1	0.2...1.0
A2E	0,1	1.0...5.0
A2F	0,1	3.2...16
A2G	0,1,2	5.4...27
A2J	1,2,3	9...45
A2L	3	18...90
A2M	4	30...150
A2N	5	60...300
A2R	6	120...600
A2T	7	256...810
A2U	8	384...1215
A2V	9	800...2250
1-Phase		
S2E	0,1	1.0...5.0
S2F	0,1	3.2...16
S2G	0,1,2	5.4...27
S2J	1,2,3	9...45
S2L	3	18...90

f

Factory Installed Modifications/Options	
For detailed information, see Modifications on page 1-106.	

or

Options	
Code	Description
9	(1) N.O. Auxiliary Contact for use on Eutectic Overload Relay
9A	(1) N.C. Auxiliary Contact for use on Eutectic Overload Relay
17	Surge Suppressor for 120 or 240V AC Coil
90	(1) N.O. Auxiliary Contact for use on Contactor*
91	(1) N.C. Auxiliary Contact for use on Contactor*

* Up to (6) combinations of auxiliary contacts can be selected. Example: Code 90011 indicates (2) N.O. and (2) N.C. contacts.

Heater Elements — Starters with eutectic alloy overload relays require 3 heater elements. See page 1-167 for heater element selection tables.

Note: All enclosed non-combination starters are supplied with external reset as standard, except for starters with E3 overload relay.

www.ab.com/catalogs Preferred availability cat. nos. are **bold**.

Publication A117-CA001A-EN-P

NEMA Non-Reversing Starters

Product Selection — Modular Kit

Product Selection of NEMA sizes 0...4 by Modular Kits



Base Contactor

Includes a 120V AC coil and (1) N.O. auxiliary contactor as standard.

Heater Elements — Starters with eutectic alloy overload relay require 3 heater elements. See page 1-167 for heater element selection tables.

NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed "Continuous Ampere Rating"						 3 Power Poles • 600V AC Maximum • 60 Hz
		1-Phase Motor Voltage		3-Phase Motor Voltage				
		115V	230V	200V	230V	50 Hz 380...415V	460...575V	Cat. No.
00	9	1/3	1	1.5	1.5	2	2	✦
0	18	1	2	3	3	5	5	509-AO [⊗] - [⊕]
1	27	2	3	7.5	7.5	10	10	509-BO [⊗] - [⊕]
2	45	3	7.5	10	15	25	25	509-CO [⊗] - [⊕]
3	90	7.5	15	25	30	50	50	509-DO [⊗] - [⊕]
4	135	—	—	40	50	75	100	509-EO [⊗] - [⊕]
5	270	—	—	75	100	150	200	✦
6	540	—	—	150	200	300	400	✦
7	810	—	—	—	300	600	600	✦
8	1215	—	—	—	450	900	900	✦
9	2250	—	—	—	800	1600	1600	✦

✦ See page 1-48 for NEMA size 00, 5...9 open type starters and NEMA size 00...9 enclosed starters.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 509-BO[⊗]-[⊕]** becomes **Cat. No. 509-BOD-[⊕]**.

[V]	24	110	120	125	208	220	240	250	277	380	415	440	480	550	600
AC, 50 Hz	J	D	—	—	—	A	—	—	—	N	I	B	—	C	—
AC, 60 Hz	J	—	D	—	H	—	A	—	F	—	—	—	B	—	C
DC	VL	—	—	VG	—	—	—	VG	—	—	—	—	—	—	—

➤ DC voltage code is only available for NEMA sizes 0...3. When ordering a DC voltage code (VL or VG), add "DC" to the catalog number. Example: **Cat. No. 509DC-BOVL**.

Note: The base contactor includes a 120V AC coil as standard. For all other voltages, a second coil will be included in the modular kit for field swap out.

⊕ Overload Relay Code

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete, select an overload relay code from the table below to complete the cat. no. Example: **Cat. No. 509-BOD-[⊕]** becomes **Cat. No. 509-BOD-A2E**.

Full Load Current Range [A]	NEMA Size (3-Phase)					NEMA Size (1-Phase)			
	0	1	2	3	4	0	1	2	3
0.2...1.0	A2C	A2C	—	—	—	—	—	—	—
1.0...5.0	A2E	A2E	—	—	—	S2E	S2E	—	—
3.2...16	A2F	A2F	—	—	—	S2F	S2F	—	—
5.4...27	A2G	A2G	A2G	—	—	S2G	S2G	S2G	—
9...45	—	A2J	A2J	A2J	—	—	S2J	S2J	S2J
18...90	—	—	—	A2L	—	—	—	—	S2L
30...150	—	—	—	—	A2M	—	—	—	—

Options for Modular Kit	
Code	Description
9	(1) N.O. Auxiliary Contact for use on Eutectic Overload Relay
9A	(1) N.C. Auxiliary Contact for use on Eutectic Overload Relay
17	Surge Suppressor for 120 or 240V AC Coil
90	(1) N.O. Auxiliary Contact for use on Contactor*
91	(1) N.C. Auxiliary Contact for use on Contactor*

* Up to (6) combinations of auxiliary contacts can be selected. Example: Code 90011 indicates (2) N.O. and (2) N.C. contacts.

Example: Cat. No. 509-BOD-A2F-17-901 includes a NEMA size 1, 3-pole, contactor with a 120V AC coil, surge suppressor, and (2) auxiliary contacts, (1) N.O. and (1) N.C.

Product Selection of NEMA sizes 0...4 by Components



Base Contactor Eutectic Overload Relay Solid-State Overload Relay

Coil Auxiliary Contact Contactor Surge Suppressor Auxiliary Contact Eutectic Overload Relay



Base Contactor		
NEMA Size	Continuous Ampere Rating [A]	Cat. No.
0	18	500F-AOD930
1	27	500F-BOD930
2	45	500F-COD930
3	90	500F-DOD930
4	135	500F-EOD930

Eutectic Overload Relays	
NEMA Size	Cat. No.
0,1	592-EUTB
2	592-EUTC
3	592-EUTD
4	592-EUTE

Solid-State E1 Plus Overload Relays		
NEMA Size	Current Range [A]	Cat. No.
3-Phase		
0,1	0.2...1.0	592-EEBC
0,1	1.0...5.0	592-EECC
0,1	3.2...16	592-EEDC
0...2	5.4...27	592-EEEC
0...2	9...45	592-EEFC
3	9...45	592-EEFD
3	18...90	592-EEGD
4	30...150	592-EEHE
1-Phase		
0,1	1.0...5.0	592S-EEPC
0,1	3.2...16	592S-EERC
0...2	5.4...27	592S-EESC
0...2	9...45	592S-EETC
3	18...90	592S-EEUD

Description	Coils			
	NEMA Size			
	0...1	2	3	4
24V 50/60 Hz	CB013	CC013	CD013	CE013
110V 50 Hz, 120V 60 Hz	CB236	CC236	CD236	CE236
208V 60 Hz	CB249	CC249	CD249	CE249
220V 50 Hz, 240V 60 Hz	CB254	CC254	CD254	CE254
277V 60 Hz	CB260	CC260	CD260	CE260
380V 50 Hz	CB354	CC354	CD354	CE354
415V 50 Hz	CB357	CC357	CD357	CE357
440V 50 Hz, 480V 60 Hz	CB273	CC273	CD273	CE273
550V 50 Hz, 600V 60 Hz	CB278	CC278	CD278	CE278
24V DC	599-B24DC	599-C24DC	599-D24DC	—
125...250V DC	599-B250DC	599-C250DC	599-D250DC	—

Auxiliary Contact — Contactors		
Description	NEMA Size	Cat. No.
1 N.O.	0...5	595-A
2 N.O.	0...5	595-AA
1 N.C.	0...5	595-B
2 N.C.	0...5	595-BB
1 N.O. and N.C.	0...5	595-AB

Surge Suppressor		
Description	NEMA Size	Cat. No.
12...120V AC	0...5	599-K04
240...264V AC Varistor		599-KA04

Overload Accessory — Auxiliary Contact (For eutectic alloy overload relays only*)		
Description	NEMA Size	Cat. No.
1 N.O.	0...2	595-A02
1 N.C.		595-B02
1 N.O.	3...4	595-A34‡
1 N.C.		595-B34§

* Auxiliary contact for solid-state overload relays is included in the product.
 ‡ Auxiliary contact mounted on right-hand side of overload relay provides N.O. contact function. Auxiliary contact mounted on left-hand side of overload relay provides N.C. contact function.
 § To be mounted on right-hand side of overload to provide additional AC contact function.

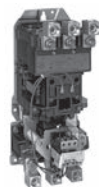
NEMA Non-Reversing Starters

Product Selection — Factory Assembled

Product Selection as Factory Assembled



Bulletin 509, Size 3 with Eutectic Alloy Overload Relay, Open Type without Enclosure



Bulletin 509, Size 5 with Solid-State Overload Relay, Open Type without Enclosure



Bulletin 509, Size 0 Stainless Steel Enclosure

Heater Elements — Starters with eutectic alloy overload relay require 3 heater elements. See page 1-167 for heater element selection tables.

3-Phase • 600V AC Maximum • 60 Hz • With 3-Pole Overload Protection									
NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed "Continuous Ampere Rating"				Open Type Without Enclosure	Type 1 General Purpose Enclosure Surface Mounting	Type 3R/4/12 Rainproof, Dusttight Industrial Use Enclosure	Type 4/4X Watertight Corrosion-Resistant Enclosures Stainless Steel
		Motor Voltage							
		200V	230V	50 Hz 380... 415V	460... 575V				
						Cat. No.	Cat. No.	Cat. No.	Cat. No.*
00	9	1.5	1.5	2	2	509-TO	509-TA	Use Size 0 starter	
0	18	3	3	5	5	♣	509-AA	509-AJ	509-AC
1	27	7.5	7.5	10	10	♣	509-BA	509-BJ	509-BC
2	45	10	15	25	25	♣	509-CA	509-CJ	509-CC
3	90	25	30	50	50	♣	509-DA	509-DJ	509-DC
4	135	40	50	75	100	♣	509-EA	509-EJ	509-EC
5	270	75	100	150	200	509-FO	509-FA	509-FJ	509-FC
6‡	540	150	200	300	400	509-GO	§ 509-GA	§ 509-GJ	§ 509-GC
7‡	810	—	300	600	600	509-HO	509-HA	509-HJ	—
8‡	1215	—	450	900	900	509-JO	509-JA	509-JJ	—
9	2250	—	800	1600	1600	509-KO	509-KA	509-KJ	—

* Sizes 6...8 are painted enclosures.

‡ Does not include line and load lugs, see page 1-118 for kits.

§ Price includes control current transformer.

♣ See page 1-46 for NEMA size 0...4 open type starters.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 509-BA** becomes **Cat. No. 509-BAD**. For other voltages, please consult your local Rockwell Automation sales office or Allen-Bradley distributor.

[M]		24	110	120	125	200-208	220	240	250	277	380	415	440	480	550	600
Common Control+	AC, 50 Hz	—	—	—	—	—	A	—	—	—	N	I	B	—	C	—
	AC, 60 Hz	—	—	—	—	H	—	A	—	—	—	—	—	—	—	—
Transformer Control	AC, 60 Hz	—	—	—	—	H	—	A	—	—	—	—	—	B	—	C
Separate Control (without transformer)	AC, 50 Hz	K	D	—	—	—	—	—	—	—	—	—	—	—	—	—
	AC, 60 Hz	J	—	D	—	—	—	—	—	F	—	—	—	—	—	—
	DC>	VL	—	—	VG	—	—	—	VG	—	—	—	—	—	—	—

+ When selecting a factory-installed control circuit transformer (see Modifications on page 1-106), use the common control coil voltage code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 509-BAB-6P** will have a transformer with a 480V primary/120V secondary voltage and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second coil voltage code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 509-BABJ-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.

> DC voltage code is only available for NEMA sizes 0...3. When ordering a DC voltage code (VL or VG), add "DC" to the catalog number. Example: **Cat. No. 509DC-BOVL**.

⊗ Overload Relay Code

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete. Select an overload relay code from page 1-164 to complete the cat. no. Example: **Cat. No. 509-BAD** becomes **Cat. No. 509-BAD-A2E**.

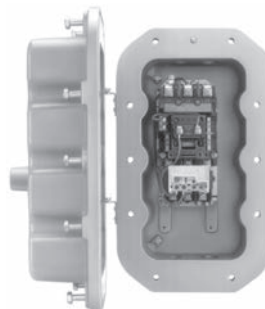
NEMA Non-Reversing Starters

Product Selection — Factory Assembled

Product Selection as Factory Assembled, Continued



Unilock Enclosure



Bulletin 509, Size 1
with Solid-State Overload Relay
Bolted Enclosure (Shown with Cover Open)

1

Heater Elements — Starters with eutectic alloy overload relays require 3 heater elements. See page 1-167 for heater element selection tables.

3-Phase • 600V AC Maximum • 60 Hz • With 3-Pole Overload Protection							
NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed “Continuous Ampere Rating”				Hazardous Locations	
		Motor Voltage				Unilock Enclosures Type 3R, 7 & 9 Class I, Groups C & D Class II, Groups E, F & G – Divisions 1 & 2 – Cat. No.*❖	Bolted Enclosures Type 3R, 7 & 9 Class I, Groups C & D Class II, Groups E, F & G – Divisions 1 & 2 – Cat. No.‡
		200V	230V	50 Hz 380... 415V	460... 575V		
0	18	3	3	5	5	509-AU❖	509-AH❖
1	27	7-1/2	7-1/2	10	10	509-BU❖	509-BH❖
2	45	10	15	25	25	509-CU❖	509-CH❖
3	90	25	30	50	50	509-DU❖	509-DH❖
4	135	40	50	75	100	509-EU❖	509-EH❖
5	270	75	100	150	200	509-FU❖	509-FH❖

* For NEMA Type 3R application it is **necessary** that a drain or breather and drain be **added**. See factory modifications or accessories.

❖ **Omission of Overload Relays** — Bulletin 509 full voltage starters are available without overload protection. Cat. nos. for all starters without overload protection will be the cat. no. with the No. 23 added. Example: **Cat. No. 509-AUD❖** would be **Cat. No. 509-AUD-23**.

‡ Includes drain and cover gasket.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 509-BA❖** becomes **Cat. No. 509-BAD❖**. For other voltages, please contact your local Rockwell Automation sales office or Allen-Bradley distributor.

[V]		24	110	120	125	200- 208	220	240	250	277	380	415	440	480	550	600
Common Control†	AC, 50 Hz	—	—	—	—	—	A	—	—	—	N	I	B	—	C	—
	AC, 60 Hz	—	—	—	—	H	—	A	—	—	—	—	—	—	—	—
Transformer Control	AC, 60 Hz	—	—	—	—	H	—	A	—	—	—	—	—	B	—	C
Separate Control (without transformer)	AC, 50 Hz	K	D	—	—	—	—	—	—	—	—	—	—	—	—	—
	AC, 60 Hz	J	—	D	—	—	—	—	—	F	—	—	—	—	—	—
	DC➤	VL	—	—	VG	—	—	—	VG	—	—	—	—	—	—	—

† When selecting a factory-installed control circuit transformer (see Modifications on page 1-106), use the common control coil voltage code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 509-BAB-6P** will have a transformer with a 480V primary/120V secondary voltage and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second coil voltage code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 509-BABJ-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.

➤ DC voltage code is only available for NEMA sizes 0...3. When ordering a DC voltage code (VL or VG), add "DC" to the catalog number. Example: 509DC-BOVL.

★ Overload Relay Code

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete. Select an overload relay code from page 1-159 to complete the cat. no. Example: **Cat. No. 509-BUD❖** becomes **Cat. No. 509-BUD-A2E**.

NEMA Non-Reversing Starters

Product Selection — Factory Assembled

Heater Elements — Starters with eutectic alloy overload relays require 1 heater element. See page 1-167 for heater element selection tables.

1-Phase • 277 AC Maximum • 60 Hz • With 3-Pole Overload Protection

NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed "Continuous Ampere Rating"		Open Type Without Enclosure Cat. No.	Type 1 General Purpose Surface Mounting Cat. No.	Type 3R/4/12 Rainproof, Dusttight Industrial Use Enclosure Cat. No.	Type 4/4X Watertight, Corrosion- Resistant Enclosure Stainless Steel Cat. No.
		Motor Voltage					
		115V	230V				
00	9	1/3	1	509-TO [⊕]	509-TA [⊕]	—	—
0	18	1	2	⊕	509-AA [⊕]	509-AJ [⊕]	509-AC [⊕]
1	27	2	3	⊕	509-BA [⊕]	509-BJ [⊕]	509-BC [⊕]
2	45	3	7.5	⊕	509-CA [⊕]	509-CJ [⊕]	509-CC [⊕]
3	90	7.5	15	⊕	509-DA [⊕]	509-DJ [⊕]	509-DC [⊕]

⊕ See page 1-46 for NEMA size 0...4 open type starters. Three-phase starters can be wired for single-phase applications, as shown on page 1-51.

1-Phase • 240V AC Maximum • 60 Hz • With 3-Pole Overload Protection

NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed "Continuous Ampere Rating"		Hazardous Location Enclosures Type 3R, 7 & 9 Class I, Groups C & D Class II, Groups E, F & G — Divisions 1 & 2 — Cat. No.⊕
		Motor Voltage		
		115V	230V	
0	18	1	2	509-AH [⊕]
1	27	2	3	509-BH [⊕]
2	45	3	7-1/2	509-CH [⊕]

⊕ Includes drain and cover gasket.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 509-BAX[⊗]** becomes **Cat. No. 509-BAXD[⊗]**. For other voltages, please contact your local Rockwell Automation sales office or Allen-Bradley distributor.

[V]		24	110	120	200...208	220...230	230...240	277
Common Control‡	AC, 50 Hz	—	XD	—	—	XA	—	—
	AC, 60 Hz	—	—	XD	XH	—	XA	XF
Separate Control (without transformer)	AC, 50 Hz	—	XWD	—	—	XWA	—	—
	AC, 60 Hz	XWJ	—	XWD	XWH	—	XWA	XWF

‡ When selecting a factory-installed control circuit transformer (see Modifications on page 1-106), use the common control coil voltage code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 509-BAXA-6P** will have a transformer with a 240V primary/120V secondary voltage and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second coil voltage code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 509-BAXAJ-6P** will have a transformer with a 240V primary/24V secondary and a 24V starter coil.

⊕ Overload Relay Code

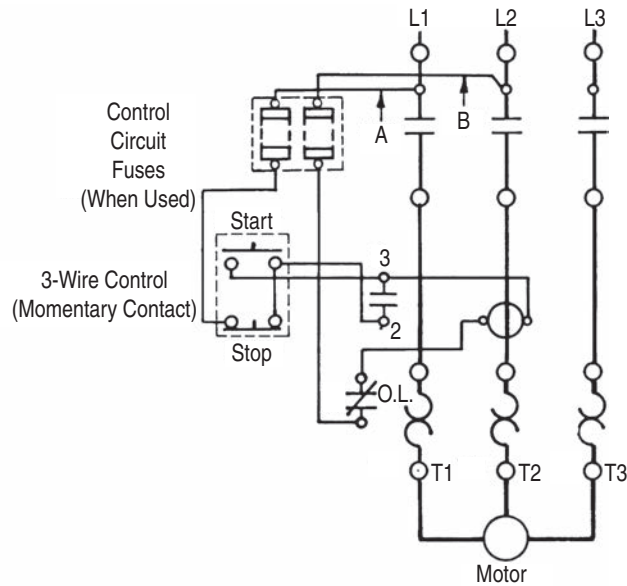
Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete. Select an overload relay code from page 1-159 to complete the cat. no. Example: **Cat. No. 509-BAXA[⊕]** becomes **Cat. No. 509-BAXA-S2E**.



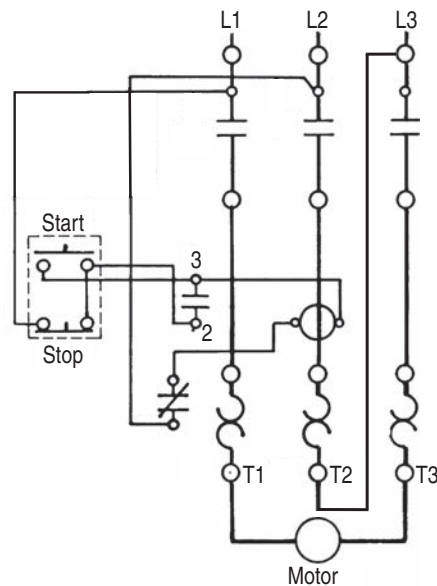
Typical Wiring Diagrams

If the controller coil is to operate on a voltage other than line voltage, check coil rating for compatibility and change coil if necessary. Disconnect wires "A" and "B" from Lines L1 and L2. Connect wires "A" and "B" to the separate control source. Refer to the National Electrical Code for control circuit disconnection requirements.

Note: Additional control circuit overcurrent protection may be required. Refer to the National Electrical Code. The current rating of the control circuit conductors furnished with this device is 15 A (Sizes 0...3) or 20 A (Size 4).



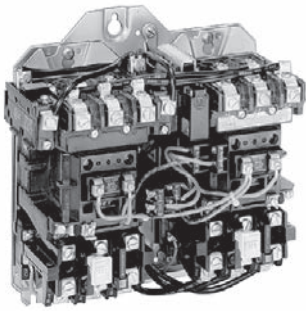
3-Phase 3-Wire System



NEMA Multi-Speed Starters

Product Overview/Cat. No. Explanation

1



Bulletin 520F
Size 0, with Eutectic Alloy
Overload Relay
2-Speed, Consequent Pole
Open Type without Enclosure

Bulletin 520

- NEMA sizes 0...7
- Exceptional electrical life
- Dependable coil operation
- Eutectic alloy overload relays: Class 10, 20, or 30
- Solid-state overload relays: Class 10, 15, 20, or 30
- Vertically arranged available — Bulletin 520V sizes 0...5

Bulletin 520 multi-speed starters are designed for the control of two speed squirrel cage motors of either consequent pole or separate winding types. These starters are available for constant horsepower, constant torque or variable torque, three-phase motors. Multi-speed motor starters are commonly used on machine tools, fans, blowers, refrigeration compressors, and many other types of equipment. All Bulletin 520 multi-speed starters are available with Bulletin 592 eutectic alloy relays as standard and solid-state overloads are optional for additional flexibility in motor protection. Bulletin 520V vertically arranged starters are available in Sizes 0...5, in the Open Type without Enclosure construction only.

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Standards Compliance

NEMA/EEMAC ICS 2
 UL 508
 CSA C22.2 No.14

Certifications

CSA Certified (LR1234)
 UL Listed (File No. E3125, Guide No. NLDX)
 Hazardous Location: UL Listed (File No. E10314, CSA Certified (LR 11924)

Catalog Number Explanation

Example Cat. No.

520 - **B** **A** **D** - **1**
 a **b** **c** **d**

a

NEMA Size	
Code	Description
T	00
A	0
B	1
C	2
D	3
E	4
F	5
G	6
H	7

b

NEMA Enclosure Type	
Code	Type
A	Type 1
C	Type 4X (stainless steel)
H	Type 3R, 7 & 9 bolted
J	Type 3R/4/12
O	No enclosure

c

Nominal Coil Voltage		
Code	Voltage	Frequency
A	220V	50 Hz
	240V	60 Hz
B	440V	50 Hz
	480V	60 Hz
C	550V	50 Hz
	600V	60 Hz
D	110V	50 Hz
	120V	60 Hz
F	277V	60 Hz
H	200...208V	60 Hz
I	415V	50 Hz
J	24V	50/60 Hz
N	380V	50 Hz

d

Factory Installed Modifications/Options	
For detailed information, see Modifications on page 1-106.	

Note: All enclosed non-combination starters are supplied with external reset as standard, except for starters with E3 overload relay.

2-Speed Separate Winding, 3-Pole — 3-Pole, Constant Horsepower

Heater Elements — Starters with eutectic alloy overload relays require 3 heater elements for each speed. See page 1-167 for heater element selection tables.

3-Phase • 600V AC Maximum • 60 Hz • With 3-Pole Overload Protection

NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed "Continuous Ampere Rating"				Open Type Without Enclosure	Type 1 General Purpose Enclosure Surface Mounting	Type 3R/4/12 Rainproof, Dusttight Industrial Use Enclosure	Type 4/4X Watertight Corrosion- Resistant Enclosures Stainless Steel
		Motor Voltage							
		200V	230V	50 Hz 380... 415V	460... 575V				
0	18	2	2	3	3	520E-AO-⊗-⊗	520E-AA-⊗-⊗	520E-AJ-⊗-⊗	520E-AC-⊗-⊗
1	27	5	5	7.5	25	520E-BO-⊗-⊗	520E-BA-⊗-⊗	520E-BJ-⊗-⊗	520E-BC-⊗-⊗
2	45	7-1/2	10	20	20	520E-CO-⊗-⊗	520E-CA-⊗-⊗	520E-CJ-⊗-⊗	520E-CC-⊗-⊗
3	90	20	25	40	40	520E-DO-⊗-⊗	520E-DA-⊗-⊗	520E-DJ-⊗-⊗	520E-DC-⊗-⊗
4	135	30	40	60	75	520E-EO-⊗-⊗	520E-EA-⊗-⊗	520E-EJ-⊗-⊗	520E-EC-⊗-⊗
5	270	60	75	100	150	520E-FO-⊗-⊗	520E-FA-⊗-⊗	520E-FJ-⊗-⊗	520E-FC-⊗-⊗
6§	540	100	150	200	300	520E-GO-⊗-⊗	520E-GA-⊗-⊗	520E-GJ-⊗-⊗	—
7§	810	—	225	—	450	520E-HO-⊗-⊗	520E-HA-⊗-⊗	520E-HJ-⊗-⊗	—

⊗ **Coil Voltage Code**

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 520E-AA-⊗-⊗** becomes **Cat. No. 520E-AAD-⊗-⊗**, and **Cat. No. 520E-AC-⊗-⊗** becomes **Cat. No. 520E-ACD-⊗-⊗**. For other voltages, please consult your local Rockwell Automation sales office or Allen-Bradley distributor.

[V]		24➤	110V	120	200... 208	220	240	277	380	415	440	480	550	600
Common Control	AC, 50 Hz	—	—	—	—	A	—	—	N	I	B	—	C	—
	AC, 60 Hz	—	—	—	H	—	A	—	—	—	—	B	—	C
Transformer Control⌘	AC, 60 Hz	—	—	—	H	—	A	—	—	—	—	B	—	C
Separate Control (without transformer)	AC, 50 Hz	J	D	—	—	—	—	—	—	—	—	—	—	—
	AC, 60 Hz	J	—	D	—	—	—	F	—	—	—	—	—	—

⊗-⊗ **Overload Relay Code**

Use to order solid-state overload relays. Do not use when ordering eutectic alloy overload relays. The cat. no. as listed is incomplete. Select two overload relay codes from page 1-159 to complete the cat. no. The first code will denote the high-speed overload relay and the second code will denote the low-speed overload relay. Example: **Cat. No. 520E-AAD-⊗-⊗** becomes **Cat. No. 520E-AAD-A2E-A2C**.

- * These starters are for wye connected motor windings. They may not be used with open delta connected motor windings. For starters to be used with open delta connected separate winding motors, use consequent pole starter prices, and furnish complete ordering information, page 1-55.
- ⌘ **Vertically Arranged** — Multi-speed starters, sizes 0...5, open type without enclosure can be supplied in a vertically arranged construction. To order, change the bulletin number in the listed **Cat. No. from 520E to 520VE**. Example: **Cat. No. 520VE-AOD-A2E-A2E**.
- § Does not include line and load lugs, see page 1-118 for kits.
- When using 24V coils on size 4 or 5, an interposing relay may be required. See coil VA values on page 1-129.
- ⌘ When selecting a factory-installed control circuit transformer (see Modifications on page 1-106), use the common control coil voltage code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 520E-BAB-6P**, and **Cat. No. 520E-BCB-6P** and will have transformers with a 480V primary/120V secondary voltage and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second coil voltage code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 520E-BABJ-6P**, and **Cat. No. 520E-BCBJ-6P** will have transformers with a 480V primary/24V secondary and a 24V starter coil.



2-Speed Separate Winding, 3-Pole — 3-Pole, Constant Horsepower, Continued

1



Bulletin 520E, Size 1
with Eutectic Alloy Overload Relays
Bolted Enclosure (with Cover Open)
Shown with Optional Modifications



Bulletin 520E, Size 1
with Solid-State Overload Relays
Bolted Enclosure (with Cover Open)
Shown with Optional Modifications

Heater Elements — Starters with eutectic alloy overload relays require 3 heater elements for each speed. See page 1-167 for heater element selection tables.

3-Phase • 600V AC Maximum • 60 Hz • With 3-Pole Overload Protection							
NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed "Continuous Ampere Rating"				Hazardous Locations Bolted Enclosures Type 3R, 7 & 9* Class I, Groups C & D Class II, Groups E, F & G - Divisions 1 & 2 -	
		Motor Voltage				Cat. No.	
		200V	230V	380...415V	460...575V		
0	18	2	2	3	3	520E-AH⊗-⊕-⊕	
1	27	5	5	7-1/2	7-1/2	520E-BH⊗-⊕-⊕	
2	45	7-1/2	10	20	20	520E-CH⊗-⊕-⊕	
3	90	20	25	40	40	520E-DH⊗-⊕-⊕	
4	135	30	40	60	75	520E-EH⊗-⊕-⊕	

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 520E-AE⊗-⊕-⊕** becomes **Cat. No. 520E-AED-⊕-⊕**. For other voltages, please consult your local Rockwell Automation sales office or Allen-Bradley distributor.

[V]		24➤	110V	120	200... 208	220	240	277	380	415	440	480	550	600
Common Control	AC, 50 Hz	—	—	—	—	A	—	—	N	I	B	—	C	—
	AC, 60 Hz	—	—	—	H	—	A	—	—	—	—	B	—	C
Transformer Control⊗	AC, 60 Hz	—	—	—	H	—	A	—	—	—	—	B	—	C
Separate Control (without transformer)	AC, 50 Hz	J	D	—	—	—	—	—	—	—	—	—	—	—
	AC, 60 Hz	J	—	D	—	—	—	F	—	—	—	—	—	—

⊕-⊕ Overload Relay Code

Use to order solid-state overload relays. Do not use when ordering eutectic alloy overload relays. The cat. no. as listed is incomplete. Select two overload relay codes from page 1-159 to complete the cat. no. The first code will denote the high-speed overload relay and the second code will denote the low-speed overload relay. Example: **Cat. No. 520E-AHD-⊕-⊕** becomes **Cat. No. 520E-AHD-A2E-A2C**.

* These starters are for wye connected motor windings. They may not be used with open delta connected motor windings. For starters to be used with open delta connected separate winding motors, use consequent pole starter prices, and furnish complete ordering information, see page 1-55.

⊗ Includes drain and cover gasket.

➤ When using 24V coils on size 4 or 5, an interposing relay may be required.

⊗ When selecting a factory-installed control circuit transformer (see Modifications on page 1-106), use the common control coil voltage code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 520E-BHB-6P** will have a transformer with a 480V primary/120V secondary voltage and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second coil voltage code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 520E-BHBJ-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.



2-Speed Consequent Pole, 5-Pole — 3-Pole, Constant or Variable Torque



Bulletin 520F, Type 4/4X
 Watertight Corrosion-Resistant
 Enclosure Stainless Steel



Heater Elements — Starters with eutectic alloy overload relays require 3 heater elements for each speed. See page 1-167 for heater element selection tables.

3-Phase • 600V AC Maximum • 60 Hz • With 3-Pole Overload Protection									
NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed "Continuous Ampere Rating"				Open Type Without Enclosure Cat. No.*	Type 1 General Purpose Enclosure Surface Mounting Cat. No.	Type 3R/4/12 Rainproof, Dusttight Industrial Use Enclosure Cat. No.	Type 4/4X Watertight Corrosion-Resistant Enclosure Stainless Steel Cat. No.
		Motor Voltage							
		200V	230V	50 Hz 380...415V	460...575V				
0	18	3	3	5	5	520F-AO-0-0-0	520F-AA-0-0-0	520F-AJ-0-0-0	520F-AC-0-0-0
1	27	7-1/2	7-1/2	10	10	520F-BO-0-0-0	520F-BA-0-0-0	520F-BJ-0-0-0	520F-BC-0-0-0
2	45	10	15	25	25	520F-CO-0-0-0	520F-CA-0-0-0	520F-CJ-0-0-0	520F-CC-0-0-0
3	90	25	30	50	50	520F-DO-0-0-0	520F-DA-0-0-0	520F-DJ-0-0-0	520F-DC-0-0-0
4	135	40	50	75	100	520F-EO-0-0-0	520F-EA-0-0-0	520F-EJ-0-0-0	520F-EC-0-0-0
5§	270	75	100	150	200	520F-FO-0-0-0	520F-FA-0-0-0	520F-FJ-0-0-0	520F-FC-0-0-0

⊗ **Coil Voltage Code**

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 520F-AA-0-0-0** becomes **Cat. No. 520F-AAD-0-0-0**. For other voltages, please consult your local Rockwell Automation sales office or Allen-Bradley distributor.

[V]		24➤	110V	120	200... 208	220	240	277	380	415	440	480	550	600
Common Control	AC, 50 Hz	—	—	—	—	A	—	—	N	I	B	—	C	—
	AC, 60 Hz	—	—	—	H	—	A	—	—	—	—	B	—	C
Transformer Control⌘	AC, 60 Hz	—	—	—	H	—	A	—	—	—	—	B	—	C
Separate Control (without transformer)	AC, 50 Hz	J	D	—	—	—	—	—	—	—	—	—	—	—
	AC, 60 Hz	J	—	D	—	—	—	F	—	—	—	—	—	—

★-★ **Overload Relay Code**

Use to order solid-state overload relays. Do not use when ordering eutectic alloy overload relays. The cat. no. as listed is incomplete. Select two overload relay codes from page 1-159 to complete the cat. no. The first code will denote the high-speed overload relay and the second code will denote the low-speed overload relay. Example: **Cat. No. 520F-AAD-0-0-0** becomes **Cat. No. 520F-AAD-A2E-A2C**.

* **Vertically Arranged** — Multi-speed starters, sizes 0...5, open type without enclosure can be supplied in a vertically arranged construction. To order, change the bulletin number in the listed cat. no. from **520F to 520VF**. Example: **Cat. No. 520VF-AOD-A2E-A2E**.

§ For proper overload relay selection, when low speed full load currents are less than 77 A, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

➤ Only available on sizes 0...5. When using 24V coils on sizes 4 and 5, an interposing relay may be required. See coil VA values on page 1-129.

⌘ When selecting a factory-installed control circuit transformer (see Modifications on page 1-106), use the common control coil voltage code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 520F-BAB-6P** will have a transformer with a 480V primary/120V secondary voltage and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second coil voltage code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 520F-BABJ-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.

NEMA Multi-Speed Starters

Product Selection

2-Speed Consequent Pole, 5-Pole — 3-Pole, Constant or Variable Torque, Continued

1



Bulletin 520F, Size 1
with Eutectic Alloy Overload Relay
Bolted Enclosure (with Cover Open)



Bulletin 520F, Size 1
with Solid-State Overload Relay
Bolted Enclosure (with Cover Open)

Heater Elements — Starters with eutectic alloy overload relays require 3 heater elements for each speed. See page 1-167 for heater element selection tables.

3-Phase • 600V AC Maximum • 60 Hz • With 3-Pole Overload Protection							Hazardous Locations
NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed "Continuous Ampere Rating"				Bolted Enclosures Type 3R, 7 & 9* Class I, Groups C & D Class II, Groups E, F & G – Divisions 1 & 2 – Cat. No.	
		Motor Voltage					
		200V	230V	50Hz 380...415V	460...575V	Cat. No.	
0	18	3	3	5	5	520F-AH⊗-⊕-⊕	
1	27	7-1/2	7-1/2	10	10	520F-BH⊗-⊕-⊕	
2	45	10	15	25	25	520F-CH⊗-⊕-⊕	
3	90	25	30	50	50	520F-DH⊗-⊕-⊕	

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 520F-AE⊗-⊕-⊕** becomes **Cat. No. 520F-AED-⊕-⊕**. For other voltages, please consult your local Rockwell Automation sales office or Allen-Bradley distributor.

[V]		24➤	110V	120	200... 208	220	240	277	380	415	440	480	550	600
Common Control	AC, 50 Hz	—	—	—	—	A	—	—	N	I	B	—	C	—
	AC, 60 Hz	—	—	—	H	—	A	—	—	—	—	B	—	C
Transformer Control⌘	AC, 60 Hz	—	—	—	H	—	A	—	—	—	—	B	—	C
Separate Control (without transformer)	AC, 50 Hz	J	D	—	—	—	—	—	—	—	—	—	—	—
	AC, 60 Hz	J	—	D	—	—	—	F	—	—	—	—	—	—

⊕-⊕ Overload Relay Code

Use to order solid-state overload relays. Do not use when ordering eutectic alloy overload relays. The cat. no. as listed is incomplete. Select two overload relay codes from page 1-159 to complete the cat. no. The first code will denote the high-speed overload relay and the second code will denote the low-speed overload relay. Example: **Cat. No. 520F-AHD-⊕-⊕** becomes **Cat. No. 520F-AHD-A2E-A2C**.

* Includes drain and cover gasket.

⌘ When selecting a factory-installed control circuit transformer (see Modifications on page 1-106), use the common control coil voltage code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 520F-BHB-6P** will have a transformer with a 480V primary/120V secondary voltage and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second coil voltage code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 520F-BHBJ-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.



2-Speed Consequent Pole, 5-Pole — 3-Pole, Constant Horsepower



Bulletin 520F, Type 4/4X
 Watertight Corrosion-Resistant
 Enclosure Stainless Steel

Heater Elements — Starters with eutectic alloy overload relays require 3 heater elements for each speed. See page 1-167 for heater element selection tables.

3-Phase • 600V AC Maximum • 60 Hz • With 3-Pole Overload Protection									
NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed "Continuous Ampere Rating"				Open Type Without Enclosure Cat. No.*	Type 1 General Purpose Enclosure Surface Mounting Cat. No.	Type 3R/4/12 Rainproof, Dusttight Industrial Use Enclosure Cat. No.	Type 4/4X Watertight Corrosion-Resistant Enclosures Stainless Steel Cat. No.
		Motor Voltage							
		200V	230V	50 Hz 380...415V	460...575V				
0	18	2	2	3	3	520G-AO-⊗-⊗-⊗	520G-AA-⊗-⊗-⊗	520G-AJ-⊗-⊗-⊗	520G-AC-⊗-⊗-⊗
1	27	5	5	7-1/2	7-1/2	520G-BO-⊗-⊗-⊗	520G-BA-⊗-⊗-⊗	520G-BJ-⊗-⊗-⊗	520G-BC-⊗-⊗-⊗
2	45	7-1/2	10	20	20	520G-CO-⊗-⊗-⊗	520G-CA-⊗-⊗-⊗	520G-CJ-⊗-⊗-⊗	520G-CC-⊗-⊗-⊗
3	90	20	25	40	40	520G-DO-⊗-⊗-⊗	520G-DA-⊗-⊗-⊗	520G-DJ-⊗-⊗-⊗	520G-DC-⊗-⊗-⊗
4	135	30	40	60	75	520G-EO-⊗-⊗-⊗	520G-EA-⊗-⊗-⊗	520G-EJ-⊗-⊗-⊗	520G-EC-⊗-⊗-⊗
5	270	60	75	100	150	520G-FO-⊗-⊗-⊗	520G-FA-⊗-⊗-⊗	520G-FJ-⊗-⊗-⊗	520G-FC-⊗-⊗-⊗

⊗ **Coil Voltage Code**

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 520G-AA-⊗-⊗-⊗** becomes **Cat. No. 520G-AA-⊗-⊗-⊗**. For other voltages, please consult your local Rockwell Automation sales office or Allen-Bradley distributor.

[V]		24➤	110V	120	200... 208	220	240	277	380	415	440	480	550	600
Common Control	AC, 50 Hz	—	—	—	—	A	—	—	N	I	B	—	C	—
	AC, 60 Hz	—	—	—	H	—	A	—	—	—	—	B	—	C
Transformer Control⌘	AC, 60 Hz	—	—	—	H	—	A	—	—	—	—	B	—	C
Separate Control (without transformer)	AC, 50 Hz	J	D	—	—	—	—	—	—	—	—	—	—	—
	AC, 60 Hz	J	—	D	—	—	—	F	—	—	—	—	—	—

⊕-⊕ **Overload Relay Code**

Use to order solid-state overload relays. Do not use when ordering eutectic alloy overload relays. The cat. no. as listed is incomplete. Select two overload relay codes from page 1-159 to complete the cat. no. The first code will denote the high-speed overload relay and the second code will denote the low-speed overload relay. Example: **Cat. No. 520G-AAD-⊕-⊕** becomes **Cat. No. 520G-AAD-A2E-A2C**.

* **Vertically Arranged** — Multi-speed starters, sizes 0...5, open type without enclosure can be supplied in a vertically arranged construction. To order, change the bulletin number in the listed cat. no. from **520G to 520VG**. Example: **Cat. No. 520VG-AOD-A2E-A2E**.

➤ Only available in sizes 0...5. When using 24V coils on sizes 4 and 5, an interposing relay may be required. See coil VA values on page 1-129.

⌘ When selecting a factory-installed control circuit transformer (see Modifications on page 1-106), use the common control coil voltage code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 520G-BAB-6P** will have a transformer with a 480V primary/120V secondary voltage and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second coil voltage code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 520G-BABJ-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.

2-Speed Consequent Pole, 5-Pole — 3-Pole, Constant Horsepower, Continued

1



Bulletin 520G, Size 1
with Eutectic Alloy Overload Relay
Bolted Enclosure (with Cover Open)



Bulletin 520G, Size 1
with Solid-State Overload Relay
Bolted Enclosure (with Cover Open)

Heater Elements — Starters with eutectic alloy overload relays require 3 heater elements for each speed. See page 1-167 for heater element selection tables.

3-Phase • 600V AC Maximum • 60 Hz • With 3-Pole Overload Protection						
NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed “Continuous Ampere Rating”				Hazardous Locations
		Motor Voltage				Bolted Enclosures Type 3R, 7 & 9* Class I, Groups C & D Class II, Groups E, F & G – Divisions 1 & 2 – Cat. No.
		200V	230V	380...415V	460...575V	
0	18	3	3	5	5	520G-AH⊗-⊕-⊕
1	27	7-1/2	7-1/2	10	10	520G-BH⊗-⊕-⊕
2	45	10	15	25	25	520G-CH⊗-⊕-⊕
3	90	25	30	50	50	520G-DH⊗-⊕-⊕

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 520G-AE⊗-⊕-⊕** becomes **Cat. No. 520G-AED-⊕-⊕**. For other voltages, please consult your local Rockwell Automation sales office or Allen-Bradley distributor.

[V]		24➤	110V	120	200... 208	220	240	277	380	415	440	480	550	600
Common Control	AC, 50 Hz	—	—	—	—	A	—	—	N	I	B	—	C	—
	AC, 60 Hz	—	—	—	H	—	A	—	—	—	—	B	—	C
Transformer Control⌘	AC, 60 Hz	—	—	—	H	—	A	—	—	—	—	B	—	C
Separate Control (without transformer)	AC, 50 Hz	J	D	—	—	—	—	—	—	—	—	—	—	—
	AC, 60 Hz	J	—	D	—	—	—	F	—	—	—	—	—	—

⊕-⊕ Overload Relay Code

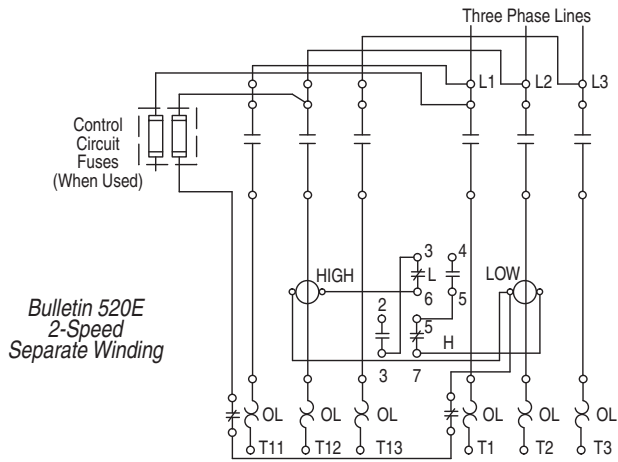
Use to order solid-state overload relays. Do not use when ordering eutectic alloy overload relays. The cat. no. as listed is incomplete. Select two overload relay codes from page 1-159 to complete the cat. no. The first code will denote the high-speed overload relay and the second code will denote the low-speed overload relay. Example: **Cat. No. 520G-AHD-⊕-⊕** becomes **Cat. No. 520G-AHD-A2E-A2C**.

* Includes drain and cover gasket.

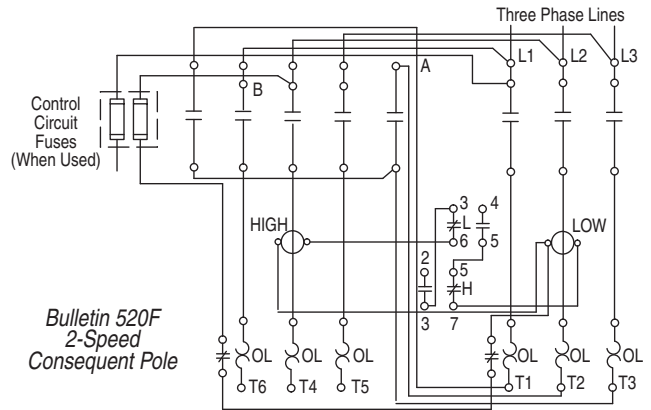
⌘ When selecting a factory-installed control circuit transformer (see Modifications on page 1-106), use the common control coil voltage code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 520G-BHB-6P** will have a transformer with a 480V primary/120V secondary voltage and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second coil voltage code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 520G-BHB-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.



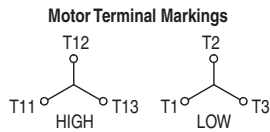
Typical Wiring Diagrams



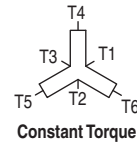
Bulletin 520E
 2-Speed
 Separate Winding



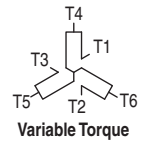
Bulletin 520F
 2-Speed
 Consequent Pole



Motor Terminal Markings



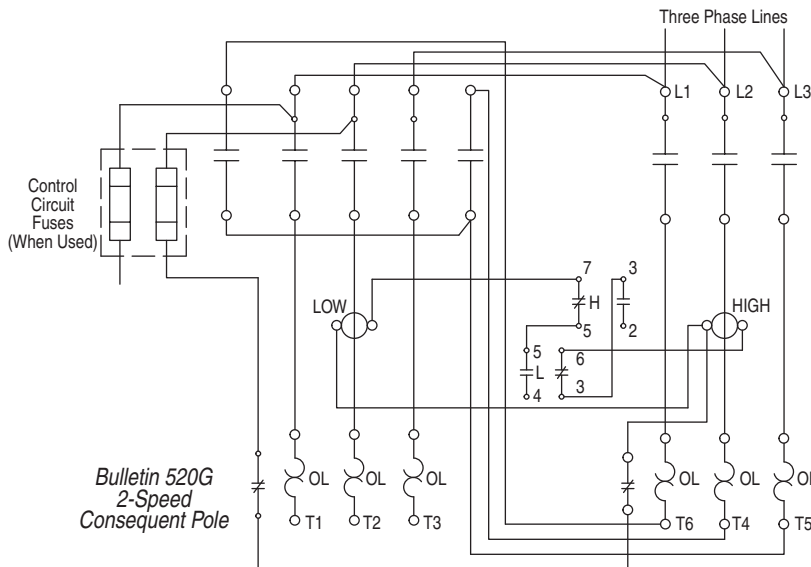
Constant Torque



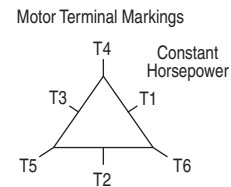
Variable Torque

Size 0...4
 2-Speed Separate Winding, Constant or Variable Torque and Constant
 Horsepower with Eutectic Alloy Overload Relay
 or Solid-State Overload Relay

Size 0...4
 2-Speed Consequent Pole, Constant or Variable Torque
 with Eutectic Alloy Overload Relay or
 Solid-State Overload Relay




Bulletin 520G
 2-Speed
 Consequent Pole



Motor Terminal Markings

Constant
 Horsepower

Size 0...4
 2-Speed Consequent Pole, Constant Horsepower
 with Eutectic Alloy Overload Relay or
 Solid-State Overload Relay

	<p>Bulletin 300</p> <ul style="list-style-type: none"> • NEMA sizes 0...5 • Compact size (space saving design) • Guarded terminals • Complete range of accessories • Solid-state overload relays • Electronic and conventional coils • 35 mm DIN Rail mountable <p>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 the most compact and flexible NEMA starter component system available.</p>	<p>Table of Contents</p> <p>Product Selection..... this page</p> <p>Specifications..... 1-64</p> <p>Accessories..... 1-66</p> <p>Approximate Dimensions..... 1-71</p> <p>Standards Compliance</p> <p>UL 508 CSA C22.2, No. 14 NEMA/EEMAC ICS2</p> <p>Certifications</p> <p>cULus Listed (File E41850 Guide No. NLDX, NLDX7) CE Marked (EN 60947-4-1)</p>
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Product Selection

Feed-Through Wiring for Motor Loads

NEMA Size*	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed "Continuous Ampere Rating"				Open Type Without Enclosure Cat. No.
		Motor Voltage				
		200V	230V	380...415V	460...575V	
0	18	3	3	5	5	300-AO®930
1	27	7.5	7.5	10	10	300-BO®930
2	45	10	15	25	25	300-CO®930
3	90	25	30	50	50	300-DO®930
4	135	40	50	75	100	300-EO®930
5	270	75	100	150	200	300-FO®930

* Contactor sizes 0...3 come standard with 1 N.O. auxiliary contact.
 Contactor sizes 4...5 come standard with 1 N.O. and 1 N.C. auxiliary contact.

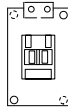
⊗ Coil Voltage Code and Terminal Position (NEMA Sizes 0...3)

The cat. no. as listed is incomplete. To complete the cat. no., select a Coil Voltage Code from the table below and insert into the cat. no.
 Example: 120V, 60 Hz: **Cat. No. 300-AO®930** becomes **Cat. No. 300-AOD930**.

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

Coil Terminal Position

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



Cat. No. 300-AO®930 Line Side

⊗ Coil Voltage Code (NEMA Sizes 4...5)

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 Interface*	[V]	24	110...130	200...255	208...277	380...415	440...480	500			
	NEMA Size 4...5	AC, 50/60 Hz	—	ED	—	EA	EN	EN	EN		
	NEMA Size 4...5	DC	EZJ	EZD	EZA	—	—	—	—		

* Signal voltage of the 300 Line electronic interface: Nominal U_g : 24V DC/ I_g : 15 mA
 Pickup voltage: 13.0...30.2V DC, Dropout Voltage: -3.0...+5.0V DC.

Bulletin 193-EE – Three-Phase Devices

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

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	40...200	193-EEJF
5	40...200	193-EEJG
	60...300	193-EEKG



E3 Overload Relay

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

NEMA Size	Adjustment Range [A]	E3 Plus		
		E3	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
4	42...210	* 193-EC1GF	* 193-EC2GF	* 193-EC3GF
5	42...210	* 193-EC1GG	* 193-EC2GG	* 193-EC3GG
	60...302	* 193-EC1HG	* 193-EC2HG	* 193-EC3HG

* Does not include terminal lugs.

E3 and E3 Plus Solid-State Overload Relays

Panel Mount Devices for use with External Current Transformers*‡

Description	Adjustment Range [A]§	Cat. No.
<ul style="list-style-type: none"> • 2 Inputs • 1 Output 	9...5000	193-EC1ZZ
<ul style="list-style-type: none"> • 4 Inputs • 2 Outputs • External Ground Fault Sensor Input • PTC Thermistor Input • DeviceLogix 	9...5000	193-EC2ZZ

* Current transformers supplied by customer. Refer to Specifications, [T-353355] for proper current transformer selection.

‡ Order panel adapter, Cat. No. 193-ECPM2, separately.

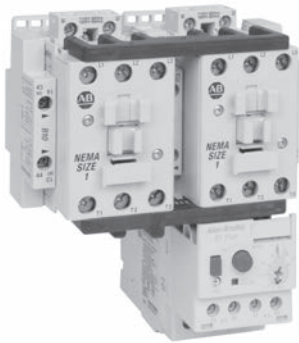
§ CT Ratio to FLA setting range correlation.

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

AC Compact Reversing Starters

Product Overview/Product Selection

1



Bulletin 305 — NEMA AC Starters

- NEMA sizes 0...2
- Cost saving design
- E1 Plus electronic overload relays
- Compact size

Bulletin 305 reversing starters are most commonly used for full-voltage starting and reversing of polyphase squirrel-cage motors. Starters size 0...2 are electrically and mechanically interlocked to avoid both contactors being closed simultaneously. Bulletin 305 reversing starters are available with Bulletin 193 E1 Plus electronic overload relays for additional flexibility in motor protection.

For pricing, please consult your local Rockwell Automation sales office or Allen-Bradley distributor.

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Standards Compliance

- NEMA, EEMAC ICS 2 (Industrial Control Systems)
- UL 508, CSA C22.2 No. 14, ABS 4/15.115
- USCG 46 CFR 111.70
- CE Marked

Certifications

- cULus Listed (File No. E3125, Guide No. NLDX, NLDX7)

Product Selection

3-Phase • 600V AC Maximum • 60 Hz • with 3-Pole Overload Protection

NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed "Continuous Ampere Rating"				Open Type without Enclosure*
		Motor Voltage				
		200V	230V	50 Hz 380...415V	460...575V	Cat. No.
0	18	3	3	5	5	305-AO⊗-⊕
1	27	7-1/2	7-1/2	10	10	305-BO⊗-⊕
2	45	10	15	25	25	305-CO⊗-⊕

* Enclosed starters are available through NEMA Modified Standards. Contact Rockwell Automation Technical Sales for additional information.

⊗ Voltage Suffix Code and Terminal Position (NEMA Sizes 0...2)

The cat. no. as listed is incomplete. Select a voltage suffix code from the table below to complete the cat. no. Example: **Cat. No. 305-AO⊗-⊕** becomes **Cat. No. 305-AOD-⊕**. For other voltages, please consult your local Rockwell Automation sales office or Allen-Bradley distributor.

[V]	24	110	120	220	240	440	480	550	600
AC, 50 Hz	—	D	—	A	—	B	—	C	—
AC, 60 Hz	—	—	D	—	A	—	B	—	C
AC, 50/60 Hz	KJ	—	—	—	—	—	—	—	—

⊗ Voltage Suffix Code for DC Control

NEMA Size	24V DC Electronic Coil Code
0, 1, and 2	EJ

⊕ Overload Relay Codes

The cat. no. as listed is incomplete. Select an overload relay code from the table below to complete the cat. no. Example: **Cat. No. 305-AOD-⊕** becomes **Cat. No. 305-AOD-EEC**. For other voltages, please consult your local Rockwell Automation sales office or Allen-Bradley distributor.

NEMA Size	Full Load Current Adjustment Range	Overload Relay Code
0	1.0...5	EEC
0, 1	5.4...27	EEE
2	9...45	EEF



AC Compact Non-Reversing Starters

Product Overview/Product Selection



Bulletin 309 — NEMA AC Starters

- NEMA sizes 0...2
- Cost saving design
- E1 Plus electronic overload relays
- Compact size

Bulletin 309 starters are designed for full-voltage starting of polyphase squirrel-cage motors. These starters meet NEMA standards, are easy to wire and service, simple to select, and offer a broad range.

These starters may be operated by remote control with push buttons, float switches, thermostats, pressure switches, snap switches, limit switches, or any other suitable two- or three-wire pilot device.

Bulletin 309 non-reversing starters are available with Bulletin 193 E1 Plus electronic overload relays for additional flexibility in motor protection.

For pricing, please consult your local Rockwell Automation sales office or Allen-Bradley distributor.

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Standards Compliance

- NEMA, EEMAC ICS 2 (Industrial Control Systems)
- UL 508, CSA C22.2 No. 14, ABS 4/15.115
- USCG 46 CFR 111.70
- CE Marked

Certifications

- cULus Listed (File No. E3125, Guide No. NLDX, NLDX7)

Product Selection

3-Phase • 600V AC Maximum • 60 Hz • with 3-Pole Overload Protection

NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed "Continuous Ampere Rating"				Open Type Without Enclosure*
		Motor Voltage				
		200V	230V	50 Hz 380...415V	460...575V	Cat. No.
0	18	3	3	5	5	309-AO⊗-⊕
1	27	7-1/2	7-1/2	10	10	309-BO⊗-⊕
2	45	10	15	25	25	309-CO⊗-⊕

* Enclosed starters are available through NEMA Modified Standards. Contact Rockwell Automation Technical Sales for additional information.

⊗ Voltage Suffix Code and Terminal Position (NEMA Sizes 0...2)

The cat. no. as listed is incomplete. Select a voltage suffix code from the table below to complete the cat. no. Example: **Cat. No. 309-AO⊗-⊕** becomes **Cat. No. 309-AOD-⊕**. For other voltages, please consult your local Rockwell Automation sales office or Allen-Bradley distributor.

[V]	24	110	120	220	240	440	480	550	600
AC, 50 Hz	—	D	—	A	—	B	—	C	—
AC, 60 Hz	—	—	D	—	A	—	B	—	C
AC, 50/60 Hz	KJ	—	—	—	—	—	—	—	—

⊗ Voltage Suffix Code for DC Control

NEMA Size	24V DC Electronic Coil Code
0, 1, and 2	EJ

⊕ Overload Relay Codes






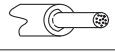



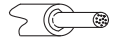

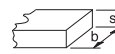
The cat. no. as listed is incomplete. Select an overload relay code from the table below to complete the cat. no. Example: **Cat. No. 309-AOD-⊕** becomes **Cat. No. 309-AOD-EEC**. For other voltages, please consult your local Rockwell Automation sales office or Allen-Bradley distributor.

NEMA Size	Full Load Current Adjustment Range	Overload Relay Code
0	1.0...5	EEC
0, 1	5.4...27	EEE
2	9...45	EEF

Bulletin 300 Line
AC Compact Contactors and Starters
 Specifications

1

Coil Type :	Conventional Electronic — EI	NEMA Size						
		0	1	2	3	4	5	
		X	X	X	X	X	—	
		—	—	—	—	—	X	X
Resistance and Power Dissipation								
Main current circuit resistance	[mΩ]	2.7	2	1.5	0.9	0.42	0.42	0.18
Power dissipation by all circuits at I_e AC-3/400V	[W]	2.1	8.2	8.3	19.5	40.8	40.8	48.6
Total power dissipation								
At I_e AC-3/400V	AC [W]	4.7	11.2	11.5	17.5	50.8	46.8	54.6
	DC [W]	8.1	17.4	18.4	17.5	48.8	46.8	54.6
Lifespan								
Mechanical AC control	[Mil. operations]	13	13	12	10	10	10	10
Mechanical DC control	[Mil. operations]	13	13	13	10	10	10	10
Electrical AC-3 (400 V)	[Mil. operations]	1.3	1.3	1	1	1	1	1

Coil Type :	Conventional Electronic — EI	NEMA Size					
		0	1	2	3	4	5
		X	X	X	X	—	—
		—	—	—	—	X	X
Conductor Cross Sections - Main Contacts Terminal type							
	(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]	—	—	—	—	25	30
	c max. [mm]	—	—	—	—	12.5	15
	s max. [mm]	—	—	—	—	5	6
	Ø min. [mm]	—	—	—	—	8.3	10.5
Recommended torque	[N•m]	1.5...2.5	2.5...3.5	2.5...3.5	3.5...6	22	43
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	195	380
With terminal lug kit		—	—	—	—	100-DL180‡	100-DL420‡
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‡	100-DTB420*
	top opening [mm ²]	—	—	—	—	16...35	25...240♣
	bottom opening [mm ²]	—	—	—	—	16...95	25...240
	top opening [mm ²]	—	—	—	—	16...50	25...300
	bott. opening [mm ²]	—	—	—	—	16...120	25...300
	b max. [mm ²]	—	—	—	—	20	25
	s top [mm ²]	—	—	—	—	3...9	4...20
	s bottom [mm ²]	—	—	—	—	3...14	4...20
Recommended torque	[N•m]	—	—	—	—	14	25
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





* Pozidriv No. 2/Blade No. 3 screw
 † Pozidriv No. 2/Blade No. 4 screw
 ‡ Hexagonal socket screw
 § Hexagonal screw
 ♣ 25...95 mm² with sleeve per DIN 46228

Coil Type			NEMA Size					
			0	1	2	3	4	5
			X	X	X	X	—	—
Conventional			X	X	X	X	—	—
Electronic — EI			—	—	—	—	X	X
Operating Limits								
50 Hz, 60 Hz, 50/60 Hz	pick-up	[x Us]	0.85...1.1			0.85...1.1		0.85...1.1
	dropout	[x Us]	0.3...0.6			0.3...0.6		0.3...0.5
DC (conventional)	pick-up	[x Us]	0.8...1.1			0.8...1.1		0.85...1.1
	dropout	[x Us]	0.1...0.6			0.1...0.6		
DC (electronic)	pick-up	[x Us]	0.7...1.25			—		0.3...0.5
	dropout	[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	380/240*	
	hold-in	[VA/W]	8/2.6	9/3	10/3.2	16/4.5	13/6	
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	—	265*	
	hold-in	[W]	1.7	1.7	10.1	—	6	
Operating Times								
AC	closing delay	[ms]	15...30	15...30	15...30	20...40	20...45	
	opening delay	[ms]	10...60	10...60	10...60	10...60	25...110	
With RC module	opening delay	[ms]	10...60	10...60	10...60	10...60	—	
DC (conventional)	closing delay	[ms]	40...70	50...80	50...80	20...40	25...50	
	opening delay	[ms]	7...15	7...15	7...15	—	35...110	
With integ. diode	opening delay	[ms]	14...20	17...23	17...23	≤ 220V 20...35	—	
With external diode	opening delay	[ms]	70...95	80...125	80...125	—	—	
DC (electronic)	closing delay	[ms]	—	20...40		—	25...50	
	opening delay	[ms]	—	20...40		—	35...110	
Max. Ripple			± 15%			—		—
Min. OFF time		[ms]	200			—		—









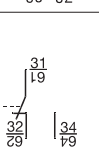
* Electronic coil drives are designed to minimize power requirements, but this control may exhibit a higher inrush (540 W, < 10 ms) when energizing. This must be taken into account for the proper sizing of supply devices, all-or-nothing relays and cross-sections of coil supply lines. Please contact your local Rockwell Automation sales office or Allen-Bradley distributor for detailed information.

Auxiliary Contacts









1

	Description			For Use With NEMA Sizes	Cat. No.	Bifurcated Auxiliary Contact Cat. No.
		N.O.	N.C.			
	Auxiliary Contact Blocks for Front Mounting* - 2- and 4-pole - Quick and easy mounting without tools - Electronic-compatible contacts down to 17V, 5 mA - Mechanically linked performance between N.O. and N.C. poles and 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-FAB02
		1	1		100-FA11	100-FAB11
		2	0		100-FA20	100-FAB20
		1L	1L		100-FBL11	—
		0	4		100-FA04	100-FAB04
		1	3		100-FA13	100-FAB13
		2	2		100-FA22	100-FAB22
		3	1		100-FA31	100-FAB31
		4	0		100-FA40	100-FAB40
		1+1L	1+1L		100-FAL22	—
	Auxiliary Contact Blocks for Side Mounting with Sequence Terminal Designations* - 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	—

* Max. number of auxiliary contacts that may 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 Diagram	For Use With NEMA Sizes	Cat. No.
		No. of N.O. Contacts	No. of N.C. Contacts			
	Auxiliary Contacts Side mounted With sequence terminal designations	1	1		4...5 Left/Right inside mounting	100-DS1-11
		1	1		4...5 Left/Right outside mounting	100-DS2-11
		1	1L		4...5 Left/Right inside mounting	100-DS1-L11
		2	0			100-DS1-20
		2	0		4...5 Left/Right outside mounting	100-DS2-20
		1	1		4...5 Left/Right inside mounting	100-DS1-B11

Control Modules

	Description		For Use With NEMA Sizes	Cat. No.	
	Pneumatic Timing Modules Pneumatic timing element contacts switch after the delay time. The contacts on the main control relay continue to operate without delay.	On-Delay 0.3...30 s Range 1.8...180 s Range	0...3 with AC coils	100-FPTA30 100-FPTA180	
		Off-Delay 0.3...30 s Range 1.8...180 s Range	0...3	100-FPTB30 100-FPTB180	
	Electronic Timing Modules — On-Delay Delay of the contactor or control relay solenoid. The contactor or control relay is energized at the end of the delay time.	On-Delay 0.1...3 s Range 1...30 s Range 10...180 s Range 110...240V, 50/60 Hz 110...250V DC	0...3	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 or control relay is de-energized at the end of the delay time.	Off-Delay 0.3...3 s Range 1...30 s Range 10...180 s Range 110...240V, 50/60 Hz	0...3 with AC coils	100-ETB3 100-ETB30 100-ETB180	
	Electronic Timing Modules Delay of the contactor solenoid. Contactor K 3 (Y) is de-energized (off) and K 2 (D) is energized (on) after the end of the set Y end time. (Switching delay at 50 ms.) Continuous adjustment range High repeat accuracy	Transition Time Y Contactor 1...30 s Range 110...240V, 50/60 Hz	0...3 with AC coils	100-ETY30	
	Mechanical Interlocks For interlocking of two contactors. Common interlock for all Bul. 300 contactor sizes 0...3 Interlocking of different sizes possible Mechanical and electrical interlocking possible in one module by means of integrated auxiliary contacts 9 mm dovetail connector included	Mechanical only, without auxiliary contacts	0...3	100-MCA00	
		Mechanical/electrical interlock with 2 N.C. auxiliary contacts	0...3	100-MCA02	
	DC Interface (electronic) Interface between the DC control signal (PLC) and the AC operating mechanism of the contactor/control relay. Control (input) voltage 12V DC 18...30V DC (24V nominal) 48V DC Requires no additional surge suppression on the relay coils		0...3 with AC coils	100-JE	
	Mechanical Latch Following contactor latching, 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 all Bul. 300 contactor sizes 0...3		0...3 with AC coils	100-FL11 ⊗	
	Surge Suppressors For limitation of coil switching transients. Plug-in, coil mounted Suitable for all Bul. 300 contactor sizes 0...3 RC, varistor, and diode versions	RC Module AC operating mechanism	0...3 with AC coils	24...48V AC, 50/60 Hz	100-FSC48
				110...280V AC, 50/60 Hz	100-FSC280
				380...480V AC, 50/60 Hz	100-FSC480
		Varistor Module AC/DC operating mechanism	0...3	12...55V AC/ 12...77V DC	100-FSV55
				56...136V AC/ 78...180V DC	100-FSV136
				137...277V AC/ 181...350V DC	100-FSV277
278...575V AC	100-FSV575				

⊗ **Voltage Suffix Code**

The cat. no. as listed is incomplete. Select a voltage suffix code from the table below to complete the cat. no. Example: 120V, 60 Hz:
Cat. No. 100-FL11⊗ becomes **Cat. No. 100-FL11D**.






Voltage*	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

* For special voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.






Bulletin 300 Line
AC Compact Contactors and Starters
 Accessories

Assembly Components


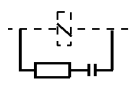
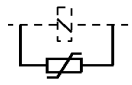
	Description	For Use With NEMA Sizes	Pkg. Quantity	Cat. No.
 Cat. No. 100-S0	Dovetail Connectors For use in contactor and starter assemblies. Single Connector — 0 mm Spacing	0...3	10	100-S0
	Dovetail Connectors For use in contactor and starter assemblies. Dual Connector — 9 mm Spacing			100-S9
 Cat. No. 100-SCCA	Protective Covers Provides protection against unintended manual operation	0...3	1	100-SCCA
 Cat. No. 100-SCFA	For contactors and front mounted auxiliary contacts, pneumatic timers and latches	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	105-PW23
		1		105-PW37
		2		105-PW43
		3		105-PW85
 DIN (#3) symmetrical rail 35 x 7.5 x 1 m		0...2	10	199-DR1

Marking Systems

	Description	Pkg. Qty.*	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	100	100-FMA1
	Marking Tag Adapters To be used with marking tag: System 1492 W	100	100-FMA2

* Must be ordered in multiples of package quantities.

Suppressor Modules

	Description	Circuit Diagram	Suppressor Rating	For Use With NEMA Sizes	Cat. No.	
	Suppressor Module for Bul. 100-D Contactors <ul style="list-style-type: none"> For limiting surge voltage when coil circuits are interrupted Supplied as standard on all conventional DC coil contactors and all electronic coil contactors (as part of the supply module or delivered with separate suppressor module) 		RC Module (AC control) for contactors with conventional coil 21...48V, 50 Hz; 24...55V, 60 Hz	4	100-DFSC48	
			95...110V, 50 Hz; 110...127V, 60 Hz		100-DFSC110	
			180...277V, 50 Hz; 208...277V, 60 Hz		100-DFSC240	
			380...550V, 50 Hz; 440...600V, 60 Hz		100-DFSC550	
			Varistor Module for contactors with conventional coil 55V AC	4	56...136V AC	100-DFSV55
					137...277V AC	100-DFSV136
					278...600V AC	100-DFSV277
					208...277V AC*	100-DFSV575
						100-DFSV550

* For overvoltage category IV (IEC 947 for 100-D...-E1) e.g., lightning protection requirements.

Connecting Components



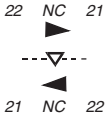



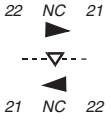
	Description	Output Connection	For Use With NEMA Sizes		Terminal Connection	Cat. No.
			4	5		
	Reversing: Input Connection Wye-Delta: Main-Delta connection	50 mm ²	X		Lugs, 100-DL...	100-D180-VL
		120 mm ²		X		100-D420-VL
	Reversing: Output Connection Wye-Delta: Delta-Wye connection	50 mm ²	X		Terminal Blocks, 100-DTB...	100-D180-VLTB
		120 mm ²		X		100-D420-VLTB
	Delta-Wye connection if 100-D95...180 is used as a Wye contactor	50 mm ²	X		Lugs, 100-DL...	100-D180-VT
		120 mm ²		X		100-D420-VT
	Wye-Delta: Neutral bridge	50 mm ²	X		Terminal Blocks, 100-DTB...	100-D180-VTTB
		120 mm ²		X		100-D420-VTTB
	Power Wiring Kits (for contactors using 100-DL lug kits)	80 mm ²		X	Terminal Blocks, 100-DTB...	100-D420-VYTB
		—	X			—
		—		X	—	100-D420-VYU
	Power Wiring Kits (for contactors using 100-DL lug kits)	NEMA Size 4 • Reversing • Two-speed, or changeover • Wye-Delta/Star-Delta				100-DPW180 100-D180-VL 100-DPY180
		NEMA Size 5 • Reversing • Two-speed, or changeover • Wye-Delta/Star-Delta				100-DPW420 100-D420-VL 100-DPY420



	Description	For Use With NEMA Sizes		Cat. No.
	Terminal Lugs • Set of two • Protection class IP2X per IEC 60529 and DIN 40 050	4, 193-EC_F, 193-EE_F		100-DTB180
		5, 193-EC_G, 193-EF2C, 193-EE_G		100-DTB420
	Terminal Lugs (UL/CSA), Copper Frame Set of three	4, 193-EC_F, 193-EE_F		100-DL180
		5, 193-EC_G, 193-EE_G		100-DL420
	Terminal Lugs (UL/CSA), Aluminum Frame Set of three	4		100-DLA180
		5		100-DLA420
	Control Circuit Terminal 2 x 2.5 mm ²	4		100-DAT1
		5		100-DAT2
	Terminal Shields • Set of two • Protection class IP10 per IEC 60529 and DIN 40 050 • For direct-on-line, reversing, two-speed, and wye-delta/star-delta assemblies	4		100-DTS180
		5		100-DTS420
	Terminal Covers • Protection class IP20 per IEC 60529 and DIN 40 050 • For direct-on-line, reversing, two-speed, and wye-delta/star-delta assemblies	4, 193-EC_F, 193-EE_F		100-DTC180
		5, 193-EC_G, 193-EE_G		100-DTC420
	Mounting Plate • Galvanized steel plate for starter combinations • For direct-on-line, reversing, two-speed, wye-delta/star-delta, and Dahlander assemblies	4	Direct-on-line	100-DMS180
			Reversing, two-speed or changeover	100-DMU180
			Y-Δ or Dahlander	100-DMY180
		5	Direct-on-line	100-DMS420
Reversing, two-speed or changeover	100-DMU420			
		Y-Δ or Dahlander	100-DMY420	
	Mounting Plate For two-speed or changeover switches	For interlocking between two size 4 contactors		100-DMU85

Bulletin 300 Line
AC Compact Contactors and Starters
 Accessories

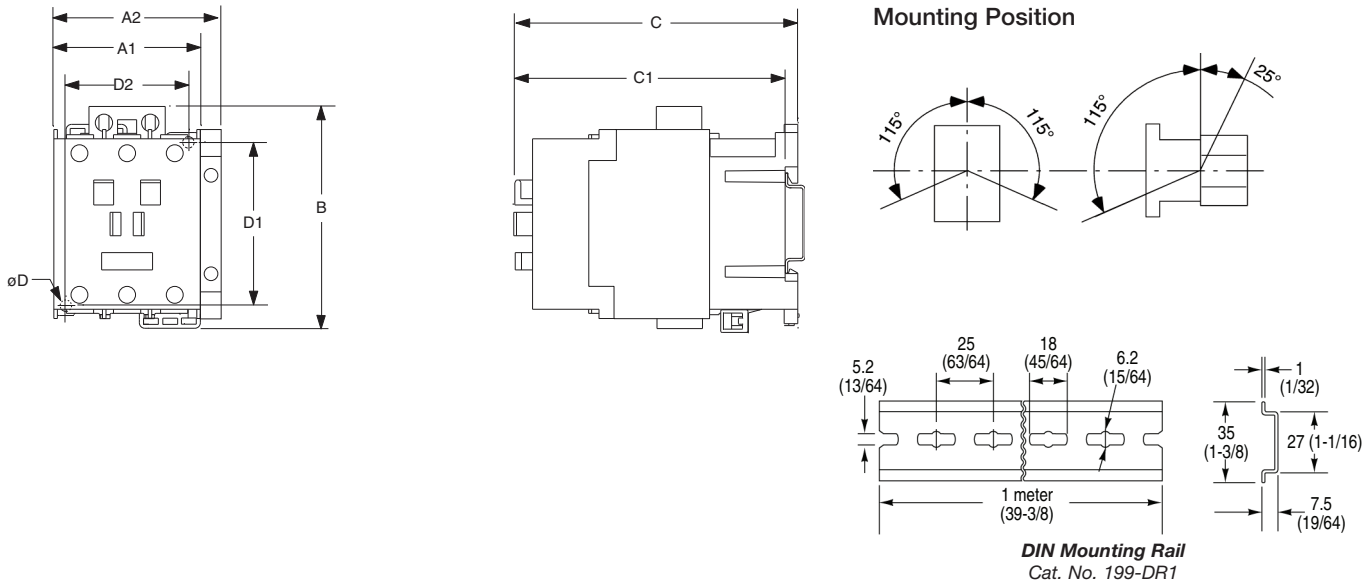
Interlocks

	Description	Circuit Diagram	For Use With NEMA Sizes	Cat. No.
	Interlock — Mechanical Only No additional space required		4...5	100-DMA00
	Interlock — Dual Electrical/Mechanical No additional space required Two N.C. auxiliary contacts		4...5	100-DMD02
	Interlock — Mechanical Only No additional space required		4...5	100-DMD00
	Interlock — Mechanical Only Provides interlocking between size 3 and size 4 contactors.		3...4	100-DMC00
	Interlock — Dual Electrical/Mechanical Provides interlocking between size 3 and size 4 contactors. Two N.C. auxiliary contacts		3...4	100-DMC02

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

Bulletin 300 Contactors and Accessories



AC Contactors

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

Accessories

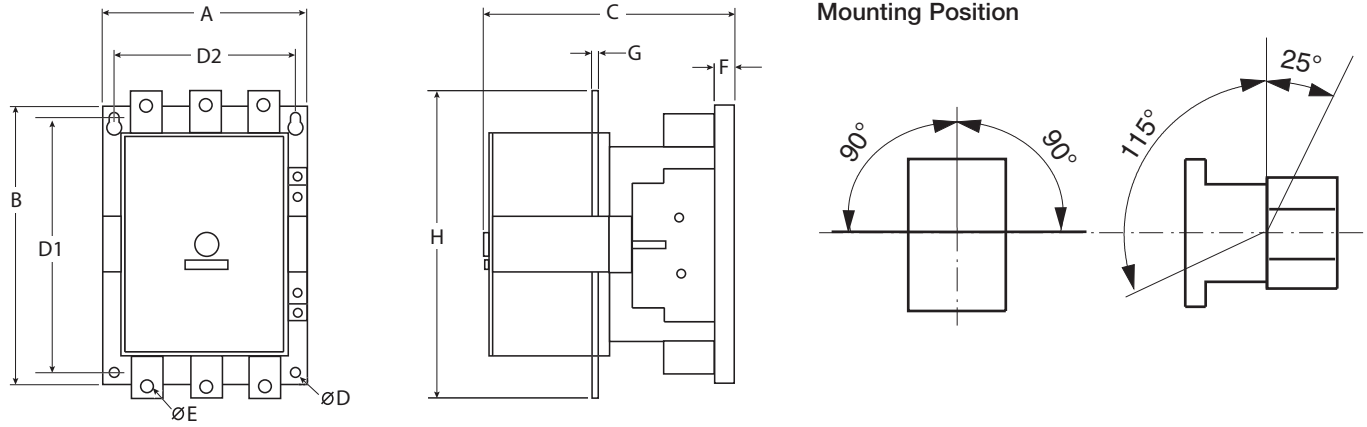
Contactors with		in. (mm)
Auxiliary contact block for front mounting	2- or 4-pole	C/C1 + 1.54 (39)
Auxiliary contact block for side mounting	1- or 2-pole	A + 0.35 (9)
Pneumatic Timing Module		C/C1 + 2.28 (58)
Electronic Timing Module	on coil terminal side	B + 0.94 (24)
Mechanical Interlock	on side of 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 Bul. 1492W	+ 0.22 (5.5)

Bulletin 300 Line
AC Compact Contactors and Starters
 Approximate Dimensions

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

Bulletin 300 Contactors and Accessories, Continued

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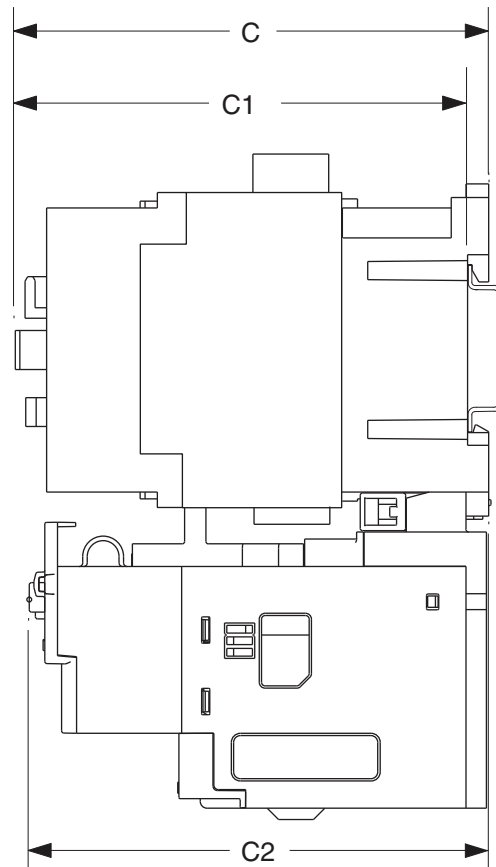
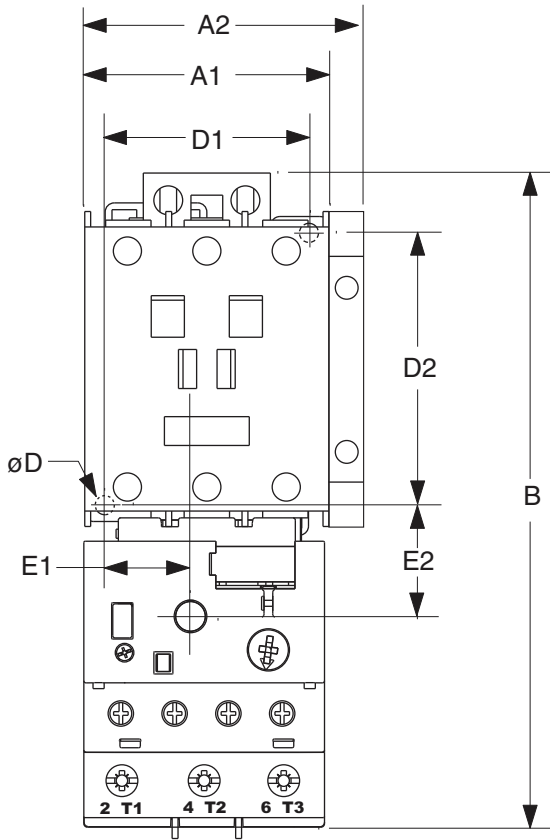
Cat. No.	NEMA Size	A	B	C	Mounting Dimensions			ØE	F	G	H
					ØD	D1	D2				
300-EO_	4	4.72 (120)	6.69 (170)	6.14 (156)	0.21 (5.2)	5.71 (145)	3.94 (100)	0.34 (8.5)	0.59 (15)	0.157 (4)	7.17 (182)
300-FO_	5	6.10 (155)	8.07 (205)	7.09 (180)	0.26 (6.5)	7.09 (180)	5.12 (130)	0.41 (10.4)	0.59 (15)	0.236 (6)	8.74 (222)

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

* Conventional DC coil contactors will accept only Cat. No. 100-DS2_ auxiliary contacts.

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

Bulletin 309 with E1 Plus Solid-State Overload Relay



Cat. No.	NEMA Size	A1	A2	B	C	C1	C2	Mounting Dimensions			Reset Location	
								ØD	D1	D2	E1	E2
193*-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*-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*-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*-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)

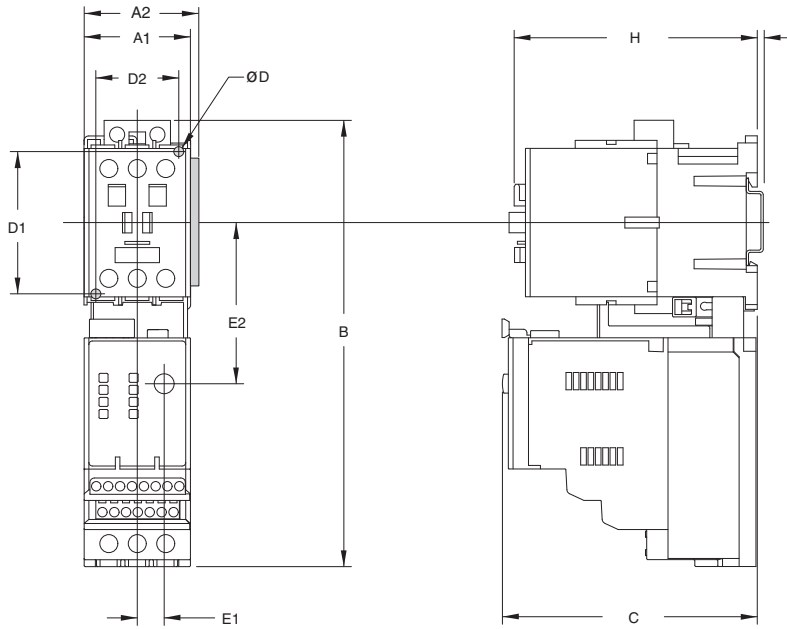
* Valid for Bulletin Nos. 193, 193R, and 193S.

Bulletin 300 Line
AC Compact Contactors and Starters
 Approximate Dimensions

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

Bulletin 309 with E3, E3 Plus Solid-State Overload Relay

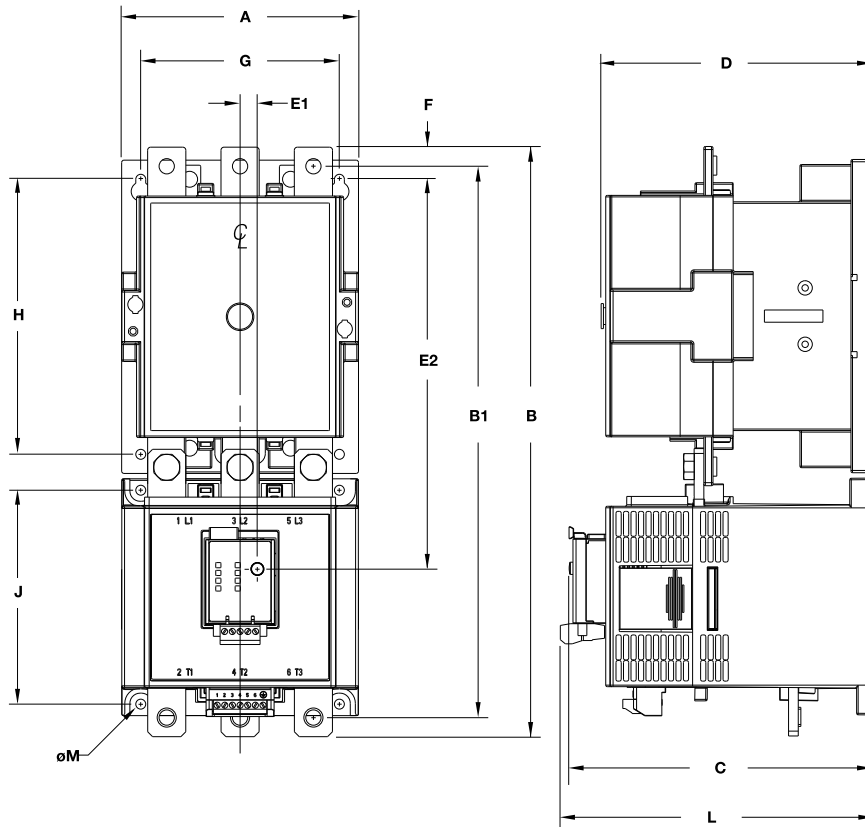
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Overload Cat. No.	NEMA Size	A1	A2	B Height		B1	C Depth	ØD	D1	D2	E1	E2	H	J
				without 193- EIMD	with 193- EIMD									
193-EC_B	0	1.76 (45)	—	7.40 (188)	8.19 (208)	5.71 (145)	4.21 (107)	0.17 (4.5)	2.36 (60)	1.38 (35)	0.43 (11)	2.68 (68)	3.35 (85)	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)	0.43 (11)	2.68 (68)	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)	1.38 (35)	0.43 (11)	2.68 (68)	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)	0.43 (11)	3.54 (90)	4.96 (126)	0.08 (2)

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

Bulletin 309 with E3, E3 Plus Solid-State Overload Relay



Overload Cat. No.	NEMA Size	A Width	B Height		B1	C Depth	D	E1	E2
			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)
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)
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)
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)

Overload Cat. No.	NEMA Size	F	G	H	J	L	M
193-EC_F 193-EE_F	4	0.63 (16)	3.94 (100)	5.71 (145)	5.31 (135)	7.13 (181)	0.21 (5.2)
193-EC_G 193-EE_G	5	0.83 (21)	5.12 (130)	7.09 (180)	5.51 (140)	8.07 (205)	0.26 (6.5)

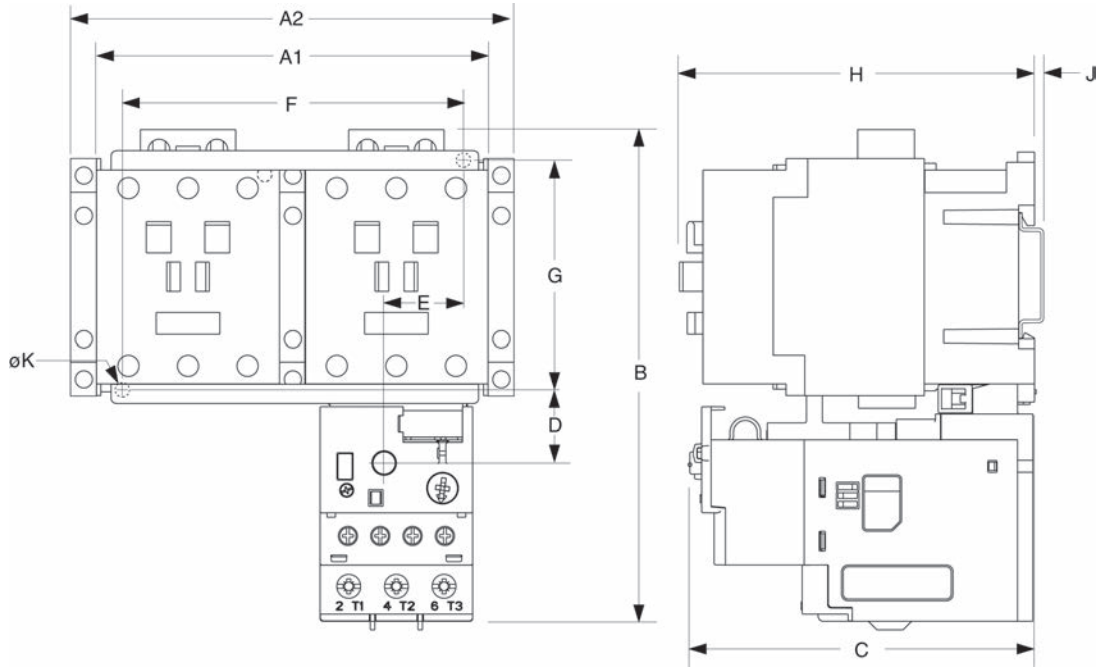
AC Compact Contactors and Starters

Approximate Dimensions

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

Bulletin 305 with E1 Plus Solid-State Overload Relay

1








Cat. No.	A1	A2	B	C	D	E	F	G	H	J	ØK
305-AO	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-BO	—	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-CO	—	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)

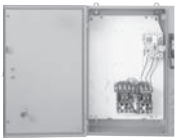




NEMA Combination Starters and Pump Control Panels

Product Overview

NEMA Combination Starters and Pump Panels

					
Bulletin	502/503	506/507	512/513, 512M/513M	512H/513H	512V/513V
Features	Non-reversing combination contactor	Reversing combination starter	Non-reversing combination starter and non-reversing starter with extra panel space	Non-reversing combination starter mounted in a horizontal enclosure	Non-reversing vacuum combination starter
Disconnecting Means	<ul style="list-style-type: none"> • 502 disconnect switch • 503 circuit breaker 	<ul style="list-style-type: none"> • 506 disconnect switch • 507 circuit breaker 	<ul style="list-style-type: none"> • 512/512M disconnect switch • 513/513M circuit breaker 	<ul style="list-style-type: none"> • 512H disconnect switch • 513H circuit breaker 	<ul style="list-style-type: none"> • 512V disconnect switch • 513V circuit breaker
Type 1 — Painted Metal Enclosure Latch Fastener	NEMA Size 0...5	NEMA Size 0...5	NEMA Size: 0...5 (512/513), — (512M/513M)	—	NEMA Size 4...5
Type 3R/4/12 — Painted Metal Enclosure Screw Fasteners	NEMA Size 0...5	NEMA Size 0...5	NEMA Size: 0...7 (512/513), 1...2 (512M/513M)	—	NEMA Size 4...6
Type 3R/4/12 — Painted Metal Enclosure Door Safety Hardware	NEMA Size 0...5	NEMA Size 0...5	NEMA Size: 0...5 (512/513), 1...2 (512M/513M)	NEMA Size 1...2	NEMA Size 4...5
Type 4/4X — Stainless Steel Enclosure Screw Fasteners	NEMA Size 0...5	NEMA Size 0...5	NEMA Size: 0...6 (512/513), 1...2 (512M/513M)	—	NEMA Size 4...5
Product Selection	Page 1-79 (Bul. 502) or page 1-80 (Bul. 503)	Page 1-81 (Bul. 506) or page 1-82 (Bul. 507)	Page 1-84 (Bul. 512), page 1-86 (Bul. 512M), page 1-87 (Bul. 513), page 1-90 (Bul. 513M)	Web†	Web†

			
Bulletin	522/523	1232X/1233X	1232V/1233V
Features	<ul style="list-style-type: none"> • Combination multi-speed starter constant horsepower • Combination multi-speed starter constant or variable torque • Combination multi-speed starter consequent pole 	Non-reversing starter with extra panel space	Non-reversing vacuum pump control panel
Disconnecting Means	<ul style="list-style-type: none"> • 522E,F,G disconnect switch • 523E,F,G circuit breaker 	<ul style="list-style-type: none"> • 1232X disconnect switch • 1233X circuit breaker 	<ul style="list-style-type: none"> • 1232V disconnect switch • 1233V circuit breaker
Type 1 — Painted Metal Enclosure Latch Fastener	NEMA Size 1...5	—	—
Type 3R/4/12 — Painted Metal Enclosure Screw Fasteners	NEMA Size 1...5	NEMA Size 1...7 (Type 3R only)	NEMA Size 4...6 (Type 3R only)
Type 3R/4/12 — Painted Metal Enclosure Door Safety Hardware	NEMA Size 1...5	—	—
Type 4/4X — Stainless Steel Enclosure Screw Fasteners	NEMA Size 1...5	—	—
Product Selection	Page 1-91 (Bul. 522) or page 1-95 (Bul. 523)	Page 1-100 (Bul. 1232X) or page 1-103 (Bul. 1233X)	Page 1-101 (Bul. 1232V) or page 1-105 (Bul. 1233V)

† Information for this product line is available on the Industrial Controls Catalog website: www.ab.com/catalogs.

Note: For reduced voltage starters such as wye-delta, part-winding, and autotransformer, see the Industrial Controls Catalog website: www.ab.com/catalogs.

NEMA Combination Starters

Cat. No. Explanation

Configuration of a Basic Combination Starter

The information below is for reference purposes only. Not all combinations will produce a valid cat. no. Refer to the tables on the following pages for product selection.

Example Cat. No.

512 – A
A
CD – A2E – 1
– 24R – 90

a
b
c
d
e
f

1

Bulletin No.	
Bulletin No.	Description
502	Combination contactor with disconnect switch
503	Combination contactor with circuit breaker
506	Reversing combination starter with disconnect switch
506X	Reversing combination starter with disconnect switch in a narrow enclosure
507	Reversing combination starter with circuit breaker
507X	Reversing combination starter with circuit breaker in a narrow enclosure
512	Non-reversing combination starter with disconnect switch
512M	Non-reversing combination starter with disconnect switch — extra panel space
513	Non-reversing combination starter with circuit breaker
513M	Non-reversing combination starter with circuit breaker — extra panel space
522E	2-speed, separate-winding, full voltage, multi-speed combination starter with disconnect switch
522F	2-speed, 1-winding, constant or variable torque, full voltage, multi-speed combination starter with disconnect switch
522G	2-speed, 1-winding, constant horsepower, full voltage, multi-speed combination starter with disconnect switch
523E	2-speed, separate-winding, full voltage, multi-speed combination starter with circuit breaker
523F	2-speed, 1-winding, constant or variable torque, full voltage, multi-speed combination starter with circuit breaker
523G	2-speed, 1-winding, constant horsepower, full voltage, multi-speed combination starter with circuit breaker
1232	Pump panel with disconnect switch (Narrow)
1232X	Pump panel with disconnect switch (Extra space)
1232V	Pump panel with vacuum contactor and disconnect switch (Extra space)
1233	Pump panel with circuit breaker (Narrow)
1233X	Pump panel with circuit breaker (Extra space)
1233V	Pump panel with vacuum contactor and circuit breaker (Extra space)

Starter Size	
NEMA Size Code	NEMA Size
A	0
B	1
C	2
D	3
E	4
F	5
G	6
H	7

Enclosure Type	
Code	Type
A	Type 1: General purpose, painted metal enclosure with spring latch door fastener, external overload relay reset, and non-metallic handle
F	Type 3R/4/12: Rainproof, watertight, dusttight, painted metal enclosure with screw fasteners, external overload relay reset, and non-metallic handle
J	Type 3R/4/12: Rainproof, watertight, dusttight, painted metal enclosure with door safety hardware, metal handle, and NO external overload relay reset
N	Type 3R: Rainproof, painted metal enclosure with screw fasteners, external overload relay reset, and a non-metallic handle
C	Type 4/4X: Watertight corrosion-resistant stainless steel enclosure with screw fasteners, external overload relay reset, and a stainless steel handle
L	Type 12: Hazardous location (Class II, Division 2, Group F + G and Class III, Divisions 1 + 2) painted metal enclosure with screw fasteners, external overload relay reset, and a non-metallic handle.
H	Type 3R/7/9: Hazardous location bolted enclosure, rain proof, metal handle.
U	Type 3R/7/9: Hazardous location Unilock enclosure, rain proof, metal handle.

Coil Voltage			
Voltage Code	Description	Line Voltage [V]	Coil Voltage [V]
H	Common Control (without transformer)	208	208
A		240	240
B		480	480
C		600	600
H	Transformer Control*	208	120
A		240	120
B		480	120
C		600	120
HD	Separate Control (without transformer)	208	120
AD		240	120
BD		480	120
CD		600	120

Overload Relay	
Code	Description
None	Eutectic Alloy
See page 1-164	Solid-State

Options	
See page 1-109	

***Note:** When selecting a factory-installed control circuit transformer use the Transformer Control Voltage Suffix Code to denote the transformer primary voltage. The transformer secondary voltage and starter coil will both be 120V AC by default. Example: **Cat. No. 512-BAB-6P-24R** will have a transformer with a 480V primary voltage, 120V secondary voltage, and a 120V starter coil voltage.

NEMA Combination Starters

Product Selection — Disconnect Type



Bulletin 502

- NEMA contactor sizes 0...5 (no overload relay)
- Fusible or non-fusible disconnect switch
- Painted metal enclosures: Type 1, Type 3R/4/12
- Stainless steel enclosures: Type 4/4X
- Modifications — factory-installed
- Accessories — field-installed
- Service entrance rated

A Bulletin 502 combination contactor consists of a Bulletin 500, 3-pole contactor, and a disconnect switch (fused or non-fused) mounted in a common enclosure.

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Accessories..... 1-111
 Modifications..... 1-108
 Specifications..... 1-128
 Full Load Currents of AC Motors..... 1-132
 Approximate Dimensions..... 1-146

Standards Compliance

UL 508
 CSA C22.2, No. 14

Certifications

cULus Listed (File No. E3125, Guide No. NLDX, NLDX7)



NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Line Voltage [V]	Fuse Clip Rating Amperes [A] Fuses not included. Select per NEC	Type 1 General Purpose	Type 3R/4/12 Rainproof, Waterproof, Dusttight	Type 3R/4/12 Rainproof, Waterproof, Dusttight (Door Safety Hardware)	Type 4/4X Watertight Corrosion-Resistant Stainless Steel
		Motor Voltage									
		60 Hz 200V	60 Hz 230V	50 Hz 380... 415V	60 Hz 460... 575V						
0	18	3	3	—	—	208...240	30	502-AA®-24R	502-AF®-24R	502-AJ®-24R	502-AC®-24R
		—	—	5	5	480...600	30	502-AA®-24R	502-AF®-24R	502-AJ®-24R	502-AC®-24R
1	27	7-1/2	7-1/2	—	—	208...240	30	502-BA®-24R	502-BF®-24R	502-BJ®-24R	502-BC®-24R
		—	—	10	10	480...600	30	502-BA®-24R	502-BF®-24R	502-BJ®-24R	502-BC®-24R
		7-1/2	7-1/2	—	—	208...240	60	502-BA®-25R	502-BF®-25R	502-BJ®-25R	502-BC®-25R
		—	—	10	10	480...600	60	502-BA®-25R	502-BF®-25R	502-BJ®-25R	502-BC®-25R
2	45	—	—	25	25	480...600	30	502-CA®-24R	502-CF®-24R	502-CJ®-24R	502-CC®-24R
		10	15	—	—	208...240	60	502-CA®-25R	502-CF®-25R	502-CJ®-25R	502-CC®-25R
		—	—	25	25	480...600	60	502-CA®-25R	502-CF®-25R	502-CJ®-25R	502-CC®-25R
		10	15	—	—	208...240	100	502-CA®-26J	502-CF®-26J	502-CJ®-26J	502-CC®-26J
3	90	—	—	25	25	480...600	100	502-CA®-26J	502-CF®-26J	502-CJ®-26J	502-CC®-26J
		—	—	50	50	480...600	60	502-DA®-25R	502-DF®-25R	502-DJ®-25R	502-DC®-25R
		25	30	—	—	208...240	100	502-DA®-26R	502-DF®-26R	502-DJ®-26R	502-DC®-26R
		—	—	50	50	480...600	100	502-DA®-26R	502-DF®-26R	502-DJ®-26R	502-DC®-26R
4	135	25	30	—	—	208...240	200	502-DA®-27J	502-DF®-27J	502-DJ®-27J	502-DC®-27J
		—	—	50	50	480...600	200	502-DA®-27J	502-DF®-27J	502-DJ®-27J	502-DC®-27J
		—	—	75	100	480...600	100	502-EA®-26R	502-EF®-26R	502-EJ®-26R	502-EC®-26R
		40	50	—	—	208...240	200	502-EA®-27R	502-EF®-27R	502-EJ®-27R	502-EC®-27R
5	270	—	—	75	100	480...600	200	502-EA®-27R	502-EF®-27R	502-EJ®-27R	502-EC®-27R
		40	50	—	—	208...240	400	502-EA®-28J	502-EF®-28J	502-EJ®-28J	502-EC®-28J
		—	—	75	100	480...600	400	502-EA®-28J	502-EF®-28J	502-EJ®-28J	502-EC®-28J
		40	50	—	—	208...240	200	502-FA®-27R	502-FF®-27R	502-FJ®-27R	502-FC®-27R
5	270	—	—	75	100	480...600	200	502-FA®-27R	502-FF®-27R	502-FJ®-27R	502-FC®-27R
		75	100	150	200	208...600	400	502-FA®-28R	502-FF®-28R	502-FJ®-28R	502-FC®-28R
		—	—	150	200	480...600	400	502-FA®-28R	502-FF®-28R	502-FJ®-28R	502-FC®-28R

*Non-Fusible Disconnect Type

Cat. nos. listed above include a fusible disconnect switch with Class R or J fuse clips. To order a non-fusible disconnect switch, eliminate the fuse clip code from the cat. no. Example: **Cat. No. 502-BFB-24R** becomes **Cat. No. 502-BFB**.

* Class H fuse clips can be supplied. Example: **Cat. No. 502-AA®-24R** becomes **Cat. No. 502-AA®-24H**. Class J fuse clips can be supplied. Example: **Cat. No. 502-AA®-24R** becomes **Cat. No. 502-AA®-24J**. Class HRC form II fuse clips can be supplied. Example: **Cat. No. 502-AA®-24R** becomes **Cat. No. 502-AA®-24E**.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a Coil Voltage Code from the table below to complete the cat. no.

Example: **Cat. No. 502-AA®-24R** becomes **Cat. No. 502-AAB-24R**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control (See page 1-78 Note)		AD	AD	CD	CD
120V Separate Control (without transformer)		AD	AD	CD	CD

NEMA Combination Starters

Product Selection — Circuit Breaker Type

1



Bulletin 503

- NEMA contactor sizes 0...5
- Circuit breaker thermal magnetic (inverse time)
- Painted metal enclosures: Type 1, Type 3R/4/12
- Stainless steel enclosures: Type 4/4X
- Modifications — factory installed
- Accessories — field installed
- Service entrance rated

A Bulletin 503 combination contactor consists of a Bulletin 500, 3-pole contactor, and a thermal magnetic circuit breaker (inverse time) mounted in a common enclosure.

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 Accessories..... 1-111
 Specifications..... 1-128
 Approximate Dimensions..... 1-146

Standards Compliance

UL 508
 CSA C22.2, No. 14

Certifications

cULus Listed (File No. E3125, Guide No. NLDX, NLDX7)

NEMA Size	Continuous Ampere Rating [A]*	Maximum Horsepower Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Type 1 General Purpose Cat. No.*	Type 3R/4/12 Rainproof, Waterproof, Dusttight Cat. No.*	Type 3R/4/12 Rainproof, Waterproof, Dusttight (Door Safety Hardware) Cat. No.*	Type 4/4X Watertight Corrosion-Resistant Stainless Steel Cat. No.*
		Motor Voltage							
		200V	230V	460V	575V				
0	18	0...1/3	0...1/3	—	—	503-AA⊗-32T	503-AF⊗-32T	503-AJ⊗-32T	503-AC⊗-32T
		1/2...1	1/2...1	0...1	0...1	503-AA⊗-35T	503-AF⊗-35T	503-AJ⊗-35T	503-AC⊗-35T
		1-1/2...3	1-1/2...3	1-1/2...3	1-1/2...3	503-AA⊗-38T	503-AF⊗-38T	503-AJ⊗-38T	503-AC⊗-38T
		—	—	5	5	503-AA⊗-39T	503-AF⊗-39T	503-AJ⊗-39T	503-AC⊗-39T
1	27	0...1/3	0...1/3	—	—	503-BA⊗-32T	503-BF⊗-32T	503-BJ⊗-32T	503-BC⊗-32T
		1/2...1	1/2...1	0...1	0...1	503-BA⊗-35T	503-BF⊗-35T	503-BJ⊗-35T	503-BC⊗-35T
		1-1/2...3	1-1/2...3	1-1/2...3	1-1/2...3	503-BA⊗-38T	503-BF⊗-38T	503-BJ⊗-38T	503-BC⊗-38T
		5	—	—	—	503-BA⊗-39T	503-BF⊗-39T	503-BJ⊗-39T	503-BC⊗-39T
		7-1/2	5...7-1/2	5...7-1/2	5...7-1/2	503-BA⊗-40T	503-BF⊗-40T	503-BJ⊗-40T	503-BC⊗-40T
2	45	—	—	10	10	503-BA⊗-41T	503-BF⊗-41T	503-BJ⊗-41T	503-BC⊗-41T
		10	10	—	—	503-CA⊗-41T	503-CF⊗-41T	503-CJ⊗-41T	503-CC⊗-41T
		—	15	15	15	503-CA⊗-42T	503-CF⊗-42T	503-CJ⊗-42T	503-CC⊗-42T
3	90	—	—	20...25	20...25	503-CA⊗-44T	503-CF⊗-44T	503-CJ⊗-44T	503-CC⊗-44T
		15...25	20...25	—	—	503-DA⊗-44T	503-DF⊗-44T	503-DJ⊗-44T	503-DC⊗-44T
		—	30	—	30	503-DA⊗-45T	503-DF⊗-45T	503-DJ⊗-45T	503-DC⊗-45T
4	135	—	—	30...50	40...50	503-DA⊗-47T	503-DF⊗-47T	503-DJ⊗-47T	503-DC⊗-47T
		30	—	—	—	503-EA⊗-45T	503-EF⊗-45T	503-EJ⊗-45T	503-EC⊗-45T
		40	40	—	—	503-EA⊗-46T	503-EF⊗-46T	503-EJ⊗-46T	503-EC⊗-46T
		—	50	—	—	503-EA⊗-47T	503-EF⊗-47T	503-EJ⊗-47T	503-EC⊗-47T
		—	—	—	60	503-EA⊗-48T	503-EF⊗-48T	503-EJ⊗-48T	503-EC⊗-48T
		—	—	60...75	—	503-EA⊗-49T	503-EF⊗-49T	503-EJ⊗-49T	503-EC⊗-49T
5	270	—	—	100	75...100	503-EA⊗-50T	503-EF⊗-50T	503-EJ⊗-50T	503-EC⊗-50T
		50...60	—	—	—	503-FA⊗-48T	503-FF⊗-48T	503-FJ⊗-48T	503-FC⊗-48T
		75	60...75	—	—	503-FA⊗-49T	503-FF⊗-49T	503-FJ⊗-49T	503-FC⊗-49T
		—	100	—	—	503-FA⊗-50T	503-FF⊗-50T	503-FJ⊗-50T	503-FC⊗-50T
		—	—	—	125	503-FA⊗-51T	503-FF⊗-51T	503-FJ⊗-51T	503-FC⊗-51T
		—	—	125...150	—	503-FA⊗-52T	503-FF⊗-52T	503-FJ⊗-52T	503-FC⊗-52T
—	—	200	150...200	503-FA⊗-54T	503-FF⊗-54T	503-FJ⊗-54T	503-FC⊗-54T		

* To order contactors (sizes 0...3) with current limiters, change the letter **T** to **D** at the end of the listed cat. no. Example: **Cat. No. 503-AA⊗-35D**.

⊗ When controlling high efficiency motors – consult your local Rockwell Automation sales office or Allen-Bradley distributor for proper circuit breaker selection.

⊗ Coil Voltage Code

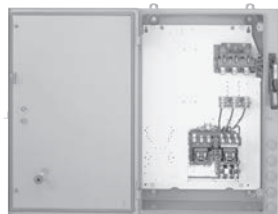
The cat. no. as listed is incomplete. Select a Coil Voltage Code from the table below to complete the cat. no.

Example: **Cat. No. 503-BA⊗-35T** becomes **Cat. No. 503-BAB-35T**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

		[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz		H	A	B	C
Transformer Control (See page 1-78 Note)			HD	AD	BD	CD
120V Separate Control (without transformer)						

NEMA Combination Reversing Starters

Product Selection — Disconnect Type (Fusible with Class R Fuse Clips) (Non-Fusible)



Bulletin 506

- NEMA starter sizes 0...5
- Overload relays: Eutectic supplied as standard, solid-state available as an option
- Fusible or non-fusible disconnect switch
- Painted metal enclosures: Type 1, Type 3R/4/12
- Stainless steel enclosures: Type 4/4X
- Modifications — factory installed
- Accessories — field installed
- Service entrance rated

A Bulletin 506 combination reversing starter consists of a Bulletin 505 reversing starter and a disconnect switch (fused or non-fused) mounted in a common enclosure.

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 Specifications..... 1-128
 Approximate Dimensions..... 1-146

Standards Compliance

UL 508
 CSA C22.2, No. 14

Certifications

cULus Listed (File No. E3125, Guide No. NLDX, NLDX7)



Heater Elements — Starters with eutectic alloy overload relays require 3 heater elements. Located on page 1-167.

NEMA Size	Cont. Ampere Rating [A]	Max. Hp Rating FLC Must Not Exceed Continuous Amp Rating				Line Voltage [V]	Fuse Clip Rating Amperes [A] Fuses not included. Select per NEC	Type 1 General Purpose Cat. No. *†‡	Type 3R/4/12 Rainproof, Waterproof, Dusttight Cat. No. *†‡	Type 3R/4/12 Rainproof, Waterproof, Dusttight (Door Safety Hardware) Cat. No. *†‡	Type 4/4X Watertight Corrosion-Resistant Stainless Steel Cat. No. *†
		Motor Voltage									
		60 Hz 200V	60 Hz 230V	50 Hz 380...415V	50 Hz 460...575V						
0	18	3	3	—	—	208...240	30	506-AA⊗-⊕-24R	506-AF⊗-⊕-24R	506-AJ⊗-⊕-24R	506-AC⊗-⊕-24R
		—	—	5	5	480...600	30	506-AA⊗-⊕-24R	506-AF⊗-⊕-24R	506-AJ⊗-⊕-24R	506-AC⊗-⊕-24R
1	27	7-1/2	7-1/2	—	—	208...240	30	506-BA⊗-⊕-24R	506-BF⊗-⊕-24R	506-BJ⊗-⊕-24R	506-BC⊗-⊕-24R
		—	—	10	10	480...600	30	506-BA⊗-⊕-24R	506-BF⊗-⊕-24R	506-BJ⊗-⊕-24R	506-BC⊗-⊕-24R
		7-1/2	7-1/2	—	—	208...240	60	506-BA⊗-⊕-25R	506-BF⊗-⊕-25R	506-BJ⊗-⊕-25R	506-BC⊗-⊕-25R
		—	—	10	10	480...600	60	506-BA⊗-⊕-25R	506-BF⊗-⊕-25R	506-BJ⊗-⊕-25R	506-BC⊗-⊕-25R
2	45	—	—	25	25	480...600	30	506-CA⊗-⊕-24R	506-CF⊗-⊕-24R	506-CJ⊗-⊕-24R	506-CC⊗-⊕-24R
		10	15	—	—	208...240	60	506-CA⊗-⊕-25R	506-CF⊗-⊕-25R	506-CJ⊗-⊕-25R	506-CC⊗-⊕-25R
		—	—	25	25	480...600	60	506-CA⊗-⊕-25R	506-CF⊗-⊕-25R	506-CJ⊗-⊕-25R	506-CC⊗-⊕-25R
		10	15	—	—	208...240	100	506-CA⊗-⊕-26R	506-CF⊗-⊕-26R	506-CJ⊗-⊕-26R	506-CC⊗-⊕-26J
		—	—	25	25	480...600	100	506-CA⊗-⊕-26J	506-CF⊗-⊕-26J	506-CJ⊗-⊕-26J	506-CC⊗-⊕-26J
3	90	—	—	50	50	480...600	60	506-DA⊗-⊕-25J	506-DF⊗-⊕-25J	506-DJ⊗-⊕-25J	506-DC⊗-⊕-25R
		25	30	—	—	208...240	100	506-DA⊗-⊕-26R	506-DF⊗-⊕-26R	506-DJ⊗-⊕-26R	506-DC⊗-⊕-26R
		—	—	50	50	480...600	100	506-DA⊗-⊕-26R	506-DF⊗-⊕-26R	506-DJ⊗-⊕-26R	506-DC⊗-⊕-26R
		25	30	—	—	208...240	200	506-DA⊗-⊕-27J	506-DF⊗-⊕-27J	506-DJ⊗-⊕-27J	506-DC⊗-⊕-27J
		—	—	50	50	480...600	200	506-DA⊗-⊕-27J	506-DF⊗-⊕-27J	506-DJ⊗-⊕-27J	506-DC⊗-⊕-27J
4	135	—	—	75	100	480...600	100	506-EA⊗-⊕-26R	506-EF⊗-⊕-26R	506-EJ⊗-⊕-26R	506-EC⊗-⊕-26R
		40	50	—	—	208...240	200	506-EA⊗-⊕-27R	506-EF⊗-⊕-27R	506-EJ⊗-⊕-27R	506-EC⊗-⊕-27R
		—	—	75	100	480...600	200	506-EA⊗-⊕-27R	506-EF⊗-⊕-27R	506-EJ⊗-⊕-27R	506-EC⊗-⊕-27R
		—	—	—	100	480...600	400	506-EA⊗-⊕-28R	506-EF⊗-⊕-28R	506-EJ⊗-⊕-28R	506-EC⊗-⊕-28R
		—	—	75	100	480...600	400	506-EA⊗-⊕-28J	506-EF⊗-⊕-28J	506-EJ⊗-⊕-28J	506-EC⊗-⊕-28J
5	270	75	100	—	—	208...240	400	506-FA⊗-⊕-28R	506-FF⊗-⊕-28R	506-FJ⊗-⊕-28R	506-FC⊗-⊕-28R
		—	—	150	200	480...600	400	506-FA⊗-⊕-28R	506-FF⊗-⊕-28R	506-FJ⊗-⊕-28R	506-FC⊗-⊕-28R

*Non-Fusible Disconnect Type

Cat. nos. listed above include a fusible disconnect switch with Class R or J fuse clips. To order a non-fusible disconnect switch, eliminate the fuse clip code from the cat. no. Example: **Cat. No. 506-BFB-24R** becomes **Cat. No. 506-BFB**.

* Class H fuse clips can be supplied. Example: **Cat. No. 506-AA⊗-24R** becomes **Cat. No. 506-AA⊗-24**. Class J fuse clips can be supplied. Example: **Cat. No. 506-AA⊗-24R** becomes **Cat. No. 506-AA⊗-24J**. Class HRC form II fuse clips can be supplied. Example: **Cat. No. 506-AA⊗-24R** becomes **Cat. No. 506-AA⊗-24E**.

‡ **Bulletin 506 Narrow Enclosure** — Sizes 0 & 1 are supplied in a (30 in. H x 20 in. W) enclosure. If a narrow enclosure (27 in. H x 10 in. W) is required, add the letter X to the Bulletin Number (506X). Only available in Type 1 or 12.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a Coil Voltage Code from the table below to complete the cat. no.

Example: **Cat. No. 506-AA⊗-⊕-24R** becomes **Cat. No. 506-AAB-⊕-24R**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208V	230...240V	460...480V	575...600V
Common Control	60 Hz	H	A	B	C
Transformer Control (See page 1-78 Note)		AD	AD	CD	CD
120V — Separate Control (without transformer)					

⊕ Overload Relay Code

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete.

Select an overload relay code from page 1-159 to complete the cat. no.

Example: **Cat. No. 506-AAB-⊕-24R** becomes **Cat. No. 506-AAB-A2E-24R**.

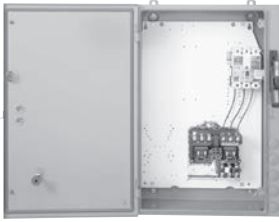


www.ab.com/catalogs Preferred availability cat. nos. are bold.

NEMA Combination Reversing Starters

Product Selection — Circuit Breaker Type

1



Bulletin 507

- NEMA starter sizes 0...5
- Overload relays: Eutectic supplied as standard, solid-state available as an option
- Circuit breaker magnetic only (instantaneous)
- Painted metal enclosures: Type 1, Type 3R/4/12
- Stainless steel enclosures: Type 4/4X
- Hazardous location enclosures: Type 3R, 7 & 9
- Modifications — factory installed
- Accessories — field installed
- Service entrance rated

A Bulletin 507 combination reversing starter consists of a Bulletin 505 reversing starter and a circuit breaker magnetic only (instantaneous trip) mounted in a common enclosure.

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Ordinary Locations
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 Guide No. NOTH, NOTH7)

Heater Elements — Starters with eutectic alloy overload relay require 3 heater elements. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]‡	Maximum Horsepower Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Type 1 General Purpose Cat. No.*	Type 3R/4/12 Rainproof, Waterproof, Dusttight Cat. No.*	Type 3R/4/12 Rainproof, Waterproof, Dusttight (Door Safety Hardware) Cat. No.*	Type 4/4X Watertight Corrosion Resistant Stainless Steel Cat. No.*
		Motor Voltage							
		200V	230V	460V	575V				
0	18	0...1/3	0...1/3	—	—	507-AA-0-32	507-AF-0-32	507-AJ-0-32	507-AC-0-32
		1/2...1	1/2...1	0...1	0...1	507-AA-0-35	507-AF-0-35	507-AJ-0-35	507-AC-0-35
		1-1/2...3	1-1/2...3	1-1/2...3	1-1/2...3	507-AA-0-38	507-AF-0-38	507-AJ-0-38	507-AC-0-38
		—	—	5	5	507-AA-0-39	507-AF-0-39	507-AJ-0-39	507-AC-0-39
1	27	0...1/3	0...1/3	—	—	507-BA-0-32	507-BF-0-32	507-BJ-0-32	507-BC-0-32
		1/2...1	1/2...1	0...1	0...1	507-BA-0-35	507-BF-0-35	507-BJ-0-35	507-BC-0-35
		1-1/2...3	1-1/2...3	1-1/2...3	1-1/2...3	507-BA-0-38	507-BF-0-38	507-BJ-0-38	507-BC-0-38
		5	—	—	—	507-BA-0-39	507-BF-0-39	507-BJ-0-39	507-BC-0-39
		7-1/2	5...7-1/2	5...7-1/2	5...7-1/2	507-BA-0-40	507-BF-0-40	507-BJ-0-40	507-BC-0-40
2	45	—	—	10	10	507-CA-0-41	507-CF-0-41	507-CJ-0-41	507-CC-0-41
		10	10	—	—	507-CA-0-42	507-CF-0-42	507-CJ-0-42	507-CC-0-42
		—	15	15	15	507-CA-0-44	507-CF-0-44	507-CJ-0-44	507-CC-0-44
3	90	—	—	20...25	20...25	507-DA-0-44	507-DF-0-44	507-DJ-0-44	507-DC-0-44
		15...25	20...25	—	—	507-DA-0-45	507-DF-0-45	507-DJ-0-45	507-DC-0-45
		—	30	—	30	507-DA-0-47	507-DF-0-47	507-DJ-0-47	507-DC-0-47
4	135	—	—	30...50	40...50	507-DA-0-47	507-DF-0-47	507-DJ-0-47	507-DC-0-47
		30	—	—	—	507-EA-0-45	507-EF-0-45	507-EJ-0-45	507-EC-0-45
		40	40	—	—	507-EA-0-46	507-EF-0-46	507-EJ-0-46	507-EC-0-46
		—	50	—	—	507-EA-0-47	507-EF-0-47	507-EJ-0-47	507-EC-0-47
		—	—	—	60	507-EA-0-48	507-EF-0-48	507-EJ-0-48	507-EC-0-48
		—	—	60...75	—	507-EA-0-49	507-EF-0-49	507-EJ-0-49	507-EC-0-49
5	270	—	—	100	75...100	507-EA-0-50	507-EF-0-50	507-EJ-0-50	507-EC-0-50
		50...60	60	—	—	507-FA-0-48	507-FF-0-48	507-FJ-0-48	507-FC-0-48
		75	—	—	—	507-FA-0-49	507-FF-0-49	507-FJ-0-49	507-FC-0-49
		—	75...100	—	—	507-FA-0-50	507-FF-0-50	507-FJ-0-50	507-FC-0-50
		—	—	—	125	507-FA-0-51	507-FF-0-51	507-FJ-0-51	507-FC-0-51
		—	—	125...150	150	507-FA-0-52	507-FF-0-52	507-FJ-0-52	507-FC-0-52
—	—	200	200	507-FA-0-54	507-FF-0-54	507-FJ-0-54	507-FC-0-54		

* **Bulletin 507 Narrow Enclosure** — Sizes 0 & 1 are supplied in a (30 in. H x 20 in. W) enclosure. If a narrow enclosure (27 in. H x 10 in. W) is required, add the letter **X** to the Bulletin Number (507X).

‡ To order Visa-Window Breakers for certain mining applications (Canada only), add the letter **V** to the cat. no. Example: **Cat. No. 507-BA-0-35**.

‡ When controlling high efficiency motors – consult your local Rockwell Automation sales office or Allen-Bradley distributor for proper circuit breaker selection.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a Coil Voltage Code from the table below to complete the cat. no.

Example: **Cat. No. 507-BA-0-35** becomes **Cat. No. 507-BAB-0-35**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control (See page 1-79 Note)		HD	AD	BD	CD
120V — Separate Control					

⊗ Overload Relay Code

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete.

Select an overload relay code from page 1-164 to complete the cat. no.

Example: **Cat. No. 507-BAB-0-35** becomes **Cat. No. 507-BAB-A2E-35**.

NEMA Combination Reversing Starters

Product Selection — Circuit Breaker Type

Heater Elements — Starters with eutectic alloy overload relay require 3 heater elements. Located on page 1-164.

NEMA Size	Continuous Ampere Rating [A]‡	Maximum Horsepower Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Type 3R, 7 & 9 Bolted Class I, Groups C & D Class II, Groups E, F & G – Divisions 1 & 2 –
		Motor Voltage				
		200V	230V	460V	575V	Cat. No.*‡
0	18	0...1/3	0...1/3	—	—	507-AH⊗-⊕-32
		1/2...1	1/2...1	0...1	0...1	507-AH⊗-⊕-35
		1-1/2...3	1-1/2...3	1-1/2...3	1-1/2...3	507-AH⊗-⊕-38
		—	—	5	5	507-AH⊗-⊕-39
1	27	0...1/3	0...1/3	—	—	507-BH⊗-⊕-32
		1/2...1	1/2...1	0...1	0...1	507-BH⊗-⊕-35
		1-1/2...3	1-1/2...3	1-1/2...3	1-1/2...3	507-BH⊗-⊕-38
		5	—	—	—	507-BH⊗-⊕-39
		7-1/2	5...7-1/2	5...7-1/2	5...7-1/2	507-BH⊗-⊕-40
2	45	—	—	10	10	507-BH⊗-⊕-41
		10	10	—	—	507-CH⊗-⊕-41
		—	15	15	15	507-CH⊗-⊕-42
		—	—	20...25	20...25	507-CH⊗-⊕-44
3	90	15...25	20...25	—	—	507-DH⊗-⊕-44
		—	30	—	30	507-DH⊗-⊕-45
		—	—	30...50	40...50	507-DH⊗-⊕-47
4	135	30	—	—	—	507-EH⊗-⊕-45
		40	40	—	—	507-EH⊗-⊕-46
		—	50	—	—	507-EH⊗-⊕-47
		—	—	—	60	507-EH⊗-⊕-48
		—	—	60...75	—	507-EH⊗-⊕-49
		—	—	—	75...100	507-EH⊗-⊕-50

* Includes drain and cover with gasket.

‡ To order Visa-Window Breakers for certain mining applications (Canada only), add the letter **V** to the cat. no. Example: **Cat. No. 507-BH⊗-⊕-35V**.

‡ When controlling high efficiency motors – consult your local Rockwell Automation sales office or Allen-Bradley distributor for proper circuit breaker selection.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a Coil Voltage Code from the table below to complete the cat. no.

Example: **Cat. No. 507-BE⊗-⊕-35** becomes **Cat. No. 507-BEB-⊕-35**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control (See page 1-78 Note)		HD	AD	BD	CD
120V — Separate Control					

⊕ Overload Relay Code

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete.

Select an overload relay code from page 1-159 to complete the cat. no.

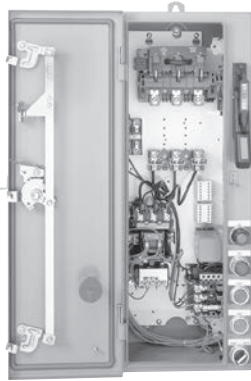
Example: **Cat. No. 507-BHB-⊕-35** becomes **Cat. No. 507-BHB-A2E-35**.



NEMA Combination Non-Reversing Starters

Product Selection — Disconnect Type (Fusible with Class R Fuse Clips) (Non-Fusible)

1



Bulletin 512

- NEMA starter sizes 0...7
- Fusible or non-fusible disconnect switch
- Overload relays: eutectic supplied as standard, solid-state available as an option
- Painted metal enclosures: Type 1, Type 3R/4/12
- Stainless steel enclosures: Type 4/4X
- Modifications — factory installed
- Accessories — field installed
- Service entrance rated

A Bulletin 512 combination non-reversing starter consists of a Bulletin 509 starter and a disconnect switch (fused or unfused) mounted in a common enclosure.

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Standards Compliance

UL 508
 CSA 22.2, No. 14

Certifications

Fusible Versions

cULus Listed (File No. E125316, Guide No. NKJH, NKJH7)

Non-Fusible Versions

cULus Listed (File No. E3125, Guide No. NLDX, NLDX7)
 American Bureau of Shipping

Heater Elements — Starters with eutectic alloy overload relay require 3 heater elements. Located on page 1-164.

NEMA Size	Continuous Ampere Rating [A]	Max. Hp Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Line Voltage [V]	Fuse Clip Rating Amperes [A] Fuses not included. Select per NEC	Type 1 General Purpose	Type 3R/4/12 Rainproof, Waterproof, Dusttight	Type 3R/4/12 Rainproof, Waterproof, Dusttight (Door Safety Hardware)†	Type 4/4X Watertight Corrosion-Resistant Stainless Steel
		Motor Voltage									
		60 Hz	60 Hz	50 Hz	60 Hz						
		200V	230V	380 ... 415V	460 ... 575V						
0	18	3	3	—	—	208...240	30	512-AA⊗-⊕-24R	512-AF⊗-⊕-24R	512-AJ⊗-⊕-24R	512-AC⊗-⊕-24R
		—	—	5	5	480...600	30	512-AA⊗-⊕-24R	512-AF⊗-⊕-24R	512-AJ⊗-⊕-24R	512-AC⊗-⊕-24R
1	27	7-1/2	7-1/2	—	—	208...240	30	512-BA⊗-⊕-24R	512-BF⊗-⊕-24R	512-BJ⊗-⊕-24R	512-BC⊗-⊕-24R
		—	—	10	10	480...600	30	512-BA⊗-⊕-24R	512-BF⊗-⊕-24R	512-BJ⊗-⊕-24R	512-BC⊗-⊕-24R
		7-1/2	7-1/2	—	—	208...240	60	512-BA⊗-⊕-25R	512-BF⊗-⊕-25R	512-BJ⊗-⊕-25R	512-BC⊗-⊕-25R
		—	—	10	10	480...600	60	512-BA⊗-⊕-25R	512-BF⊗-⊕-25R	512-BJ⊗-⊕-25R	512-BC⊗-⊕-25R
2	45	—	—	25	25	480...600	30	512-CA⊗-⊕-24R	512-CF⊗-⊕-24R	512-CJ⊗-⊕-24R	512-CC⊗-⊕-24R
		10	15	—	—	208...240	60	512-CA⊗-⊕-25R	512-CF⊗-⊕-25R	512-CJ⊗-⊕-25R	512-CC⊗-⊕-25R
		—	—	25	25	480...600	60	512-CA⊗-⊕-25R	512-CF⊗-⊕-25R	512-CJ⊗-⊕-25R	512-CC⊗-⊕-25R
		10	15	—	—	208...240	100	512-CA⊗-⊕-26J	512-CF⊗-⊕-26J	512-CJ⊗-⊕-26J	512-CC⊗-⊕-26J
		—	—	25	25	480...600	100	512-CA⊗-⊕-26J	512-CF⊗-⊕-26J	512-CJ⊗-⊕-26J	512-CC⊗-⊕-26J

*Non-Fusible Disconnect Type

Cat. nos. listed above include a fusible disconnect switch with Class R or J fuse clips. To order a non-fusible disconnect switch, eliminate the fuse clip code from the cat. no. Example: **Cat. No. 512-BFB-24R** becomes **Cat. No. 512-BFB**.

⊗ Class H fuse clips can be supplied. Example: **Cat. No. 512-AA⊗-24R** becomes **Cat. No. 512-AA⊗-24**. Class J fuse clips can be supplied. Example: **Cat. No. 512-AA⊗-24R** becomes **Cat. No. 512-AA⊗-24J**. Class HRC form II fuse clips can be supplied.

Example: **Cat. No. 512-AA⊗-24R** becomes **Cat. No. 512-AA⊗-24E**.

† Type 3R/4/12 starters do not include an external reset button for the overload relay. To order an external reset, replace the second letter **J** in the listed cat. no. with the letter **D**. Example: **Cat. No. 512-AJ⊗-⊕-24R** becomes **Cat. No. 512-AD⊗-⊕-24R**.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a Coil Voltage Code from the table below to complete the cat. no.

Example: **Cat. No. 512-AA⊗-⊕-24R** becomes **Cat. No. 512-AAB-⊕-24R**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control (See page 1-78 Note)		AD	AD	CD	CD
120V Separate Control (without transformer)		AD	AD	CD	CD

⊗ Overload Relay Code

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete.

Select an overload relay code from page 1-159 to complete the cat. no.

Example: **Cat. No. 512-AAB-⊕-24R** becomes **Cat. No. 512-AAB-A2E-24R**.

NEMA Combination Non-Reversing Starters

Product Selection — Disconnect Type (Fusible with Class R Fuse Clips) (Non-Fusible)

Heater Elements — Starters with eutectic alloy overload relay require 3 heater elements. Located on page 1-164.

NEMA Size	Continuous Ampere Rating [A]	Max. Hp Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Line Voltage [V]	Fuse Clip Rating Amperes [A] Fuses not included. Select per NEC	Type 1 General Purpose	Type 3R/4/12 Rainproof, Waterproof, Dusttight	Type 3R/4/12 Rainproof, Waterproof, Dusttight (Door Safety Hardware)	Type 4/4X Watertight Corrosion-Resistant Stainless Steel
		Motor Voltage									
		60 Hz	60 Hz	50 Hz	60 Hz						
		200V	230V	380 ... 415V	460 ... 575V						
3	90	—	—	50	50	480...600	60	512-DA-25R	512-DF-25R	512-DJ-25R	512-DC-25R
		25	30	—	—	208...240	100	512-DA-26R	512-DF-26R	512-DJ-26R	512-DC-26R
		—	—	50	50	480...600	100	512-DA-26R	512-DF-26R	512-DJ-26R	512-DC-26R
		25	30	—	—	208...240	200	512-DA-27J	512-DF-27J	512-DJ-27J	512-DC-27J
		—	—	50	50	480...600	200	512-DA-27J	512-DF-27J	512-DJ-27J	512-DC-27J
4	135	—	—	75	100	480...600	100	512-EA-26R	512-EF-26R	512-EJ-26R	512-EC-26R
		40	50	—	—	208...240	200	512-EA-27R	512-EF-27R	512-EJ-27R	512-EC-27R
		—	—	75	100	480...600	200	512-EA-27R	512-EF-27R	512-EJ-27R	512-EC-27R
		40	50	—	—	208...240	400	512-EA-28J	512-EF-28J	512-EJ-28J	512-EC-28J
		—	—	75	100	480...600	400	512-EA-28J	512-EF-28J	512-EJ-28J	512-EC-28J
5	270	40	50	—	—	208...240	200	512-FA-27R	512-FF-27R	512-FJ-27R	512-FC-27R
		—	75	75	100	480...600	200	512-FA-27R	512-FF-27R	512-FJ-27R	512-FC-27R
		75	100	150	200	208...600	400	512-FA-28R	512-FF-28R	512-FJ-28R	512-FC-28R
6	540	150	200	300	400	208...600	600‡	—	512-GF-29R	—	512-GC-29J
7	810	—	300	500	600	240...600	1200	—	512-HF-25L	—	—

*Non-Fusible Disconnect Type

Cat. nos. listed above include a fusible disconnect switch with Class R or J fuse clips. To order a non-fusible disconnect switch, eliminate the fuse clip code from the cat. no. Example: **Cat. No. 512-BFB-24R** becomes **Cat. No. 512-BFB**.

* Class H fuse clips can be supplied. Example: **Cat. No. 512-AA-24R** becomes **Cat. No. 512-AA-24**. Class J fuse clips can be supplied. Example: **Cat. No. 512-AA-24R** becomes **Cat. No. 512-AA-24J**. Class HRC form II fuse clips can be supplied.

Example: **Cat. No. 512-AA-24R** becomes **Cat. No. 512-AA-24E**.

‡ For 230V and 460V Hp ratings, limit the maximum fuse sizing to 125% of motor full load current.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a Coil Voltage Code from the table below to complete the cat. no.

Example: **Cat. No. 512-AA-24R** becomes **Cat. No. 512-AAB-24R**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control (See page 1-78 Note)					
120V Separate Control (without transformer)		AD	AD	CD	CD

⊛ Overload Relay Code

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete.

Select an overload relay code from page 1-159 to complete the cat. no.

Example: **Cat. No. 512-AAB-24R** becomes **Cat. No. 512-AAB-A2E-24R**.



NEMA Combination Non-Reversing Starters with Extra Panel Space

Product Selection — Disconnect Type (Fusible with Class R Fuse Clips) (Non-Fusible)

1



Bulletin 512M

- NEMA starter sizes 1...2
- Overload relays: Eutectic supplied as standard, solid-state available as an option
- Fusible or non-fusible disconnect switch
- Painted metal extra capacity enclosures: Type 3R/4/12
- Stainless steel extra capacity enclosures: Type 4/4X
- Modifications — factory installed
- Accessories — field installed
- Service entrance rated

A Bulletin 512M combination non-reversing starter consists of a Bulletin 509 starter and a disconnect switch (fused or unfused) mounted in a common enclosure with extra panel space.

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UL 508
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Fusible Versions

cULus Listed (File No. E125316, Guide No. NKJH, NKJH7)

Non-Fusible Versions

cULus Listed (File No. E3125, Guide No. NLDX, NLDX7)
 American Bureau of Shipping

Heater Elements — Starters with eutectic alloy overload relay require 3 heater elements. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Line Voltage [V]	Fuse Clip Rating Amperes [A] Fuses not included. Select per NEC	Type 3R/4/12 Rainproof, Waterproof, Dusttight	Type 3R/4/12 Rainproof, Waterproof, Dusttight (Door Safety Hardware)	Type 4/4X Watertight, Corrosion- Resistant, Stainless Steel
		Motor Voltage						Cat. No.**	Cat. No.**	Cat. No.**
		60 Hz 200V	60 Hz 230V	50 Hz 380... 415V	60 Hz 460... 575V					
1	27	7-1/2	7-1/2	—	—	208...240	30	512M-BF-24R	512M-BJ-24R	512M-BC-24R
		—	—	10	10	480...600	60	512M-BF-25R	512M-BJ-25R	512M-BC-25R
		—	—	10	10	480...600	30	512M-BF-24R	512M-BJ-24R	512M-BC-24R
		—	—	10	10	480...600	60	512M-BF-25R	512M-BJ-25R	512M-BC-24R
2	45	10	15	—	—	208...240	60	512M-CF-25R	512M-CJ-25R	512M-CC-25R
		—	—	25	25	480...600	100	512M-CF-26J	512M-CJ-26J	512M-CC-26J
		—	—	25	25	480...600	30	512M-CF-24R	512M-CJ-24R	512M-CC-24R
		—	—	25	25	480...600	60	512M-CF-25R	512M-CJ-25R	512M-CC-25R
—	—	25	25	480...600	100	512M-CF-26J	512M-CJ-26J	512M-CC-26J		

*Non-Fusible Disconnect Type

Cat. nos. listed above include a fusible disconnect switch with Class R or J fuse clips. To order a non-fusible disconnect switch, eliminate the fuse clip code from the cat. no. Example: **Cat. No. 512M-BFB-24R** becomes **Cat. No. 512M-BFB**.

* Class H fuse clips can be supplied. Example: **Cat. No. 512M-BA-24R** becomes **Cat. No. 512M-BA-24**.

Class J fuse clips can be supplied. Example: **Cat. No. 512M-BA-24R** becomes **Cat. No. 512M-BA-24J**.

Class HRC form II fuse clips can be supplied. Example: **Cat. No. 512M-BA-24R** becomes **Cat. No. 512M-BA-24E**.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a Coil Voltage Code from the table below to complete the cat. no.

Example: **Cat. No. 512M-BF-24R** becomes **Cat. No. 512M-BFB-24R**. For other values, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control (See page 1-79 Note)		AD	AD	CD	CD
120V Separate Control (without transformer)		AD	AD	CD	CD

⊕ Overload Relay Code

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete.

Select an overload relay code from page 1-159 to complete the cat. no.


Example: **Cat. No. 512M-BJB-24R** becomes **Cat. No. 512M-BJB-A2E-24R**.



NEMA Combination Non-Reversing Starters

Product Selection — Circuit Breaker Type





Bulletin 513

- NEMA starter sizes 0...7
- Overload relays: Eutectic supplied as standard, solid-state available as an option
- Circuit breaker magnetic only (instantaneous)
- Painted metal enclosures: Type 1, Type 3R/4/12
- Stainless steel enclosures: Type 4/4X
- Hazardous location enclosures: Type 7 & 9
- Modifications — factory installed
- Accessories — field installed
- Service entrance rated

A Bulletin 513 combination non-reversing starter consists of a Bulletin 509 starter and a circuit breaker magnetic only (instantaneous trip) mounted in a common enclosure. Starters sizes 6 & 7 consists of a thermal magnetic (inverse time) circuit breaker.

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CSA C22.2, No. 14

Certifications

Circuit Breaker Versions
cULus Listed (File No. E125316, Guide No. NKJH, NKJH7)

Hazardous Locations
cULus Listed (File No. E138817, Guide No. NOTH, NOTH7)
American Bureau of Shipping

Heater Elements — Starters with eutectic alloy overhead relays require 3 heater elements. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]‡	Maximum Horsepower Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Type 1 General Purpose Cat. No.*❖	Type 3R/4/12 Rainproof, Waterproof, Dusttight Cat. No.*❖	Type 3R/4/12 Rainproof, Waterproof, Dusttight (Door Safety Hardware) Cat. No.*❖	Type 4/4X Watertight Corrosion- Resistant Stainless Steel Cat. No.*❖
		Motor Voltages							
		200V	230V	460V	575V				
0	18	0...1/3	0...1/3	—	—	513-AA⊗-⊕-32	513-AF⊗-⊕-32	513-AJ⊗-⊕-32	513-AC⊗-⊕-32
		1/2...1	1/2...1	0...1	0...1	513-AA⊗-⊕-35	513-AF⊗-⊕-35	513-AJ⊗-⊕-35	513-AC⊗-⊕-35
		1-1/2...3	1-1/2...3	1-1/2...3	1-1/2...3	513-AA⊗-⊕-38	513-AF⊗-⊕-38	513-AJ⊗-⊕-38	513-AC⊗-⊕-38
		—	—	5	5	513-AA⊗-⊕-39	513-AF⊗-⊕-39	513-AJ⊗-⊕-39	513-AC⊗-⊕-39
1	27	0...1/3	0...1/3	—	—	513-BA⊗-⊕-32	513-BF⊗-⊕-32	513-BJ⊗-⊕-32	513-BC⊗-⊕-32
		1/2...1	1/2...1	0...1	0...1	513-BA⊗-⊕-35	513-BF⊗-⊕-35	513-BJ⊗-⊕-35	513-BC⊗-⊕-35
		1-1/2...3	1-1/2...3	1-1/2...3	1-1/2...3	513-BA⊗-⊕-38	513-BF⊗-⊕-38	513-BJ⊗-⊕-38	513-BC⊗-⊕-38
		5	—	—	—	513-BA⊗-⊕-39	513-BF⊗-⊕-39	513-BJ⊗-⊕-39	513-BC⊗-⊕-39
		7-1/2	5...7-1/2	5...7-1/2	5...7-1/2	513-BA⊗-⊕-40	513-BF⊗-⊕-40	513-BJ⊗-⊕-40	513-BC⊗-⊕-40
		—	—	10	10	513-BA⊗-⊕-41	513-BF⊗-⊕-41	513-BJ⊗-⊕-41	513-BC⊗-⊕-41
2	45	10	10	—	—	513-CA⊗-⊕-41	513-CF⊗-⊕-41	513-CJ⊗-⊕-41	513-CC⊗-⊕-41
		—	15	15	15	513-CA⊗-⊕-42	513-CF⊗-⊕-42	513-CJ⊗-⊕-42	513-CC⊗-⊕-42
		—	—	20...25	20...25	513-CA⊗-⊕-44	513-CF⊗-⊕-44	513-CJ⊗-⊕-44	513-CC⊗-⊕-44

* To order starters (size 0...4) with current limiters, add the letter **C** at the end of the listed cat. no. Example: **Cat. No. 513-AA⊗-⊕-35C**.
 ❖ To order Visa-Window Breakers for certain mining applications (Canada only), add the letter **V** to the cat. no. Example: **Cat. No. 513-BA⊗-⊕-35V**.
 ‡ When controlling high efficiency motors – consult your local Rockwell Automation sales office or Allen-Bradley distributor for proper circuit breaker selection.

⊗ **Coil Voltage Code**

The cat. no. as listed is incomplete. Select a Coil Voltage Code from the table below to complete the cat. no.
 Example: **Cat. No. 513-BA⊗-⊕-35** becomes **Cat. No. 513-BAB-⊕-35**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control (See page 1-78 Note)					
120V Separate Control (without transformer)		HD	AD	BD	CD

⊕ **Overload Relay Code**

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete. Select an overload relay code from page 1-159 to complete the cat. no.
 Example: **Cat. No. 513-BAB-32** becomes **Cat. No. 513-BAB-A2F-32**.

NEMA Combination Non-Reversing Starters

Product Selection — Circuit Breaker Type

Heater Elements — Starters with eutectic alloy overhead relays require 3 heater elements. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]‡	Maximum Horsepower Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Hazardous Locations			
		Motor Voltage				Type 1 General Purpose	Type 3R/4/12 Rainproof, Waterproof, Dustlight	Type 3R/4/12 Rainproof, Waterproof, Dustlight (Door Safety Hardware)	Type 4/4X Watertight Corrosion- Resistant Stainless Steel
		200V	230V	460V	575V				
3	90	15...25	20...25	—	—	513-DA ⊗- 44	513-DF ⊗- 44	513-DJ⊗-44	513-DC ⊗- 44
		—	30	—	30	513-DA ⊗- 45	513-DF ⊗- 45	513-DJ⊗-45	513-DC ⊗- 45
		—	—	30...50	40...50	513-DA⊗-47	513-DF⊗-47	513-DJ⊗-47	513-DC ⊗- 47
4	135	30	—	—	—	513-EA ⊗- 45	513-EF ⊗- 45	513-EJ ⊗- 45	513-EC ⊗- 45
		40	40	—	—	513-EA ⊗- 46	513-EF ⊗- 46	513-EJ ⊗- 46	513-EC ⊗- 46
		—	50	—	—	513-EA ⊗- 47	513-EF ⊗- 47	513-EJ ⊗- 47	513-EC ⊗- 47
		—	—	—	60	513-EA ⊗- 48	513-EF ⊗- 48	513-EJ ⊗- 48	513-EC ⊗- 48
		—	—	60...75	—	513-EA⊗-49	513-EF⊗-49	513-EJ⊗-49	513-EC ⊗- 49
		—	—	100	75...100	513-EA⊗-50	513-EF ⊗- 50	513-EJ⊗-50	513-EC ⊗- 50
5	270	50...60	—	—	—	513-FA ⊗- 48	513-FF ⊗- 48	513-FJ ⊗- 48	513-FC ⊗- 48
		75	60...75	—	—	513-FA ⊗- 49	513-FF ⊗- 49	513-FJ ⊗- 49	513-FC ⊗- 49
		—	100	—	—	513-FA ⊗- 50	513-FF ⊗- 50	513-FJ ⊗- 50	513-FC ⊗- 50
		—	—	—	125	513-FA ⊗- 51	513-FF ⊗- 51	513-FJ ⊗- 51	513-FC ⊗- 51
		—	—	125...150	—	513-FA ⊗- 52	513-FF ⊗- 52	513-FJ ⊗- 52	513-FC ⊗- 52
		—	—	200	150...200	513-FA ⊗- 54	513-FF⊗-54	513-FJ ⊗- 54	513-FC ⊗- 54
6	540	100	—	—	—	—	513-GF⊗-50T	—	513-GC⊗-50T
		125	125	—	—	—	513-GF⊗-51T	—	513-GC⊗-51T
		150	150	—	—	—	513-GF⊗-52T	—	513-GC⊗-52T
		—	200	—	—	—	513-GF⊗-54T	—	513-GC⊗-54T
		—	—	250	250	—	513-GF⊗-56T	—	513-GC⊗-56T
		—	—	300	300	—	513-GF⊗-57T	—	513-GC⊗-57T
		—	—	—	350	—	513-GF⊗-58T	—	513-GC⊗-58T
7	810	—	250	—	—	—	513-HF⊗-56T	—	—
		—	300	—	—	—	513-HF⊗-57T	—	—
		—	—	450...500	—	—	513-HF⊗-61T	—	—
		—	—	—	450...600	—	513-HF⊗-62T	—	—

* To order Visa-Window Breakers for certain mining applications (Canada only), add the letter **V** to the cat. no. Example: **Cat. No. 513-BA**⊗-**35V**.

‡ When controlling high efficiency motors – consult your local Rockwell Automation sales office or Allen-Bradley distributor for proper circuit breaker selection.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a Coil Voltage Code from the table below to complete the cat. no.

Example: **Cat. No. 513-BA**⊗-**35** becomes **Cat. No. 513-BAA**-**35**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control (See page 1-78 Note)		HD	AD	BD	CD
120V Separate Control (without transformer)					

★ Overload Relay Code

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete.

Select an overload relay code from page 1-159 to complete the cat. no.

Example: **Cat. No. 513-BAB**-**32** becomes **Cat. No. 513-BAB-A2F-32**.

NEMA Combination Non-Reversing Starters

Product Selection — Circuit Breaker Type

Heater Elements — Starters with eutectic alloy overhead relays require 3 heater elements. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]➤	Maximum Horsepower Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Hazardous Locations	
		Motor Voltage				Unilock Enclosure	Bolted Enclosure
		200V	230V	460V	575V	Type 3R/7 & 9 Class I, Groups C & D Class II, Groups E, F & G – Divisions 1 & 2 – Cat. No.*‡	Type 3R/7 & 9 Class I, Groups C & D Class II, Groups E, F & G – Divisions 1 & 2 – Cat. No.*‡
0	18	0...1/3	0...1/3	—	—	513-AU⊗-⊖-32	513-AH⊗-⊖-32
		1/2...1	1/2...1	0...1	0...1	513-AU⊗-⊖-35	513-AH⊗-⊖-35
		1-1/2...3	1-1/2...3	1-1/2...3	1-1/2...3	513-AU⊗-⊖-38	513-AH⊗-⊖-38
		—	—	5	5	513-AU⊗-⊖-39	513-AH⊗-⊖-39
1	27	0...1/3	0...1/3	—	—	513-BU⊗-⊖-32	513-BH⊗-⊖-32
		1/2...1	1/2...1	0...1	0...1	513-BU⊗-⊖-35	513-BH⊗-⊖-35
		1-1/2...3	1-1/2...3	1-1/2...3	1-1/2...3	513-BU⊗-⊖-38	513-BH⊗-⊖-38
		5	—	—	—	513-BU⊗-⊖-39	513-BH⊗-⊖-39
		7-1/2	5...7-1/2	5...7-1/2	5...7-1/2	513-BU⊗-⊖-40	513-BH⊗-⊖-40
2	45	—	—	10	10	513-BU⊗-⊖-41	513-BH⊗-⊖-41
		10	10	—	—	513-CU⊗-⊖-41	513-CH⊗-⊖-41
		—	15	15	15	513-CU⊗-⊖-42	513-CH⊗-⊖-42
3	90	—	—	20...25	20...25	513-CU⊗-⊖-44	513-CH⊗-⊖-44
		15...25	20...25	—	—	513-DU⊗-⊖-44	513-DH⊗-⊖-44
		—	30	—	30	513-DU⊗-⊖-45	513-DH⊗-⊖-45
4	135	—	—	30...50	40...50	513-DU⊗-⊖-47	513-DH⊗-⊖-47
		30	—	—	—	513-EU⊗-⊖-45	513-EH⊗-⊖-45
		40	40	—	—	513-EU⊗-⊖-46	513-EH⊗-⊖-46
		—	50	—	—	513-EU⊗-⊖-47	513-EH⊗-⊖-47
		—	—	—	60	513-EU⊗-⊖-48	513-EH⊗-⊖-48
		—	—	60...75	—	513-EU⊗-⊖-49	513-EH⊗-⊖-49
5	270§	—	—	100	75...100	513-EU⊗-⊖-50	513-EH⊗-⊖-50
		50...60	50...60	50...60	50...60	513-FU⊗-⊖-48	513-FH⊗-⊖-48
		75	60...75	—	—	513-FU⊗-⊖-49	513-FH⊗-⊖-49
		—	100	—	—	513-FU⊗-⊖-50	513-FH⊗-⊖-50
		—	—	—	125	513-FU⊗-⊖-51	513-FH⊗-⊖-51
		—	—	125...150♣	—	513-FU⊗-⊖-52	513-FH⊗-⊖-52
—	—	200	150...200	513-FU⊗-⊖-54	513-FH⊗-⊖-54		

- * For Type 3R applications, it is **necessary** that a drain or breather and drain fitting be added to the enclosure. Either option -137 or -138 must be added.
- ⊗ To order Visa-Window Breakers for certain mining applications (Canada only), add the letter **V** to the cat. no. Example: **Cat. No. 513-BU⊗-⊖-35V**.
- ‡ Includes drain and cover with gasket.
- § NEMA size 5 Unilock enclosed starters have a continuous ampere rating of 210 A.
- ♣ Bolted enclosure suitable for use on motors from 125...200 HP, 460V.
- When controlling high efficiency motors – consult your local Rockwell Automation sales office or Allen-Bradley distributor for proper circuit breaker selection.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a Coil Voltage Code from the table below to complete the cat. no.
 Example: **Cat. No. 513-BU⊗-⊖-35** becomes **Cat. No. 513-BUA⊗-⊖-35**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control (See page 1-78 Note)		HD	AD	BD	CD
120V Separate Control (without transformer)					

★ Overload Relay Code

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete. Select an overload relay code from page 1-159 to complete the cat. no.
 Example: **Cat. No. 513-BUB-⊖-35** becomes **Cat. No. 513-BUB-A2E-35**.

NEMA Combination Non-Reversing Starters with Extra Panel Space

Product Selection — Circuit Breaker Type

1



Bulletin 513M

- NEMA starter sizes 1...2
- Overload relays: Eutectic supplied as standard, solid-state available as an option
- Circuit breaker magnetic only (instantaneous trip)
- Painted metal extra capacity enclosures: Type 1, Type 3R/4/12
- Stainless steel extra capacity enclosures: Type 4/4X
- Modifications — factory installed
- Accessories — field installed
- Service entrance rated

A Bulletin 513M combination non-reversing starter consists of a Bulletin 509 starter and a circuit breaker magnetic only (instantaneous trip) mounted in a common enclosure with extra panel space.

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Standards Compliance

UL 508
 CSA 22.2, No. 14

Certifications

cULus Listed (File No. E125316, Guide No. NKJH)

Heater Elements — Starters with eutectic alloy overload relay require 3 overload heater elements. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Type 3R/4/12 Rainproof, Waterproof, Dusttight	Type 3R/4/12 Rainproof, Waterproof, Dusttight (Door Safety Hardware)	Type 4/4X Watertight, Corrosion-Resistant, Stainless Steel
		Motor Voltage						
		200V	230V	460V	575V	Cat. No.*	Cat. No.*	Cat. No.*
1	27	0...1/3	0...1/3	—	—	513M-BF-32	513M-BJ-32	513M-BC-32
		1/2...1	1/2...1	0...1	0...1	513M-BF-35	513M-BJ-35	513M-BC-35
		1-1/2...3	1-1/2...3	1-1/2...3	1-1/2...3	513M-BF-38	513M-BJ-38	513M-BC-38
		5	—	—	—	513M-BF-39	513M-BJ-39	513M-BC-39
		7-1/2	5...7-1/2	5...7-1/2	5...7-1/2	513M-BF-40	513M-BJ-40	513M-BC-40
2	45	—	—	10	10	513M-BF-41	513M-BJ-41	513M-BC-41
		10	10	—	—	513M-CF-41	513M-CJ-41	513M-CC-41
		—	15	15	15	513M-CF-42	513M-CJ-42	513M-CC-42
—	—	20...25	20...25	513M-CF-44	513M-CJ-44	513M-CC-44		

* To order starters (size 0...4) with current limiters, add the letter **C** at the end of the listed cat. no. Example: **Cat. No. 513M-AA-35C**.
 * To order Visa-Window Breakers for certain mining applications (Canada only), add the letter **V** to the cat. no. Example: **Cat. No. 513M-BA-35V**.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a Coil Voltage Code from the table below to complete the cat. no.
 Example: **Cat. No. 513M-BF-35** becomes **Cat. No. 513M-BFB-35**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

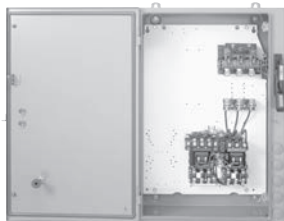
		[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz		H	A	B	C
Transformer Control (See page 1-78 Note)						
120V Separate Control (without transformer)			HD	AD	BD	CD

⊛ Overload Relay Code

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete. Select an overload relay code from page 1-164 to complete the cat. no.
 Example: **Cat. No. 513M-BAB-35** becomes **Cat. No. 513M-BAB-A2E-35**.

NEMA Combination Multi-Speed Starters

Product Selection — Disconnect Type (Fusible with Class R Fuse Clips) (Non-Fusible)



Bulletin 522

- NEMA starter sizes 1...5
- 2-speed separate winding, constant or variable torque
- 2-speed separate winding, constant horsepower
- 2-speed con. pole, single winding, constant or variable Torque
- 2-speed con. pole, single winding, constant horsepower
- Overload relays: Eutectic supplied as standard, solid-state available as an option
- Modifications — factory installed
- Accessories — field installed
- Service entrance rated

A Bulletin 522 combination multi-speed starter consists of a Bulletin 520 multi-speed starter and a disconnect switch (fused or non-fused) mounted in a common enclosure.

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2-Speed Separate Winding, 3-Pole – 3-Pole, Constant or Variable Torque (Constant Horsepower — page 1-92)

Heater Elements — Starters with eutectic alloy overhead relays require 3 heater elements for each speed located on page 1-167.

NEMA Size	Con- tinuous Ampere Rating [A]	Maximum Hp Rating FLC Must Not Exceed Continuous Ampere Rating				Line Voltage [V]	Fuse Clip Rating Amperes [A] Fuses not included. Select per NEC	Type 1 General Purpose Cat. No.*†‡	Type 3R/4/12 Rainproof, Waterproof, Dusttight Cat. No.*†‡	Type 3R/4/12 Rainproof, Waterproof, Dusttight (Door Safety Hardware) Cat. No.*†‡	Type 4/4X Watertight Corrosion-Resistant Stainless Steel Cat. No.*†‡
		Motor Voltage									
		60 Hz 200V	60 Hz 230V	50 Hz 380...415V	60 Hz 460...575V						
1	27	5	5	—	—	208...240	30	522E-BA⊗-⊗-⊗-24R	522E-BF⊗-⊗-⊗-24R	522E-BJ⊗-⊗-⊗-24R	522E-BC⊗-⊗-⊗-24R
		—	—	7-1/2	7-1/2	480...600	30	522E-BA⊗-⊗-⊗-24R	522E-BF⊗-⊗-⊗-24R	522E-BJ⊗-⊗-⊗-24R	522E-BC⊗-⊗-⊗-24R
		7-1/2	7-1/2	—	—	208...240	30	522E-BA⊗-⊗-⊗-24R	522E-BF⊗-⊗-⊗-24R	522E-BJ⊗-⊗-⊗-24R	522E-BC⊗-⊗-⊗-24R
		—	—	10	10	480...600	30	522E-BA⊗-⊗-⊗-24R	522E-BF⊗-⊗-⊗-24R	522E-BJ⊗-⊗-⊗-24R	522E-BC⊗-⊗-⊗-24R
2	45	7-1/2	7-1/2	—	—	208...240	60	522E-BA⊗-⊗-⊗-25R	522E-BF⊗-⊗-⊗-25R	522E-BJ⊗-⊗-⊗-25R	522E-BC⊗-⊗-⊗-25R
		—	—	10	10	480...600	60	522E-BA⊗-⊗-⊗-25R	522E-BF⊗-⊗-⊗-25R	522E-BJ⊗-⊗-⊗-25R	522E-BC⊗-⊗-⊗-25R
		10	15	—	—	208...240	60	522E-CA⊗-⊗-⊗-25R	522E-CF⊗-⊗-⊗-25R	522E-CJ⊗-⊗-⊗-25R	522E-CC⊗-⊗-⊗-25R
		—	—	25	25	480...600	60	522E-CA⊗-⊗-⊗-25R	522E-CF⊗-⊗-⊗-25R	522E-CJ⊗-⊗-⊗-25R	522E-CC⊗-⊗-⊗-25R
3	90	10	15	—	—	208...240	100	522E-CA⊗-⊗-⊗-26J	522E-CF⊗-⊗-⊗-26J	522E-CJ⊗-⊗-⊗-26J	522E-CC⊗-⊗-⊗-26J
		—	—	25	25	480...600	100	522E-CA⊗-⊗-⊗-26J	522E-CF⊗-⊗-⊗-26J	522E-CJ⊗-⊗-⊗-26J	522E-CC⊗-⊗-⊗-26J
		25	30	—	—	208...240	100	522E-DA⊗-⊗-⊗-26R	522E-DF⊗-⊗-⊗-26R	522E-DJ⊗-⊗-⊗-26R	522E-DC⊗-⊗-⊗-26R
		—	—	50	50	480...600	100	522E-DA⊗-⊗-⊗-26R	522E-DF⊗-⊗-⊗-26R	522E-DJ⊗-⊗-⊗-26R	522E-DC⊗-⊗-⊗-26R
4	135	25	30	—	—	208...240	200	522E-DA⊗-⊗-⊗-27J	522E-DF⊗-⊗-⊗-27J	522E-DJ⊗-⊗-⊗-27J	522E-DC⊗-⊗-⊗-27J
		—	—	50	50	480...600	200	522E-DA⊗-⊗-⊗-27J	522E-DF⊗-⊗-⊗-27J	522E-DJ⊗-⊗-⊗-27J	522E-DC⊗-⊗-⊗-27J
		40	50	—	—	208...240	200	522E-EA⊗-⊗-⊗-27R	522E-EF⊗-⊗-⊗-27R	522E-EJ⊗-⊗-⊗-27R	522E-EC⊗-⊗-⊗-27R
		—	—	75	100	480...600	200	522E-EA⊗-⊗-⊗-27R	522E-EF⊗-⊗-⊗-27R	522E-EJ⊗-⊗-⊗-27R	522E-EC⊗-⊗-⊗-27R
5	270	40	50	—	—	208...240	400	522E-EA⊗-⊗-⊗-28J	522E-EF⊗-⊗-⊗-28J	522E-EJ⊗-⊗-⊗-28J	522E-EC⊗-⊗-⊗-28J
		—	—	75	100	480...600	400	522E-EA⊗-⊗-⊗-28J	522E-EF⊗-⊗-⊗-28J	522E-EJ⊗-⊗-⊗-28J	522E-EC⊗-⊗-⊗-28J
		40	50	—	—	208...240	200	522E-FA⊗-⊗-⊗-27R	522E-FF⊗-⊗-⊗-27R	522E-FJ⊗-⊗-⊗-27R	522E-FC⊗-⊗-⊗-27R
		—	—	75	100	480...600	200	522E-FA⊗-⊗-⊗-27R	522E-FF⊗-⊗-⊗-27R	522E-FJ⊗-⊗-⊗-27R	522E-FC⊗-⊗-⊗-27R
5	270	75	100	150	200	208...600	400	522E-FA⊗-⊗-⊗-28R	522E-FF⊗-⊗-⊗-28R	522E-FJ⊗-⊗-⊗-28R	522E-FC⊗-⊗-⊗-28R
		—	—	75	100	480...600	200	522E-FA⊗-⊗-⊗-27R	522E-FF⊗-⊗-⊗-27R	522E-FJ⊗-⊗-⊗-27R	522E-FC⊗-⊗-⊗-27R

* Non-Fusible Disconnect Type

Cat. nos. listed above include a fusible disconnect switch with Class R or J fuse clips. To order a non-fusible disconnect switch, eliminate the fuse clip code from the cat. no. Example: **Cat. No. 522E-BFB-24R** becomes **Cat. No. 522E-BFB**.

⊗ Class H fuse clips can be supplied. Example: **Cat. No. 522E-BA⊗-⊗⊗24R** becomes **Cat. No. 522E-BA⊗-⊗⊗24**. Class J fuse clips can be supplied. Example: **Cat. No. 522E-BA⊗-⊗⊗24R** becomes **Cat. No. 522E-BA⊗-⊗⊗24J**. Class HRC form II fuse clips can be supplied. Example: **Cat. No. 522E-BA⊗-⊗⊗24R** becomes **Cat. No. 522E-BA⊗-⊗⊗24E**.

‡ These starters are for wye connected motor windings. They may not be used with open delta connected motor windings. For starters to be used with open delta connected separate winding motors, use consequent pole starter, and furnish complete ordering information, see page 1-93.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a Coil Voltage Code from the table below to complete the cat. no.

Example: **Cat. No. 522E-BA⊗-⊗-⊗-24R** becomes **Cat. No. 522E-BAB-⊗-⊗-24R**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control (See page 1-78 Note)		AD	AD	CD	CD
120V Separate Control (without transformer)		AD	AD	CD	CD

⊗ Overload Relay Code

Use to order solid-state overload relays. Do not use when ordering eutectic alloy overload relays. The cat. no. as listed is incomplete. Select two overload relay codes from page 1-159 to complete the cat. no. The first code will denote the high speed overload relay and the second code will denote the low speed overload relay.

Example: **Cat. No. 522E-BAB-⊗-⊗-24R** becomes **Cat. No. 522E-BAB-A2E-A2E-24R**.



NEMA Combination Multi-Speed Starters

Product Selection — Disconnect type (Fusible with Class R Fuse Clips) (Non-Fusible)

2-Speed Separate Winding, 3-Pole – 3-Pole, Constant Horsepower (Constant or Variable Torque — page 1-91)

Heater Elements — Starters with eutectic alloy overhead relays require 3 heater elements for each overload. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]	Maximum Hp Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Line Voltage [V]	Fuse Clip Rating Amperes [A] Fuses not included. Select per NEC	Type 1 General Purpose Cat. No.*†‡	Type 3R/4/12 Rainproof, Waterproof, Dusttight Cat. No.*†‡	Type 3R/4/12 Rainproof, Waterproof, Dusttight (Door Safety Hardware) Cat. No.*†‡	Type 4/4X Watertight Corrosion-Resistant Stainless Steel Cat. No.*†‡
		Motor Voltage									
		60 Hz 200V	60 Hz 230V	50 Hz 380...415V	60 Hz 460...575V						
1	27	5	5	—	—	208...240	30	522E-BA⊗-⊗-⊗-24R	522E-BF⊗-⊗-⊗-24R	522E-BJ⊗-⊗-⊗-24R	522E-BC⊗-⊗-⊗-24R
		—	—	7-1/2	7-1/2	480...600	30	522E-BA⊗-⊗-⊗-24R	522E-BF⊗-⊗-⊗-24R	522E-BJ⊗-⊗-⊗-24R	522E-BC⊗-⊗-⊗-24R
		5	5	—	—	208...240	60	522E-BA⊗-⊗-⊗-25R	522E-BF⊗-⊗-⊗-25R	522E-BJ⊗-⊗-⊗-25R	522E-BC⊗-⊗-⊗-25R
		—	—	7-1/2	7-1/2	480...600	60	522E-BA⊗-⊗-⊗-25R	522E-BF⊗-⊗-⊗-25R	522E-BJ⊗-⊗-⊗-25R	522E-BC⊗-⊗-⊗-25R
2	45	7-1/2	10	—	—	208...240	60	522E-CA⊗-⊗-⊗-25R	522E-CF⊗-⊗-⊗-25R	522E-CJ⊗-⊗-⊗-25R	522E-CC⊗-⊗-⊗-25R
		—	—	20	20	480...600	60	522E-CA⊗-⊗-⊗-25R	522E-CF⊗-⊗-⊗-25R	522E-CJ⊗-⊗-⊗-25R	522E-CC⊗-⊗-⊗-25R
		7-1/2	10	—	—	208...240	100	522E-CA⊗-⊗-⊗-26J	522E-CF⊗-⊗-⊗-26J	522E-CJ⊗-⊗-⊗-26J	522E-CC⊗-⊗-⊗-26J
		—	—	20	20	480...600	100	522E-CA⊗-⊗-⊗-26J	522E-CF⊗-⊗-⊗-26J	522E-CJ⊗-⊗-⊗-26J	522E-CC⊗-⊗-⊗-26J
3	90	20	25	—	—	208...240	100	522E-DA⊗-⊗-⊗-26R	522E-DF⊗-⊗-⊗-26R	522E-DJ⊗-⊗-⊗-26R	522E-DC⊗-⊗-⊗-26R
		—	—	40	40	480...600	100	522E-DA⊗-⊗-⊗-26R	522E-DF⊗-⊗-⊗-26R	522E-DJ⊗-⊗-⊗-26R	522E-DC⊗-⊗-⊗-26R
		20	25	—	—	208...240	200	522E-DA⊗-⊗-⊗-27J	522E-DF⊗-⊗-⊗-27J	522E-DJ⊗-⊗-⊗-27J	522E-DC⊗-⊗-⊗-27J
		—	—	40	40	480...600	200	522E-DA⊗-⊗-⊗-27J	522E-DF⊗-⊗-⊗-27J	522E-DJ⊗-⊗-⊗-27J	522E-DC⊗-⊗-⊗-27J
4	135	30	40	—	—	208...240	200	522E-EA⊗-⊗-⊗-27R	522E-EF⊗-⊗-⊗-27R	522E-EJ⊗-⊗-⊗-27R	522E-EC⊗-⊗-⊗-27R
		—	—	60	75	480...600	200	522E-EA⊗-⊗-⊗-27R	522E-EF⊗-⊗-⊗-27R	522E-EJ⊗-⊗-⊗-27R	522E-EC⊗-⊗-⊗-27R
		30	40	—	—	208...240	400	522E-EA⊗-⊗-⊗-28J	522E-EF⊗-⊗-⊗-28J	522E-EJ⊗-⊗-⊗-28J	522E-EC⊗-⊗-⊗-28J
		—	—	60	75	480...600	400	522E-EA⊗-⊗-⊗-28J	522E-EF⊗-⊗-⊗-28J	522E-EJ⊗-⊗-⊗-28J	522E-EC⊗-⊗-⊗-28J
5	270	30	40	—	—	208...240	200	522E-FA⊗-⊗-⊗-27R	522E-FF⊗-⊗-⊗-27R	522E-FJ⊗-⊗-⊗-27R	522E-FC⊗-⊗-⊗-27R
		—	—	60	75	480...600	200	522E-FA⊗-⊗-⊗-27R	522E-FF⊗-⊗-⊗-27R	522E-FJ⊗-⊗-⊗-27R	522E-FC⊗-⊗-⊗-27R
		60	75	100	150	208...600	400	522E-FA⊗-⊗-⊗-28R	522E-FF⊗-⊗-⊗-28R	522E-FJ⊗-⊗-⊗-28R	522E-FC⊗-⊗-⊗-28R

* Non-Fusible Disconnect Type

Cat. nos. listed above include a fusible disconnect switch with Class R or J fuse clips. To order a non-fusible disconnect switch, eliminate the fuse clip code from the cat. no. Example: **Cat. No. 522E-BFB-24R** becomes **Cat. No. 522E-BFB**.

⊗ Class H fuse clips can be supplied. Example: **Cat. No. 522E-BA⊗-⊗⊗24R** becomes **Cat. No. 522E-BA⊗-⊗⊗24**. Class J fuse clips can be supplied. Example: **Cat. No. 522E-BA⊗-⊗⊗24R** becomes **Cat. No. 522E-BA⊗-⊗⊗24J**. Class HRC form II fuse clips can be supplied. Example: **Cat. No. 522E-BA⊗-⊗⊗24R** becomes **Cat. No. 522E-BA-⊗-⊗⊗24E**.

‡ These starters are for wye connected motor windings. They may not be used with open delta connected motor windings. For starters to be used with open delta connected separate winding motors, use consequent pole starter, and furnish complete ordering information, see page 1-93.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a Coil Voltage Code from the table below to complete the cat. no.

Example: **Cat. No. 522E-BA⊗-⊗-⊗-24R** becomes **Cat. No. 522E-BAB-⊗-⊗-24R**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control (See page 1-78 Note)					
120V Separate Control (without transformer)					

⊗-⊗ Overload Relay Code

Use to order solid-state overload relays. Do not use when ordering eutectic alloy overload relays. The cat. no. as listed is incomplete. Select two overload relay codes from page 1-159 to complete the cat. no. The first code will denote the high speed overload relay and the second code will denote the low speed overload relay. Example: **Cat. No. 522E-BAB-⊗-⊗-24R** becomes **Cat. No. 522E-BAB-A2E-A2E-24R**.

NEMA Combination Multi-Speed Starters

Product Selection — Disconnect Type (Fusible with Class R Fuse Clips) (Non-Fusible)

2-Speed Consequent Pole, 5-Pole – 3-Pole, Single Winding, Constant or Variable Torque (Constant Horsepower — page 1-94)

Heater Elements — Starters with eutectic alloy overhead relays require 3 heater elements for each speed. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]	Maximum Hp Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Line Voltage [V]	Fuse Clip Rating Amperes [A] Fuses not included. Select per NEC	Type 1 General Purpose Cat. No.**	Type 3R/4/12 Rainproof, Waterproof, Dusttight Cat. No.**	Type 3R/4/12 Rainproof, Waterproof, Dusttight (Door Safety Hardware) Cat. No.**	Type 4/4X Watertight Corrosion-Resistant Stainless Steel Cat. No.**
		Motor Voltage									
		60 Hz		50 Hz							
		200V	230V	380...415V	460...575V						
1	27	7-1/2	7-1/2	—	—	208...240	30	522F-BA-0-0-24R	522F-BF-0-0-24R	522F-BJ-0-0-24R	522F-BC-0-0-24R
		—	—	10	10	480...600	30	522F-BA-0-0-24R	522F-BF-0-0-24R	522F-BJ-0-0-24R	522F-BC-0-0-24R
		7-1/2	7-1/2	—	—	208...240	60	522F-BA-0-0-25R	522F-BF-0-0-25R	522F-BJ-0-0-25R	522F-BC-0-0-25R
		—	—	10	10	480...600	60	522F-BA-0-0-25R	522F-BF-0-0-25R	522F-BJ-0-0-25R	522F-BC-0-0-25R
2	45	10	15	—	—	208...240	60	522F-CA-0-0-25R	522F-CF-0-0-25R	522F-CJ-0-0-25R	522F-CC-0-0-25R
		—	—	25	25	480...600	60	522F-CA-0-0-25R	522F-CF-0-0-25R	522F-CJ-0-0-25R	522F-CC-0-0-25R
		10	15	—	—	208...240	100	522F-CA-0-0-26J	522F-CF-0-0-26J	522F-CJ-0-0-26J	522F-CC-0-0-26J
		—	—	25	25	480...600	100	522F-CA-0-0-26J	522F-CF-0-0-26J	522F-CJ-0-0-26J	522F-CC-0-0-26J
3	90	25	30	—	—	208...240	100	522F-DA-0-0-26R	522F-DF-0-0-26R	522F-DJ-0-0-26R	522F-DC-0-0-26R
		—	—	50	50	480...600	100	522F-DA-0-0-26R	522F-DF-0-0-26R	522F-DJ-0-0-26R	522F-DC-0-0-26R
		25	30	—	—	208...240	200	522F-DA-0-0-27J	522F-DF-0-0-27J	522F-DJ-0-0-27J	522F-DC-0-0-27J
		—	—	50	50	480...600	200	522F-DA-0-0-27J	522F-DF-0-0-27J	522F-DJ-0-0-27J	522F-DC-0-0-27J
4	135	40	50	—	—	208...240	200	522F-EA-0-0-27R	522F-EF-0-0-27R	522F-EJ-0-0-27R	522F-EC-0-0-27R
		—	—	75	100	480...600	200	522F-EA-0-0-27R	522F-EF-0-0-27R	522F-EJ-0-0-27R	522F-EC-0-0-27R
		40	50	—	—	208...240	400	522F-EA-0-0-28J	522F-EF-0-0-28J	522F-EJ-0-0-28J	522F-EC-0-0-28J
		—	—	75	100	480...600	400	522F-EA-0-0-28J	522F-EF-0-0-28J	522F-EJ-0-0-28J	522F-EC-0-0-28J
5	270	40	50	—	—	208...240	200	522F-FA-0-0-27R	522F-FF-0-0-27R	522F-FJ-0-0-27R	—
		—	—	75	100	480...600	200	522F-FA-0-0-27R	522F-FF-0-0-27R	522F-FJ-0-0-27R	—
		75	100	150	200	208...600	400	522F-FA-0-0-28R	522F-FF-0-0-28R	522F-FJ-0-0-28R	—

* Non-Fusible Disconnect Type

Cat. nos. listed above include a fusible disconnect switch with Class R or J fuse clips. To order a non-fusible disconnect switch, eliminate the fuse clip code from the cat. no. Example: **Cat. No. 522F-BJB-24R** becomes **Cat. No. 522F-BJB**.

* Class H fuse clips can be supplied. Example: **Cat. No. 522F-BA-0-0-24R** becomes **Cat. No. 522F-BA-0-0-24**. Class J fuse clips can be supplied. Example: **Cat. No. 522F-BA-0-0-24R** becomes **Cat. No. 522F-BA-0-0-24J**. Class HRC form II fuse clips can be supplied. Example: **Cat. No. 522F-BA-0-0-24R** becomes **Cat. No. 522F-BA-0-0-24E**.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a Coil Voltage Code from the table below to complete the cat. no.

Example: **Cat. No. 522F-BA-0-0-24R** becomes **Cat. No. 522F-BAB-0-0-24R**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control (See page 1-78 Note)					
120V Separate Control (without transformer)					

⊕ Overload Relay Code

Use to order solid-state overload relays. Do not use when ordering eutectic alloy overload relays. The cat. no. as listed is incomplete. Select two overload relay codes from page 1-159 to complete the cat. no. The first code will denote the high speed overload relay and the second code will denote the low speed overload relay. Example: **Cat. No. 522F-BAB-0-0-24R** becomes **Cat. No. 522F-BAB-A2E-A2E-24R**.

NEMA Combination Multi-Speed Starters

Product Selection — Disconnect Type (Fusible with Class R Fuse Clips) (Non-Fusible)

2-Speed Consequent Pole, 5-Pole – 3-Pole, Single Winding, Constant Horsepower (Constant or Variable Torque — page 1-93)

Heater Elements — Starters with eutectic alloy overhead relays require 3 heater elements for each overload. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]	Maximum Hp Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Line Voltage [V]	Fuse Clip Rating Amperes [A] Fuses not included. Select per NEC	Type 1 General Purpose Cat. No.*	Type 3R/4/12 Rainproof, Waterproof, Dusttight Cat. No.*	Type 3R/4/12 Rainproof, Waterproof, Dusttight (Door Safety Hardware) Cat. No.*	Type 4/4X Watertight Corrosion-Resistant Stainless Steel Cat. No.*
		Motor Voltage									
		60 Hz	60 Hz	50 Hz	60 Hz						
1	27	200 V	230 V	380...415V	460...575V	208...240	30	522G-BA-0-0-24R	522G-BF-0-0-24R	522G-BJ-0-0-24R	522G-BC-0-0-24R
		5	5	—	—	480...600	30	522G-BA-0-0-24R	522G-BF-0-0-24R	522G-BJ-0-0-24R	522G-BC-0-0-24R
		—	—	7-1/2	7-1/2	208...240	60	522G-BA-0-0-25R	522G-BF-0-0-25R	522G-BJ-0-0-25R	522G-BC-0-0-25R
		—	—	—	—	480...600	60	522G-BA-0-0-25R	522G-BF-0-0-25R	522G-BJ-0-0-25R	522G-BC-0-0-25R
2	45	7-1/2	10	—	—	208...240	60	522G-CA-0-0-25R	522G-CF-0-0-25R	522G-CJ-0-0-25R	522G-CC-0-0-25R
		—	—	20	20	480...600	60	522G-CA-0-0-25R	522G-CF-0-0-25R	522G-CJ-0-0-25R	522G-CC-0-0-25R
		7-1/2	10	—	—	208...240	100	522G-CA-0-0-26J	522G-CF-0-0-26J	522G-CJ-0-0-26J	522G-CC-0-0-26J
		—	—	20	20	480...600	100	522G-CA-0-0-26J	522G-CF-0-0-26J	522G-CJ-0-0-26J	522G-CC-0-0-26J
3	90	20	25	—	—	208...240	100	522G-DA-0-0-26R	522G-DF-0-0-26R	522G-DJ-0-0-26R	522G-DC-0-0-26R
		—	—	40	40	480...600	100	522G-DA-0-0-26R	522G-DF-0-0-26R	522G-DJ-0-0-26R	522G-DC-0-0-26R
		20	25	—	—	208...240	200	522G-DA-0-0-27J	522G-DF-0-0-27J	522G-DJ-0-0-27J	522G-DC-0-0-27J
		—	—	40	40	480...600	200	522G-DA-0-0-27J	522G-DF-0-0-27J	522G-DJ-0-0-27J	522G-DC-0-0-27J
4	135	30	40	—	—	208...240	200	522G-EA-0-0-27R	522G-EF-0-0-27R	522G-EJ-0-0-27R	522G-EC-0-0-27R
		—	—	60	75	480...600	200	522G-EA-0-0-27R	522G-EF-0-0-27R	522G-EJ-0-0-27R	522G-EC-0-0-27R
		30	40	—	—	208...240	400	522G-EA-0-0-28J	522G-EF-0-0-28J	522G-EJ-0-0-28J	522G-EC-0-0-28J
		—	—	60	75	480...600	400	522G-EA-0-0-28J	522G-EF-0-0-28J	522G-EJ-0-0-28J	522G-EC-0-0-28J
5	270	30	40	—	—	208...240	200	522G-FA-0-0-27R	522G-FF-0-0-27R	522G-FJ-0-0-27R	—
		—	—	60	75	480...600	200	522G-FA-0-0-27R	522G-FF-0-0-27R	522G-FJ-0-0-27R	—
		60	75	100	150	208...600	400	522G-FA-0-0-28R	522G-FF-0-0-28R	522G-FJ-0-0-28R	—

*** Non-Fusible Disconnect Type**

Cat. nos. listed above include a fusible disconnect switch with Class R or J fuse clips. To order a non-fusible disconnect switch, eliminate the fuse clip code from the cat. no. Example: **Cat. No. 522G-BJB-24R** becomes **Cat. No. 522G-BJB**.

⊛ Class H fuse clips can be supplied. Example: **Cat. No. 522G-BA-0-0-24R** becomes **Cat. No. 522G-BA-0-0-24H**. Class J fuse clips can be supplied. Example: **Cat. No. 522G-BA-0-0-24R** becomes **Cat. No. 522G-BA-0-0-24J**. Class HRC form II fuse clips can be supplied. Example: **Cat. No. 522G-BA-0-0-24R** becomes **Cat. No. 522G-BA-0-0-24E**.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a Coil Voltage Code from the table below to complete the cat. no. Example: **Cat. No. 522G-BA-0-0-24R** becomes **Cat. No. 522G-BAB-0-0-24R**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

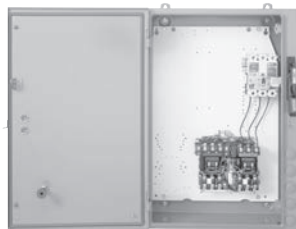
	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control (See page 1-78 Note)		AD	AD	CD	CD
120V Separate Control (without transformer)		AD	AD	CD	CD

⊛⊛ Overload Relay Code

Use to order solid-state overload relays. Do not use when ordering eutectic alloy overload relays. The cat. no. as listed is incomplete. Select two overload relay codes from page 1-159 to complete the cat. no. The first code will denote the high speed overload relay and the second code will denote the low speed overload relay. Example: **Cat. No. 522G-BAB-0-0-24R** becomes **Cat. No. 522G-BAB-A2E-A2E-24R**.

NEMA Combination Multi-Speed Starters

Product Selection Circuit Breaker Type



Bulletin 523

- NEMA starter sizes 1...5
- Circuit breaker magnetic only (instantaneous trip)
- 2-speed separate winding, constant or variable torque
- 2-speed separate winding, constant horsepower
- 2-speed consequent pole, single winding, constant or variable torque
- 2-speed consequent pole, single winding, constant horsepower
- Overload relays: Eutectic supplied as standard, solid-state available as an option
- Modifications — factory installed
- Accessories — field installed
- Service entrance rated

A Bulletin 523 combination multi-speed starter consists of a Bulletin 520 multi-speed starter and a circuit breaker magnetic only (instantaneous trip) mounted in a common enclosure.

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Standards Compliance

UL 508
 CSA 22.2, No. 14

Certifications

cULus Listed (File No. E3125, Guide No. NLDX, NLDX7)



2-Speed Separate Winding, 3-Pole – 3-Pole, Constant or Variable Torque (Constant Horsepower — page 1-96)

Heater Elements — Starters with eutectic alloy overload relays require 3 heater elements for each overload. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]§	Maximum Horsepower Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Type 1 General Purpose Cat. No.*§	Type 3R/4/12 Rainproof, Waterproof, Dusttight Cat. No.*§	Type 3R/4/12 Rainproof, Waterproof, Corrosion- Resistant (Door Safety Hardware) Cat. No.*§	Type 4/4X Watertight Corrosion- Resistant Stainless Steel Cat. No.*§
		Motor Voltage							
		200V	230V	460V	575V				
1	27	0...1/3	0...1/3	—	—	523E-BA⊗-⊗-⊗-32	523E-BF⊗-⊗-⊗-32	523E-BJ⊗-⊗-⊗-32	523E-BC⊗-⊗-⊗-32
		1/2...1	1/2...1	0...1	0...1	523E-BA⊗-⊗-⊗-35	523E-BF⊗-⊗-⊗-35	523E-BJ⊗-⊗-⊗-35	523E-BC⊗-⊗-⊗-35
		1-1/2...3	1-1/2...3	1-1/2...3	1-1/2...3	523E-BA⊗-⊗-⊗-38	523E-BF⊗-⊗-⊗-38	523E-BJ⊗-⊗-⊗-38	523E-BC⊗-⊗-⊗-38
		—	—	1-1/2...3	5	523E-BA⊗-⊗-⊗-39	523E-BF⊗-⊗-⊗-39	523E-BJ⊗-⊗-⊗-39	523E-BC⊗-⊗-⊗-39
		5‡	—	—	—	523E-BA⊗-⊗-⊗-39	523E-BF⊗-⊗-⊗-39	523E-BJ⊗-⊗-⊗-39	523E-BC⊗-⊗-⊗-39
		7-1/2	5...7-1/2‡	7-1/2‡	7-1/2‡	523E-BA⊗-⊗-⊗-40	523E-BF⊗-⊗-⊗-40	523E-BJ⊗-⊗-⊗-40	523E-BC⊗-⊗-⊗-40
2	45	—	—	10	10	523E-BA⊗-⊗-⊗-41	523E-BF⊗-⊗-⊗-41	523E-BJ⊗-⊗-⊗-41	523E-BC⊗-⊗-⊗-41
		10	10	—	—	523E-CA⊗-⊗-⊗-41	523E-CF⊗-⊗-⊗-41	523E-CJ⊗-⊗-⊗-41	523E-CC⊗-⊗-⊗-41
		—	15	15	15	523E-CA⊗-⊗-⊗-42	523E-CF⊗-⊗-⊗-42	523E-CJ⊗-⊗-⊗-42	523E-CC⊗-⊗-⊗-42
3	90	—	—	20...25	20...25	523E-CA⊗-⊗-⊗-44	523E-CF⊗-⊗-⊗-44	523E-CJ⊗-⊗-⊗-44	523E-CC⊗-⊗-⊗-44
		15...25	20...25	—	—	523E-DA⊗-⊗-⊗-44	523E-DF⊗-⊗-⊗-44	523E-DJ⊗-⊗-⊗-44	523E-DC⊗-⊗-⊗-44
		—	30	—	30	523E-DA⊗-⊗-⊗-45	523E-DF⊗-⊗-⊗-45	523E-DJ⊗-⊗-⊗-45	523E-DC⊗-⊗-⊗-45
4	135	—	—	30...50	40...50	523E-DA⊗-⊗-⊗-47	523E-DF⊗-⊗-⊗-47	523E-DJ⊗-⊗-⊗-47	523E-DC⊗-⊗-⊗-47
		30	—	—	—	523E-EA⊗-⊗-⊗-45	523E-EF⊗-⊗-⊗-45	523E-EJ⊗-⊗-⊗-45	523E-EC⊗-⊗-⊗-45
		40	40	—	—	523E-EA⊗-⊗-⊗-46	523E-EF⊗-⊗-⊗-46	523E-EJ⊗-⊗-⊗-46	523E-EC⊗-⊗-⊗-46
		—	50	—	—	523E-EA⊗-⊗-⊗-47	523E-EF⊗-⊗-⊗-47	523E-EJ⊗-⊗-⊗-47	523E-EC⊗-⊗-⊗-47
		—	—	—	60	523E-EA⊗-⊗-⊗-48	523E-EF⊗-⊗-⊗-48	523E-EJ⊗-⊗-⊗-48	523E-EC⊗-⊗-⊗-48
		—	—	60...75	—	523E-EA⊗-⊗-⊗-49	523E-EF⊗-⊗-⊗-49	523E-EJ⊗-⊗-⊗-49	523E-EC⊗-⊗-⊗-49
5	270	—	—	100	75...100	523E-EA⊗-⊗-⊗-50	523E-EF⊗-⊗-⊗-50	523E-EJ⊗-⊗-⊗-50	523E-EC⊗-⊗-⊗-50
		50...60	—	—	—	523E-FA⊗-⊗-⊗-48	523E-FF⊗-⊗-⊗-48	523E-FJ⊗-⊗-⊗-48	523E-FC⊗-⊗-⊗-48
		75	60...75	—	—	523E-FA⊗-⊗-⊗-49	523E-FF⊗-⊗-⊗-49	523E-FJ⊗-⊗-⊗-49	523E-FC⊗-⊗-⊗-49
		—	100	—	—	523E-FA⊗-⊗-⊗-50	523E-FF⊗-⊗-⊗-50	523E-FJ⊗-⊗-⊗-50	523E-FC⊗-⊗-⊗-50
		—	—	—	125	523E-FA⊗-⊗-⊗-51	523E-FF⊗-⊗-⊗-51	523E-FJ⊗-⊗-⊗-51	523E-FC⊗-⊗-⊗-51
		—	—	125...150	—	523E-FA⊗-⊗-⊗-52	523E-FF⊗-⊗-⊗-52	523E-FJ⊗-⊗-⊗-52	523E-FC⊗-⊗-⊗-52

* These starters are for wye connected motor windings. They may not be used with open delta connected motor windings. For starters to be used with open delta connected separate winding motors, use consequent pole starter prices, and furnish complete ordering information, see page 1-97.

§ To order Visa-Window Breakers for certain mining applications (Canada only), add the letter **V** to the cat. no. Example: **Cat. No. 523E-BA⊗-⊗-⊗-40V**.

‡ State horsepower if less than listed.

§ When controlling high efficiency motors – consult your local Rockwell Automation sales office or Allen-Bradley distributor for proper circuit breaker selection.

⊗ Coil Voltage Code

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

Example: **Cat. No. 523E-BA⊗-⊗-⊗-40** becomes **Cat. No. 523E-BAB-⊗-⊗-40**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control (See page 1-78 Note)		HD	AD	BD	CD
120V Separate Control (without transformer)					

⊕-⊕ Overload Relay Code

Use to order solid-state overload relays. Do not use when ordering eutectic alloy overload relays. The cat. no. as listed is incomplete. Select two overload relay codes from page 1-159 to complete the cat. no. The first code will denote the high speed overload relay and the second code will denote the low speed overload relay. Example: **Cat. No. 523E-BAB-⊕-⊕-40** becomes **523E-BAB-A2E-A2E-40**.

NEMA Combination Multi-Speed Starters

Product Selection — Circuit Breaker Type

2-Speed Separate Winding, 3-Pole – 3-Pole, Constant Horsepower (Constant or Variable Torque — page 1-95)

Heater Elements — Starters with eutectic alloy overload relays require 3 heater elements for each overload. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]§	Maximum Horsepower Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Type 1 General Purpose Cat. No.*§	Type 3R/4/12 Rainproof, Waterproof, Dusttight Cat. No.*§	Type 3R/4/12 Rainproof, Waterproof, Dusttight (Door Safety Hardware) Cat. No.*§	Type 4/4X Watertight Corrosion- Resistant Stainless Steel Cat. No.*§
		Motor Voltage							
		200V	230V	460V	575V				
1	27	0...1/3	0...1/3	—	—	523E-BAⓈ-Ⓢ-Ⓢ-32	523E-BFⓈ-Ⓢ-Ⓢ-32	523E-BJⓈ-Ⓢ-Ⓢ-32	523E-BCⓈ-Ⓢ-Ⓢ-32
		1/2...1	1/2...1	0...1	0...1	523E-BAⓈ-Ⓢ-Ⓢ-35	523E-BFⓈ-Ⓢ-Ⓢ-35	523E-BJⓈ-Ⓢ-Ⓢ-35	523E-BCⓈ-Ⓢ-Ⓢ-35
		1-1/2...2	1-1/2...2	—	—	523E-BAⓈ-Ⓢ-Ⓢ-37	523E-BFⓈ-Ⓢ-Ⓢ-37	523E-BJⓈ-Ⓢ-Ⓢ-37	523E-BCⓈ-Ⓢ-Ⓢ-37
		—	—	1-1/2...3	1-1/2...3	523E-BAⓈ-Ⓢ-Ⓢ-38	523E-BFⓈ-Ⓢ-Ⓢ-38	523E-BJⓈ-Ⓢ-Ⓢ-38	523E-BCⓈ-Ⓢ-Ⓢ-38
		3‡	3‡	—	—	523E-BAⓈ-Ⓢ-Ⓢ-38	523E-BFⓈ-Ⓢ-Ⓢ-38	523E-BJⓈ-Ⓢ-Ⓢ-38	523E-BCⓈ-Ⓢ-Ⓢ-38
		5	5	—	—	523E-BAⓈ-Ⓢ-Ⓢ-39	523E-BFⓈ-Ⓢ-Ⓢ-39	523E-BJⓈ-Ⓢ-Ⓢ-39	523E-BCⓈ-Ⓢ-Ⓢ-39
2	45	—	—	5...7-1/2‡	5...7-1/2‡	523E-BAⓈ-Ⓢ-Ⓢ-40	523E-CFⓈ-Ⓢ-Ⓢ-40	523E-BJⓈ-Ⓢ-Ⓢ-40	523E-BCⓈ-Ⓢ-Ⓢ-40
		7-1/2	7-1/2	—	—	523E-CAⓈ-Ⓢ-Ⓢ-40	523E-CFⓈ-Ⓢ-Ⓢ-40	523E-CJⓈ-Ⓢ-Ⓢ-40	523E-CCⓈ-Ⓢ-Ⓢ-40
		—	10	—	—	523E-CAⓈ-Ⓢ-Ⓢ-41	523E-CFⓈ-Ⓢ-Ⓢ-41	523E-CJⓈ-Ⓢ-Ⓢ-41	523E-CCⓈ-Ⓢ-Ⓢ-41
		—	—	10...15	10...15	523E-CAⓈ-Ⓢ-Ⓢ-42	523E-CFⓈ-Ⓢ-Ⓢ-42	523E-CJⓈ-Ⓢ-Ⓢ-42	523E-CCⓈ-Ⓢ-Ⓢ-42
		—	—	20	20	523E-CAⓈ-Ⓢ-Ⓢ-43	523E-DFⓈ-Ⓢ-Ⓢ-43	523E-CJⓈ-Ⓢ-Ⓢ-43	523E-CCⓈ-Ⓢ-Ⓢ-43
		—	—	20	20	523E-CAⓈ-Ⓢ-Ⓢ-43	523E-DFⓈ-Ⓢ-Ⓢ-43	523E-CJⓈ-Ⓢ-Ⓢ-43	523E-CCⓈ-Ⓢ-Ⓢ-43
3	90	10	10	—	—	523E-DAⓈ-Ⓢ-Ⓢ-41	523E-DFⓈ-Ⓢ-Ⓢ-41	523E-DJⓈ-Ⓢ-Ⓢ-41	523E-DCⓈ-Ⓢ-Ⓢ-41
		15...20	—	—	—	523E-DAⓈ-Ⓢ-Ⓢ-43	523E-DFⓈ-Ⓢ-Ⓢ-43	523E-DJⓈ-Ⓢ-Ⓢ-43	523E-DCⓈ-Ⓢ-Ⓢ-43
		—	15...25	25	—	523E-DAⓈ-Ⓢ-Ⓢ-44	523E-DFⓈ-Ⓢ-Ⓢ-44	523E-DJⓈ-Ⓢ-Ⓢ-44	523E-DCⓈ-Ⓢ-Ⓢ-44
		—	—	—	25...30	523E-DAⓈ-Ⓢ-Ⓢ-45	523E-DFⓈ-Ⓢ-Ⓢ-45	523E-DJⓈ-Ⓢ-Ⓢ-45	523E-DCⓈ-Ⓢ-Ⓢ-45
		—	—	30...40	40	523E-DAⓈ-Ⓢ-Ⓢ-46	523E-EFⓈ-Ⓢ-Ⓢ-46	523E-DJⓈ-Ⓢ-Ⓢ-46	523E-DCⓈ-Ⓢ-Ⓢ-46
		—	—	—	—	523E-DAⓈ-Ⓢ-Ⓢ-46	523E-EFⓈ-Ⓢ-Ⓢ-46	523E-DJⓈ-Ⓢ-Ⓢ-46	523E-DCⓈ-Ⓢ-Ⓢ-46
4	135	25	—	—	—	523E-EAⓈ-Ⓢ-Ⓢ-44	523E-EFⓈ-Ⓢ-Ⓢ-44	523E-EJⓈ-Ⓢ-Ⓢ-44	523E-ECⓈ-Ⓢ-Ⓢ-44
		30	—	—	—	523E-EAⓈ-Ⓢ-Ⓢ-45	523E-EFⓈ-Ⓢ-Ⓢ-45	523E-EJⓈ-Ⓢ-Ⓢ-45	523E-ECⓈ-Ⓢ-Ⓢ-45
		—	30...40	—	—	523E-EAⓈ-Ⓢ-Ⓢ-46	523E-EFⓈ-Ⓢ-Ⓢ-46	523E-EJⓈ-Ⓢ-Ⓢ-46	523E-ECⓈ-Ⓢ-Ⓢ-46
		—	—	50	—	523E-EAⓈ-Ⓢ-Ⓢ-47	523E-EFⓈ-Ⓢ-Ⓢ-47	523E-EJⓈ-Ⓢ-Ⓢ-47	523E-ECⓈ-Ⓢ-Ⓢ-47
		—	—	—	50...60	523E-EAⓈ-Ⓢ-Ⓢ-48	523E-EFⓈ-Ⓢ-Ⓢ-48	523E-EJⓈ-Ⓢ-Ⓢ-48	523E-ECⓈ-Ⓢ-Ⓢ-48
		—	—	60...75	75	523E-EAⓈ-Ⓢ-Ⓢ-49	523E-FFⓈ-Ⓢ-Ⓢ-49	523E-EJⓈ-Ⓢ-Ⓢ-49	523E-ECⓈ-Ⓢ-Ⓢ-49
5	270	40	—	—	—	523E-FAⓈ-Ⓢ-Ⓢ-46	523E-FFⓈ-Ⓢ-Ⓢ-46	523E-FJⓈ-Ⓢ-Ⓢ-46	523G-FCⓈ-Ⓢ-Ⓢ-46
		—	50	—	—	523E-FAⓈ-Ⓢ-Ⓢ-47	523E-FFⓈ-Ⓢ-Ⓢ-47	523E-FJⓈ-Ⓢ-Ⓢ-47	523G-FCⓈ-Ⓢ-Ⓢ-47
		50...60	—	—	—	523E-FAⓈ-Ⓢ-Ⓢ-48	523E-FFⓈ-Ⓢ-Ⓢ-48	523E-FJⓈ-Ⓢ-Ⓢ-48	523E-FCⓈ-Ⓢ-Ⓢ-48
		—	60...75	—	—	523E-FAⓈ-Ⓢ-Ⓢ-49	523E-FFⓈ-Ⓢ-Ⓢ-49	523E-FJⓈ-Ⓢ-Ⓢ-49	523E-FCⓈ-Ⓢ-Ⓢ-49
		—	—	100	—	523E-FAⓈ-Ⓢ-Ⓢ-50	523E-FFⓈ-Ⓢ-Ⓢ-50	523E-FJⓈ-Ⓢ-Ⓢ-50	523E-FCⓈ-Ⓢ-Ⓢ-50
		—	—	—	100...125	523E-FAⓈ-Ⓢ-Ⓢ-51	523E-FFⓈ-Ⓢ-Ⓢ-51	523E-FJⓈ-Ⓢ-Ⓢ-51	523E-FCⓈ-Ⓢ-Ⓢ-51
—	—	125...150	150	523E-FAⓈ-Ⓢ-Ⓢ-52	523G-FFⓈ-Ⓢ-Ⓢ-52	523E-FJⓈ-Ⓢ-Ⓢ-52	523E-FCⓈ-Ⓢ-Ⓢ-52		

* These starters are for wye connected motor windings. They may not be used with open delta connected motor windings. For starters to be used with open delta connected separate winding motors, use consequent pole starter prices, and furnish complete ordering information, see page 1-97.

Ⓢ To order Visa-Window Breakers for certain mining applications (Canada only), add the letter **V** to the cat. no. Example: **Cat. No. 523E-BAⓈ-Ⓢ-Ⓢ-40V**.

‡ State horsepower if less than listed.

§ When controlling high efficiency motors – consult your local Rockwell Automation sales office or Allen-Bradley distributor for proper circuit breaker selection.

⊗ Coil Voltage Code

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

Example: **Cat. No. 523E-ACⓈ-Ⓢ-Ⓢ-40** becomes **Cat. No. 523E-ACB-Ⓢ-Ⓢ-40**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control (See page 1-78 Note)		HD	AD	BD	CD
120V Separate Control (without transformer)					

★ Overload Relay Code

Use to order solid-state overload relays. Do not use when ordering eutectic alloy overload relays. The cat. no. as listed is incomplete. Select two overload relay codes from page 1-159 to complete the cat. no. The first code will denote the high speed overload relay and the second code will denote the low speed overload relay. Example: **Cat. No. 523E-BAB-Ⓢ-Ⓢ-40** becomes **Cat. No. 523E-BAB-A2E-A2E-40**.



NEMA Combination Multi-Speed Starters

Product Selection — Circuit Breaker Type

2-Speed Consequent Pole, Single Winding, 5-Pole – 3-Pole, Constant or Variable Torque
(Constant Horsepower — Page 1-98)

Heater Elements —Starters with eutectic alloy overload relays require 3 heater elements for each overload. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]‡	Maximum Horsepower Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Type 1 General Purpose Cat. No.*	Type 3R/4/12 Rainproof, Waterproof, Dusttight	Type 3R/4/12 Rainproof, Waterproof, Dusttight (Door Safety Hardware) Cat. No.*	Type 4/4X Watertight Corrosion- Resistant Stainless Steel Cat. No.*
		Motor Voltage							
		200V	230V	460V	575V				
1	27	0...1/3	0...1/3	—	—	523F-BA-0-0-32	523F-BF-0-0-32	523F-BJ-0-0-32	523F-BC-0-0-32
		1/2...1	1/2...1	0...1	0...1	523F-BA-0-0-35	523F-BF-0-0-35	523F-BJ-0-0-35	523F-BC-0-0-35
		1-1/2...3	1-1/2...3	1-1/2...3	1-1/2...3	523F-BA-0-0-38	523F-BF-0-0-38	523F-BJ-0-0-38	523F-BC-0-0-38
		—	—	5	5	523F-BA-0-0-39	523F-BF-0-0-39	523F-BJ-0-0-39	523F-BC-0-0-39
		—*	—	5	5	523F-BA-0-0-39	523F-BF-0-0-39	523F-BJ-0-0-39	523F-BC-0-0-39
		7-1/2	5...7-1/2*	5...7-1/2*	5...7-1/2*	523F-BA-0-0-40	523F-BF-0-0-40	523F-BJ-0-0-40	523F-BC-0-0-40
2	45	—	—	10	10	523F-BA-0-0-41	523F-BF-0-0-41	523F-BJ-0-0-41	523F-CC-0-0-41
		10	10	—	—	523F-CA-0-0-41	523F-CF-0-0-41	523F-CJ-0-0-41	523F-CC-0-0-41
		—	15	15	15	523F-CA-0-0-42	523F-CF-0-0-42	523F-CJ-0-0-42	523F-CC-0-0-42
3	90	—	—	20...25	20...25	523F-CA-0-0-44	523F-CF-0-0-44	523F-CJ-0-0-44	523F-DC-0-0-44
		15...25	20...25	—	—	523F-DA-0-0-44	523F-DF-0-0-44	523F-DJ-0-0-44	523F-DC-0-0-44
		—	30	—	30	523F-DA-0-0-45	523F-DF-0-0-45	523F-DJ-0-0-45	523F-DC-0-0-45
4	135	—	—	30...50	40...50	523F-DA-0-0-47	523F-DF-0-0-47	523F-DJ-0-0-47	523F-EC-0-0-47
		30	—	—	—	523F-EA-0-0-45	523F-EF-0-0-45	523F-EJ-0-0-45	523F-EC-0-0-45
		40	40	—	—	523F-EA-0-0-46	523F-EF-0-0-46	523F-EJ-0-0-46	523F-EC-0-0-46
		—	50	—	—	523F-EA-0-0-47	523F-EF-0-0-47	523F-EJ-0-0-47	523F-EC-0-0-47
		—	—	—	60	523F-EA-0-0-48	523F-EF-0-0-48	523F-EJ-0-0-48	523F-EC-0-0-48
		—	—	60...75	—	523F-EA-0-0-49	523F-EF-0-0-49	523F-EJ-0-0-49	523F-EC-0-0-49
5	270	—	—	100	75...100	523F-EA-0-0-50	523F-EF-0-0-50	523F-EJ-0-0-50	523F-FC-0-0-50
		50...60	—	—	—	523F-FA-0-0-48	523F-FF-0-0-48	523F-FJ-0-0-48	523F-FC-0-0-48
		75	60...75	—	—	523F-FA-0-0-49	523F-FF-0-0-49	523F-FJ-0-0-49	523F-FC-0-0-49
		—	100	—	—	523F-FA-0-0-50	523F-FF-0-0-50	523F-FJ-0-0-50	523F-FC-0-0-50
		—	—	—	125	523F-FA-0-0-51	523F-FF-0-0-51	523F-FJ-0-0-51	523F-FC-0-0-51
		—	—	125...150	—	523F-FA-0-0-52	523F-FF-0-0-52	523F-FJ-0-0-52	523F-FC-0-0-52
—	—	200	150...200	523F-FA-0-0-54	523F-FF-0-0-54	523F-FJ-0-0-54	523F-FC-0-0-54		

* To order Visa-Window Breakers for certain mining applications (Canada only), add the letter **V** to the cat. no. Example: **Cat. No. 523E-BA-0-0-40V**.
 * State horsepower if less than listed.
 ‡ When controlling high efficiency motors – consult your local Rockwell Automation sales office or Allen-Bradley distributor for proper circuit breaker selection.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no.
 Example: **Cat. No. 523F-BA-0-0-40** becomes **Cat. No. 523F-BAB-0-0-40**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control (See page 1-78 Note)		HD	AD	BD	CD
120V Separate Control (without transformer)					

★ Overload Relay Code

Use to order solid-state overload relays. Do not use when ordering eutectic alloy overload relays. The cat. no. as listed is incomplete. Select two overload relay codes from page 1-159 to complete the cat. no. The first code will denote the high speed overload relay and the second code will denote the low speed overload relay. Example: **Cat. No. 523F-BAB-0-0-40** becomes **Cat. No. 523F-BAB-A2E-A2E-40**.

NEMA Combination Multi-Speed Starters

Product Selection — Circuit Breaker Type

2-Speed Consequent Pole, Single Winding, 5-Pole – 3-Pole, Constant Horsepower
(Constant or Variable Torque — page 1-97)

Heater Elements — Starters with eutectic alloy overload relays require 3 heater elements for each overload. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]‡	Maximum Horsepower Rating Full Load Current Must Not Exceed Continuous Ampere Rating*				Type 1 General Purpose Cat. No.*	Type 3R/4/12 Rainproof, Waterproof, Dusttight Cat. No.*	Type 3R/4/12 Rainproof, Waterproof, Dusttight (Door Safety Hardware) Cat. No.*	Type 4/4X Watertight Corrosion- Resistant Stainless Steel Cat. No.*
		Motor Voltage							
		200V	230V	460V	575V				
1	27	0...1/3	0...1/3	—	—	523G-BAⓈ-Ⓢ-Ⓢ-32	523G-BFⓈ-Ⓢ-Ⓢ-32	523G-BJⓈ-Ⓢ-Ⓢ-32	523G-BCⓈ-Ⓢ-Ⓢ-32
		1/2...1	1/2...1	0...1	0...1	523G-BAⓈ-Ⓢ-Ⓢ-35	523G-BFⓈ-Ⓢ-Ⓢ-35	523G-BJⓈ-Ⓢ-Ⓢ-35	523G-BCⓈ-Ⓢ-Ⓢ-35
		1-1/2...2	1-1/2...2	—	—	523G-BAⓈ-Ⓢ-Ⓢ-37	523G-BFⓈ-Ⓢ-Ⓢ-37	523G-BJⓈ-Ⓢ-Ⓢ-37	523G-BCⓈ-Ⓢ-Ⓢ-37
		—	—	1-1/2...3	1-1/2...3	523G-BAⓈ-Ⓢ-Ⓢ-38	523G-BFⓈ-Ⓢ-Ⓢ-38	523G-BJⓈ-Ⓢ-Ⓢ-38	523G-BCⓈ-Ⓢ-Ⓢ-38
		3*	3*	—	—	523G-BAⓈ-Ⓢ-Ⓢ-38	523G-BFⓈ-Ⓢ-Ⓢ-38	523G-BJⓈ-Ⓢ-Ⓢ-38	—
		5	5	—	—	523G-BAⓈ-Ⓢ-Ⓢ-39	523G-BFⓈ-Ⓢ-Ⓢ-39	523G-BJⓈ-Ⓢ-Ⓢ-39	523G-BCⓈ-Ⓢ-Ⓢ-39
2	45	—	—	5...7-1/2*	5...7-1/2*	523G-BAⓈ-Ⓢ-Ⓢ-40	523G-BFⓈ-Ⓢ-Ⓢ-40	523G-BJⓈ-Ⓢ-Ⓢ-40	523G-BCⓈ-Ⓢ-Ⓢ-40
		7-1/2	7-1/2	—	—	523G-CAⓈ-Ⓢ-Ⓢ-40	523G-CFⓈ-Ⓢ-Ⓢ-40	523G-CJⓈ-Ⓢ-Ⓢ-40	523G-CCⓈ-Ⓢ-Ⓢ-40
		—	10	—	—	523G-CAⓈ-Ⓢ-Ⓢ-41	523G-CFⓈ-Ⓢ-Ⓢ-41	523G-CJⓈ-Ⓢ-Ⓢ-41	523G-CCⓈ-Ⓢ-Ⓢ-41
		—	—	10...15	10...15	523G-CAⓈ-Ⓢ-Ⓢ-42	523G-CFⓈ-Ⓢ-Ⓢ-42	523G-CJⓈ-Ⓢ-Ⓢ-42	523G-CCⓈ-Ⓢ-Ⓢ-42
3	90	—	—	20	20	523G-CAⓈ-Ⓢ-Ⓢ-43	523G-CFⓈ-Ⓢ-Ⓢ-43	523G-CJⓈ-Ⓢ-Ⓢ-43	523G-CCⓈ-Ⓢ-Ⓢ-43
		10	—	—	—	523G-DAⓈ-Ⓢ-Ⓢ-41	523G-DFⓈ-Ⓢ-Ⓢ-41	523G-DJⓈ-Ⓢ-Ⓢ-41	523G-DCⓈ-Ⓢ-Ⓢ-41
		15...20	—	—	—	523G-DAⓈ-Ⓢ-Ⓢ-43	523G-DFⓈ-Ⓢ-Ⓢ-43	523G-DJⓈ-Ⓢ-Ⓢ-43	523G-DCⓈ-Ⓢ-Ⓢ-43
		—	15...25	25	—	523G-DAⓈ-Ⓢ-Ⓢ-44	523G-DFⓈ-Ⓢ-Ⓢ-44	523G-DJⓈ-Ⓢ-Ⓢ-44	523G-DCⓈ-Ⓢ-Ⓢ-44
		—	—	—	25...30	523G-DAⓈ-Ⓢ-Ⓢ-45	523G-DFⓈ-Ⓢ-Ⓢ-45	523G-DJⓈ-Ⓢ-Ⓢ-45	523G-DCⓈ-Ⓢ-Ⓢ-45
		—	—	30...40	40	523G-DAⓈ-Ⓢ-Ⓢ-46	523G-DFⓈ-Ⓢ-Ⓢ-46	523G-DJⓈ-Ⓢ-Ⓢ-46	523G-DCⓈ-Ⓢ-Ⓢ-46
4	135	25	—	—	—	523G-EAⓈ-Ⓢ-Ⓢ-44	523G-EFⓈ-Ⓢ-Ⓢ-44	523G-EJⓈ-Ⓢ-Ⓢ-44	523G-EAⓈ-Ⓢ-Ⓢ-44
		30	—	—	—	523G-EAⓈ-Ⓢ-Ⓢ-45	523G-EFⓈ-Ⓢ-Ⓢ-45	523G-EJⓈ-Ⓢ-Ⓢ-45	523G-ECⓈ-Ⓢ-Ⓢ-45
		—	30...40	—	—	523G-EAⓈ-Ⓢ-Ⓢ-46	523G-EFⓈ-Ⓢ-Ⓢ-46	523G-EJⓈ-Ⓢ-Ⓢ-46	523G-ECⓈ-Ⓢ-Ⓢ-46
		—	—	50	—	523G-EAⓈ-Ⓢ-Ⓢ-47	523G-EFⓈ-Ⓢ-Ⓢ-47	523G-EJⓈ-Ⓢ-Ⓢ-47	523G-ECⓈ-Ⓢ-Ⓢ-47
		—	—	—	50...60	523G-EAⓈ-Ⓢ-Ⓢ-48	523G-EFⓈ-Ⓢ-Ⓢ-48	523G-EJⓈ-Ⓢ-Ⓢ-48	523G-ECⓈ-Ⓢ-Ⓢ-48
		—	—	60...75	—	523G-EAⓈ-Ⓢ-Ⓢ-49	523G-EFⓈ-Ⓢ-Ⓢ-49	523G-EJⓈ-Ⓢ-Ⓢ-49	523G-ECⓈ-Ⓢ-Ⓢ-49
5	270	40	—	—	—	523G-FAⓈ-Ⓢ-Ⓢ-46	523G-FFⓈ-Ⓢ-Ⓢ-46	523G-FJⓈ-Ⓢ-Ⓢ-46	523G-FCⓈ-Ⓢ-Ⓢ-46
		—	50	—	—	523G-FAⓈ-Ⓢ-Ⓢ-47	523G-FFⓈ-Ⓢ-Ⓢ-47	523G-FJⓈ-Ⓢ-Ⓢ-47	523G-FCⓈ-Ⓢ-Ⓢ-47
		50...60	—	—	—	523G-FAⓈ-Ⓢ-Ⓢ-48	523G-FFⓈ-Ⓢ-Ⓢ-48	523G-FJⓈ-Ⓢ-Ⓢ-48	523G-FCⓈ-Ⓢ-Ⓢ-48
		—	60...70	—	—	523G-FAⓈ-Ⓢ-Ⓢ-49	523G-FFⓈ-Ⓢ-Ⓢ-49	523G-FJⓈ-Ⓢ-Ⓢ-49	523G-FCⓈ-Ⓢ-Ⓢ-49
		—	—	100	—	523G-FAⓈ-Ⓢ-Ⓢ-50	523G-FFⓈ-Ⓢ-Ⓢ-50	523G-FJⓈ-Ⓢ-Ⓢ-50	523G-FCⓈ-Ⓢ-Ⓢ-50
		—	—	—	100...125	523G-FAⓈ-Ⓢ-Ⓢ-51	523G-FFⓈ-Ⓢ-Ⓢ-51	523G-FJⓈ-Ⓢ-Ⓢ-51	523G-FCⓈ-Ⓢ-Ⓢ-51
—	—	125...150	150	523G-FAⓈ-Ⓢ-Ⓢ-52	523G-FFⓈ-Ⓢ-Ⓢ-52	523G-FJⓈ-Ⓢ-Ⓢ-52	523G-FCⓈ-Ⓢ-Ⓢ-52		

* To order Visa-Window Breakers for certain mining applications (Canada only), add the letter **V** to the cat. no. Example: **Cat. No. 523E-BAⓈ-Ⓢ-Ⓢ-40V**.

* State horsepower if less than listed.

‡ When controlling high efficiency motors – consult your local Rockwell Automation sales office or Allen-Bradley distributor for proper circuit breaker selection.

⊗ Coil Voltage Code

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

Example: **Cat. No. 523G-BAⓈ-Ⓢ-Ⓢ-40** becomes **Cat. No. 523G-BAB-Ⓢ-Ⓢ-40**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

		[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz		H	A	B	C
Transformer Control (See page 1-78 Note)			HD	AD	BD	CD
120V Separate Control (without transformer)						

★ Overload Relay Code

Use to order solid-state overload relays. Do not use when ordering eutectic alloy overload relays. The cat. no. as listed is incomplete. Select two overload relay codes from page 1-159 to complete the cat. no. The first code will denote the high speed overload relay and the second code will denote the low speed overload relay. Example: **Cat. No. 523G-BAB-Ⓢ-Ⓢ-40** becomes **Cat. No. 523G-BAB-A2E-A2E-40**.



NEMA Pump Control Panels

Product Overview/Product Selection



Bulletin 1232 - NEMA Pump Control Panels — Narrow Enclosure

- Narrow enclosure size when extra panel space is not required
- NEMA starter sizes 1...3
- Fusible disconnect switch
- Painted metal enclosure: Type 3R
- Overload relays: Eutectic supplied as standard, solid-state available as an option.
- Modifications — factory installed
- Accessories — field installed
- Service entrance rated

A Bulletin 1232 pump control panel (with fusible disconnect switch) consists of a Bulletin 509 starter mounted in an enclosure.

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Standards Compliance

UL 508
 CSA C22.2 No. 14

Certifications

cULus Listed (File No. E125316, Guide No. NKJH, NKJH7)

Heater Elements — Starters with eutectic alloy overload relays require 3 heater elements. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Line Voltage [V]	Fuse Clip Rating Amperes [A] Fuses not included. Select per NEC	Type 3R Rainproof with Narrow Enclosure Cat. No.*
		AC Motor Voltage						
		60 Hz 200V	60 Hz 230V	50 Hz 380...415V	60 Hz 460...575V			
1	27	7-1/2	7-1/2	—	—	208...240	30	1232-BN ⊗ - ⊗ -24
		—	—	10	10	480...600	30	1232-BN ⊗ - ⊗ -24
		7-1/2	7-1/2	—	—	208...240	60	1232-BN ⊗ - ⊗ -25
		—	—	10	10	480...600	60	1232-BN ⊗ - ⊗ -25
2	45	10	15	—	—	208...240	60	1232-CN ⊗ - ⊗ -25
		—	—	25	25	480...600	60	1232-CN ⊗ - ⊗ -25
		10	15	—	—	208...240	100	1232-CN ⊗ - ⊗ -26
		—	—	25	25	480...600	100	1232-CN ⊗ - ⊗ -26
3	90	25	30	—	—	208...240	100	1232-DN ⊗ - ⊗ -26
		—	—	50	50	480...600	100	1232-DN ⊗ - ⊗ -26
		25	30	—	—	208...240	200	1232-DN ⊗ - ⊗ -27
		—	—	50	50	480...600	200	1232-DN ⊗ - ⊗ -27

* Class R fuse clips can be supplied as a factory option in place of Class H clips. To order Class R fuse clips, add an "R" after the cat. no. Example: **Cat. No. 1232-BN - -24** becomes **Cat. No. 1232-BN - -24R**. Class H fuse clips will accept Class R fuses. However, only Class R fuse clips are the rejection type which limit their use to Class R fuses. To order Class J fuse clips, add a "J" after the cat. no. Example: **Cat. No. 1232-BN - -24** becomes **Cat. No. 1232-BN - -24J**.

⊗ Some applications may require time-delay fuses when this size fuse clip is used.

⊗ Coil Voltage Code

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

Example: **Cat. No. 1232-BN~~⊗~~-~~⊗~~-24** becomes **Cat. No. 1232-BNA-~~⊗~~-24**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

Voltage ‡ [V]		208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control §		AD	AD	CD	CD
120V Separate Control (without transformer)		AD	AD	CD	CD

‡ Starters are suitable for use on 50 Hz. Consult your local Rockwell Automation sales office or Allen-Bradley distributor.

§ When selecting a factory-installed control circuit transformer, use the Common Control Voltage Suffix Code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 1232-BNB-6P-24** will have a transformer with a 480V primary/120V secondary voltage and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second Voltage Suffix Code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 1232-BNB-6P-24** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.

⊕ Overload Relay Code

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete.

Select an overload relay code from page 1-159 to complete the cat. no.

Example: **Cat. No. 1232-BNA-~~⊗~~-24** becomes **Cat. No. 1232-BNA-A2E-24**.

NEMA Pump Control Panels

Product Selection — Disconnect Type (Fusible with Class R Fuse Clips)

1



Bulletin 1232X

- NEMA starter sizes 1...7
- Fusible disconnect switch
- Painted metal extra capacity enclosures: Type 3R
- Overload relays: Eutectic supplied as standard, solid-state available as an option
- Modifications — factory installed
- Accessories — field installed
- Service entrance rated

A Bulletin 1232X pump control panel (with fusible disconnect switch) consists of a Bulletin 509 starter mounted in an enclosure with extra panel space.

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 Approximate Dimensions..... 1-148

Standards Compliance

UL 508
 CSA 22.2, No. 14

Certifications

cULus Listed (File No. E125316, Guide No. NKJH, NKJH7)

Heater Elements — Starters with eutectic alloy overload relays require 3 heater elements. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Line Voltage [V]	Fuse Clip Rating Amperes [A] Fuses not included. Select per NEC	Type 3R Rainproof with Extra Panel Space Cat. No.
		Motor Voltage						
		60 Hz	60 Hz	50 Hz	60 Hz			
1	27	200V	230V	380...415V	460...575V	208...240	30	1232X-BN 0 - 0 -24R
		7-1/2	7-1/2	—	—	480...600	30	1232X-BN 0 - 0 -24R
		—	—	10	10	208...240	60	1232X-BN 0 - 0 -25R
		—	—	10	10	480...600	60	1232X-BN 0 - 0 -25R
2	45	10	15	—	—	208...240	60	1232X-CN 0 - 0 -25R
		—	—	25	25	480...600	60	1232X-CN 0 - 0 -25R
		10	15	—	—	208...240	100	1232X-CN 0 - 0 -26J
		—	—	25	25	480...600	100	1232X-CN 0 - 0 -26J
3	90	25	30	—	—	208...240	100	1232X-DN 0 - 0 -26R
		—	—	50	50	480...600	100	1232X-DN 0 - 0 -26R
		25	30	—	—	208...240	200	1232X-DN 0 - 0 -27J
		—	—	50	50	480...600	200	1232X-DN 0 - 0 -27J
4	135	40	50	—	—	208...240	200	1232X-EN 0 - 0 -27R
		—	—	75	100	480...600	200	1232X-EN 0 - 0 -27R
		40	50	—	—	208...240	400	1232X-EN 0 - 0 -28J
		—	—	75	100	480...600	400	1232X-EN 0 - 0 -28J
5	270	75	100	—	—	208...240	400	1232X-FN 0 - 0 -28R
		—	—	150	200	480...600	400	1232X-FN 0 - 0 -28R
6	540	150	200	300	400	208...600	600*	1232X-GN 0 - 0 -29R
7	810	—	300	500	600	240...600	1200	1232X-HN 0 - 0 -25L

* For 230V and 460V Hp ratings, limit the maximum fuse sizing to 125% of motor full load current.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no.
 Example: **Cat. No. 1232X-BN~~0~~-~~0~~-24** becomes **Cat. No. 1232X-BNA-~~0~~-24**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control (See page 1-78 Note)		AD	AD	CD	CD
120V Separate Control (without transformer)		AD	AD	CD	CD

★ Overload Relay Code

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete. Select an overload relay code from page 1-159 to complete the cat. no.
 Example: **Cat. No. 1232X-BNA-~~0~~-24** becomes **Cat. No. 1232X-BNA-A2E-24**.

NEMA Vacuum Pump Control Panels

Product Selection — Vacuum Circuit Breaker Type



Bulletin 1232V

- NEMA starter sizes 4...6
- Painted metal extra capacity enclosures: Type 3R
- Modifications — factory installed
- Accessories — field installed
- Service entrance rated

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1

Heater Elements — Starters with eutectic alloy overload relays require 3 heater elements. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]	Max. Hp Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Line Voltage [V]	Fuse Clip Rating Amperes [A] Fuses not included. Select per NEC	Type 3R Rainproof with Extra Panel Space* Cat. No.
		Motor Voltage						
		60 Hz 200V	60 Hz 230V	50 Hz 380...415V	60 Hz 460...575V			
4	135	40	50	—	—	208...240	200	1232V-EN-⊗-27R
		—	—	75	100	480...600	200	1232V-EN-⊗-27R
		40	50	—	—	208...240	400	1232V-EN-⊗-28J
		—	—	75	100	480...600	400	1232V-EN-⊗-28J
5	270	75	100	—	—	208...240	400	1232V-FN-⊗-28R
		—	—	150	200	480...600	400	1232V-FN-⊗-28R
6	540	150	200	300	400	208...600	600*	1232V-GN-⊗-29R

* For 230V and 460V Hp ratings, limit the maximum fuse sizing to 125% of motor full load current.

⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a Coil Voltage Code from the table below to complete the cat. no.

Example: **Cat. No. 1232V-EN-⊗-27R** becomes **Cat. No. 1232V-ENA-⊗-27R**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	—	A	B	—
Transformer Control (See page 1-78 Note)		H	A	B	C
120V Separate Control (without transformer)		AD	AD	CD	CD

★ Overload Relay Code

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete.

Select an overload relay code from page 1-159 to complete the cat. no.

Example: **Cat. No. 1232V-ENA-⊗-27R** becomes **Cat. No. 1232V-ENA-A2M-27R**.



Allen-Bradley

www.ab.com/catalogs Preferred availability cat. nos. are **bold**.

Publication A117-CA001A-EN-P

NEMA Pump Control Panels

Product Overview/Product Selection

1



Bulletin 1233 - NEMA Pump Control Panels — Narrow Enclosure

- Narrow enclosure size when extra panel space is not required
- NEMA starter sizes 1...3
- Circuit breaker magnetic only (instantaneous trip)
- Painted metal enclosures: Type 3R
- Overload relays: Eutectic supplied as standard, solid-state available as an option
- Modifications — factory installed
- Accessories — field installed
- Service entrance rated

A Bulletin 1233 pump control panel with circuit breaker magnetic only (instantaneous trip) consists of a Bulletin 509 starter mounted in an enclosure.

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Heater Elements — Starters with eutectic alloy overload relays require 3 heater elements. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]*	Maximum Horsepower Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Type 3R Rainproof with Narrow Enclosure Cat. No.
		AC Motor Voltage				
		200V	230V	460V	575V	
1	27	0...1/3	0...1/3	—	—	1233-BN ⊗ - ⊖ -32
		1/2...1	1/2...1	0...1	0...1	1233-BN ⊗ - ⊖ -35
		1-1/2...3	1-1/2...3	1-1/2...3	1-1/2...3	1233-BN ⊗ - ⊖ -38
		5	—	—	—	1233-BN ⊗ - ⊖ -39
		7-1/2	5...7-1/2	5...7-1/2	5...7-1/2	1233-BN ⊗ - ⊖ -40
2	45	—	—	10	10	1233-BN ⊗ - ⊖ -41
		10	10	—	—	1233-CN ⊗ - ⊖ -41
		—	15	15	15	1233-CN ⊗ - ⊖ -42
3	90	—	—	20...25	20...25	1233-CN ⊗ - ⊖ -44
		15...25	25	—	—	1233-DN ⊗ - ⊖ -44
		—	30	—	30	1233-DN ⊗ - ⊖ -45
		—	—	30...50	40...50	1233-DN ⊗ - ⊖ -47

* When controlling high efficiency motors – consult your local Rockwell Automation sales office or Allen-Bradley distributor for proper circuit breaker selection.

⊗ Coil Voltage Code

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

Example: **Cat. No. 1233-BN~~⊗~~-~~⊖~~-35** becomes **Cat. No. 1233-BNB~~⊗~~-~~⊖~~-35**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

Voltage [‡]		[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz		H	A	B	C
Transformer Control [*]						
120V Separate Control (without transformer)			HD	AD	BD	CD

[‡] Starters are suitable for use on 50 Hz. Consult your local Rockwell Automation sales office or Allen-Bradley distributor. For 380...415V, 50 Hz motor voltage, order entry must specify actual horsepower.

^{*} When selecting a factory-installed control circuit transformer, use the Common Control Voltage Suffix Code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: Cat. No. 1233-BNB-6P-35 will have a transformer with a 480V primary/120V secondary voltage and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second Voltage Suffix Code must be added to denote the coil/transformer secondary voltage. Example: Cat. No. 1233-BNB-6P-35 will have a transformer with a 480V primary/24V secondary and a 24V starter coil.

★ Overload Relay Code

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete.

Select an overload relay code from page 1-159 to complete the cat. no.

Example: **Cat. No. 1233-BNB~~⊗~~-~~⊖~~-35** becomes **Cat. No. 1233-BNB-A2E-35**.





Bulletin 1233X

- NEMA starter sizes 1...7
- Circuit breaker magnetic only (instantaneous trip)
- Painted metal enclosures: Type 3R
- Overload relays: Eutectic supplied as standard, solid-state available as an option
- Modifications — factory installed
- Accessories — field installed
- Service entrance rated

A Bulletin 1233X pump control panel with circuit breaker magnetic only (instantaneous trip) consists of a Bulletin 509 starter mounted in an enclosure with extra panel space. Starter sizes 6 & 7 consist of a thermal magnetic (inverse time) circuit breaker.

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Heater Elements — Starters with eutectic alloy overload relays require 3 heater elements. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]*	Maximum Horsepower Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Type 3R Rainproof with Extra Panel Space Cat. No.
		Motor Voltage				
		200V	230V	460V	575V	
1	27	0...1/3	0...1/3	—	—	1233X-BNⓈ-Ⓢ-32
		1/2...1	1/2...1	0...1	0...1	1233X-BNⓈ-Ⓢ-35
		1-1/2...3	1-1/2...3	1-1/2...3	1-1/2...3	1233X-BNⓈ-Ⓢ-38
		5	—	—	—	1233X-BNⓈ-Ⓢ-39
		7-1/2	5...7-1/2	5...7-1/2	5...7-1/2	1233X-BNⓈ-Ⓢ-40
2	45	—	—	10	10	1233X-BNⓈ-Ⓢ-41
		10	10	—	—	1233X-CNⓈ-Ⓢ-41
		—	15	15	15	1233X-CNⓈ-Ⓢ-42
		—	—	20...25	20...25	1233X-CNⓈ-Ⓢ-44
3	90	15...25	25	—	—	1233X-DNⓈ-Ⓢ-44
		—	30	—	30	1233X-DNⓈ-Ⓢ-45
		—	—	30...50	40...50	1233X-DNⓈ-Ⓢ-47
4	135	30	—	—	—	1233X-ENⓈ-Ⓢ-45
		40	40	—	—	1233X-ENⓈ-Ⓢ-46
		—	50	—	—	1233X-ENⓈ-Ⓢ-47
		—	—	—	60	1233X-ENⓈ-Ⓢ-48
		—	—	60...75	—	1233X-ENⓈ-Ⓢ-49
—	—	100	75...100	1233X-ENⓈ-Ⓢ-50		

* When controlling high efficiency motors – consult your local Rockwell Automation sales office or Allen-Bradley distributor for proper circuit breaker selection.

⊗ **Coil Voltage Code**

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

Example: **Cat. No. 1233X-BNⓈ-Ⓢ-35** becomes **Cat. No. 1233X-BNB-Ⓢ-35**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control (See page 1-78 Note)		HD	AD	BD	CD
120V Separate Control (without transformer)					

⊕ **Overload Relay Code**

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete.

Select an overload relay code from page 1-159 to complete the cat. no.

Example: **Cat. No. 1233X-BNB-Ⓢ-35** becomes **Cat. No. 1233X-BNB-A2E-35**.

NEMA Pump Control Panels

Product Selection — Circuit Breaker Type

Heater Elements — Starters with eutectic alloy overload relays require 3 heater elements. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]*	Maximum Horsepower Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Type 3R Rainproof with Extra Panel Space Cat. No.
		Motor Voltage				
		200V	230V	460V	575V	
5	270	50...60	—	—	—	1233X-FN⊗-ⓐ-48
		75	60...75	—	—	1233X-FN⊗-ⓐ-49
		—	100	—	—	1233X-FN⊗-ⓐ-50
		—	—	—	125	1233X-FN⊗-ⓐ-51
		—	—	125...150	—	1233X-FN⊗-ⓐ-52
		—	—	200	150...200	1233X-FN⊗-ⓐ-54
6	540	100	—	—	—	1233X-GN⊗-ⓐ-50T
		125	125	—	—	1233X-GN⊗-ⓐ-51T
		150	150	—	—	1233X-GN⊗-ⓐ-52T
		—	200	—	—	1233X-GN⊗-ⓐ-54T
		—	—	250	250	1233X-GN⊗-ⓐ-56T
		—	—	300	300	1233X-GN⊗-ⓐ-57T
		—	—	—	350	1233X-GN⊗-ⓐ-58T
		—	—	350...400	400	1233X-GN⊗-ⓐ-59T
7	810	—	250	—	—	1233X-HN⊗-ⓐ-56T
		—	300	—	—	1233X-HN⊗-ⓐ-57T
		—	—	450...500	—	1233X-HN⊗-ⓐ-61T
		—	—	—	450...600	1233X-HN⊗-ⓐ-62T

* When controlling high efficiency motors – consult your local Rockwell Automation sales office or Allen-Bradley distributor for proper circuit breaker selection.

⊗ Coil Voltage Code

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

Example: **Cat. No. 1233X-BN⊗-ⓐ-35** becomes **Cat. No. 1233X-BNB-ⓐ-35**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	H	A	B	C
Transformer Control (See page 1-78 Note)		HD	AD	BD	CD
120V Separate Control (without transformer)					

⊕ Overload Relay Code

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete.

Select an overload relay code from page 1-159 to complete the cat. no.

Example: **Cat. No. 1233X-BNB-ⓐ-35** becomes **Cat. No. 1233X-BNB-A2E-35**.





Bulletin 1233V

- NEMA starter size 4
- Circuit breaker — thermal inverse time, magnetic only
- Painted metal enclosures: Type 3R
- Modifications — factory installed
- Accessories — field installed
- Service entrance rated

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Heater Elements — Starters with eutectic alloy overload relays require 3 heater elements. Located on page 1-167.

NEMA Size	Continuous Ampere Rating [A]	Maximum Horsepower Rating Full Load Current Must Not Exceed Continuous Ampere Rating				Type 3R Rainproof with Extra Panel Space Cat. No.
		Motor Voltage				
		200V	230V	460V	575V	
4	135	30	—	—	—	1233V-EN-⊗-45T
		40	40	—	—	1233V-EN-⊗-46T
		—	50	—	—	1233V-EN-⊗-47T
		—	—	—	60	1233V-EN-⊗-48T
		—	—	60...75	—	1233V-EN-⊗-49T
		—	—	100	75...100	1233V-EN-⊗-50T
5	270	50...60	—	—	—	1233V-FN-⊗-48T
		75	60...75	—	—	1233V-FN-⊗-49T
		—	100	—	—	1233V-FN-⊗-50T
		—	—	—	125	1233V-FN-⊗-51T
		—	—	125...150	—	1233V-FN-⊗-52T
		—	—	200	150...200	1233V-FN-⊗-54T
6	540	100	—	—	—	1233V-GN-⊗-50T
		125	125	—	—	1233V-GN-⊗-51T
		150	150	—	—	1233V-GN-⊗-52T
		—	200	—	—	1233V-GN-⊗-54T
		—	—	250	250	1233V-GN-⊗-56T
		—	—	300	300	1233V-GN-⊗-57T
		—	—	—	350	1233V-GN-⊗-58T
		—	—	350...400	400	1233V-GN-⊗-59T

⊗ **Coil Voltage Code**

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

Example: **Cat. No. 1233V-EN-⊗-45T** becomes **Cat. No. 1233V-ENA-⊗-45T**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	208	230...240	460...480	575...600
Common Control	AC, 60 Hz	—	A	B	—
Transformer Control (See page 1-78 Note)		H	A	B	C
120V Separate Control (without transformer)		HD	AD	BD	CD

⊕ **Overload Relay Code**

Use to order solid-state overload relay. Do not use when ordering eutectic alloy overload relay. The cat. no. as listed is incomplete.

Select an overload relay code from page 1-159 to complete the cat. no.

Example: **Cat. No. 1233V-ENA-⊗-45T** becomes **Cat. No. 1233V-ENA-A2M-45T**.

Bulletin 500 Line
Modifications — Factory Installed
NEMA Non-Combination Contactors/Starters

For Use on Bulletins 500, 500F, 500L, 500LP, 505, 505V, 509, 520, and 520V; excluding Modular Kits

Listed on this and the following pages are factory-installed modifications and special features that are available for the low voltage (600V maximum) contactors/starters listed in this catalog. To order, add a dash followed by the suffix number listed in these tables to the end of the product cat. no. Example: **Cat. No. 509-BAD-A2E-1**.

Bulletin 500	Size Rating	0	1	2	3	4	5	6	7	8	9
Bulletin 500L	Ampere Rating	15/20	30	60	100	200	300	540	810	1215	2250

Description of Modification	Suffix No.	Enclosure Type	NEMA Size											
			00	0	1	2	3	4	5	6	7	8	9	
Pilot Devices in Cover or Flange														
Full Voltage Non-Reversing Single Speed Contactors or Starters (Buls. 500, 500F, 500L, 500LP, 509)														
START-STOP Push Button I/O (Canada only)	1	1*	A	A	A	A	A	A	A	A	A	A	A	A
	1	3R/4/12, 4/4X Bolted⊛	NA	A	A	A	A	A	A	A	A	A	A	NA
	1	Unilock‡	NA	A	A	A	A	A	A	A	A	A	A	NA
ON-OFF Push Button	1E	1*	A	A	A	A	A	A	A	A	A	A	A	A
	1E	3R/12, 4/4X, 4X Bolted⊛	NA	A	A	A	A	A	A	A	A	A	A	NA
	1E	Unilock‡	NA	A	A	A	A	A	A	A	A	A	A	NA
HAND-OFF-AUTO Selector Switch	3	1*	A	A	A	A	A	A	A	A	A	A	A	A
	3	3R/12, 4/4X, 4X Bolted⊛	NA	A	A	A	A	A	A	A	A	NA	NA	NA
	3	Unilock‡	NA	A	A	A	A	A	A	A	A	A	A	NA
OFF-ON Selector Switch	3E	1*	A	A	A	A	A	A	A	A	A	A	A	A
	3E	3R/12, 4/4X, 4X Bolted⊛	NA	A	A	A	A	A	A	A	A	NA	NA	NA
	3E	Unilock‡	NA	A	A	A	A	A	A	A	A	NA	NA	NA
HAND-OFF-AUTO Selector Switch (For Permanent Magnet Latch Type Contactor Only)	3	All Listed*	NA	A	A	A	A	A	A	NA	NA	NA	NA	
PILOT LIGHT (Red Lens)	4R	1, 3R/12, 4/4X, 4X* §	NA	A	A	A	A	A	A	A	NA	NA	NA	A
	4R	Bolted⊛	NA	A	A	A	A	A	A	NA	NA	NA	NA	NA
	4R	Unilock‡	NA	A	A	A	A	A	A	NA	NA	NA	NA	NA
PUSH-TO-TEST PILOT LIGHT (Red Lens)	5R	1, 3R/12, 4/4X, 4X	NA	A	A	A	A	A	A	NA	NA	NA	NA	NA
	5R	Bolted⊛	NA	A	A	A	A	A	A	NA	NA	NA	NA	NA
Full Voltage Reversing and Multi-Speed Starters (Buls. 505, 505V, 520V, 520V)														
FOR-REV-STOP Push Button	1	1, 3R/12, 4/4X, 4X	A	A	A	A	A	A	A	A	A	A	A	A
	1	Bolted⊛	NA	A	A	A	A	A	A	A	NA	NA	NA	NA
	1	Unilock‡	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FOR-OFF-REV Selector Switch	3	1, 3R/12, 4/4X, 4X	A	A	A	A	A	A	A	A	A	A	A	A
	3	Bolted⊛	NA	A	A	A	A	A	A	NA	NA	NA	NA	NA
	3	Unilock‡	NA	A	A	NA	NA	NA	NA	NA	NA	NA	NA	NA
HIGH-LOW-STOP Push Button	1	1, 3R/12, 4/4X, 4X	A	A	A	A	A	A	A	A	A	A	A	A
	1	Bolted⊛	NA	A	A	A	A	A	A	NA	NA	NA	NA	NA
HIGH-OFF-LOW Selector Switch	3	1, 3R/12, 4/4X, 4X	A	A	A	A	A	A	A	A	A	A	A	A
	3	Bolted⊛	NA	A	A	A	A	A	A	NA	NA	NA	NA	NA
HIGH-LOW-OFF-AUTO Selector Switch	3J	1, 3R/12, 4/4X, 4X	NA	A	A	A	A	A	A	A	A	A	A	A
PILOT LIGHTS (2)	4R	1, 3R/12, 4/4X, 4X* §	NA	A	A	A	A	A	A	A	A	A	A	A

A = Available

NA = Not Available

* Bulletin 500L and 500FL require a normally open auxiliary contact when used with a push button. See page 1-111. Only one push button or one selector switch (not both) may be added to a Bulletin 509 for NEMA Type 1 without transformers. Only one pilot light may be added to a Bulletin 509 Type 1 without transformers.

⊛ Bolted suitable for Type 7 & 9 or Type 3R, 7 & 9.

‡ Unilock suitable for Type 7 & 9 or Type 3R, 7 & 9 with the addition of a drain or breather and drain.

§ OFF pilot lights for non-reversing and non-multi-speed applications require a normally closed auxiliary contact add -91 to Cat. No. Red and amber (up to 240V AC) are the only colors available on Type 1 non-combination starters (lift-off). On non-combination starters (hinged), specify other lens colors by changing the letter to: **A** = Amber; **B** = Blue; **C** = Clear; **G** = Green; **W** = White.

* For multi-speed and reversing starters, one pilot light for each contactor. Add additional letters to identify two lens colors. The first letter specifies FORWARD, HIGH, or ON; the second letter specifies REVERSE, LOW, or OFF; e.g., **4AG**.



For Use on Bulletins 500, 500F, 500L, 500LP, 505, 505V, 509, 520, and 520V; excluding Modular Kits

Description of Modification	Suffix No.	Enclosure Type	NEMA Size										
			00	0	1	2	3	4	5	6	7	8	9
Control Circuit Transformer*													
Includes 2 primary fuses and 1 secondary fuse with standard capacity 60 or 50 Hz	6P	1, 3R/12, 4/4X, 4X Bolted‡ Unilock§	NA	A	A	A	A	A	A	STD	STD	STD	STD
	6P		NA	A	A	A	A	A	A	STD	NA	NA	NA
	6P		NA	A	A	A	A	A	A	A	STD	NA	NA
With 100 W extra capacity 60 or 50 Hz	6XP	1, 3R/12, 4/4X, 4X Bolted‡ Unilock§	NA	A	A	A	A	A	A	STD	STD	STD	STD
	6XP		NA	A	A	A	A	A	A	STD	NA	NA	NA
	6XP		NA	A	A	A	A	A	A	A	STD	NA	NA
Control Circuit													
Auxiliary contact installed on contactor	N.O. N.C.	90 ➤ 91 ➤	All listed All listed	NA NA	A A	A A	A A	A A	A A	A A	A A	A A	A A
Fused control circuit for applications less transformer	(1 Fuse — Fuse Included) (2 Fuses — Fuses Included)	21 22	1, 3R/12, 4/4X, 4X 1, 3R/12, 4/4X, 4X	NA NA	A A	A A	A A	A A	A A	NA NA	NA NA	NA NA	NA NA
Surge suppression for 120 or 240V AC Coil		17	All listed	NA	A	A	A	A	A	NA	NA	NA	NA
Terminal blocks (Cat. No. 1492-CA1 or similar) per block		⌘	1, 3R/12, 4/4X, 4X	NA	A	A	A	A	A	A	NA	NA	NA
DC operation of control circuit (power circuit remains AC) Add letters "DC" to Bulletin No. (add per solenoid)		⌘	Open 1, 4/4X, 4X, 12	NA NA	A ⌘	A ⌘	A ⌘	A ⌘	A ⌘	NA NA	NA NA	NA NA	NA NA
Overload Relays (Eutectic Alloy)													
N.O. alarm contact adder (Bulletin 592)		9	All listed	NA	A	A	A	A	A	A	A	NA	NA
N.C. alarm contact adder (Bulletin 592)		9A	All listed	NA	A	A	A	A	A	A	A	NA	NA
Omit 3 overload relays (For Bulletins 505 and 520 only)		23 †	All listed	A	A	A	A	A	A	A	A	NA	NA
Auxiliary Relays (Indicate Contact Arrangement and Coil Voltage)													
3Ø Powermonitor (Timemark Model 258)		400	1, 3R/12, 4/4X, 4X	NA	A	A	A	A	A	NA	NA	NA	NA
Control relay (4-pole maximum)⌘		❖	1, 3R/12 4/4X, 4X Unilock§	NA NA NA	NA NA NA	A A A	A A A	A A A	A A A	NA NA NA	NA NA NA	NA NA NA	NA NA NA
	Addition of timing relay⌘	❖	1, 3R/12 4/4X, 4X Unilock§	NA NA	A NA	A A	A A	A A	A A	NA NA	NA NA	NA NA	NA NA
			❖	—	NA	NA	A	A	A	A	A	A	A
Add Bulletin 813S⌘ (Line voltage monitor) (Line current monitor)		❖ ❖	— —	NA NA	NA NA	A A	A A	A A	A A	A A	A A	A A	A A
Bulletin 596 (used on Bulletin 500...509, 3-pole maximum) (Coil - 180 s timing range)	ON Delay OFF Delay	87A 87B	Open Type Open Type	NA NA	A A	A A	A A	A A	A A	NA NA	NA NA	NA NA	NA NA
Extra strong coil for addition of power pole adders required for sizes 2...4		88	All listed	NA	NA	NA	A	A	A	NA	NA	NA	NA
Form A compelling relay▲ (used on Bulletin 520)		70	1, 3R/12, 4/4X, 4X	NA	A	A	A	A	A	A	NA	NA	NA
Form B auto. seq. accelerating relay for each higher speed -controls the sequence of acceleration from low to high speed. (Used on Bulletin 520)		71	1, 3R/12, 4/4X, 4X	NA	A	A	A	A	A	A	NA	NA	NA
Form C auto. seq. decelerating relay for each lower speed -interposes a time delay between each lower speed. (Used on Bulletin 520)		72	1, 3R/12, 4/4X, 4X	NA	A	A	A	A	A	A	NA	NA	NA
Enclosure													
Breather		136	Bolted‡	NA	A	A	A	A	A	NA	NA	NA	NA
Breather and drain		137	Unilock§ and Bolted‡	NA	A	A	A	A	A	NA	NA	NA	NA
Drain		138	Unilock§ and Bolted‡	NA	A	A	A	A	A	NA	NA	NA	NA
Protective Covers for Contactors and Starters		426	1, 3R/12, 4/4X, 4	NA	A	A	A	A	A	NA	NA	NA	NA

A = Available

NA = Not Available

STD = Standard

* If the transformer secondary is to be grounded, add the suffix letter **G** at no additional charge. Example: **6GP**.

‡ Bolted suitable for Type 7 & 9 or Type 3R, 7 & 9.

§ Unilock suitable for Type 7 & 9 or Type 3R, 7 & 9.

♣ Multiple auxiliary contacts are to be group coded: e.g. use 9 followed by second digit for each auxiliary used: 90-91-98 group coded to "9018". Maximum quantity of auxiliary contacts (any type) group coded shall be 5.

➤ For Bulletins 505 and 520 devices, one auxiliary contact is installed on each of the two contactors.

⌘ Order by description.

† Contactors provided on short mounting plate, please contact your local Rockwell Automation sales office or Allen-Bradley distributor for dimensions.

❖ Only one relay per starter.

▲ Through control wiring the starter is forced to operate in the low speed before switching to high speed.



Modifications — Factory Installed

NEMA Combination Contactors/Starters

For Use on Bulletins 502, 502L, 503, 503L, 506, 506X, 507, 507X, 512, 512H, 512M, 512V, 513, 513H, 513M, 513V, 522, 522E, 522F, 522G, 523, 523E, 523F, 523G, 530, 532, 533, 540, 542, 543, 570, 572, 573, 1242, 1243, 1272, 1273, 1232X, 1232V, 1233X, and 1233V

1

Description of Modification	Suffix No.	Enclosure Type	NEMA Size								
			0	1	2	3	4	5	6	7	
Pilot Devices in Cover or Flange											
START-STOP push button	1	1	A	A	A	A	A	A	NA	NA	
	1	3R/4/12, 4/4X	A	A	A	A	A	A	A	A	
	1	Bolted	A	A	A	A	A	A	NA	NA	
	1	Unilock	A	A	A	A	A	A	NA	NA	
ON-OFF push button	1E	1	A	A	A	A	A	A	NA	NA	
	1E	3R/4/12, 4/4X	A	A	A	A	A	A	A	A	
	1E	Bolted	A	A	A	A	A	A	NA	NA	
	1E	Unilock	A	A	A	A	A	A	NA	NA	
START-STOP illuminated push button	1L	1	A	A	A	A	A	A	NA	NA	
	1L	3R/4/12, 4/4X	A	A	A	A	A	A	NA	NA	
HAND-OFF-AUTO selector switch	3	1	A	A	A	A	A	A	NA	NA	
	3	3R/4/12, 4/4X	A	A	A	A	A	A	A	A	
	3	Bolted	A	A	A	A	A	A	NA	NA	
	3	Unilock	A	A	A	A	A	A	NA	NA	
OFF-ON selector switch	3E	1	A	A	A	A	A	A	NA	NA	
	3E	3R/4/12, 4/4X	A	A	A	A	A	A	A	A	
	3E	Bolted	A	A	A	A	A	A	NA	NA	
	3E	Unilock	A	A	A	A	A	A	NA	NA	
HAND-AUTO selector switch	3H	1	A	A	A	A	A	A	NA	NA	
	3H	3R/4/12, 4/4X	A	A	A	A	A	A	A	A	
	3H	Bolted	A	A	A	A	A	A	NA	NA	
	3H	Unilock	A	A	A	A	A	A	NA	NA	
PILOT LIGHT	Transformer Type — incandescent bulb	4*⊛	1, 3R/4/12, 4/4X, 3R	A	A	A	A	A	A	A	
		4*⊛	Bolted	A	A	A	A	A	A	NA	NA
		4*⊛	Unilock	A	A	A	A	A	A	NA	NA
	Transformer Type—LED bulb	4L*⊛	1, 3R/4/12, 4/4X, 3R	A	A	A	A	A	A	A	
PUSH-TO-TEST PILOT LIGHT	Transformer—incandescent bulb	5*⊛	1, 3R/4/12, 4/4X, 3R	A	A	A	A	A	A	A	
		5*⊛	Bolted	A	A	A	A	A	A	A	
		5L*⊛	1, 3R/4/12, 4/4X, 3R	A	A	A	A	A	A	A	
START-STOP push button and HAND-OFF-AUTO selector switch (unwired)		13	1	A	A	A	A	A	A	A	
		13	3R/4/12, 4/4X	A	A	A	A	A	A	A	
FOR-REV-STOP push button	Bulletin 506...507	1	1, 3R/4/12, 4/4X	A	A	A	A	A	A	NA	
	Bulletin 507	1	Bolted (7 & 9)	A	A	A	A	A	A	NA	
FOR-OFF-REV selector switch (Bulletin 506...507)		3	1, 3R/4X12, 4/4X, 3R	A	A	A	A	A	A	NA	
		3	Bolted	A	A	A	A	A	A	NA	
		3	Unilock	A	A	A	A	A	A	NA	
HAND-AUTO		3H	1	A	A	A	A	A	A	NA	
		3H	3R/4/12, 4/4X,	A	A	A	A	A	A	NA	
		3H	Bolted	A	A	A	A	A	A	NA	
		3H	Unilock	A	A	A	A	A	A	NA	
HIGH-LOW-STOP push button	Bulletin 522...523	1	1, 3R/4/12, 4/4X	A	A	A	A	A	A	NA	
	Bulletin 523	1	Bolted	A	A	A	A	A	A	NA	
HIGH-OFF-LOW selector switch	Bulletin 522...523	3	1, 3R/4/12, 4/4X	A	A	A	A	A	A	NA	
	Bulletin 523	3	Bolted	A	A	A	A	A	A	NA	
HIGH-LOW-OFF-AUTO selector switch		3J	1, 3R/4/12, 4/4X	A	A	A	A	A	A	NA	
PILOT LIGHT (2)	Transformer Type — Incandescent Bulb	4*⊕	1, 3R/4/12, 4/4X	A	A	A	A	A	A	NA	
	Transformer Type—LED Bulb	4L⊕	1, 3R/4/12, 4/4X	A	A	A	A	A	A	NA	
PUSH-TO-TEST PILOT LIGHT	Transformer— Incandescent Bulb	5*⊕	1, 3R/4/12, 4/4X	A	A	A	A	A	A	NA	
	Transformer—LED Bulb	5L*	1, 3R/4/12, 4/4X	A	A	A	A	A	A	NA	

A = Available

NA = Not Available

* "OFF" pilot lights for non-reversing and non-multi-speed applications require a normally closed auxiliary contact (-91).

⊛ The suffix number is incomplete. Specify the lens with the following letters: **A** = Amber; **B** = Blue; **C** = Clear; **G** = Green; **W** = White.

⊕ For multi-speed and reversing starters, one pilot light for each container. Add additional letter to identify two lens colors. The first letter specifies "FORWARD" or "HIGH", or "ON"; the second letter specifies "REVERSE" or "LOW", or "OFF"; e.g. **4AG**.



Modifications — Factory Installed

NEMA Combination Contactors/Starters

For Use on Bulletins 502, 502L, 503, 503L, 506, 506X, 507, 507X, 512, 512H, 512M, 512V, 513, 513H, 513M, 513V, 522, 522E, 522F, 522G, 523, 523E, 523F, 523G, 530, 532, 533, 540, 542, 543, 570, 572, 573, 1242, 1243, 1272, 1273, 1232X, 1232V, 1233X, and 1233V, Continued

Description of Modification	Suffix No.	Enclosure Type	NEMA Size									
			0	1	2	3	4	5	6	7		
Control Circuit Transformers Includes 2 Primary Fuses and 1 Secondary Fuse	With standard capacity, 60 or 50 Hz	6P	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	A	A	
	With standard capacity with fuse covers	6PC	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	A	A	
	With standard capacity, 60 or 50 Hz	6P	Bolted*	A	A	A	A	A	A	NA	NA	
	With standard capacity, 60 or 50 Hz	6P	Unilock*	A	A	A	A	A	A	NA	NA	
	With 100 W extra capacity, 60 or 50 Hz	6XP	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	A	A	
	With 100 W extra capacity with fuse covers	6XPC	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	A	A	
	With 100 W extra capacity, 60 or 50 Hz	6XP	Bolted*	A	A	A	A	A	A	NA	NA	
	With 100 W extra capacity, 60 or 50 Hz	6XP	Unilock*	A	A	A	A	A	A	NA	NA	
	With 200VA capacity	6XXP	1, 3R/4X/12, 4/4X, 3R	A	A	A	NA	NA	NA	NA	NA	
	With 200VA capacity with fuse covers	6XXPC	1, 3R/4X/12, 4/4X, 3R	A	A	A	NA	NA	NA	NA	NA	
	With 200 W extra capacity, 60 or 50 Hz	6YP	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	NA	NA	
	With 200 W extra capacity with fuse covers	6YPC	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	NA	NA	
With 300 W extra capacity, 60 or 50 Hz	6YYP	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	NA	NA		
With 300 W extra capacity with fuse covers	6YPC	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	NA	NA		
With 400 W extra capacity, 60 or 50 Hz	6YYP	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	NA	NA		
With 400 W extra capacity with fuse covers	6YYPC	1, 3R/4X/12, 4/4X, 4X	A	A	A	A	A	A	NA	NA		
Auxiliary Contacts	Auxiliary contact installed on contactors	N.O.	90†	1, 3R/4X/12, 4/4X	A	A	A	A	A	A	A	
		N.C.	91†	Bolted	A	A	A	A	A	A	NA	NA
	Auxiliary contact — contactor (four maximum)		97	1, 3R/4/12, 4/4X, 3R	A	A	A	A	A	A	NA	NA
	Auxiliary contact installed on disconnect	N.O.	98	1, 3R/4/12, 4/4X, 3R	A	A	A	A	A	A	A	A
		N.C.	99	1, 3R/4/12, 4/4X, 3R	A	A	A	A	A	A	A	A
	Auxiliary contact installed on circuit breaker (external to breaker) to operate with handle (two maximum)	N.O.	98	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	A	A
		N.O.	98	Bolted*	A	A	A	A	A	A	NA	NA
		N.O.	98	Unilock*	A	A	A	A	A	A	NA	NA
		N.C.	99	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	A	A
		N.C.	99	Bolted*	A	A	A	A	A	A	NA	NA
		N.C.	99	Unilock*	A	A	A	A	A	A	NA	NA
	Control Circuit	1 Fuse — Fuse Included	21	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	A	A
1 Fuse with Protective Cover — Fuse Included		21C	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	A	A	
2 Fuses — Fuses Included		22	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	A	A	
2 Fuse with Protective Cover — Fuse Included		22C	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	A	A	
Surge suppression for 120V or 240V AC Coil	17	1, 3R/4X/12, 4/4X, 3R Bolted* Unilock*	A	A	A	A	A	A	NA	NA		
Terminal blocks (Cat No. 1492-HC6)	6-Point Block	TB6	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	A		
Terminal blocks (Cat No. 1492-HC12)	12-Point Block	TB12	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	A		
Overload Relays (Eutectic Alloy)	N.O. alarm contact adder (Bulletin 592)	9	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	NA	NA	
	N.C. alarm contact adder (Bulletin 592)	9A	Bolted* Unilock*	A	A	A	A	A	A	NA	NA	
	Omit overload relays	For Bulletins 506, 506X, 507, 507X Deduct	23	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	NA	NA
		For Bulletins 522, 523 Deduct	23	Bolted* Unilock*	A	A	A	A	A	A	NA	NA
Accessories	3-phase Powermonitor (Timemark Model 258)	400		A	A	A	A	A	A	A	A	
	Bulletin 596 (used on Bulletin 500...509), 3-pole maximum	On Delay	87A	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	NA	NA
		Off Delay	87B	Bolted (3R, 7 & 9) Unilock (7 & 9)	a	A	A	A	A	A	NA	NA
	Form A compelling relay (used on Bulletin 522...523)	70	1, 3R/4/12, 4/4X	A	A	A	A	A	A	NA	NA	
Form B auto. seq. accelerating relay for each higher speed (used on Bulletin 522...523)	71	1, 3R/4/12, 4/4X	A	A	A	A	A	A	NA	NA		
Form C auto. seq. decelerating relay for each higher speed (used on Bulletin 522...523)	72	1, 3R/4/12, 4/4X	A	A	A	A	A	A	NA	NA		

A = Available

NA = Not Available

* Bolted suitable for Type 7 & 9 or Type 3R, 7 & 9.

* Unilock suitable for Type 7 & 9 or Type 3R, 7 & 9 with the addition of a drain or a breather and drain. White LED option not available, incandescent only.

† For Bulletins 506, 507, 522 and 523 devices. One auxiliary contact is installed on each of the two contactors.

Modifications — Factory Installed

NEMA Combination Contactors/Starters

For Use on Bulletins 502, 502L, 503, 503L, 506, 506X, 507, 507X, 512, 512H, 512M, 512V, 513, 513H, 513M, 513V, 522, 522E, 522F, 522G, 523, 523E, 523F, 523G, 530, 532, 533, 540, 542, 543, 570, 572, 573, 1242, 1243, 1272, 1273, 1232X, 1232V, 1233X, and 1233V, Continued

Description of Modification	Suffix No.	Enclosure Type	NEMA Size								
			0	1	2	3	4	5	6	7	
Circuit Breakers											
Marine Requirements	345	—	A	A	A	A	A	A	NA	NA	
Current Limiters Add the letter "C" to the instantaneous circuit breaker no. code.	C	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	NA	NA	
Thermal Magnetic Circuit Breakers Add the letter "T" to the circuit breaker no. code.	T	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	S	S	
Current Limiters Add the letter "D" to the inverse time circuit breaker no. code.	D	1, 3R/4X/12, 4/4X, 3R	A	A	A	A	A	A	NA	NA	
Accessories											
Enclosure											
Breather	136	Bolted*	A	A	A	A	A	A	NA	NA	
Breather and drain	137	Unilock and Bolted*⊛	A	A	A	A	A	A	NA	NA	
Drain	138	Bolted and Unilock*⊛	A	A	A	A	A	A	NA	NA	
Enclosure Door Viewing Window	203W	1, 3R/4/12, 3R	A	A	A	A	A	A	NA	NA	
Handles											
For Disconnect	412	Painted metal	A	A	A	A	A	S	S	S	
Switch or Circuit Breaker	413	Stainless steel	A	A	A	A	A	S	S	S	
	419	Molded plastic (deduct)	A	A	A	A	A	NA	NA	NA	
Fuse Cover Protective fuse cover for disconnect switch	414	1, 3R/4/12, 4/4X, 3R	A	A	A	A	A	A	NA	NA	
Control Relay (Plug-In)											
2-Pole	415	1, 3R/4/12, 4/4X, 3R	A	A	A	A	A	A	A	A	
3-Pole	416		A	A	A	A	A	A	A	A	
Timing Relay (Plug-In)											
On-Delay	417	1, 3R/4/12, 4/4X, 3R	A	A	A	A	A	A	A	A	
Off-Delay	418		A	A	A	A	A	A	A	A	
Electrical Interlock											
Early Break (1 N.O. and 1 N.C.)	420	1, 3R/4/12, 4/4X, 3R	A	A	A	A	A	A	NA	NA	
Early Break (2 N.O. and 2 N.C.)	421	1, 3R/4/12, 4/4X, 3R	A	A	A	A	A	A	NA	NA	
Bracket Mounting Feet for Pump Panels‡	424	3R	NA	A	A	A	A	A	NA	NA	
Elapsed Time Meter (ENM - Series T50)	425	3R	NA	A	A	A	A	A	A	A	
Protective Covers for Contactors and Starters	426	1, 3R/12, 4/4X, 4	NA	A	A	A	A	A	NA	NA	

A = Available

NA = Not Available

S = Standard

* Bolted suitable for Type 7 & 9 or Type 3R, 7, & 9.

⊛ Unilock suitable for Type 7 & 9 or Type 3R, 7, & 9 with the addition of a drain or a breather and drain.


‡ Pump panel comes standard with pole mounting bracket.

Accessories — Field Installed

NEMA Non-Combination Contactors/Starters and Combination Contactors/Starters




Contactor Accessories

For use on Bulletins 500, 500F, 500L, 500FL, 500LP, 502, 502L, 503, 503L, 505, 505V, 506, 506X, 507, 507X, 509, 512, 512H, 512M, 512V, 513, 513H, 513M, 513V, 520, 520V, 522, 523, 530, 532, 533, 540, 542, 543, 570, 572, 573, 1242, 1243, 1272, 1273, 1282, 1283, 1232X, 1233X, and 1233V

Description	NEMA Size	Cat. No.	
	0...1	Coils (60 Hz) 115...120V	CB-236
		200...208V	CB-249
		230...240V	CB-254
		460...480V	CB-273
		575...600V	CB-278
	2	115...120V	CC-236
		200...208V	CC-249
		230...240V	CC-254
		460...480V	CC-273
		575...600V	CC-278
	3	115...120V	CD-236
		200...208V	CD-249
		230...240V	CD-254
		460...480V	CD-273
		575...600V	CD-278
	4	115...120V	CE-236
		200...208V	CE-249
		230...240V	CE-254
		460...480V	CE-273
		575...600V	CE-278
5 (SER. L)	115...120V	AF-236	
	200...208V	AF-249	
	230...240V	AF-254	
5	460...480V	AF-273	
575...600V	AF-278		

Note: For complete listing of coils available, see page 1-157




Surge Suppressor — Made to be easily mounted directly across the coil terminals of contactors and starters with 120V or 240V AC coils. The purpose of the suppressor is to limit voltage transients for applications requiring interface with solid-state components. One suppressor is required per coil.


	RC Module AC Operating Mechanism 24...48V AC, 50/60 Hz	00*	100-FSC48
	110...280V AC, 50/60 Hz		100-FSC280
	380...480V AC, 50/60 Hz		100-FSC480
	Varistor Module AC/DC Operating Mechanism 12...55V AC/ 12...77V DC	00*	100-FSV55
	56...136V AC/ 78...180V DC		100-FSV136
	137...277V AC/ 181...350V DC		100-FSV277
	278...575V AC		100-FSV575
	12...120V AC		599-K04
	240...264V AC Varistor	0...5	599-KA04
	12...120V AC		199-FSMA1*
	12...120V AC Varistor		199-GSMA1‡
120V AC	7...8	700-N24	

Cat. No. 100-FSC280

Cat. No. 599-K04

* For non-combination starters only.
* For use on the interposing relay.
‡ For use on the contactor or starter.

Description	NEMA Size	Cat. No.	
	Line side terminal covers	0...1	599-TC01N
		2	599-TC2N
		3	599-TC3N
		4	599-TC4N
		5	599-TC5N
	Line side terminal covers (reversing)	0...1	599-TC01R
		0...2	599-TP02
	Tie Point Terminal	3...5	599-TP34

Description	For Use With	No. of Poles	NEMA Size	Cat. No.
	500/F/FL, 500L, 500LP, 505	3	0...1	599-PC01
				509, 505, 520E (2), 520F/G
	500L, 500LP	5	0...1	599-PC01-5 ‡
	520F/G	5	0...1	599-PS01-5 ➤
	500/F/FL, 500L, 500LP, 505	3	2	599-PC2
	509, 505, 520E (2), 520F/G			599-PS2 ➤
	500L, 500LP	5	2	599-PC2-5 ‡
	520F/G			599-PS2-5 ➤
	500/F/FL, 500L, 500LP, 505	3	3	599-PC3
	509, 505, 520E (2), 520F/G			599-PS3 ➤
	500L, 500LP	5	3	599-PC3-5 ‡
	520F/G			599-PS3-5 ➤
	500/F/FL, 500L, 500LP, 505	3	4	599-PC4
	509, 505, 520E (2), 520F/G			599-PS4 ➤
	500L, 500LP	5	4	599-PC4-5 ‡
	520F/G			599-PS4-5 ➤
	500/F/FL, 500L, 500LP	3	5	599-PC5
	509			599-PS5 ➤

‡ Used on 5-pole contactors and starters.
➤ Bul. 592 Eutectic alloy or solid-state overload relays.

Accessories — Field Installed

NEMA Non-Combination Contactors/Starters and Combination Contactors/Starters

Contactors Accessories, continued

For use on Bulletins 500, 500F, 500L, 500LP, 502, 502L, 503, 503L, 505, 505V, 506, 506X, 507, 507X, 509, 512, 512H, 512M, 512V, 513, 513H, 513M, 513V, 520, 520V, 522, 523, 530, 532, 533, 540, 542, 543, 570, 572, 573, 1242, 1243, 1272, 1273, 1282, 1283, 1232X, 1232V, 1233X and 1233V

1

Timer Attachment Kit — A pneumatic timer attachment may be field installed in the space of two adjacent auxiliary contact blocks. Timing units are available for either ON-Delay or OFF-Delay operation with a timed set of one (1) N.O. and one (1) N.C. snap-action contacts that are electrically isolated.

Repetitive accuracy within the timer range is approximately ±10% provided a minimum reset time of 75 ms is allowed.


Note:

- Sizes 0...5: Timers can be added to the left- or right-hand side of the contactor body. On Size 00 they can be mounted to the front of the contactor.
- Size 0, 1 and 2: Timers cannot be used on the same side as power pole adders.
- Size 2 Devices: The operating coil must be changed. See [T-1678929] and refer to the size 2 operating coil listing. Order the coil listed for a 4-...5-pole device.

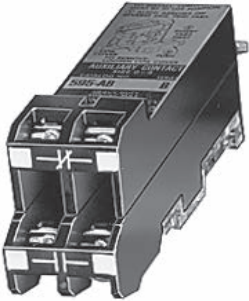
Note: These coils can also be factory installed.

- Enclosed Devices: Please contact your local Rockwell Automation sales office or Allen-Bradley distributor.

Contact Ratings: NEMA A600 (10 A, 600V AC max.)
NEMA P300 (5 A, 300V DC max.)

Description	NEMA Size	Cat. No.
 Cat No. 596-TR32	On-Delay	100-FPTA30
	On-Delay	100-FPTA180
	Off-Delay	100-FPTB30
	Off-Delay	100-FPTB180
Left-hand ON Delay	00§	596-TL32
		596-TL33
		596-TR32
		596-TR33
Left-hand OFF Delay	0...5	596-TL32
		596-TL33
		596-TR32
		596-TR33
Right-hand ON Delay	0...5	596-TR32
		596-TR33
Right-hand OFF Delay	0...5	596-TR33

§ For open type, non-combination starters only.

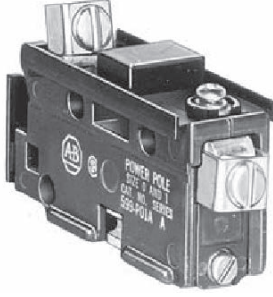
Description	NEMA Size	Cat. No.
 Auxiliary Contact — Contactors	1 N.O.	0...5 595-A
	2 N.O.	0...5 595-AA
	1 N.C.	0...5 595-B
	2 N.C.	0...5 595-BB
	1 N.O. and N.C.	0...5 595-AB
	1 N.C.L.B.	0...5 595-BL
	1 N.O.	6 195-GA10
	1 N.O.	7 ♣ 1495-J6
	2 N.O.	6 195-GA20
	2 N.O.	7...8 ♣ 1495-K6
	2 N.O.	9 ♣ 1495-K8
	1 N.C.	6 195-GB01
	1 N.C.	7...9 ♣ 1495-J6
	2 N.C.	6 195-GB02
	2 N.C.	7...8 ♣ 1495-K6
	2 N.C.	9 ♣ 1495-K8
1 N.O. and N.C.	6 195-GB11	
2 N.O.	7...8 ♣ 1495-K6	
2 N.O.	9 ♣ 1495-K8	
1 N.C.L.B.	6 195-GL01	

♣ The normally open contacts can easily be changed to normally closed in the field.

Power Pole Adders — The 1 N.O. and 1 N.C. power poles may be field added to all size 0...4 Bulletin 500 line contactors and starters except the Bulletin 500L and 500FL. Two- and three-pole contactors will accept a maximum of two adder poles and four-pole devices will accept one adder pole. Each adder pole kit includes a mechanical load balancer to be used when only one power pole is added.

Note: When power poles are added to Size 2, 3, or 4 (2- or 3-pole devices) the operating coil must be changed. Refer to the listing for the size of your contactor or starter. Order the operating coil listed for a 4-...5-pole device.


Note: These coils can also be factory installed.

Description	NEMA Size	Cat. No.
 Cat. No. 599-P01A (1 N.O.) Size 0...1, 27 Amps.	1 N.O.	599-P01A
	1 N.C.	599-P01B
	1 N.C. Late Break	599-P01BL
	1 N.O.	599-P2A
	1 N.C.	599-P2B
	1 N.C. Late Break	599-P2BL
1 N.O.	599-P3A	
1 N.C.	3	599-P3B
1 N.O.	4	599-P4A
1 N.C.	4	599-P4B

Contactors Kick-off Springs — For horizontal mounting of 2- or 3-pole Bulletin 500 contactors and starters.


Note: When kick-off springs are added to Size 2, 3 or 4, the operating coil must be changed. Refer to the listing for the size of your contactor or starter. Order the operating coil listed for a 4-pole device.

Note: These coils can also be factory installed.

Description	NEMA Size	Cat. No.
	0...1	599-N11
	2	599-N12
	3	599-N13
	4...5	599-N14


Wire Size	NEMA Size	Cat. No.
Lug Connectors (3 per package)		
#14...8 AWG Wire	0...1	*
#14...4 AWG Wire	2	1494R-N1
#8...1/0 AWG Wire	3	1494R-N2
#6...4/0 AWG Wire	4	1494R-N3
2 of #1/0...350 MCM Wire	5	42450-804-01

* All terminals of the 30 A switches are furnished with self-lifting pressure plate connectors as standard.

Description	NEMA Size	Cat. No.
 Terminal Lug Kit	6	199-LJ1
Terminal Lug Kit	7...8	199-LG1

Contactor Accessories, continued

For use on Bulletins 500, 500F, 500L, 500LP, 502, 502L, 503, 503L, 505, 505V, 506, 506X, 507, 507X, 509, 512, 512H, 512M, 512V, 513, 513H, 513M, 513V, 520, 520V, 522, 523, 530, 532, 533, 540, 542, 543, 570, 572, 573, 1242, 1243, 1272, 1273, 1282, 1283, 1232X, 1232V, 1233X and 1233V

Description	NEMA Size	Cat. No.
Auxiliary Contact Adder Decks — The same 2- and 4-pole auxiliary contact blocks in various combinations of normally open and normally closed will slide and snap on to the front of the contactor. Adder decks have convenient backed out wire clamps to make lugging of control wires unnecessary. Fits on Open Type devices only.		
 <p>4-pole</p>	2 N.O.	100-FA20
	1 N.O. -1 N.C.	100-FA11
	2 N.C.	100-FA02
	4 N.O.	100-FA40
	3 N.O.-1 N.C.	100-FA31
	2 N.O. -2 N.C.	100-FA22
	4 N.C.	100-FA04

24V DC Interface Module — Mounts to the top of the contactor. It provides a 24V DC, 0.5 w input signal that can be used to operate the 24...240V AC coil of the contactor. **Fits on Open Type devices only.**

	—	00	100-JE
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Latch Attachment — On the front of the contactor. **Fits on Open Type devices only.**

	—	00	100-FL11⊗
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Interposing Contactor — For open type Bulletin 500 and 500L.

120V, 60 Hz	6	500-NX100D
240V, 60 Hz	6	500-NX100A

Top Wiring Kit — Consists of (3) power lugs for the purpose of making extra connections to the load side of the contactor. A second set of overload relays can be wired to these lugs if two motors are being controlled by a single contactor.

 <p>Cat No. 599-TW01</p>	—	0...1	599-TW01
	—	2	599-TW2
	—	3	599-TW3
	—	4	599-TW4
	—	5	599-TW5P

⊗ Voltage Suffix Code

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

Example: 120V, 60 Hz: **Cat. No. 100-FL11**⊗ becomes **Cat. No. 100-FL11D**. For other voltages, please consult your local Rockwell Automation sales office or Allen-Bradley distributor.


[V]	24	48	100	110	120	230... 240	240	277	380... 400	400... 415	400	480
50 Hz	K	Y	KP	D	—	VA	T	—	N	G	B	—
60 Hz	J	—	—	—	D	—	A	T	—	—	N	B

‡ To complete cat. no., insert in the third position the desired numeric symbol (0...5) or one of the following letters — A, B, C, D, E, F, H, L, M, P, R, S, T, U, or W.

Accessories — Field Installed

NEMA Non-Combination Contactors/Starters and Combination Contactors/Starters

Contactor Accessories, continued

Description		Enclosure Type	NEMA Size	Cat. No.
	Adapter Plates — For replacement of: <ul style="list-style-type: none"> • Allen-Bradley (Bulletin 709 Series K) • Cutler Hammer (Citation & Freedom Series) • Furnas (Class 14 and ESP 100) • General Electric (Series 300) • Joslyn-Clark (Type HP) • Square D (Type S) • Westinghouse (A200 and W200 Advantage) 	1 (hinged), 3R, 3R/4/12, 4/4X (stainless)	0, 1	599-CP01
			2	599-CP2


For use on Bulletins 512V, 513V, 1232V, 1233V

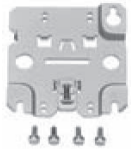
Contactors are supplied with one normally open and one normally closed auxiliary contact (A600 rating) as standard. Additional auxiliary contacts, two normally open and two normally closed, can be added in the field.

Description	Cat. No.
Auxiliary Contact (10 A @ 600V)	1195C-N3
Auxiliary Contact (10 mA @ 5V DC)	1195C-N4

Overload Accessories

For use on Bulletins 500, 500F, 500FL, 500L, 500LP, 502, 502L, 503, 503L, 505, 505V, 506, 506X, 507, 507X, 509, 512, 512H, 512M, 512V, 513, 513H, 513M, 513V, 520, 520V, 522, 523, 530, 532, 533, 540, 542, 543, 570, 572, 573, 1242, 1243, 1272, 1273, 1282, 1283, 1232X, 1232V, 1233X, and 1233V

Description	NEMA Size	Cat. No.	
 <p>Auxiliary Contact — For eutectic alloy overload relays only*</p> <p>Contact Ratings — NEMA A600 (10 A, 600V AC max.) NEMA P300 (5 A, 300V DC max.)</p>	Auxiliary Contact — For eutectic alloy overload relays only*		
	1 N.O.	00, 3-phase*	595-A00
	1 N.C.	00, 3-phase*	595-B00
	1 N.O.	0...2, 5...9	595-A02
	1 N.C.		595-B02
	1 N.O.	3...4	595-A34†
1 N.C.	595-B34§		

Description	Max. Continuous Current Rating [A]	Cat. No.
	DIN Rail Mounting Adapter for Bulletin 592 compact type 3-pole overload relays	40
	DIN Rail Mounting Adapter for Bulletin 592 compact type 1-pole overload relays	62

* Auxiliary contact for solid-state overload relays is included in the product.

‡ Non-combination starters only.

† Auxiliary contact mounted on right-hand side of overload relay provides N.O. contact function. Auxiliary contact mounted on left-hand side of overload relay provides N.C. contact function.

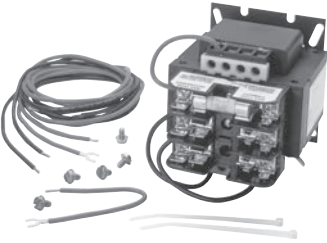
§ To be mounted on right-hand side of overload to provide additional AC contact function.

NEMA Non-Combination Contactors/Starters and Combination Contactors/Starters

Voltage Control Accessories

For use on Bulletins 500, 500F, 500L, 500LP, 502, 502L, 503, 503L, 505, 505V, 506, 506X, 507, 507X, 509, 512, 512H, 512M, 512V, 513, 513H, 513M, 513V, 520, 520V, 522, 523, 530, 532, 533, 540, 542, 543, 570, 572, 573, 1242, 1243, 1272, 1273, 1282, 1283, 1232X, 1232V, 1233X, and 1233V; **excluding Modular Kits**


Control Circuit Transformer with Top-Mounted Fuse Block Kits (pre-wired)*❖

	NEMA Size	Primary Voltage	Capacity – 120V Secondary Voltage									
			Standard		100 W Extra		200 W Extra		300 W Extra		400 W Extra	
			VA	Cat. No.	VA	Cat. No.	VA	Cat. No.	VA	Cat. No.	VA	Cat. No.
	0...2	208V	80	1497-N1PK	130	1497-N15PK	250	1497-N7PK	350	1497-N10PK	500	1497-N18PK
		240V & 480V		1497-N2PK		1497-N16PK		1497-N8PK		1497-N11PK		1497-N19PK
		600V		1497-N3PK		1497-N17PK		1497-N9PK		1497-N12PK		1497-N20PK
	3	208V	200	1497-N4PK	250	1497-N7PK	350	1497-N10PK	500	1497-N18PK	500	1497-N18PK
		240V & 480V		1497-N5PK		1497-N8PK		1497-N11PK		1497-N19PK		1497-N19PK
		600V		1497-N6PK		1497-N9PK		1497-N12PK		1497-N20PK		1497-N20PK
	4	208V	250	1497-N7PK	350	1497-N10PK	500	1497-N18PK	—	—	—	—
		240V & 480V		1497-N8PK		1497-N11PK		1497-N19PK		—		—
		600V		1497-N9PK		1497-N12PK		1497-N20PK		—		—
	5	208V	350	1497-N10PK	500	1497-N18PK	—	—	—	—	—	—
		240V & 480V		1497-N11PK		1497-N19PK		—		—		
		600V		1497-N12PK		1497-N20PK		—		—		
6	208V	500	1497-N18PK	—	—	—	—	—	—	—	—	
	240V & 480V		1497-N19PK		—		—					
	600V		1497-N20PK		—		—					

* Transformers for NEMA sizes 7...9 are included as standard.

❖ Type 4/4X non-metallic enclosures and Type 7 & 9 hazardous location enclosures require transformers with separately mounted fuse blocks. For a complete listing of transformers, see page 8-39.

Control Circuit Transformers with Top Mounted Fuse Blocks‡❖

	NEMA Size	Primary Voltage/ 3 Pole Fuse Block	Capacity – 120V Secondary Voltage	
			Standard	
			VA	Cat. No.
	0...2	208V	80	1497-B-HXDX-3-N
		240V & 480V		1497-B-BASX-3-N
		600V		1497-B-CXSX-3-N
	3	208V	200	1497-D-HXDX-3-N
		240V & 480V		1497-D-BASX-3-N
		600V		1497-D-CXSX-3-N
	4	208V	250	1497-E-HXDX-3-N
		240V & 480V		1497-E-BASX-3-N
		600V		1497-E-CXSX-3-N
	5	208V	350	1497-F-HXDX-3-N
		240V & 480V		1497-F-BASX-3-N
		600V		1497-F-CXSX-3-N

‡ Transformers can be installed in Type 1, 3R, 3R/4/12 painted enclosures and Type 4/4X stainless steel enclosures.

❖ Type 4/4X non-metallic enclosures and Type 7 & 9 hazardous location enclosures require transformers with separately mounted fuse blocks. For a complete listing of transformers, see page 8-39.

Accessories — Field Installed

NEMA Non-Combination Contactors/Starters and Combination Contactors/Starters

Voltage Control Accessories, continued

For use on Bulletins 500, 500F, 500L, 500LP, 502, 502L, 503, 503L, 505, 505V, 506, 506X, 507, 507X, 509, 512, 512H, 512M, 512V, 513, 513H, 513M, 513V, 520, 520V, 522, 523, 530, 532, 533, 540, 542, 543, 570, 572, 573, 1242, 1243, 1272, 1273, 1282, 1283, 1232X, 1232V, 1232X, and 1233V; **excluding Modular Kits**

For Use When Fuse Block Is Not Integrated with the Transformers

1



Cat. No. 1491-R165
1-Pole Fuse Block



Cat. No. 1491-R167
2-Pole Fuse Block



Cat. No. 1491-R171
3-Pole Fuse Block



Cat. No. 1491-R169
3-Pole Fuse Block



Cat. No. 1491-R150
Fuse Cover without Fuse*

These control circuit fusing kits are intended to be used for control circuit transformer protection and protection of control circuits capable of delivering no more than 200 000 RMS symmetrical amperes, 600V maximum. (Fuses not included.)

Description*	Cat. No.
One-pole kit — panel-mounted (midget fuse)*	1491-R165
Control Circuit Fuse Block For Class CC rejection type fuses (fuses not included)*	1491-R162
Two-pole kit — panel-mounted (two midget fuses)*	1491-R167
Three-pole kit — panel-mounted (one midget fuse/two Class CC fuses)*	1491-R169
Three-pole kit — panel-mounted (three Class CC fuses)	1491-R171
Single-pole kit — Bulletin 500 line controller mounted (Class CC fuses)†	599-FR04
One-pole kit — panel-mounted (31...60 A Class J fuse)	1491-R173
One-pole kit — panel-mounted (61...100 A Class J fuse)	1491-R175


* For control circuit transformers with a 350 VA or larger rating, it is recommended that Bussmann Type FNQ-R, Ferraz-Shawmut Type ATDR, Littelfuse Type KLDR time delay fuses, or equivalent be used for primary fusing.

* These kits use only Class CC or midget fuses (rated 0.5...30 A) such as those offered by the following manufacturers:

- Bussmann KTK-R
- Ferraz-Shawmut ATM R
- Littelfuse KLK

† **Cat. No. 599-FR04** is rated for 6 A fuse maximum. Controller mounting applies to size 0...5 devices only.

* One cover per pole is required. Example: transformer with top-mounted fuse block requires three covers. Fuse block kit for separate control requires two covers. Fuses not included.




Description	NEMA Size	Cat. No.
 <p>Single-pole kit — Bulletin 500 line controller mounted (Class CC fuses)</p>	0...5	599-FR04

Note: One cover per pole is required. Example: transformer with top-mounted fuse block requires three covers. Fuse block kit for separate control requires two covers.

NEMA Non-Combination Contactors/Starters and Combination Contactors/Starters

Disconnect Switch Accessories

For use on Bulletins 502, 502L, 506, 506X, 512, 512H, 512M, 512V, 522, 532, 542, 572, 1242, 1272, 1282, 1232X, and 1232V

	Description	NEMA Size	Cat. No.
	Fuse Clips		
	0...30 A, 250V AC, Class H	0...2	1401-N41
	0...30 A, 250V AC, Class J 0...30 A, 600V AC, Class H 0...30 A, 600V AC, Class J 31...60 A, 250V AC, Class H	1...3	1401-N42
	31...60 A, 250V AC, Class J 31...60 A, 600V AC, Class H 31...60 A, 600V AC, Class J	1...3	1401-N43
	61...100 A, 250V AC, Class H 61...100 A, 250V AC, Class J 61...100 A, 600V AC, Class H 61...100 A, 600V AC, Class J	2...4	1401-N44
	101...200 A, 250V AC, Class H 101...200 A, 250V AC, Class J 101...200 A, 600V AC, Class H 101...200 A, 600V AC, Class J	3...5	1401-N45
	201...400 A, 250V AC, Class H 201...400 A, 250V AC, Class J 201...400 A, 600V AC, Class H 201...400 A, 600V AC, Class J	4...5	1401-N46
	0...30 A, 250V AC, Class R 0...30 A, 600V AC, Class R 31...60 A, 250V AC, Class R	0...2*	1401-N50
			1401-N51
	31...60 A, 600V AC, Class R	1...3	1401-N52
	61...100 A, 250V AC, Class R 61...100 A, 600V AC, Class R	2...4	1401-N53
	101...200 A, 250V AC, Class R 101...200 A, 600V AC, Class R	3...5	1401-N54
	201...400 A, 250V AC, Class R 201...400 A, 600V AC, Class R	5...6	1401-N55
	0...30 A, 250V AC HRC Form II Fusing* 0...30 A, 600V AC HRC Form II Fusing* 31...60 A, 250V AC HRC Form II Fusing* 31...60 A, 600V AC HRC Form II Fusing*	0...2* 1...3	⌘
	Auxiliary Contacts for Disconnect Switches 1 N.O.	0...5	1495-N8
	1 N.C.	0...5	1495-N9

* HRC Form II fusing for Canada only.

* For 0...30 A only.

⌘ Fuse clip not required. Fuse bolts directly to switch and trailer fuse block.

Accessories — Field Installed

NEMA Non-Combination Contactors/Starters and Combination Contactors/Starters

Disconnect Switch Accessories, continued

For use on Bulletins 502, 502L, 506, 506X, 512, 512H, 512M, 512V, 522, 532, 542, 572, 1242, 1272, 1282, 1232X, and 1232V

1



Cat. No. 1494R-N3

Description		For Use With	Cat. No.
Lug Connectors (3 per package)			
Disconnect Size [A]	Wire Size	1494C, 1494F, 1494G, and 1494V Disconnect Switches	
30	#14...8 AWG Wire		*
60	#14...4 AWG Wire		§ 1494R-N1
100	#8...1/0 AWG Wire		§ 1494R-N2
200	#6...4/0 AWG Wire		§ 1494R-N3
400	#6...250 MCM AWG 16 mm ² ...120 mm ²		1494R-N14
400	#4 AWG...500 MCM Wire (oversized)		1494R-N15
600	(2) of #1/0...350 MCM Wire		§ 1494R-N10
600	(2) of #1/0...350 MCM Wire	1491-N621 or 1491-R621 600 A fuse blocks	♣ 1494R-N11



Protective Fuse Covers				
Switch Rating [A]	Fuse Class	Fuse Clip Rating [A]		Cat. No.
		250V	600V	
30	Non-fusible	—	—	1495-N64
30	H, R	30	—	
60	H, R	60	—	
30	J	30	30	
60	J	60	60	
60	Non-fusible	—	—	
100	Non-fusible	—	—	
30	H, R	—	30	1495-N65
60	H, R	—	60	
100	J	100	100	
100	H, R	100	100	1495-N66
	J	200	200	
200	Non-fusible	—	—	♢ 1495-N67
200	H, J, R	200	200	
	J	400	400	
200	Non-fusible	—	—	♢ 1495-N62
200	H, J, R	200	200	
400	Non-fusible	—	—	♢ 1495-N68
400	H, J, R	400	400	
400	Non-fusible	—	—	♢ 1495-N63
400	H, J, R	400	400	
600	Non-fusible	—	—	♢ 1495-N61
	J	600	600	

* All terminals of the 30 A switches are furnished with self-lifting pressure plate connectors (N56, N57, and N58) as standard.

§ Each kit contains three lugs.

♣ Each kits contains two lugs.

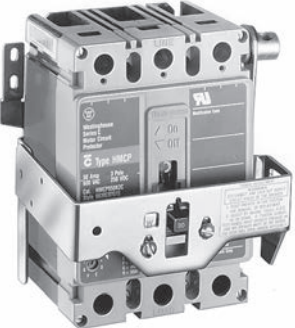


♢ Switch with right-hand mechanism.

♢ Switch with left-hand mechanism.



Circuit Breaker Accessories

For use on Bulletins 503, 503L, 507, 507X, 513, 513H, 513M, 513V, 523, 533, 543, 573, 1243, 1273, 1283, 1233X, and 1233V

	Description	NEMA Size	Cat. No.	
	Circuit Breaker Kits			
	3 A, 0...1/3 Hp @ 200 and 230V 3 A, 0...1 Hp @ 460 and 575V	0...1	1401-N60	
	7 A, 0.5...1 Hp @ 200 and 230V 7 A, 1.5...3 Hp @ 460 and 575V	0...1	1401-N61	
	15 A, 1.5...3 Hp @ 200 and 230V 15 A, 5...7.5 Hp @ 460 and 575V	0...1	1401-N62	
	30 A, 5 Hp @ 200V 30 A, 5...7.5 Hp @ 230V 30 A, 10...15 Hp @ 460 and 575V	1...2	1401-N63	
	50 A, 5...10 Hp @ 200V 50 A, 10 Hp @ 230V 50 A, 20...25 Hp @ 460V 50 A, 20...30 Hp @ 575V	1...3	1401-N64	
	100 A, 15...25 Hp @ 200 and 230V 100 A, 30...50 Hp @ 460V 100 A, 40...50 Hp @ 575V	2...4	1401-N65	
	150 A, 30 Hp @ 200V 150 A, 30...40 Hp @ 230V 150 A, 60...75 Hp @ 460V 150 A, 75...100 Hp @ 575 V	3...4	1401-N66	
	250 A, 125 Hp @ 575V	5	1401-N68	
	250 A, 50...60 Hp @ 200V 250 A, 60...75 Hp @ 230V		1401-N69	
		Auxiliary Contacts for Disconnect Switches		
		One normally open (1 N.O.) Adapter kit may be required. * Bolted — One normally open (1 N.O.)* Unilock — One normally open (1 N.O.)*	0...5‡ 4...5§	1495-N8
One normally closed (1 N.C.) Adapter kit may be required.* Bolted — One normally closed (1 N.C.)* Unilock — One normally closed (1 N.C.)*	0...5	1495-N9		
	Unilock — One normally open (1 N.O.)*	0...2	1495-N14	
	Unilock — One normally closed (1 N.C.)*	0...2	1495-N15	
	HMCP Circuit Breaker Adapter Kits (for mounting 1 or 2 auxiliary contacts)	5	1495-N16	
	400 A Frame*			
	150 A Frame	3...4	1495-N21	
	250 A Frame - Enclosure Type 1, 3R/4/12, 3R and 4/4X (stainless steel)	4...5♣	1495-N22	
	250 A Frame - Enclosure Type 7 & 9 (bolted & Unilock) and 4/4X (non-metallic)	0...5➤		
	250 A Frame - Enclosure Type 1, 3R/4/12, 3R, and 4/4X (stainless steel)	4	1495-N23	
Unilock — 150 A Frame*	3...4	1495-N21		
Unilock — 250 A Frame*	4...5	1495-N22		

* Contact Ratings — NEMA B600 and NEMA P600.

* Not available on larger sizes 6...9.

‡ For Bolted and 1 N.O.

§ For Unilock 1 N.C.

♣ For Enclosure Type 1.

➤ For Enclosure Types 7 & 9.





Accessories — Field Installed

NEMA Non-Combination Contactors/Starters and Combination Contactors/Starters

Pilot Device Accessories

For use on Bulletins 500, 500F, 500L, 500LP, 502, 502L, 503, 503L, 505, 505V, 506, 506X, 507, 507X, 509, 512, 512H, 512M, 512V, 513, 513H, 513M, 513V, 520, 520V, 522, 523, 530, 532, 533, 540, 542, 543, 570, 572, 573, 1242, 1243, 1272, 1273, 1282, 1283, 1232X, 1232V, 1233X, and 1233V

1



Description	Enclosure Type	NEMA Size	Cat. No.		
Selector Switch Kits					
	OFF-ON/HAND-OFF-AUTO*❖	1 (Lift-off)	00...2		
			599-SSL		
			599-SS2L		
	HAND-OFF-AUTO	1, 3R/4/12	0...5	599-SS09HJ	
		4, 4X (stainless steel and non-metallic)		599-SS09HS	
	OFF-ON	1, 3R/4/12		599-SS09OJ	
		4, 4X (stainless steel and non-metallic)		599-SS09OS	
	FOR-OFF-REV	1, 3R/4/12		599-SS09RJ	
		4, 4X (stainless steel and non-metallic)		599-SS09RS	
	TEST-OFF-AUTO (spring return from TEST)	1, 3R/4/12		599-SS09TJ	
		4, 4X (stainless steel and non-metallic)		599-SS09TS	
	FOR-OFF-REV (Unilock)	3R, 7 & 9		0...2	1481-N48
	OFF-ON (Unilock)			1481-N54	
	HAND-OFF-AUTO (Unilock)		1481-N55		
OFF-ON (Unilock)	1481-N59				
HAND-OFF-AUTO (Unilock)	3...5		1481-N60		
FOR-OFF-REV (Unilock)	1481-N62				
Push Button Kits					
	START-STOP*❖	1 (Lift-off)	00...2		
			599-PBL		
	START-STOP	1, 3R/4/12	0...5	599-PB09SJ	
		4, 4X (stainless steel and non-metallic)		599-PB09SS	
	FOR-REV-STOP	1, 3R/4/12		599-PB09RJ	
		4, 4X (stainless steel and non-metallic)		599-PB09RS	
	HIGH-LOW-STOP	1, 3R/4/12		599-PB09WJ	
		4, 4X (stainless steel and non-metallic)		599-PB09WS	
	START-STOP (Unilock)	7 & 9	0...2	1481-N53	
			3...5	1481-N58	
	START-STOP (bolted)		0...9	Use 800H-DPH16AAXX64	

* Must order mounting bracket (Cat. No. **599-BRL**) separately.

❖ For Type 1, lift-off, non-combination starters only (Bulletins 500, 500L, 505, and 509).

Pilot Device Accessories, continued

For use on Bulletins 500, 500F, 500L, 500LP, 502, 502L, 503, 503L, 505, 505V, 506, 506X, 507, 507X, 509, 512, 512H, 512M, 512V, 513, 513H, 513M, 513V, 520, 520V, 522, 523, 530, 532, 533, 540, 542, 543, 570, 572, 573, 1242, 1243, 1272, 1273, 1282, 1283, 1232X, 1232V, 1233X, and 1233V

Description	Enclosure Type	NEMA Size	Cat. No.	
	Pilot Light Kits ‡ 120V	1, 3R/4/12	599-PL09DJ	
	120V	4, 4X (stainless steel and non-metallic)	599-PL09DS	
	240V	1, 3R/4/12	599-PL09AJ	
	240V	4, 4X (stainless steel and non-metallic)	599-PL09AS	
	480V	1, 3R/4/12	599-PL09BJ	
	480V	4, 4X (stainless steel and non-metallic)	599-PL09BS	
	600V	1, 3R/4/12	599-PL09CJ	
	600V	4, 4X (stainless steel and non-metallic)	599-PL09CS	
	ON*‡♣	120V AC	1 (lift-off)	599-PLLD
		240V AC		599-PLLA
	Optional Pilot Light Lens Covers	All	0...5	800T-N26R
	Red			800T-N26G
	Green			800T-N26A
	Amber			800T-N26B
	Blue			800T-N26C
Clear	800T-N26W			
White				
ON (Unilock 120V) — Red*§	3R, 7 & 9 (Unilock)	0...5	1481-N56A120R	
ON (Unilock 120V) — Green*§			1481-N56A120G	
	Push-to-Test Pilot Light Kits ‡ 120V	1, 3R/4/12	599-PT09DJ	
	120V	4, 4X (stainless steel and non-metallic)	599-PT09DS	
	240V	1, 3R/4/12	599-PT09AJ	
	240V	4, 4X (stainless steel and non-metallic)	599-PT09AS	
	480V	1, 3R/4/12	599-PT09BJ	
	480V	4, 4X (stainless steel and non-metallic)	599-PT09BS	
	600V	1, 3R/4/12	599-PT09CJ	
	600V	4, 4X (stainless steel and non-metallic)	599-PT09CS	
	Optional Push-to-Test Pilot Light Lens Covers	All	0...5	800T-N40
	Red			800T-N41
	Green			800T-N42
	Amber			800T-N43
	Blue			800T-N45
	Clear			800T-N44
	White			
Mounting bracket*‡	All lift-off pilot devices, Type 1	00...2	599-BRL	

* Must order mounting bracket (Cat. No. 599-BRL) separately.

‡ For Type 1, lift-off, non-combination starters only (Bulletins 500, 500L, 505, and 509).

‡ Pilot light kits and push-to-test pilot light kits include one green and one red cover as standard.

§ An adapter (Cat. No. 1481-N61) is required for each pilot light added to Size 3, 4, and 5 Unilock enclosures.

♣ Supplied with red lens only.

Note: Bulletins 505 and 520 with two pilot lights are supplied in hinged enclosures, with or without control circuit transformers.


Accessories — Field Installed

NEMA Non-Combination Contactors/Starters and Combination Contactors/Starters

Pilot Device Accessories, continued

For use on Bulletins 500, 500F, 500L, 500LP, 502, 502L, 503, 503L, 505, 505V, 506, 506X, 507, 507X, 509, 512, 512H, 512M, 512V, 513, 513H, 513M, 513V, 520, 520V, 522, 523, 530, 532, 533, 540, 542, 543, 570, 572, 573, 1242, 1243, 1272, 1273, 1282, 1283, 1232X, 1232V, 1233X, and 1233V

1

Description	Enclosure Type	NEMA Size	Cat. No.	
ON * (Unilock) — Red Lens (120V)	3R, 7 & 9 (Unilock)	0...5	1481-N56A120R	
ON * (Unilock) — Green Lens (120V)			1481-N56A120G	
Transformers for pilot lights 240V, 60 Hz and 220V, 50 Hz*		00...5	1481-NX1	
480V, 60 Hz and 440V, 50 Hz			1481-NX2	
600V, 60 Hz and 550V, 50 Hz			1481-NX3	
 Replacement Bulbs for all Pilot Lights 120V coil voltage - incandescent Amber, green, red, or blue lens color		—	—	800T-N169
	120V coil voltage - LED Amber lens color	—	—	800T-N320A
	Green lens color	—	—	800T-N320G
	Red lens color	—	—	800T-N320R
	Blue lens color	—	—	800T-N320B
	240/480/600V coil voltage - incandescent Amber, green, red, or blue lens color	—	—	800T-N65
	240/480/600V coil voltage - LED Amber lens color	—	—	800T-N318A
	Green lens color	—	—	800T-N318G
	Red lens color	—	—	800T-N318R
	Blue lens color	—	—	800T-N318B
	Additional Pilot Devices Additional pilot devices	1, 3R/4/12	0...9	Use Bulletin 800T devices (See page 10-2)
	Additional pilot devices	4/4X, 4X	0...9	Use Bulletin 800H Type 4X devices (See page 10-2)
Additional pilot devices (bolted)	3R, 7 & 9	0...9	Use Bulletin 800H Type 7 & 9 devices (See page 10-152)	





* When the control voltage is other than 120V, 60 Hz or 110V, 50 Hz it is necessary to also use one of the following transformers.

* An adaptor (**Cat. No. 1481-N61**) is required for each pilot light added to size 3, 4, and 5 Unilock enclosures.

NEMA Non-Combination Contactors/Starters and Combination Contactors/Starters

Enclosure Accessories

For use on Bulletins 500, 500F, 500L, 500LP, 502, 502L, 503, 503L, 505, 505V, 506, 506X, 507, 507X, 509, 512, 512H, 512M, 512V, 513, 513H, 513M, 513V, 520, 520V, 522, 523, 530, 532, 533, 540, 542, 543, 570, 572, 573, 1242, 1243, 1272, 1273, 1282, 1283, 1232X, 1232V, 1233X, and 1233V

Description	Enclosure Type	NEMA Size	Cat. No.		
 <p>Non-metallic Conduit Connectors 1/2 in. (12.7 mm) 3/4 in. (19 mm) 1 in. (24.5 mm) 1-1/4 in. (31.75 mm) 1-1/2 in. (38.1 mm) 2 in. (50.8 mm) 2-1/2 in. (63.5 mm) 3 in. (76.2 mm)</p>	4, 4X (stainless steel and non-metallic)	0...1	1490-N1		
			1490-N9		
			1490-N10		
				2	1490-N11
				3	1490-N5
				4	1490-N6
					1490-N7
				5	1490-N8
 <p>Grounding Adapters 1/2 in. (12.7 mm), #14...10 AWG 3/4 in. (19 mm), #14...8 AWG 1 in. (24.5 mm), #14...8 AWG 1-1/4 in. (31.75 mm), #14...4 AWG 1-1/2 in. (38.1 mm), #8...1/0 AWG 2 in. (50.8 mm), #8...1/0 AWG 2-1/2 in. (63.5 mm), #6...2/0 AWG 3 in. (76.2 mm), #6...4/0 AWG</p>	4, 4X (stainless steel and non-metallic)*	0...1	1490-N19		
			1490-N20		
			1490-N21		
				2	1490-N22
				3	1490-N23
				4	1490-N24
					1490-N25
				5	1490-N26
 <p>Handle Kits with Universal Link for Switch and Breaker Painted Metal 5-1/2 in. base Painted Metal 7-1/2 in. base Stainless Steel 5-1/2 in. base Stainless Steel 7-1/2 in. base Nonmetallic Handle 5-1/2 in. base</p>	1, 3R, 3R/4/12*	0...4	1494F-M1		
			1494F-M2		
	4/4X (stainless steel)	0...4	1494F-S1		
			1494F-S2		
	Nonmetallic Handle 5-1/2 in. base	1, 3R, 3R/4/12, 4/4X (non-metallic)	0...4	1494F-P1	
	 <p>Hole Plugs 30.5 mm hole plug for pilot devices 19.5 mm hole plug for resets and door safety hardware</p>	All	0...5	800T-N1	
598-N1					

* For combination starters only.

* Bulletin 1490 grounding adapters are available for use with these conduit hubs. These bushings provide a convenient method of connecting a ground wire to the conduit system. See conduit connector (hub) above proper size.


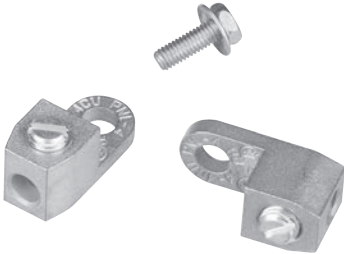
Accessories — Field Installed

NEMA Non-Combination Contactors/Starters and Combination Contactors/Starters

For use on Bulletins 500, 500F, 500L, 500LP, 502, 502L, 503, 503L, 505, 505V, 506, 506X, 507, 507X, 509, 512, 512M, 512V, 513, 513M, 513V, 520, 520V, 522, 523, 530, 532, 533, 540, 542, 543, 570, 572, 573, 1242, 1243, 1272, 1273, 1282, 1283, 1232X, 1232V, 1233X, and 1233V

Enclosure Accessories, continued

1

Description	Enclosure Type	NEMA Size	Cat. No.	
 <p>Door Safety Hardware Kits Enclosure Size (H x W x D) 27 x 10 x 8.2 in.</p>	3R/4/12*	0...2	1494F-V1	
		30 x 20 x 9.7 in.	0...4	1494F-V2
		50 x 22 x 11.1 in.	3...4	1494F-V3
		56 x 30 x 14 in.	5	1494F-V4
<p>Breather Bulletin 505, 507, 509, and 513 — Unilock and bolted Class I, Groups C and D Class II, Groups E, F and G♣‡</p> <p>Drain Bulletin 505, 507, 509, and 513 — Unilock and bolted Class I, Groups C and D Class II, Groups E, F and G♣‡</p> <p>Breather Drain Combination§ Bulletin 505, 507, 509, and 513 — Unilock and bolted Class I, Groups C and D Class II, Groups E, F and G♣‡</p>		0...5	1401-N1	
			1401-N2	
			1401-N3	
 <p>Ground Lug Kits</p>		0...2	599-GR1	
		3...5	599-GR2	
		6...7	599-GR3	

Description of Accessory Kit	Size 0...2	Size 3	Size 4	Size 5	Size 6...9
	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Reset Buttons (Each Kit Contains One Reset)					
Type 1, 3R/12 Bulletin 506...507 — One Kit Required Per Starter Bulletin 512...513 — One Kit Required Per Starter Bulletin 522...523 — Two Kits Required Per Starter	1493-N21	1493-N21	1493-N31*‡	— 1493-N21 ▶	—
Type 4/4X	—	—	1493-N32	—	—
Pneumatic Timer Mounting Plate Adapter (For Mtg. Bulletin 849A Timer) Bulletin 509 and 513 — Unilock♣	1401-N4	—	—	—	—

* Converts combination starter enclosure **F** to enclosure code **D** or **J** with door safety hardware.

‡ Standard on bolted Type 3R, 7 & 9.

§ The breather-drain combination can be in enclosure top as a breather or bottom as a drain. Specify (2) when both functions are required.

♣ Unilock suitable for Types 7 & 9 or Types 3R, 7 & 9 with the addition of a drain or a breather and drain.






▶ For Bulletins 512...513 only.

*‡Also use for NEMA sizes 0...2 lift-off enclosure.



System Accessories

For use on Bulletins 500, 500F, 500L, 500LP, 502, 502L, 503, 503L, 505, 505V, 506, 506X, 507, 507X, 509, 512, 512H, 512M, 512V, 513, 513H, 513M, 513V, 520, 520V, 522, 523, 530, 532, 533, 540, 542, 543, 570, 572, 573, 1242, 1243, 1272, 1273, 1282, 1283, 1232X, 1232V, 1233X, and 1233V

Description	Enclosure Type	NEMA Size	Cat. No.	
 <p>Power Monitor Kit*❖ 3-phase, 240V AC — (Time Mark Model A258)</p>	1 (hinged), 3R, 3R/4/12, 4/4X (stainless)	0...7	599-PM1	
			3-phase, 480V AC — (Time Mark Model A258B)	599-PM2
 <p>Terminal Block* Panel Mount (6 point)‡</p>	1 (hinged), 3R, 3R/4/12, 4/4X (stainless)	0...7	1492-HC6	
 <p>Timing Relays* 120V AC, ON-Delay — 8-pin socket (Cat. No. 700-HN125) required 0.1...10 s</p>	1 (hinged), 3R, 3R/4/12, 4/4X (stainless)	0...7	700-HT12AU120	
			120V AC, ON-Delay — 8-pin socket (Cat. No. 700-HN125) required 1.0...180 s	700-HT12BU120
	120V AC, OFF-Delay — 11-pin socket (Cat. No. 700-HN126) required 0.1...10 s	1 (hinged), 3R, 3R/4/12, 4/4X (stainless)	0...7	700-HT22AU120
	120V AC, OFF-Delay — 11-pin socket (Cat. No. 700-HN126) required 1.0...180 s	1 (hinged), 3R, 3R/4/12, 4/4X (stainless)	0...7	700-HT22BU120
 <p>Control Relays* DPDT 2-pole 2 Form C Single AgNi Contact</p>	1 (hinged), 3R, 3R/4/12, 4/4X (stainless)	0...7	700-HA32A1	
	3PDT 3-pole 3 Form C Single AgNi Contact	1 (hinged), 3R, 3R/4/12, 4/4X (stainless)	0...7	700-HA33A1
 <p>Relay Sockets* 8-pin socket</p>	1 (hinged), 3R, 3R/4/12, 4/4X (stainless)	0...7	700-HN125	
		11-pin socket	0...7	700-HN126

* For combination starters only.

❖ 3-phase power monitor kit includes the time mark phase monitor and socket.

‡ Up to two 6-point terminal blocks may be added to each combination starter.

NEMA Specifications

NEMA Non-Combination and Combination Contactors/Starters

Electrical Ratings

NEMA Size	Load Voltage [V]	Continuous Current Rating [A]	Service Limit Current Rating [A]*	Maximum Hp Rating (Non-plugging and non-jogging duty)		Maximum Hp Rating (Plugging and jogging duty)*		Transformer Primary Switching kVa Rating (Inrush Current ≤ 20 times Continuous Current)		Transformer Primary Switching kVa Rating (Inrush Current = 20 to 40 times Continuous Current)		Capacitor Switching kVAR‡	Maximum Circuit Closing Inrush Current [A] Peak Including Offset
				1Ø	3Ø	1Ø	3Ø	1Ø	3Ø	1Ø	3Ø		
				1Ø	3Ø	1Ø	3Ø	1Ø	3Ø	1Ø	3Ø		
00	115	9	11	1/3	—	1/4	—	—	—	—	—	—	87
	200			—	1-1/2	—	1	—	—	—	—	—	
	230			1	1-1/2	1/2	1	—	—	—	—	—	
	380			—	1-1/2	—	1	—	—	—	—	—	
	460			—	2	—	1-1/2	—	—	—	—	—	
575	—	2	—	1-1/2	—	—	—	—	—	—			
0	115	18	21	1	—	1/2	—	0.6	—	0.3	—	—	140
	200			—	3	—	1-1/2	—	1.8	—	0.9	—	
	230			2	3	1	1-1/2	1.2	2.1	0.6	1	—	
	380			—	5	—	1-1/2	—	—	—	—	—	
	460			—	5	—	2	2.4	4.2	1.2	2.1	—	
575	—	5	—	2	3	5.2	1.5	2.6	—	—			
1	115	27	32	2	—	1	—	1.2	—	0.6	—	—	288
	200			—	7-1/2	—	3	—	3.6	—	1.8	—	
	230			3	7-1/2	2	3	2.4	4.3	1.2	2.1	6	
	380			—	10	—	5	—	—	—	—	—	
	460			—	10	—	5	4.9	8.5	2.5	4.3	13.5	
575	—	10	—	5	6.2	11	3.1	5.3	17	—			
1P	115	36	42	3	—	1-1/2	—	—	—	—	—	—	—
	230			5	—	3	—	—	—	—	—	—	—
2	115	45	52	3	—	2	—	2.1	—	1	—	—	483
	200			—	10	—	7-1/2	—	6.3	—	3.1	—	
	230			7-1/2	15	5	10	4.1	7.2	2.1	3.6	12	
	380			—	25	—	15	—	—	—	—	—	
	460			—	25	—	15	8.3	14	4.2	7.2	25	
575	—	25	—	15	10	18	5.2	8.9	31	—			
3	115	90	104	7-1/2	—	7-1/2	—	4.1	—	2	—	—	947
	200			—	25	—	15	—	12	—	6.1	—	
	230			15	30	15	20	8.1	14	4.1	7.0	27	
	380			—	50	—	30	—	—	—	—	—	
	460			—	50	—	30	16	28	8.1	14	53	
575	—	50	—	30	20	35	10	18	67	—			
4	115	135	156	—	—	—	—	6.8	—	3.4	—	—	1581
	200			—	40	—	25	—	20	—	10	—	
	230			—	50	—	30	14	23	6.8	12	40	
	380			—	75	—	50	—	—	—	—	—	
	460			—	100	—	60	27	47	14	23	80	
575	—	100	—	60	34	59	17	29	100	—			
5	115	270	311	—	—	—	—	14	—	6.8	—	—	3163
	200			—	75	—	60	—	41	—	20	—	
	230			—	100	—	75	27	47	14	24	80	
	380			—	150	—	125	—	—	—	—	—	
	460			—	200	—	150	54	94	27	47	160	
575	—	200	—	150	68	117	34	59	200	—			
6	115	540	621	—	—	—	—	27	—	14	—	—	6326
	200			—	150	—	125	—	81	—	41	—	
	230			—	200	—	150	54	94	27	47	160	
	380			—	300	—	250	—	—	—	—	—	
	460			—	400	—	300	108	188	54	94	320	
575	—	400	—	300	135	234	68	117	400	—			
7	230	810	932	—	300	—	—	—	—	—	—	240	9470
	460			—	600	—	—	—	—	—	—	480	
	575			—	600	—	—	—	—	—	—	600	
8	230	1215	1400	—	450	—	—	—	—	—	—	360	14205
	460			—	900	—	—	—	—	—	—	720	
	575			—	900	—	—	—	—	—	—	900	
9	230	2250	2590	—	800	—	—	—	—	—	—	665	25380
	460			—	1600	—	—	—	—	—	—	1325	
	575			—	1600	—	—	—	—	—	—	1670	

* **Service-Limit Current Ratings** — The service-limit current ratings shown represent the maximum rms current, in amperes, which the controller shall be permitted to carry for protracted periods in normal service. At service-limit current ratings, temperature rises shall be permitted to exceed those obtained by testing the controller at its continuous current rating. The current rating of overload relays or the trip current of other motor protective devices used shall not exceed the service-limit current rating of the controller.

* **Plugging or Jogging Service** — The listed horsepower ratings are recommended for those applications requiring repeated interruption of stalled motor current encountered in rapid motor reversal in excess of five openings or closings per minute and shall not be more than ten in a ten minute period.

‡ If maximum available current (at capacitor terminals) is greater than 3000 A, please contact your local Rockwell Automation sales office, Allen-Bradley distributor, or NEMA ICS-2 Standard.



Mechanical Ratings

NEMA Size	Mechanical Life (Millions of Operations)	Maximum Number of Auxiliary Contacts	Operating Time [ms]	
			Pick-up (Average)	Drop-out (Average)
00	10	5	20	16
0	10	8	21	16
1	10	8	22	14
2	10	8	27	13
3	5	8	37	20
4	5	8	27	20
5	5	8	25	18
6	5	4	25...79	10...22
7	—	8	88	40
8	—	8	88	45
9	—	8	118	84



Construction

NEMA Size	Wire Size for Power Terminals	Required Torque on Power Terminal Wire Clamps and Pressure Connectors or Lugs	Type of Power Terminal	Contact Material		Requirements for Sizing of Wire			
				Power Contacts	Auxiliary Contacts				
00	#16...10 AWG	9 lb•in	Pressure terminals	Silver alloy	Silver	All wire rated 167 °F (75 °C) or higher must be sized per the local Electrical Code for 167°F (75 °C) wire.			
0	#14...10 AWG	20 lb•in	Saddle or wire clamps						
1	#14...8 AWG	20 lb•in							
2	#14...4 AWG	45 lb•in	Pressure terminals						
3	#8...1/0 AWG	150 lb•in							
4	#6...4/0 AWG	275 lb•in							
5	#4 AWG...500 MCM	375 lb•in							
6	Lugs sold separately. See page 1-113.								
7									
8									
9	Direct bus connections only.								

Environmental

NEMA Size	Operating Position	Operating Temperature Range	Altitude	Corrosion-Resistance
00	Horizontal	Starters with eutectic alloy Overload relay -13...+149 °F (-25...+65 °C) Starters with SMP Overload relay -13...+131 °F (-25...+55 °C) (provided condensation is prevented)	10 000 feet before derating	All metal parts are treated for corrosion-resistance
0	Vertical			
1				
2				
3				
4				
5	Horizontal			
6				
7				
8				
9				

Short Circuit Rating

Combination contactors and starters with disconnect switch: Bulletin 502, 506, 512, 522E, 522F, 522G, and 1232X

Combination Contactors and Starters with Disconnect Switch: Bulletin 502, 506, 512, 522E, 522F, 522G, and 1232X			
NEMA Size	Fuse Type	Available Short Circuit Amperes RMS Symmetrical [A]	Maximum Voltage [V]
0...3	H, K	5000	600
4...5	H, K	10 000	
0...5	J, R	100 000	
6	L	18 000	
7	L	18 000	
Combination Lighting Contactors with Disconnect Switch: Bulletin 502L			
Lighting Contactor Rating [A]	Fuse Type	Available Short Circuit Amperes RMS Symmetrical [A]	Maximum Voltage [V]
20...100	H, K	5000	600
200...300	H, K	10 000	
20...300	J, R	100 000	
Combination Contactors and Starters with Circuit Breaker: Bulletin 503, 507, 513, 523E, 523F, 523G, and 1233X*			
Enclosure Type	NEMA Size	Available Short Circuit Amperes RMS Symmetrical [A]	Maximum Voltage [V]
1, 3R, 3R/4/12, 4/4X (stainless)	0...5	65 000	480
Unilock 3R, 7, & 9	0...5	65 000	
Bolted 3R, 7, & 9	0...2	65 000	
1, 3R, 3R/4/12, 4/4X (stainless)	0...5	25 000	600
Unilock 3R, 7, & 9	0...3	5000	
Unilock 3R, 7, & 9	4...5	10 000	
Bolted 3R, 7, & 9	0...2	5000	
3R, 3R/4/12	6...7	10 000	
Combination Lighting Contactors with Circuit Breaker: Bulletin 503L*			
Enclosure Type	Lighting Contactor Rating [A]	Available Short Circuit Amperes RMS Symmetrical [A]	Maximum Voltage [V]
1, 3R, 3R/4/12, 4/4X (stainless)	20...300	65 000	480
Unilock 3R, 7, & 9	20...300	65 000	
Bolted 3R, 7, & 9	20...300	65 000	
1, 3R, 3R/4/12, 4/4X (stainless)	20...300	25 000	600
Unilock 3R, 7, & 9	20...100	5000	
Unilock 3R, 7, & 9	20...300	10 000	
Bolted 3R, 7, & 9	20...300	5000	

* For the most up-to-date SCCRs, please see the on-line Industrial Controls catalog at www.ab.com/catalogs.

AC Coil Data

NEMA Size	Operating Volt Amperes Burden [VA]		Heat Dissipation [W]	Coil Operating Limits
	60 Hz Coils			
	Inrush	Sealed		
00	70	8	2.7	85...110%
0	192	29	5.9	
1 & 1P	192	29	5.9	
2 (2...3 poles)	240	29	5.9	
2 (4...5 poles)	315	38	5.9	
3 (2...3 poles)	660	45	10	
3 (4...5 poles)	840	58	10	
4 (2...3 poles)	1225	69	14.8	
4 (4...5 poles)	1490	96	14.8	
5 (Series L)	1490	96	19.8	
6*	4860	254	65.7	
6 (Interposing relay)	52.44	3.96	—	
7*	Economized DC Coil		—	
7 (Interposing relay)	74.40	9.84	—	
8†	Economized DC Coil		—	
8 (Interposing relay)	74.40	9.84	—	
9§	Economized DC Coil		—	
9 (Interposing relay)	144	19.20	—	

* This rating is for the size 6 contactor coil only. All starters are shipped with an interposing relay as standard.

‡ Size 7 starters are shipped with a 250 VA control circuit transformer and an interposing relay with a 120V coil. Voltage is then rectified to DC for the contactor coil.

† Size 8 starters are shipped with a 350 VA control circuit transformer and an interposing relay with a 120V coil. Voltage is then rectified to DC for the contactor coil.

§ Size 9 starters are shipped with a 750 VA control circuit transformer and an interposing relay with a 120V coil. Voltage is then rectified to DC for the contactor coil.

Auxiliary Contacts (NEMA A600 and P300) — Bulletin 595, 596

Maximum AC Contact Rating Per Pole						
AC Rating Designation	Maximum Voltage 60 or 50 Hz	[A]		Continuous Carrying Current [A]	[VA]	
		Make	Break		Make	Break
A600	120	60	6	10	7200	720
	240	30	3	10	7200	720
	480	15	1.5	10	7200	720
	600	12	1.2	10	7200	720
Maximum DC Contact Rating Per Pole for 595, 596 Auxiliary Contacts (Maximum Continuous Carrying Current is 5 A)						
DC Rating Designation	125V DC		250V DC		600V DC	
P300	0.55 A		0.55 A (Requires 2 Contacts in Series)		—	
	1.1 A (Requires 2 Contacts in Series)					



Load-Life Curves

Bulletin 500 Line contactors and starters are designed to provide superior performance in a variety of applications. These load-life curves are based on Rockwell Automation tests according to the requirements defined in IEC 947-4. Actual contact life may vary based on the application, duty cycle, and environmental conditions from that indicated by the curves.

To find the contactor's estimated electrical life, follow these guidelines:

- Choose the appropriate graph that most closely approximates the utilization category of the application.
- Locate the intersection of the life-load curve of the appropriate contactor with the application's operational current (I^e) found on the horizontal axis.
- Read the estimated contact life in millions of operations along the vertical axis.

Utilization Categories

Category Typical Duty

AC3 Starting of squirrel cage motors and switching off only after the motor is up to speed.

AC4 Starting of squirrel cage motors with inching and plugging duty.

Contact Life for Mixed Utilization Categories AC3 and AC4

In many applications, the utilization category cannot be defined as either purely AC3 or AC4. In those applications, the electrical life of the contactor can be estimated from the following equation:

$$L_{mixed} = \frac{L_{AC3}}{1 + P_{AC4} \left(\frac{L_{AC3}}{L_{AC4}} - 1 \right)}$$

Where:

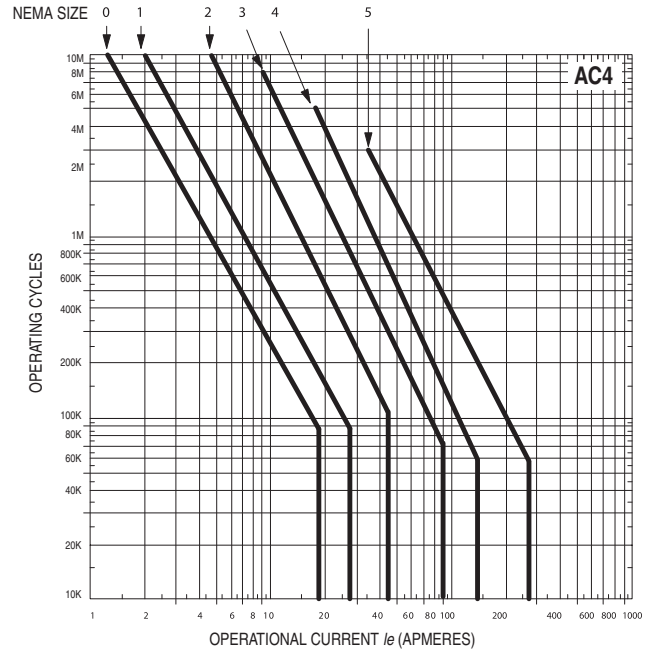
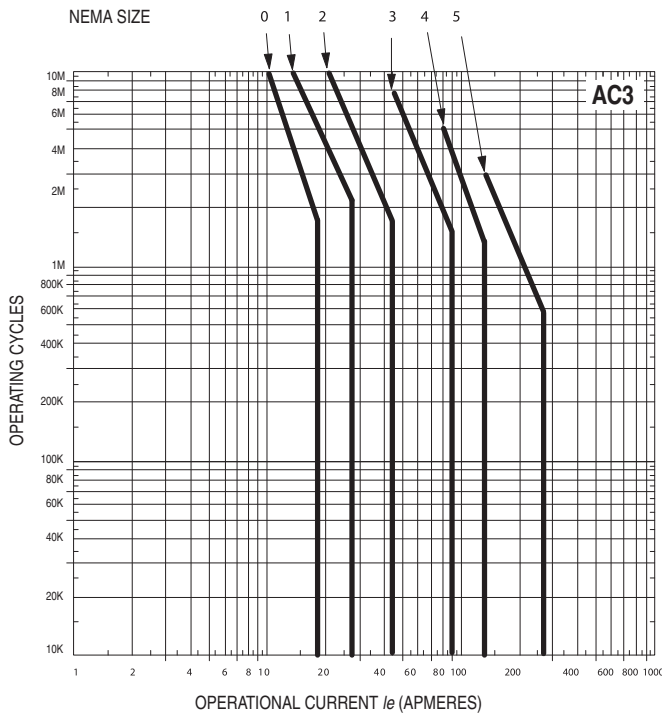
L_{mixed} = Approximate contact life for a mixed AC3/AC4 utilization category application

L_{AC3} = Approximate contact life in operations for AC3 utilization category (from AC3 life-load curves below)

L_{AC4} = Approximate contact life in operations for AC4 utilization category (from AC4 life-load curves below)

P_{AC4} = Percentage of AC4 operations

Bulletin 500 Load/ Life Curves — AC3 and AC4



Group Motor Ratings for NEMA Contactors/Starters

Manual Starters	FLA Range (Amps)	Group Rating (480V)		Contactors				
		w/o Limiter	with Limiter	Size 00	Size 0	Size 1	Size 2	Size 3
140-MN-0016	0.10...0.16	42 kA	42 kA	500-TO*	500-AO*	500-BO*	—	—
140-MN-0025	0.16...0.25	42 kA	42 kA	500-TO*	500-AO*	500-BO*	—	—
140-MN-0040	0.25...0.40	42 kA	42 kA	500-TO*	500-AO*	500-BO*	—	—
140-MN-0063	0.40...0.63	42 kA	42 kA	500-TO*	500-AO*	500-BO*	—	—
140-MN-0100	0.63...1.0	42 kA	42 kA	500-TO*	500-AO*	500-BO*	—	—
140-MN-0160	1.0...1.6	42 kA	42 kA	500-TO*	500-AO*	500-BO*	—	—
140-MN-0250	1.6...2.5	42 kA	42 kA	500-TO*	500-AO*	500-BO*	—	—
140-MN-0400	2.5...4.0	42 kA	42 kA	500-TO*	500-AO*	500-BO*	—	—
140-MN-0630	4.0...6.3	42 kA	42 kA	500-TO*	500-AO*	500-BO*	—	—
140-MN-1000	6.3...10.0	42 kA	42 kA	500-TO*	500-AO*	500-BO*	—	—
140-MN-1600	10.0...16.0	10 kA	42 kA	—	500-AO*	500-BO*	500-CO*	—
140-MN-2000	16.0...20.0	10 kA	14 kA	—	500-AO*	500-BO*	500-CO*	—
140-MN-2500	20.0...25.0	10 kA	10 kA	—	—	500-BO*	500-CO*	—
190-MN+190-P320	24.0...32.0	—	42 kA	—	—	—	500-CO*	500-DO*
190-MN+190-P400	32.0...42.0	—	30 kA	—	—	—	500-CO*	500-DO*

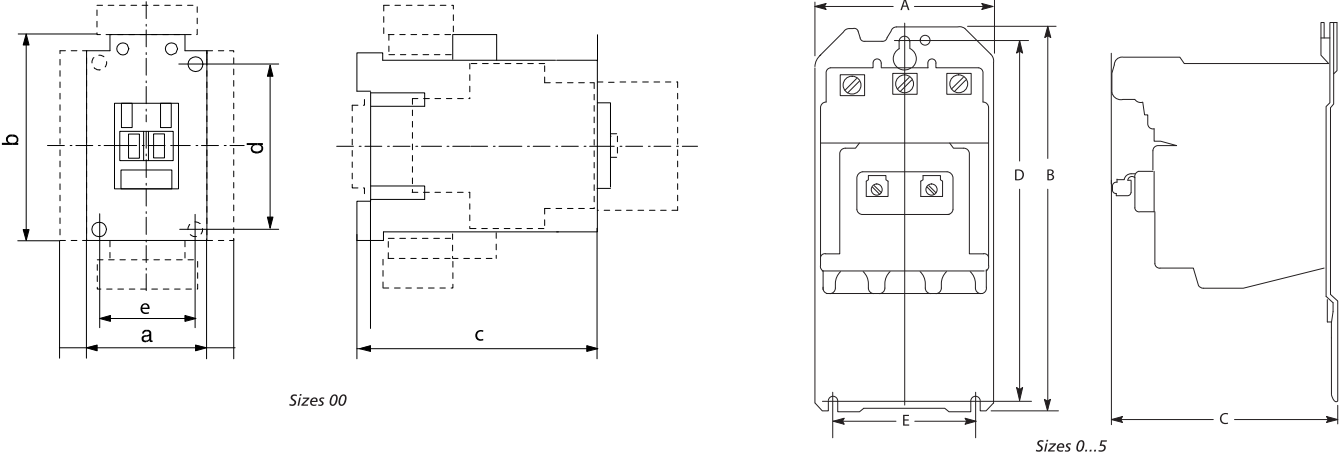
Manual Starters	FLA Range (Amps)	Group Rating (480V)		Starters				
		w/o Limiter	with Limiter	Size 00	Size 0	Size 1	Size 2	Size 3
140-MN-0016	0.10...0.16	42 kA	42 kA	509-TO*	509-AO*	509-BO*	—	—
140-MN-0025	0.16...0.25	42 kA	42 kA	509-TO*	509-AO*	509-BO*	—	—
140-MN-0040	0.25...0.40	42 kA	42 kA	509-TO*	509-AO*	509-BO*	—	—
140-MN-0063	0.40...0.63	42 kA	42 kA	509-TO*	509-AO*	509-BO*	—	—
140-MN-0100	0.63...1.0	42 kA	42 kA	509-TO*	509-AO*	509-BO*	—	—
140-MN-0160	1.0...1.6	42 kA	42 kA	509-TO*	509-AO*	509-BO*	—	—
140-MN-0250	1.6...2.5	42 kA	42 kA	509-TO*	509-AO*	509-BO*	—	—
140-MN-0400	2.5...4.0	42 kA	42 kA	509-TO*	509-AO*	509-BO*	—	—
140-MN-0630	4.0...6.3	42 kA	42 kA	509-TO*	509-AO*	509-BO*	—	—
140-MN-1000	6.3...10.0	42 kA	42 kA	509-TO*	509-AO*	509-BO*	—	—
140-MN-1600	10.0...16.0	10 kA	42 kA	—	509-AO*	509-BO*	509-CO*	—
140-MN-2000	16.0...20.0	10 kA	14 kA	—	509-AO*	509-BO*	509-CO*	—
140-MN-2500	20.0...25.0	10 kA	10 kA	—	—	509-BO*	509-CO*	—
190-MN+190-P320	24.0...32.0	—	42 kA	—	—	—	509-CO*	509-DO*
190-MN+190-P400	32.0...42.0	—	30 kA	—	—	—	509-CO*	509-DO*

* Cat. No. is incomplete. Refer to page 1-31.

* Cat. No. is incomplete. Refer to page 1-46.

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

Open Type without Enclosure for Bulletin 500 and 500F Contactors — NEMA sizes 0...4



NEMA Size	Number of Switching Poles	Dimensions in Inches (Millimeters)					Approximate Shipping Weight [lb (kg)]
		A Width	B Height	C Depth	D	E	
0...1	2...3	3-9/16 (90.5)	7-5/8 (193)	4-15/32 (113)	7-1/16 (180)	2-3/4 (70)	3 (1.4)
	4	4-3/8 (111)					3-1/2 (1.6)
	5	4-15/16 (125)					4-3/4 (2.2)
2	2...3	3-15/16 (100)	9-25/32 (248)	4-23/32 (120)	9-1/4 (235)	3-5/32 (80)	4 (1.8)
	4	4-31/32 (126)					4-3/4 (2.2)
	5	5-1/2 (140)					6-1/4 (2.8)
3	2...3	6-1/8 (155.5)	10-3/64 (255)	6-19/32 (167.4)	8-21/32 (220)	5-33/64 (140)	14.5 (6.5)
	4	7-15/16 (201.6)					16 (7.25)
	5	8-13/16 (223.8)					18 (8)
4	2...3	7 (178)	12-11/64 (309)*	7-13/16 (198.4)	9-27/32 (250)	6-5/16 (160)	22 (10)
	4	9-1/16 (230.2)					25.5 (11.5)
	5	10-7/16 (265.1)					28.5 (13)

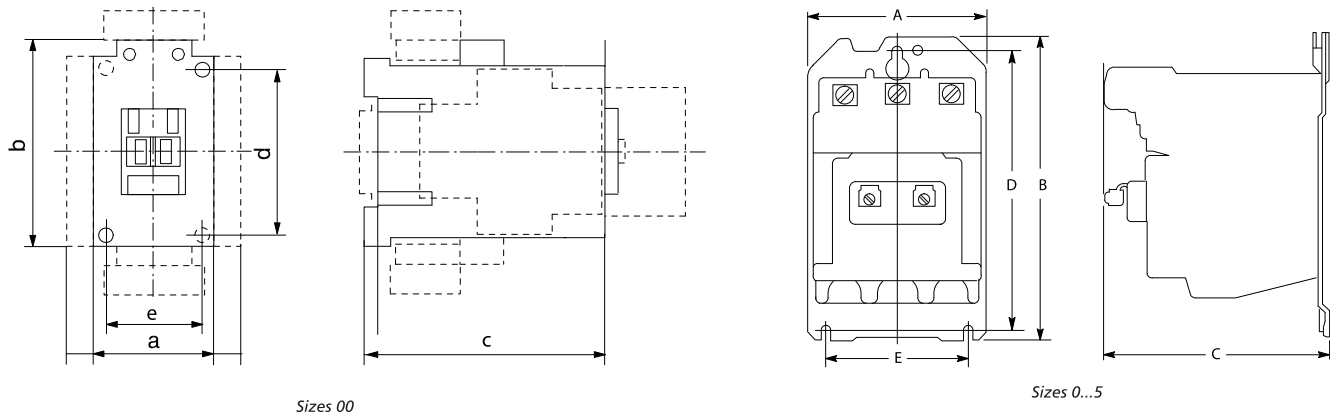
* For Feed-Through Wiring this dimension is 11-11/16 in. (297 mm).

Bulletin 500 Line
Approximate Dimensions
 NEMA AC Contactors

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

Open Type without Enclosure for Bulletin 500FL, 500L, and 500LP and for NEMA sizes 00, 5...9 for Bulletin 500 and 500F Contactors

1



Note: Top mounting hole on Size 00 is 1/4 in. (6.35 mm) to the left of centerline on Open Type. Mounting screws: 3...#10 for sizes 0...2, 1/4...#20, or 5/16...#18 for sizes 3...5.

NEMA Size	Number of Switching Poles		Dimensions in Inches (Millimeters)					Approximate Shipping Weight [lb (kg)]
	Bulletin 500 500F-500FL	Bulletin 500L-500LP	A Width	B Height	C Depth	D	E	
00 5/10A	1-2-3	2...3	1-25/32 (45)	3-3/16 (81)	3-11/64 (80.5)	2-23/64 (60)	1-25/64 (35)	1 (0.45)
0...1 15/20A 30A	2...3	2...3	3-9/16 (90.5)	6 (152)*	4-15/32 (113)	5-1/2 (140)	2-3/4 (70)	3 (1.4)
	4	—	4-3/8 (111)					3-1/2 (1.6)
	5	4	4-15/16 (125)					4-3/4 (2.2)
2 60A	2...3	2...3	3-15/16 (100)	6-27/32 (173)*	4-23/32 (120)	6-5/16 (160)	3-5/32 (80)	4 (1.8)
	4	—	4-31/32 (126)					4-3/4 (2.2)
	5	4	5-1/2 (140)					6-1/4 (2.8)
3 100A	2...3	2...3	6-1/8 (155.5)	10-3/64 (255)	6-19/32 (167.4)	8-21/32 (220)	5-33/64 (140)	14.5 (6.5)
	4	—	7-15/16 (201.6)					16 (7.25)
	5	4	8-13/16 (223.8)					18 (8)
4 200A	2...3	2...3	7 (178)	12-11/64 (309)*	7-13/16 (198.4)	9-27/32 (250)	6-5/16 (160)	22 (10)
	4	—	9-1/16 (230.2)					25.5 (11.5)
	5	4	10-7/16 (265.1)					28.5 (13)
5 300A	2...3	2...3	7 (178)	13-25/64 (340)†	8-17/32 (217)	9-27/32 (250)	6-5/16 (160)	24 (10.9)

* For Feed-Through Wiring this dimension is 6-15/16 in. (176 mm).
 * For Feed-Through Wiring this dimension is 11-11/16 in. (297 mm).
 † For Feed-Through Wiring this dimension is 12-37/64 in. (320 mm).

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

Open Type without Enclosure for Bulletin 505 Full Voltage Reversing Starters with Eutectic Alloy Overload Relay



NEMA Size	Style	Dimensions in Inches (Millimeters)							Approx. Shipping Weight [lb (kg)]
		A Width	B Height	C Relay Reset Depth	D	E	F	G Depth	
00	With Eutectic Alloy Overload Protection	4-7/8 (124)	6-9/16 (167)	3-27/32 (98)	6-1/64 (153)	4-3/8 (111)	—	—	4 (1.8)
0...1		8 (203)	9-5/32 (233)	4-11/16 (119)	8-21/32 (220)	7-3/32 (180)	—	4-5/8 (117)	10 (4.5)
2		9-1/16 (230)	10-11/32 (263)	4-11/16 (119)	9-27/32 (250)	7-7/8 (200)	—	4-29/32 (125)	12-3/4 (5.8)
3		12-7/8 (327)	12-29/64 (316)	6-21/64 (161)	9-27/32 (250)	11-13/16 (300)	11-13/16 (300)	6-55/64 (174)	34 (15.5)
4		14-27/32 (377)	14-5/8 (371)	6-23/32 (171)	11-13/16 (300)	13-25/32 (350)	13-25/32 (350)	8-5/64 (205)	52 (24)
5		14-27/32 (377)	17-55/64 (453)	8-35/64 (217)	16-15/16 (430)	13-25/32 (350)	13-25/32 (350)	8-13/16 (224)	65 (29.5)
6		23-13/32 (594.5)	25-5/64 (637)	10-9/16 (268.5)	—	—	—	11-27/64 (290)	—
7		31-1/2 (800)	32-13/16 (833.4)	12-9/32 (311.9)	—	—	—	—	—
8		35-1/4 (896)	36-7/8 (937)	12-9/32 (311.9)	—	—	—	—	—
9		For dimensions, please contact your local Rockwell Automation sales office or Allen-Bradley distributor.							
00	Without Overload Protection	4-7/8 (124)	4-5/16 (110)	2-3/16 (55.6)	3-3/4 (95.3)	4-3/8 (111)	—	—	2-3/4 (1.2)
0...1		8 (203)	7-19/32 (193)	—	7-3/32 (180)	7-3/32 (180)	—	4-5/8 (117)	8-3/4 (4)
2		9-1/16 (230)	8-3/8 (213)	—	7-7/8 (200)	7-7/8 (200)	—	4-29/32 (125)	11 (5)
3		12-7/8 (327)	10-21/32 (271)	—	9-27/32 (250)	11-13/16 (300)	11-13/16 (300)	6-55/64 (174)	30 (13.5)
4		14-27/32 (377)	12-23/32 (323)	—	11-13/16 (300)	13-25/32 (350)	13-25/32 (350)	8-5/64 (205)	47 (21.3)
5		14-27/32 (377)	12-23/32 (323)	—	11-13/16 (300)	13-25/32 (350)	13-25/32 (350)	8-13/16 (224)	47 (21.3)
6		23-13/32 (594.5)	17-1/16 (433)	—	—	—	—	11-27/64 (290)	—
7		31-1/2 (800)	32-13/16 (833.4)	—	—	—	—	11-11/32 (288.1)	—
8		35-1/4 (896)	36-7/8 (937)	—	—	—	—	11-13/16 (300)	—
9		For dimensions, please contact your local Rockwell Automation sales office or Allen-Bradley distributor.							

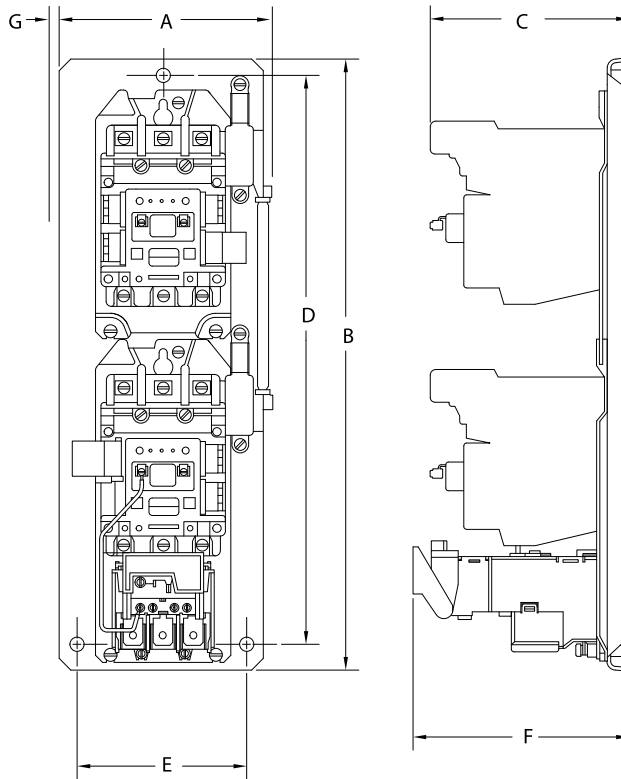
* Sizes 00...2 only.
 * Sizes 3...5 only.

Bulletin 500 Line
Approximate Dimensions
 NEMA Reversing Starters

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

Open Type without Enclosure for Bulletin 505V Full Voltage Reversing Starters with Solid State Overload Relay

1

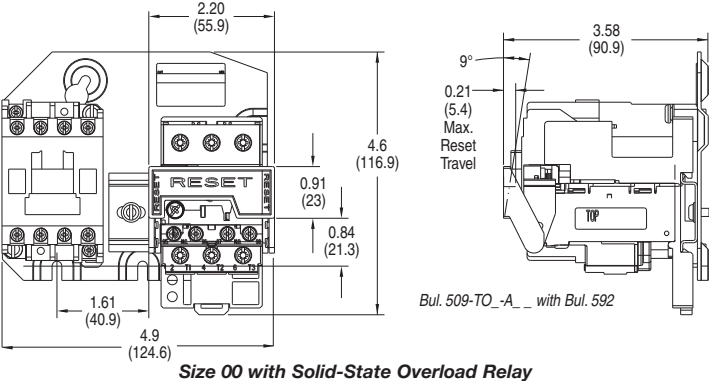
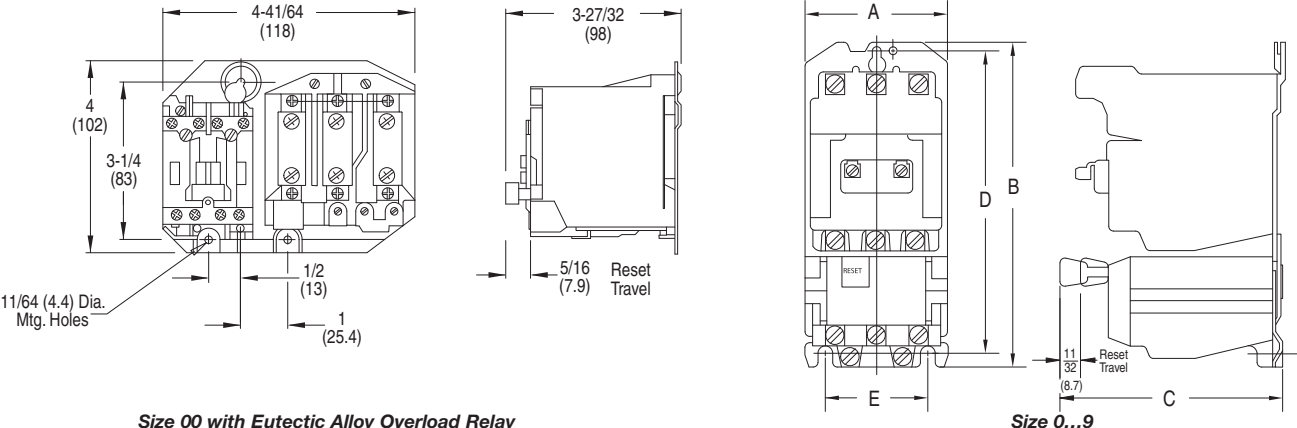


NEMA Size	Overload Relay	Dimensions in Inches (Millimeters)							Approx. Shipping Weight [lb (kg)]
		A Width	B Height	C Depth	D	E	F Relay Reset Depth	G*	
0...1	E1 Plus Solid-State	5-11/16 (144)	14-11/16 (373)	4-31/32 (126)	13-25/32 (350)	4-5/16 (109)	5 (127)	1/16 (1.6)	Size 0: 11.5 (5.2) Size 1: 12.2 (5.5)
		5-11/16 (144)	16-27/32 (428)	4-31/32 (126)	13-25/32 (350)	4-11/32 (110)	5-9/32 (134)	1/16 (1.6)	
2	E1 Plus Solid-State	6-1/8 (156)	17-1/16 (434)	5-7/32 (133)	15-3/4 (400)	4-23/32 (120)	5 (127)	1/4 (6.4)	14.5 (6.6)
		6-1/8 (156)	18-7/8 (479)	5-7/32 (133)	15-3/4 (400)	4-23/32 (120)	5-9/32 (134)	1/4 (6.4)	
3	E1 Plus Solid-State	7-17/32 (192)	25-1/8 (639)	7-19/32 (193)	21-21/32 (550)	5-29/32 (150)	7-1/16 (179)	1-3/32 (28)	57.4 (26.0)
		7-17/32 (192)	27-13/32 (696)	7-19/32 (193)	21-21/32 (550)	5-29/32 (150)	7-5/32 (182)	1-3/32 (28)	
4	E1 Plus Solid-State	8-5/32 (208)	29-3/32 (739)	8-13/16 (224)	25-19/32 (650)	6-23/32 (171)	7-15/32 (190)	2 (51)	86.0 (39.0)
		8-5/32 (208)	29-3/32 (739)	8-13/16 (224)	25-19/32 (650)	6-23/32 (171)	8-11/16 (221)	2-5/32 (55)	
5	E1 Plus Solid-State	8-7/16 (215)	37-7/8 (962)	9-17/32 (242)	36-31/32 (939)	6-11/16 (170)	9-9/32 (236)	2 (51)	112 (50.8)
		8-7/16 (215)	37-7/8 (962)	9-17/32 (242)	36-31/32 (939)	6-11/16 (170)	9-29/32 (252)	2 (51)	

* Allow additional space for internal wiring.

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

Open Type without Enclosure for Bulletin 509 Full Voltage Starters with Eutectic Alloy and Solid-State Overload Relay



NEMA Size	Dimensions in Inches (Millimeters)					Approx. Shipping Weight [lb (kg)]
	A Width	B Height	C Relay Reset Depth	D	E	
00	*	*	*	*	*	0.9 (0.4)
0...1	3-9/16 (90.5)	7-5/8 (194)	4-1/2 (114)	7-3/32 (180)	2-3/4 (70)	4-1/4 (1.9)
2	3-15/16 (100)	9-5/32 (233)	4-1/2 (114)	8-21/32 (220)	3-5/32 (80)	5-3/4 (2.6)
3	6-11/64 (157)	12-29/64 (316)	6-1/16 (154)	8-21/32 (220)	5-33/64 (140)	15 (6.8)
4	7 (178)	14-21/32 (372)	7-13/16 (198)	9-27/32 (250)	6-5/16 (160)	23-1/5 (10.6)
5	7-3/8 (187)	16-7/6 (429)	8-17/32 (217)	14-32/32 (380)	6-5/16 (160)	35 (15.9)
6	13-1/4 (337)	25-3/32 (637)	11-7/16 (291)	17-23/32 (450)	11-13/16 (300)	160 (72)
7	16-1/2 (419)	30-27/32 (783)	12-9/32 (312)	18-5/16 (465)	15 (381)	247 (112)
8	21-1/2 (546)	39-1/2 (1003)	15-19/32 (396)	22-5/8 (575)	20 (508)	370 (168)
9	34 (864)	53-11/16 (1364)	28 (711)	—	—	—

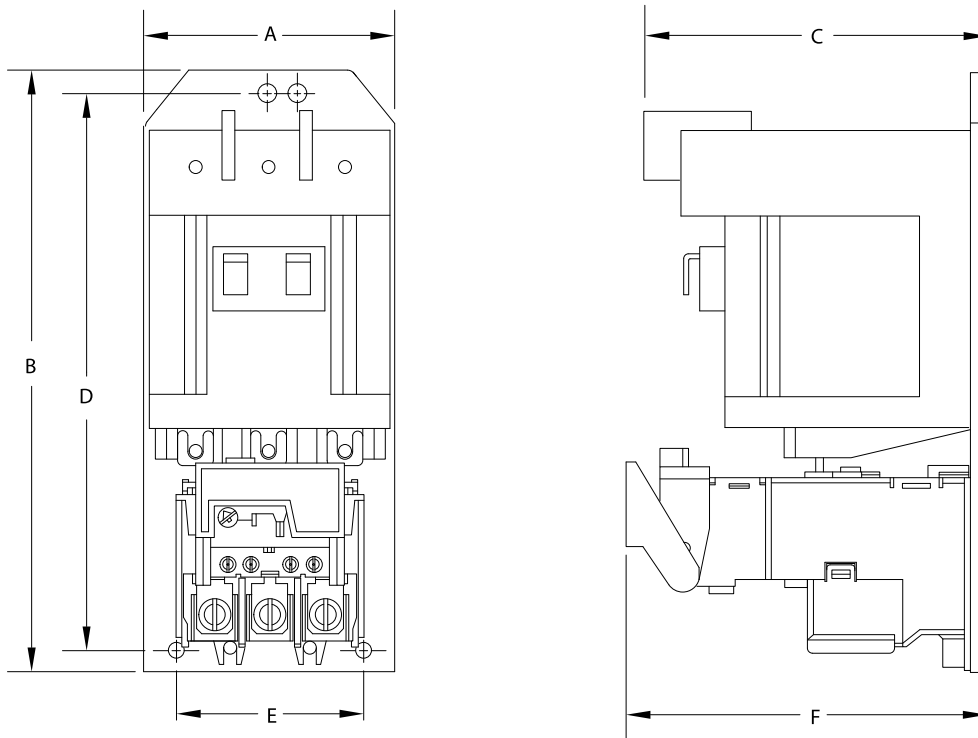
* See drawing for dimensions.

Bulletin 500 Line
Approximate Dimensions
 NEMA Starters

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

Open Type without Enclosure for Bulletin 509 Full Voltage Starters with Solid-State Overload Relay

1

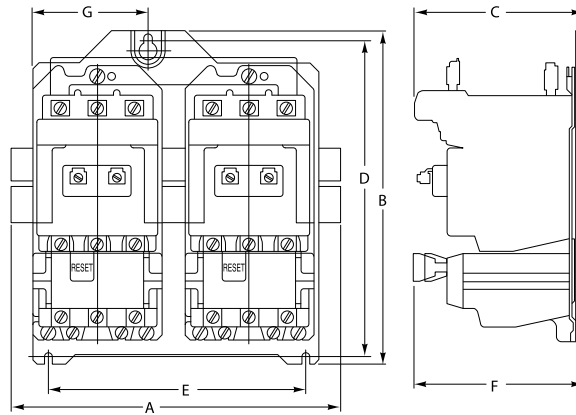


NEMA Size	Overload Relay	Dimensions in Inches (Millimeters)						Approx. Shipping Weight [lb (kg)]
		A Width	B Height	C Depth	D	E	F Relay Reset Depth	
0...1	Solid-State E1 Plus	3-9/16 (91)	7-5/8 (193)	4-15/32 (113)	7-1/16 (180)	2-3/4 (70)	4-1/2 (114)	4.3 (1.9)
	Solid-State E3 Plus	3-9/16 (91)	9-25/32 (248)	4-15/32 (113)	9-1/4 (235)	2-3/4 (70)	4-5/8 (118)	
2	Solid-State E1 Plus	3-15/16 (100)	9-5/32 (233)	4-11/16 (119)	8-5/8 (219)	3-5/32 (80)	4-1/2 (114)	6.0 (2.7)
	Solid-State E3 Plus	3-15/16 (100)	10-25/32 (274)	4-23/32 (120)	10-1/4 (260)	3-5/32 (80)	4-5/8 (118)	
3	Solid-State E1 Plus	6-1/8 (156)	12-7/16 (316)	6-19/32 (168)	8-21/32 (220)	5-1/2 (140)	6-1/16 (154)	16.0 (7.3)
	Solid-State E3 Plus	6-1/8 (156)	14-9/16 (370)	6-19/32 (168)	8-21/32 (220)	5-1/2 (140)	5-61/64 (151)	
4	Solid-State E1 Plus	6-1/2 (165)	16-1/2 (419)	7-13/16 (198)	14-31/32 (380)	6-5/16 (160)	7-27/32 (199)	24.6 (11.2)
	Solid-State E3 Plus	6-1/2 (165)	16-1/2 (419)	7-13/16 (198)	14-31/32 (380)	6-5/16 (160)	8-29/64 (215)	
5	Solid-State E1 Plus	6-1/2 (165)	16-29/32 (429)	8-11/32 (212)	14-31/32 (380)	6-5/16 (160)	7-5/8 (194)	33.9 (15.4)
	Solid-State E3 Plus	6-1/2 (165)	16-29/32 (429)	8-11/32 (212)	14-31/32 (380)	6-5/16 (160)	8-11/64 (208)	
6	Solid-State E1 Plus	13-1/4 (337)	25-3/32 (637)	11-13/32 (289)	17-23/32 (450)	11-13/16 (300)	9-25/32 (248)	116 (52.6)
	Solid-State E3 Plus	13-1/4 (337)	25-3/32 (637)	11-13/32 (289)	17-23/32 (450)	11-13/16 (300)	9-5/8 (244)	

Note: For Bulletin 509 Size 00, please contact your local Rockwell Automation sales office or Allen-Bradley distributor.

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

Open Type without Enclosure for Bulletin 520E, 520F, and 520G Multi-Speed Starters with Eutectic Alloy Overload Relay

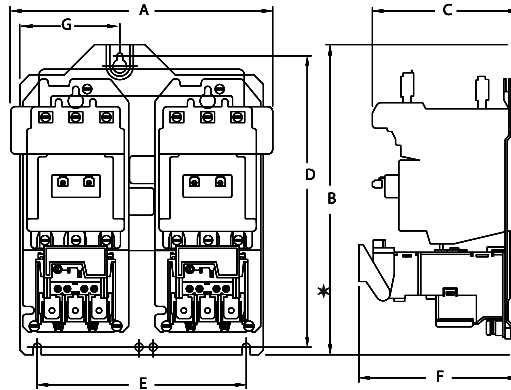


NEMA Size	Dimensions in Inches (Millimeters)							Approx. Shipping Weight [lb (kg)]
	A Width	B Height	C Depth	D	E	F Relay Reset Depth	G	
2-Speed Separate Winding Bulletin 520E								
0...1	8 (203)	9-5/32 (233)	4-11/16 (119)	8-21/32 (220)	7-3/32 (180)	—	4-5/8 (117)	11-1/4 (5.1)
2	9-1/16 (230)	10-11/32 (263)	4-11/16 (119)	9-27/32 (250)	7-7/8 (200)	—	4-29/32 (125)	13-3/4 (6.2)
3	12-7/8 (327)	12-29/64 (316)	6-21/64 (161)	9-27/32 (250)	11-13/16 (300)	6-1/16 (154)	6-55/64 (174)	34 (15.3)
4	14-27/32 (377)	15-1/64 (381)	6-23/32 (171)	11-13/16 (300)	13-25/32 (350)	7-13/16 (198)	8-5/64 (205)	54 (24.3)
5	16-13/16 (427)	17-55/64 (453)	8-35/64 (217)	16-15/16 (430)	15-3/4 (400)	8-17/32 (217)	8-13/16 (224)	82 (36.9)
2-Speed Consequent Pole Bulletin 520F and 520G								
0...1	9-5/16 (236.5)	9-5/32 (233)	4-11/16 (119)	8-21/32 (220)	7-3/32 (180)	—	4-5/8 (117)	12 (5.4)
2	10-1/4 (260.4)	10-11/32 (263)	4-11/16 (119)	9-27/32 (250)	7-7/8 (200)	—	4-29/32 (125)	15-1/4 (7)
3	16-1/4 (413)	12-29/64 (316.3)	6-21/64 (161)	9-27/32 (250)	13-25/32 (350)	6-1/16 (154)	6-55/64 (174)	44 (19.8)
4	18-7/32 (463)	14-39/64 (371)	6-23/32 (171)	11-13/16 (300)	15-3/4 (400)	7-13/16 (198)	8-5/64 (205)	63 (28.4)
5	18-11/32 (466)	17-55/64 (453)	8-35/64 (217)	16-15/16 (430)	15-3/4 (400)	8-17/32 (217)	8-13/16 (224)	85 (38.6)

Bulletin 500 Line
Approximate Dimensions
 NEMA Multi-Speed Starters

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

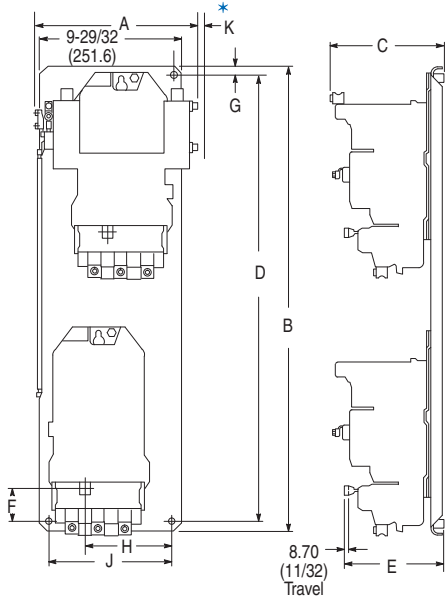
Open Type Enclosure for Bulletin 520E, 520F, and 520G Multi-Speed Starters with Solid State Overload Relay



NEMA Size	Overload Relay	Dimensions in Inches (Millimeters)							Approx. Shipping Weight [lb (kg)]
		A Width	B Height	C Depth	D	E	F Relay Reset Depth	G	
2-Speed Separate Winding Bulletin 520E									
0...1	E1 Plus Solid-State	8 (203)	9-5/32 (233)	4-5/8 (118)	8-21/32 (220)	7-3/32 (180)	4-11/16 (118)	3-3/16 (81)	11.3 (5.1)
		8 (203)	11-11/32 (288)	4-5/8 (118)	10-27/32 (276)	7-3/32 (180)	4-31/32 (126)	3-3/16 (81)	
2	E1 Plus Solid-State	9-1/16 (230)	10-11/32 (263)	4-29/32 (125)	9-27/32 (250)	7-7/8 (200)	4-11/16 (118)	4-11/32 (110)	14.9 (6.8)
		9-1/16 (230)	12-5/32 (309)	4-29/32 (125)	11-21/32 (296)	7-7/8 (200)	4-31/32 (126)	4-11/32 (110)	
3	E1 Plus Solid-State	12-7/8 (327)	12-13/32 (315)	6-7/8 (175)	9-27/32 (250)	11-13/16 (300)	6-11/32 (161)	—	35.6 (16.1)
		12-7/8 (327)	14-9/16 (370)	6-55/64 (174)	9-27/32 (250)	11-13/16 (300)	6-17/64 (158)		
4	E1 Plus Solid-State	14-27/32 (377)	14-7/16 (365)	8-3/32 (205)	11-13/16 (300)	13-25/32 (350)	6-23/32 (171)	—	61.0 (27.7)
		14-27/32 (377)	15-21/32 (397)	8-3/32 (205)	11-13/16 (300)	13-25/32 (350)	7-3/4 (196.9)		
5	E1 Plus Solid-State	16-13/16 (427)	17-7/8 (454)	8-13/16 (224)	16-15/16 (430)	15-3/4 (400)	8-9/16 (217)	—	93.5 (42.4)
		16-13/16 (427)	17-7/8 (454)	8-13/16 (224)	16-15/16 (430)	15-3/4 (400)	9-3/16 (233)		
6	E1 Plus Solid-State	23-13/32 (595)	25-3/32 (637)	11-27/64 (290)	17-23/32 (450)	21-31/32 (558)	10-37/64 (269)	—	254 (115)
		23-13/32 (595)	25-3/32 (637)	11-27/64 (290)	17-23/32 (450)	21-31/32 (558)	11-9/16 (294)		
2-Speed Consequent Pole Bulletin 520F and 520G									
0...1	E1 Plus Solid-State	9-5/16 (237)	9-5/32 (233)	4-5/8 (117)	8-21/32 (220)	7-3/32 (180)	4-11/16 (118)	3-9/16 (91)	12.0 (5.4)
		9-5/16 (237)	11-11/32 (288)	4-5/8 (117)	10-27/32 (275)	7-3/32 (180)	4-31/32 (126)	3-9/16 (91)	
2	E1 Plus Solid-State	10-1/4 (260)	10-11/32 (263)	4-29/32 (125)	9-27/32 (250)	7-7/8 (200)	4-11/16 (118)	4-3/4 (121)	15.6 (7.1)
		10-1/4 (260)	12 (305)	4-29/32 (125)	11-1/2 (292)	7-7/8 (200)	4-31/32 (126)	4-3/4 (121)	
3	E1 Plus Solid-State	16-1/4 (413)	12-3/4 (324)	6-7/8 (175)	9-27/32 (250)	13-25/32 (350)	6-11/32 (161)	—	45.0 (20.4)
		16-1/4 (413)	14-7/8 (378)	6-7/8 (175)	9-27/32 (250)	13-25/32 (350)	6-15/32 (164)		
4	E1 Plus Solid-State	18-7/32 (463)	14-27/32 (377)	8-3/32 (205)	11-13/16 (300)	15-3/4 (400)	6-3/4 (172)	—	73.0 (33.1)
		18-3/4 (476)	16-1/16 (408)	8-3/32 (205)	11-13/16 (300)	15-3/4 (400)	7-15/16 (202)		
5	E1 Plus Solid-State	18-11/32 (466)	17-7/8 (454)	8-13/16 (224)	16-15/16 (430)	15-3/4 (400)	8-9/16 (217)	—	131 (59.4)
		18-11/32 (466)	17-7/8 (454)	8-13/16 (224)	16-15/16 (430)	15-3/4 (400)	9-3/16 (233)		

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

Open Type without Enclosure for Bulletin 520VE, 520VF, and 520VG Multi-Speed Starters with Eutectic Alloy Overload Relay



1

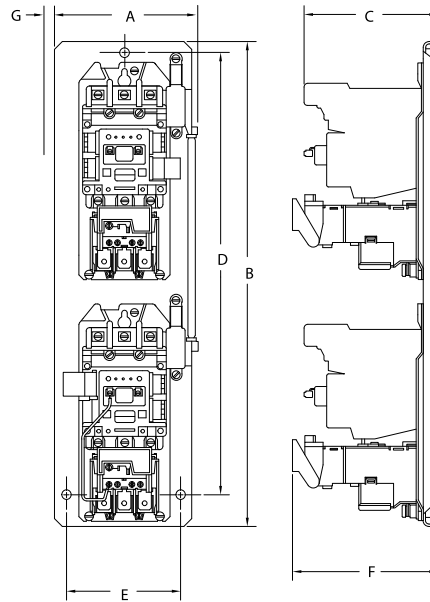
Dimensions in Inches (Millimeters)											
NEMA Size	A Width	B Height	C Depth	D	E Relay Reset Depth	F	G	H	J	K	Approx. Shipping Weight [lb (kg)]
2-Speed Separate Winding Bulletin 520VE											
0...1	5-11/16 (144.5)	17-9/64 (435.4)	4-15/16 (125.4)	15-3/4 (400)	5 (127)	1-11/32 (34.1)	29/64 (11.5)	1-13/16 (46)	4-21/64 (109.9)	1/16 (1.6)	5.4 (12)
2	6-1/8 (155.6)	20-37/64 (522.7)	4-5/8 (117.5)	19-11/16 (500)	4-5/16 (109.5)	1-21/32 (42.1)	29/64 (11.5)	2-27/32 (72.2)	4-23/32 (119.8)	1/4 (6.4)	6.8 (15)
3	7-17/32 (191.3)	30-5/16 (769.9)	7-1/4 (184.1)	27-9/16 (700.1)	6-45/64 (170.3)	2-55/64 (72.6)	5/8 (15.9)	3-41/64 (92.5)	5-29/32 (150)	1-3/32 (27.8)	18.1 (40)
4	8-5/16 (211.2)	35-1/4 (895.4)	8-23/64 (212.3)	31-1/2 (800.1)	7 (177.8)	2-63/64 (75.8)	5/8 (15.9)	3-63/64 (101.2)	6-11/16 (169.9)	1-1/2 (38.1)	60-1/2 (27.4)
5	8-7/16 (214.4)	42-11/64 (1071.1)	9-17/32 (242.1)	41-17/64 (1048.1)	9-17/64 (235.4)	5-45/64 (144.8)	29/64 (11.5)	3-23/32 (94.4)	6-11/16 (170)	3 (76.2)	—
2-Speed Consequent Pole Bulletin 520VF/520VG											
0...1	6-3/64 (164.7)	17-1/2 (444.5)	4-15/16 (125.4)	15-3/4 (400)	5 (127)	1-11/32 (34.1)	29/64 (11.5)	2-63/64 (75.8)	5-1/8 (130.2)	33/64 (13.1)	13 (5.9)
2	6-29/32 (175.4)	20-37/64 (522.7)	4-5/8 (117.5)	19-11/16 (500)	4-5/16 (109.5)	1-21/32 (42.1)	29/64 (11.5)	31-19/64 (83.7)	5-33/64 (140.1)	23/32 (18.1)	16 (7.3)
3	9-1/8 (231.8)	30-5/16 (777.9)	7-1/4 (184.1)	27-9/16 (700.1)	6-45/64 (170.3)	2-55/64 (72.6)	5/8 (15.9)	5-23/64 (136.2)	7-31/64 (190.1)	2-1/8 (54)	45-1/2 (20.7)
4	10-9/32 (261.1)	35-1/4 (895.4)	8-23/64 (212.3)	31-1/2 (800.1)	7 (177.8)	2-63/64 (75.8)	5/8 (15.9)	5-61/64 (151.2)	8-21/32 (219.9)	3-7/32 (81.8)	72-1/2 (32.9)
5	11-29/32 (302.4)	42-11/64 (1071.1)	9-17/32 (242.1)	41-17/64 (1048.1)	9-17/64 (235.4)	5-45/64 (144.8)	13/32 (10.3)	5-11/16 (144.4)	8-21/32 (220)	4 (101.6)	—

* Allow additional space for internal wiring.

Bulletin 500 Line
Approximate Dimensions
 NEMA Multi-Speed Starters

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

Open Type without Enclosure for Bulletin 520VE, 520VF, and 520VG Multi-Speed Starters with Solid State Overload Relay



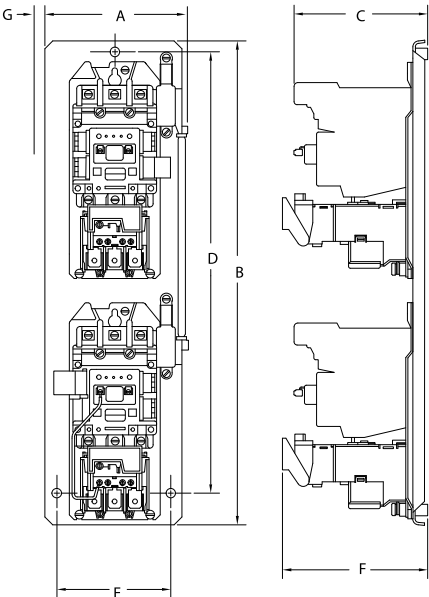
Note: The typical drawing above shows 3-point mounting. Sizes 3...5 have 4-point mounting holes at each corner of the mounting plate.

2-Speed Separate Winding Bulletin 520VE									Approx. Shipping Weight [lb (kg)]
NEMA Size	Overload Relay	Dimensions in Inches (Millimeters)							
		A Width	B Height	C Depth	D	E	F Relay Reset Depth	G*	
0...1	E1 Plus Solid-State	5-11/16 (145)	17-1/4 (438)	4-15/16 (126)	15-3/4 (400)	4-5/16 (109)	5 (127)	1/16 (1.6)	12.7 (5.3)
		5-11/16 (145)	21-1/2 (546)	4-15/16 (126)	15-3/4 (400)	4-11/32 (110)	5-9/32 (134)	1/16 (1.6)	
2	E1 Plus Solid-State	6-1/8 (156)	20-9/16 (522)	4-5/8 (118)	19-11/16 (500)	4-23/32 (120)	4-15/16 (125.5)	1/4 (6.4)	16.0 (7.3)
		6-1/8 (156)	23-13/16 (605)	4-5/8 (118)	19-11/16 (500)	4-23/32 (120)	5-9/32 (134)	1/4 (6.4)	
3	E1 Plus Solid-State	7-17/32 (192)	31-1/16 (789)	7-19/32 (193)	27-9/16 (700)	5-29/32 (150)	7-1/16 (179.4)	1-3/32 (28)	74.8 (33.9)
		7-17/32 (192)	35-9/16 (903)	7-19/32 (193)	34-23/32 (882)	5-29/32 (150)	7-5/32 (182)	1-3/32 (28)	
4	E1 Plus Solid-State	8-5/16 (208)	35 (889)	8-13/16 (224)	31-1/2 (800)	6-11/16 (170)	7-15/32 (190)	1-1/2 (38)	98.0 (44.4)
		8-5/16 (208)	37-23/32 (958)	8-13/16 (224)	36-13/16 (935)	6-11/16 (170)	8-23/32 (222)	1-1/8 (29)	
5	E1 Plus Solid-State	8-7/16 (215)	42-3/16 (1072)	9-17/32 (242)	41-9/32 (1049)	6-11/16 (170)	9-9/32 (236)	3 (76)	113 (51.2)
		8-7/16 (215)	42-3/16 (1072)	9-17/32 (242)	41-9/32 (1049)	6-11/16 (170)	9-9/32 (236)	3 (76)	

* Allow additional space for internal wiring.

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

Open Type without Enclosure for Bulletin 520VE, 520VF, and 520VG Multi-Speed Starters with Solid State Overload Relay, Continued



2-Speed Consequent Pole Bulletin 520VF and 520VG									
NEMA Size	Overload Relay	Dimensions in Inches (Millimeters)							Approx. Shipping Weight [lb (kg)]
		A Width	B Height	C Depth	D	E	F Relay Reset Depth	G*	
0...1	E1 Plus Solid-State	6-5/8 (168)	17-1/2 (444.5)	4-15/16 (126)	15-3/4 (146)	5-1/8 (130)	5 (127)	1/2 (13)	12.7 (5.8)
		7 (177)	22-11/16 (576)	4-15/16 (126)	15-3/4 (146)	5-1/8 (130)	5-9/32 (134)	17/32 (13)	
2	E1 Plus Solid-State	6-29/32 (176)	20-19/32 (523)	4-5/8 (118)	19-11/16 (500)	5-17/32 (141)	4-5/16 (110)	3/4 (19)	16.0 (7.3)
		6-29/32 (176)	23-13/16 (605)	4-5/8 (118)	19-11/16 (500)	5-17/32 (141)	5-9/32 (134)	3/4 (19)	
3	E1 Plus Solid-State	9-1/8 (232)	31-1/16 (789)	7-19/32 (193)	27-9/16 (700)	7-1/2 (191)	7-1/16 (179)	2-1/8 (54)	74.8 (33.9)
		10-3/32 (256)	35-9/16 (903)	7-19/32 (193)	34-23/32 (882)	7-1/2 (191)	7-5/32 (182)	1-25/32 (29)	
4	E1 Plus Solid-State	11-23/32 (298)	35 (889)	8-13/16 (224)	31-1/2 (800)	8-21/32 (220)	7-15/32 (190)	3-7/32 (82)	98.0 (44.4)
		11-23/32 (298)	37-23/32 (958)	8-13/16 (224)	36-13/16 (935)	8-21/32 (220)	8-23/32 (222)	1-25/32 (29)	
5	E1 Plus Solid-State	11-29/32 (303)	42-3/16 (1072)	9-17/32 (242)	41-9/32 (1049)	8-21/32 (220)	9-9/32 (236)	4 (102)	113 (51.2)
		11-29/32 (303)	42-3/16 (1072)	9-17/32 (242)	41-9/32 (1049)	8-21/32 (220)	9-9/32 (236)	4 (102)	

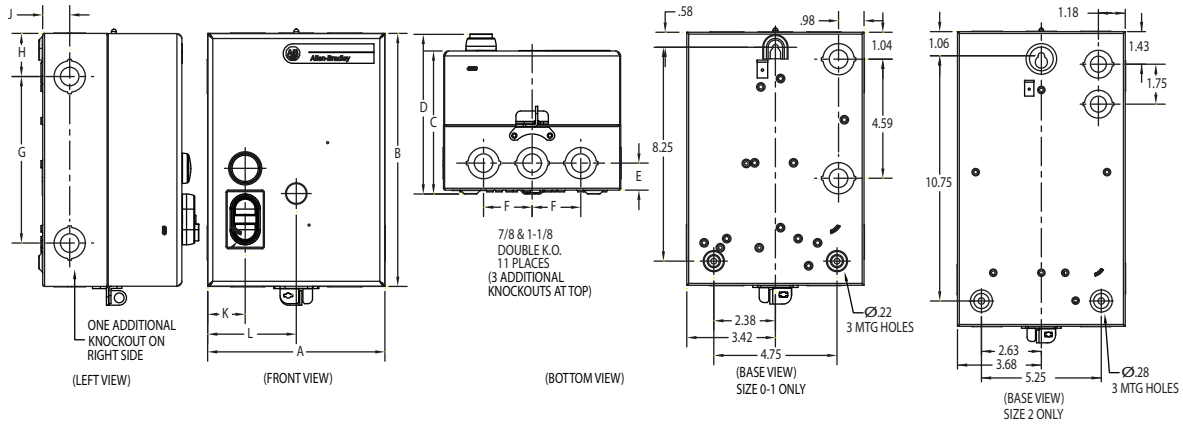
* Allow additional space for internal wiring.

Approximate Dimensions

For NEMA AC Contactors/Starters

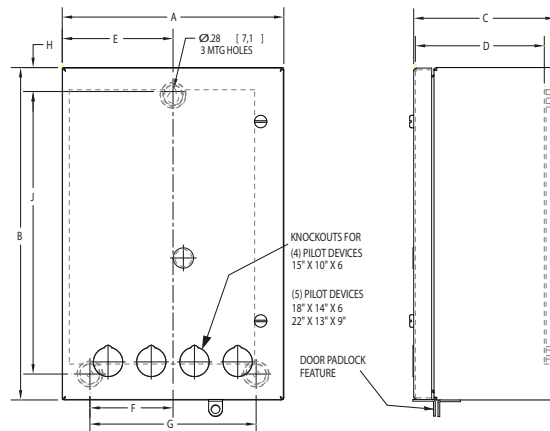
Approximate dimensions are shown in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Type 1 General Purpose Lift-Off Enclosure for Bulletins 500, 500L, & 509 Contactors & Starters 3-Pole



NEMA Size/ Current Rating	Bulletin No.	Dimensions in Inches (Millimeters)										
		A Width	B Height	C Depth	D	E	F	G	H	J	K	L
00...1	500 & 509											
5/10 A 15/20 A 30 A	500L	6.84 (174)	9.76 (248)	5.52 (140)	6.16 (156)	1.04 (26)	1.88 (48)	6.42 (163)	1.66 (42)	1.04 (26)	1.45 (37)	3.42 (87)
2	500 & 509											
60 A	500L	7.35 (187)	12.91 (328)	5.53 (140)	6.24 (158)	1.27 (32)	2.38 (60)	8.88 (226)	1.94 (49)	1.27 (32)	1.49 (38)	3.68 (93)

Type 1 Hinged Enclosure — with or without Control Transformer for Bulletins 500, 500L, 500LP, 505, 509, 520E, 520F, & 520G Contactors & Starters 3-...5-Pole



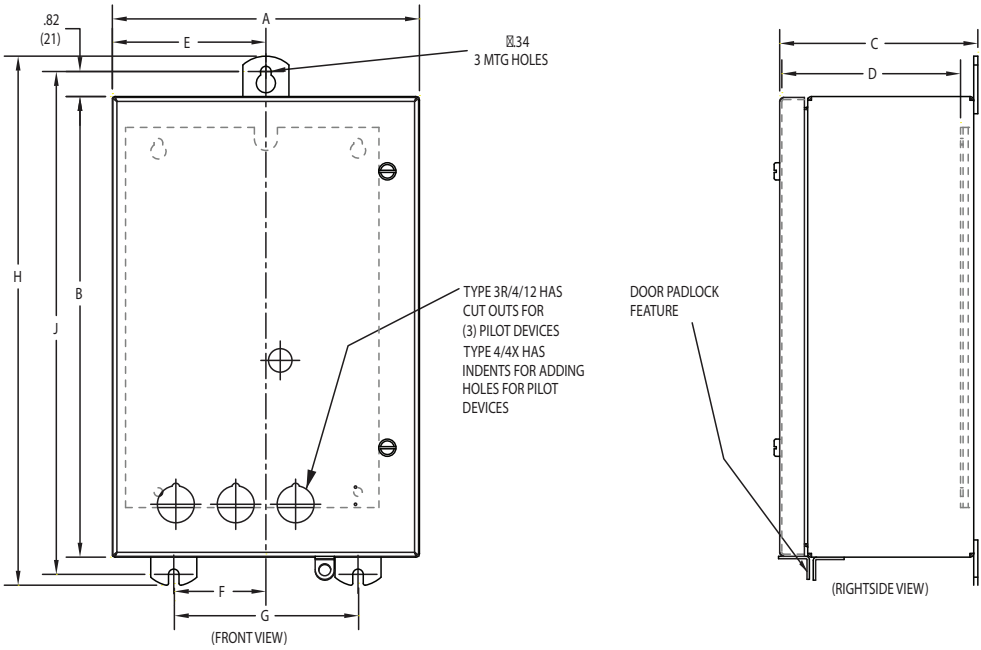
NEMA Size/ Current Rating	Bulletin No.	Dimensions in Inches (Millimeters)								
		A Width	B Height	C Depth	D	E (Mounting)	F (Mounting)	G (Mounting)	H	J (Mounting)
00...1	500 & 509	10.00 (254)	15.00 (381)	6.39 (162)	5.82 (148)	5.00 (127)	3.75 (95)	7.50 (191)	1.08 (27)	12.75 (324)
15...30 A	500L & 500LP									
2	500 & 509									
60 A	500L & 500LP	14.00 (356)	18.00 (457)	6.39 (162)	5.83 (148)	7.00 (178)	5.75 (146)	11.50 (292)	1.00 (25)	15.75 (400)
0...1	505 & 520									
3	500 & 509									
100 A	500L & 500LP	13.00 (330)	22.00 (559)	8.50 (216)	7.89 (201)	6.50 (165)	5.25 (133)	10.50 (267)	1.08 (27)	19.75 (502)
2	505 & 520									

Note: For Types 3R/12, 4/4X, 4X, and Bolted Type 7 & 9 and 3R, 7 & 9 dimensions, please contact your local Rockwell Automation sales office or Allen-Bradley distributor.

Bulletin 500 Line
Approximate Dimensions
 For NEMA AC Contactors/Starters

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

Type 3R/12, 4/4X Enclosure — with or without Control Transformer for Bulletins 500, 500L, 505, 509, 520E, 520F, & 520G Contactors & Starters 3-...5-Pole



NEMA Size/ Current Rating	Bulletin No.	Approximate Dimensions In Inches (Millimeters)								
		A Width	B Height	C Depth	D	E (Mounting)	F (Mounting)	G (Mounting)	H	J (Mounting)
00...1	500 & 509	10.00 (254)	15.00 (381)	6.45 (164)	5.82 (148)	5.00 (127)	3.00 (76)	6.00 (152)	17.23 (438)	16.38 (416)
15...30 A	500L & 500LP	14.00 (356)	18.00 (457)	6.45 (164)	5.83 (148)	7.00 (178)	5.00 (127)	10.00 (254)	20.23 (514)	19.38 (492)
2	500 & 509	13.00 (330)	22.00 (559)	8.57 (218)	7.89 (201)	6.50 (165)	4.43 (113)	9.00 (229)	24.23 (615)	23.38 (594)
60 A	500L & 500LP									
0...1	505 & 509									
3	500 & 509									
100 A	500L & 500LP									
2	505 & 520									

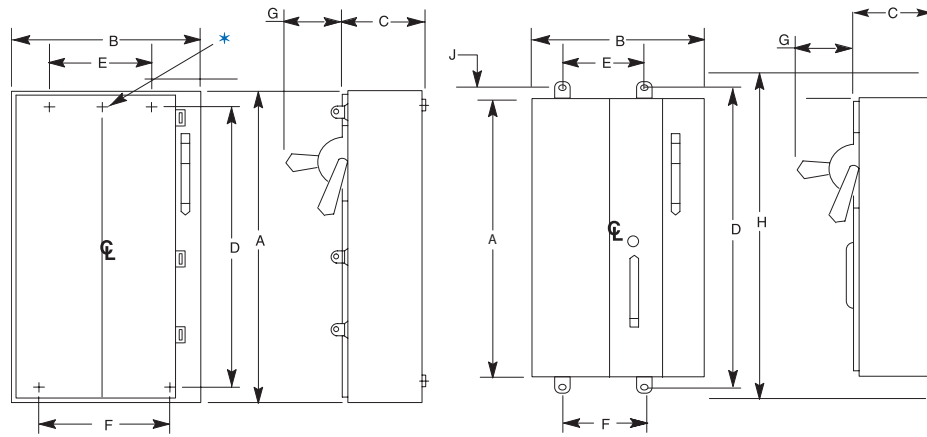
Approximate Dimensions

For NEMA AC Contactors/Starters

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

Type 1 (Enclosure Code "A") General Purpose Painted Enclosure for Bulletins 500, 500L, 502, 502L, 503, 503L, 505, 506, 506X, 507, 507X, 509, 512, 512M, 512V, 513, 513M, 513V, 520E, 520F, 520G, 522E, 522F, 522G, 523E, 523F, 523G, 530, 532, 533, 540, 542, 543, 570, 572 and 573

1



Size 1...4 Size 5

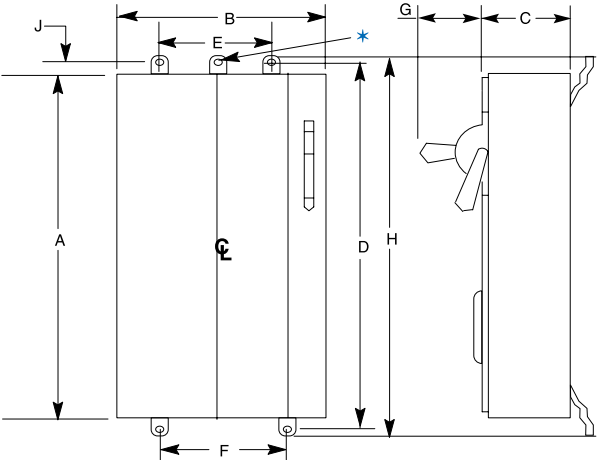
NEMA Size	Bulletin No.	Approximate Dimensions in Inches (Millimeters)							Approx. Shipping Weight [lb (kg)]
		A Height	B Width	C Depth	D Mounting	E Mounting	F Mounting	G Handle Depth	
0...2	506X, 507X	27.50 (968)	10.50 (267)	8.25 (210)	25.13 (639)	*	5.25 (133)	5.56 (141)	40 (18.14)
0...2	502, 502L, 503, 503L, 512, 513								
0...2	506, 507, 512M, 513M, 522E, 522F, 522G, 523E, 523F, 523G	30 (762)	20.5 (521)	9.88 (251)	27.63 (702)	15.25 (387)	15.25 (387)	5.56 (141)	90 (40.82)
3	502, 502L, 503, 503L, 505, 512, 513, 520E, 520F, 520G								
4	500, 500L, 503, 503L, 509, 513								
1PW, 2PW 1YD	530, 532, 533 540, 542, 543								
3	506, 507, 522E, 522F, 522G, 523E, 523F, 523G	50 (1270)	22 (559)	11.19 (284)	47.63 (1210)	15.25 (387)	15.25 (387)	5.56 (141)	250 (113.4)
4	500LP, 505, 506, 507, 520E, 520F, 520G, 522E, 522F, 522G, 523E, 523F, 523G								
4	502, 502L, 512								
5	500, 500L, 505, 509, 520E, 520F, 520G								
3PW	530, 532, 533								
2YD, 3YD	540, 542, 543								
2	570, 572, 573								
5	502, 502L, 503, 503L, 506, 506X, 507, 507X, 512, 513, 523E, 523F, 523G	56 (1422)	30.5 (775)	13.79 (350)	57.63 (1463)	20 (508)	25.25 (641)	7.62 (194)	360 (163.3)
6	500, 500L, 505, 509, 520E								
4PW	530, 532, 533								
5PW	532, 533								
4YD	540, 542, 543								
3, 4	570, 572, 573								
5YD	540, 542, 543	60 (1524)	37.38 (949)	16.00 (406)	61.69 (1567)	33.88 (861)	33.88 (861)	7.62 (194)	420 (190.5)
5, 6	570, 572, 573								
5	522E, 522F, 522G								
5PW	530								

* Sizes 0, 1, and 2 have one top mounting hole located on the center line. Larger size enclosures have two top mounting holes located as shown.



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

Type 3R/4/12 (Enclosure Codes "D", "F", and "J") Rainproof, Dusttight — Industrial Use Enclosures for Bulletins 500, 500L, 502, 502L, 503, 503L, 505, 506, 506X, 507, 507X, 509, 512, 512M, 512V, 513, 513M, 513V, 520E, 520F, 520G, 522E, 522F, 522G, 523E, 523F, 523G, 530, 532, 533, 540, 542, 543, 570, 572 and 573



NEMA Size	Bulletin No.	Approximate Dimensions in Inches (Millimeters)									Approx. Shipping Weight [lb (kg)]
		A Height	B Width	C Depth	D Mounting	E Mounting	F Mounting	G Handle Depth	H	J	
0...2	506X, 507X	27.50 (698)	10.50 (267)	8.25 (210)	28.88 (733)	*	5.25 (133)	5.56 (141)	29.88 (759)	0.81 (21)	40 (18.14)
	502, 507, 503, 503L, 512, 513										
	506, 507, 512M, 513M, 522E, 522F, 522G, 523E, 523F, 523G										
3	502, 507, 503, 503L, 505, 512, 513, 520E, 520F, 520G	30 (762)	20.5 (521)	10.19 (259)	31.38 (797.05)	15.25 (387)	15.25 (387)	5.56 (141)	32.38 (822)	0.81 (21)	90 (40.82)
4	500, 500L, 509, 513										
1PW, 2PW	530, 532, 533										
1YD	540, 542, 543										
3	506, 507, 522E, 522F, 522G, 523E, 523F, 523G										
4	500LP, 502, 502L, 505, 507, 512, 520E, 520F, 520G, 522E, 522F, 522G, 523E, 523F, 523G	50 (1270)	22 (559)	11.5 (292)	51.38 (1305)	15.25 (387)	15.25 (387)	5.56 (141)	52.38 (1330)	0.71 (18)	250 (113.4)
5	500, 500L, 509, 520E, 520F, 520G										
3PW	530, 532, 533										
2YD, 3YD	540, 542, 543										
2	570, 572, 573										
4PW	530, 532, 533										
5PW	532, 533										
4YD	540, 542, 543										
3, 4	570, 572, 573	56 (1422)	30.5 (775)	13.79 (350)	57.63 (313)	20 (508)	25.25 (641)	7.62 (194)	62.62 (1590)	1 (25.4)	360 (163.3)
5	502, 502L, 503, 503L, 506, 512, 513, 523E, 523F, 523G										
6	500, 500L, 505, 509, 512*, 513, 520E										
6	512‡										
5	522E, 522F, 522G	60 (1524)	37.38 (949)	16 (906)	61.69 (1567)	33.88 (861)	33.88 (861)	7.62 (194)	63.5 (1613)	1.5 (38)	420 (190.5)
5PW	530										
5YD	540, 542, 543										
5, 6	570, 572, 573										
7	512, 513	84 (2134)	39.5 (1003)	18 (457)	—	—	—	7.62 (194)	—	—	650 (249.8)

* Sizes 0, 1, and 2 have one top mounting hole located on the center line. All sizes in large enclosures have two top mounting holes located as shown.
 * Fusible disconnect switch with Class J fuses.
 ‡ Fusible disconnect switch with Class R fuses.

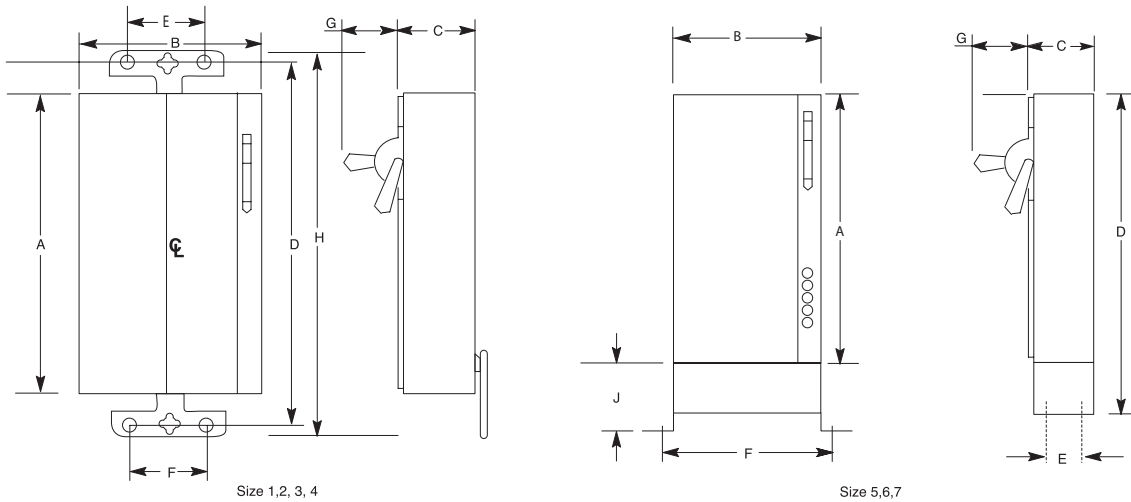
Approximate Dimensions

For NEMA AC Starters

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

Type 3R (Enclosure Code "N") Rainproof. Enclosures with Extra Panel Space Bulletins 1232X, 1233X, 1242, 1243, 1272, 1273, 1282, 1283

1

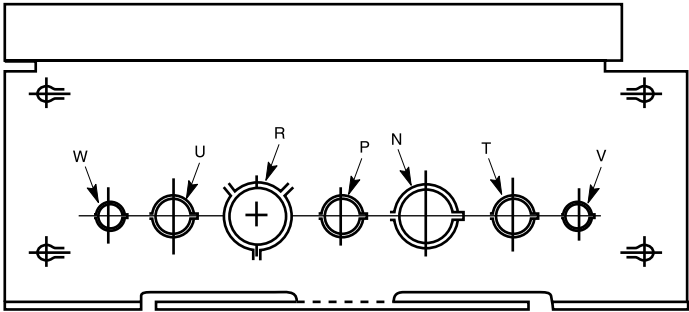


NEMA Size	Bulletin No.	Approximate Dimensions in Inches (Millimeters)									Approx. Shipping Weight [lb (kg)]
		A Height	B Width	C Depth	D Mounting	E Mounting	F Mounting	G Handle Depth	H	J	
1...2	1232X	30	20.5	8.72	34.88	10	10	5.56	36.38	—	90
1...2	1233X	(762)	(521)	(221)	(886)	(254)	(254)	(141)	(924)	—	(40.82)
3...4	1232X, 1233X	50 (1270)	22 (559)	9.90 (251)	54.88 (1394)	15.25 (387)	15.25 (387)	5.56 (141)	56.38 (1432)	—	250 (113.4)
1PW, 2PW	1282, 1283										
1YD, 2YD	1242, 1243										
2	1272, 1273										
4	1232X										
3PW, 4PW	1282	56 (1422)	30.5 (775)	13.78 (350)	—	11 (279)	40.72 (1034)	7.62 (194)	—	—	360 (163.3)
3PW...5PW	1283										
3YD, 4YD	1242										
3YD...5YD	1243										
3, 4	1272										
3...5	1273										
5	1232X, 1233X	56 (1422)	30.5 (775)	13.78 (350)	65.68 (1668)	11 (279)	33.84 (860)	7.62 (194)	—	9.68 (246)	360 (163.3)
6	1233X										
5PW	1282										
5YD	1242										
5, 6	1272										
6	1273										
6	1232X*										
6	1232X*	60 (1524)	37.38 (949)	16 (406)	69.68 (1769.9)	11 (279)	40.72 (1034)	7.62 (194)	—	9.68 (246)	420 (190.5)
7	1232X, 1233X	84 (2134)	39.5 (1003)	18 (457)	93.68 (2379.5)	11 (279)	42.84 (1088)	7.62 (194)	—	9.68 (246)	650 (294.8)

* Fusible disconnect switch with Class J fuses.
 * Fusible disconnect switch with Class R fuses.

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

Type 3R (Enclosure Code "N") Rainproof Enclosures with Extra Panel Space — for Bulletins 1232X and 1233X



Bulletin No.	NEMA Size	Approximate Dimensions in Inches (Millimeters)							
		N		P		R		T	
		Inside	Outside	Inside	Outside	Inside	Outside	Inside	Outside
1232X 1233X	1	1-3/8 (35)	1-23/32 (44)	7/8 (22)	1-1/8 (29)	1-23/32 (44)	1-31/32 (50)	7/8 (22)	1-1/8 (29)
	2	1 in. Hub	1-1/4 in. Hub	1/2 in. Hub	3/4 in. Hub	1-1/4 in. Hub	1-1/2 in. Hub	1/2 in. Hub	3/4 in. Hub
	3	7/8 (22)	1-1/8 (29)	1-31/32 (50)	2-15/32 (63)	1-3/8 (35)	—	1-3/8 (35)	1-23/32 (44)
	4	1/2 in. Hub	3/4 in. Hub	1-1/2 in. Hub	2 in. Hub	1 in. Hub	—	1 in. Hub	1-1/4 in. Hub
	5	7/8 (22) 1/2 in. Hub	1-1/8 (29) 3/4 in. Hub	—	—	1-31/32 (50) 1-1/2 in. Hub	2-15/32 (63) 2 in. Hub	1-31/32 (50) 1-1/2 in. Hub	2-15/32 (63) 2 in. Hub

Bulletin No.	NEMA Size	Approximate Dimensions in Inches (Millimeters)					
		U		V		W	
		Inside	Outside	Inside	Outside	Inside	Outside
1232X 1233X	1	7/8 (22)	1-1/8 (29)	—	—	7/8 (22)	1-1/8 (29)
	2	1/2 in. Hub	3/4 in. Hub	—	—	1/2 in. Hub	3/4 in. Hub
	3	7/8 (22)	1-1/8 (29)	1-31/32 (50)	2-15/32 (63)	3 (76)	3 (76)
	4	1/2 in. Hub	3/4 in. Hub	1-1/2 in. Hub	2 in. Hub	2-1/2 in. Hub	2-1/2 in. Hub
	5	7/8 (22) 1/2 in. Hub	1-1/8 (29) 3/4 in. Hub	3 (76) 2-1/2 in. Hub	3-5/8 (96) 3 in. Hub	3 (76) 2-1/2 in. Hub	3-5/8 (96) 3 in. Hub

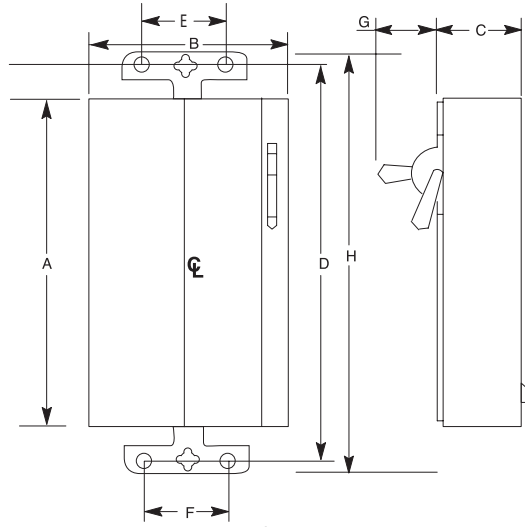
Approximate Dimensions

For NEMA AC Contactors

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

Type 3R (Enclosure Code "N") Rainproof - Narrow Enclosure for Bulletins 1232 and 1233

1



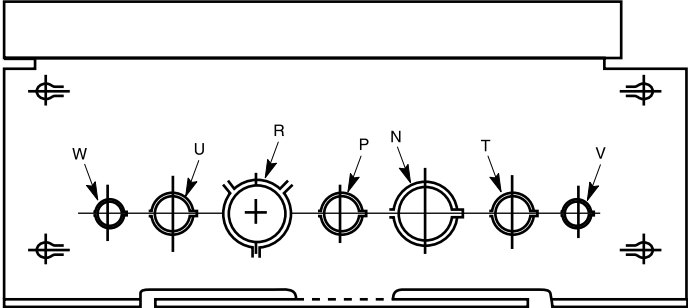
Size 1, 2, 3, 4

NEMA Size	Approximate Dimensions in Inches (Millimeters)								Approx. Shipping Weight [lb (kg)]
	A Height	B Width	C Depth	D Mounting	E Mounting	F Mounting	G Handle Depth	H	
1...2	27.50 (698)	10.5 (267)	8.26 (210)	28.88 (733)	*	7 (178)	5.56 (141)	29.75 (756)	40 (18.14)
3	30 (762)	20.5 (521)	8.72 (221)	34.88 (886)	10 (254)	10 (254)	5.56 (141)	36.38 (924)	90 (40.82)

* Sizes 1 and 2 have one top mounting hole located on the center line. All sized in large enclosures have two top mounting holes located as shown.

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

Type 3R (Enclosure Code "N") Rainproof Narrow Enclosures — for Bulletins 1232 and 1233



Bulletin No.	NEMA Size	Approximate Dimensions in Inches (Millimeters)							
		N		P		R		T	
		Inside	Outside	Inside	Outside	Inside	Outside	Inside	Outside
1232 1233	1	1-3/8 (35)	1-23/32 (44)	7/8 (22)	1-1/8 (29)	1-23/32 (44)	1-31/32 (50)	7/8 (22)	1-1/8 (29)
	2	1 in. Hub	1-1/4 in. Hub	1/2 in. Hub	3/4 in. Hub	1-1/4 in. Hub	1-1/2 in. Hub	1/2 in. Hub	3/4 in. Hub
	3	7/8 (22) 1/2 in. Hub	1-1/8 (29) 3/4 in. Hub	1-31/32 (50) 1-1/2 in. Hub	2-15/32 (63) 2 in. Hub	1-3/8 (35) 1 in. Hub	1-31/32 (50) 1-1/2 in. Hub	1-3/8 (35) 1 in. Hub	1-23/32 (44) 1-1/4 in. Hub

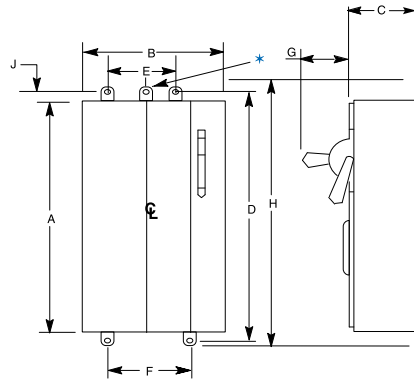
Bulletin No.	NEMA Size	Approximate Dimensions in Inches (Millimeters)					
		U		V		W	
		Inside	Outside	Inside	Outside	Inside	Outside
1232 1233	1	7/8 (22)	1-1/8 (29)	—	—	7/8 (22)	1-1/8 (29)
	2	1/2 in. Hub	3/4 in. Hub	—	—	1/2 in. Hub	3/4 in. Hub
	3	7/8 (22) 1/2 in. Hub	1-1/8 (29) 3/4 in. Hub	1-31/32 (50) 1-1/2 in. Hub	2-15/32 (63) 2 in. Hub	3 (76) 2-1/2 in. Hub	3 (76) 2-1/2 in. Hub

Approximate Dimensions

For NEMA AC Contactors/Starters

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

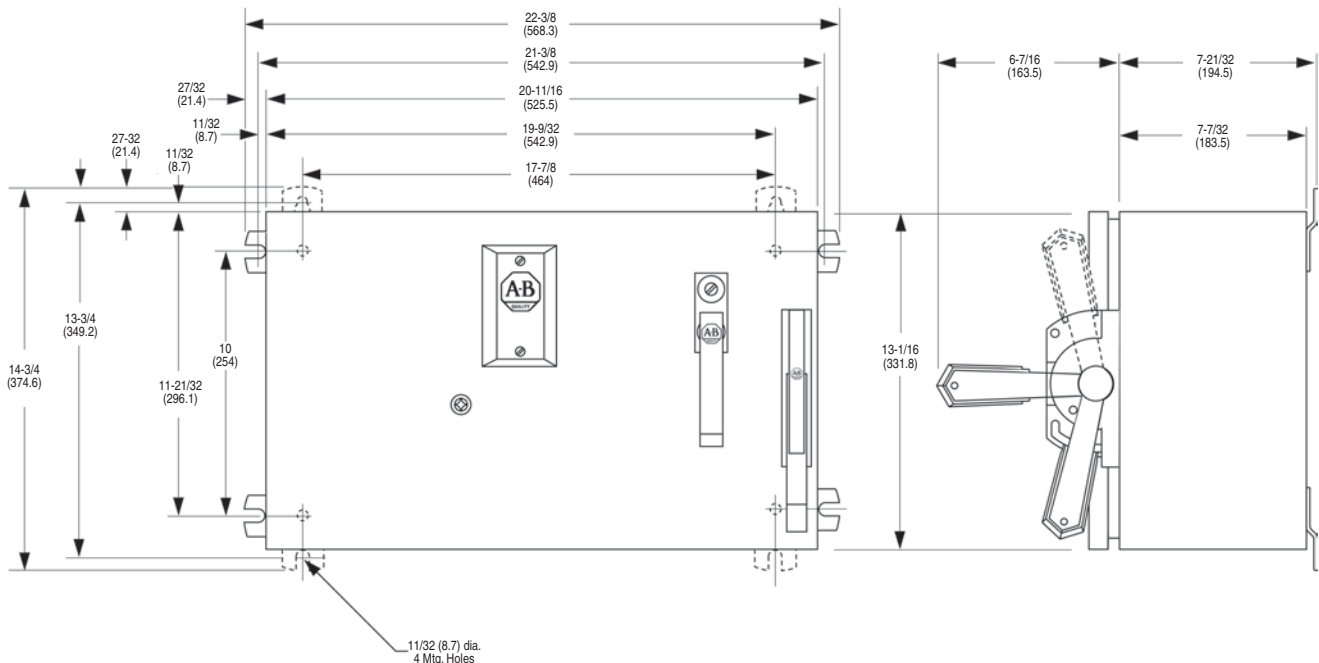
Type 4/4X (Enclosure Codes "C") Stainless Steel — Industrial Use Enclosures for Bulletins 500, 500L, 502, 502L, 503, 503L, 505, 506, 507, 509, 512, 512M, 513, 513M, 520E, 520F, 520G, 522E, 522F, 522G, 523E, 523F, and 523G



NEMA Size	Bulletin No.	A Height	B Width	C Depth	D Mounting	E Mounting	F Mounting	G Handle Depth	H	J	Approx. Shipping Weight [lb (kg)]
0...2	502, 502L, 503, 503L, 512, 513	27.50 (698)	10.50 (267)	8.25 (210)	28.88 (733)	*	7 (178)	5.56 (141)	29.75 (756)	0.81 (21)	40 (18.14)
0...2	506, 507, 512M, 513M, 522E, 522F, 522G, 523E, 523F, 523G,	30 (762)	20.5 (521)	9.88 (251)	31.38 (797)	17 (432)	17 (432)	5.56 (141)	32.26 (819)	0.81 (21)	90 (40.82)
3	502, 502L, 503, 503L, 505, 512, 513, 520E, 520F, 520G										
4	500, 500L, 503, 503L, 509, 513	50 (1270)	22 (559)	11.19 (284)	51.38 (1305)	18.5 (470)	18.5 (470)	5.56 (141)	52.26 (1327)	0.81 (21)	250 (113.4)
3	506, 507, 522E, 522F, 522G, 523E, 523F, 523G										
4	500LP, 502, 502L, 505, 506, 507, 512, 520E, 520F, 520G, 522F, 523G, 523E, 523F, 523G										
5	500, 500L, 505, 509, 520E, 520F, 520G	56 (1422)	30.5 (775)	12.34 (313)	57.63 (1464)	20 (508)	25.25 (641)	5.56 (141)	58.62 (1489)	1 (25.4)	360 (163.3)
5...6	503, 503L, 507, 513, 523E, 523F, 523G										
5	512										
6	500, 500L, 505, 509, 512*, 520E										
5...6	502, 502L, 506							7.62 (194)			

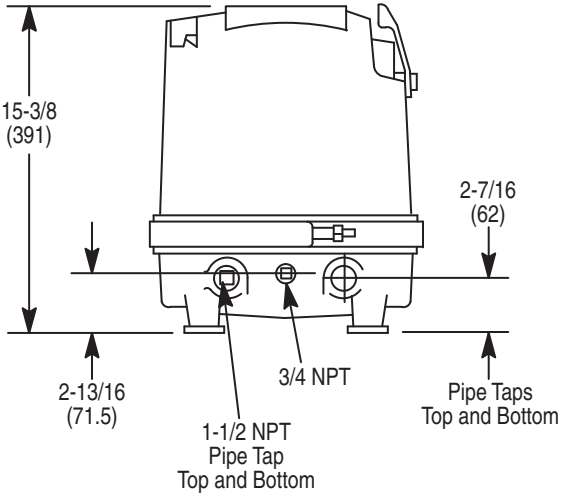
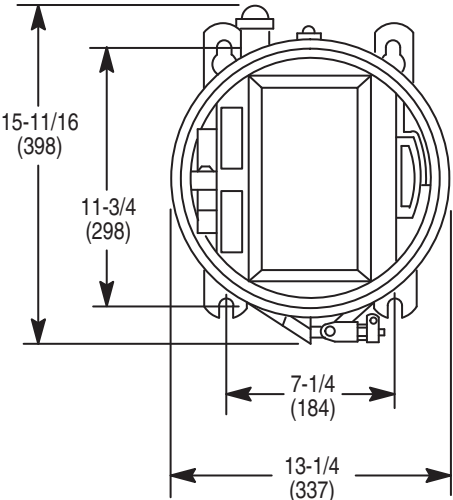
* Sizes 0, 1, and 2 have one top mounting hole located on the center line. All sizes in large enclosures have two top mounting holes located as shown.
 * Fusible disconnect switch with Class J fuses.

Type 12 (Enclosure Codes "J") Stainless Steel — Industrial Use Horizontal Enclosures for Bulletins 512H and 513H

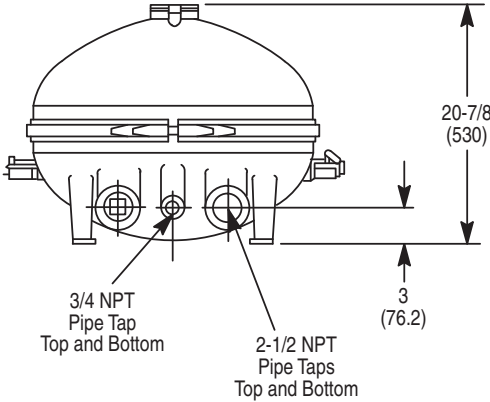
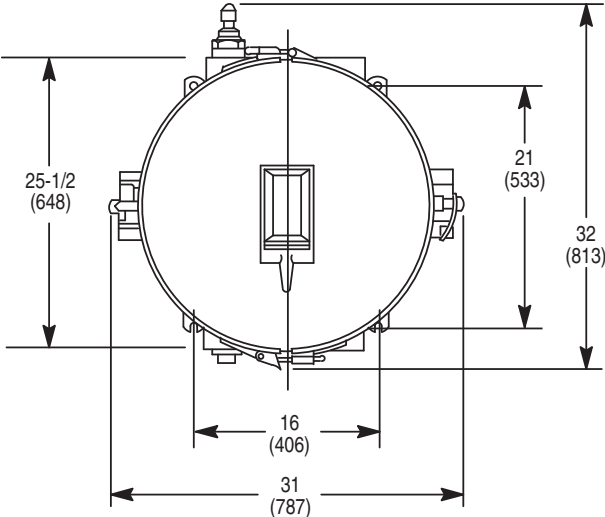


Approximate dimensions are shown in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Unilock Enclosures — Type 3R, 7 & 9, Class I (Enclosure Code "U") Groups C & D, Class II, Groups E, F & G — Divisions 1 & 2 for Bulletins 505, 509, and 513



Sizes 0...2



Sizes 3...5

Note: For bolted enclosures Type 7 & 9 and Type 3R, 7, & 9 dimensions, consult factory.

Approximate Dimensions

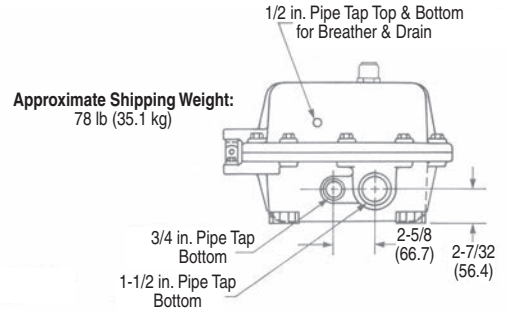
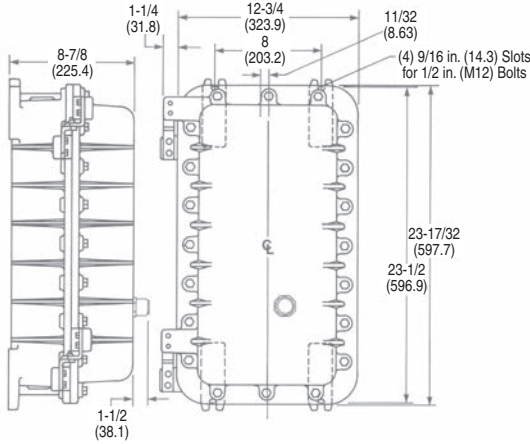
For NEMA AC Contactors

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

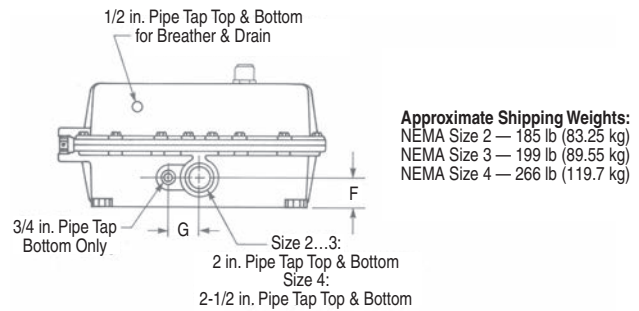
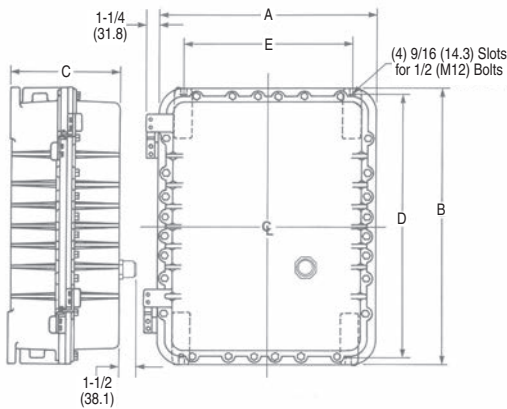
Bolted Enclosures — Type 7 & 9 and Type 3R, 7 & 9, Class I, Groups C & D, Class II, Groups E, F, & G — Divisions 1 & 2 for Bulletin 505 Full Voltage Reversing Starters

NEMA Sizes 0...1

1



NEMA Sizes 2...4



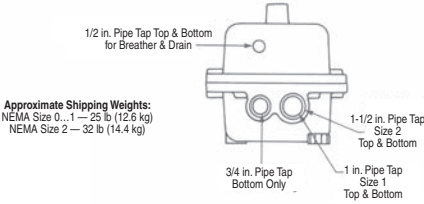
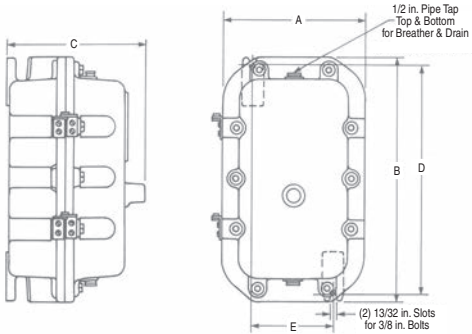
NEMA Size	Approximate Dimensions in Inches (Millimeters)						
	A Wide	B High	C Deep	D	E	F	G
2	21	26-3/4	10-7/32	25-1/2	16-1/4	2-7/16	2-5/8
3	(533.4)	(679.5)	(259.6)	(647.7)	(412.8)	(61.9)	(66.7)
4	21-3/8	32-5/8	11-7/16	31-3/8	16-1/4	2-13/16	3-1/2
	(542.9)	(828.7)	(290.5)	(796.9)	(412.8)	(71.4)	(88.9)



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

Bolted Enclosures — Type 7 & 9 and Type 3R, 7 & 9, Class I, Groups C & D, Class II, Groups E, F & G — Divisions 1 & 2 for Bulletin 509 Full Voltage Starters

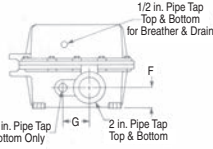
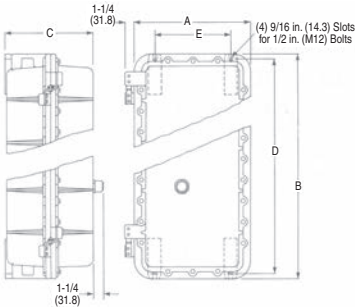
NEMA Sizes 0...2



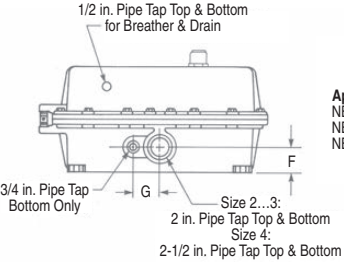
Approximate Shipping Weights:
 NEMA Size 0...1 — 25 lb (12.6 kg)
 NEMA Size 2 — 32 lb (14.4 kg)

NEMA Size	Approximate Dimensions in Inches (Millimeters)				
	A Wide	B High	C Deep	D	E
0...1	8-3/4 (222.2)	15-1/16 (382.6)	8-13/18 (208.8)	14-3/16 (360.4)	5 (127)
2	8-7/8 (225.4)	18-5/16 (465.1)	8-13/16 (208.8)	17-7/16 (442.9)	5-3/8 (136.5)

NEMA Sizes 3...4



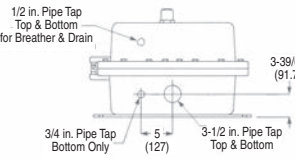
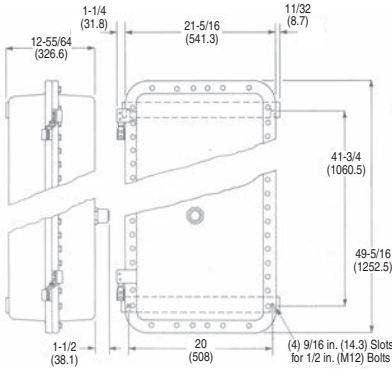
Approximate Shipping Weights:
 NEMA Size 3 — 81 lb (36.45 kg)
 NEMA Size 4 — 136 lb (61.2 kg)



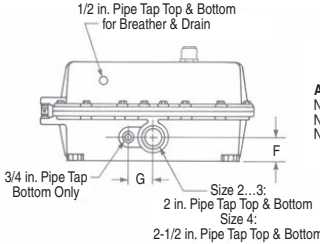
Approximate Shipping Weights:
 NEMA Size 2 — 185 lb (83.25 kg)
 NEMA Size 3 — 199 lb (89.55 kg)
 NEMA Size 4 — 266 lb (119.7 kg)

NEMA Size	Approximate Dimensions in Inches (Millimeters)						
	A Wide	B High	C Deep	D	E	F	G
3	12-3/4 (323.9)	23-17/32 (597.7)	8-7/8 (225.4)	23-1/2 (596.9)	8 (203.2)	2-7/32 (56.4)	2-5/8 (66.7)
4	15-1/8 (384.2)	32-5/8 (828.7)	10-3/8 (269.9)	31-3/8 (796.9)	10 (254)	2-9/18 (65.1)	3-1/2 (88.9)

NEMA Size 5



Approximate Shipping Weight:
 387 lb (174.15 kg)



Approximate Shipping Weights:
 NEMA Size 2 — 185 lb (83.25 kg)
 NEMA Size 3 — 199 lb (89.55 kg)
 NEMA Size 4 — 266 lb (119.7 kg)

Approximate Dimensions

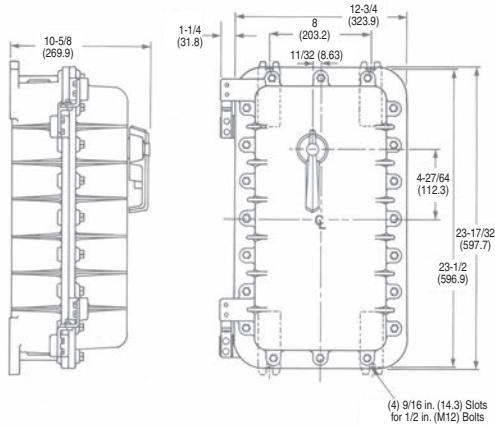
For NEMA AC Contactors

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

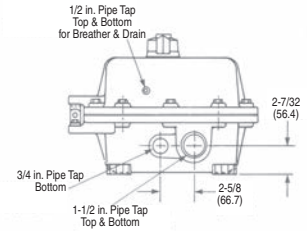
Bolted Enclosures — Type 7 & 9 and Type 3R, 7 & 9, Class I, Groups C & D, Class II, Groups E, F & G — Divisions 1 & 2 for Bulletin 513 Full Voltage Combination Starters

NEMA Sizes 0...2

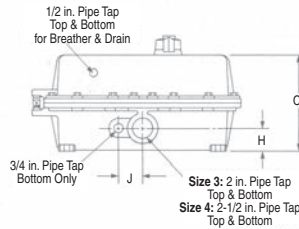
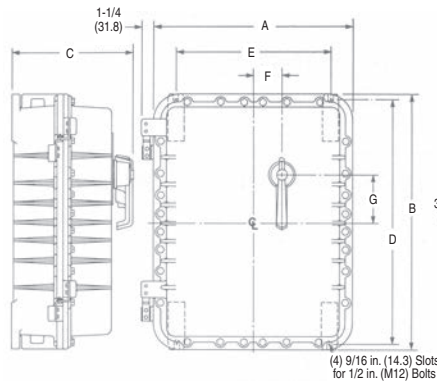
1



Approximate Shipping Weight:
83 lb (37.35 kg)

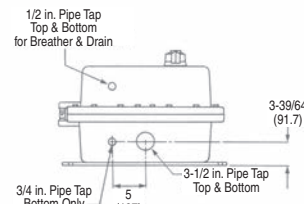
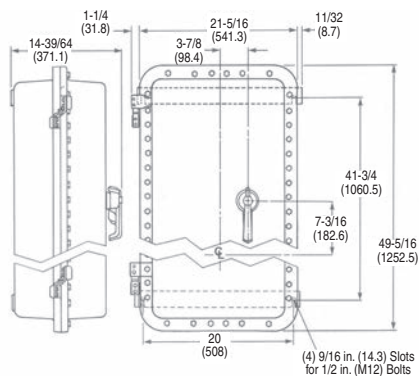


NEMA Sizes 3...4



NEMA Size	Approximate Dimensions in Inches (Millimeters)									Approx. Shipping Weight [lb (kg)]
	A Wide	B High	C Deep	D	E	F	G	H	J	
3	21 (533.4)	26-3/4 (679.5)	11-31/32 (304.1)	25-1/2 (647.7)	16-1/4 (412.8)	2-7/8 (73)	4-13/16 (122.2)	2-7/16 (61.9)	2-5/8 (66.7)	200 (90)
4	21-3/8 (542.9)	32-5/8 (828.7)	13-3/16 (335)	31-3/8 (796.9)	16-1/4 (412.8)	2-11/16 (68.3)	5-1/4 (133.4)	2-13/16 (71.4)	3-1/2 (88.9)	275 (123.8)

NEMA Size 5



Approximate Shipping Weight:
430 lb (193.5 kg)



Bulletin 500 Line of Contactors and Starters (excluding Modular Kits)



Used on Size 00, Series B



Used on Size 00, Series D



Used on Size 0...5

1

AC Operating Coils

Voltage [V]	Frequency [Hz]	Size 00		Size 0...1 Size 15/20...30 A		Size 2 Size 60 A	
		Series B	Series D	2-...3-Pole*	4-Pole* 4-...5-Pole*	2-Pole* 2-...3-Pole*	3-...4-Pole* 4-...5-Pole*
		Part. No.					
24	50	GA407	TA407	—	—	—	—
	60	GA013	TA013	CB013		CC013	CC013C
110 120	50	GA473‡	TA473	CB236		CC236	CC236C
	60	—					
200...208	60	GA049	TA049	CB249		CC249	CC249C
220 240	50	GA474§	TA474§	CB254		CC254	CC254C
	60						
277	60	GA060	TA480	CB260		CC260	CC260C
380	50	GA454	TA071	CB354	CB354C	CC354	CC354C
415	50	GA457	TA457	CB357	CB357C	CC357	CC357C
440 480	50	GA475	TA475	CB273		CC273	CC273C
	60	—	—				
550 600	50	—	TA476	CB278		CC278	CC278C
	60	GA476					
Voltage [V]	Frequency [Hz]	Size 3 Size 100 A		Size 4 Size 200 A		Size 5 Size 300 A	
		2-Pole* 2-...3-Pole*	3-...4-Pole* 4-...5-Pole*	2-Pole* 2-...3-Pole*	3-...4-Pole* 4-...5-Pole*	Series L	
		Part. No.					
24	60	CD013	CD013C	—	—	—	—
110 120	50	CD236	CD236C	CE236	CE236C	AF236	
	60						
200...208	60	CD249	CD249C	CE249	CE249C	AF249	
220 240	50	CD254	CD254C	CE254	CE254C	AF254	
	60						
277	60	CD260	CD260C	CE260	CE260C	AF260	
380	50	CD354	CD354C	CE354	CE354C	AF354	
415	50	CD357	CD357C	CE357	CE357C	AF357	
440 480	50	CD273	CD273C	CE273	CE273C	AF273	
	60						
550 600	50	CD278	CD278C	CE278	CE278C	AF278	
	60						

* For non-motor loads (Bulletin 500L).
 * For motor rated contactors and starters.
 ‡ Also for 120V, 60Hz.
 § Also for 240V, 60Hz.

Bulletin 500 Line of Contactors and Starters (excluding Modular Kits), Continued

1

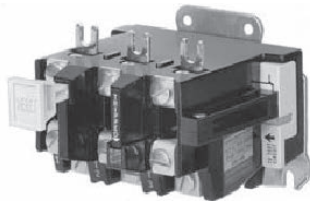
Single Pole Contact Kit — Sizes 00...5 (Includes Front and Rear Stationary Contact, Movable Contact and Contact Spring)



Motor Rated Contactors and Starters (Bulletin 500, 505, 509, and 520)			Non-Motor Rated Contactors (Bulletin 500L)		
Size	Part No.	Size	No. of Poles	Part No.	
0	‡ 40410-331-51	15/20 A	2...3	‡ 40410-331-53	
1	‡ 40410-331-52	30 A	2...3	‡ 40410-331-54	
1P	‡ 40410-331-55	60 A	2...3	‡ 40420-322-52	
2	‡ 40420-322-51	100 A	2...3	40430-300-52	
			4	40430-300-53	
3	40430-300-51	200 A	2...3	40440-325-52	
4	40440-300-51		4	40440-325-53	
—		300 A (Series A)	2	Z-34119	
			3	Z-34120	
5 (Series L)	42450-805-01	300 A (Series L)	2...3	42450-805-02	
6 (Series B&C)	40783-802-02	540A (Series B&C)	3	40783-802-02	

Manual Reset (Eutectic Alloy) Overload Relays

Heater Elements — Order heater elements as a separate item. See page 1-167 for heater element selection tables.



Size	Cat. No.
3-Phase or 1-Phase (3 elements)	
00 (Series B & D)	592-JOV16
0, 1	592-EUTB
2	592-EUTC
3	592-EUTD
4	592-EUTE
5	592-BOV16
1-Phase (1 element)	
Size	Part No.
00 (Series B & D)	Cat. No. 592-BOV4
0, 1	42185-804-01
1P	40185-803-01
2	40185-804-01
3	40185-805-01

Note: Auxiliary contacts on Size 3 and 4 overload relays are replaceable. Order Cat. No. 595-A34. See page 1-112 for complete information.

‡ Not for use on Power Pole Adders. Replace complete Power Pole Adder Kit with one selected from the listing on page 1-112.

➤ Mounting plate is not included.

Power Pole Adder Kit (Used Only for 4- and 5-Pole Devices)



Motor Rated Contactors and Starters	
Size	Cat. No.
0...1	599-P01A
2	599-P2A
3	599-P3A
4	599-P4A
Non-Motor Rated Contactors	
Rating [A]	Part No.
15/20	40410-452-04
30	40410-452-08
60	40420-452-04
100	40430-453-51
200	40440-452-51
300	42450-600-01

Starters Without Overload Relays for Field Assembly of Starters Using Bulletin 592 Overload Relays ❖

These products are intended for field installation of Bulletin 592 Eutectic, or 592 electronic overload relays (select Bulletin 592 overload relays from page 1-161...page 1-164). The overload relays ship in a starter carton with provisions for mounting the overload relay (includes a starter mounting plate, screws/bolts, and instructions).

Eutectic Alloy Overload Relays — Overload relay codes do not apply. Use Cat. No. as listed in the product selection tables. Select heater elements from page 1-167.

❖ All Sizes — No overload relay.

Bulletins 520, 522, and 523 require two overload relays.

Bulletins 530, 1282, and 1283 require two overload relays. When selecting the proper electronic overload relay or heater, divide motor nameplate full load amperes by 2.00. Use this value to select the proper overload relays.

Bulletins 540, 1242, and 1243 have one overload relay. When selecting the proper electronic overload relay or heater, divide motor nameplate full load amperes by 1.73. Use this value to select the proper overload relays.

E1 Plus Solid-State Three-Phase Overload Relay (Selectable Class 10, 20, or 30) (Automatic/Manual Reset)

For use with Bulletins 505, 505V, 506, 507, 509, 512, 512M, 513, 520, 522, 523, 530, 532, 533, 540, 542, 543, 570, 572, 573, 1232, 1232X, 1233, 1233X, 1242, 1243, 1272, 1273, 1282, and 1283. ⚡ ➤ ⚙

NEMA Size	Full Load Current Adjustment Range [A]	Overload Relay Code
		Class 10, 15, 20, 30
00	0.1...0.5	A2A
	0.2...1.0	A2C
	1.0...5.0	A2E
	3.2...16	A2F
0, 1 1PW 1YD	0.2...1.0	A2C
	1.0...5.0	A2E
	3.2...16	A2F
	5.4...27	A2G
1	9...45	A2J
2 2PW 2YD	5.4...27	A2G
	9...45	A2J
3 3PW 3YD	9...45	A2J
	18...90	A2L
4 4PW 4YD	30...150	A2M
5 5PW 5YD	60...300	A2N
6 6PW 6YD	120...600	A2R
7+	256...810	A2T
8+	384...1215	A2U
9+	800...2250	A2V

E1 Plus Solid-State Single-Phase Overload Relay (Selectable Class 10, 20, or 30) (Automatic/Manual Reset)

For use with Bulletins 505, 505V, 506, 507, 509, 512, 512M, 513, 520, 522, 523, 530, 532, 533, 540, 542, 543, 570, 572, 573, 1232, 1232X, 1233, 1233X, 1242, 1243, 1272, 1273, 1282, and 1283. ⚡ ➤ ⚙

NEMA Size	FLC Adjustment Range [A]	Overload Relay Code
00	1.0...5.0	S2E
	3.2...16	S2F
	5.4...27	S2G
0...2	1.0...5.0	S2E
	3.2...16	S2F
	5.4...27	S2G
	9...45	S2J
3	18...90	S2L

+ These overload relays have an interposing relay with a 120V AC coil.

⚡ Bulletin 520, 522, and 523 require two overload relay codes to complete the Cat. No. The first code will denote the high speed overload relay and the second code will denote the low speed overload relay.

➤ Bulletins 530, 532, 533, 1282, and 1283 have two overload relays and require two overload relay codes to complete the Cat. No. When selecting the proper overload relay, divide motor nameplate full load amperes by 2.00. Use this value to select the proper overload relay codes.

⚙ Bulletins 540, 542, 543, 1242, and 1243 have one overload relay. When selecting the proper overload relay, divide motor nameplate full load amperes by 1.73. Use this value to select the proper overload relay code.

E3 Electronic Overload Relay: 2 Inputs/1 Output

For use with Bulletins 509, 512, 512M, 513, 530, 532, 533, 540, 542, 543, 570, 572, 573, 1232, 1232X, 1233, 1233X, 1242, 1243, 1272, 1273, 1282, and 1283.

NEMA Size	FLC Adjustment Range [A]	Overload Relay Code*
00	1...5	EC1A
	3...15	EC1B
0...2	1...5	EC1A
	3...15	EC1B
	5...25	EC1C
3	9...45	EC1D
	9...45	EC1D
	18...90	EC1E
4	28...140	EC1F
5	60...302	EC1H
6	125...630	EC1K

E3 Plus Electronic Overload Relay: 4 Inputs/2 Outputs, Built-In Ground Fault Sensor, PTC Thermistor Input

For use with Bulletins 505, 505V, 506, 507, 509, 512, 512M, 513, 520, 522, 523, 530, 532, 533, 540, 542, 543, 570, 572, 573, 1232, 1232X, 1233, 1233X, 1242, 1243, 1272, 1273, 1282, and 1283; **excluding Modular Kits.***

NEMA Size	FLC Adjustment Range [A]	Overload Relay Code*
00	1...5	EC2A
	3...15	EC2B
0...2	1...5	EC2A
	3...15	EC2B
	5...25	EC2C
	9...45	EC2D
3	9...45	EC2D
	18...90	EC2E
4	28...140	EC2F
5	60...302	EC2H

* Bulletin 520 requires two overload relay codes to complete the cat. no. The first code will denote the high speed overload relay and the second code will denote the low speed overload relay.

⚙ Rockwell Automation recommends using 120 or 240V AC coils on all NEMA Starters with E3 or E3 Plus electronic overload relays. When using coil voltages other than 120 or 240V AC, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

Bulletin 592
Overload Relays
 Product Overview

Overload Relays

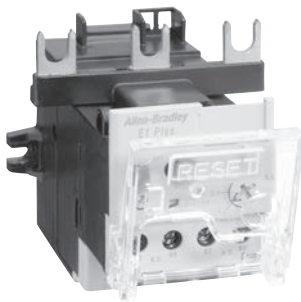
1

Bulletin	592-EE	592-EC1	592-EC2/EC3	592-EC5	592
Type	E1 Plus Electronic Overload Relay	E3 Electronic Overload Relay	E3 Plus Electronic Overload Relay	E3 Plus Electronic Overload Relay	Eutectic Alloy Overload Relay
Rated Current (Range)	0.1...800 A	0.4...5000 A			0.2...2250 A
NEMA Operating Voltage, Nominal	600V				
IEC Operating Voltage, Nominal	690/1000V	690/1000V			—
Overload Type	Electronic	Microprocessor-Based			Eutectic Alloy
Trip Class (Fixed)	—	—			10, 20, 30
Trip Class (Adjustable)	10, 15, 20, 30	5...30			—
Ambient Temperature Compensated	✓	✓	✓	✓	—
Reset Type	Automatic and Manual	Automatic and Manual	Automatic and Manual	Automatic and Manual	Manual Only
Adjustment Range	5:1	5:1	5:1	5:1	—
Phase Loss	3 s	Adjustable Delay	Adjustable Delay	Adjustable Delay	—
Ground (Earth) Fault	Optional	—	Sensitive	Sensitive	—
Overcurrent (Jam) Detection	Optional	✓	✓	✓	—
Stall Detection	—	✓	✓	✓	—
Underload Detection	—	✓	✓	✓	—
Current Imbalance	—	✓	✓	✓	—
PTC Thermistor Monitoring	Optional	—	✓	✓	—
Warning Settings	—	✓	✓	✓	—
N.C. Trip Contact	✓	✓	✓	✓	✓
N.O. Alarm Contact	✓	—	—	—	✓ (Option)
No. of Outputs	—	1	2	2	—
No. of Inputs	—	2	4	6	—
ODVA (DeviceNet) Conformance	Optional	✓	✓	✓	—
Variable Frequency Drive (VFD) Compatible	—	✓	✓	✓	✓
Voltage Detection	—	—	—	✓	—
Power Monitoring	—	—	—	✓	—
Product Selection	Page 1-161	Page 1-163			Page 1-164

E1 Plus Electronic Overload Relays

Overview/Product Selection

1



E1 Plus Electronic Overload Relays

- 0.1 ... 90 A Current Range
- Single- and Three-Phase Devices
- Self-Powered
- Phase Loss Protection
- Wide Adjustment Range (5:1)
- Insert-Molded Power Connections
- 1 N.O. and 1 N.C. Isolated Auxiliary Contacts (B600 Rated)
- Low Energy Consumption (150 mW)
- Ambient Temperature Compensation
- Visible Trip Indication
- Selectable Trip Class (10, 15, 20, or 30)
- Selectable Manual/Auto-Manual Reset

Table of Contents

Product Selection..... this page
 Approximate
 Dimensions..... 1-162
 Accessories..... 2-212
 Specifications..... 2-215

Standards Compliance

IEC EN 60947-4-1
 EN 60947-5-1
 CSA 22.2, No. 14
 UL 508

Certifications

cULus Listed (File No. E14840,
 Guide No. NKCR, NKCR7)

Product Selection

Bulletin 592-EE – Three Phase Devices

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

Mounts to Contactor	Adjustment Range [A]	Cat. No.
00	0.1...0.5	592-EEAT
	0.2...1.0	592-EEBT
	1.0...5.0	592-EECT
	3.2...16	592-EEDT
0...2	0.2...1.0	592-EEBC
	1.0...5.0	592-EECC
	3.2...16	592-EEDC
	5.4...27	592-EEEC
	9...45	592-EEFC
3	9...45	592-EEFD
	18...90	592-EEGD
4	30...150	592-EEHE
5	60...300	592-EEKF
6	120...600	592-EEMG

Bulletin 592S-EE – Single-Phase Devices

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

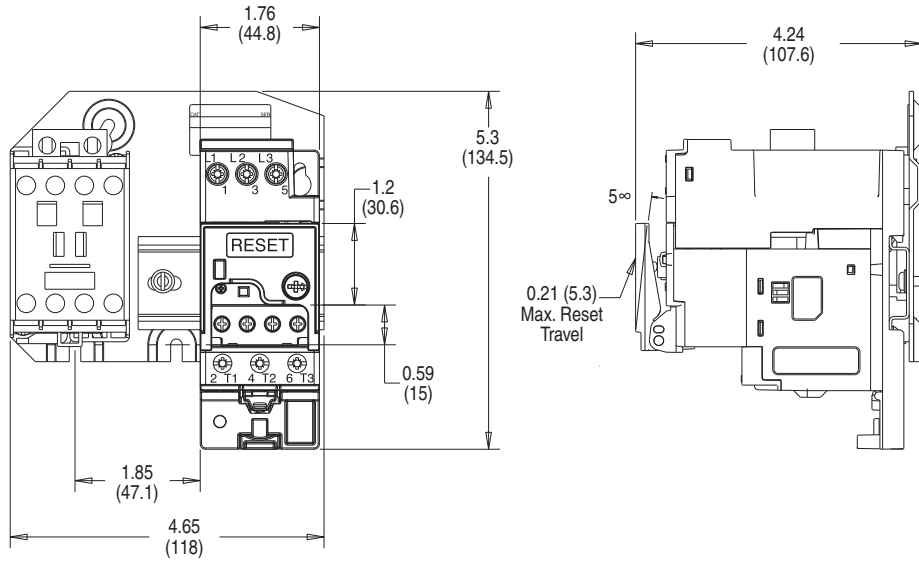
Mounts to Contactor	Adjustment Range [A]	Cat. No.
00	1.0...5.0	592S-EEPT
	3.2...16	592S-EERT
	5.4...27	592S-EEST
	1.0...5.0	592S-EEPC
0...2	3.2...16	592S-EERC
	5.4...27	592S-EESC
	9...45	592S-EETC
3	18...90	592S-EEUD

E1 Plus Electronic Overload Relays

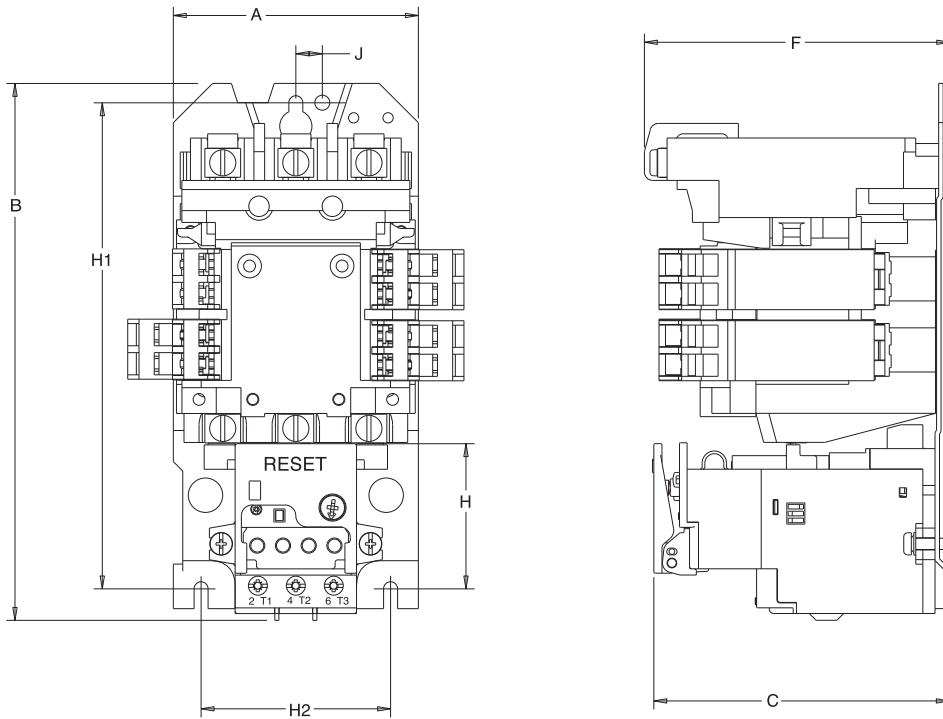
Approximate Dimensions

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

Size 00



Size 0...3



Overload Cat. No.	Contactor	A	B	C	F	H1	H2	J
592-EE_C	Size 0 and 1	91 (3-9/16)	198 (7-25/32)	114 (4-1/2)	113 (4-7/16)	180 (7-1/16)	70 (2-3/4)	9.8 (3/8)
592-EE_C	Size 2	100 (3-15/16)	233 (9-11/64)	114 (4-1/2)	119 (4-11/16)	219 (8-5/8)	80 (3-5/32)	9.8 (3/8)
592-EE_D	Size 3	155.5 (6-1/8)	336.7 (13-1/4)	154 (6-1/16)	150.1 (5-29/32)	219.9 (8-21/32)	139.9 (5-1/2)	19.9 (25/32)
592-EE_E	Size 4	187.5 (7-3/8)	419 (16-1/2)	199 (7-27/32)	198 (7-13/16)	380 (15)	160 (6-1/8)	24 (61/64)
592-EE_F	Size 5	187.5 (7-3/8)	401.6 (15-13/16)	204.7 (8-1/16)	212.1 (8-9/64)	380 (15)	160 (6-1/8)	27.5 (1-5/64)
592-EE_G	Size 6	336.8 (13-1/4)	637.8 (25-7/64)	254 (10)	281.7 (11-3/32)	434.8 (17-1/8)	226.3 (8-29/32)	—

E3 and E3 Plus Electronic Overload Relays

Overview/Product Selection



Bulletin 592

- Bulletin 592-EC1:**
- 0.4...90 A current range
 - DeviceNet Ready (ODVA Conformance tested)
 - LED indicators and Test/Reset button
 - Adjustable trip class 5...30
 - Ambient temperature compensation
 - True RMS current sensing (20...250 Hz)
 - Protection for single- and three-phase motors
 - Integrated I/O (2 in/1 out)
 - Programmable trip and warning settings
 - Diagnostic functions (history of last 5 trips)
- Bulletin 592-EC2 & -EC3 also include:**
- Integrated I/O (4 in/2 out)
 - Ground fault protection
 - PTC thermistor monitoring
 - DeviceLogix component technology (series B & C)
- Bulletin 592-EC5 also includes:**
- Integrated I/O (6 in/2 out)
 - Ground fault protection
 - DeviceLogix component technology (series C)
 - Power monitoring
 - Voltage protection

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- Standards Compliance**
- EN 60947-4-1, EN 60947-5-1
 CSA 22.2, No. 14
 UL 508
 UL 1053
- Certifications**
- CE
 cULus (File No. E14840, Guide No. NKCR, NKCR7) (File E53935, Guide No. KDAX)
 C-tick
 ABS

Description

The E3 Overload Relay is a multi-function electronic microprocessor-based electronic overload relay for the protection of single- or three-phase squirrel cage induction motors. In addition to providing ambient compensated overload protection, the E3 Overload Relay also includes advanced features such as: warning diagnostics, variable frequency and true RMS current sensing, I/O capabilities, and direct DeviceNet connectivity. The E3 Plus Overload Relay offers the added features of zero sequence (core balance) ground fault protection, PTC thermistor input, and additional I/O capabilities.

Catalog Number Explanation

592 – **EC1** **B** **T**

a *b* *c*

Type	
Code	Description
EC1	E3
EC2	E3 Plus
EC3	
EC5	

b

Adjustment Range [A]	
Code	Description
P	0.4...2.0
A	1...5
B	3...15
C	5...25
D	9...45
E	18...90
F	28...140
H	60...302
K	125...630

c

Bulletin 500 Contactor Size	
Code	Description
T	Size 00
C	Size 0...2
D	Size 3
E	Size 4
F	Size 5
G	Size 6

Product Selection

Your order must include 1) the Cat. No. of the overload relay selected, and 2) if required, Cat. No. of any accessories.

Bulletin 592-EC1 Electronic Motor Protection Relays — Direct Contactor Mount

- 2 inputs
- 1 output

For Installation on NEMA Starter Size	Adjustment Range [A]*	Cat. No.
00	0.4...2.0	592-EC1PT
	1...5	592-EC1AT
	3...15	592-EC1BT
0...2	0.4...2.0	592-EC1PC
	1...5	592-EC1AC
	3...15	592-EC1BC
	5...25	592-EC1CC
	9...45	592-EC1DC
3	9...45	592-EC1DD
	18...90	592-EC1ED
4	28...140	592-EC1FE
5	60...302	592-EC1HF
6	125...630	592-EC1KG

Bulletin 592-EC2, -EC3, and -EC5 Electronic Motor Protection Relays — Direct Contactor Mount

- 4 inputs (EC5 - 6 inputs)
- 2 outputs
- Ground fault sensing
- PTC thermistor input (EC2 & EC3 only)
- DeviceLogix (series B & C)

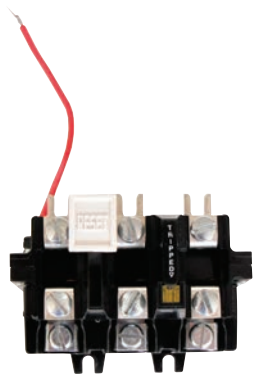
For Installation on NEMA Starter Size	Adjustment Range [A]*	Cat. No.		
00	0.4...2.0	592-EC2PT	—	—
	1...5	592-EC2AT	—	—
	3...15	592-EC2BT	—	—
0...2	0.4...2.0	592-EC2PC	592-EC3PC	592-EC5PC
	1...5	592-EC2AC	592-EC3AC	592-EC5AC
	3...15	592-EC2BC	592-EC3BC	592-EC5BC
	5...25	592-EC2CC	592-EC3CC	592-EC5CC
	9...45	592-EC2DC	592-EC3DC	592-EC5DC
3	9...45	592-EC2DD	—	—
	18...90	592-EC2ED	592-EC3ED	592-EC5ED
4	28...140	—	592-EC3FE	592-EC5FE
5	60...302	—	592-EC3HF	592-EC5HF
6	125...630	—	592-EC3KG	592-EC5KG

* For applications greater than 300 A, see the Bulletin 193 panel mount devices for use with external current transformers.

Eutectic Alloy Overload Relays

Overview/Product Selection

1



*Eutectic Alloy Type
Panel Mount*

Bulletin 592

- A Rockwell Automation exclusive — overload relay is the same for all three trip classes (10, 20, and 30) for each starter size.
- Trip current ratings are easily selected by choosing the proper heater element — no need to change the overload relay.
- The trip-free mechanism means you still have overload protection even if the reset button is held down.

The Bulletin 592 Overload Relay is a manual reset, eutectic alloy, thermal type overload device. When coordinated with the proper short circuit protection, the overload relay is intended to protect the motor, motor controller, and power wiring against overheating due to excessive overcurrents.

All Bulletin 592 block type relays are furnished with an optical indicator which becomes visible when the relay has tripped. A manual contact test module is provided as standard on block type Bulletin 592 overload relays. One N.O. or N.C. auxiliary contact may be field added to block type Bulletin 592 overload relays. This extra contact module physically replaces the contact test module.

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Standards Compliance

UL 508
 CSA 22.2 No. 14
 CE Mark

Certifications

UL Listed (File No. E14840,
 Guide No. NKCR)
 CSA Certified (File No. LR1234)

Eutectic Alloy Type — Manual Reset, Starter Mount

STARTER MOUNT — For installation on Bulletin 500 Line NEMA contactors.

Heater Elements — Overload relays require 3 overload heater elements. See page 1-167 for heater element selection.

Starter Size (Series B & D)	Number of Poles	Open Type without Enclosure	
		N.C. Contact Cat. No.	N.O.-N.C. Contact Cat. No.
		00 (Series B & D)	3
0, 1	3	592-EUTB	592-BOW169
2		592-EUTC	592-COW169
3		592-EUTD	592-DOW169
4		592-EUTE	592-EOW169

Eutectic Alloy Type — Manual Reset, Panel Mount

PANEL MOUNT — For installation and wiring separate from the contactor.

Heater Elements — Overload relays require 1 or 3 overload heater elements. See page 1-167 for heater element selection.

Type	Maximum Continuous Current (A)	Number of Poles	Open Type without Enclosure		Type 1 General Purpose Enclosure	
			N.C. Contact Cat. No.	N.O.-N.C. Contacts Cat. No.	N.C. Contact Cat. No.	N.O.-N.C. Contacts Cat. No.
			Compact	24	3	592-JOV16
Standard	32	3	592-KOV16	592-KOV169	—	—
	40	1	592-BOV4	592-BOV49	—	—
		3	592-BOV16	592-BOV169	592-BAV16	592-BAV169
	62	1	592-COV4	592-COV49	—	—
		3	592-COV16	592-COV169	592-CAV16	592-CAV169
	125	3	592-DOV16	592-DOV169	—	—
165	3	592-EOV16	592-EOV169	—	—	

Current Transformer Type — Eutectic Alloy, Manual Reset

Heater Elements — Overload relays require 3 overload heater elements. See page 1-167 for heater element selection.

Full Load Current Range (A)	Cat. No.*	Lug Kits Cat. No.
60...200‡	592-TPD200	199-LF1
120...300‡	592-TPD300	199-LG1
160...496	592-TPD400	199-LH1
250...630‡	592-TPD630	199-LJ1

* Terminal lugs are not included.

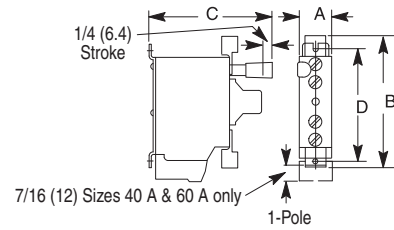
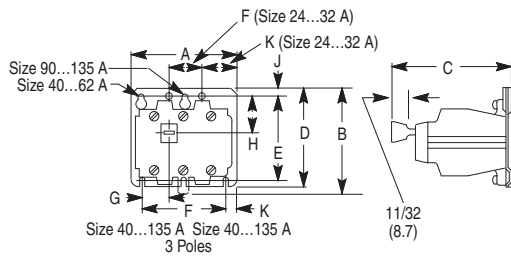
‡ Can be applied up to 1500V.

Eutectic Alloy Overload Relays

Approximate Dimensions

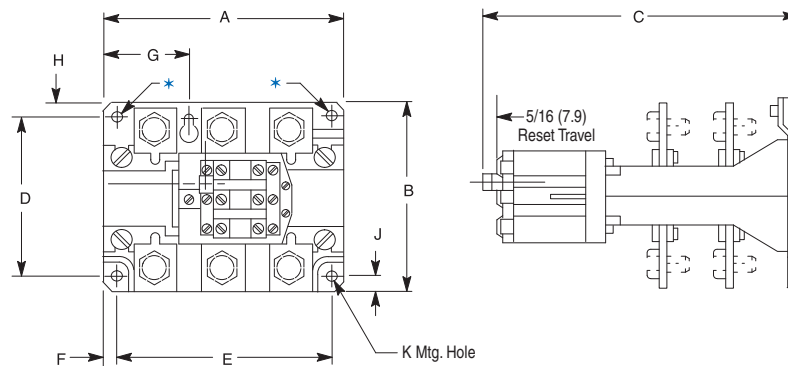
Dimensions are shown in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Open Type without Enclosure for Bulletin 592 Eutectic Alloy Type — Manual Reset — Panel Mount



Maximum Current [A]	No. of Poles	A Wide	B High	C Deep	D	E	F	G	H	J	K
24/32	3	2-11/16 (68.3)	3-1/4 (82.6)	3-41/64 (92.6)	—	2-3/4 (70)	55/64 (22)	—	—	1/4 (6.4)	29/32 (23)
40	1	7/8 (22.2)	3-1/4 (82.6)	3-9/16 (90.5)	2-29/32 (73.8)	—	—	—	—	—	—
	3	3-15/16 (100)	—	4-1/2 (114)	3-21/32 (93)	3-5/32 (80)	3-5/32 (80)	1-3/64 (26.5)	1-3/8 (35)	1-9/64 (7.5)	25/64 (9.9)
62	1	7/8 (22.2)	3-13/16 (96.8)	3-9/16 (90.5)	3-1/8 (79.4)	—	—	—	—	—	—
	3	3-15/16 (100)	3-31/32 (101)	4-1/2 (114)	3-21/32 (93)	3-5/32 (80)	3-5/32 (80)	1-3/64 (26.5)	1-3/8 (35)	1-9/64 (7.5)	25/64 (9.9)
125	3	6-7/32 (158)	5-7/8 (149)	4-49/64 (121)	6-1/4 (159)	5-1/2 (140)	5-1/2 (140)	1-61/64 (49.6)	2-3/4 (69.8)	5/16 (7.9)	23/64 (9.1)
165	3	6-7/32 (158)	6-17/32 (166)	4-49/64 (121)	6-1/4 (159)	5-1/2 (140)	5-1/2 (140)	1-61/64 (49.6)	2-3/4 (69.8)	5/16 (7.9)	23/64 (9.1)

Open Type without Enclosure for Bulletin 592 Current Transformer Type — Eutectic Alloy, Manual Reset



Cat. No.	A Wide	B High	C Deep	D	E	F	G	H	J	K
592-TPD200	5-5/16 (135)	5-19/32 (142)	8-9/16 (217.5)	4-23/32 (120)	4-23/32 (120)	19/64 (7.5)	1-59/64 (49)	29/64 (12)	51/64 (10)	21/64 (8.4)
592-TPD300	6-63/64 (177.3)	5-19/32 (142)	9-5/32 (233)	4-23/32 (120)	6-9/64 (156)	27/64 (10.6)	22-1/2 (63.6)	29/64 (12)	51/64 (10)	9/32 (7)
592-TPD400	6-63/64 (177.3)	10-15/32 (266)	9-5/32 (233)	4-23/32 (120)	6-9/64 (156)	27/64 (10.6)	22-1/2 (63.6)	29/64 (12)	51/64 (10)	9/32 (7)
592-TPD630	9-27/32 (250)	7-55/64 (210)	8-19/32 (218)	7-3/32 (180)	8-57/64 (226)	15/32 (12)	3-19/64 (84)	25/64 (10)	51/64 (10)	9/32 (7)

* Mounting holes for Cat. Nos. 592-TPD400 and 592-TPD630 only.

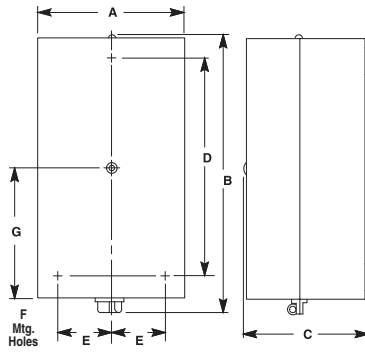
Eutectic Alloy Overload Relays

Approximate Dimensions

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

Type 1 General Purpose Enclosure for Bulletin 592

1



Maximum Current [A]	A Wide	B High	C Deep	D	E	F	G
Bulletin 592							
40...60	6-13/16 (173)	10-5/8 (270)	5-23/32 (145)	8-1/4 (210)	2-3/8 (60.5)	7/32 (5.5)	5-5/16 (135)



Type W Heater Elements

Eutectic Alloy Overload Relay Heater Elements

- Type J — CLASS 10
- Type P — CLASS 20 (Bul. 600 ONLY)
- Type W — CLASS 20
- Type WL — CLASS 30

Heater Element Selection Table of Contents

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 Class Designation..... this page

Heater Element
 Selection this page

Ambient
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 Correction this page

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Index to Heater
 Element Selection
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Description

Overload Relay Class Designation

United States Industry Standards (NEMA ICS 2 Part 4) designate an overload relay by a class number indicating the maximum time in seconds at which it will trip when carrying a current equal to 600 percent of its current rating.

A Class 10 overload relay will trip in 10 seconds or less at a current equal to 600 percent of its rating.

A Class 20 overload relay will trip in 20 seconds or less at a current equal to 600 percent of its rating.

A Class 30 overload relay will trip in 30 seconds or less at a current equal to 600 percent of its rating.

Allen-Bradley standard overload relay protection is provided using Type W heater elements for the 500 Line. This provides Class 20 operation and is recommended for General Applications.

Specific Applications may require Class 10 or Class 30 overload relays. Class 10 overload relays are often used with hermetic motors, submersible pumps, or motors with short locked rotor time capability. Class 30 overload relays should be used with motors driving high inertia loads, where additional accelerating time is needed and the safe permissible locked rotor time of the motor is within Class 30 performance requirements.

For applications requiring Class 30 protection, Type WL heater elements are available. To order, use the applicable Type W selection table, follow the heater element selection instructions and change the “W” in the Heater Type Number to “WL”.

For applications requiring Class 10 overload relays, Type J elements are available. See page 1-170 for Index to Heater Element Selection Tables.

Heater Element Selection

The “Full Load Amperes” listed in the tables are to be used for heater element selection. For Type J and W Heater Elements, the rating of the relay in amperes at +40 °C (+104 °F) is 115% of the “Full Load Amperes” listed for the “Heater Type Number”. For Type WL Heater Elements, the rating is 120% of the “Full Load Amperes” listed for the “Heater Type Number.”

Refer to the motor nameplate for the full load current, the service factor, and/or the motor classification by application and temperature rise.

Use this motor nameplate information, the application rules, and the “Full Load Amperes” listed in the proper table (see Index) to determine the “Heater Type Number.”

The following is for motors rated for Continuous Duty:

For motors with marked service factor of not less than 1.15, or motors with a marked temperature rise not over +40 °C (+104 °F), apply application rules 1 through 3. Apply application rules 2 and 3 when the temperature difference does not exceed +10 °C (+18 °F). When the temperature difference is greater, see below.

- 1. The Same Temperature at the Controller and the Motor** — Select the “Heater Type Number” with the listed “Full Load Amperes” nearest the full load value shown on the motor nameplate.
- 2. Higher Temperature at the Controller than at the Motor** — If the full load current value shown on the motor nameplate is between the listed “Full Load Amperes”, select the “Heater Type Number” with the higher value.
- 3. Lower Temperature at the Controller than at the Motor** — If the full load current value shown on the motor nameplate is between the listed “Full Load Amperes”, select the “Heater Type Number” with the lower value.

For motors with Marked Service Factor of less than 1.15, select the “Heater Type Number” one rating smaller than determined by the rules in paragraphs 1, 2 and 3.

Motors rated for Intermittent Duty — Please contact your local Rockwell Automation sales office or Allen-Bradley distributor for additional information.

Heater Element Selection Procedure — When Temperature at Controller is ±10 °C (±18 °F) Greater than Temperature at Motor

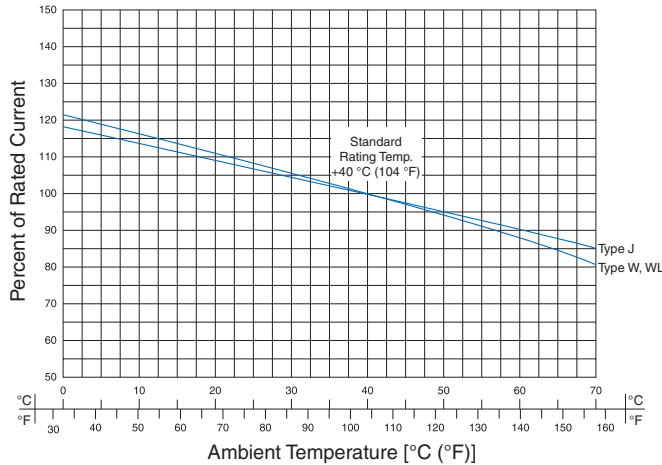
Ambient Temperature Correction

The ambient temperature at the motor and controller is the same in most applications. Under this condition, the overload relay is designed to sense changes in ambient temperature and also protect the motor over a range of temperatures.

Output that a motor can safely deliver varies with temperature. The motor can deliver its full rated horsepower at an ambient temperature specified by the motor manufacturers, normally +40 °C (+104 °F). At high temperatures (higher than +40 °C) less than 100% of the normal rated current can be drawn from the motor without shortening the insulation life. At lower temperatures (less than +40 °C) more than 100% of the normal rated current could be drawn from the motor without shortening the insulation life. Thus, there is an inverse relationship between motor ambient temperature and motor output. In any motor, allowable output decreases as the ambient temperature is raised and vice versa.

Heater Element Selection Procedure — When Temperature at Controller is ±10 °C (±18 °F) Greater than Temperature at Motor (Continued)

Ambient Temperature Correction Curve
 (See Performance Data on page Important-3)



When the temperature difference between the motor and controller does not exceed +10 °C the heater elements should be selected according to the directions given in the Heater Element Selection, page 1-167.

When the temperature difference is more than +10 °C an ambient temperature correction factor should be used as part of the process for selecting heater elements. The ambient temperature correction curve shown above shows the factor by which heater selection rating changes with ambient temperature changes.

Heater Element Selection Procedure

In solving problems where ambient temperature correction is necessary, the following simple procedure is recommended:

1. First find the correction factor ratio ("C.F.R."). This is the ratio of correction factor of the motor ambient temperature (C.F.m) to the correction factor of the controller ambient temperature (C.F.c). The formula for calculating the correction factor ratio is:

$$C.F.R. = \frac{C.F. \text{ motor}}{C.F. \text{ controller}}$$

Both correction factors are selected from the curve for the type of heater element to be used. The heater element selection tables are based on a +40 °C ambient temperature. This means the correction factor for a +40 °C is 1.00. In other words, there is no correction factor at +40 °C.

2. Next in this heater element selection process is to adjust the motor nameplate full load current (FLC) by the C.F. Ratio. This readjusted value of motor nameplate full load current (FLC) is the yardstick in selecting the proper heater element.
3. The last step is to refer to the suggested heater element table and pick the element whose rating for the given controller size is closest to FLC.

Examples — To become familiar with this heater element selection process, consider a few examples.

Example 1. Starter at Normal +40 °C Ambient — Motor Lower. 3-Phase, AC, squirrel cage motor, 25 Hp, 460V, 60 Hz, 1800 rpm, FLC of 34 A, service factor 1.15, *Temperature at starter +40 °C, Temperature at motor +25 °C, Type W heater elements will be used.*

In Example 1, the motor is at a much cooler ambient temperature (+25 °C) compared to the controller which is at the normal +40 °C. Because the motor is normally rated for use at +40 °C, it will deliver a little more than its rated horsepower. This means that a heater element with a higher than normal motor nameplate full load current rating can be used.

Referring to the Type W ambient temperature correction curve on this page for a motor at +25 °C ambient, the motor correction factor (C.F. motor) is shown to be 108%. The correction factor for the starter ambient temperature is 100% since it is at +40 °C. Thus,

$$C.F. \text{ Ratio} = \frac{C.F. \text{ motor}}{C.F. \text{ controller}} = \frac{108\%}{100\%} = 1.08$$

Now, using this correction factor, the readjusted full load current value can be determined by:

$$FLC = 34.0 \times 1.08 = 36.7 \text{ A}$$

A Bulletin 512, Size 2, was specified for this application. The directions for heater element selection indicate that Table 153 should be used. The table shows that 36.7 A falls between two values, 35.0 A (W66) and 38.0 A (W67). Because 38.0 A is closer to the requirement, select the heater element W67.

Example 2. Starter at Normal +40 °C Ambient — Motor Higher. 3-Phase AC, squirrel cage motor, 25 Hp, 460V, 60 Hz, 1800 rpm. FLC of 34 A, service factor 1.15. Type W heater elements, *Temperature at starter +40 °C, Temperature at motor +55 °C.*

This represents a situation where the motor ambient temperature is higher than +40 °C. In this example, the motor is at +55 °C ambient temperature and the controller is at +40 °C. When the motor is functioning in a warmer environment than the controller it will not be able to deliver the normal horsepower. To protect it from damage, it becomes necessary to downsize the heater element compared to the same motor operating in a +40 °C ambient temperature. Referring to the Type W ambient temperature correction curve, the correction factor would be:

$$C.F. \text{ Ratio} = \frac{C.F. \text{ motor}}{C.F. \text{ controller}} = \frac{91\%}{100\%} = 0.91$$

Having determined the correction factor, the current rating to be used when selecting a heater element would be:

$$FLC = 34.0 \times 0.91 = 30.9 \text{ A}$$

For Bulletin 512, Size 2, again refer to Table 153. The value of 30.9 A falls between 30.0 A (W64) and 32.5 A (W66). Since 30.0 is closer to 30.9 specify the W64 heater element.

Example 3: Starter Lower than +40 °C — Motor Higher. 3-Phase, AC, squirrel cage motor, 25 Hp, 460V, 60 Hz, 1800 rpm. FLC of 34 A, service factor 1.15. Type W heater elements, *Temperature at starter +25 °C, Temperature at motor +55 °C.*

Next, consider a case where both the controller and the motor are at ambient temperatures other than +40 °C. In Example 3 the temperature of the controller is +25 °C ambient (cooler) while the temperature of the motor is +55 °C ambient (warmer). As stated earlier, a motor running in a warmer environment will deliver less than its normal horsepower. This requires downsizing the heater element rating. The controller in this case is in a cooler environment which prevents the heater element from heating up as much as in a +40 °C ambient temperature. This also requires downsizing the heater element rating to provide adequate protection. Thus, the net effect of a warmer motor and a cooler controller is to further downsize the heater element. Using the Type W temperature correction curve, the correction factor in this case is:

$$C.F. \text{ Ratio} = \frac{C.F. \text{ motor}}{C.F. \text{ controller}} = \frac{91\%}{108\%} = 0.84$$

The readjusted value of current FLC for this example is:

$$FLC = 34.0 \times 0.84 = 28.6 \text{ A}$$

Table 153 shows that this value falls between 28.0 A (W63) and 30.0 A (W64). Because 28.0 A is closer to the requirement, select the heater element W63.

Heater Element Selection Procedure

Example 4: Starter Above +40 °C — Motor Lower. 3-Phase, AC, squirrel cage motor, 25 Hp, 460V, 60 Hz, 1800 rpm. FLC of 34 A, service factor 1.15. Type W heater elements, *Temperature at starter +65 °C, Temperature at motor +35 °C.*

Now, consider the effect of a controller in a warmer environment and a motor in a cooler environment. In Example 4, the controller is at +65 °C ambient (warmer) and the motor at +35 °C ambient (cooler). As mentioned earlier, a motor at a cooler temperature can deliver more than its normal horsepower. The controller when in a warmer environment will heat up faster causing the eutectic alloy to melt before the normal overload condition. This requires upsizing the heater element rating. Referring to the Type W ambient temperature correction curve (page 1-168), the correction factor in this case is:

$$\text{C.F. Ratio} = \frac{\text{C.F. motor}}{\text{C.F. controller}} = \frac{103\%}{84.5\%} = 1.22$$

This correction factor allows a heater element with current rating of:

$$\text{FLC} = 34.0 \times 1.22 = 41.48 \text{ A}$$

Referring to Table 153, this value of 41.4 A falls between 40.5 A (W68) and 43.5 A (W69). Because 40.5 A is closer to the requirement, select heater element W68.

Example 5: Starter Above +40 °C — Motor Above. 3-Phase, AC, squirrel cage motor, 25 Hp, 460V, 60 Hz, 1800 rpm. FLC of 35 A, service factor 1.15. Type W heater elements, *Temperature at starter +45 °C, Temperature at motor +60 °C.*

Next, take an example where both the controller and the motor are both warmer than +40 °C ambient temperature but their ambient temperatures are different. For instance, the controller could be at +45 °C ambient and the motor is at +60 °C ambient. Since the difference in their ambient temperatures is greater than +10 °C an ambient temperature correction must be made. In Example 5 the correction factor is given by:

$$\text{C.F. Ratio} = \frac{\text{C.F. motor}}{\text{C.F. controller}} = \frac{88\%}{97\%} = 0.91$$

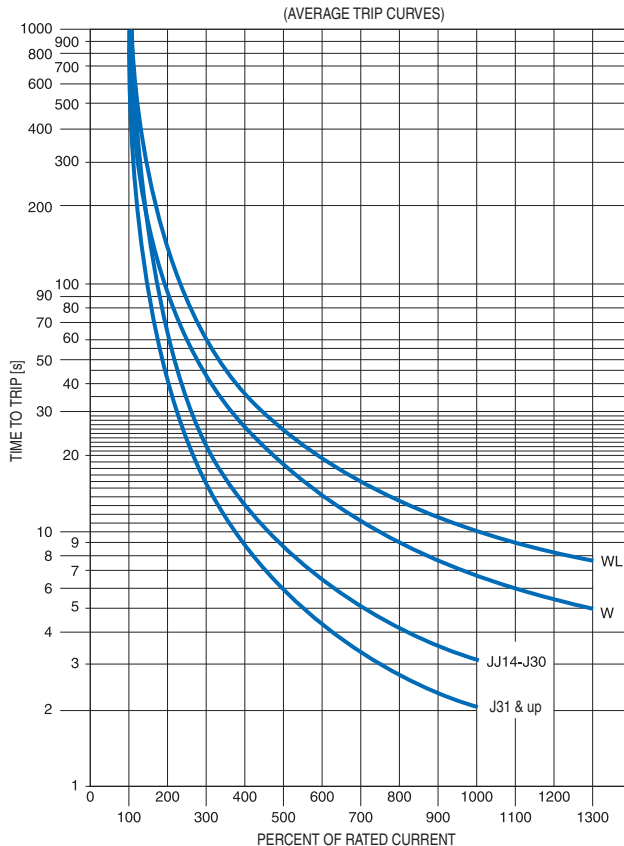
This means that the rating of the heater element should be 90% of the normal nameplate motor full load current or:

$$35.0 \times 0.91 = 31.9 \text{ A}$$

For Bulletin 512, Size 2 controller, Table 153 shows this rating to fall between 30.0 A (W64) and 32.5 A (W65). Because 32.5 A is closer, select heater element W65. Note here that the net effect has been to downsize the heater element rating compared to a normal +40 °C ambient operation.

Note: The heater element selection tables are designed to accommodate motor service factors of 1.15 or greater, as given in all the preceding examples. If the service factor had been less than 1.15 (for example, S.F. = 1.0) a heater element one rating smaller than selected in each example would have been the correct choice. This would provide protection at 10% lower current levels.

Time — Current Characteristics at +40 °C (+104 °F) (See Performance Data, page Important-3)



Heater Elements Selection

For Application on Bulletin 100/500/609/1200 Line Starters

Index to Heater Element Selection Tables

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Bulletin Number	Encl. Type	Size	Table No.			
			Manual Reset			
			Type W Element		Type J Element	
1Ø, One Element	3Ø or 1Ø, Three Elements	1Ø, One Element	3Ø or 1Ø, Three Elements			
105, 109	Open	9...30 A	—	180	—	182
		36...110 A	—	191	—	187
		180 A	—	195	—	196
505	Open, 1, 3R/4/12	00	127	180	55	182
		0...4	156	151	164	162
		5	—	347	—	547
505	Open 1, 3R/4/12, 4/4X	6	—	195	—	196
		7...8	—	133	—	132
505	4/4X	0...4	—	146	—	158
		5	—	177	—	178
505	4X	0...2	—	145	—	158
505	Unilock 3R/7 & 9	0...1	—	166	—	159
		0...3	—	171	—	172
505	Bolted 3R/7 & 9, 7 & 9	4	156	168	164	162
		505V	Open	0...4	—	154
506, 507	1, 3R/12, 4/4X, 4X	0...4	—	152	—	161
		5	—	347	—	547
507	1, 3R/4/12, 4/4X, 4X	6	—	195	—	196
		7	—	134	—	165
507	Bolted 3R/7 & 9, 7 & 9	0...2	—	168	—	172
		3	—	168	—	162
		4	—	171	—	172
509	Open, 1, 3R/12	00	127	180	55	182
509	Open	0...4, 1P	156	152	164	163
509	1, 3R/4/12	0...4	155	150	164	162
509 with control xfmr	1, 3R/4/12	0...4, 1P	156	150	164	162
509	Open, 1, 3R/4/12	5	—	347	—	547
509	Open, 1, 3R/4/12, 4/4X	6	—	195	—	196
509	Open 1, 3R/4/12, 4/4X	7...8	—	133	—	132
		0...3	—	144	—	158
		4	—	148	—	—
509	4/4X	5	—	177	—	178
		509	4X	0...2	156	146
509	Unilock 3R/7 & 9	0...4	—	166	—	159
		5	—	177	—	178
509	Bolted 3R/7 & 9, 7 & 9	0...3, 1P	156	171	164	172
		4	—	171	—	162
		5	—	171	—	547
512	1, 3R/4/12, 4/4X, 4X	0...4	—	152	—	163
		5	—	347	—	547
		6	—	195	—	196
512M	3R/4/12	1...2	—	153	—	163
513	1, 3R/4/12, 4/4X, 4X	0...4	—	152	—	160
		5	—	347	—	547
		6	—	195	—	196
		7	—	134	—	165
513	Unilock 3R/7 & 9	0...4	—	167	—	159
		5	—	169	—	178

Bulletin Number	Encl. Type	Size	Table No.			
			Manual Reset			
			Type W Element		Type J Element	
1Ø, One Element	3Ø or 1Ø, Three Elements	1Ø, One Element	3Ø or 1Ø, Three Elements			
513	Bolted 3R/7 & 9, 7 & 9	0...3	—	168	—	172
		4	—	168	—	160
		5	—	168	—	160
520	Open, 1, 3R/4/12	0...4	—	152	—	162
		5	—	347	—	547
		6	—	195	—	196
		7	—	133	—	132
520	4/4X	0...4	—	146	—	158
		5	—	177	—	178
520	4X	0...2	—	145	—	158
520E	Bolted 3R/7 & 9, 7 & 9	0...3	—	171	—	172
		4	—	168	—	162
520F & G	Bolted 3R/7 & 9, 7 & 9	0...2	—	168	—	172
		3	—	168	—	162
530*	1	1PW... 2PW	—	150	—	162
		3PW... 4PW	—	148	—	162
		5PW	—	347	—	547
		6PW	—	195	—	196
		7PW... 8PW	—	133	—	132
540*	1	1YD... 4YD	—	152	—	162
		5YD	—	347	—	547
		6YD	—	195	—	196
		7YD... 8YD	—	133	—	132
570	1	2...4	—	154	—	162
		5	—	347	—	547
		6	—	195	—	196
		7...8...9	—	133	—	132
592	Open	24...32 A	—	180	—	182
		40...165 A	192	191	198	187
592	1	40...165 A	192	181	198	183
592 with current xfmr	Open	—	—	195	—	196
600	All	—	—	—	5 (Type P)	—
609, 609RS, 609TS, 609U, 609TU	All	0...1...1P	112	110	117	116
1232X, 1233X	—	0...2	—	152	—	163
		3, 4	—	149	—	163
		5	—	347	—	547

* When selecting heater elements for Bulletin 530, divide the motor nameplate full load amperes by 2.00 — use this value to select the proper "Heater Element Cat. No.".

* When selecting heater elements for Bulletin 540, divide the motor nameplate full load amperes by 1.73 — use this value to select the proper "Heater Element Cat. No.".



Bulletin Eutectic Alloy Overload Relays
Heater Elements Selection
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TABLE 5	
Heater Element Cat. No.	Full Load Amperes
P1	0.17
P2	0.21
P3	0.25
P4	0.32
P5	0.39
P6	0.46
P7	0.57
P8	0.71
P9	0.79
P10	0.87
P11	0.98
P12	1.08
P13	1.19
P14	1.30
P15	1.43
P16	1.58
P17	1.75
P18	1.88
P19	2.13
P20	2.40
P21	2.58
P22	2.92
P23	3.09
P24	3.32
P25	3.37
P26	4.16
P27	4.51
P28	4.93
P29	5.43
P30	6.03
P31	6.83
P32	7.72
P33	8.24
P34	8.90
P35	9.60
P36	10.8
P37	12.0
P38	13.5
P39	15.2

TABLE 55						
Heater Element Cat. No.	Full Load Amperes					
	Size 00	Size 0	Size 1	Size 1P	Size 2	Size 3
JJ14	0.22	0.22	0.22	—	—	—
JJ13	0.24	0.24	0.24	—	—	—
JJ12	0.27	0.27	0.27	—	—	—
JJ11	0.30	0.30	0.30	—	—	—
JJ10	0.33	0.33	0.33	—	—	—
JJ9	0.36	0.36	0.36	—	—	—
JJ8	0.40	0.40	0.40	—	—	—
JJ7	0.44	0.44	0.44	—	—	—
JJ6	0.48	0.48	0.48	—	—	—
JJ5	0.53	0.53	0.53	—	—	—
JJ4	0.58	0.58	0.58	—	—	—
JJ3	0.65	0.65	0.65	—	—	—
JJ2	0.71	0.71	0.71	—	—	—
JJ1	0.78	0.78	0.78	—	—	—
J1	0.87	0.87	0.87	—	—	—
J2	0.95	0.95	0.95	—	—	—
J3	1.05	1.05	1.05	—	—	—
J4	1.16	1.16	1.16	—	—	—
J5	1.28	1.28	1.28	—	—	—
J6	1.41	1.41	1.41	—	—	—
J7	1.55	1.55	1.55	—	—	—
J8	1.70	1.70	1.70	—	—	—
J9	1.87	1.87	1.87	—	—	—
J10	2.06	2.06	2.06	—	—	—
J11	2.27	2.27	2.27	—	—	—
J12	2.51	2.51	2.51	—	—	—
J13	2.78	2.78	2.78	—	—	—
J14	3.07	3.07	3.07	—	—	—
J15	3.38	3.38	3.38	—	—	—
J16	3.72	3.72	3.72	—	—	—
J17	4.10	4.10	4.10	—	—	—
J18	4.52	4.52	4.52	—	—	—
J19	4.98	4.98	4.98	—	—	—
J20	5.49	5.49	5.49	—	—	—
J21	6.04	6.04	6.04	—	—	—
J22	6.66	6.66	6.66	—	—	—
J23	7.35	7.35	7.35	—	—	—
J24	8.13	8.13	8.13	—	—	—
J25	8.96	8.96	8.96	—	—	—
J26	9.90	9.90	9.90	—	—	—
J27	—	10.9	10.9	11.0	—	—
J28	—	12.0	12.0	12.2	—	—
J29	—	13.2	13.2	13.4	—	—
J30	—	14.6	14.6	14.8	—	—
J31	—	16.1	16.1	16.3	—	—
J32	—	17.7	17.7	17.9	18.3	—
J33	—	—	19.5	19.8	20.2	—
J34	—	—	21.4	21.8	22.2	—
J35	—	—	23.6	24.0	24.4	—
J36	—	—	26.0	26.4	26.9	—
J37	—	—	28.5	29.0	29.8	—
J38	—	—	—	32.0	33.0	—
J39	—	—	—	35.0	36.5	40.5
J40	—	—	—	38.5	40.5	45.5
J41	—	—	—	—	45.5	51
J42	—	—	—	—	—	56
J43	—	—	—	—	—	62
J44	—	—	—	—	—	68
J45	—	—	—	—	—	74
J46	—	—	—	—	—	82
J70	—	—	—	—	—	90
J71	—	—	—	—	—	—
J72	—	—	—	—	—	—
J73	—	—	—	—	—	—
J74	—	—	—	—	—	—



Refer to Heater Element Selection Procedure on page 1-167 before using tables.

Heater Elements Selection

For Application on Bulletin 100/500/609/1200 Line Starters

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TABLE 110		
Heater Element Cat. No.	Full Load Amperes	
	Size 0	Size 1
W10	0.18	0.18
W11	0.20	0.20
W12	0.22	0.22
W13	0.24	0.24
W14	0.27	0.27
W15	0.30	0.30
W16	0.33	0.33
W17	0.36	0.36
W18	0.40	0.40
W19	0.44	0.44
W20	0.48	0.48
W21	0.53	0.53
W22	0.59	0.59
W23	0.65	0.65
W24	0.71	0.71
W25	0.78	0.78
W26	0.86	0.86
W27	0.95	0.95
W28	1.05	1.05
W29	1.16	1.16
W30	1.27	1.27
W31	1.41	1.41
W32	1.55	1.55
W33	1.71	1.71
W34	1.89	1.89
W35	2.08	2.08
W36	2.30	2.30
W37	2.53	2.53
W38	2.79	2.79
W39	3.07	3.07
W40	3.38	3.38
W41	3.73	3.73
W42	4.11	4.11
W43	4.51	4.51
W44	4.96	4.96
W45	5.44	5.44
W46	5.98	5.98
W47	6.57	6.57
W48	7.21	7.21
W49	7.92	7.92
W50	8.70	8.70
W51	9.57	9.5
W52	10.5	10.5
W53	11.6	11.6
W54	12.7	12.7
W55	14.0	14.0
W56	15.4	15.4
W57	16.8	16.8
W58	18.3	18.3
W59	—	19.9
W60	—	21.7
W61	—	23.6
W62	—	25.7
W63	—	28.0

TABLE 112			
Heater Element Cat. No.	Full Load Amperes		
	Size 0	Size 1	Size 1P
W10	0.21	0.21	—
W11	0.23	0.23	—
W12	0.25	0.25	—
W13	0.28	0.28	—
W14	0.31	0.31	—
W15	0.34	0.34	—
W16	0.37	0.37	—
W17	0.41	0.41	—
W18	0.45	0.45	—
W19	0.49	0.49	—
W20	0.54	0.54	—
W21	0.59	0.59	—
W22	0.65	0.65	—
W23	0.71	0.71	—
W24	0.78	0.78	—
W25	0.86	0.86	—
W26	0.94	0.94	—
W27	1.04	1.04	—
W28	1.14	1.14	—
W29	1.26	1.26	—
W30	1.39	1.39	—
W31	1.53	1.53	—
W32	1.69	1.69	—
W33	1.86	1.86	—
W34	2.05	2.05	—
W35	2.26	2.26	—
W36	2.49	2.49	—
W37	2.74	2.74	—
W38	3.02	3.02	—
W39	3.33	3.33	—
W40	3.67	3.67	—
W41	4.04	4.04	—
W42	4.45	4.45	—
W43	4.89	4.89	—
W44	5.38	5.38	—
W45	5.92	5.92	—
W46	6.51	6.51	—
W47	7.16	7.16	—
W48	7.87	7.87	—
W49	8.66	8.66	—
W50	9.52	9.52	—
W51	10.5	10.5	10.5
W52	11.5	11.5	11.5
W53	12.6	12.6	12.6
W54	13.9	13.9	13.9
W55	15.2	15.2	15.2
W56	16.7	16.7	16.7
W57	18.3	18.3	18.3
W58	—	19.9	19.9
W59	—	21.8	21.8
W60	—	23.8	23.8
W61	—	26.0	26.0
W62	—	28.5	28.5
W63	—	—	31.0
W64	—	—	34.0
W65	—	—	37.0

Refer to Heater Element Selection Procedure on page 1-167 before using tables.



Bulletin Eutectic Alloy Overload Relays
Heater Elements Selection
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TABLE 116		
Heater Element Cat. No.	Full Load Amperes	
	Size 0	Size 1
JJ14	0.19	0.19
JJ13	0.21	0.21
JJ12	0.23	0.23
JJ11	0.26	0.26
JJ10	0.29	0.29
JJ9	0.31	0.31
JJ8	0.35	0.35
JJ7	0.39	0.39
JJ6	0.43	0.43
JJ5	0.47	0.47
JJ4	0.52	0.52
JJ3	0.58	0.58
JJ2	0.64	0.64
JJ1	0.71	0.71
J1	0.79	0.79
J2	0.87	0.87
J3	0.96	0.96
J4	1.07	1.07
J5	1.18	1.18
J6	1.31	1.31
J7	1.45	1.45
J8	1.60	1.60
J9	1.76	1.76
J10	1.94	1.94
J11	2.13	2.13
J12	2.35	2.35
J13	2.59	2.59
J14	2.85	2.85
J15	3.14	3.14
J16	3.45	3.45
J17	3.80	3.80
J18	4.19	4.19
J19	4.62	4.62
J20	5.08	5.08
J21	5.60	5.60
J22	6.17	6.17
J23	6.80	6.80
J24	7.48	7.48
J25	8.24	8.24
J26	9.08	9.08
J27	10.0	10.0
J28	11.0	11.0
J29	12.2	12.2
J30	13.6	13.6
J31	15.1	15.1
J32	16.7	16.7
J33	18.6	18.6
J34	—	20.4
J35	—	22.5
J36	—	24.8
J37	—	27.5
J38	—	—
J39	—	—
J40	—	—

TABLE 117			
Heater Element Cat. No.	Full Load Amperes		
	Size 0	Size 1	Size 1P
JJ14	0.20	0.20	—
JJ13	0.22	0.22	—
JJ12	0.24	0.24	—
JJ11	0.27	0.27	—
JJ10	0.30	0.30	—
JJ9	0.33	0.33	—
JJ8	0.37	0.37	—
JJ7	0.40	0.40	—
JJ6	0.45	0.45	—
JJ5	0.50	0.50	—
JJ4	0.55	0.55	—
JJ3	0.60	0.60	—
JJ2	0.67	0.67	—
JJ1	0.74	0.74	—
J1	0.82	0.82	—
J2	0.91	0.91	—
J3	1.00	1.00	—
J4	1.11	1.11	—
J5	1.22	1.22	—
J6	1.35	1.35	—
J7	1.49	1.49	—
J8	1.66	1.66	—
J9	1.83	1.83	—
J10	2.02	2.02	—
J11	2.24	2.24	—
J12	2.48	2.48	—
J13	2.75	2.75	—
J14	3.03	3.03	—
J15	3.35	3.35	—
J16	3.70	3.70	—
J17	4.10	4.10	—
J18	4.53	4.53	—
J19	5.01	5.01	—
J20	5.54	5.54	—
J21	6.13	6.13	—
J22	6.78	6.78	—
J23	7.49	7.49	—
J24	8.29	8.29	—
J25	9.16	9.16	—
J26	10.1	10.1	—
J27	11.2	11.2	—
J28	12.4	12.4	12.4
J29	13.7	13.7	13.7
J30	15.2	15.2	15.2
J31	16.8	16.8	16.8
J32	18.5	18.5	18.5
J33	—	20.5	20.5
J34	—	22.8	22.8
J35	—	25.0	25.0
J36	—	27.5	27.5
J37	—	—	30.0
J38	—	—	33.5
J39	—	—	36.0
J40	—	—	—

Refer to Heater Element Selection Procedure on page 1-167 before using tables.

Heater Elements Selection

For Application on Bulletin 100/500/609/1200 Line Starters

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TABLE 127	
Heater Element Cat. No.	Full Load Amperes
	Size 00
W10	0.21
W11	0.23
W12	0.25
W13	0.27
W14	0.30
W15	0.34
W16	0.37
W17	0.41
W18	0.45
W19	0.50
W20	0.55
W21	0.60
W22	0.65
W23	0.71
W24	0.78
W25	0.86
W26	0.95
W27	1.04
W28	1.14
W29	1.25
W30	1.36
W31	1.50
W32	1.65
W33	1.82
W34	2.01
W35	2.21
W36	2.45
W37	2.67
W38	3.00
W39	3.31
W40	3.65
W41	4.06
W42	4.49
W43	4.98
W44	5.48
W45	6.06
W46	6.68
W47	7.35
W48	8.09
W49	8.90
W50	9.80

TABLE 132		
Heater Element Cat. No.	Full Load Amperes	
	Size 7	Size 8
J7	231	350
J8	253	380
J9	276	415
J10	305	455
J11	330	495
J12	360	540
J13	400	600
J14	440	660
J15	485	722
J16	530	795
J17	585	880
J18	645	965
J19	710	1160
J20	780	1170
J21	860	1290

TABLE 133		
Heater Element Cat. No.	Full Load Amperes	
	Size 7	Size 8
W29	—	—
W30	—	—
W31	230	345
W32	248	375
W33	272	410
W34	305	460
W35	325	485
W36	355	535
W37	390	585
W38	430	645
W39	475	710
W40	520	780
W41	575	860
W42	630	945
W43	690	1035
W44	755	1135
W45	835	1255

TABLE 134	
Heater Element Cat. No.	Size 7
W29	240
W30	261
W31	285
W32	310
W33	340
W34	370
W35	405
W36	445
W37	490
W38	540
W39	590
W40	650
W41	710
W42	780
W43	860
W44	—

Refer to Heater Element Selection Procedure on page 1-167 before using tables.

Bulletin Eutectic Alloy Overload Relays
Heater Elements Selection
 For Application on Bulletin 100/500/609/1200 Line Starters



TABLE 144					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
W10	0.18	0.18	—	—	—
W11	0.20	0.20	—	—	—
W12	0.22	0.22	—	—	—
W13	0.24	0.24	—	—	—
W14	0.26	0.26	—	—	—
W15	0.29	0.29	—	—	—
W16	0.32	0.32	—	—	—
W17	0.35	0.35	—	—	—
W18	0.38	0.38	—	—	—
W19	0.42	0.42	—	—	—
W20	0.46	0.46	—	—	—
W21	0.51	0.51	—	—	—
W22	0.56	0.56	—	—	—
W23	0.62	0.62	—	—	—
W24	0.68	0.68	—	—	—
W25	0.75	0.75	—	—	—
W26	0.82	0.82	—	—	—
W27	0.90	0.90	—	—	—
W28	0.99	0.99	—	—	—
W29	1.09	1.09	—	—	—
W30	1.20	1.20	—	—	—
W31	1.32	1.32	—	—	—
W32	1.45	1.45	—	—	—
W33	1.59	1.59	—	—	—
W34	1.75	1.75	—	—	—
W35	1.93	1.93	—	—	—
W36	2.12	2.12	—	—	—
W37	2.33	2.33	—	—	—
W38	2.56	2.56	—	—	—
W39	2.81	2.81	—	—	—
W40	3.09	3.09	—	—	—
W41	3.40	3.40	—	—	—
W42	3.74	3.74	—	—	—
W43	4.11	4.11	—	—	—
W44	4.52	4.52	—	—	—
W45	4.97	4.97	—	—	—
W46	5.46	5.46	5.60	—	—
W47	6.01	6.01	6.15	—	—
W48	6.60	6.60	6.76	—	—
W49	7.26	7.26	7.43	—	—
W50	7.98	7.98	8.17	—	—
W51	8.78	8.78	8.98	—	—
W52	9.65	9.65	9.87	—	—
W53	10.6	10.6	10.8	—	—
W54	11.7	11.7	11.9	—	—
W55	12.8	12.8	13.1	—	—
W56	14.1	14.1	14.4	—	—
W57	15.4	15.4	15.7	—	—
W58	16.8	16.8	17.1	—	—
W59	18.3	18.3	18.6	—	—
W60	—	19.8	20.1	—	—
W61	—	21.3	21.7	25.5	—
W62	—	22.7	23.1	28.1	—
W63	—	24.4	24.8	31.0	32.0
W64	—	26.2	28.6	34.0	35.0
W65	—	28.2	30.5	37.0	38.5
W66	—	—	33.0	40.0	42.5
W67	—	—	35.5	43.5	46.5
W68	—	—	38.0	47	51
W69	—	—	40.5	51	55
W70	—	—	43.5	55	59
W71	—	—	47.0	59	64
W72	—	—	—	63	69
W73	—	—	—	67	74
W74	—	—	—	71	79
W75	—	—	—	76	84
W76	—	—	—	80	90
W77	—	—	—	85	96
W78	—	—	—	90	102
W79	—	—	—	—	107
W80	—	—	—	—	113
W81	—	—	—	—	118
W82	—	—	—	—	124
W83	—	—	—	—	130
W84	—	—	—	—	135
W85	—	—	—	—	—

TABLE 145			
Heater Element Cat. No.	Full Load Amperes		
	Size 0	Size 1	Size 2
W10	0.18	0.18	—
W11	0.20	0.20	—
W12	0.22	0.22	—
W13	0.24	0.24	—
W14	0.27	0.27	—
W15	0.30	0.30	—
W16	0.33	0.33	—
W17	0.36	0.36	—
W18	0.40	0.40	—
W19	0.44	0.44	—
W20	0.49	0.49	—
W21	0.54	0.54	—
W22	0.60	0.60	—
W23	0.66	0.66	—
W24	0.73	0.73	—
W25	0.80	0.80	—
W26	0.88	0.88	—
W27	0.97	0.97	—
W28	1.06	1.06	—
W29	1.17	1.17	—
W30	1.29	1.29	—
W31	1.42	1.42	—
W32	1.56	1.56	—
W33	1.71	1.71	—
W34	1.89	1.89	—
W35	2.08	2.08	—
W36	2.28	2.28	—
W37	2.51	2.51	—
W38	2.76	2.76	—
W39	3.04	3.04	—
W40	3.34	3.34	—
W41	3.68	3.68	—
W42	4.05	4.05	—
W43	4.45	4.45	—
W44	4.90	4.90	—
W45	5.39	5.39	5.58
W46	5.88	5.88	6.11
W47	6.41	6.41	6.70
W48	6.99	6.99	7.34
W49	7.63	7.63	7.97
W50	8.32	8.32	8.69
W51	9.07	9.07	9.52
W52	9.89	9.89	10.4
W53	10.8	10.8	11.4
W54	11.8	11.8	12.5
W55	12.9	12.9	13.6
W56	14.2	14.2	14.9
W57	15.5	15.5	16.2
W58	16.8	16.8	17.4
W59	18.5	18.5	19.3
W60	—	20.3	21.0
W61	—	22.2	23.0
W62	—	24.0	25.0
W63	—	26.1	27.1
W64	—	28.4	29.6
W65	—	—	32.0
W66	—	—	34.5
W67	—	—	38.0
W68	—	—	41.5
W69	—	—	45.0
W70	—	—	—
W71	—	—	—
W72	—	—	—
W73	—	—	—
W74	—	—	—
W75	—	—	—
W76	—	—	—
W77	—	—	—
W78	—	—	—
W79	—	—	—
W80	—	—	—
W81	—	—	—
W82	—	—	—
W83	—	—	—
W84	—	—	—
W85	—	—	—

Bulletin Eutectic Alloy Overload Relays
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TABLE 146					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
W10	0.18	0.18	—	—	—
W11	0.20	0.20	—	—	—
W12	0.22	0.22	—	—	—
W13	0.24	0.24	—	—	—
W14	0.27	0.27	—	—	—
W15	0.30	0.30	—	—	—
W16	0.33	0.33	—	—	—
W17	0.36	0.36	—	—	—
W18	0.40	0.40	—	—	—
W19	0.44	0.44	—	—	—
W20	0.49	0.49	—	—	—
W21	0.54	0.54	—	—	—
W22	0.60	0.60	—	—	—
W23	0.66	0.66	—	—	—
W24	0.73	0.73	—	—	—
W25	0.80	0.80	—	—	—
W26	0.88	0.88	—	—	—
W27	0.97	0.97	—	—	—
W28	1.06	1.06	—	—	—
W29	1.17	1.17	—	—	—
W30	1.29	1.29	—	—	—
W31	1.42	1.42	—	—	—
W32	1.56	1.56	—	—	—
W33	1.71	1.71	—	—	—
W34	1.89	1.89	—	—	—
W35	2.08	2.08	—	—	—
W36	2.28	2.28	—	—	—
W37	2.51	2.51	—	—	—
W38	2.76	2.76	—	—	—
W39	3.04	3.04	—	—	—
W40	3.34	3.34	—	—	—
W41	3.68	3.68	—	—	—
W42	4.05	4.05	—	—	—
W43	4.45	4.45	—	—	—
W44	4.90	4.90	—	—	—
W45	5.39	5.39	5.53	—	—
W46	5.88	5.88	6.04	—	—
W47	6.41	6.41	6.60	—	—
W48	6.99	6.99	7.21	—	—
W49	7.63	7.63	7.87	—	—
W50	8.32	8.32	8.60	—	—
W51	9.07	9.07	9.39	—	—
W52	9.89	9.89	10.3	—	—
W53	10.8	10.8	11.2	—	—
W54	11.8	11.8	12.2	—	—
W55	12.8	12.8	13.3	—	—
W56	14.0	14.0	14.6	—	—
W57	15.3	15.3	15.8	—	—
W58	16.7	16.7	17.3	—	—
W59	18.1	18.1	18.9	—	—
W60	—	19.7	20.6	—	—
W61	—	21.5	22.5	25.5	—
W62	—	23.5	24.6	28.1	—
W63	—	25.7	26.8	31.0	32.0
W64	—	27.5	29.4	34.0	35.0
W65	—	—	32.0	37.0	38.5
W66	—	—	34.5	40.0	42.5
W67	—	—	37.5	43.5	46.5
W68	—	—	41.0	47.0	51
W69	—	—	44.5	51	55
W70	—	—	47.0	55	59
W71	—	—	—	59	64
W72	—	—	—	63	69
W73	—	—	—	67	74
W74	—	—	—	71	79
W75	—	—	—	76	84
W76	—	—	—	80	90
W77	—	—	—	85	96
W78	—	—	—	90	102
W79	—	—	—	—	107
W80	—	—	—	—	113
W81	—	—	—	—	118
W82	—	—	—	—	124
W83	—	—	—	—	130
W84	—	—	—	—	135

TABLE 148					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
W10	0.19	0.19	—	—	—
W11	0.21	0.21	—	—	—
W12	0.23	0.23	—	—	—
W13	0.25	0.25	—	—	—
W14	0.28	0.28	—	—	—
W15	0.30	0.30	—	—	—
W16	0.33	0.33	—	—	—
W17	0.36	0.36	—	—	—
W18	0.39	0.39	—	—	—
W19	0.43	0.43	—	—	—
W20	0.48	0.48	—	—	—
W21	0.52	0.52	—	—	—
W22	0.57	0.57	—	—	—
W23	0.62	0.62	—	—	—
W24	0.69	0.69	—	—	—
W25	0.76	0.76	—	—	—
W26	0.83	0.83	—	—	—
W27	0.91	0.91	—	—	—
W28	1.01	1.01	—	—	—
W29	1.12	1.12	—	—	—
W30	1.22	1.22	—	—	—
W31	1.34	1.34	—	—	—
W32	1.47	1.47	—	—	—
W33	1.62	1.62	—	—	—
W34	1.78	1.78	—	—	—
W35	1.96	1.96	—	—	—
W36	2.15	2.15	—	—	—
W37	2.36	2.36	—	—	—
W38	2.60	2.60	—	—	—
W39	2.86	2.86	—	—	—
W40	3.16	3.16	—	—	—
W41	3.48	3.48	—	—	—
W42	3.84	3.84	—	—	—
W43	4.22	4.22	—	—	—
W44	4.65	4.65	—	—	—
W45	5.12	5.12	5.13	—	—
W46	5.63	5.63	5.64	—	—
W47	6.20	6.20	6.22	—	—
W48	6.82	6.82	6.85	—	—
W49	7.51	7.51	7.56	—	—
W50	8.23	8.23	8.45	—	—
W51	9.07	9.07	9.32	—	—
W52	9.95	9.95	10.3	10.6	—
W53	10.8	10.8	11.4	11.6	—
W54	11.9	11.9	12.4	12.6	—
W55	13.0	13.0	13.6	13.9	—
W56	14.2	14.2	14.8	15.3	—
W57	15.5	15.5	16.1	16.9	17.3
W58	16.4	16.4	17.3	18.7	19.0
W59	17.7	17.7	18.7	20.7	21.0
W60	19.7	19.7	20.6	22.8	23.1
W61	—	21.7	22.7	25.1	25.5
W62	—	24.2	25.2	27.5	28.0
W63	—	27.0	28.0	30.5	31.0
W64	—	—	30.0	33.5	34.0
W65	—	—	32.5	36.5	37.0
W66	—	—	35.0	39.5	40.0
W67	—	—	38.0	42.5	44.0
W68	—	—	40.5	46	48.5
W69	—	—	43.5	50	53.0
W70	—	—	46.5	54	57.0
W71	—	—	—	58	62.0
W72	—	—	—	62	67.0
W73	—	—	—	67	72.0
W74	—	—	—	72	77.0
W75	—	—	—	76	82.0
W76	—	—	—	81	87.0
W77	—	—	—	86	93.0
W78	—	—	—	90	99.0
W79	—	—	—	—	105
W80	—	—	—	—	112
W81	—	—	—	—	117
W82	—	—	—	—	123
W83	—	—	—	—	129
W84	—	—	—	—	135
W85	—	—	—	—	—



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TABLE 149					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
W10	0.18	0.18	—	—	—
W11	0.20	0.20	—	—	—
W12	0.22	0.22	—	—	—
W13	0.24	0.24	—	—	—
W14	0.27	0.27	—	—	—
W15	0.30	0.30	—	—	—
W16	0.33	0.33	—	—	—
W17	0.36	0.36	—	—	—
W18	0.40	0.40	—	—	—
W19	0.44	0.44	—	—	—
W20	0.49	0.49	—	—	—
W21	0.54	0.54	—	—	—
W22	0.60	0.60	—	—	—
W23	0.66	0.66	—	—	—
W24	0.73	0.73	—	—	—
W25	0.80	0.80	—	—	—
W26	0.88	0.88	—	—	—
W27	0.97	0.97	—	—	—
W28	1.06	1.06	—	—	—
W29	1.17	1.17	—	—	—
W30	1.29	1.29	—	—	—
W31	1.42	1.42	—	—	—
W32	1.56	1.56	—	—	—
W33	1.71	1.71	—	—	—
W34	1.89	1.89	—	—	—
W35	2.08	2.08	—	—	—
W36	2.28	2.28	—	—	—
W37	2.51	2.51	—	—	—
W38	2.76	2.76	—	—	—
W39	3.04	3.04	—	—	—
W40	3.34	3.34	—	—	—
W41	3.68	3.68	—	—	—
W42	4.05	4.05	—	—	—
W43	4.45	4.45	—	—	—
W44	4.90	4.90	—	—	—
W45	5.39	5.39	5.53	—	—
W46	5.88	5.88	6.00	—	—
W47	6.41	6.41	6.60	—	—
W48	6.99	6.99	7.20	—	—
W49	7.63	7.63	7.84	—	—
W50	8.32	8.32	8.53	—	—
W51	9.07	9.07	9.30	—	—
W52	9.89	9.89	10.2	10.6	—
W53	10.8	10.8	11.2	11.6	—
W54	11.8	11.8	12.2	12.6	—
W55	12.8	12.8	13.2	13.9	—
W56	14.0	14.0	14.4	15.3	—
W57	15.3	15.3	15.8	16.9	18.5
W58	16.2	16.2	16.8	18.7	20.5
W59	17.6	17.6	18.3	20.7	22.5
W60	19.5	19.5	20.3	22.8	25.0
W61	—	21.5	22.4	25.1	27.5
W62	—	23.4	24.4	27.5	30.0
W63	—	25.7	26.8	30.5	33.0
W64	—	27.5	28.7	33.5	36.0
W65	—	—	31.5	37.0	39.5
W66	—	—	34.0	41.0	43.0
W67	—	—	37.0	44.0	47.5
W68	—	—	40.5	47.5	52.0
W69	—	—	43.5	52.0	56.0
W70	—	—	46.5	57.0	61.0
W71	—	—	—	61.0	66.0
W72	—	—	—	66.0	71.0
W73	—	—	—	71.0	76.0
W74	—	—	—	75.0	81.0
W75	—	—	—	79.0	87.0
W76	—	—	—	83.0	93.0
W77	—	—	—	87.0	99.0
W78	—	—	—	91.0	105
W79	—	—	—	—	111
W80	—	—	—	—	118
W81	—	—	—	—	125
W82	—	—	—	—	132
W83	—	—	—	—	139
W84	—	—	—	—	—

TABLE 150					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
W10	0.18	0.18	—	—	—
W11	0.20	0.20	—	—	—
W12	0.22	0.22	—	—	—
W13	0.24	0.24	—	—	—
W14	0.26	0.26	—	—	—
W15	0.28	0.28	—	—	—
W16	0.31	0.31	—	—	—
W17	0.34	0.34	—	—	—
W18	0.37	0.37	—	—	—
W19	0.41	0.41	—	—	—
W20	0.46	0.46	—	—	—
W21	0.50	0.50	—	—	—
W22	0.55	0.55	—	—	—
W23	0.60	0.60	—	—	—
W24	0.67	0.67	—	—	—
W25	0.73	0.73	—	—	—
W26	0.80	0.80	—	—	—
W27	0.88	0.88	—	—	—
W28	0.97	0.97	—	—	—
W29	1.07	1.07	—	—	—
W30	1.17	1.17	—	—	—
W31	1.29	1.29	—	—	—
W32	1.42	1.42	—	—	—
W33	1.57	1.57	—	—	—
W34	1.73	1.73	—	—	—
W35	1.90	1.90	—	—	—
W36	2.08	2.08	—	—	—
W37	2.28	2.28	—	—	—
W38	2.51	2.51	—	—	—
W39	2.76	2.76	—	—	—
W40	3.04	3.04	—	—	—
W41	3.34	3.34	—	—	—
W42	3.68	3.68	—	—	—
W43	4.04	4.04	—	—	—
W44	4.46	4.46	—	—	—
W45	4.94	4.94	5.13	—	—
W46	5.46	5.46	5.64	—	—
W47	6.03	6.03	6.22	—	—
W48	6.65	6.65	6.85	—	—
W49	7.33	7.33	7.56	—	—
W50	8.13	8.13	8.45	—	—
W51	8.95	8.95	9.32	—	—
W52	9.90	9.90	10.3	10.4	—
W53	10.7	10.7	11.3	11.4	—
W54	11.7	11.7	12.3	12.5	—
W55	12.8	12.8	13.4	13.7	—
W56	14.0	14.0	14.5	15.1	—
W57	15.3	15.3	15.8	16.7	18.5
W58	16.2	16.2	16.7	18.4	20.5
W59	17.5	17.5	18.0	20.3	22.5
W60	19.4	19.4	19.9	22.5	25.0
W61	—	21.3	21.9	24.8	27.5
W62	—	23.3	24.2	27.2	30.0
W63	—	25.5	26.8	30.0	33.0
W64	—	27.2	28.7	33.0	36.0
W65	—	—	31.0	36.0	39.5
W66	—	—	33.5	39.5	43.0
W67	—	—	36.0	43.5	47.0
W68	—	—	38.5	47.5	51.0
W69	—	—	41.5	52.0	56.0
W70	—	—	45.0	56.0	61.0
W71	—	—	—	60.0	66.0
W72	—	—	—	65.0	71.0
W73	—	—	—	69.0	76.0
W74	—	—	—	74.0	82.0
W75	—	—	—	79.0	87.0
W76	—	—	—	85.0	93.0
W77	—	—	—	91.0	99.0
W78	—	—	—	—	105
W79	—	—	—	—	111
W80	—	—	—	—	118
W81	—	—	—	—	125
W82	—	—	—	—	132
W83	—	—	—	—	139
W84	—	—	—	—	—
W85	—	—	—	—	—

Heater Elements Selection

For Application on Bulletin 100/500/609/1200 Line Starters

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TABLE 151					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
W10	0.19	0.19	—	—	—
W11	0.21	0.21	—	—	—
W12	0.23	0.23	—	—	—
W13	0.25	0.25	—	—	—
W14	0.28	0.28	—	—	—
W15	0.30	0.30	—	—	—
W16	0.33	0.33	—	—	—
W17	0.36	0.36	—	—	—
W18	0.39	0.39	—	—	—
W19	0.43	0.43	—	—	—
W20	0.48	0.48	—	—	—
W21	0.52	0.52	—	—	—
W22	0.57	0.57	—	—	—
W23	0.62	0.62	—	—	—
W24	0.69	0.69	—	—	—
W25	0.76	0.76	—	—	—
W26	0.83	0.83	—	—	—
W27	0.91	0.91	—	—	—
W28	1.01	1.01	—	—	—
W29	1.12	1.12	—	—	—
W30	1.22	1.22	—	—	—
W31	1.34	1.34	—	—	—
W32	1.47	1.47	—	—	—
W33	1.62	1.62	—	—	—
W34	1.78	1.78	—	—	—
W35	1.96	1.96	—	—	—
W36	2.15	2.15	—	—	—
W37	2.36	2.36	—	—	—
W38	2.60	2.60	—	—	—
W39	2.86	2.86	—	—	—
W40	3.16	3.16	—	—	—
W41	3.48	3.48	—	—	—
W42	3.84	3.84	—	—	—
W43	4.22	4.22	—	—	—
W44	4.65	4.65	—	—	—
W45	5.12	5.12	5.13	—	—
W46	5.63	5.63	5.64	—	—
W47	6.20	6.20	6.22	—	—
W48	6.82	6.82	6.85	—	—
W49	7.51	7.51	7.56	—	—
W50	8.23	8.23	8.45	—	—
W51	9.07	9.07	9.32	—	—
W52	9.95	9.95	10.3	10.6	—
W53	10.8	10.8	11.3	11.6	—
W54	11.9	11.9	12.3	12.6	—
W55	13.0	13.0	13.4	13.9	—
W56	14.2	14.2	14.5	15.3	—
W57	15.5	15.5	15.8	16.9	—
W58	16.4	16.4	16.7	18.7	—
W59	17.7	17.7	18.1	20.7	—
W60	19.7	19.7	20.0	22.8	—
W61	—	21.7	22.0	25.1	25.0
W62	—	24.2	24.5	27.5	27.7
W63	—	27.0	27.3	30.5	31.0
W64	—	—	29.2	33.5	34.0
W65	—	—	31.5	36.5	38.0
W66	—	—	34.5	40.0	41.5
W67	—	—	37.0	44.0	45.5
W68	—	—	39.5	48.0	49.0
W69	—	—	42.5	52.0	53.0
W70	—	—	46.0	57.0	57.0
W71	—	—	—	61.0	62.0
W72	—	—	—	66.0	67.0
W73	—	—	—	70.0	72.0
W74	—	—	—	75.0	77.0
W75	—	—	—	80.0	84.0
W76	—	—	—	86.0	92.0
W77	—	—	—	92.0	97.0
W78	—	—	—	—	102
W79	—	—	—	—	109
W80	—	—	—	—	117
W81	—	—	—	—	125
W82	—	—	—	—	130
W83	—	—	—	—	136
W84	—	—	—	—	—
W85	—	—	—	—	—

TABLE 152					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
W10	0.19	0.19	—	—	—
W11	0.21	0.21	—	—	—
W12	0.23	0.23	—	—	—
W13	0.25	0.25	—	—	—
W14	0.28	0.28	—	—	—
W15	0.31	0.31	—	—	—
W16	0.34	0.34	—	—	—
W17	0.37	0.37	—	—	—
W18	0.41	0.41	—	—	—
W19	0.45	0.45	—	—	—
W20	0.50	0.50	—	—	—
W21	0.55	0.55	—	—	—
W22	0.60	0.60	—	—	—
W23	0.66	0.66	—	—	—
W24	0.73	0.73	—	—	—
W25	0.80	0.80	—	—	—
W26	0.88	0.88	—	—	—
W27	0.97	0.97	—	—	—
W28	1.06	1.06	—	—	—
W29	1.16	1.16	—	—	—
W30	1.27	1.27	—	—	—
W31	1.39	1.39	—	—	—
W32	1.51	1.51	—	—	—
W33	1.65	1.65	—	—	—
W34	1.80	1.80	—	—	—
W35	1.96	1.96	—	—	—
W36	2.15	2.15	—	—	—
W37	2.36	2.36	—	—	—
W38	2.60	2.60	—	—	—
W39	2.86	2.86	—	—	—
W40	3.16	3.16	—	—	—
W41	3.48	3.48	—	—	—
W42	3.85	3.85	—	—	—
W43	4.23	4.23	—	—	—
W44	4.68	4.68	—	—	—
W45	5.18	5.18	5.25	—	—
W46	5.68	5.68	5.81	—	—
W47	6.28	6.28	6.41	—	—
W48	6.94	6.94	7.09	—	—
W49	7.71	7.71	7.86	—	—
W50	8.45	8.45	8.56	—	—
W51	9.29	9.29	9.40	—	—
W52	10.3	10.3	10.4	10.6	—
W53	11.4	11.4	11.5	11.6	—
W54	12.5	12.5	12.6	12.6	—
W55	13.7	13.7	13.8	13.9	—
W56	15.0	15.0	15.1	15.3	—
W57	16.3	16.3	16.4	16.9	18.5
W58	17.6	17.6	17.7	18.7	20.5
W59	18.9	18.9	19.1	20.7	22.5
W60	—	20.9	21.1	22.8	25.0
W61	—	22.9	23.2	25.1	27.5
W62	—	25.0	25.7	27.5	30.0
W63	—	27.6	28.5	30.5	33.0
W64	—	—	30.5	33.5	36.0
W65	—	—	33.0	36.5	39.5
W66	—	—	35.5	40.0	43.0
W67	—	—	38.5	44.0	47.0
W68	—	—	41.5	48.5	51.0
W69	—	—	45.0	53.0	56.0
W70	—	—	—	58.0	61.0
W71	—	—	—	62.0	66.0
W72	—	—	—	67.0	72.0
W73	—	—	—	72.0	77.0
W74	—	—	—	77.0	83.0
W75	—	—	—	82.0	89.0
W76	—	—	—	88.0	95.0
W77	—	—	—	94.0	102
W78	—	—	—	—	108
W79	—	—	—	—	116
W80	—	—	—	—	123
W81	—	—	—	—	130
W82	—	—	—	—	137
W83	—	—	—	—	—

Bulletin Eutectic Alloy Overload Relays
Heater Elements Selection
 For Application on Bulletin 100/500/609/1200 Line Starters



TABLE 153					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
W10	0.19	0.19	—	—	—
W11	0.21	0.21	—	—	—
W12	0.23	0.23	—	—	—
W13	0.25	0.25	—	—	—
W14	0.28	0.28	—	—	—
W15	0.31	0.31	—	—	—
W16	0.34	0.34	—	—	—
W17	0.37	0.37	—	—	—
W18	0.41	0.41	—	—	—
W19	0.45	0.45	—	—	—
W20	0.5	0.50	—	—	—
W21	0.55	0.55	—	—	—
W22	0.6	0.60	—	—	—
W23	0.66	0.66	—	—	—
W24	0.73	0.73	—	—	—
W25	0.8	0.80	—	—	—
W26	0.88	0.88	—	—	—
W27	0.97	0.97	—	—	—
W28	1.06	1.06	—	—	—
W29	1.16	1.16	—	—	—
W30	1.27	1.27	—	—	—
W31	1.39	1.39	—	—	—
W32	1.51	1.51	—	—	—
W33	1.65	1.65	—	—	—
W34	1.8	1.80	—	—	—
W35	1.98	1.98	—	—	—
W36	2.18	2.18	—	—	—
W37	2.39	2.39	—	—	—
W38	2.63	2.63	—	—	—
W39	2.9	2.90	—	—	—
W40	3.19	3.19	—	—	—
W41	3.5	3.50	—	—	—
W42	3.85	3.85	—	—	—
W43	4.24	4.24	—	—	—
W44	4.66	4.66	—	—	—
W45	5.13	5.13	5.25	—	—
W46	5.64	5.64	5.78	—	—
W47	6.2	6.20	6.35	—	—
W48	6.82	6.82	6.99	—	—
W49	7.51	7.51	7.69	—	—
W50	8.25	8.25	8.45	—	—
W51	9.07	9.07	9.32	—	—
W52	9.98	9.98	10.3	10.6	—
W53	11	11.0	11.4	11.6	—
W54	12.1	12.1	12.4	12.6	—
W55	13.3	13.3	13.6	13.9	—
W56	14.6	14.6	15.0	15.3	—
W57	16	16.0	16.4	16.9	18.5
W58	17.4	17.4	17.8	18.7	20.5
W59	19	19.0	19.5	20.7	22.5
W60	—	20.7	21.2	22.8	25.0
W61	—	22.7	23.3	25.1	27.5
W62	—	24.7	25.3	27.5	30.0
W63	—	27.0	28.0	30.5	33.0
W64	—	—	30.0	33.5	36.0
W65	—	—	32.5	36.5	39.5
W66	—	—	35.0	39.5	43.0
W67	—	—	38.0	42.5	47.0
W68	—	—	40.5	46.0	51.0
W69	—	—	43.5	50.0	56.0
W70	—	—	46.5	54.0	61.0
W71	—	—	—	58.0	66.0
W72	—	—	—	62.0	71.0
W73	—	—	—	67.0	76.0
W74	—	—	—	72.0	82.0
W75	—	—	—	76.0	87.0
W76	—	—	—	81.0	93.0
W77	—	—	—	86.0	99.0
W78	—	—	—	90.0	105
W79	—	—	—	—	111
W80	—	—	—	—	118
W81	—	—	—	—	125
W82	—	—	—	—	132
W83	—	—	—	—	139
W84	—	—	—	—	—

TABLE 154					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
W10	0.20	0.20	—	—	—
W11	0.22	0.22	—	—	—
W12	0.24	0.24	—	—	—
W13	0.26	0.26	—	—	—
W14	0.29	0.29	—	—	—
W15	0.32	0.32	—	—	—
W16	0.35	0.35	—	—	—
W17	0.38	0.38	—	—	—
W18	0.42	0.42	—	—	—
W19	0.47	0.47	—	—	—
W20	0.51	0.51	—	—	—
W21	0.56	0.56	—	—	—
W22	0.61	0.61	—	—	—
W23	0.67	0.67	—	—	—
W24	0.74	0.74	—	—	—
W25	0.81	0.81	—	—	—
W26	0.89	0.89	—	—	—
W27	0.98	0.98	—	—	—
W28	1.08	1.08	—	—	—
W29	1.19	1.19	—	—	—
W30	1.30	1.30	—	—	—
W31	1.43	1.43	—	—	—
W32	1.55	1.55	—	—	—
W33	1.70	1.70	—	—	—
W34	1.90	1.90	—	—	—
W35	2.02	2.02	—	—	—
W36	2.22	2.22	—	—	—
W37	2.43	2.43	—	—	—
W38	2.68	2.68	—	—	—
W39	2.96	2.96	—	—	—
W40	3.25	3.25	—	—	—
W41	3.58	3.58	—	—	—
W42	3.94	3.94	—	—	—
W43	4.30	4.30	—	—	—
W44	4.72	4.72	—	—	—
W45	5.22	5.22	5.25	—	—
W46	5.78	5.78	5.81	—	—
W47	6.38	6.38	6.41	—	—
W48	7.06	7.06	7.09	—	—
W49	7.83	7.83	7.86	—	—
W50	8.55	8.55	8.58	—	—
W51	9.41	9.41	9.48	—	—
W52	10.5	10.5	10.6	11.1	—
W53	11.6	11.6	11.7	12.2	—
W54	12.7	12.7	12.8	13.4	—
W55	14.0	14.0	14.1	14.7	—
W56	15.3	15.3	15.4	16.3	—
W57	16.7	16.7	16.9	17.9	19.5
W58	18.0	18.0	18.3	19.7	21.4
W59	—	19.3	19.9	21.7	23.7
W60	—	21.3	21.9	23.8	26.0
W61	—	23.3	24.2	26.1	28.7
W62	—	25.6	26.8	28.7	31.5
W63	—	28.1	29.6	31.5	34.5
W64	—	—	32.5	34.5	37.5
W65	—	—	35.0	38.0	41.0
W66	—	—	37.5	41.5	44.5
W67	—	—	41.0	45.5	48.5
W68	—	—	45.0	49.5	53
W69	—	—	—	54	58
W70	—	—	—	59	63
W71	—	—	—	64	68
W72	—	—	—	70	74
W73	—	—	—	76	80
W74	—	—	—	81	86
W75	—	—	—	87	92
W76	—	—	—	93	98
W77	—	—	—	—	105
W78	—	—	—	—	112
W79	—	—	—	—	120
W80	—	—	—	—	128
W81	—	—	—	—	136
W82	—	—	—	—	—
W83	—	—	—	—	—
W84	—	—	—	—	—
W85	—	—	—	—	—

Heater Elements Selection

For Application on Bulletin 100/500/609/1200 Line Starters

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TABLE 155					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 1P	Size 2	Size 3
W10	0.20	0.20	—	—	—
W11	0.22	0.22	—	—	—
W12	0.24	0.24	—	—	—
W13	0.26	0.26	—	—	—
W14	0.29	0.29	—	—	—
W15	0.32	0.32	—	—	—
W16	0.35	0.35	—	—	—
W17	0.39	0.39	—	—	—
W18	0.43	0.43	—	—	—
W19	0.47	0.47	—	—	—
W20	0.51	0.51	—	—	—
W21	0.56	0.56	—	—	—
W22	0.61	0.61	—	—	—
W23	0.67	0.67	—	—	—
W24	0.74	0.74	—	—	—
W25	0.81	0.81	—	—	—
W26	0.89	0.89	—	—	—
W27	0.98	0.98	—	—	—
W28	1.08	1.08	—	—	—
W29	1.19	1.19	—	—	—
W30	1.30	1.30	—	—	—
W31	1.43	1.43	—	—	—
W32	1.56	1.56	—	—	—
W33	1.70	1.70	—	—	—
W34	1.88	1.88	—	—	—
W35	2.05	2.05	—	—	—
W36	2.24	2.24	—	—	—
W37	2.44	2.44	—	—	—
W38	2.69	2.69	—	—	—
W39	2.97	2.97	—	—	—
W40	3.30	3.30	—	—	—
W41	3.64	3.64	—	—	—
W42	4.10	4.10	—	—	—
W43	4.57	4.57	—	—	—
W44	5.01	5.01	—	—	—
W45	5.51	5.51	—	5.48	—
W46	6.06	6.06	—	6.09	—
W47	6.62	6.62	—	6.65	—
W48	7.22	7.22	—	7.26	—
W49	7.89	7.89	—	7.94	—
W50	8.62	8.62	—	8.68	—
W51	9.41	9.41	—	9.48	—
W52	10.5	10.5	—	10.6	11.5
W53	11.6	11.6	11.6	11.7	12.6
W54	12.7	12.7	12.7	12.8	13.8
W55	14.0	14.0	14.0	14.1	15.1
W56	15.3	15.3	15.3	15.4	16.7
W57	16.7	16.7	16.7	16.8	18.3
W58	18.0	18.0	18.0	18.1	20.1
W59	—	19.3	19.3	19.5	22.1
W60	—	21.3	21.3	21.5	24.4
W61	—	23.3	23.3	23.8	27.0
W62	—	25.6	25.6	26.4	29.5
W63	—	28.1	28.1	29.2	32.5
W64	—	—	30.5	31.5	35.0
W65	—	—	32.5	34.0	38.5
W66	—	—	34.0	36.5	42.0
W67	—	—	36.0	39.5	46.0
W68	—	—	—	42.5	50
W69	—	—	—	46.0	54
W70	—	—	—	—	59
W71	—	—	—	—	64
W72	—	—	—	—	70
W73	—	—	—	—	76
W74	—	—	—	—	81
W75	—	—	—	—	87
W76	—	—	—	—	93
W77	—	—	—	—	—
W78	—	—	—	—	—
W79	—	—	—	—	—
W80	—	—	—	—	—

TABLE 156						
Heater Element Cat. No.	Full Load Amperes					
	Size 0	Size 1	Size 1P	Size 2	Size 3	Size 4
W10	0.20	0.20	—	—	—	—
W11	0.22	0.22	—	—	—	—
W12	0.24	0.24	—	—	—	—
W13	0.26	0.26	—	—	—	—
W14	0.29	0.29	—	—	—	—
W15	0.32	0.32	—	—	—	—
W16	0.35	0.35	—	—	—	—
W17	0.39	0.39	—	—	—	—
W18	0.43	0.43	—	—	—	—
W19	0.47	0.47	—	—	—	—
W20	0.51	0.51	—	—	—	—
W21	0.56	0.56	—	—	—	—
W22	0.61	0.61	—	—	—	—
W23	0.67	0.67	—	—	—	—
W24	0.74	0.74	—	—	—	—
W25	0.81	0.81	—	—	—	—
W26	0.89	0.89	—	—	—	—
W27	0.98	0.98	—	—	—	—
W28	1.08	1.08	—	—	—	—
W29	1.19	1.19	—	—	—	—
W30	1.30	1.30	—	—	—	—
W31	1.43	1.43	—	—	—	—
W32	1.57	1.57	—	—	—	—
W33	1.72	1.72	—	—	—	—
W34	1.90	1.90	—	—	—	—
W35	2.08	2.08	—	—	—	—
W36	2.28	2.28	—	—	—	—
W37	2.49	2.49	—	—	—	—
W38	2.74	2.74	—	—	—	—
W39	3.02	3.02	—	—	—	—
W40	3.33	3.33	—	—	—	—
W41	3.68	3.68	—	—	—	—
W42	4.14	4.14	—	—	—	—
W43	4.61	4.61	—	—	—	—
W44	5.06	5.06	—	—	—	—
W45	5.56	5.56	—	5.57	—	—
W46	6.11	6.11	—	6.12	—	—
W47	6.72	6.72	—	6.73	—	—
W48	7.40	7.40	—	7.38	—	—
W49	8.18	8.18	—	8.20	—	—
W50	8.88	8.88	—	8.92	—	—
W51	9.70	9.70	—	9.81	—	—
W52	10.8	10.8	—	10.9	11.7	—
W53	11.8	11.8	11.8	11.9	12.8	—
W54	12.9	12.9	12.9	13.0	13.9	—
W55	14.2	14.2	14.2	14.3	15.2	—
W56	15.5	15.5	15.5	15.6	16.8	—
W57	17.0	17.0	17.0	17.1	18.5	19.5
W58	18.3	18.3	18.3	18.5	20.2	21.4
W59	—	19.9	19.9	20.1	22.2	23.7
W60	—	22.0	22.0	22.2	24.5	26.0
W61	—	24.3	24.3	24.5	27.1	28.7
W62	—	27.0	27.0	27.2	29.9	31.5
W63	—	—	29.5	30.0	32.5	34.5
W64	—	—	32.0	33.0	35.5	37.5
W65	—	—	34.0	35.5	39.0	41.0
W66	—	—	36.0	38.0	42.5	44.5
W67	—	—	—	41.5	47.0	48.5
W68	—	—	—	45.0	52	53
W69	—	—	—	—	57	58
W70	—	—	—	—	62	63
W71	—	—	—	—	67	68
W72	—	—	—	—	73	74
W73	—	—	—	—	79	80
W74	—	—	—	—	85	86
W75	—	—	—	—	92	93
W76	—	—	—	—	—	100
W77	—	—	—	—	—	108
W78	—	—	—	—	—	116
W79	—	—	—	—	—	125
W80	—	—	—	—	—	135
W81	—	—	—	—	—	—
W82	—	—	—	—	—	—
W83	—	—	—	—	—	—
W84	—	—	—	—	—	—
W85	—	—	—	—	—	—

Refer to Heater Element Selection Procedure on page 1-167 before using tables.



Bulletin Eutectic Alloy Overload Relays
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TABLE 158					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
JJ14	0.19	0.19	—	—	—
JJ13	0.21	0.21	—	—	—
JJ12	0.23	0.23	—	—	—
JJ11	0.26	0.26	—	—	—
JJ10	0.28	0.28	—	—	—
JJ9	0.31	0.31	—	—	—
JJ8	0.34	0.34	—	—	—
JJ7	0.38	0.38	—	—	—
JJ6	0.42	0.42	—	—	—
JJ5	0.46	0.46	—	—	—
JJ4	0.51	0.51	—	—	—
JJ3	0.57	0.57	—	—	—
JJ2	0.63	0.63	—	—	—
JJ1	0.69	0.69	—	—	—
J1	0.76	0.76	—	—	—
J2	0.84	0.84	—	—	—
J3	0.92	0.92	—	—	—
J4	1.02	1.02	—	—	—
J5	1.12	1.12	—	—	—
J6	1.23	1.23	—	—	—
J7	1.36	1.36	—	—	—
J8	1.50	1.50	—	—	—
J9	1.65	1.65	—	—	—
J10	1.82	1.82	—	—	—
J11	2.00	2.00	—	—	—
J12	2.20	2.20	—	—	—
J13	2.43	2.43	—	—	—
J14	2.68	2.68	—	—	—
J15	2.95	2.95	—	—	—
J16	3.25	3.25	—	—	—
J17	3.58	3.58	—	—	—
J18	3.96	3.96	—	—	—
J19	4.37	4.37	—	—	—
J20	4.82	4.82	—	—	—
J21	5.32	5.32	—	—	—
J22	5.87	5.87	—	—	—
J23	6.48	6.48	—	—	—
J24	7.15	7.15	—	—	—
J25	7.89	7.89	—	—	—
J26	8.70	8.70	8.84	—	—
J27	9.56	9.56	9.71	—	—
J28	10.5	10.5	10.7	—	—
J29	11.5	11.5	11.8	—	—
J30	12.7	12.7	13.0	—	—
J31	13.9	13.9	14.4	—	—
J32	15.3	15.3	15.9	—	—
J33	16.8	16.8	17.6	—	—
J34	18.5	18.5	19.4	21.6	—
J35	—	20.3	21.4	23.9	—
J36	—	22.3	23.5	26.5	—
J37	—	24.5	25.8	29.3	—
J38	—	27.0	28.8	32.5	34.5
J39	—	—	32.5	36.0	38
J40	—	—	36.0	40.0	42
J41	—	—	39.0	44.0	46
J42	—	—	42.0	49	51
J43	—	—	45.0	55	57
J44	—	—	—	60	62
J45	—	—	—	66	68
J46	—	—	—	72	74
J70	—	—	—	78	80
J71	—	—	—	84	87
J72	—	—	—	92	95
J73	—	—	—	—	104
J74	—	—	—	—	113
J75	—	—	—	—	122
J76	—	—	—	—	132
J77	—	—	—	—	143

TABLE 159					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
JJ14	0.19	0.19	—	—	—
JJ13	0.21	0.21	—	—	—
JJ12	0.23	0.23	—	—	—
JJ11	0.26	0.26	—	—	—
JJ10	0.28	0.28	—	—	—
JJ9	0.31	0.31	—	—	—
JJ8	0.34	0.34	—	—	—
JJ7	0.38	0.38	—	—	—
JJ6	0.42	0.42	—	—	—
JJ5	0.46	0.46	—	—	—
JJ4	0.51	0.51	—	—	—
JJ3	0.57	0.57	—	—	—
JJ2	0.63	0.63	—	—	—
JJ1	0.69	0.69	—	—	—
J1	0.76	0.76	—	—	—
J2	0.84	0.84	—	—	—
J3	0.92	0.92	—	—	—
J4	1.02	1.02	—	—	—
J5	1.12	1.12	—	—	—
J6	1.23	1.23	—	—	—
J7	1.36	1.36	—	—	—
J8	1.50	1.50	—	—	—
J9	1.65	1.65	—	—	—
J10	1.82	1.82	—	—	—
J11	2.00	2.00	—	—	—
J12	2.20	2.20	—	—	—
J13	2.43	2.43	—	—	—
J14	2.68	2.68	—	—	—
J15	2.95	2.95	—	—	—
J16	3.25	3.25	—	—	—
J17	3.59	3.59	—	—	—
J18	3.96	3.96	—	—	—
J19	4.37	4.37	—	—	—
J20	4.82	4.82	—	—	—
J21	5.32	5.32	—	—	—
J22	5.87	5.87	—	—	—
J23	6.48	6.48	—	—	—
J24	7.15	7.15	—	—	—
J25	7.89	7.89	—	—	—
J26	8.70	8.70	8.84	—	—
J27	9.56	9.56	9.71	—	—
J28	10.5	10.5	10.7	—	—
J29	11.5	11.5	11.7	—	—
J30	12.7	12.7	12.9	—	—
J31	13.9	13.9	14.2	—	—
J32	15.3	15.3	15.8	—	—
J33	16.8	16.8	17.5	—	—
J34	18.5	18.5	19.4	20.9	—
J35	—	20.3	21.2	23.2	—
J36	—	22.3	23.2	25.7	—
J37	—	24.6	25.3	28.4	31.5
J38	—	27.0	27.7	31.5	35.0
J39	—	—	30.5	35.0	38.5
J40	—	—	33.0	39.0	43.0
J41	—	—	36.0	43.5	47.0
J42	—	—	39.5	48.5	51
J43	—	—	43.0	54	56
J44	—	—	47.0	59	61
J45	—	—	—	64	67
J46	—	—	—	70	73
J70	—	—	—	77	81
J71	—	—	—	85	90
J72	—	—	—	92	99
J73	—	—	—	—	108
J74	—	—	—	—	118
J75	—	—	—	—	129
J76	—	—	—	—	140

Refer to Heater Element Selection Procedure on page 1-167 before using tables.

Heater Elements Selection

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TABLE 160						
Heater Element Cat. No.	Full Load Amperes					
	Size 0	Size 1	Size 2	Size 3	Size 4	Size 5
JJ14	0.19	0.19	—	—	—	—
JJ13	0.21	0.21	—	—	—	—
JJ12	0.23	0.23	—	—	—	—
JJ11	0.26	0.26	—	—	—	—
JJ10	0.28	0.28	—	—	—	—
JJ9	0.31	0.31	—	—	—	—
JJ8	0.34	0.34	—	—	—	—
JJ7	0.38	0.38	—	—	—	—
JJ6	0.42	0.42	—	—	—	—
JJ5	0.46	0.46	—	—	—	—
JJ4	0.51	0.51	—	—	—	—
JJ3	0.57	0.57	—	—	—	—
JJ2	0.63	0.63	—	—	—	—
JJ1	0.69	0.69	—	—	—	—
J1	0.76	0.76	—	—	—	—
J2	0.84	0.84	—	—	—	—
J3	0.93	0.93	—	—	—	—
J4	1.03	1.03	—	—	—	—
J5	1.14	1.14	—	—	—	—
J6	1.26	1.26	—	—	—	76
J7	1.39	1.39	—	—	—	83
J8	1.53	1.53	—	—	—	91
J9	1.68	1.68	—	—	—	100
J10	1.86	1.86	—	—	—	108
J11	2.05	2.05	—	—	—	117
J12	2.25	2.25	—	—	—	127
J13	2.48	2.48	—	—	—	138
J14	2.73	2.73	—	—	—	150
J15	3.01	3.01	—	—	—	165
J16	3.31	3.31	—	—	—	179
J17	3.65	3.65	—	—	—	195
J18	4.02	4.02	—	—	—	211
J19	4.42	4.42	—	—	—	230
J20	4.87	4.87	—	—	—	250
J21	5.37	5.37	—	—	—	272
J22	5.91	5.91	—	—	—	—
J23	6.50	6.50	6.50	—	—	—
J24	7.19	7.19	7.21	—	—	—
J25	7.94	7.94	7.99	—	—	—
J26	8.78	8.78	8.85	—	—	—
J27	9.71	9.71	9.81	—	—	—
J28	10.7	10.7	10.9	—	—	—
J29	11.8	11.8	12.1	—	—	—
J30	13.1	13.1	13.4	—	—	—
J31	14.5	14.5	14.9	—	—	—
J32	16.0	16.0	16.5	—	—	—
J33	17.7	17.7	18.3	—	—	—
J34	19.6	19.6	20.2	22.2	—	—
J35	—	21.6	22.4	24.5	—	—
J36	—	23.9	24.8	27.1	—	—
J37	—	26.4	27.4	29.9	—	—
J38	—	29.3	30.5	33.0	33.5	—
J39	—	—	33.5	36.5	37.5	—
J40	—	—	37.0	40.5	41.5	—
J41	—	—	41.0	45.0	46.5	—
J42	—	—	45.5	50	52	—
J43	—	—	—	56	57	—
J44	—	—	—	61	63	—
J45	—	—	—	67	68	—
J46	—	—	—	73	75	—
J70	—	—	—	80	83	—
J71	—	—	—	87	91	—
J72	—	—	—	95	99	—
J73	—	—	—	—	108	—
J74	—	—	—	—	117	—
J75	—	—	—	—	126	—
J76	—	—	—	—	135	—

TABLE 161					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
JJ14	0.19	0.19	—	—	—
JJ13	0.21	0.21	—	—	—
JJ12	0.23	0.23	—	—	—
JJ11	0.26	0.26	—	—	—
JJ10	0.28	0.28	—	—	—
JJ9	0.31	0.31	—	—	—
JJ8	0.34	0.34	—	—	—
JJ7	0.38	0.38	—	—	—
JJ6	0.42	0.42	—	—	—
JJ5	0.46	0.46	—	—	—
JJ4	0.51	0.51	—	—	—
JJ3	0.57	0.57	—	—	—
JJ2	0.63	0.63	—	—	—
JJ1	0.69	0.69	—	—	—
J1	0.76	0.76	—	—	—
J2	0.84	0.84	—	—	—
J3	0.93	0.93	—	—	—
J4	1.03	1.03	—	—	—
J5	1.13	1.13	—	—	—
J6	1.24	1.24	—	—	—
J7	1.37	1.37	—	—	—
J8	1.51	1.51	—	—	—
J9	1.66	1.66	—	—	—
J10	1.84	1.84	—	—	—
J11	2.02	2.02	—	—	—
J12	2.22	2.22	—	—	—
J13	2.45	2.45	—	—	—
J14	2.70	2.70	—	—	—
J15	2.97	2.97	—	—	—
J16	3.27	3.27	—	—	—
J17	3.61	3.61	—	—	—
J18	3.98	3.98	—	—	—
J19	4.39	4.39	—	—	—
J20	4.84	4.84	—	—	—
J21	5.34	5.34	—	—	—
J22	5.89	5.89	—	—	—
J23	6.49	6.49	—	—	—
J24	7.16	7.16	—	—	—
J25	7.91	7.91	—	—	—
J26	8.73	8.73	9.11	—	—
J27	9.58	9.58	10.1	—	—
J28	10.6	10.6	11.1	—	—
J29	11.7	11.7	12.2	—	—
J30	13.0	13.0	13.5	—	—
J31	14.4	14.4	14.9	—	—
J32	15.9	15.9	16.4	—	—
J33	17.6	17.6	18.1	—	—
J34	19.5	19.5	20.0	22.2	—
J35	—	21.5	22.1	24.5	—
J36	—	23.6	24.3	27.1	—
J37	—	25.9	26.8	29.9	—
J38	—	28.5	29.5	33.0	34.5
J39	—	—	32.5	36.5	38.5
J40	—	—	35.5	40.5	42.5
J41	—	—	39.0	45.0	47.0
J42	—	—	43.0	50	52
J43	—	—	47.5	56	58
J44	—	—	—	61	64
J45	—	—	—	67	70
J46	—	—	—	73	77
J70	—	—	—	80	85
J71	—	—	—	87	93
J72	—	—	—	95	102
J73	—	—	—	—	112
J74	—	—	—	—	123
J75	—	—	—	—	135

Refer to Heater Element Selection Procedure on page 1-167 before using tables.

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Heater Elements Selection
 For Application on Bulletin 100/500/609/1200 Line Starters

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TABLE 162					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
JJ14	0.19	0.19	—	—	—
JJ13	0.21	0.21	—	—	—
JJ12	0.23	0.23	—	—	—
JJ11	0.26	0.26	—	—	—
JJ10	0.28	0.28	—	—	—
JJ9	0.31	0.31	—	—	—
JJ8	0.34	0.34	—	—	—
JJ7	0.38	0.38	—	—	—
JJ6	0.42	0.42	—	—	—
JJ5	0.46	0.46	—	—	—
JJ4	0.51	0.51	—	—	—
JJ3	0.57	0.57	—	—	—
JJ2	0.63	0.63	—	—	—
JJ1	0.69	0.69	—	—	—
J1	0.76	0.76	—	—	—
J2	0.84	0.84	—	—	—
J3	0.92	0.92	—	—	—
J4	1.02	1.02	—	—	—
J5	1.12	1.12	—	—	—
J6	1.23	1.23	—	—	—
J7	1.36	1.36	—	—	—
J8	1.50	1.50	—	—	—
J9	1.65	1.65	—	—	—
J10	1.82	1.82	—	—	—
J11	2.00	2.00	—	—	—
J12	2.20	2.20	—	—	—
J13	2.43	2.43	—	—	—
J14	2.68	2.68	—	—	—
J15	2.95	2.95	—	—	—
J16	3.25	3.25	—	—	—
J17	3.59	3.59	—	—	—
J18	3.99	3.99	—	—	—
J19	4.42	4.42	—	—	—
J20	4.87	4.87	—	—	—
J21	5.41	5.41	—	—	—
J22	5.98	5.98	6.04	—	—
J23	6.61	6.61	6.73	—	—
J24	7.26	7.26	7.41	—	—
J25	7.98	7.98	8.19	—	—
J26	8.77	8.77	9.05	—	—
J27	9.61	9.61	10.0	—	—
J28	10.6	10.6	11.1	—	—
J29	11.7	11.7	12.2	—	—
J30	13.0	13.0	13.5	—	—
J31	14.4	14.4	14.9	—	—
J32	15.9	15.9	16.5	—	—
J33	17.5	17.5	18.3	—	—
J34	19.4	19.4	20.2	21.6	—
J35	—	21.3	22.4	23.9	—
J36	—	23.3	24.8	26.5	—
J37	—	25.5	27.4	29.3	—
J38	—	28.0	30.5	32.5	33.5
J39	—	—	33.5	36.0	37.5
J40	—	—	37.5	40.0	41.0
J41	—	—	41.0	44.5	46.5
J42	—	—	45.0	49.5	52
J43	—	—	—	55	57
J44	—	—	—	60	63
J45	—	—	—	66	68
J46	—	—	—	72	75
J70	—	—	—	78	83
J71	—	—	—	85	91
J72	—	—	—	92	99
J73	—	—	—	—	108
J74	—	—	—	—	117
J75	—	—	—	—	126
J76	—	—	—	—	135

TABLE 163					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
JJ14	0.19	0.19	—	—	—
JJ13	0.21	0.21	—	—	—
JJ12	0.23	0.23	—	—	—
JJ11	0.26	0.26	—	—	—
JJ10	0.28	0.28	—	—	—
JJ9	0.31	0.31	—	—	—
JJ8	0.34	0.34	—	—	—
JJ7	0.38	0.38	—	—	—
JJ6	0.42	0.42	—	—	—
JJ5	0.46	0.46	—	—	—
JJ4	0.51	0.51	—	—	—
JJ3	0.57	0.57	—	—	—
JJ2	0.63	0.63	—	—	—
JJ1	0.69	0.69	—	—	—
J1	0.77	0.77	—	—	—
J2	0.86	0.86	—	—	—
J3	0.95	0.95	—	—	—
J4	1.06	1.06	—	—	—
J5	1.18	1.18	—	—	—
J6	1.32	1.32	—	—	—
J7	1.44	1.44	—	—	—
J8	1.58	1.58	—	—	—
J9	1.72	1.72	—	—	—
J10	1.88	1.88	—	—	—
J11	2.06	2.06	—	—	—
J12	2.25	2.25	—	—	—
J13	2.48	2.48	—	—	—
J14	2.73	2.73	—	—	—
J15	3.01	3.01	—	—	—
J16	3.31	3.31	—	—	—
J17	3.65	3.65	—	—	—
J18	4.02	4.02	—	—	—
J19	4.42	4.42	—	—	—
J20	4.87	4.87	—	—	—
J21	5.37	5.37	—	—	—
J22	5.91	5.91	—	—	—
J23	6.50	6.50	6.50	—	—
J24	7.19	7.19	7.21	—	—
J25	7.94	7.94	8.52	—	—
J26	8.78	8.78	9.30	—	—
J27	9.71	9.71	10.2	—	—
J28	10.7	10.7	11.1	—	—
J29	11.8	11.8	12.1	—	—
J30	13.1	13.1	13.4	—	—
J31	14.5	14.5	14.9	—	—
J32	16.0	16.0	16.5	—	—
J33	17.7	17.7	18.3	—	—
J34	19.6	19.6	20.2	21.8	—
J35	—	21.7	22.4	23.9	—
J36	—	23.9	24.8	26.6	—
J37	—	26.4	27.4	29.6	—
J38	—	29.3	30.5	33.0	33.5
J39	—	—	33.5	37.0	37.5
J40	—	—	37.0	41.0	41.5
J41	—	—	41.0	45.5	46.0
J42	—	—	45.5	51	52
J43	—	—	—	56	57
J44	—	—	—	61	63
J45	—	—	—	67	69
J46	—	—	—	73	76
J70	—	—	—	79	84
J71	—	—	—	87	92
J72	—	—	—	95	102
J73	—	—	—	—	112
J74	—	—	—	—	123
J75	—	—	—	—	135

Refer to Heater Element Selection Procedure on page 1-167 before using tables.

Heater Elements Selection

For Application on Bulletin 100/500/609/1200 Line Starters

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TABLE 164					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 1P	Size 2	Size 3
JJ14	0.20	0.20	—	—	—
JJ13	0.22	0.22	—	—	—
JJ12	0.24	0.24	—	—	—
JJ11	0.27	0.27	—	—	—
JJ10	0.30	0.30	—	—	—
JJ9	0.33	0.33	—	—	—
JJ8	0.36	0.36	—	—	—
JJ7	0.40	0.40	—	—	—
JJ6	0.44	0.44	—	—	—
JJ5	0.49	0.49	—	—	—
JJ4	0.54	0.54	—	—	—
JJ3	0.59	0.59	—	—	—
JJ2	0.65	0.65	—	—	—
JJ1	0.72	0.72	—	—	—
J1	0.80	0.80	—	—	—
J2	0.88	0.88	—	—	—
J3	0.97	0.97	—	—	—
J4	1.07	1.07	—	—	—
J5	1.18	1.18	—	—	—
J6	1.31	1.31	—	—	—
J7	1.44	1.44	—	—	—
J8	1.59	1.59	—	—	—
J9	1.76	1.76	—	—	—
J10	1.94	1.94	—	—	—
J11	2.14	2.14	—	—	—
J12	2.36	2.36	—	—	—
J13	2.60	2.60	—	—	—
J14	2.86	2.86	—	—	—
J15	3.15	3.15	—	—	—
J16	3.46	3.46	—	—	—
J17	3.81	3.81	—	—	—
J18	4.19	4.19	—	—	—
J19	4.61	4.61	—	—	—
J20	5.07	5.07	—	—	—
J21	5.58	5.58	—	—	—
J22	6.14	6.14	—	—	—
J23	6.75	6.75	—	6.75	—
J24	7.47	7.47	—	7.49	—
J25	8.26	8.26	—	8.31	—
J26	9.14	9.14	—	9.22	—
J27	10.1	10.1	—	10.2	—
J28	11.2	11.2	11.2	11.3	—
J29	12.4	12.4	12.4	12.6	—
J30	13.7	13.7	13.7	14.0	—
J31	15.2	15.2	15.2	15.5	—
J32	16.8	16.8	16.8	17.1	—
J33	18.6	18.6	18.6	19.0	—
J34	—	20.5	20.5	21.0	23.3
J35	—	22.7	22.7	23.2	25.8
J36	—	25.1	25.1	25.7	28.8
J37	—	27.8	27.8	28.4	31.5
J38	—	—	30.5	31.5	35.5
J39	—	—	34.0	35.0	39.5
J40	—	—	38.0	39.0	44.0
J41	—	—	—	43.5	47.0
J42	—	—	—	48.0	52
J43	—	—	—	—	58
J44	—	—	—	—	63
J45	—	—	—	—	69
J46	—	—	—	—	76
J70	—	—	—	—	84
J71	—	—	—	—	92
J72	—	—	—	—	—
J73	—	—	—	—	—
J74	—	—	—	—	—
J75	—	—	—	—	—

TABLE 165	
Heater Element Cat. No.	Full Load Amperes
	Size 7
J5	230
J6	253
J7	279
J8	310
J9	340
J10	375
J11	410
J12	455
J13	500
J14	550
J15	610
J16	670
J17	740
J18	810
J19	—

Refer to Heater Element Selection Procedure on page 1-167 before using tables.



Heater Elements Selection

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TABLE 168						
Heater Element Cat. No.	Full Load Amperes					
	Size 0	Size 1	Size 2	Size 3	Size 4	Size 5
W10	0.18	0.18	—	—	—	—
W11	0.20	0.20	—	—	—	—
W12	0.22	0.22	—	—	—	—
W13	0.24	0.24	—	—	—	—
W14	0.26	0.26	—	—	—	—
W15	0.29	0.29	—	—	—	—
W16	0.32	0.32	—	—	—	—
W17	0.35	0.35	—	—	—	—
W18	0.39	0.39	—	—	—	—
W19	0.43	0.43	—	—	—	—
W20	0.47	0.47	—	—	—	—
W21	0.51	0.51	—	—	—	—
W22	0.56	0.56	—	—	—	—
W23	0.61	0.61	—	—	—	—
W24	0.67	0.67	—	—	—	—
W25	0.74	0.74	—	—	—	—
W26	0.82	0.82	—	—	—	—
W27	0.94	0.94	—	—	—	—
W28	1.02	1.02	—	—	—	—
W29	1.12	1.12	—	—	—	70
W30	1.23	1.23	—	—	—	76
W31	1.38	1.38	—	—	—	82
W32	1.50	1.50	—	—	—	90
W33	1.64	1.64	—	—	—	98
W34	1.78	1.78	—	—	—	106
W35	1.95	1.95	—	—	—	115
W36	2.10	2.10	—	—	—	125
W37	2.28	2.28	—	—	—	137
W38	2.57	2.57	—	—	—	150
W39	2.83	2.83	—	—	—	162
W40	3.12	3.12	—	—	—	176
W41	3.47	3.47	—	—	—	191
W42	3.84	3.84	—	—	—	210
W43	4.26	4.26	—	—	—	230
W44	4.68	4.68	4.78	—	—	249
W45	5.18	5.18	5.28	—	—	270
W46	5.71	5.71	5.79	—	—	—
W47	6.28	6.28	6.35	—	—	—
W48	6.90	6.90	6.97	—	—	—
W49	7.59	7.59	7.65	—	—	—
W50	8.35	8.35	8.40	—	—	—
W51	9.28	9.28	9.30	—	—	—
W52	10.2	10.2	10.2	—	—	—
W53	11.2	11.2	11.2	—	—	—
W54	12.1	12.1	12.2	—	—	—
W55	13.3	13.3	13.4	—	—	—
W56	14.5	14.5	14.7	—	—	—
W57	15.7	15.7	16.1	—	—	—
W58	16.6	16.6	17.6	—	—	—
W59	17.8	17.8	19.3	—	—	—
W60	19.6	19.6	21.1	—	—	—
W61	—	21.5	22.9	25.0	—	—
W62	—	23.5	25.0	27.7	—	—
W63	—	25.7	27.1	30.5	—	—
W64	—	28.2	29.5	34.0	34.0	—
W65	—	—	32.0	36.5	37.0	—
W66	—	—	34.5	39.5	40.0	—
W67	—	—	37.0	42.5	44.0	—
W68	—	—	40.0	46.0	48.5	—
W69	—	—	42.5	51	53	—
W70	—	—	45.0	55	57	—
W71	—	—	—	59	62	—
W72	—	—	—	64	67	—
W73	—	—	—	69	72	—
W74	—	—	—	74	77	—
W75	—	—	—	79	82	—
W76	—	—	—	83	87	—
W77	—	—	—	88	93	—
W78	—	—	—	93	99	—
W79	—	—	—	—	105	—
W80	—	—	—	—	112	—
W81	—	—	—	—	117	—
W82	—	—	—	—	123	—
W83	—	—	—	—	129	—
W84	—	—	—	—	135	—

TABLE 169	
Heater Element Cat. No.	Full Load Amperes
	Size 5
W29	70
W30	77
W31	85
W32	89
W33	94
W34	100
W35	107
W36	118
W37	127
W38	140
W39	154
W40	167
W41	181
W42	194
W43	207
W44	221

Refer to Heater Element Selection Procedure on page 1-167 before using tables.

Bulletin Eutectic Alloy Overload Relays
Heater Elements Selection
 For Application on Bulletin 100/500/609/1200 Line Starters

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TABLE 171							
Heater Element Cat. No.	Full Load Amperes						
	Size 00	Size 0	Size 1	Size 2	Size 3	Size 4	Size 5
W10	0.17	0.17	0.17	—	—	—	—
W11	0.19	0.19	0.19	—	—	—	—
W12	0.21	0.21	0.21	—	—	—	—
W13	0.22	0.22	0.22	—	—	—	—
W14	0.25	0.25	0.25	—	—	—	—
W15	0.28	0.28	0.28	—	—	—	—
W16	0.31	0.31	0.31	—	—	—	—
W17	0.34	0.34	0.34	—	—	—	—
W18	0.37	0.37	0.37	—	—	—	—
W19	0.42	0.42	0.42	—	—	—	—
W20	0.46	0.46	0.46	—	—	—	—
W21	0.50	0.50	0.50	—	—	—	—
W22	0.56	0.56	0.56	—	—	—	—
W23	0.62	0.62	0.62	—	—	—	—
W24	0.69	0.69	0.69	—	—	—	—
W25	0.76	0.76	0.76	—	—	—	—
W26	0.84	0.84	0.84	—	—	—	—
W27	0.93	0.93	0.93	—	—	—	—
W28	1.02	1.02	1.02	—	—	—	—
W29	1.13	1.13	1.13	—	—	—	71
W30	1.25	1.25	1.25	—	—	—	78
W31	1.38	1.38	1.38	—	—	—	85
W32	1.49	1.49	1.49	—	—	—	92
W33	1.61	1.61	1.61	—	—	—	100
W34	1.74	1.74	1.74	—	—	—	109
W35	1.89	1.89	1.89	—	—	—	119
W36	2.04	2.04	2.04	—	—	—	130
W37	2.22	2.22	2.22	—	—	—	140
W38	2.49	2.49	2.49	—	—	—	153
W39	2.75	2.75	2.75	—	—	—	166
W40	3.03	3.03	3.03	—	—	—	180
W41	3.37	3.37	3.37	—	—	—	200
W42	3.73	3.73	3.73	—	—	—	222
W43	4.13	4.13	4.13	—	—	—	248
W44	4.55	4.55	4.55	—	—	—	267
W45	5.02	5.02	5.02	—	—	—	295
W46	5.53	5.53	5.53	—	—	—	—
W47	6.08	6.08	6.08	—	—	—	—
W48	6.68	6.68	6.68	—	—	—	—
W49	7.34	7.34	7.34	—	—	—	—
W50	8.07	8.07	8.07	8.31	—	—	—
W51	8.95	8.95	8.95	9.26	—	—	—
W52	9.83	9.83	9.83	10.2	—	—	—
W53	—	10.8	10.8	11.1	—	—	—
W54	—	11.6	11.6	12.1	12.5	—	—
W55	—	12.7	12.7	13.1	13.8	—	—
W56	—	13.8	13.8	14.5	15.2	—	—
W57	—	14.9	14.9	15.8	16.5	—	—
W58	—	15.7	15.7	16.9	17.9	—	—
W59	—	17.0	17.0	18.1	19.7	—	—
W60	—	18.4	18.4	19.8	21.8	—	—
W61	—	—	20.0	21.6	24.2	—	—
W62	—	—	21.8	23.7	26.5	—	—
W63	—	—	24.5	26.0	29.3	—	—
W64	—	—	27.8	28.6	32.0	33.5	—
W65	—	—	—	31.0	36.0	37.0	—
W66	—	—	—	34.0	38.0	40.5	—
W67	—	—	—	37.0	42.0	44.5	—
W68	—	—	—	40.0	46.0	49.0	—
W69	—	—	—	43.0	50.0	54.0	—
W70	—	—	—	46.0	53	59	—
W71	—	—	—	—	58	64	—
W72	—	—	—	—	62	69	—
W73	—	—	—	—	66	74	—
W74	—	—	—	—	70	79	—
W75	—	—	—	—	74	84	—
W76	—	—	—	—	80	90	—
W77	—	—	—	—	85	96	—
W78	—	—	—	—	89	102	—
W79	—	—	—	—	94	108	—
W80	—	—	—	—	—	116	—
W81	—	—	—	—	—	123	—
W82	—	—	—	—	—	131	—
W83	—	—	—	—	—	139	—

TABLE 172					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
JJ14	0.19	0.19	—	—	—
JJ13	0.21	0.21	—	—	—
JJ12	0.23	0.23	—	—	—
JJ11	0.26	0.26	—	—	—
JJ10	0.29	0.29	—	—	—
JJ9	0.31	0.31	—	—	—
JJ8	0.35	0.35	—	—	—
JJ7	0.38	0.38	—	—	—
JJ6	0.41	0.41	—	—	—
JJ5	0.46	0.46	—	—	—
JJ4	0.50	0.50	—	—	—
JJ3	0.56	0.56	—	—	—
JJ2	0.61	0.61	—	—	—
JJ1	0.67	0.67	—	—	—
J1	0.75	0.75	—	—	—
J2	0.82	0.82	—	—	—
J3	0.91	0.91	—	—	—
J4	1.00	1.00	—	—	—
J5	1.11	1.11	—	—	—
J6	1.22	1.22	—	—	—
J7	1.34	1.34	—	—	—
J8	1.47	1.47	—	—	—
J9	1.62	1.62	—	—	—
J10	1.78	1.78	—	—	—
J11	1.96	1.96	—	—	—
J12	2.17	2.17	—	—	—
J13	2.40	2.40	—	—	—
J14	2.65	2.65	—	—	—
J15	2.92	2.92	—	—	—
J16	3.21	3.21	—	—	—
J17	3.54	3.54	—	—	—
J18	3.91	3.91	—	—	—
J19	4.30	4.30	—	—	—
J20	4.75	4.75	—	—	—
J21	5.22	5.22	—	—	—
J22	5.76	5.76	—	—	—
J23	6.36	6.36	—	—	—
J24	7.03	7.03	—	—	—
J25	7.75	7.75	8.08	—	—
J26	8.57	8.57	8.90	—	—
J27	9.44	9.44	9.86	—	—
J28	10.4	10.4	10.8	—	—
J29	11.4	11.4	11.9	13.1	—
J30	12.7	12.7	13.2	14.5	—
J31	14.0	14.0	14.5	15.9	—
J32	15.4	15.4	15.9	17.6	—
J33	17.0	17.0	17.6	19.4	—
J34	18.7	18.7	20.5	21.3	—
J35	—	20.6	22.4	23.4	—
J36	—	22.8	24.6	25.7	—
J37	—	25.1	27.1	28.5	31.5
J38	—	27.9	29.8	31.5	35.0
J39	—	—	33.0	35.0	38.5
J40	—	—	36.0	39.0	43.0
J41	—	—	40.0	44.0	47.0
J42	—	—	43.0	48	51
J43	—	—	47.0	53	56
J44	—	—	—	58	61
J45	—	—	—	62	67
J46	—	—	—	69	73
J70	—	—	—	75	81
J71	—	—	—	81	90
J72	—	—	—	89	99
J73	—	—	—	96	108
J74	—	—	—	—	118
J75	—	—	—	—	129
J76	—	—	—	—	140

Heater Elements Selection

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TABLE 177	
Heater Element Cat. No.	Full Load Amperes
	Size 5
W29	70
W30	76
W31	82
W32	90
W33	98
W34	106
W35	115
W36	125
W37	137
W38	150
W39	162
W40	176
W41	191
W42	210
W43	230
W44	248
W45	270

TABLE 178	
Heater Element Cat. No.	Full Load Amperes
	Size 5
J5	68
J6	75
J7	82
J8	90
J9	99
J10	108
J11	118
J12	128
J13	140
J14	154
J15	168
J16	184
J17	200
J18	220
J19	233
J20	258
J21	282

TABLE 180	
Heater Element Cat. No.	Full Load Amps
	24/32 A/Size 00
W10	0.19
W11	0.20
W12	0.23
W13	0.25
W14	0.28
W15	0.31
W16	0.34
W17	0.37
W18	0.40
W19	0.44
W20	0.49
W21	0.55
W22	0.61
W23	0.69
W24	0.77
W25	0.86
W26	0.93
W27	1.02
W28	1.11
W29	1.22
W30	1.33
W31	1.50
W32	1.60
W33	1.70
W34	1.90
W35	2.01
W36	2.28
W37	2.50
W38	2.72
W39	3.00
W40	3.34
W41	3.67
W42	4.00
W43	4.40
W44	5.00
W45	5.52
W46	5.95
W47	6.60
W48	7.20
W49	8.00
W50	8.76
W51	9.60
W52	10.7
W53	11.9
W54	13.0
W55	14.2
W56	15.5
W57	16.9
W58	18.0
W59	20.0
W60	21.7
W61	24.0
W62	26.2
W63	29.0
W64	34.0

Refer to Heater Element Selection Procedure on page 1-167 before using tables.



Bulletin Eutectic Alloy Overload Relays
Heater Elements Selection
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TABLE 181						
Heater Element Cat. No.	Full Load Amperes					
	Size 24 A	Size 32 A	Size 40 A	Size 62A	Size 125 A	Size 165 A
W10	0.19	0.19	0.19	—	—	—
W11	0.20	0.2	0.21	—	—	—
W12	0.22	0.22	0.23	—	—	—
W13	0.24	0.24	0.25	—	—	—
W14	0.27	0.27	0.28	—	—	—
W15	0.29	0.29	0.31	—	—	—
W16	0.32	0.32	0.34	—	—	—
W17	0.36	0.36	0.37	—	—	—
W18	0.39	0.39	0.41	—	—	—
W19	0.44	0.44	0.45	—	—	—
W20	0.49	0.49	0.50	—	—	—
W21	0.54	0.54	0.55	—	—	—
W22	0.6	0.60	0.60	—	—	—
W23	0.67	0.67	0.66	—	—	—
W24	0.74	0.74	0.73	—	—	—
W25	0.84	0.84	0.80	—	—	—
W26	0.9	0.90	0.88	—	—	—
W27	1	1.00	0.97	—	—	—
W28	1.1	1.10	1.06	—	—	—
W29	1.22	1.22	1.16	—	—	—
W30	1.31	1.31	1.27	—	—	—
W31	1.43	1.43	1.39	—	—	—
W32	1.55	1.55	1.51	—	—	—
W33	1.66	1.66	1.65	—	—	—
W34	1.8	1.80	1.80	—	—	—
W35	1.97	1.97	1.96	—	—	—
W36	2.12	2.12	2.15	—	—	—
W37	2.33	2.33	2.36	—	—	—
W38	2.59	2.59	2.60	—	—	—
W39	2.84	2.84	2.86	—	—	—
W40	3.15	3.15	3.16	—	—	—
W41	3.46	3.46	3.48	—	—	—
W42	3.84	3.84	3.85	—	—	—
W43	4.27	4.27	4.23	—	—	—
W44	4.73	4.73	4.68	—	—	—
W45	5.36	5.36	5.18	—	—	—
W46	5.82	5.82	5.68	—	—	—
W47	6.33	6.33	6.28	—	—	—
W48	6.97	6.97	6.94	—	—	—
W49	7.63	7.63	7.71	—	—	—
W50	8.49	8.49	8.45	—	—	—
W51	9.24	9.24	9.29	9.40	—	—
W52	10.1	10.1	10.3	10.4	—	—
W53	11.1	11.1	11.4	11.5	—	—
W54	12.2	12.2	12.5	12.6	—	—
W55	13.6	13.6	13.7	13.8	—	—
W56	14.6	14.6	15.0	15.1	—	—
W57	15.7	15.7	16.3	16.4	—	—
W58	17.2	17.2	17.6	17.7	—	—
W59	18.9	18.9	18.9	19.1	—	—
W60	20.5	20.5	20.9	21.1	—	—
W61	22.2	22.2	22.9	23.2	25.1	—
W62	24.3	24.3	25.0	25.7	27.5	—
W63	—	26.4	27.6	28.5	30.5	—
W64	—	28.5	30.0	30.5	33.5	—
W65	—	32.5	32.0	33.0	36.5	—
W66	—	—	34.0	35.5	40	43.0
W67	—	—	37.0	38.5	44	47.0
W68	—	—	39.0	41.5	48.5	51
W69	—	—	41.0	45.0	53	56
W70	—	—	—	48.5	58	61
W71	—	—	—	53	62	66
W72	—	—	—	56	67	72
W73	—	—	—	58	72	77
W74	—	—	—	60	77	83
W75	—	—	—	62	82	89
W76	—	—	—	—	88	95
W77	—	—	—	—	94	102
W78	—	—	—	—	98	108
W79	—	—	—	—	102	116
W80	—	—	—	—	108	123
W81	—	—	—	—	117	130
W82	—	—	—	—	125	137
W83	—	—	—	—	—	150
W84	—	—	—	—	—	160
W85	—	—	—	—	—	165

TABLE 182	
Heater Element Cat. No.	Full Load Amps
	24/32 A/Size 00
JJ14	0.21
JJ13	0.22
JJ12	0.24
JJ11	0.26
JJ10	0.28
JJ9	0.30
JJ8	0.34
JJ7	0.38
JJ6	0.42
JJ5	0.47
JJ4	0.52
JJ3	0.58
JJ2	0.64
JJ1	0.71
J1	0.79
J2	0.89
J3	0.98
J4	1.10
J5	1.22
J6	1.35
J7	1.47
J8	1.59
J9	1.76
J10	1.94
J11	2.10
J12	2.30
J13	2.50
J14	2.76
J15	3.00
J16	3.24
J17	3.57
J18	3.90
J19	4.31
J20	4.77
J21	5.20
J22	5.80
J23	6.40
J24	7.02
J25	7.97
J26	8.80
J27	9.82
J28	11.0
J29	12.2
J30	13.6
J31	15.0
J32	17.0
J33	18.2
J34	20.8
J35	24.0

Refer to Heater Element Selection Procedure on page 1-167 before using tables.

Heater Elements Selection

For Application on Bulletin 100/500/609/1200 Line Starters

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TABLE 183

Heater Element Cat. No.	Full Load Amperes					
	Size 24 A	Size 32 A	Size 40 A	Size 62A	Size 125 A	Size 165 A
JJ14	0.20	0.20	0.19	—	—	—
JJ13	0.21	0.21	0.21	—	—	—
JJ12	0.23	0.23	0.23	—	—	—
JJ11	0.25	0.25	0.26	—	—	—
JJ10	0.27	0.27	0.28	—	—	—
JJ9	0.29	0.29	0.31	—	—	—
JJ8	0.33	0.33	0.34	—	—	—
JJ7	0.37	0.37	0.38	—	—	—
JJ6	0.41	0.41	0.42	—	—	—
JJ5	0.45	0.45	0.46	—	—	—
JJ4	0.50	0.50	0.51	—	—	—
JJ3	0.55	0.55	0.57	—	—	—
JJ2	0.62	0.62	0.63	—	—	—
JJ1	0.68	0.68	0.69	—	—	—
J1	0.78	0.78	0.77	—	—	—
J2	0.84	0.84	0.86	—	—	—
J3	0.93	0.93	0.95	—	—	—
J4	1.05	1.05	1.06	—	—	—
J5	1.17	1.17	1.18	—	—	—
J6	1.30	1.30	1.32	—	—	—
J7	1.44	1.44	1.44	—	—	—
J8	1.61	1.61	1.58	—	—	—
J9	1.80	1.80	1.72	—	—	—
J10	1.93	1.93	1.88	—	—	—
J11	2.12	2.12	2.06	—	—	—
J12	2.30	2.30	2.25	—	—	—
J13	2.50	2.50	2.48	—	—	—
J14	2.73	2.73	2.73	—	—	—
J15	2.95	2.95	3.01	—	—	—
J16	3.20	3.20	3.31	—	—	—
J17	3.54	3.54	3.65	—	—	—
J18	3.90	3.90	4.02	—	—	—
J19	4.28	4.28	4.42	—	—	—
J20	4.65	4.65	4.87	—	—	—
J21	5.18	5.18	5.37	—	—	—
J22	5.75	5.75	5.91	—	—	—
J23	6.40	6.40	6.50	—	—	—
J24	7.10	7.10	7.19	—	—	—
J25	7.82	7.82	7.94	—	—	—
J26	8.75	8.75	8.78	9.30	—	—
J27	9.63	9.63	9.71	10.2	—	—
J28	10.9	10.9	10.7	11.1	—	—
J29	12.0	12.0	11.8	12.1	—	—
J30	13.2	13.2	13.1	13.4	—	—
J31	14.9	14.9	14.5	14.9	—	—
J32	16.4	16.4	16.0	16.5	—	—
J33	17.6	17.6	17.7	18.3	—	—
J34	19.4	19.4	19.6	20.2	—	—
J35	22.7	22.7	21.7	22.4	—	—
J36	24.2	24.2	23.9	24.8	26.6	—
J37	—	26.9	26.4	27.4	29.6	—
J38	—	30.0	29.3	30.5	33.0	—
J39	—	34.0	33.0	33.5	37.0	—
J40	—	—	36.0	37.0	41.0	45.1
J41	—	—	38.5	41.0	45.5	46
J42	—	—	40.5	45.5	51.0	52
J43	—	—	—	50.0	56.0	57
J44	—	—	—	54.0	61.0	63
J45	—	—	—	57.0	67.0	69
J46	—	—	—	60.0	73.0	76
J70	—	—	—	63.0	79.0	84
J71	—	—	—	—	87.0	92
J72	—	—	—	—	95.0	102
J73	—	—	—	—	101	112
J74	—	—	—	—	111	123
J75	—	—	—	—	122	135
J76	—	—	—	—	—	150
J77	—	—	—	—	—	158
J78	—	—	—	—	—	161

TABLE 187

Heater Element Cat. No.	Full Load Amperes			
	Cat. No. 592-BOV16	Cat. No. 592-COV16	Cat. No. 592-DOV16	Cat. No. 592-EOV16
JJ14	0.19	—	—	—
JJ13	0.21	—	—	—
JJ12	0.23	—	—	—
JJ11	0.26	—	—	—
JJ10	0.28	—	—	—
JJ9	0.31	—	—	—
JJ8	0.34	—	—	—
JJ7	0.38	—	—	—
JJ6	0.42	—	—	—
JJ5	0.46	—	—	—
JJ4	0.51	—	—	—
JJ3	0.57	—	—	—
JJ2	0.63	—	—	—
JJ1	0.69	—	—	—
J1	0.77	—	—	—
J2	0.86	—	—	—
J3	0.95	—	—	—
J4	1.06	—	—	—
J5	1.18	—	—	—
J6	1.32	—	—	—
J7	1.44	—	—	—
J8	1.58	—	—	—
J9	1.72	—	—	—
J10	1.88	—	—	—
J11	2.06	—	—	—
J12	2.25	—	—	—
J13	2.48	—	—	—
J14	2.73	—	—	—
J15	3.01	—	—	—
J16	3.31	—	—	—
J17	3.65	—	—	—
J18	4.02	—	—	—
J19	4.42	—	—	—
J20	4.87	—	—	—
J21	5.37	—	—	—
J22	5.91	—	—	—
J23	6.50	—	—	—
J24	7.19	—	—	—
J25	7.94	—	—	—
J26	8.78	9.3	—	—
J27	9.71	10.2	—	—
J28	10.7	11.1	—	—
J29	11.8	12.1	—	—
J30	13.1	13.4	—	—
J31	14.5	14.9	—	—
J32	16.0	16.5	—	—
J33	17.7	18.3	—	—
J34	19.6	20.2	—	—
J35	21.7	22.4	—	—
J36	23.9	24.8	26.6	—
J37	26.4	27.4	29.6	—
J38	29.3	30.5	33.0	—
J39	33.0	33.5	37.0	—
J40	36.0	37.0	41.0	41.5
J41	38.5	41.0	45.5	46.0
J42	42.5	45.5	51	52
J43	—	50	56	57
J44	—	56	61	63
J45	—	59	67	69
J46	—	62	73	76
J70	—	68	79	84
J71	—	—	87	92
J72	—	—	95	102
J73	—	—	105	112
J74	—	—	116	123
J75	—	—	125	135
J76	—	—	—	155
J77	—	—	—	165
J78	—	—	—	172



Bulletin Eutectic Alloy Overload Relays
Heater Elements Selection
 For Application on Bulletin 100/500/609/1200 Line Starters



TABLE 191				
Heater Element Cat. No.	Full Load Amperes			
	Cat. No. 592-BOV16	Cat. No. 592-COV16	Cat. No. 592-DOV16	Cat. No. 592-EOV16
W10	0.20	—	—	—
W11	0.22	—	—	—
W12	0.24	—	—	—
W13	0.26	—	—	—
W14	0.29	—	—	—
W15	0.32	—	—	—
W16	0.35	—	—	—
W17	0.38	—	—	—
W18	0.42	—	—	—
W19	0.47	—	—	—
W20	0.51	—	—	—
W21	0.56	—	—	—
W22	0.61	—	—	—
W23	0.67	—	—	—
W24	0.74	—	—	—
W25	0.81	—	—	—
W26	0.89	—	—	—
W27	0.98	—	—	—
W28	1.08	—	—	—
W29	1.19	—	—	—
W30	1.30	—	—	—
W31	1.43	—	—	—
W32	1.55	—	—	—
W33	1.70	—	—	—
W34	1.90	—	—	—
W35	2.02	—	—	—
W36	2.22	—	—	—
W37	2.43	—	—	—
W38	2.68	—	—	—
W39	2.96	—	—	—
W40	3.25	—	—	—
W41	3.58	—	—	—
W42	3.94	—	—	—
W43	4.30	—	—	—
W44	4.72	—	—	—
W45	5.22	—	—	—
W46	5.78	—	—	—
W47	6.38	—	—	—
W48	7.06	—	—	—
W49	7.83	—	—	—
W50	8.55	—	—	—
W51	9.41	9.48	—	—
W52	10.5	10.6	—	—
W53	11.6	11.7	—	—
W54	12.7	12.8	—	—
W55	14.0	14.1	—	—
W56	15.3	15.4	—	—
W57	16.7	16.9	—	—
W58	18.0	18.3	—	—
W59	19.3	19.9	—	—
W60	21.3	21.9	—	—
W61	23.3	24.2	26.1	—
W62	25.6	26.8	28.7	—
W63	28.1	29.6	31.5	—
W64	31.0	32.5	34.5	—
W65	34.0	35.0	38.0	41.0
W66	36.0	37.5	41.5	44.5
W67	38.0	41.0	45.5	48.5
W68	41.0	45.0	49.5	53
W69	—	48.0	54	58
W70	—	52	59	63
W71	—	57	64	68
W72	—	60	70	74
W73	—	63	76	80
W74	—	65	81	86
W75	—	68	87	92
W76	—	—	93	98
W77	—	—	100	105
W78	—	—	105	112
W79	—	—	110	120
W80	—	—	120	128
W81	—	—	—	136
W82	—	—	—	145
W83	—	—	—	154
W84	—	—	—	162
W85	—	—	—	170

TABLE 192				
Heater Element Cat. No.	Full Load Amperes			
	Size 40 A	Size 68 A	Size 120 A	Size 184 A
W10	0.21	—	—	—
W11	0.23	—	—	—
W12	0.25	—	—	—
W13	0.27	—	—	—
W14	0.30	—	—	—
W15	0.34	—	—	—
W16	0.37	—	—	—
W17	0.41	—	—	—
W18	0.45	—	—	—
W19	0.50	—	—	—
W20	0.55	—	—	—
W21	0.60	—	—	—
W22	0.65	—	—	—
W23	0.71	—	—	—
W24	0.78	—	—	—
W25	0.86	—	—	—
W26	0.95	—	—	—
W27	1.04	—	—	—
W28	1.14	—	—	—
W29	1.25	—	—	—
W30	1.36	—	—	—
W31	1.50	—	—	—
W32	1.65	—	—	—
W33	1.82	—	—	—
W34	2.01	—	—	—
W35	2.21	—	—	—
W36	2.45	—	—	—
W37	2.67	—	—	—
W38	3.00	—	—	—
W39	3.31	—	—	—
W40	3.65	—	—	—
W41	4.06	—	—	—
W42	4.49	—	—	—
W43	4.98	—	—	—
W44	5.48	—	—	—
W45	6.06	—	—	—
W46	6.68	—	—	—
W47	7.35	—	—	—
W48	8.09	—	—	—
W49	8.90	9.03	—	—
W50	9.80	9.96	—	—
W51	10.9	11.1	—	—
W52	12.0	12.2	—	—
W53	13.2	13.3	—	—
W54	14.3	14.6	—	—
W55	15.7	15.8	—	—
W56	17.1	17.5	—	—
W57	18.6	19.1	—	—
W58	19.7	20.5	—	—
W59	21.4	21.9	—	—
W60	23.4	24.1	25.6	—
W61	25.8	26.4	27.8	—
W62	28.4	29.1	30.0	—
W63	31.0	32.0	34.0	—
W64	35.5	35.5	38.5	—
W65	38.5	39.0	42.5	43.5
W66	41.0	42.5	44.5	47.5
W67	—	47.5	50	52
W68	—	53	54	58
W69	—	57	60	61
W70	—	60	65	66
W71	—	65	73	74
W72	—	71	78	80
W73	—	—	87	89
W74	—	—	94	97
W75	—	—	100	104
W76	—	—	109	113
W77	—	—	113	125
W78	—	—	121	133
W79	—	—	—	142
W80	—	—	—	153
W81	—	—	—	165
W82	—	—	—	170
W83	—	—	—	184

Heater Elements Selection

For Application on Bulletin 100/500/609/1200 Line Starters

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TABLE 195

Heater Element Cat. No.	Full Load Amperes			
	Cat. No. 592-TPD200 184 A	Cat. No. 592-TPD300 304 A	Cat. No. 592-TPD400 496 A	NEMA Size 6 Cat. No. 592-TPD630 608 A
W26	—	—	—	115
W27	43*	—	78	125
W28	45*	—	85	135
W29	50*	—	94	147
W30	54*	—	104	165
W31	59*	—	114	179
W32	65*	—	125	196
W33	70	—	139	216
W34	75	127	150	232
W36	89	151	175	287
W37	98	166	195	315
W38	110	183	215	350
W39	120	198	235	385
W40	132	218	260	420
W41	143	239	293	465
W42	155	260	320	515
W43	170	285	350	570*
W44	193	310	380	630
W45	—	—	415	—
W46	—	—	455	—
W47	—	—	500	—
W48	—	—	550	—

TABLE 196

Heater Element Cat. No.	Full Load Amperes			
	Cat. No. 592-TPD200 184 A	Cat. No. 592-TPD300 304 A	Cat. No. 592-TPD400 496 A	NEMA Size 6 Cat. No. 592-TPD630 608 A
J7	64*	—	115	195
J8	72*	—	127	220
J9	74*	—	140	239
J10	85*	125	155	260
J11	87*	142	170	285
J12	96	155	186	315
J13	107	172	205	340
J14	116	188	215	375
J15	128	205	145	410
J16	139	225	270	450
J17	153	250	296	495
J18	168	275	330	540*
J19	184	305	360	590
J20	200	—	400	640
J21	215	—	440	—
J22	—	—	480	—
J23	—	—	520	—

* Exceeds 20 seconds at six times rating, providing Class 30 protection.

* Maximum element for NEMA Size 6.

TABLE 198

Heater Element Cat. No.	Full Load Amperes			
	Size 40 A	Size 68 A	Size 120 A	Size 184 A
JJ14	0.22	—	—	—
JJ13	0.24	—	—	—
JJ12	0.27	—	—	—
JJ11	0.30	—	—	—
JJ10	0.33	—	—	—
JJ9	0.36	—	—	—
JJ8	0.40	—	—	—
JJ7	0.44	—	—	—
JJ6	0.48	—	—	—
JJ5	0.53	—	—	—
JJ4	0.58	—	—	—
JJ3	0.65	—	—	—
JJ2	0.71	—	—	—
JJ1	0.78	—	—	—
J1	0.87	—	—	—
J2	0.95	—	—	—
J3	1.05	—	—	—
J4	1.16	—	—	—
J5	1.28	—	—	—
J6	1.41	—	—	—
J7	1.55	—	—	—
J8	1.70	—	—	—
J9	1.87	—	—	—
J10	2.06	—	—	—
J11	2.27	—	—	—
J12	2.51	—	—	—
J13	2.78	—	—	—
J14	3.07	—	—	—
J15	3.38	—	—	—
J16	3.72	—	—	—
J17	4.10	—	—	—
J18	4.52	—	—	—
J19	4.98	—	—	—
J20	5.49	—	—	—
J21	6.04	—	—	—
J22	6.66	—	—	—
J23	7.35	—	—	—
J24	8.13	—	—	—
J25	8.96	9.03	—	—
J26	9.90	9.95	—	—
J27	10.9	11.0	—	—
J28	12.0	12.3	—	—
J29	13.2	13.8	—	—
J30	14.6	15.3	—	—
J31	16.1	17.1	—	—
J32	18.6	18.8	—	—
J33	20.9	21.1	—	—
J34	22.8	23.5	24.5	—
J35	25.1	26.0	29.9	—
J36	28.5	29.1	33.0	—
J37	33.0	33.5	35.0	—
J38	35.5	36.0	39.5	—
J39	38.5	39.5	44.0	42.0
J40	42.0	44.0	47.5	48.5
J41	—	50.0	54	55
J42	—	56.0	59	62
J43	—	61.0	65	68
J44	—	67.0	72	75
J45	—	70.0	78	81
J46	—	—	87	90
J70	—	—	95	98
J71	—	—	105	108
J72	—	—	118	120
J73	—	—	126	131
J74	—	—	—	148
J75	—	—	—	160
J76	—	—	—	179
J77	—	—	—	198

Refer to Heater Element Selection Procedure on page 1-167 before using tables.



Heater Elements Selection

For Application on Bulletin 100/500/609/1200 Line Starters

TABLE 347

Heater Element Cat. No.	Full Load Amps
	Size 5
W29	77
W30	83
W31	90
W32	98
W33	107
W34	116
W35	126
W36	138
W37	150
W38	164
W39	178
W40	194
W41	212
W42	232
W43	254
W44	279
W45	—
W46	—
W47	—
W48	—
W49	—

TABLE 547

Heater Element Cat. No.	Full Load Amps
	Size 5
J5	72
J6	79
J7	87
J8	94
J9	103
J10	113
J11	124
J12	135
J13	148
J14	162
J15	177
J16	194
J17	212
J18	232
J19	254
J20	278
J21	—

Refer to Heater Element Selection Procedure on page 1-167 before using tables.

Single-Phase NEMA Manual Starting Switches

Product Overview

Manual Motor Starters

Bulletin	600	609	609U
Features	<ul style="list-style-type: none"> Single-phase switch Used on compressors, fans, pumps, and table saws 	<ul style="list-style-type: none"> Single- and three-phase switches Contact position indicator Locking feature Reversing and 2-speed 	<ul style="list-style-type: none"> Single- and three-phase switches Contact position indicator Locking feature Undervoltage protection
Type of Operator 1-Phase Motor Voltage Push Button/ Toggle/Lever/ Key	<p>Single Pole: 115...230V AC (1 Hp)</p> <p>Two Pole: 115...230V AC (1 Hp)</p>	115...230V AC, 60 Hz (1...5 Hp)	115...230V AC, 60 Hz (1...5 Hp)
Type of Operator 3-Phase Motor Voltage Push Button / Toggle Lever	—	115...230V AC, 60 Hz (3...10 Hp)	115...230V AC, 60 Hz (3...10 Hp)
Enclosures NEMA Type	1, 4, 7 & 9	1, 3R, 4/4X, 7 & 9, and 12	1, 3R, 4/4X, 7 & 9, and 12
Standards	<ul style="list-style-type: none"> NEMA/EEMAC ICS2 (Industrial Controls and Systems) UL 508 CSA C22.2, No. 14 EN60947-4-1 ABS 4/5.115 USCG 46 CFR 111.70 	<ul style="list-style-type: none"> NEMA/EEMAC ICS2 (Industrial Controls and Systems) UL 508 CSA C22.2, No. 14 EN60947-4-1 ABS 4/5.115 USCG 46 CFR 111.70 	<ul style="list-style-type: none"> NEMA/EEMAC ICS2 (Industrial Controls and Systems) UL 508 CSA C22.2, No. 14 EN60947-4-1 ABS 4/5.115 USCG 46 CFR 111.70
Certifications	<ul style="list-style-type: none"> UL Listed – Enclosed Products Only (File No. E14841; Guide No. NLRV) UL Recognized – Open Style Products (File No. E14841; Guide No. NLRV2) CSA Certified (File No. LR 1234) American Bureau of Shipping (ABS) CE Marked 	<ul style="list-style-type: none"> UL Listed (File No. E14841; Guide No. NLRV) CSA Certified (File No. LR 1234) American Bureau of Shipping (ABS) CE Marked 	<ul style="list-style-type: none"> UL Listed (File No. E14841; Guide No. NLRV) CSA Certified (File No. LR 1234) American Bureau of Shipping (ABS) CE Marked
Product Selection	Page 1-195	Page 1-198	Page 1-200

Single-Phase NEMA Manual Starting Switches

Overview/Product Selection



Type 1 General Purpose Enclosure with Neon Pilot Light

Bulletin 600

Starting and overload protection of small 1-phase AC/DC motors used on the following:

- Unit heaters
- Stokers
- Refrigeration compressors
- Fans
- Pumps

Bulletin 600 manual switches consist of a snap switch combined with a thermal overload device operating on the solder-ratchet principle. The switch is designed to prevent being held closed under a sustained motor overload. To reset the overload mechanism, the switch lever is moved to the OFF position. The motor can be restarted by pushing the switch lever to the ON position. Applications include compressors, fans and pumps.

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Standards Compliance

- UL 508
- EN60947-4-1
- CSA C22.2, No. 14

Certifications

- UL Listed — Enclosed Products (File No. E14841; Guide No. NLRV)
- UL Recognized — Open Style Products (File No. E14841; Guide No. NLRV2)
- CSA Certified (File No. LR 1234)
- American Bureau of Shipping (ABS)
- CE Marked
- Hazardous Location: UL Listed (File No. E10314) CSA Certified (File No. LR 11924)

Product Selection

Your order must include: 1) Cat. no. of the switch, 2) Cat. no. of the heater element(s), and 3) if required, cat. no. of any accessories.

Ratings

Single Pole — 1 Hp 115...230V AC, 1 Hp 277V AC, Open Type without Enclosure or Type 1 General Purpose Enclosure

Two Pole — 1 Hp 115...230V AC, 1 Hp 277V AC, Open Type without Enclosure or Type 1 General Purpose Enclosure, 3/4 Hp 115...230V DC

Selector Switch — 1 Hp 115...230V AC, 1 Hp 277V AC, Open Type without Enclosure or Type 1 General Purpose Enclosure

Heater Element — See page 1-167 for heater element selection table.






Description		Open Type Without Enclosure Includes Legend Plate	Type 1 General Purpose Enclosure Surface Mounting	Type 1 General Purpose Enclosure Flush Mounting Includes Flush Plate but not Switch Box	Type 4 Watertight Enclosure	Type 7 & 9 Enclosure Class I, Groups C & D Class II, Groups E, F & G – Divisions 1 & 2 – Hazardous Locations
		Cat. No.	Cat. No.	Stainless Steel Flush Plate		Cat. No.
Switch Only						
Toggle Type	1-Pole	600-TOX4	600-TAX4	600-TQX4	—	—
	2-Pole	600-TOX5	600-TAX5	600-TQX5	600-TCX5	600-TEX5
Key Type	2-Pole	600-TOX49	600-TAX49	600-TQX49	—	—
Lever Type	1-Pole	600-TOX149	600-TAX149	—	—	—
Switch with Neon Pilot Light (115 or 230V)						
Toggle Type	1-Pole	600-TOX216	600-TAX216	600-TQX216	—	—
	2-Pole	600-TOX109	600-TAX109	600-TQX109		
Key Type	2-Pole	600-TOX110	600-TAX110	600-TQX110		
Switch with Incandescent Pilot Light						
Toggle Type	2-Pole 115V	—	—	—	600-TCD7	600-TED7
	2-Pole 230V	—	—	—	600-TCA7	600-TEA7
Switch and "Hand-Off-Auto" Selector Switch (for use on AC only)						
Toggle Type	2-Pole	—	600-TAX9	600-TQX9	600-TCX9	600-TEX9
Switch with Neon Pilot Light and "Hand-Off-Auto" Selector Switch (115 or 230V, AC only)						
Toggle Type	2-Pole	—	600-TAX142	600-TQX142	—	—
Key Type	2-Pole	—	600-TAX145	—	—	—
Two Switch Units in One Enclosure						
Toggle Type	2-Pole	—	600-TAX10	—	600-TCX10	600-TEX10
Two Switch Units in One Enclosure Neon Pilot Light on Both Units (115 or 230V)						
Toggle Type	2-Pole	—	600-TAX144	600-TQX144	—	—
Two Speed Switch						
Toggle Type	2-Pole	—	600-TAX298	—	—	—
Two Speed Switch with Neon Pilot Lights (115 or 230V)						
Toggle Type	2-Pole	—	600-TAX293	600-TQX293	—	—
Separate Cover and Switch Assembly*						
Toggle Type	2-Pole	—	—	—	—	600-N12
Hand-Off-Auto		—	—	—	—	600-N14

* For use with Bulletin 800H, Type 7 and 9, Series C or later bases.

Single-Phase NEMA Manual Starting Switches

Accessories — Field-Installed/Modifications — Factory Installed/Approximate Dimensions

Accessories

Description	NEMA Enclosure Type	Cat. No.
Pilot Light Replacement Bulb Incandescent* (Mfg. Designation #120 PSB-120V) Note: Pilot lights as used on Bulletin 600 switches indicate whether the motor is running only if the switch is used to control the motor directly. If a thermostat, pressure switch, or some other pilot device controls the operation of the motor, the pilot light on the Bulletin 600 switch merely indicates whether the power is ON or OFF.	4, 7, and 9	800S-N60
		
Locking Attachment (For Toggle Operated Only)	1 (Switches in the Type 4 and Type 7 and 9 enclosures are supplied as standard with provisions for locking in the OFF or ON position.)	600-N1
		
Drain (For 3/4 in. (19 mm) Conduit Opening)	7 and 9	800H-NP21
		
Flange Seal (Provides NEMA Type 3 rating for outdoor locations in addition to maintaining NEMA Type 7 and 9 integrity) Note: An approved drain Cat. No. 800H-NP21 is required for condensation when this option is used (refer to local Electrical Code).	3, 7, and 9	800H-NP20
		
Sealing Well (See applicable codes and laws) (Not available for use with Cat. No. 600-TEX5) Note: When using a sealing well with integral flange seal for NEMA Type 3 outdoor applications, an approved drain fitting must be provided (refer to local Electrical Code).	3, 7, and 9 (With integral flange seal)	2 wire: 800H-NPRD90 4 wire: 800H-NPRD91
	7 and 9 (Without integral flange seal)	2 wire: 800H-NPD90 4 wire: 800H-NPD91

* All other devices with the pilot light option utilize a neon lamp. For replacement information consult your local Rockwell Automation sales office or Allen-Bradley distributor. (For Type 1 enclosure use replacement bulb 40268-313-51)

Modifications — Factory-Installed

Flange Seal (see applicable codes and laws) — This option provides a Type 3 rating in addition to maintaining a Type 7 & 9 integrity. Add the letter **S** to the end of the cat. no.
 Example: **Cat. No. 600-TEX9S**.

Conduit Openings (Type 4 and Type 7 & 9 only) — If two 3/4 in. (19 mm) pipe taps (one on top and one on bottom) are required, add the number **12** to the end of the cat. no.
 Example: **Cat. No. 600-TEX512**. Note: Suffix **12** is only an option for the Type 4 and 7 & 9 enclosures.

Note: All single unit devices are provided with one 3/4 in. (19 mm) pipe tap on the bottom. By reversing the switch base, the pipe tap can be located on the top.

All dual units are provided as standard with one 3/4 in. (19 mm) pipe tap on top and two on the bottom with two threaded plugs included. If 1/2 in. (12.7 mm) openings are required, reducers should be used.

Drain — In order to install a drain on single unit devices (e.g. **Cat. No. 600-TEX5**) an additional conduit opening is required. See "Conduit Openings" above.

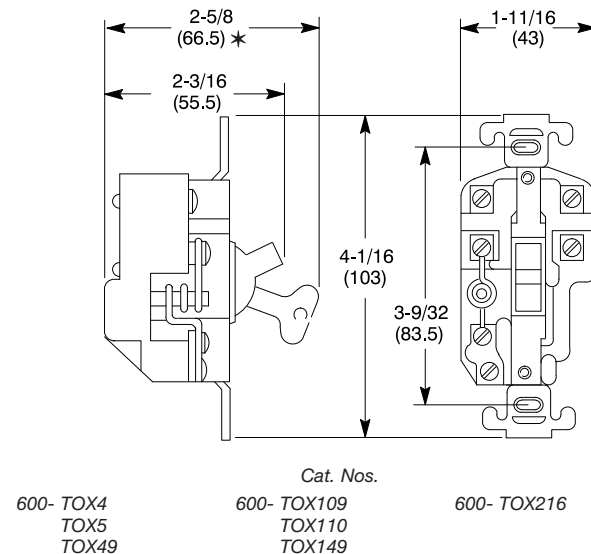
Sealing Well with Integral Flange Seal for Type 3, 7, and 9 — To order this option insert the letter **R** at the end of the listed cat. no.
 Example: **Cat. No. 600-TEX5R**.

Sealing Well without Integral Flange Seal for Type 7 and 9 — To order this option insert the letter **K** at the end of the listed cat. no.
 Example: **Cat. No. 600-TEX5K**.

Approximate Dimensions

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

Open Type without Enclosure

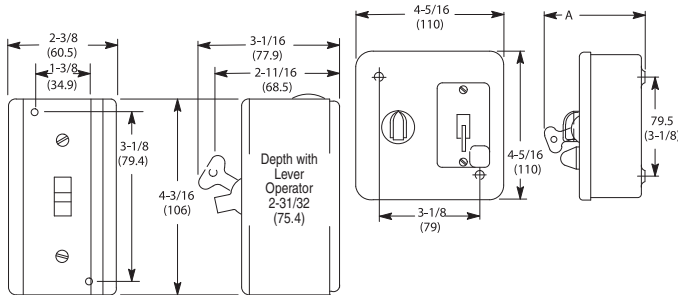


Single-Phase NEMA Manual Starting Switches

Approximate Dimensions

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

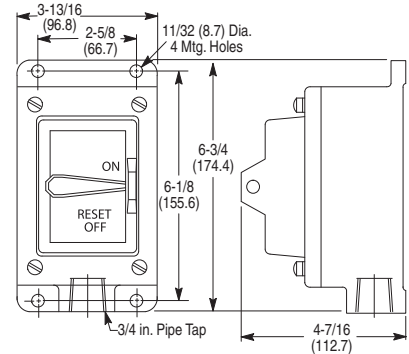
Type 1 General Purpose Enclosure Surface Mounting



- Cat. Nos.
- | | | |
|-----------|-------------|-------------|
| 600- TAX4 | 600- TAX109 | 600- TAX216 |
| TAX5 | TAX110 | |
| TAX49 | TAX149 | |
- Cat. Nos.
- | | | |
|-----------|-------------|-------------|
| 600- TAX9 | 600- TAX142 | 600- TAX145 |
| TAX10 | TAX144 | |

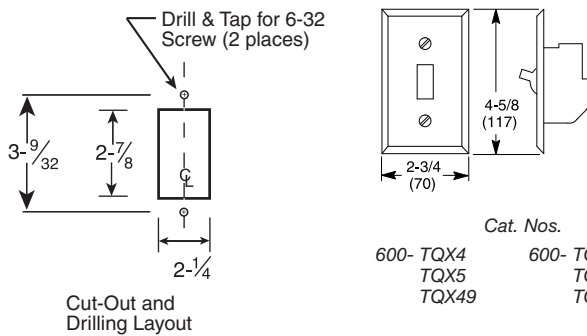
Dimension A in inches (millimeters)	
Key Inserted	1-1/8 (79.5)
Selector Switch	2-3/4 (70)
Toggle Operator	2-9/16 (65)

Type 4 Watertight Enclosure; Type 7 and 9 Hazardous Locations Enclosure

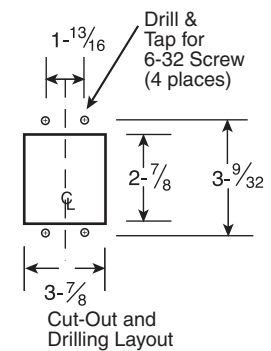


- Cat. Nos.
- | | |
|-----------|-----------|
| 600- TCX5 | 600- TEX5 |
|-----------|-----------|

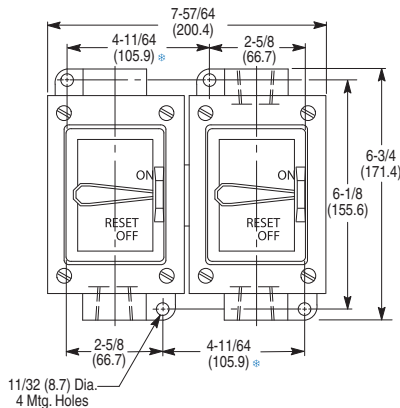
Type 1 General Purpose Enclosure Flush Mounting



- Cat. Nos.
- | | | | |
|-----------|-------------|-----------|-------------|
| 600- TQX4 | 600- TQX109 | 600- TQX9 | 600- TQX144 |
| TQX5 | TQX110 | TQX142 | |
| TQX49 | TQX216 | | |

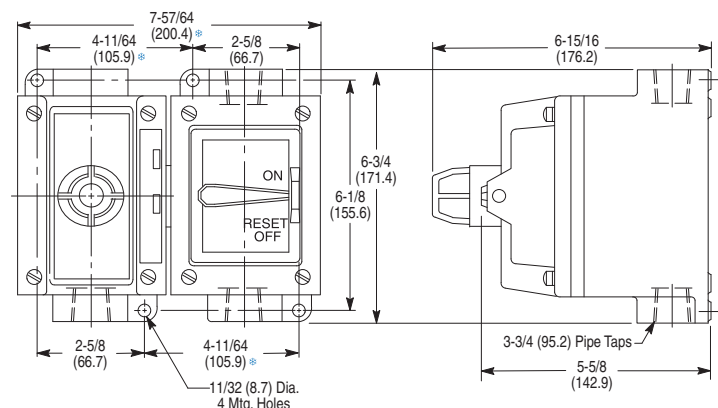


Type 4 Watertight Enclosure, Type 7 & 9



- Cat. Nos.
- | | |
|-----------|-----------|
| 600- TCX9 | 600- TEX9 |
| TCX142 | TEX10 |

Type 7 & 9 Hazardous Locations Enclosure



- Cat. Nos.
- | | |
|-----------|-----------|
| 600- TCA7 | 600- TEA7 |
| TCD75 | TED7 |

* Lever Type Dimension is 2-17/32 in. (64.5 mm).

* This dimension may vary up to ±1/8 in. (3.2 mm). Mounting holes should be located at time of installation using device as a template.

Single and Three Phase NEMA Manual Starting Switches

Overview/Product Selection

1



Open Type without Enclosure

Bulletin 609

- Contact position indicator
 - Locking features
 - Wide range of enclosures:
 - Open-type without enclosure, Type 1, and Type 12
- Bulletin 609 manual starting switches are designed for use on motor starting installations where remote push button control is not required and where undervoltage protection is not needed. The motor is started at full line voltage, and thermal type overload protection is provided. Bulletin 609RS manual starting switches are designed for manually reversing AC polyphase motors; the Bulletin 609TS manual switches are designed for operating 2-speed, separate winding wye connected motors. These switches incorporate two of the standard Bulletin 609 manual starting switches mounted on a common base plate. A mechanical interlock is provided to prevent both switches from being closed at the same time.

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- Accessories and Modifications..... 1-199
- Approximate Dimensions..... 1-203

Standards Compliance

- NEMA/EEMAC ICS2 (Industrial Controls and Systems)
- UL 508
- ABS 4/5.115
- CFR 111.70
- EN60947-4-1
- USCG 46

Certifications

- UL Listed (File No. E14841; Guide No. NLRV)
- CSA Certified (File LR 1234)
- American Bureau of Shipping (ABS)
- CE Marked
- Hazardous Location: UL Listed (File No. E10314) CSA Certified (File LR 11924)

Single- and Three-Phase NEMA Manual Starting Switches

Type of Operator	Phase	Size	Maximum Horsepower Rating							Open Type without Enclosure	Type 1 General Purpose Enclosure Surface Mounting*	Type 12 Dusttight Industrial Use Enclosure	Type 4/4X Watertight, Corrosion-Resistant Enclosure Fiberglass-Reinforced Polyester†	Hazardous Locations					
			Motor Voltage											Cat. No.	Cat. No.	Cat. No.	Cat. No.	Enclosure Class I, Groups C & D Class II, Groups E, F & G - Divisions 1 & 2	
			AC, 60 Hz			AC, 50 Hz	DC											Type 7 & 9	Type 3R, 7 & 9§
			115V	200V	230V	460... 575V	380... 415V	115... 125V	230... 250V										
Push Button	1 Ø	0	1	—	2	—	—	—	—	609-AOX	609-AAX	609-AJX	609-ACX	609-AEX	609-AHX				
		1	2	—	3	—	—	—	—	609-BOX	609-BAX	609-BJX	609-BCX	609-BEX	609-BHX				
		1 P	3	—	5	—	—	—	—	609-XOX	609-XAX	609-XJX	609-XCX	609-XEX	609-XHX				
	3 Ø	0	—	3	3	5	5	—	—	609-AOW	609-AAW	609-AJW	609-ACW	609-AEW	609-AHW				
1		—	7-1/2	7-1/2	10	10	—	—	609-BOW	609-BAW	609-BJW	609-BCW	609-BEW	609-BHW					
Toggle Lever	1 Ø	0	1	—	2	—	—	—	—	609T-AOX	609T-AAX	—	—	—	—				
		1	2	—	3	—	—	—	—	609T-BOX	609T-BAX	—	—	—	—				
		1 P	3	—	5	—	—	—	—	609T-XOX	609T-XAX	—	—	—	—				
	3 Ø	0	—	3	3	5	5	—	—	609T-AOW	609T-AAW	—	—	—	—				
1		—	7-1/2	7-1/2	10	10	—	—	609T-BOW	609T-BAW	—	—	—	—					
Push Button	DC*	0	—	—	—	—	—	1	1-1/2	609D-AOZ	609D-AAZ	—	609D-ACZ	609D-AEZ	609D-AHZ				
		1	—	—	—	—	—	1-1/2	2	609D-BOZ	609D-BAZ	—	609D-BCZ	609D-BEZ	609D-BHZ				
Toggle Lever	DC*	0	—	—	—	—	—	1	1-1/2	609DT-AOZ	609DT-AAZ	—	—	—	—				
		1	—	—	—	—	—	1-1/2	2	609DT-BOZ	609DT-BAZ	—	—	—	—				

Bulletin 609RS — Manual Reversing Switches

Push Button	3 Ø	0	—	3	3	5	5	—	—	609-AOW21	609-AAW21	—	—	—	—
		1	—	7-1/2	7-1/2	10	10	—	—	609-BOW21	609-BAW21	—	—	—	—
Toggle Lever	3 Ø	0	—	3	3	5	5	—	—	609T-AOW21	609T-AAW21	—	—	—	—
		1	—	7-1/2	7-1/2	10	10	—	—	609T-BOW21	609T-BAW21	—	—	—	—

Bulletin 609TS — Manual 2-Speed Switches

Push Button	3 Ø	0	—	3	3	5	5	—	—	609-AOW22	609-AAW22	—	—	—	—
		1	—	7-1/2	7-1/2	10	10	—	—	609-BOW22	609-BAW22	—	—	—	—
Toggle Lever	3 Ø	0	—	3	3	5	5	—	—	609T-AOW22	609T-AAW22	—	—	—	—
		1	—	7-1/2	7-1/2	10	10	—	—	609T-BOW22	609T-BAW22	—	—	—	—

* Type 1 general purpose flush mounting enclosures with pull box are also available. Order as follows. Change the second letter of the listed cat. no. from **A** to **L**. Example: **Cat. No. 609-ALX**. For a stainless steel flush plate, change the second letter of the listed cat. no. from **A** to **Q**. Example: **Cat. No. 609-AQX**.

* DC manual starters are not UL listed.

† Fiberglass-reinforced polyester hubs are included with each starter.

§ These enclosures include a cover gasket and drain. It is recommended that a breather also be installed.

- Breather **Cat. No. 1401-N1** (Can be installed at the top of an enclosure.)
- Drain **Cat. No. 1401-N2** (Can be installed at the bottom of an enclosure.)
- Breather-Drain Combination **Cat. No. 1401-N3** (Can be installed at the top of an enclosure as a breather or bottom as a drain.)



Single and Three Phase NEMA Manual Starting Switches

Accessories — Field Installed — Factory Installed

Pilot Light Kits

Kits are available for field installation of pilot lights in Type 1 General Purpose surface or flush mounting enclosures. As standard, a clear pilot light lens is supplied. Pilot lights are not available for Bulletin 609RS or 609TS manual starters.

Volts [V]	Cat. No.
120	609-N10
240	609-N20
480	609-N40
600	609-N60

Pilot Lights Factory Installed

To order, add the following suffix code after the last letter in the listed Cat. No. Example: **Cat. No. 609-AAXD4**. Available for Type 1 General Purpose Enclosure only.

Volts [V]	Suffix Code
120	D4
240	A4
480	B4
600	C4

Note: Replacement lamp is ANSI part number B2A (NE-51H), **Cat. No. 609-N9**.

Fusing

The Bulletin 609 is suitable for general installation in accordance with the local electrical code.

Group Fusing

The Bulletin 609 sizes 0 and 1 in Type 1, 4X, and 12 enclosures are UL Listed for group fusing with Class J fuses only. See table below for maximum fuse ratings.

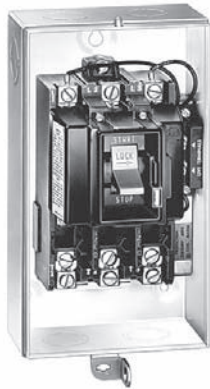
Full Load Current of Smallest Motor Amperes [A]	Maximum Fuse Ratings [A]	
	Nominal System Voltages	
	120...240V	480...600V
0.45...2.99	30	30
3.00...6.49	60	30
6.50...18.0	100	—



Manual Starting Switches

Overview

1



Toggle Lever Type Switch in Type 1 Enclosure (with Cover Removed)

Bulletin 609U

- Contact position indicator
- Locking features
- Wide range of enclosures: Open-type, Type 1, and Type 12
- Undervoltage protection

Bulletins 609U and 609TU are the same as the standard Bulletin 609 Manual Starters except for the addition of undervoltage protection. These starters provide full line voltage starting, thermal overload protection, as well as undervoltage protection. Typical applications are on woodworking machinery, metal sawing machines, and many other machine tools where undervoltage protection is needed to meet safety standards. The undervoltage protection is accomplished by an electromechanical solenoid which is energized whenever line voltage is present. The solenoid is designed to mechanically open the starter contacts upon power failure, and keep them open even if power is returned to the unit. Only after the starter has been manually reset by pushing the operator to the stop position, can the starter be re-energized. Open Type Bulletin 609U and 609TU switches can replace the Bulletin 609 switches in Types 1 and 12 enclosures of the latest construction without any field modification of the enclosure.

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 Modifications 1-202
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 Approximate Dimensions 1-203

Standards Compliance

- NEMA/EEMAC ICS2 (Industrial Controls and Systems)
- UL 508
- EN60947-4-1
- ABS 4/5.115
- USCG 46
- CFR 111.70

Certifications

- UL Listed (File No. E14841; Guide No. NLRV)
- CSA Certified (File LR 1234)
- American Bureau of Shipping (ABS)
- CE Marked
- Hazardous Location: UL Listed (File No. E10314) CSA Certified (File LR 11924)

With Undervoltage Protection

Type Of Operator	Phase	Size	Maximum Horsepower Rating					Open Type without Enclosure	Type 1 General Purpose Enclosure Surface Mounting*	Type 12 Dusttight, Industrial Use Enclosure	Type 4/4X Watertight, Corrosion-Resistant Enclosure Fiberglass-Reinforced Polyester*	Hazardous Locations	
			Motor Voltage									Enclosure Class I, Groups C & D Class II, Groups E, F & G – Divisions 1 & 2	
			AC, 60 Hz									Type 7 & 9	Type 3R, 7 & 9†
			115V	200V	230V	50 Hz							
				380...415V	460...575V						Cat. No.	Cat. No.	
Push Button	1 Ø	0	1	—	2	—	—	609U-AO⊗	609U-AA⊗	609U-AJ⊗	609U-AC⊗	609U-AE⊗	609U-AH⊗
		1	2	—	3	—	—	609U-BO⊗	609U-BA⊗	609U-BJ⊗	609U-BC⊗	609U-BE⊗	609U-BH⊗
		1P	3	—	5	—	—	609U-XO⊗	609U-XA⊗	609U-XJ⊗	609U-XC⊗	—	—
	3 Ø	0	—	3	3	5	5	609U-AO⊗	609U-AA⊗	609U-AJ⊗	609U-AC⊗	609U-AE⊗	609U-AH⊗
		1	—	7-1/2	7-1/2	10	10	609U-BO⊗	609U-BA⊗	609U-BJ⊗	609U-BC⊗	609U-BE⊗	609U-BH⊗
		1P	—	—	—	—	—	—	—	—	—	—	—
Toggle Lever	1 Ø	0	1	—	2	—	—	609TU-AO⊗	609TU-AA⊗	—	—	—	—
		1	2	—	3	—	—	609TU-BO⊗	609TU-BA⊗	—	—	—	—
		1P	3	—	5	—	—	609TU-XO⊗	609TU-XA⊗	—	—	—	—
	3 Ø	0	—	3	3	5	5	609TU-AO⊗	609TU-AA⊗	—	—	—	—
		1	—	7-1/2	7-1/2	10	10	609TU-BO⊗	609TU-BA⊗	—	—	—	—
		1P	—	—	—	—	—	—	—	—	—	—	—

* Type 1 general purpose flush mounting enclosures with pull box are also available. Order as follows. Change the second letter of the listed cat. no. from **A** to **L**. Example: **Cat. No. 609U-ALX**. For a stainless steel flush plate, change the second letter of the listed cat. no. from **A** to **Q**. Example: **Cat. No. 609U-AQX**.

⊗ Fiberglass-reinforced polyester hubs are included with each starter.

† These enclosures include a cover gasket and drain. It is recommended that a breather also be installed.

- Breather **Cat. No. 1401-N1** (Can be installed at the top of an enclosure.)
- Drain **Cat. No. 1401-N2** (Can be installed at the bottom of an enclosure.)
- Breather-Drain Combination **Cat. No. 1401-N3** (Can be installed at the top of an enclosure as a breather or bottom as a drain.)

⊗ Coil Voltage Code for 1-Phase

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 609U-AO⊗** becomes **Cat. No. 609U-AOXA**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	24	110...115	115...120	200...208	220...230	230...240	240	277
Common Control	50 Hz	—	XS	—	—	XP	—	XG	—
	60 Hz	—	XE	XD	XH	XF	XA	—	—
Separate Control	50 Hz	—	XWS	—	—	XWP	—	XWT	—
	60 Hz	XWJ	—	XWD	XWH	—	XWA	—	XWF

⊗ Coil Voltage Code for 3-Phase

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 609U-AA⊗** becomes **Cat. No. 609U-AAA**. For other voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	[V]	115... 120	200... 208	220... 230	230... 240	277	460... 480	550	575... 600
Common Control	50 Hz	—	—	P	—	—	—	—	—
	60 Hz	—	H	F	A	—	B	WC	C
Separate Control	50 Hz	—	—	—	—	—	—	—	—
	60 Hz	D	—	—	—	WF	—	—	—

Remote Stop Function

A remote stop function may be added by removing a short jumper (see typical diagram) and wiring a push button or limit switch in series with the solenoid. After operation of the emergency stop, the starter must be manually reset.

Note: The remote stop terminal block and jumper are not available on devices in the Type 7 and 9 enclosure.

Manual Starting Switches

Modifications/Typical Wiring Diagrams

Pilot Light Kits

Kits are available for field installation of pilot lights in Type 1 general purpose surface or flush mounting enclosures. A clear lens is provided as standard. Pilot lights are not available for Bulletin 609RS or 609TS manual starters.

Volts [V]	NEMA Type	Cat. No.
120	Type 1	609-N10
240		609-N20
480		609-N40
600		609-N60

Pilot Lights Factory Installed

To order, add the number **4** after the last letter in the listed cat. no. Example: **Cat. No. 609U-AAXD** becomes **Cat. No. 609U-AAXD4**. Available for Type 1 general purpose enclosure only.

Note: Replacement lamp is ANSI part number B2A (NE-51H), Allen-Bradley **Cat. No. 609-N9**.

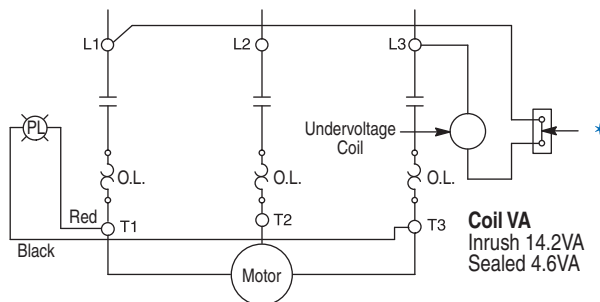
Group Fusing

The Bulletin 609U and 609TU Sizes 0 and 1 in Type 1, 4/4X, and 3R/12 enclosures are UL Listed for group fusing with Class J fuses only. See table below for maximum fuse ratings.

Full Load Current of Smallest Motor Amperes [A]	Maximum Fuse Ratings [A]	
	Nominal System Voltages	
	120...240V	480...600V
0.45...2.99	30	30
3.00...6.49	60	30
6.50...18.0	100	—

Typical Wiring Diagram

(See Applicable Codes and Laws)



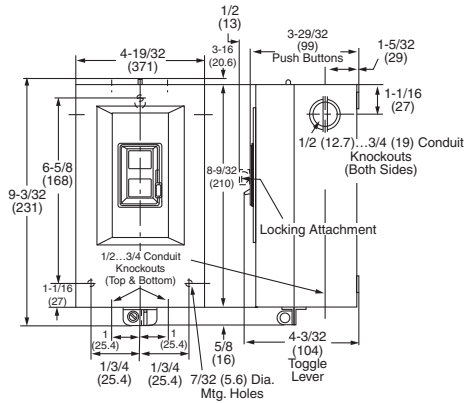
* Remove Jumper "A" to connect remote stop operator wires to vacated terminals.

Note: Jumper not available on devices in Type 7 and 9 Enclosure.

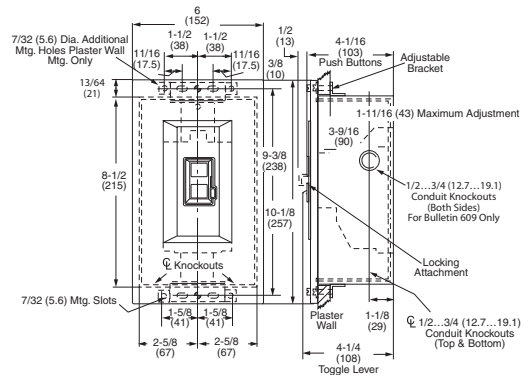
Dimensions are shown in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Bulletin 609 – 609U

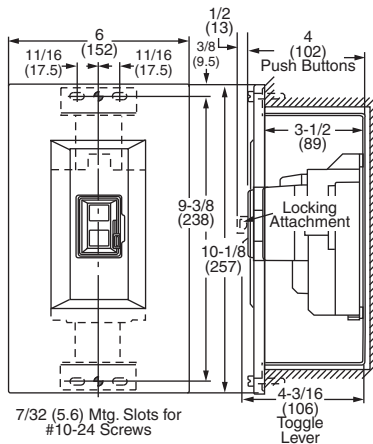
NEMA Type 1



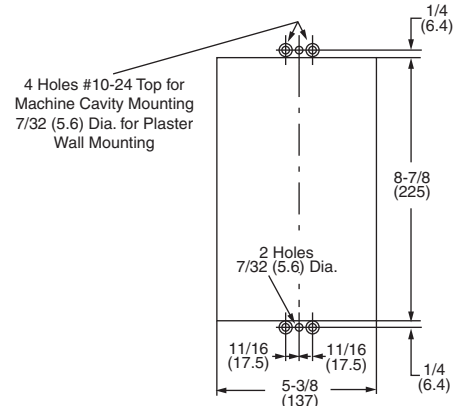
Surface Mounting



Flush Mounting for Plaster Wall

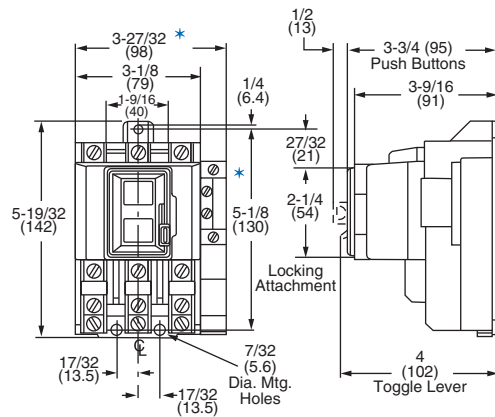
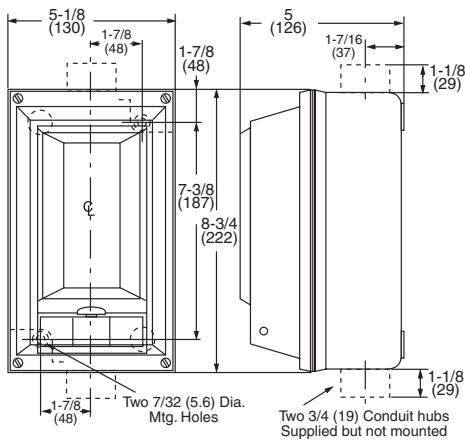


Flush Mounting for Machine Cavity



Flush Mounting Cavity and Drilling Layout

NEMA Type 4/4X



Open Type — Without Enclosure

* Undervoltage solenoid applies only to Bulletins 609U and 609TU.

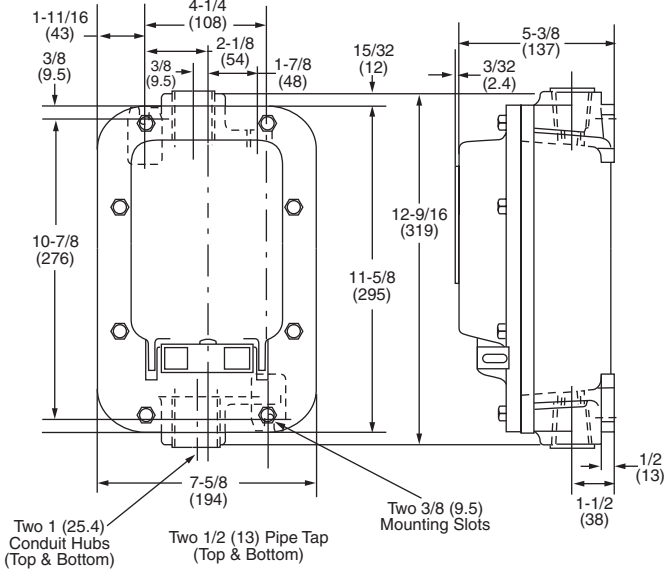
Manual Starting Switches

Approximate Dimensions

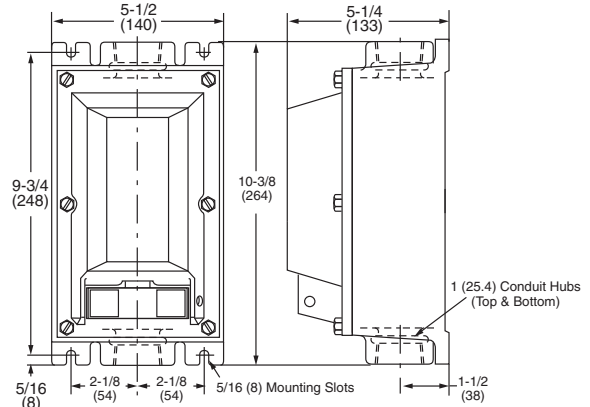
Dimensions are shown in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Bulletin 609 – 609U

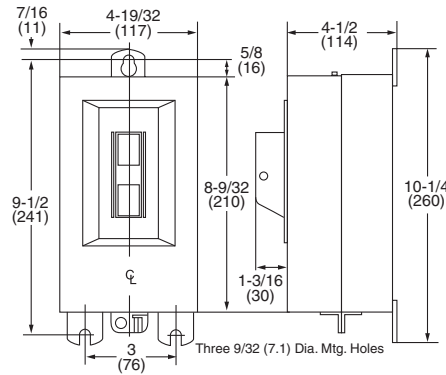
NEMA Type 3R, 7 & 9



NEMA Type 7 & 9

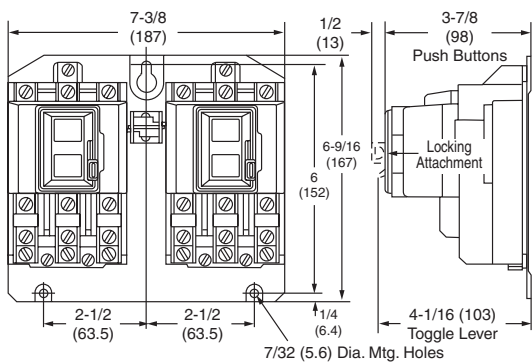


NEMA Type 12

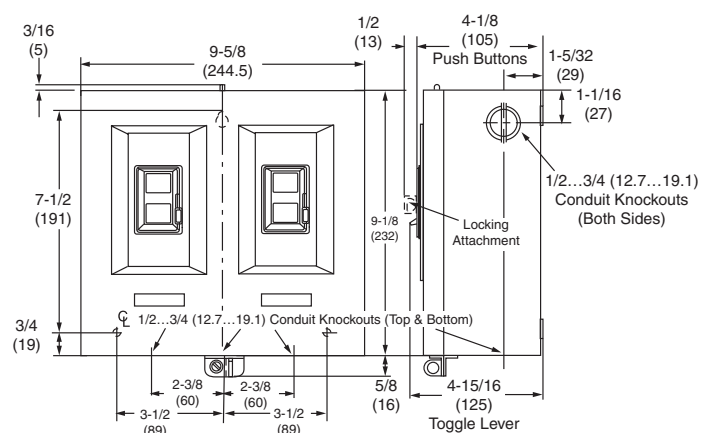


Bulletin 609RS, 609TS

Open Type Without Enclosure



NEMA Type 1



NEMA Disconnect Switches and Circuit Breaker Mechanisms

Product Overview

Disconnect Switches

Bulletin	1494V	1494C	1494F	1494R
Description	Variable depth rod operated	Variable depth cable operated	Fixed depth	Variable depth rod operated
Panel Mounting Location	Flange mounted	Flange mounted	Flange mounted	Door mounted
Switch Ratings	30...600 A	30...600 A	30...200 A	30...200 A
Fuse Versions	Fusible & non-fusible	Fusible & non-fusible	Fusible & non-fusible	Fusible & non-fusible
Fuse Accommodations	Class H, J, and R	Class H, J, and R	Class H, J, and R	Class H, J, K, and R
For Use with Enclosure Types	1/3R/4/4X/12	1/3R/4/4X/12	1, 3R, and 12	1 and 12
Safety Feature – Visible Blade Construction	✓	✓	✓	✓
200 kA A.I.C. With Proper Fusing	✓	✓	✓	✓
NFPA 79 Compliant — Handle Always Linked to the Switch	✓	✓	✓	—
Product Selection	Page 1-207	Page 1-210	Page 1-212	Web†

Circuit Breaker Mechanisms

Bulletin	1494V	1494D
Description	Variable Depth Rod Operated	Fixed Depth Rod Operated
Panel Mounting Location	Flange mounted	Flange mounted
Circuit Breaker Frame Size	up to 400 A	150...1200 A
For Use with Circuit Breaker Brands	<ul style="list-style-type: none"> Allen-Bradley (140-U, 140-M) Cutler-Hammer 	<ul style="list-style-type: none"> Allen-Bradley (140-U, 140-M) Cutler-Hammer
For Use with Enclosure Types	1/3R/4/4X/12	1 and 12
Handle always linked to the circuit breaker	✓	✓
Product Selection	Page 1-213	Web†

Safety Disconnect Switches

Bulletin	1494G	1494H	1494HL
Description	Industrial Duty	Heavy Duty	General Duty
Panel Mounting Location	Flange-mounted handle	Side-mounted handle	Side-mounted handle
Switch Ratings	30...600 A @ 600V AC	30...200 A @ 600V AC	30...200 A @ 240V AC
Fuse Versions	Fusible & non-fusible	Fusible & non-fusible	Fusible & non-fusible
Fuse Accommodations	Class H, J, and R	Class H, J, and R	Class H, J, and R
For Use with Enclosure Types	3R/4/12 and 4/4X	1, 3R, and 12	1 and 3R
Safety Feature – Visible Blade Construction	✓	✓	✓
200 kA A.I.C. With Proper Fusing	✓	✓	✓
NFPA 79 Compliant — Handle Always Linked to the Switch	✓	✓	✓
Product Selection	Page 1-216	Page 1-221	Page 1-221

† Information for this product line is available on the Industrial Controls Catalog website: www.ab.com/catalogs.

Variable-Depth Flange-Mounted Disconnect Switches

Product Overview/Cat. No. Explanation



Bul. 1494V
Disconnect Switch — 30...400 A
(Handle & connecting rod
not shown)



Bul. 1494V
Disconnect Switch — 600 A
(Handle & connecting rod
not shown)

Bulletin 1494V — Variable-Depth Flange-Mounted Disconnect Switches

Industrial rated disconnect switch for use in flange constructed enclosures up to 24 in. deep.

- 3 pole, 600V AC rating
- 30...600 A ratings
- Can accommodate Class H, J, and R fuses
- Available in fusible and non-fusible versions
- Complete kits with accessories
- Accessories field installed
- NFPA 79 compliant —
Disconnect switch linked to the handle at all times
- Visible blade construction for safety
- Can be used with enclosure Types 1, 3R, 4, 4X, and 12
- Lockable handle in OFF and ON positions

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Standards Compliance

UL 98
 CSA C22.2 No. 4

Certifications

cULus Listed
 (File No. E47426, Guide No.
 WHTY, WHTY7)

CE Certified

Catalog Number Explanation

The information below is for reference purposes. Not all combinations will produce a valid Cat. No. Refer to the tables on the following pages for product selection.

1494V – DR 233 – A – B – FF

a

b

c

d

a

Disconnect Switch	
Code	Description
1494V	Variable-Depth Flange mounted

b

Fusing	
30...600 A Switch with Right-Hand Mechanism§	
Code	Description
DN	Non-fusible
DH	Class H fuse clips
DJ	Class J fuse clips
DR	Class R fuse clips
30...400 A Switch with Left-Hand Mechanism	
Code	Description
DNX	Non-fusible
DHX	Class H fuse clips
DJX	Class J fuse clips
DRX	Class R fuse clips

c

Switch and Fuse Rating	
Non-Fusible	
Code	Description
30	30 A switch
60	60 A switch
100	100 A switch
200	200 A switch
400	400 A switch
600	600 A switch
Fusible	
233	250V; 30 A switch, 30 A clips
633	600V; 30 A switch, 30 A clips
666	600V; 60 A switch, 60 A clips
611	600V; 100 A switch, 100 A clips
622	600V; 200 A switch, 200 A clips
644	600V; 400 A switch, 400 A clips
606	600V; 600 A switch, 600 A clips

d

Accessories (Field Installed)	
Code	Description
A	Long connecting rod
B	Stainless steel handle
C	Non-metallic handle
D	Standard size line & load lugs‡
D1	Oversized line & load lugs*
E	Protective fuse cover
F	(1) N.O. auxiliary contact*
FF	(2) N.O. auxiliary contacts*
G	(1) N.C. auxiliary contact*
GG	(2) N.C. auxiliary contacts*
H	(1) N.O. and N.C. electrical interlock
HH	(2) N.O. and N.C. electrical interlock

‡ Only available for 60...600 A switches (lugs included with 30 A switch as standard)

* Maximum of (2) auxiliary contacts

* Only available for 200 & 400 A switch

§ 600 A switch convertible to left-hand operation in the field



Variable-Depth Flange-Mounted Disconnect Switches

Product Selection — Fusible and Non-Fusible Kits

Fusible and Non-Fusible Disconnect Switch Kits

- Non-fusible disconnect switch kit includes: switch, connecting rod, and metal handle.
- Fusible disconnect switch kit includes: switch, connecting rod, metal handle, trailer fuse block, and fuse clips.
- Optional kit accessories listed on the following pages can be added to the disconnect switch kits to create (1) cat. no.
Example: **Cat. No. 1494V-DR633-A-B-F.**

Complete Disconnect Switch Kits for Type 1, 3R, 4, and 12 Metal Enclosures

Cont. Current Rating [A] 600V AC 250V DC	UL and CSA Applications Maximum HP					AC 1-Phase		DC*		IEC Applications Maximum kW (AC23)			Fuse Clip Rating [A]		Fuse Class	Switch with Right-Hand Mechanism Cat. No.	Switch with Left-Hand Mechanism Cat. No.
	3-Phase, 60 Hz					115V	230V	125V	250V	3-Phase, 50 Hz			250V	600V			
	115V	200... 208V	230V	460V	575V					220... 240V	380... 440V	500... 600V					
30	3	7.5	7.5	15	20	2	3	3	5	5.5	11	15	—	—	—	1494V-DN30	1494V-DNX30
													30	—	H	1494V-DH233	1494V-DHX233
													30	—	R	1494V-DR233	1494V-DRX233
													—	30	H/J	1494V-DH633	1494V-DHX633
													—	30	R	1494V-DR633	1494V-DRX633
60	7.5	15	15	30	50	3	10	5	10	11	22	37	—	—	—	1494V-DN60	1494V-DNX60
													—	60	H/J	1494V-DH666	1494V-DHX666
													—	60	R	1494V-DR666	1494V-DRX666
100	—	25	30	60	75	—	—	—	20	22	45	55	—	—	—	1494V-DN100	1494V-DNX100
													100	100	H/J	1494V-DH611	1494V-DHX611
													100	100	R	1494V-DR611	1494V-DRX611
200	—	50...60	60	125	150	—	—	—	40	48	90	110	—	—	—	1494V-DN200	1494V-DNX200
													200	200	H/J	1494V-DH622	1494V-DHX622
													200	200	R	1494V-DR622	1494V-DRX622
400	—	75	125	250	350	—	—	—	50	90	185	257	—	—	—	1494V-DN400	1494V-DNX400
													400	400	H/J	1494V-DH644	1494V-DHX644
													400	400	R	1494V-DR644	1494V-DRX644
600	—	150	200	400	500	—	—	—	50	150	295	375	—	—	—	1494V-DN600	1494V-DNX600
													600	600	J	* † 1494V-DJ606	* † 1494V-DJ606

* Ratings based on utilizing two poles in series to break one line of the DC supply voltage and the remaining pole breaking the second DC supply line.

† Class J fuses bolt directly to the switch and trailer fuse block.

‡ Switch can be converted in the field for left-hand operation.

Kit Accessories

Bulletin 1494V Kit Accessories — Field Installed

Description	Suffix Code	Switch Size					
		30 A	60 A	100 A	200 A	400 A	600 A
Longer connecting rod (9-1/2...23 in.)	A	A	A	A	A	A	A
Disconnect handle — Stainless steel	▶ B	A	A	A	A	A	A
Disconnect handle — Non-metallic	▶ C	A	A	A	A	—	—
Standard size wire connecting lugs — Line and load side	D	Included	A	A	A	A	A
Oversize wire connecting lugs — Line and load side	D1	—	—	—	A	A	—
Protective fuse cover with door	E	A	A	A	A	A	A
Auxiliary contact	1 N.O.	F	A	A	A	A	A
	2 N.O.	FF	A	A	A	A	A
	1 N.C.	G	A	A	A	A	A
	2 N.C.	GG	A	A	A	A	A
Electrical interlock (Early break)	1 N.O. & 1 N.C.	H	A	A	A	A	A
	2 N.O. & 2 N.C.	HH	A	A	A	A	A

▶ Metal disconnect handle provided as standard. For stainless steel handle, select suffix code **B**. For non-metallic handle, select suffix code **C**.

Variable-Depth Flange-Mounted Disconnect Switches

Product Selection — Disconnect Switch Components

Disconnect Switches

Continuous Current Rating [A] 600V AC 250V DC	NEMA, UL, CSA Maximum Rating Hp				AC 1-Phase		DC*	IEC Utilization Category AC-23 Maximum Rating kW			Switch with Right-Hand Mechanism	Switch with Left-Hand Mechanism
	3-Phase, 60 Hz							3-Phase, 50 Hz				
	200...208V	230V	460V	575V	115	230	250	220...240V	380...440V	500...600V	Cat. No. Switch Only	Cat. No. Switch Only
30	7.5	7.5	15	20	2	3	5	5.5	11	15	1494V-DS30	1494V-DSX30
60	15	15	30	50	3	10	10	11	22	37	1494V-DS60	1494V-DSX60
100	25	30	60	75	—	—	20	22	45	55	1494V-DS100	1494V-DSX100
200	50...60	60	125	150	—	—	40	48	90	110	1494V-DS200	1494V-DSX200
400	75	125	250	350	—	—	50	90	185	257	1494V-DS400	1494V-DSX400
600	150	200	400	500	—	—	50	150	295	375	1494V-DS600	1494V-DS600

* Ratings based on utilizing two poles in series to break one line of the DC supply voltage and the remaining pole breaking the second DC supply line.

‡ Switch can be converted in the field for left-hand operation.

Connecting Rods

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

Disconnect Switch Size [A]	Enclosure Depth*		Cat. No.
	Minimum	Maximum	
30, 60, 100, 200	6-3/4 (172)	9-1/8 (232)	1494V-RA3
	6-3/4 (172)	21-5/8 (549)	1494V-RA4
400, 600	9-1/2 (241)	10 (254)	▶ 1494V-RB3
	9-1/2 (241)	23 (584)	▶ 1494V-RB4

* Enclosure depth is measured from the top of the flange to the disconnect switch mounting surface (mm).

▶ Kit includes two connecting rods.

Operating Handles

Handle Type	Description	Mounting	Disconnect Switch Size [A]	Cat. No.
Type 1, 3R, 4, 4X, 12	Nonmetallic	Right or Left Flange	30, 60, 100, 200	1494F-P1
Type 1, 3R, 4, 12	Painted Metal	Right or Left Flange	30, 60, 100, 200	1494F-M1
			400, 600	1494F-M2
Type 4, 4X	Stainless Steel	Right or Left Flange	30, 60, 100, 200	1494F-S1
			400, 600	1494F-S2

Trailer Fuse Block Kits

For Class H, J, or R fuses, select the proper fuse clip kit from the table below.

Disconnect Switch Size [A]	Cat. No.
30	1494V-FS30
60	1494V-FS60
100	1494V-FS100
200	❖ 1494V-FS200
400	1494V-FS400
600 — 600 A Class J fuse	1494V-FS600
600 — 400 A Class H, J, and R fuse	1494V-FSV400
600 — 600 A Class H fuse	‡ 1491-N621
600 — 600 A Class R fuse	‡ 1491-R621

❖ When installing 400 A Class J fuses, use adapter kit that bolts to the switch (Cat. No. **1401-N171**). Fuse clips are not required.

‡ Separately mounted fuse blocks (3 required).

Fuse Clip Kits

Includes six clips and mounting hardware.

Fuse Class	Fuse Clip Rating [A]		For Use With	Cat. No.
	250V	600V		
H	30	—	1494C, 1494F, 1494G, 1494M, 1494V Disconnect Switches	1401-N41
	60	30		1401-N42
	—	60		1401-N43
	100	100		1401-N44
	200	200		1401-N45
	400	400		1401-N46
	600	600		§
J	30	30	1494C, 1494F, 1494G, 1494M, 1494V Disconnect Switches	1401-N42
	60	60		1401-N43
	100	100		1401-N44
	200	200		1401-N45
	400	400		1401-N46
R	600	600	1494C, 1494F, 1494G, 1494M, 1494V Disconnect Switches	▲
	30	—		1401-N50
	60	30		1401-N51
	—	60		1401-N52
	100	100		1401-N53
	200	200		1401-N54
	400	400		1401-N55
600	600	§		

▲ Fuse clips not required: fuse bolts directly to terminal.

§ Included with Bulletin 1491 separately mounted fuse blocks.



Cable-Operated Disconnect Switches

Product Overview/Cat. No. Explanation



Bulletin 1494C — Cable-Operated Disconnect Switches

Allen-Bradley Bulletin 1494C cable-operated, flange-mounted disconnect switches that meet industrial requirements for dependable disconnecting means.

- 30...600 A ratings
- Available with 3, 4, 5, 6, and 10 ft cable lengths
- Can accommodate Class H, J, and R fuses
- Precise alignment of the switch with respect to the handle is not required resulting in faster installation
- Complete kits with accessories
- Accessories field installed
- NFPA 79 Compliant — Disconnect switch linked to the handle at all times
- Visible blade construction for safety
- Can be used with enclosure Types 1, 3R, 4, 4X, and 12
- Lockable handle in OFF and ON positions

Table of Contents

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Standards Compliance

UL 98
 CSA C22.2, No. 4

Certifications

cULus Listed (File No. E47426, Guide No. WHTY, WHTY7)

Catalog Number Explanation

The information below is for reference purposes. Not all combinations will produce a valid cat. no. Refer to the tables on the following pages for product selection.

1494C - **DR** **233** - **A4** - **B** - **FF**

a *b* *c* *d*

a

Disconnect Switch	
Code	Description
1494C	Cable operated flange mounted

b

Fusing	
30...600 A Switch with Right-Hand Mechanism	
Code	Description
DN	Non-fusible
DH	Class H fuse clips
DJ	Class J fuse clips
DR	Class R fuse clips
30...600 A Switch with Left-Hand Mechanism	
Code	Description
DNX	Non-fusible
DHX	Class H fuse clips
DJX	Class J fuse clips
DRX	Class R fuse clips

c

Switch and Fuse Rating	
Non-Fusible	
Code	Description
30	30 A switch
60	60 A switch
100	100 A switch
200	200 A switch
400	400 A switch
600	600 A switch
Fusible	
233	250V, 30 A switch 30 A clips
633	600V, 30 A switch 30 A clips
666	600V, 60 A switch 60 A clips
611	250V & 600V, 100 A switch 100 A clips
622	250V & 600V, 200 A switch 200 A clips
644	250V & 600V, 400 A switch 400 A clips
606	600V, 600 A switch 600 A clips

d

Accessories (field installed)	
Code	Description
A3	3 ft. cable*
A4	4 ft. cable
A5	5 ft. cable
A6	6 ft. cable*
A10	10 ft. cable
B	Stainless steel handle
B1	Painted metal handle
D	Standard size line & load lugs*
D1	Oversized line & load lugs§
E	Protective fuse cover
F	(1) N.O. auxiliary contact‡
FF	(2) N.O. auxiliary contacts‡
G	(1) N.C. auxiliary contact‡
GG	(2) N.C. auxiliary contacts‡
H	(1) N.O. and N.C. electrical interlock
HH	(2) N.O. and N.C. electrical interlock

* Only available with 30...100 A switches
 * Only available with 200...600 A switches
 ‡ Maximum of (2) auxiliary contacts
 § Only available for 200 & 400 A switches
 * Only available for 60...600 A switches (lugs included on 30 A switches as standard)

Cable-Operated Disconnect Switches

Product Selection — Fusible and Non-Fusible Kits

Fusible and Non-Fusible Disconnect Switch Kits

- Non-fusible disconnect switch kit includes: switch and non-metallic handle (cable mechanism code must be added to complete the kit).
- Fusible disconnect switch kit includes: switch, non-metallic handle, trailer fuse block, and fuse clips (cable mechanism code must be added to complete the kit).
- Optional kit accessories listed on the following pages can be added to the disconnect switch kits to create (1) cat. no.
Example: **Cat. No. 1494C-DR633-A3-F**.

Complete Disconnect Switch Kits for Type 1, 3R, 4, and 12 Metal Enclosures

Cont. Current Rating [A] 600V AC 250V DC	UL and CSA Applications Maximum HP					AC 1-Phase		DC*		IEC Applications Maximum kW (AC23)			Fuse Clip Rating [A]		Fuse Class	Switch with Right-Hand Mechanism Cat. No.*	Switch with Left-Hand Mechanism Cat. No.*
	3-Phase, 60 Hz					115V	230V	125V	250V	3-Phase, 50 Hz			250V	600V			
	115V	200...208V	230V	460V	575V					220...240V	380...440V	500...600V					
30	3	7.5	7.5	15	20	2	3	3	5	5.5	11	15	—	—	—	1494C-DN30	1494C-DNX30
													30	—	H	1494C-DH233	1494C-DHX233
													30	—	R	1494C-DR233	1494C-DRX233
													—	30	H/J	1494C-DH633	1494C-DHX633
60	7.5	15	15	30	50	3	10	5	10	11	22	37	—	—	—	1494C-DN60	1494C-DNX60
													—	60	H/J	1494C-DH666	1494C-DHX666
													—	60	R	1494C-DR666	1494C-DRX666
100	—	25	30	60	75	—	—	—	20	22	45	55	—	—	—	1494C-DN100	1494C-DNX100
													100	100	H/J	1494C-DH611	1494C-DHX611
													100	100	R	1494C-DR611	1494C-DRX611
200	—	50...60	60	125	150	—	—	—	40	48	90	110	—	—	—	1494C-DN200	1494C-DNX200
													200	200	H/J	1494C-DH622	1494C-DHX622
													200	200	R	1494C-DR622	1494C-DRX622
400	—	75	125	250	300	—	—	—	50	90	185	259	—	200	—	1494C-DN400	1494C-DNX400
													400	400	H/J	1494C-DH644	1494C-DHX644
													400	400	R	1494C-DR644	1494C-DRX644
600	—	150	200	400	500	—	—	—	50	150	295	375	—	—	—	1494C-DN600	1494C-DNX600
													600	600	J	1494C-DJ606	1494C-DJX606

* The catalog number is incomplete until you select the cable mechanism code from Cable Mechanism Code table.
 * Ratings based on utilizing two poles in series to break one line of the DC supply voltage and the remaining pole breaking the second DC line.

Cable Mechanism Code

Select the desired cable length to complete the catalog number.

Example: **Cat. No. 1494C-DH633** with a 4 ft cable becomes **Cat. No. 1494C-DH633-A4**.

Bulletin 1494C Cable Mechanism Code	
Description	Suffix Code
3 ft cable	§ A3
4 ft cable	A4
5 ft cable	A5
6 ft cable	♣ A6
10 ft cable	A10

§ Only available with 30...100 A switches.
 ♣ Only available with 200...600 A switches.

Kit Accessories

Example: **Cat. No. 1494C-DH233-A4-D-E** is a 30 A fusible disconnect switch with 4 ft cable, non-metallic handle, line and load lugs, and fuse cover.

Bulletin 1494V Kit Accessories — Field Installed

Description	Suffix Code	Switch Size					
		30 A	60 A	100 A	200 A	400 A	600 A
Disconnect handle — Stainless steel	➤ B	A	A	A	A	A	A
Disconnect handle — Metal	➤ B1	A	A	A	A	—	—
Standard size wire connecting lugs — Line and load side	D	Included	A	A	A	A	A
Oversize wire connecting lugs — Line and load side	D1	—	—	—	A	A	—
Protective fuse cover with door	E	A	A	A	A	A	A
Auxiliary contact	1 N.O.	F	A	A	A	A	A
	2 N.O.	FF	A	A	A	A	A
	1 N.C.	G	A	A	A	A	A
	2 N.C.	GG	A	A	A	A	A
Electrical interlock (Early break)	1 N.O. & 1 N.C.	H	A	A	A	A	A
	2 N.O. & 2 N.C.	HH	A	A	A	A	A

➤ Non-metallic handle provided as standard on the 30...200 A switches. The painted metal handle is provided as standard on the 400...600 A switches; no non-metallic handle is available for these sizes. For stainless steel handle, select suffix code B. For metal handle, select suffix code B1.



Cable-Operated Disconnect Switches

Product Selection — Disconnect Switch Components

Disconnect Switches

Cont. Current Rating* [A] 600V AC 250V DC	NEMA, UL, CSA Maximum Rating Hp				AC 1-Phase		DC*	IEC Utilization Category AC-23 Maximum Rating kW			Switch for Right-Hand Mechanism	Switch for Left-Hand Mechanism
	3-Phase, 60 Hz				115	230		3-Phase, 50 Hz			Cat. No. Switch Only	Cat. No. Switch Only
	200...208V	230V	460V	575V			220...240V	380...440V	500...600V			
30	7.5	7.5	15	20	2	3	5	5.5	11	15	1494F-D30	1494F-DX30
60	15	15	30	50	3	10	10	11	22	37	1494F-D60	1494F-DX60
100	25	30	60	75	—	—	20	22	45	55	1494F-D100	1494F-DX100
200	50...60	60	125	150	—	—	40	48	90	110	1494F-D200	1494F-DX200
400	75	125	250	350	—	—	50	90	185	257	1494F-D400	1494F-DX400
600	150	200	400	500	—	—	50	150	295	375	1494V-DS600 ‡	1494V-DS600

* Also rated operational current for utilization categories AC-20 and AC-21 (IEC 408).

‡ Ratings based on utilizing two poles in series to break one line of the DC supply voltage and the remaining pole breaking the second DC supply line.

‡ Switch can be converted in the field for left-hand operation.

Cable Mechanisms

Disconnect Switch Size [A]	Cable Length [ft]	Right-Hand Cable Mechanisms	Left-Hand Cable Mechanisms
		Cat. No.	Cat. No.
30, 60, 100	3	1494C-CM1	1494C-CMX1
	4	1494C-CM2	1494C-CMX2
	5	1494C-CM3	1494C-CMX3
	10	1494C-CM4	1494C-CMX4
200	4	1494C-CM5	1494C-CMX5
	5	1494C-CM6	1494C-CMX6
	6	1494C-CM7	1494C-CMX7
	10	1494C-CM8	1494C-CMX8
400	4	1494C-CM9	1494C-CMX9
	5	1494C-CM10	1494C-CMX10
	6	1494C-CM11	1494C-CMX11
	10	1494C-CM12	1494C-CMX12
600	4	1494C-CM13	1494C-CMX13
	5	1494C-CM14	1494C-CMX14
	6	1494C-CM15	1494C-CMX15
	10	1494C-CM16	1494C-CMX16

Operating Handles

Handle Type	Description	Mounting	Disconnect Switch Size [A]	Cat. No.
Type 1, 3R, 4, 4X, 12	Nonmetallic	Right or Left Flange	30, 60, 100, 200	1494F-P1
Type 1, 3R, 4, 12	Painted Metal	Right or Left Flange	30, 60, 100, 200	1494F-M1
			400, 600	1494F-M2
Type 4, 4X	Stainless Steel	Right or Left Flange	30, 60, 100, 200	1494F-S1
			400, 600	1494F-S2

Trailer Fuse Block Kits

For Class H, J, or R fuses, select the proper fuse clip kit from the table below.

Disconnect Switch Size [A]	Cat. No.
30	1494V-FS30
60	1494V-FS60
100	1494V-FS100
200	‡ 1494V-FS200
400	1494V-FS400
600 — 600 A Class J fuse	1494V-FS600
600 — 400 A Class H, J, and R fuse	1494V-FSV400
600 — 600 A Class H fuse	‡ 1491-N621
600 — 600 A Class R fuse	‡ 1491-R621

‡ When installing 400 A Class J fuses, use adapter kit that bolts to the switch (**Cat. No. 1401-N171**). Fuse clips are not required.

‡ Separately mounted fuse blocks (3 required).

Fuse Clip Kits

Includes six clips and mounting hardware.

Fuse Class	Fuse Clip Rating [A]		For Use With	Cat. No.
	250V	600V		
H	30	—	1494C, 1494F, 1494G, 1494M, 1494V Disconnect Switches	1401-N41
	60	30		1401-N42
	—	60		1401-N43
	100	100		1401-N44
	200	200		1401-N45
	400	400		1401-N46
J	600	600		▶
	30	30		1401-N42
	60	60		1401-N43
	100	100		1401-N44
	200	200		1401-N45
	400	400		1401-N46
R	600	600		▲
	30	—		1401-N50
	60	30		1401-N51
	—	60		1401-N52
	100	100		1401-N53
	200	200		1401-N54
	400	400		1401-N55
600	600		▶	

▲ Fuse clips not required: fuse bolts directly to terminal.

▶ Included with Bulletin 1491 separately mounted fuse blocks.

Fixed-Depth Flange-Mounted Disconnect Switches

Product Overview/Product Selection

1



Cat. No. 1494F-N30
Disconnect Switch with Cat. No. 1494F-F30 Fuse Block Adapter Plate and Operating Mechanism

Bulletin 1494F — Fixed-Depth Flange-Mounted Disconnect Switches

Industrial rated disconnects. Pre-assembled switch, mechanism, and handle on a mounting bracket for use in flange constructed enclosures.

- 3-pole, 600V AC rating
- 30, 60, 100, and 200 A ratings
- Same switch used for fusible and non-fusible applications
- Few catalog numbers to choose from, that accommodate a wide range of fuse clip types (Class H, J, and R)
- Accessories field installed
- NFPA 79 Compliant — Disconnect switch linked to the handle at all times
- Visible blade construction for safety
- Right-hand flange operation
- Standard painted metal handle for Type 1, 3R, and 12, environments
- Lockable handle

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Standards Compliance

UL 98
CSA C22.2, No. 4

Certifications

UL Listed (File No. E47426, Guide No. WHTY)
CSA Certified (File No. LR1234)
CE Certified

Disconnect Switches

Choose a disconnect switch catalog number plus any additional accessories from the fuse clip kit and fuse block adapter plate kit tables.

Disconnect Switches for Type 1, 3R, and 12 Enclosures

Continuous Current Rating [A] 600V AC 250V DC	UL and CSA Applications Maximum Hp				AC 1-Phase		DC*	IEC Applications Maximum kW (AC23)			Fusible or Non-Fusible Switch Cat. No.
	3-Phase, 60 Hz							3-Phase, 50 Hz			
	200... 208V	230V	460V	575V	115V	230V	250V	220... 240V	380... 440V	500... 600V	
30	7.5	7.5	15	20	2	3	5	5.5	11	15	1494F-N30
60	15	15	30	50	3	10	10	11	22	30	1494F-N60
100	25	30	60	75	—	15	20	22	45	55	1494F-N100
200	50...60	60	125	150	—	—	40	45	75	75	1494F-N200

* Ratings based on utilizing two poles in series to break one line of the DC supply voltage and the remaining pole breaking the second DC supply line.

Fuse Clip Kit and Fuse Block Adapter Plate Kit

Select both a fuse clip kit and a fuse block adapter plate.

Switch Rating [A]	Fuse Clip Rating [A]	 Fuse Clip Kit				
		Class R		Class J	Class H	
		250V	600V	250/600V	250V	600V
		Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
30	30	1401-N50	1401-N51	1401-N42	1401-N41	1401-N42
	60	1401-N51	1401-N52	1401-N43	1401-N42	1401-N43
60	30	1401-N50	1401-N51	1401-N42	1401-N41	1401-N42
	60	1401-N51	1401-N52	1401-N43	1401-N42	1401-N43
100	100	1401-N53	1401-N53	1401-N44	1401-N44	1401-N44
	60	1401-N51	1401-N52	1401-N43	1401-N42	1401-N43
200	100	1401-N53	1401-N53	1401-N44	1401-N44	1401-N44
	200	1401-N54	1401-N54	1401-N45	1401-N45	1401-N45
400	100	1401-N53	1401-N53	1401-N44	1401-N44	1401-N44
	200	1401-N54	1401-N54	1401-N45	1401-N45	1401-N45
	400	—	—	1401-N171	—	—

+

 Fuse Block Adapter Plate Kit Cat. No.
1494F-F30
1494F-F60
1494F-F100
1494F-F200



Variable-Depth Flange-Mounted Circuit Breakers

Product Overview/Product Selection — Circuit Breaker Kits

1



**Cat. No. 1494V-C150
Circuit Breaker Kit
(Shown without handle
and connecting rod)**

Bulletin 1494V — Variable-Depth Flange-Mounted Circuit Breaker Operating Mechanism

Circuit breaker operating mechanisms for use with Allen-Bradley and Cutler-Hammer circuit breakers in enclosures up to 24 in. deep.

- 3-pole, 600V AC rating
- 150, 250, and 400 A circuit breaker frame sizes
- Complete kits with accessories
- Accessories — Field installed
- Can be used with enclosure Types 1, 3R, 4, 4X, and 12
- Can be field installed on a right-flanged or left-flanged enclosure
- Lockable handle

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CSA C22.2, No. 14	
Certifications	
UL Recognized (File No. E3125, Guide No. NLDX2)	
CSA Certified (File No. LR1234)	

Circuit Breaker Kits

Optional accessories listed below can be added to the circuit breaker kits to create (1) cat. no. Example: **Cat. No. 1494V-C150-A-B-F**

Circuit Breaker Kits include:

- Connecting rod
- Metal handle
- Circuit breaker operating mechanism (circuit breaker to be supplied by customer)

3-Pole Circuit Breaker			Operating Mechanism
Brand	Frame Size [A]	Frame Designation	Cat. No.
Allen-Bradley Cutler-Hammer	125 125	140U-H (MCCB), 140M-H (MPCB + MCP) EG, HMCPE	1494V-C125
Allen-Bradley Cutler-Hammer	150 150	140M-I (MPCB + MCP), 140U-I (MCCB) EHD, FD, FDB, FDC, HFD, HMCP	1494V-C150
Allen-Bradley Cutler-Hammer	250 250	140U-J (MCCB), 140M-J (MPCB + MCP) JG	1494V-C251
Cutler-Hammer	250	JD, JDB, JDC, HJD, HMCP	1494V-C250
Allen-Bradley Cutler-Hammer	400 400	140U-K (MCCB), 140M-K (MPCB + MCP) KD, KDB, KDC, HKD, HMCP	1494V-C400

Kit Accessories

Bulletin 1494V Kit Accessories — Field Installed

Description	Suffix Code	Circuit Breaker Frame Size [A]			
		125	150	250	400
Longer Connecting Rod (9-1/8...21-5/8 in.)	A	A	A	A	A
Disconnect Handle — Stainless Steel	B*	A	A	A	A
Disconnect Handle — Non-Metallic	C*	A	A	A	A
Auxiliary Contact — includes adapter kit	1 N.O.	A	A	A	A
	2 N.O.	A	A	A	A
	1 N.C.	A	A	A	A
	2 N.C.	A	A	A	A

* Metal handle provided as standard. For stainless steel handle, select suffix code **B**. For non-metallic handle, select suffix code **C**.

Variable-Depth Flange-Mounted Circuit Breakers

Product Selection — Circuit Breaker Components

Components

Circuit Breaker Operating Mechanism

The mechanism listed must be combined with a connecting rod, operating handle, and a circuit breaker (supplied by customer) to obtain a functional device.

3-Pole Circuit Breaker*			Operating Mechanism
Brand	Frame Size [A]	Frame Designation	Cat. No.
Allen-Bradley Cutler-Hammer	125 125	140U-H (MCCB), 140M-H (MPCB + MCP) EG, HMCPE	1494V-M41
Allen-Bradley Cutler-Hammer	150 150	140U-I (MCCB) EHD, FD, FDB, FDC, HFD, HMCP, 140M-I (MPCB + MCP)	1494V-M40
Allen-Bradley Cutler-Hammer	250 250	140U-J (MCCB), 140M-J (MPCB + MCP) JG	1494V-M51
Cutler-Hammer	250	JD, JDB, JDC, HJD, HMCP	1494V-M50
Allen-Bradley Cutler-Hammer	400 400	140U-K (MCCB), 140M-K (MPCB + MCP) KD, KDB, KDC, HKD, HMCP	1494V-M60
Allen-Bradley	600	140U-L (MCCB, MPCB, MCP)	

* Circuit breakers to be provided by customer.

Connecting Rods

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

Circuit Breaker Frame Size [A]	Enclosure Depth		Cat. No.
	Minimum	Maximum	
125, 150, 250, 400	6-3/4 (172)	9-1/8 (232)	1494V-RA3
	6-3/4 (172)	21-5/8 (549)	1494V-RA4

Operating Handle

Handle Type	Description	Mounting	Circuit Breaker Frame Size [A]	Operating Handle
				Cat. No.
Type 1, 3R, 4, 4X, 12	Nonmetallic	Right or Left Flange	125, 150, 250, 400	1494F-P1
Type 1, 3R, 4, 12	Painted Metal	Right or Left Flange	125, 150, 250, 400	1494F-M1
Type 4, 4X	Stainless Steel	Right or Left Flange	125, 150, 250, 400	1494F-S1

Catalog Number Explanation

1494G – B F 3 J 6 – 98 – 203W – 414
a b c d e f g

a

Bulletin Number	
Code	Description
1494G	Enclosed disconnect safety switch in standard-size enclosure (30...600 A)
1494GY	Enclosed disconnect safety switch in large-size enclosure (30...200 A)
1494GX	Enclosed disconnect safety switch in extra large-size enclosure (30...100 A)

b

Switch Ratings [A]	
Code	Description
B	30
C	60
D	100
E	200
F	400
G	600

c

Enclosure Type	
Code	Description
F	Type 3R/4/12: Rainproof, watertight, dusttight, painted metal enclosure with screw fasteners and non-metallic handle
C	Type 4/4X: Watertight, corrosion-resistant, stainless steel enclosure with screw fasteners and non-metallic handle
K	Type 12: Hazardous location (Class II, Division 2, Group F+G and Class III Division 1 and 2) painted metal enclosure with screw fasteners and non-metallic handle

d

Poles	
Code	Description
2	2-pole, 1-phase
3	3-pole, 3-phase
6	6-pole, 3-phase

e

Fusing	
Code	Description
N	Non-fusible
H	Class H fuse clips
J	Class J fuse clips
R	Class R fuse clips

f

Fuse Voltage	
Code	Description
Blank	Non-fusible
2	240V AC/250V DC
6	600V AC/600V DC

g

Options (Factory Installed)	
Code	Description
1S	Momentary push button* (Flange-mounted)
1SB	Momentary push button* (Bottom-mounted)
3	3-position selector switch*
3E	2-position selector switch*
3EI	2-position selector switch* (Illuminated)
3S	3-position selector switch* (Spring return)
4	Pilot light**
5	Push-to-test pilot light**
98	N.O. auxiliary - disconnect‡
99	N.C. auxiliary - disconnect‡
203W	Viewing window
412	Painted metal handle
413	Stainless steel handle
414	Protective fuse cover
420	1 N.O. and 1 N.C. interlock
421	2 N.O. and 2 N.C. interlocks

* Specify lens color by adding one of the following letters: **R** = Red, **A** = Amber, **B** = Blue, **G** = Green.
 * 3-pole enclosed switches can accommodate (1) pilot device, 6-pole enclosed switches can accommodate (5) pilot devices.
 ‡ Maximum of (2) auxiliary contacts.



Industrial Safety Disconnect Switches

Product Overview/Product Selection — Fusible Type

1



Cat. No. 1494G-BF3H2
Enclosed Disconnect Switch

Bulletin 1494G/1494GX/1494GY — Fusible, 240V

- 30...600 A switch ratings
- 240V: 2-pole, 1 ϕ and 3-pole, 3 ϕ Versions
- Can accommodate Class H, R, and J fuses
- Type 3R/4/12 (painted metal), Type 4/4X (stainless steel), and Type 4/4X (non-metallic) enclosures
- 30...100 A switch ratings in extra-capacity enclosures
- 30...100 A switch ratings for 6-pole, 3-phase applications
- Disconnect switch linked to the handle at all times
- Visible blade construction for safety
- Non-metallic handle — standard (30...200 A)
- Metal or stainless steel handle — optional
- Lockable handle
- Options — factory installed
- Accessories — field installed

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 UL 508
 CSA C22.2, No. 4

Certifications

cULus Listed (File No. E227497, Guide No. WIAX)

240V, Fusible with Class H Fuse Clips, (2-pole, 1-phase/3-pole, 3-phase), standard size enclosure*

Continuous Current Rating [A] 600V AC 250V DC	Horsepower				250V DC	Type 3R/4/12* Painted Metal		Type 4/4X Stainless Steel	
	240V AC, 1-Phase		240V AC, 3-Phase			2-Pole, 1-Phase	3-Pole, 3-Phase	2-Pole, 1-Phase	3-Pole, 3-Phase
	Std.	Max.	Std.	Max.		Cat. No.	Cat. No.	Cat. No.	Cat. No.
30	1.5	3	3	7.5	5	1494G-BF2H2	1494G-BF3H2	1494G-BC2H2	1494G-BC3H2
60	3	10	7.5	15	10	1494G-CF2H2	1494G-CF3H2	1494G-CC2H2	1494G-CC3H2
100	7.5	15	15	30	20	1494G-DF2H2	1494G-DF3H2	1494G-DC2H2	1494G-DC3H2
200	15	15	25	60	40	1494G-EF2H2	1494G-EF3H2	1494G-EC2H2	1494G-EC3H2
400	—	—	50	125	50	—	1494G-FF3H2	—	1494G-FC3H2
600	—	—	75	200	50	—	1494G-GF3H2	—	1494G-GC3H2

240V, Fusible with Class H Fuse Clips, (2-pole, 1-phase/3-pole, 3-phase), extra large size enclosure*

Continuous Current Rating [A] 600V AC 250V DC	Horsepower				250V DC	Type 3R/4/12* Painted Metal		Type 4/4X Stainless Steel	
	240V AC, 1-Phase		240V AC, 3-Phase			2-Pole, 1-Phase	3-Pole, 3-Phase	2-Pole, 1-Phase	3-Pole, 3-Phase
	Std.	Max.	Std.	Max.		Cat. No.	Cat. No.	Cat. No.	Cat. No.
30	1.5	3	3	7.5	5	1494GX-BF2H2	1494GX-BF3H2	1494GX-BC2H2	1494GX-BC3H2
60	3	10	7.5	15	10	1494GX-CF2H2	1494GX-CF3H2	1494GX-CC2H2	1494GX-CC3H2
100	7.5	15	15	30	20	1494GX-DF2H2	1494GX-DF3H2	1494GX-DC2H2	1494GX-DC3H2

240V, Fusible with Class H Fuse Clips, (2-pole, 1-phase/3-pole, 3-phase), large size enclosure*

Continuous Current Rating [A] 600V AC 250V DC	Horsepower				250V DC	Type 3R/4/12* Painted Metal		Type 4/4X Stainless Steel	
	240V AC, 1-Phase		240V AC, 3-Phase			2-Pole, 1-Phase	3-Pole, 3-Phase	2-Pole, 1-Phase	3-Pole, 3-Phase
	Std.	Max.	Std.	Max.		Cat. No.	Cat. No.	Cat. No.	Cat. No.
30	1.5	3	3	7.5	5	1494GY-BF2H2	1494GY-BF3H2	1494GY-BC2H2	1494GY-BC3H2
60	3	10	7.5	15	10	1494GY-CF2H2	1494GY-CF3H2	1494GY-CC2H2	1494GY-CC3H2
100	7.5	15	15	30	20	1494GY-DF2H2	1494GY-DF3H2	—	—
200	15	15	25	60	40	1494GY-EF2H2	1494GY-EF3H2	—	—

240V, Fusible with Class H Fuse Clips, (6-pole, 3-phase), standard size enclosure*

Continuous Current Rating [A] 600V AC 250V DC	Horsepower		Type 3R/4/12 Painted Metal		Type 4/4X Stainless Steel
	240V AC, 3-Phase		6-pole, 3-Phase*		6-pole, 3-Phase
	Std.	Max.	Cat. No.		Cat. No.
30	3	7.5	1494G-BF6H2		1494G-BC6H2
60	7.5	15	1494G-CF6H2		1494G-CC6H2
100	15	30	1494G-DF6H2		1494G-DC6H2

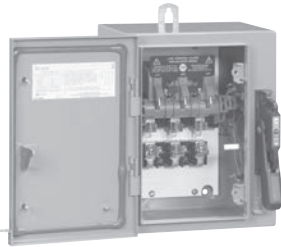
* Class R and J fuse clips can be supplied as a factory option in place of Class H clips. To order Class R fuse clips, replace **H** from the cat. no. with **R**. Example: **Cat. No. 1494G-BF2H2** becomes **1494G-BF2R2**. To order Class J fuse clips, replace **H** from the cat. no. with **J**. Example: **Cat. No. 1494G-BF2H2** becomes **1494G-BF2J2**. The same applies to Bul. 1494GX and 1494GY.

* Type 12 hazardous location enclosure (Class II, Division 2, Group F+G and Class III, Divisions 1 and 2) can be supplied by replacing the **F** in the listed cat. no. with the letter **K**. Example: **Cat. No. 1494G-BK3H2**.



Industrial Safety Disconnect Switches

Product Overview/Product Selection — Fusible Type



Cat. No. 1494G-BF3J6
Enclosed Disconnect Switch

Bulletin 1494G/1494GX/1494GY — Fusible, 600V

- 30...600 A switch ratings
- 600V: 3-pole, 3-phase and 6-pole, 3-phase versions
- Can accommodate Class H, R, and J fuses
- Type 3R/4/12 (painted metal), Type 4/4X (stainless steel), and Type 4/4X (non-metallic) enclosures
- 30...100 A switch ratings in extra-capacity enclosures
- 30...100 A switch ratings for 6-pole 3-phase applications
- Disconnect switch linked to the handle at all times
- Visible blade construction for safety
- Non-metallic handle — standard (30...200 A)
- Metal or stainless steel handle — optional
- Lockable handle
- Options — factory installed
- Accessories — field installed

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Standards Compliance

UL 98
 UL 508
 CSA C22.2, No. 4

Certifications

cULus Listed (File No. E227497, Guide No. WIAX)



600V, Fusible with Class H Fuse Clips, (3-pole, 3-phase), standard size enclosure*

Continuous Current Rating [A] 600V AC 250V DC	Horsepower					Type 3R/4/12* Painted Metal	Type 4/4X Stainless Steel
	480V AC		600V AC		250V DC	3-Pole, 3-Phase Cat. No.	3-Pole, 3-Phase Cat. No.
	Std.	Max.	Std.	Max.			
30	5	15	7.5	20	5	1494G-BF3H6	1494G-BC3H6
60	15	30	15	50	10	1494G-CF3H6	1494G-CC3H6
100	25	60	30	75	20	1494G-DF3H6	1494G-DC3H6
200	50	125	60	150	40	1494G-EF3H6	1494G-EC3H6
400	100	250	125	350	50	1494G-FF3H6	1494G-FC3H6
600	150	400	200	500	50	1494G-GF3H6	1494G-GC3H6

600V, Fusible with Class H Fuse Clips, (3-pole, 3-phase), extra large size enclosure*

Continuous Current Rating [A] 600V AC 250V DC	Horsepower					Type 3R/4/12* Painted Metal	Type 4/4X Stainless Steel
	480V AC		600V AC		250V DC	3-Pole, 3-Phase Cat. No.	3-Pole, 3-Phase Cat. No.
	Std.	Max.	Std.	Max.			
30	5	15	7.5	20	5	1494GX-BF3H6	1494GX-BC3H6
60	15	30	15	50	10	1494GX-CF3H6	1494GX-CC3H6
100	25	60	30	75	20	1494GX-DF3H6	1494GX-DC3H6

600V, Fusible with Class H Fuse Clips, (3-pole, 3-phase), large size enclosure*

Continuous Current Rating [A] 600V AC 250V DC	Horsepower					Type 3R/4/12* Painted Metal	Type 4/4X Stainless Steel
	480V AC		600V AC		250V DC	3-Pole, 3-Phase Cat. No.	3-Pole, 3-Phase Cat. No.
	Std.	Max.	Std.	Max.			
30	5	15	7.5	20	5	1494GY-BF3H6	1494GY-BC3H6
60	15	30	15	50	10	1494GY-CF3H6	1494GY-CC3H6
100	25	60	30	75	20	1494GY-DF3H6	—
200	50	125	60	150	40	1494GY-EF3H6	—

600V, Fusible with Class H Fuse Clips, (6-pole, 3-phase), standard size enclosure*

Continuous Current Rating [A] 600V AC 250V DC	Horsepower					Type 3R/4/12* Painted Metal	Type 4/4X Stainless Steel
	480V AC		600V AC		250V DC	6-Pole, 3-Phase Cat. No.	6-Pole, 3-Phase Cat. No.
	Std.	Max.	Std.	Max.			
30	5	15	7.5	20	5	1494G-BF6J6	1494G-BC6J6
60	15	30	15	50	10	1494G-CF6J6	1494G-CC6J6
100	25	60	30	75	20	1494G-DF6J6	1494G-DC6J6

* Class R and J fuse clips can be supplied as a factory option in place of Class H clips. To order Class R fuse clips, replace **H** from the cat. no. with **R**. Example: **Cat. No. 1494G-BF3H6** becomes **1494G-BF3R6**. To order Class J fuse clips, replace **H** from the cat. no. with **J**. Example: **Cat. No. 1494G-BF3H6** becomes **1494G-BF3J6**. The same applies to Bul. 1494GX and 1494GY.

* Type 12 hazardous location enclosure (Class II, Division 2, Group F+G and Class III, Divisions 1 and 2) can be supplied by replacing the **F** in the listed cat. no. with the letter **K**. Example: **Cat. No. 1494G-BK3H2**.

Industrial Safety Disconnect Switches

Product Overview/Product Selection — Non-Fusible Type

1



Cat. No. 1494GX-BF3N
Enclosed Disconnect Switch

Bulletin 1494G/1494GX/1494GY — Non-Fusible

- 30...600 A switch ratings
- 600V: 3-pole, 3-phase and 6-pole, 3-phase versions
- Non-fusible versions only
- Type 3R/4/12 (painted metal), Type 4/4X (stainless steel), and Type 4/4X (non-metallic) enclosures
- 30...100 A switch ratings in extra-capacity enclosures
- 30...100 A switch ratings for 6-pole 3-phase applications
- Disconnect switch linked to the handle at all times
- Visible blade construction for safety
- Non-metallic handle — standard (30...200 A)
- Metal or stainless steel handle — optional
- Lockable handle
- Options — factory installed
- Accessories — field installed

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Standards Compliance

UL 98
 UL 508
 CSA C22.2, No. 4

Certifications

cULus Listed (File No. E227497, Guide No. WIAX)

600V, Non-Fusible, (3-pole, 3-phase), standard size enclosure

Continuous Current Rating [A] 600V AC 250V DC	Horsepower					Type 3R/4/12* Painted Metal	Type 4/4X Stainless Steel
	480V AC		600V AC		250V DC	3-Pole, 3-Phase	3-Pole, 3-Phase
	Std.	Max.	Std.	Max.			
30	5	20	7.5	30	5	1494G-BF3N	1494G-BC3N
60	15	50	15	60	10	1494G-CF3N	1494G-CC3N
100	25	60	30	75	20	1494G-DF3N	1494G-DC3N
200	50	125	60	150	40	1494G-EF3N	1494G-EC3N
400	100	250	125	350	50	1494G-FF3N	1494G-FC3N
600	150	400	200	500	50	1494G-GF3N	1494G-GC3N

600V, Non-Fusible, (3-pole, 3-phase), extra large size enclosure

Continuous Current Rating [A] 600V AC 250V DC	Horsepower					Type 3R/4/12* Painted Metal	Type 4/4X Stainless Steel
	480V AC		600V AC		250V DC	3-Pole, 3-Phase	3-Pole, 3-Phase
	Std.	Max.	Std.	Max.			
30	5	20	7.5	30	5	1494GX-BF3N	1494GX-BC3N
60	15	50	15	60	10	1494GX-CF3N	1494GX-CC3N
100	25	60	30	75	20	1494GX-DF3N	1494GX-DC3N

600V, Non-Fusible, (3-pole, 3-phase), large size enclosure

Continuous Current Rating [A] 600V AC 250V DC	Horsepower					Type 3R/4/12* Painted Metal	Type 4/4X Stainless Steel
	480V AC		600V AC		250V DC	3-Pole, 3-Phase	3-Pole, 3-Phase
	Std.	Max.	Std.	Max.			
30	5	20	7.5	30	5	1494GY-BF3N	1494GY-BC3N
60	15	50	15	60	10	1494GY-CF3N	1494GY-CC3N
100	25	60	30	75	20	1494GY-DF3N	—
200	50	125	60	150	40	1494GY-EF3N	—

600V, Non-Fusible, (6-pole, 3-phase), standard size enclosure

Continuous Current Rating [A] 600V AC 250V DC	Horsepower					Type 3R/4/12* Painted Metal	Type 4/4X Stainless Steel
	480V AC		600V AC		250V DC	6-Pole, 3-Phase	6-Pole, 3-Phase
	Std.	Max.	Std.	Max.			
30	5	15	7.5	20	5	1494G-BF6N	1494G-BC6N
60	15	30	15	50	10	1494G-CF6N	1494G-CC6N
100	25	60	30	75	20	1494G-DF6N	1494G-DC6N

* Type 12 hazardous location enclosure (Class II, Division 2, Group F+G and Class III, Divisions 1 and 2) can be supplied by replacing the F in the listed cat. no. with the letter K. Example: **Cat. No. 1494G-BK3N**.



Bulletin 1494G/1494GX/1494GY Modifications — Factory-Installed

Description	Enclosure Type	Suffix Code	Switch Rating [A]					
			30	60	100	200	400	600
Momentary Push Button (1 N.O.) (located on enclosure flange)	3R/4/12 painted metal, 4/4X stainless steel	-1S*	A	A	A	A	A	A
Momentary Push Button (located on bottom of enclosure)	3R/4/12 painted metal, 4/4X stainless steel	-1SB*	A	A	A	A	A	A
HAND-OFF-AUTO Selector Switch	3R/4/12 painted metal, 4/4X stainless steel	-3*	A	A	A	A	A	A
3-position Selector Switch	3R/4/12 painted metal, 4/4X stainless steel	-3S*	A	A	A	A	A	A
2-position Selector Switch	3R/4/12 painted metal, 4/4X stainless steel	-3E*	A	A	A	A	A	A
2-position Illuminated Selector Switch	3R/4/12 painted metal, 4/4X stainless steel	-3EI*	A	A	A	A	A	A
Pilot Light	3R/4/12 painted metal, 4/4X stainless steel	⊛ -4*	A	A	A	A	A	A
Push-to-test Pilot Light	3R/4/12 painted metal, 4/4X stainless steel	⊛ -5*	A	A	A	A	A	A
Auxiliary Contact (1 N.O.)	3R/4/12 painted metal, 4/4X stainless steel, 4/4X non-metallic	‡ -98	A	A	A	A	A	A
Auxiliary Contact (1 N.C.)	3R/4/12 painted metal, 4/4X stainless steel, 4/4X non-metallic	‡ -99	A	A	A	A	A	A
Enclosure Door Viewing Window	3R/4/12 painted metal, 4/4X stainless steel	-203W	A	A	A	A	A	A
Painted Metal Handle	3R/4/12 painted metal	§ -412	A	A	A	A	S	S
Stainless Steel Handle	4/4X stainless steel	§ -413	A	A	A	A	A	A
Protective Fuse Cover with Door (transparent)	3R/4/12 painted metal, 4/4X stainless steel	-414	A	A	A	A	A	A
Electrical Interlock - Early Break (1 N.O. and 1 N.C.)	3R/4/12 painted metal, 4/4X stainless steel	-420	A	A	A	A	A	A
Electrical Interlock - Early Break (2 N.O. and 2 N.C.)	3R/4/12 painted metal, 4/4X stainless steel	-421	A	A	A	A	A	A
Protective Line Side Cover (transparent)	3R/4/12 painted metal, 4/4X stainless steel	-422	A	A	A	A	A	A

A = Available Option
S = Standard

* Specify lens color by adding one of the following letters: **R** = Red, **G** = Green, **A** = Amber, **B** = Blue

⊛ 3 pole enclosed switches can accommodate (1) pilot device, 6 pole enclosed switches can accommodate (5) pilot devices.

‡ Maximum of (2) auxiliary contacts.

§ Non-metallic handle provided as standard (30...200 A). For painted metal handle, select suffix code **-412**. For stainless steel handle, select suffix code **-413**.



Safety Disconnect Switches — Hazardous Locations

Product Overview/Product Selection

1



Bulletin 1494G Safety Switch — Hazardous Locations

- 100 A switch rating for use in 30, 60, and 100 A applications
- Type 3R, 7 & 9 bolted enclosure with breather and drain
- For use in Class I, Div. 1 & 2, Groups C & D hazardous gas or vapor locations
- Non-fusible version only
- Viewing window provided as standard to readily see the blades of the disconnect switch
- Auxiliary contact provided as standard
- Lockable handle
- Provisions for a mechanical key interlock switch (trapped key, kirk key, etc.)
- Hinged cover for easy access

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Standards Compliance

UL 1203
 CSA C22.2, No. 25 and 30

Certifications

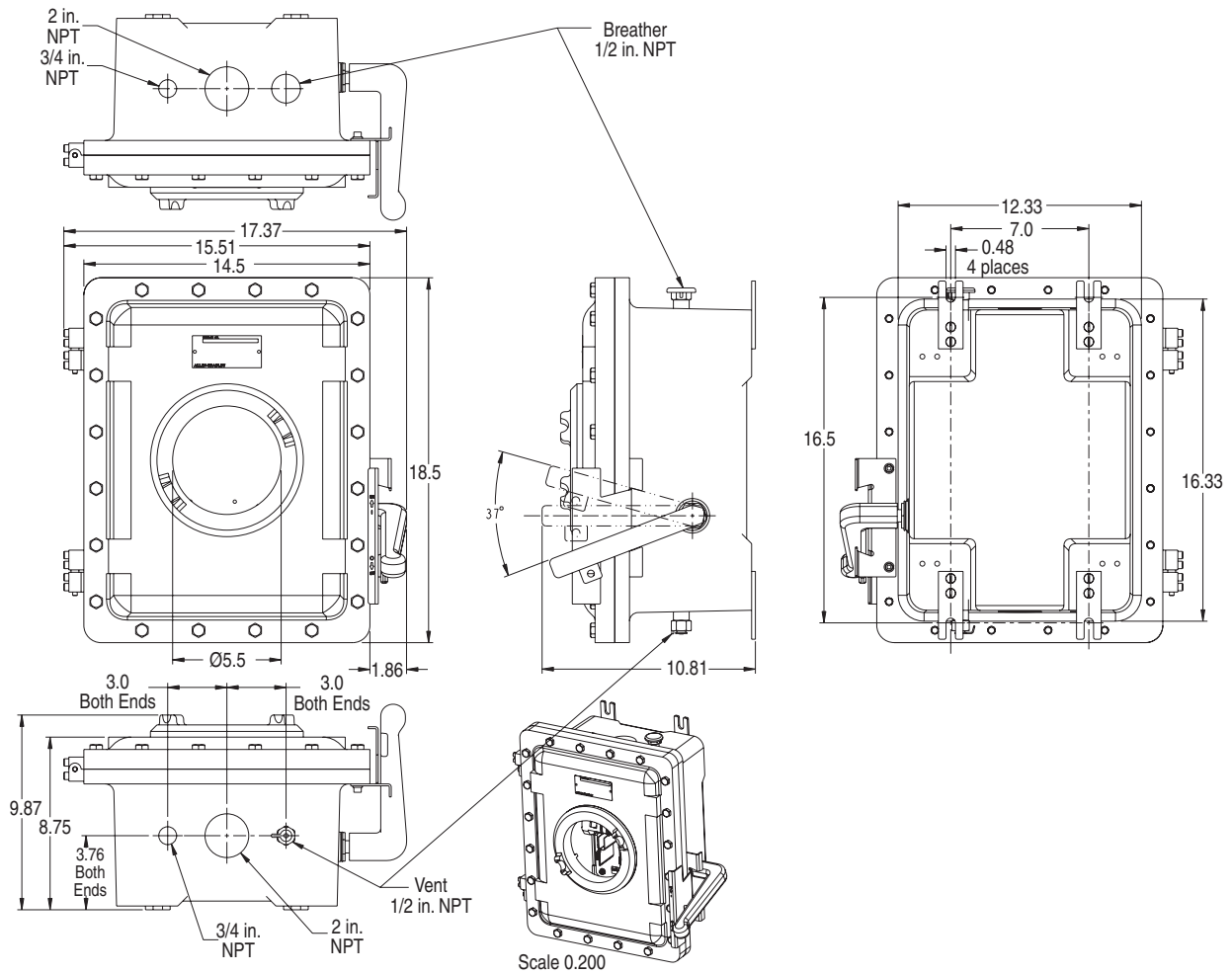
cULus Listed (File No. E239523, Guide No. WPRP)

Product Selection

Size [A]	Horsepower					Type 3R, 7 & 9 Bolted Enclosure Class I, Div. 1 & 2, Groups C & D Class II, Groups E, F, G Cat. No.
	480V AC		600V AC		250V AC	
	Std.	Max.	Std.	Max.		
30	5	15	7.5	20	5	1494G-NX8
60	15	30	15	50	10	
100	20	60	30	75	20	


Approximate Dimensions

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



Heavy Duty Safety Disconnect Switches

Product Overview/Product Selection — Fusible and Non-Fusible Type

	<p>Bulletin 1494H Heavy Duty Safety Switches</p> <ul style="list-style-type: none"> • 30...200 A switch ratings • Type 1, 3R, or 12 enclosures • 600V: 1-phase, 3-phase, non-fusible • 240V: 1-phase, 3-phase, fusible • 600V: 3-phase, fusible • Visible blade construction for safety • Side-mounted metal handle • Lockable handle • Can accommodate Class H, R, and J fuses • Accessories — field installed 	<p>Table of Contents</p> <p>Product Selection..... this page Accessories..... 1-224</p> <p>Standards Compliance</p> <p>UL 98 CSA C22.2, No. 4</p> <p>Certifications</p> <p>UL Listed (File No. E227497, Guide No. WIAX) CSA Certified (File No. LR1234)</p>
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Non-Fusible Disconnect Switch (600V AC)

Continuous Current Rating [A]	UL & CSA Application Horsepower (Maximum)						Type 1 Cat. No.	Type 3R Cat. No.	Type 12 Cat. No.	
	1-Phase (60 Hz)		3-Phase (60 Hz)			3-Phase (60 Hz)				
	240V AC		240V AC	480V AC	600V AC	125V DC				250V DC
30	3	10	20	30	3	5	1494H-BA3N	1494H-BN3N	1494H-BF3N	
60	10	20	50	60	5	10	1494H-CA3N	1494H-CN3N	1494H-CF3N	
100	20	40	75	100	—	20	1494H-DA3N	1494H-DN3N	1494H-DF3N	
200	30	60	125	150	—	40	1494H-EA3N	1494H-EN3N	1494H-EF3N	

Fusible Disconnect Switch (240V AC)*

Continuous Current Rating [A]	UL & CSA Application Horsepower										Type 1 Cat. No.	Type 3R Cat. No.	Type 12 Cat. No.		
	1-Phase (60 Hz)		3-Phase (60 Hz)				1-Phase (60 Hz)								
	240V AC		240V AC		480V AC		600V AC		125V DC					250V DC	
	Std.	Max.	Std.	Max.	Std.	Max.	Std.	Max.	Std.	Max.				Std.	Max.
30	1.5	3	3	7.5	—	—	—	—	2	3	5	—	1494H-BA3H2	1494H-BN3H2	1494H-BF3H2
60	3	10	7.5	15	—	—	—	—	5	—	10	—	1494H-CA3H2	1494H-CN3H2	1494H-CF3H2
100	7.5	15	15	30	—	—	—	—	—	—	20	—	1494H-DA3H2	1494H-DN3H2	1494H-DF3H2
200	15	—	25	60	—	—	—	—	—	—	40	—	1494H-EA3H2	1494H-EN3H2	1494H-EF3H2

* Includes a neutral lug for four wire applications.

Fusible Disconnect Switch (600V AC)

Continuous Current Rating [A]	UL & CSA Application Horsepower												Type 1 Cat. No.	Type 3R Cat. No.	Type 12 Cat. No.
	1-Phase (60 Hz)		3-Phase (60 Hz)				1-Phase (60 Hz)		250V DC						
	240V AC		240V AC		480V AC		600V AC		125V DC		250V DC				
	Std.	Max.	Std.	Max.	Std.	Max.	Std.	Max.	Std.	Max.	Std.	Max.			
30	1.5	3	3	7.5	5	15	7.5	20	2	3	5	—	1494H-BA3H6	1494H-BN3H6	1494H-BF3H6
60	3	10	7.5	15	15	30	15	50	5	—	10	—	1494H-CA3H6	1494H-CN3H6	1494H-CF3H6
100	7.5	15	15	30	25	60	30	75	—	—	20	—	1494H-DA3H6	1494H-DN3H6	1494H-DF3H6
200	15	—	25	60	50	125	60	150	—	—	40	—	1494H-EA3H6	1494H-EN3H6	1494H-EF3H6

Heavy Duty Safety Disconnect Switches

Product Selection —Fusible and Non-Fusible Type

Ground Lugs

Description	Cat. No.
Ground lug (for 30, 60 A switch)	599-GR4
Ground lug (for 100, 200 A switch)	599-GR5

Conduit Hubs (Type 3R)

Description	Cat. No.
19.05 mm (3/4 in.) hub	1495-N71
25.4 mm (1 in.) hub	1495-N72
31.75 mm (1-1/4 in.) hub	1495-N73
38.1 mm (1-1/2 in.) hub	1495-N74
50.8 mm (2 in.) hub	1495-N75
63.5 mm (2-1/2 in.) hub	1495-N76

Electrical Interlock

Description	Cat. No.
10 A DPDT – early break (for 30 A, Type 1 & 3R only)	1495-N77
15 A DPDT – early break (for 30 A, Type 12)	1495-N78
15 A DPDT – early break (for all 60 A, 100 A, & 200 A, Type 1, 3R, and 12)	

Heavy Duty Class R Fuse Clip Kits

Description	Cat. No.
30 A @ 250V AC (Type 1, 3R, and 12)	1401-N70
30 A @ 600V AC (Type 1 & 3R)	1401-N71
30 A @ 600V AC (Type 12)	1401-N72
60 A @ 250V AC (Type 1, 3R, and 12)	1401-N73
60 A @ 600V AC (Type 1, 3R, and 12)	1401-N74
100 A @ 250/600V AC (Type 12)	1401-N76
100 A @ 250/600V AC (Type 1 & 3R)	1401-N77
200 A @ 250/600V AC (Type 1, 3R, and 12)	

Neutral Kits

Description	Cat. No.
30 A @ 250/600V AC Fusible (Type 1 & 3R)	599-NK1
30 A @ 250/600V AC Non-Fusible (Type 1 & 3R)	599-NK2
30 A @ 250/600V AC Fusible & Non-Fusible (Type 12)	599-NK3
60 A @ 250/600V AC Fusible & Non-Fusible (Type 1 & 3R)	599-NK4
60 A @ 250/600V AC Fusible (Type 12)	599-NK5
60 A @ 250/600V AC Non-Fusible (Type 12)	599-NK6
100 A @ 250/600V AC Fusible (Type 1 & 3R)	599-NK7
100 A @ 250/600V AC Non-Fusible (Type 1, 3R, and 12)	599-NK8
100 A @ 250/600V AC Fusible (Type 12)	599-NK9
200 A @ 250/600V AC Fusible & Non-Fusible (Type 1 & 3R)	599-NK10
200 A @ 250/600V AC Fusible & Non-Fusible (Type 12)	599-NK11

General Duty Safety Disconnect Switches

Product Overview/Product Selection



Bulletin 1494HL General Duty Safety Switches

- 30...200 A switch rating
- Type 1, 3R
- 240V: 1-phase, 3-phase, fusible
- Visible blade construction for safety
- Side-mounted metal handle
- Lockable handle
- Can accommodate Class H,R, and K fuses
- Accessories- field installed

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Standards Compliance

UL 98
 CSA C22.2, No. 4

Certifications

UL Listed (File No. E227497,
 Guide No. WIAX)
 CSA Certified (File No. LR1234)

Fusible Disconnect Switch (240V AC)*

Continuous Current Rating [A]	UL & CSA Application Horsepower (Maximum)								Type 1 Cat. No.	Type 3R Cat. No.
	1-Phase (60 Hz) 240V AC		3-Phase (60 Hz) 240V AC		1-Phase (60 Hz) 125V DC		1-Phase (60 Hz) 250V DC			
	Std.	Max.	Std.	Max.	Std.	Max.	Std.	Max.		
30	1.5	3	3	7.5	3	3	5	—	1494HL-BA3H2	1494HL-BN3H2
60	3	10	7.5	15	5	—	10	—	1494HL-CA3H2	1494HL-CN3H2
100	7.5	15	15	30	—	—	20	—	1494HL-DA3H2	1494HL-DN3H2
200	15	—	25	60	—	—	40	—	1494HL-EA3H2	1494HL-EN3H2

* Includes a neutral lug for four wire applications.

Ground Lugs

Description	Cat. No.
Ground lug (for 30, 60 A switch)	599-GR4
Ground lug (for 100, 200 A switch)	599-GR5

General Duty Class R Fuse Clip Kits

Description	Cat. No.
30 A @ 250V AC (Type 1 & 3R)	1401-N78
60 A @ 250V AC (Type 1 & 3R)	1401-N79
100 A @ 250V AC (Type 1 & 3R)	1401-N81
200 A @ 250V AC (Type 1 & 3R)	

Conduit Hubs (Type 3R)

Description	Cat. No.
19.05 mm (3/4 in.) hub	1495-N71
25.4 mm (1 in.) hub	1495-N72
31.75 mm (1-1/4 in.) hub	1495-N73
38.1 mm (1-1/2 in.) hub	1495-N74
50.8 mm (2 in.) hub	1495-N75
63.5 mm (2-1/2 in.) hub	1495-N76

Neutral Kits

Description	Cat. No.
30 A @ 250/600V AC Fusible (Type 1 & 3R)	599-NK1
30 A @ 250/600V AC Non-Fusible (Type 1 & 3R)	599-NK2
30 A @ 250/600V AC Fusible & Non-Fusible (Type 12)	599-NK3
60 A @ 250/600V AC Fusible & Non-Fusible (Type 1 & 3R)	599-NK4
60 A @ 250/600V AC Fusible (Type 12)	599-NK5
60 A @ 250/600V AC Non-Fusible (Type 12)	599-NK6
100 A @ 250/600V AC Fusible (Type 1 & 3R)	599-NK7
100 A @ 250/600V AC Non-Fusible (Type 1, 3R, and 12)	599-NK8
100 A @ 250/600V AC Fusible (Type 12)	599-NK9
200 A @ 250/600V AC Fusible & Non-Fusible (Type 1 & 3R)	599-NK10
200 A @ 250/600V AC Fusible & Non-Fusible (Type 12)	599-NK11










Electrical Interlock

Description	Cat. No.
10 A DPDT – early break (for 30 A, Type 1 & 3R only)	1495-N77
15 A DPDT – early break (for 30 A, Type 12)	1495-N78
15 A DPDT – early break (for all 60 A, 100 A, & 200 A, Type 1, 3R, and 12)	

NEMA Disconnect Switches

Accessories

1





		Description	For Use With	Cat. No.
	Auxiliary Contacts	1 N.O. Contact	1494C, 1494F, 1494V, and 1494G (30...400 A) Disconnect Switches	1495-N8
		1 N.O. Contact (low-level switching)		1495-N8X
		1 N.C. Contact	1494D, 1494V* (125...400 A Frame) Circuit Breakers	1495-N9
		1 N.C. Contact (low-level switching)		1495-N9X
  Cat. No. 595-A Cat. No. 595-B	Auxiliary Contacts (600 A Disconnect Switch only)	1 N.O. Contact	1494C, 1494G, and 1494V Disconnect Switches 600 A only	595-A
	1 N.C. Contact	595-B		
 Cat. No. 595-N1	Auxiliary Contact Adapter Kit For Disconnect Switches	600 A		* 595-N1
 Cat. No. 1495-N24	Auxiliary Contact Adapter Kit For Disconnect Switches with Left-Hand Mechanism	30...100 A Disconnect Switch	1494V Disconnect Switch with Left-Hand Mechanism, 30...100 A	* 1495-N24
		200...400 A Disconnect Switch	1494V Disconnect Switch with Left-Hand Mechanism, 200...400 A	* 1495-N25
  Cat. No. 1495-N21 Cat. No. 1495-N23	Auxiliary Contact Adapter Kit For Circuit Breakers	125 A and 150 A Frame Allen-Bradley, Cutler-Hammer	1494D, 1494V Circuit Breakers	* 1495-N21
		250 A, 400 A Frame Allen-Bradley, Cutler-Hammer	1494V Circuit Breaker	* 1495-N23
		250 A Frame Allen-Bradley, Cutler-Hammer	1494D Circuit Breaker	* 1495-N22
		400 A Frame Allen-Bradley, Cutler-Hammer	1494D Circuit Breaker	* 1495-N16
		600 A, 800 A, 1200 A Frame Cutler-Hammer	1494D Circuit Breaker	* 1495-N13
 Cat. No. 1495-N34	Electrical Interlocks	1 N.O. and 1 N.C. — early make/break	1494C, 1494G & 1494V Disconnect Switches with Left-/Right-Hand Mechanism, 30...100 A & Right-Hand Mechanism, 600 A	† 1495-N34
		2 N.O. and 2 N.C. — early make/break		† 1495-N35
		1 N.O. and 1 N.C. — early make/break	1494C, 1494G, & 1494V Disconnect Switch with Right-Hand Mechanism, 200 A, 400 A	1495-N43
		2 N.O. and 2 N.C. — early make/break		1495-N44
		1 N.O. and 1 N.C. — early make/break	1494C and 1494V Disconnect Switch with Left-Hand Mechanism, 30...100 A	1495-N37
		2 N.O. and 2 N.C. — early make/break		1495-N38
		 Cat. No. 1495-N35	Electrical Interlocks	1 N.O. and 1 N.C. — early make/break
2 N.O. and 2 N.C. — early make/break	1495-N40			
Electrical Interlock Adapter Kit	1 N.O. and 1 N.C. — early make/break		1494V Disconnect Switch with Left-Hand Mechanism, 400 A	1495-N41
	2 N.O. and 2 N.C. — early make/break			1495-N42
	10 A DPDT — early break (for 30 A, Type 1 & 3R only)		1494H Safety Switch	1495-N77
	15 A DPDT — early break (for 30 A, Type 12)			1495-N78
	15 A DPDT — early break (for all 60 A, 100 A, & 200 A, Type 1, 3R, and 12)			
	600 A Disconnect Switch	1494C, 1494G, 1494V Disconnect Switch	1495-N36	

* Requires an adapter kit on new installations.

* One adapter kit enables up to two auxiliary contacts to be installed.

† Additional adapter kit (**Cat. No. 1495-N36**) required for installation on 600 A switch.







		Description	For Use With	Cat. No.	
 Cat. No. 1494R-N3	Lug Connectors (3 per package)		1494C, 1494F, 1494G, and 1494V Disconnect Switches		
	Disconnect Size [A]	Wire Size			
	30	#14...8 AWG Wire		*	
	60	#14...4 AWG Wire		§ 1494R-N1	
	100	#8...1/0 AWG Wire		§ 1494R-N2	
	200	#6...4/0 AWG Wire		§ 1494R-N3	
		#6...250 MCM Wire (oversized)		§ 199-LF1	
	400	(2) of #1/0...250 MCM Wire		§ 1494R-N14	
		#4 AWG...500 MCM Wire (oversized)		§ 1494R-N15	
	600	(2) of #1/0...350 MCM Wire		§ 1494R-N10	
(2) of #1/0...350 MCM Wire		1491-N621 or 1491-R621 600 A fuse blocks	♣ 1494R-N11		
	(1) of #4...500 MCM Wire		♣ 1494R-N12		
 Cat. No. 599-GR1	Ground Connectors		1494C, 1494F, 1494G, and 1494V Disconnect Switches	599-GR1	
	Ground Lug Kits	30...100 A			599-GR2
		200...400 A			599-GR3
		600 A			
		30, 60 A	1494H & 1494HL Safety Switches	599-GR4	
		100, 200 A		599-GR5	
	Neutral Kits		1494H Safety Switches	599-NK1	
	30 A @ 250/600V AC Fusible (Type 1 & 3R)			599-NK2	
	30 A @ 250/600V AC Non-Fusible (Type 1 & 3R)			599-NK3	
	30 A @ 250/600V AC Fusible & Non-Fusible (Type 12)			599-NK4	
	60 A @ 250/600V AC Fusible & Non-Fusible (Type 1 & 3R)			599-NK5	
	60 A @ 250/600V AC Fusible (Type 12)			599-NK6	
	60 A @ 250/600V AC Non-Fusible (Type 12)			599-NK7	
	100 A @ 250/600V AC Fusible (Type 1 & 3R)			599-NK8	
	100 A @ 250/600V AC Non-Fusible (Type 1, 3R, and 12)			599-NK9	
	100 A @ 250/600V AC Fusible (Type 12)			599-NK10	
	200 A @ 250/600V AC Fusible & Non-Fusible (Type 1 & 3R)			599-NK11	
200 A @ 250/600V AC Fusible & Non-Fusible (Type 12)					
	Phase Barrier Kits		1494C, 1494F, 1494G, 1494V		
	Disconnect Size [A]				
	30, 60			1494F-PH2	
	100			1494F-PH3	
	200			1494F-PH4	
	400			1494F-PH5	

* All terminals of the 30 A switches are furnished with self-lifting pressure plate connectors as standard.
 ♣ Each kits contains (2) lugs.
 § Each kit contains (3) lugs.

NEMA Disconnect Switches

Accessories

1

	Description		For Use With	Cat. No.			
	Fuse Clips (6 per package)						
	Fuse Class	Fuse Clip Rating [A]					
		H	250V	600V	1494C, 1494F, 1494G, and 1494V Disconnect Switches	30	—
	60		30	1401-N42			
	—		60	1401-N43			
	100		100	1401-N44			
	200		200	1401-N45			
	400		400	1401-N46			
	J	30	30	1494C, 1494F, 1494G, and 1494V Disconnect Switches	1401-N42		
		60	60		1494C, 1494F, 1494G, and 1494V Disconnect Switches	1401-N43	
		100	100	1494C, 1494F, 1494G, and 1494V Disconnect Switches	1401-N44		
		200	200	1494C, 1494F, 1494G, and 1494V Disconnect Switches	1401-N45		
		400	400	1494C, 1494F, 1494G, and 1494V Disconnect Switches	1401-N46		
		600	600	1494V-FS600 Fuse Blocks	‡		
	R	30	—	1494C, 1494F, 1494G, and 1494V Disconnect Switches	1401-N50		
		60	30		1401-N51		
		—	60		1401-N52		
		100	100		1401-N53		
		200	200		1401-N54		
		400	400		1401-N55		
H, R	600	600	1491 Fuse Blocks	‡			
	Class R Fuse Clip Kits		1494H Safety Switches				
	30 A @ 250V AC (Type 1, 3R, 12)				1401-N70		
	30 A @ 600V AC (Type 1, 3R)				1401-N71		
	30 A @ 600V AC (Type 12)				1401-N72		
	60 A @ 250V AC (Type 1, 3R, 12)				1401-N73		
	60 A @ 600V AC (Type 1, 3R, and 12)				1401-N74		
	100 A @ 250/600V AC (Type 1 & 3R)				1401-N75		
	100 A @ 250/600V AC (Type 12)				1401-N76		
	200 A @ 250/600V AC (Type 1, 3R, and 12)				1401-N77		
	30 A @ 250V AC (Type 1 & 3R)				1401-N78		
	60 A @ 250V AC (Type 1 & 3R)				1401-N79		
	100 A @ 250V AC (Type 1 & 3R)				1401-N80		
	200 A @ 250V AC (Type 1 & 3R)				1401-N81		
					1494HL Safety Switches		

‡ Included with Bulletin 1491 separate mounted fuse blocks. One fuse block kit per pole required.

* Fuse clips not required; fuse bolts directly to terminal.

Protective Fuse Covers (for use with Bul. 1494C, 1494F, 1494G, and 1494V disconnect switches)					
Switch Rating [A]	Fuse Class	Fuse Clip Rating [A]		Cat. No.	
		250V	600V		
30	Non-fusible	—	—	1495-N64	
30	H, R	30	—		
60	H, R	60	—		
30	J	30	30		
60	J	60	60		
100	Non-fusible	—	—		
30	H, R	—	30	1495-N65	
60	H, R	—	60		
100	J	100	100		
100	H, R	100	100	1495-N66	
100	J	200	200		
200	Non-fusible	—	—	> 1495-N67	
200	H, J, R	200	200		
200	J	400	400		
200	Non-fusible	—	—	⌘ 1495-N62	
200	H, J, R	200	200		
400	Non-fusible	—	—	> 1495-N68	
400	H, J, R	400	400		
400	Non-fusible	—	—	⌘ 1495-N63	
400	H, J, R	400	400		
600	Non-fusible	—	—	> 1495-N61	
600	J	600	600		
600	H, J, R	600	600		
Protective Line Covers (for use with Bul. 1494C, 1494F, 1494G, and 1494V disconnect switches)					
30, 60, 100	—	—	—	1495-N80	
200	—	—	—	1495-N81	
400	—	—	—	1495-N82	
600	—	—	—	1495-N83	
Terminal Lug Adapter Kit — allows two wires (maximum 8 AWG) to be installed on the line side or load side (for use with Bul. 1494C, 1494F, 1494G, and 1494V disconnect switches)					
30	—	—	—	1494R-N16	
60	—	—	—	1494R-N17	
100	—	—	—	1494R-N18	
200, 400	—	—	—	1494R-N19	

- > Switch with right-hand mechanism.
- ⌘ Switch with left-hand mechanism.
- + Used with Bulletin 1491-N621 and 1491-R621 on Bulletin 1494V/1494C/1494G.

NEMA Disconnect Switches

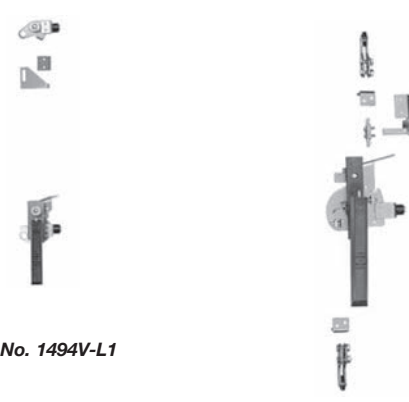



Accessories

1

	Description		For Use With	Cat. No.
	Defeater Bracket Extension Kit For use with operating handles that do not align properly with the door catch or door hardware on enclosures with a rolled lip flange construction.		All 1494F and 1494V Handles (except 1494V-R1 and 1494V-R2)	1494V-H12
	Channel Support Kits For use to prevent flexing of the operating handle mounting surface. This is especially useful when the operating handle is mounted on a channel in a multi-door enclosure.		30...200 A Switches Applies only to Operating Handle Cat. Nos. 1494F-P1, M1, and S1.	1494V-H15
	Conduit Hubs (for Type 3R enclosures)* 19.05 mm (3/4 in.) hub 25.4 mm (1 in.) hub 31.75 mm (1-1/4 in.) hub 38.1 mm (1-1/2 in.) hub 50.8 mm (2 in.) hub 63.5 mm (2-1/2 in.) hub	30 A, 60 A, 100 A 30 A, 200 A 60 A 100 A — 200 A	1494H Safety Switches	1495-N71 1495-N72 1495-N73 1495-N74 1495-N75 1495-N76
	Non-Metallic Conduit Connectors 1/2 in. (12.7 mm) 3/4 in. (19 mm) 1 in. (25.4 mm) 1-1/4 in. (31.75 mm) 1-1/2 in. (38.1 mm) 2 in. (50.8 mm) 2-1/2 in. (63.5 mm) 3 in. (76.2 mm)	30 A 30 A 30 A 60 A 100 A 200 A 200 A 400...600 A	1494G Disconnect Switches	1490-N1 1490-N9 1490-N10 1490-N11 1490-N5 1490-N6 1490-N7 1490-N8
	Grounding Adapters #14...10 AWG, 1/2 in. (12.7 mm) #14...8 AWG, 3/4 in. (19 mm) #14...8 AWG, 1 in. (24.5 mm) #14...4 AWG, 1-1/4 in. (31.8 mm) #8...1/0 AWG, 1-1/2 in. (38.1 mm) #8...1/0 AWG, 2 in. (50.8 mm) #6...2/0 AWG, 2-1/2 in. (63.5 mm) #6...4/0 AWG, 3 in. (76.2 mm)	30 A 30 A 30 A 60 A 100 A 200 A 200 A 400...600 A	1494G Disconnect Switches	1490-N19 1490-N20 1490-N21 1490-N22 1490-N23 1490-N24 1490-N25 1490-N26

* Packaged in quantities of 10.



	Description	For Use With	Cat. No.§
 Cat. No. 1494V-L1	Type 12 Door Hardware Kit Includes: handle, cam, defeater actuator lever, rollers, and shims Enclosure Height less than 40 in. (1016 mm) Top and Side (Right Hand)	1494C, All 1494V	1494V-L1*
	Top and Side (Left Hand)		1494V-LL1*
	Enclosure Height 40...60 in. (1016...1524 mm) Top and Side (Right Hand) Bottom		1494V-L1* and 1494V-L2
	Top and Side (Left Hand) Bottom		1494V-LL1* and 1494V-L2
	Enclosure Height greater than 60 in. (1524 mm) Top, Side, and Bottom (Right Hand)		1494V-L3*
 Cat. No. 1494V-L2	Top, Side, and Bottom (Left Hand)		1494V-LL3*
 Cat. No. 1494V-L3	Type 12 Door Hardware Kit Includes: Handle, cam, defeater actuator lever, rollers, and shims Enclosure Height less than 30 in. (762 mm) Top and Side (Right Hand)	1494F, 1494D	1494F-L1*
	Top and Bottom (Right Hand)		1494F-L2*
	Enclosure Height 30...48 in. (762...1219 mm) Top and Bottom (Right Hand) Side		1494F-L2* and 1494F-L3
	Enclosure Height greater than 48 in. (1219 mm) Top, Side, and Bottom (Right Hand)		1494F-L4*
 Cat. No. 1494F-L2 and 1494F-L3	Master Door Interlock Kits Interlock kits are designed to provide interlocking between the master and auxiliary doors of the same enclosure and for use with Cat. Nos. 1494F-L4 hardware kits or Cat. No. 1494V-L3 hardware kits. Specify one master door kit and as many auxiliary door kits as necessary (9 maximum). Connecting bars must be supplied by user.	1494C, 1494F, 1494D, 1494V	1494F-N20‡
	Auxiliary Door Interlock Kit		1494F-N21

* Door hardware kit does not include rectangular connecting bars (1/4 x 1/2 in.). To be provided by customer.
 * Door hardware kit does not include rectangular connecting bars (1/4 x 5/8 in.). To be provided by customer.
 ‡ Master door interlock kit does not include rectangular connecting bars (3/8 x 3/8 in.). To be provided by customer.
 § If the Rockwell Automation door hardware kits are to be installed in a commercially available enclosure, consult the enclosure manufacturer's application data for proper kit selection.

NEMA Disconnect Switches

Specifications

Bulletin 1494C, 1494F, 1494G, 1494R, 1494V Disconnect Switches

1

Disconnect Switch Electrical Ratings								
Switch Size			30 A	60 A	100 A	200 A	400 A	600 A
Rated insulation voltage U_i (UL) IEC			(600) 660V					
Ratings UL/CSA/NEMA	Hp	230V/60 Hz	7.5	15	30	60	125	200
		460V/60 Hz	15	30	60	125	250	400
	Continuous Current	575V/60 Hz	20	50	75	150	350	500
		250V DC	5	10	20	40	50	50
Ratings IEC Applications	Maximum kW (AC23)	600V AC	30	60	100	200	400	600
		250V DC						
		220V/50 Hz	5.5	11	22	48	90	150
		440V/50 Hz	11	22	45	90	185	295
		550V/50 Hz	15	37	55	110	257	375
Auxiliary Contact Electrical Ratings								
NEMA/EEMAC			B600, P300					
IEC Ratings			U_i 660V	I_{th} 10 A				
			ACII U_x	12...120V			I_c	6 A
				220...240V				3 A
			380...400V				1.5 A	
			500...600V				1.2 A	
Low level switching			5 mA @ 12V DC					
Mechanical								
Degree of protection	Operating handles	Non-metallic Type 1, 3R, 4, 4X, 12, Painted Type 1, 3R, 4, 12 Stainless steel Type 4, 4X						
Mechanical life (Typical)	20 000 operations (30...200 A) 10 000 operations (400...600 A)							
Switching frequency (operations/hr)	30, 60, 100, and 200 A sizes — 300 max. 400 and 600 A sizes — 240 max.							
Environmental								
Temperature	Operating	-35...+40 °C (-31...+104 °F)						
	Storage	-40...+65 °C (-40...+149 °F)						
Altitude (per IEC 947-5)	2000 m per IEC 337-1							
Relative Humidity (per IEC 947-3)	90% at 20 °C (68 °F) and 50% at 40 °C (104 °F)							
Design Specification/Test Requirements								
Dielectric strength	2200V for 1 minute							
Electrical life	6000 operations at rated current							
Short Circuit Withstand Capability	10 000 A: unfused 10 000 A: with Class H fuses 200 000 A: with Class J or Class R fuses							
Construction								
Switch body material	Phenolic							
Contact material	Copper, tin-plated							
Terminals	30 A	#10 - 32 screw and self-lifting pressure plate						
	60 A	1/4 in. - 28 screw-lug, copper						
	100 A	5/16 in. - 24 screw-lug, copper						
	200 A	3/8 in. - 24 screw-lug, copper						
	400 A	3/8 in. - 24 screw-lug, copper						
	600 A	1/2 in. - 13 screw-lug, copper						
All wire rated 75 °C (167 °F) or higher must be sized per the local Electric Code for 75 °C (167 °F) wire.								
Conductor Size (mm ²)	30 A	#14...8 AWG (1.5...10 mm ²)						
	60 A	#14...4 AWG (2.5...16 mm ²)						
	100 A	#8...1/0 AWG (10...50 mm ²)						
	200 A	#6...4/0 AWG (16...95 mm ²)						
	400 A	2 of #1/0 AWG...250 MCM (2 per lug) 2 of 185 mm ² ...250 MCM or (1) #4 AWG...500 MCM						
	600 A	2 of #1/0 AWG...350 MCM (2 per lug) 2 of 185 mm ² ...350 MCM or (1) #4 AWG...500 MCM						
Recommended Torque	30 A	Conductor into Lug			Lug to Terminal			
	60 A	20 lb•in			20 lb•in			
	100 A	45 lb•in			50 lb•in			
	200 A	150 lb•in			90 lb•in			
	400 A	275 lb•in			175 lb•in			
	600 A	325 lb•in			175 lb•in			
Switches, Mechanisms, and Accessory Kits			Zinc-plated steel, RoHS Compliant finish					



Bulletin 1494H, 1494HL Disconnect Switches

Disconnect Switch Electrical Ratings						
Switch Size		30 A	60 A	100 A	200 A	
Rated insulation voltage Ui (UL) IEC		(600) 660V				
Ratings UL/CSA/NEMA	Hp	230V/60 Hz	10	20	40	60
		460V/60 Hz	20	50	75	125
		575V/60 Hz	30	60	100	150
	250V DC	5	10	20	40	
Continuous Current	600V AC 250V DC	30	60	100	200	
Auxiliary Contact Electrical Ratings						
Continuous Current		10 A		15 A		
Pole Configuration		DPDT		DPDT		
Mechanical						
Degree of protection		Operating handles		Painted Type 1, 3R, 12		
Mechanical life (Typical)		10 000 operations				
Switching frequency (operations/hr)		300 maximum				
Environmental						
Temperature	Operating		-35...+40 °C (-31...+104 °F)			
	Storage		-40...+65 °C (-40...+149 °F)			
Altitude (per IEC 947-5)		2000 m per IEC 337-1				
Relative Humidity (per IEC 947-3)		90% at 20 °C (68 °F) and 50% at 40 °C (104 °F)				
Design Specification/Test Requirements						
Dielectric strength		2200V for 1 minute				
Electrical life		6000 operations at rated current				
Short Circuit Withstand Capability		10 000 A: unfused 10 000 A: with Class H fuses 200 000 A: with Class J or Class R fuses (30...100 A) 100 000 A: with Class J or Class R fuses (200 A)				
Construction						
Switch body material		Phenolic				
Contact material		Copper, tin-plated				
Terminals	30 A	#10 - 32 screw and self-lifting pressure plate 1/4 in. - 28 screw-lug, copper 5/16 in. - 24 screw-lug, copper 3/8 in. - 24 screw-lug, copper				
	60 A					
	100 A					
	200 A					
All wire rated 75 °C (167 °F) or higher must be sized per the local Electric Code for 75 °C (167 °F) wire.						
Conductor Size (mm ²)	30 A	#14...8 AWG				
	60 A	#12...2 AWG				
	100 A	#10...1/0 AWG				
	200 A	#2...250 MCM AWG				
Recommended Torque	30 A	Conductor into Lug				
	60 A	36...40 lb•in				
	100 A	35...45 lb•in				
	200 A	35...50 lb•in 275 lb•in				
Mechanisms		Zinc-plated steel, bronze chromate finish				



Bulletin 1494
NEMA Disconnect Switches
 Specifications

Bulletin 1494D, 1494V Circuit Breakers

		Electrical Ratings						
Frame Size		125 A	150 A	250 A	400 A	600 A	800 A	1200 A
		Auxiliary Contacts						
		1494V, 1494D						
NEMA/EEMAC		B600, P300						
IEC Ratings		ACII U _x		12...120V 220...240V 380...400V 500...600V		I _e		6 A 3 A 1.5 A 1.2 A
Maximum Number of Auxiliary Contacts		2						
		Mechanical Data						
Mechanical Life (Typical)		10 000						
		Construction						
Mechanisms		Zinc-plated steel						
		Environmental Data						
Ambient Temperature*	Operating	-20...+40 °C (-4...+104 °F)						
	Storage	-40...+65 °C (-40...+149 °F)						
Altitude (per IEC 947-5)		2000 m per IEC 337-1						
Relative Humidity (per IEC 947-3)		90% at 20 °C (68 °F) and 50% at 40 °C (104 °F)						

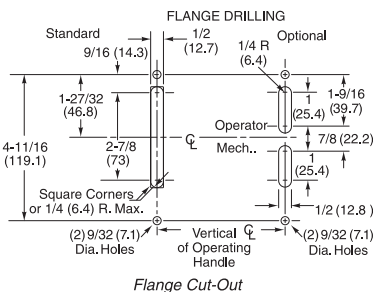
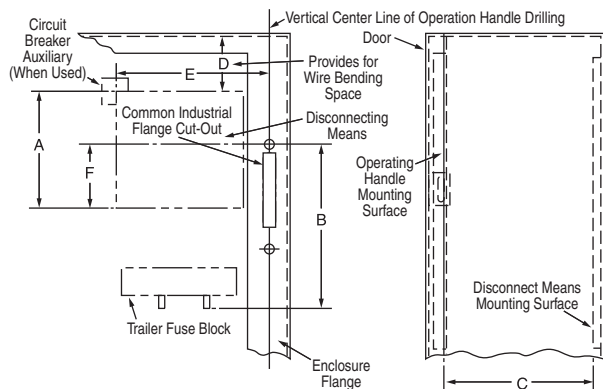
* Refer to circuit breaker specifications for other limitations.

Bulletin 1491 Fuse Blocks

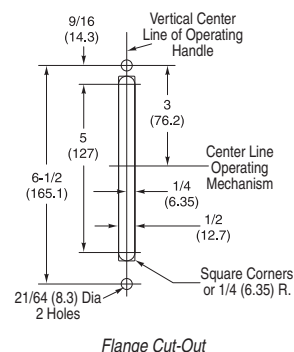
		Electrical				
UL Fuse Type		Class H	Class J	Class R	Class C	Class CC
Maximum Fuse Cartridge Size		30...600 A	30...600 A	30...600 A	30...600 A	30 A
Maximum Voltage	AC	600V	600V	600V	600V	600V
	DC	250V	250V	250V	250V	250V
Thermal Current Rating		30...600 A	30...600 A	30...600 A	30...600 A	30 A
Maximum Short Circuit Prospective Fault Current		10 kA	200 kA	200 kA	100 kA	200 kA
		Construction				
Fuse Clips		Tin-plated copper				
Terminals		Tin-plated copper				
Fuse Block Base		Phenolic or porcelain				
		Environmental				
Ambient Temperature	Open	-20...+55 °C (-4...+131 °F)				
	Enclosed	-20...+40 °C (-4...+104 °F)				
	Storage	-40...+65 °C (-40...+149 °F)				
Altitude (per IEC 947-5)		2000 m				
Relative Humidity (per IEC 947-3)		90% at 20 °C (68 °F) and 50% at 40 °C (104 °F)				

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

Bulletin 1494V



Bulletin 1494V — 30...200 A



Bulletin 1494V — 400...600 A

Disconnect Switches*

NEMA Size [A]	A	B*		C		D	E	F	Switch Mounting Hole Diameter
		Max.	Min.	Max.	Max.				
30	6-19/64 (160)	7-31/32 (202)	8-1/2 (216)	21-5/8 (549)	2-3/4 (69.9)	7-9/16 (192)	3-7/8 (98.5)	7/32 in.	
60	6-19/64 (160)	8-15/32 (215)	8-1/2 (216)	21-5/8 (549)	2-9/16 (65.1)	7-9/16 (192)	3-7/8 (98.5)	7/32 in.	
100	6-19/64 (160)	9-1/8 (231.8)	8-1/2 (216)	21-5/8 (549)	3-37/64 (90.9)	7-9/16 (192)	3-7/8 (98.5)	7/32 in.	
200	8-5/64 (205.2)	15-9/64 (384.5)	9-1/2 (241.3)	21-5/8 (549)	6-35/64 (166.3)	8-25/32 (223)	4-21/32 (118)	19/64 in.	
400	11 (279.4)	18-7/32 (462.7)	10-1/2 (266.7)	21-5/8 (549)	8 (203.2)	10 (254)	5-1/2 (139.7)	11/32 in.	
600	15-23/32 (399.2)	17-19/32 (446.8)‡	10-1/2 (266.7)	21-5/8 (549)	12 (304.8)	11-27/32 (300.8)	8-51/64 (223.3)	11/32 in.	

* Approximate dimensions are for reference only.

* This approximate dimension will vary by fuse class and size.

‡ Approximate dimension with Class J fuses.

Circuit Breakers§

Frame	A	C		D	E	F
		Min.	Max.			
125A 140U-H, 140M-H, EF, HMCPE 150A 140U-I, 140M-I EHD, FD, FDB, FDC, HFD, HMCP	6 (152.4)	6-3/4 (171.5)	23 (584.2)	6 (152.4)	5-7/16 (138.1)	5 (127)
250A 140U-J, 140M-J 250A JD, JDB, JDC, HJD, HMCP	11-1/4 (285.8)	7-7/8 (200.0)	22-9/16 (573.1)	10 (254)	5-23/32 (145.2)	9-23/32 (246.8)
400 A 140U-K, 140M-K KD, KDB, KDC, HKD, HMCP 600 A 140U-L	11-3/8 (228.9)	7-7/8 (200.0)	22-9/16 (573.1)	12 (304.8)	7-1/8 (181.0)	9-21/32 (245.3)

§ Approximate dimensions are for reference only.

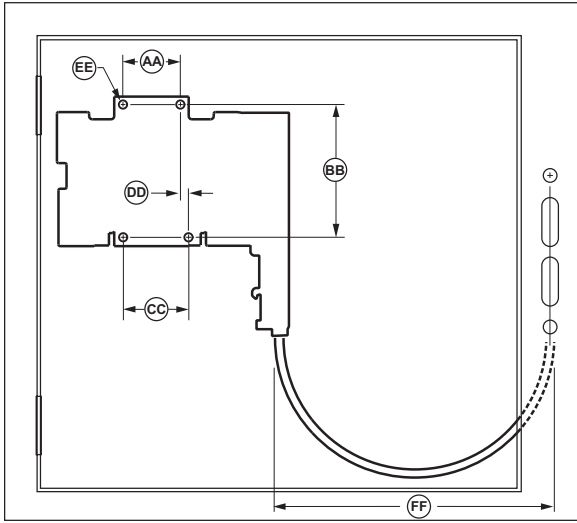
NEMA Disconnect Switches

Approximate Dimensions

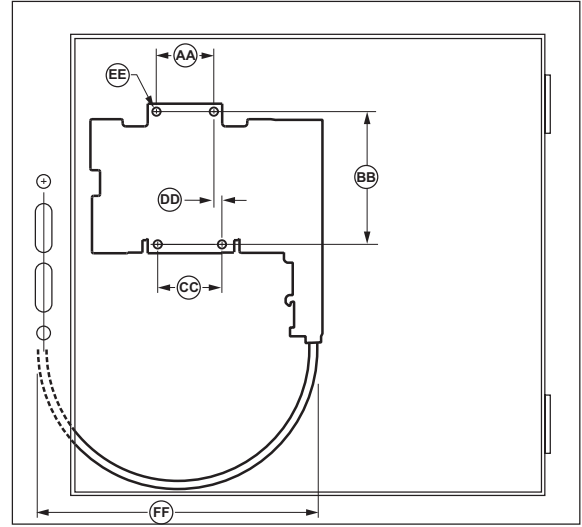
Approximate dimensions are shown in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Bulletin 1494C

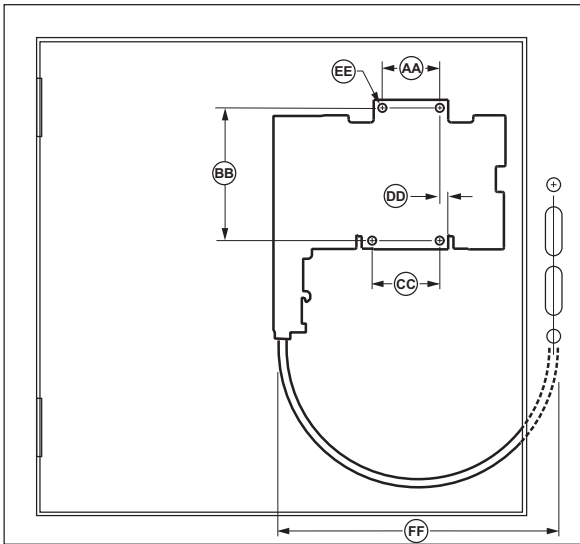
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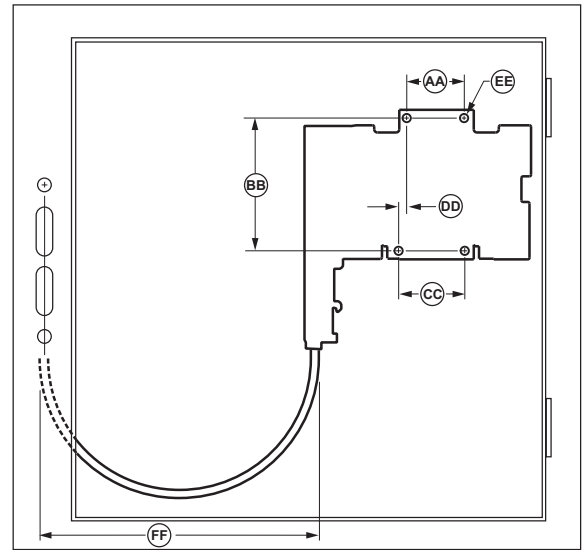
Enclosure with Right Hand Flange



Enclosure with Left Hand Flange



Enclosure with Right Hand Flange



Enclosure with Left Hand Flange

Disconnect Switches

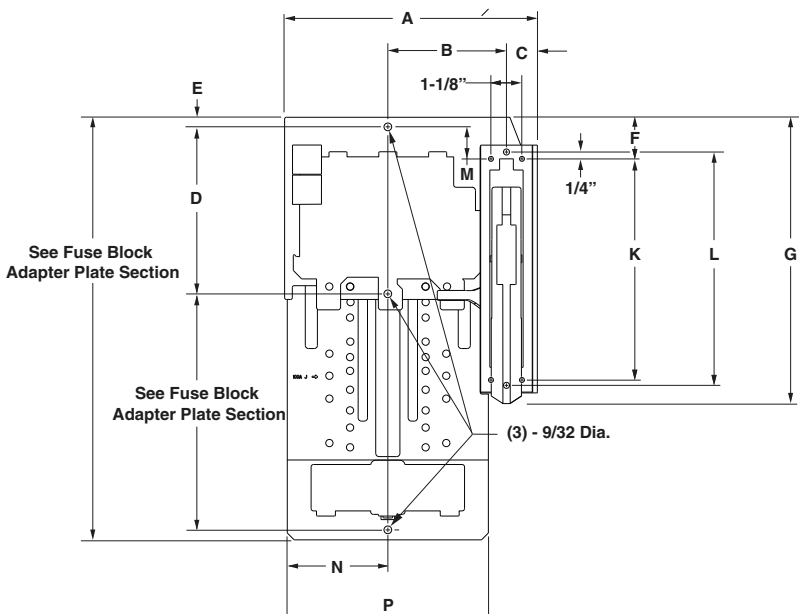
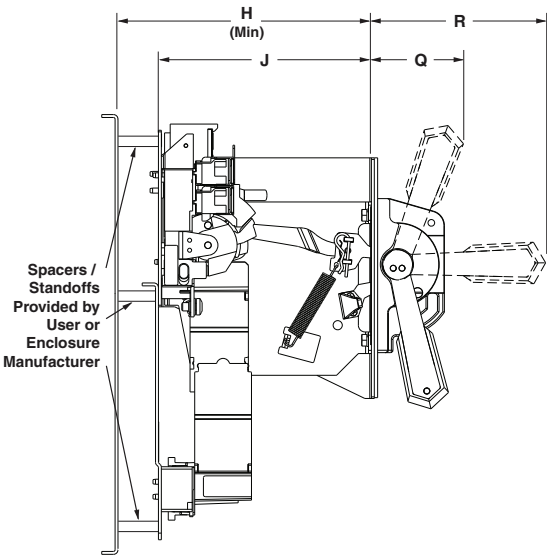
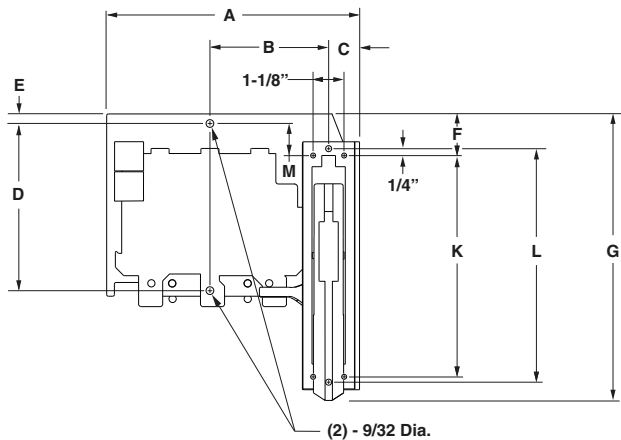
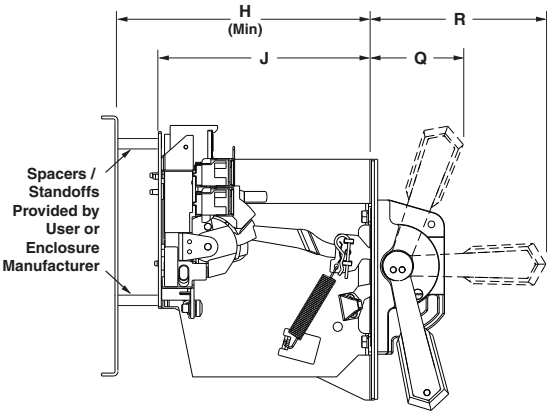
NEMA Size [A]	AA	BB	CC	DD	EE Mounting Plate Hole Diameter	FF Minimum Bevel Diameter
30	2-1/4 (57.2)	5-1/4 (133.4)	2-1/4 (57.2)	—	11/64 (4.37)	12 (304.8)
60	2-1/4 (57.2)	5-1/4 (133.4)	2-1/4 (57.2)	—	11/64 (4.37)	12 (304.8)
100	2-1/4 (57.2)	5-1/4 (133.4)	2-1/4 (57.2)	—	11/64 (4.37)	12 (304.8)
200	2 (50.8)	8-1/4 (209.6)	4-1/4 (108)	1-1/8 (28.6)	7/32 (5.56)	16 (406.4)
400	2 (50.8)	11 (279.4)	4-3/4 (120.7)	1-3/8 (34.9)	9/32 (7.14)	16 (406.4)
600	8-1/4 (209.6)	15 (381)	8-1/4 (209.6)	—	—	16 (406.4)



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

Bulletin 1494F Disconnect Switches

Non-Fusible Disconnect Switch



Switch Size [A]	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
30	9-3/16 (233.4)	4-5/16 (109.5)	1-1/8 (28.6)	6 (152.4)	3/8 (9.5)	1-9/16 (39.7)	10-1/2 (266.7)	8-1/2 (215.9)	6-7/8 (174.6)	8 (203.2)	8-1/2 (215.9)	15/16 (23.8)	3-21/32 (92.9)	7-5/16 (185.7)	3 (76.2)	5-7/16 (138.1)
60	9-3/16 (233.4)	4-5/16 (109.5)	1-1/8 (28.6)	6 (152.4)	3/8 (9.5)	1-9/16 (39.7)	10-1/2 (266.7)	8-1/2 (215.9)	6-7/8 (174.6)	8 (203.2)	8-1/2 (215.9)	15/16 (23.8)	3-21/32 (92.9)	7-5/16 (185.7)	3 (76.2)	5-7/16 (138.1)
100	9-3/16 (233.4)	4-5/16 (109.5)	1-1/8 (28.6)	6 (152.4)	3/8 (9.5)	1-9/16 (39.7)	10-1/2 (266.7)	9-3/4 (247.7)	8-1/8 (206.4)	8 (203.2)	8-1/2 (215.9)	15/16 (23.8)	3-21/32 (92.9)	7-5/16 (185.7)	3 (76.2)	5-7/16 (138.1)
200	9-5/8 (244.5)	4-3/4 (120.7)	1-5/32 (29.4)	8-3/16 (208)	7/16 (11.1)	2 (50.8)	10-29/32 (277)	9-3/4 (247.7)	8-1/8 (206.4)	8 (203.2)	8-1/2 (215.9)	1-5/16 (33.3)	3-3/4 (95.3)	7-1/2 (190.5)	3 (76.2)	5-7/16 (138.1)

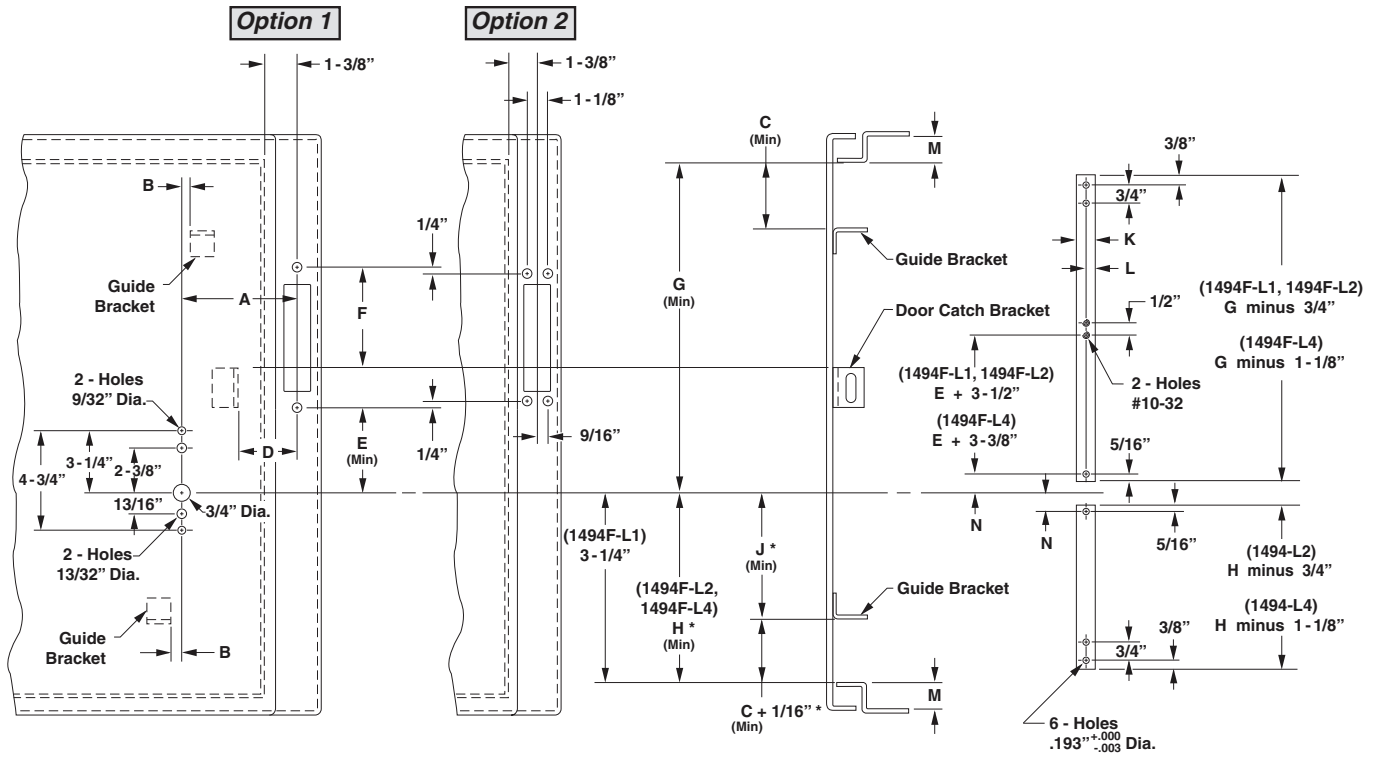


Bulletin 1494
NEMA Disconnect Switches
 Approximate Dimensions

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

Bulletin 1494F Disconnect Switches Vault Hardware Latching (Non Pre-drilled Enclosures)

1

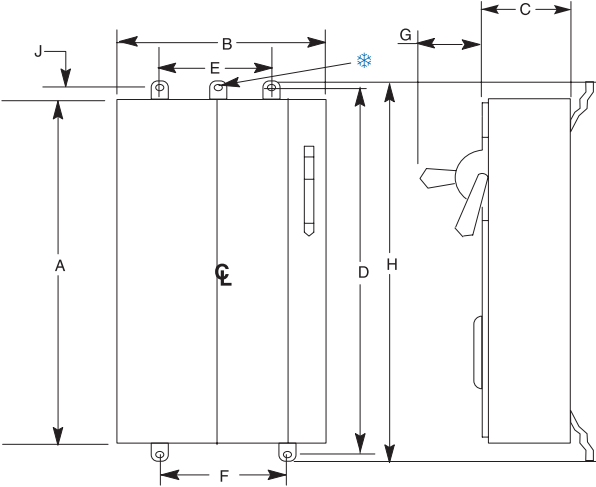


* Non applicable for 1494F-L1

Vault Hardware Kits*	Switch Size [A]	A	B	C (Min.)	D	E (Min.)	F	G (Min.)	H (Min.)	J (Min.)	K	L	M	N
Small and Intermediate Enclosures														
1494F-L1 1494F-L2 1494F-L3	30	3-7/8 (98.4)	3/8 (9.5)	3-1/16 (77.8)	2-1/8 (54)	4-1/2 (114.3)	3-13/16 (96.8)	13 (330.2)	8-1/8 (206.4)	5 (127)	1/2 (12.7)	1/4 (6.4)	11/16 (17.5)	1/2 (12.7)
	60							14 (355.6)						
	100							18-7/8 (479.4)						
	200							23-25/32 (604)						
Large Enclosures														
1494F-L4	30	4 (101.6)	1/2 (12.7)	3-3/4 (95.3)	2-1/8 (54)	5 (127)	3-13/16 (96.8)	13-1/8 (333.4)	9-13/16 (249.2)	6 (152.4)	5/8 (15.9)	5/16 (7.9)	1-1/4 (31.8)	3/4 (19.1)
	60							13-5/8 (346.1)						
	100							18-1/2 (469.9)						
	200							23-13/32 (594.5)						

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

Bulletin 1494G, 1494GX, 1494GY Enclosed Disconnect Safety Switches
 Type 3R/4/12 (Enclosure Code "F") Painted Metal Enclosures



Size [A]	Fuse Style*	Number of Poles	Bulletin No.	Approximate Dimensions in Inches (Millimeters)									Approx. Shipping Weight [lb (kg)]
				A Height	B Width	C Depth	D Mounting	E Mounting	F Mounting	G Handle Depth	H	J	
30	A	2 or 3	1494G	13-5/16 (338)	10-1/2 (267)	8-1/4 (210)	14-11/16 (373)	*	5-1/4 (133)	5-9/16 (141)	15-21/32 (398)	11/32 (9)	20 (9.07)
60				20 (509)	10-1/2 (267)	10-3/16 (259)	21-7/16 (545)	*	5-1/4 (133)	5-9/16 (141)	22-13/32 (569)	11/32 (9)	30 (13.6)
30	B	2 or 3	1494G	27-1/2 (698)	10-1/2 (267)	8-1/4 (210)	28-7/8 (733)	*	5-1/4 (133)	5-9/16 (141)	29-7/8 (759)	13/16 (21)	60 (27.21)
60													
100	A	6	1494G	27-1/2 (698)	10-1/2 (267)	8-1/4 (210)	28-7/8 (733)	*	5-1/4 (133)	5-9/16 (141)	29-7/8 (759)	13/16 (21)	60 (27.21)
30	C												
60	C												
100	D												
30	A	2 or 3	1494GY	27-1/2 (698)	10-1/2 (267)	8-1/4 (210)	28-7/8 (733)	*	5-1/4 (133)	5-9/16 (141)	29-7/8 (759)	13/16 (21)	60 (27.21)
60	B												
30	A	2 or 3	1494GX	30 (762)	20-1/2 (521)	10-3/16 (259)	31-3/8 (797)	15-1/4 (387)	15-1/4 (387)	5-9/16 (141)	32-3/8 (822)	13/16 (21)	90 (40.82)
60	B												
100	D	6	1494G	31-1/2 (800)	10-1/2 (267)	10-3/32 (257)	32-7/8 (835)	*	5-1/4 (133)	5-9/16 (141)	33-27/32 (860)	11/32 (9)	70 (31.73)
100	A	2 or 3	1494GY	31-1/2 (800)	10-1/2 (267)	10-3/32 (257)	32-7/8 (835)	*	5-1/4 (133)	5-9/16 (141)	33-27/32 (860)	11/32 (9)	70 (31.73)
100	B												
100	B	2 or 3	1494G	31-1/2 (800)	10-1/2 (267)	10-3/32 (257)	32-7/8 (835)	*	5-1/4 (133)	5-9/16 (141)	33-27/32 (860)	11/32 (9)	70 (31.73)
100	C												
200	A	2 or 3	1494G	50 (1270)	22 (559)	11-1/2 (292)	51-3/8 (1305)	15-1/4 (387)	15-1/4 (387)	5-9/16 (141)	52-11/32 (1330)	11/32 (9)	200 (90.7)
200	B												
100	A	2 or 3	1494GX	50 (1270)	22 (559)	11-1/2 (292)	51-3/8 (1305)	15-1/4 (387)	15-1/4 (387)	5-9/16 (141)	52-11/32 (1330)	11/32 (9)	200 (90.7)
200	B												
200	C	6	1494G	50 (1270)	22 (559)	11-1/2 (292)	51-3/8 (1305)	15-1/4 (387)	15-1/4 (387)	5-9/16 (141)	52-11/32 (1330)	11/32 (9)	200 (90.7)
200	D	6	1494G	50 (1270)	22 (559)	11-1/2 (292)	51-3/8 (1305)	15-1/4 (387)	15-1/4 (387)	5-9/16 (141)	52-11/32 (1330)	11/32 (9)	200 (90.7)
400	A	2 or 3	1494G	50 (1270)	22 (559)	11-1/2 (292)	51-3/8 (1305)	15-1/4 (387)	15-1/4 (387)	7-5/8 (194)	52-11/32 (1330)	11/32 (9)	200 (90.7)
600	A												
400	B	2 or 3	1494G	56 (1422)	30-1/2 (775)	13-51/64 (350)	57-5/8 (1464)	20 (508)	25-1/4 (641)	7-5/8 (194)	62-5/8 (1590)	1 (25.4)	300 (136.05)
600	B												

* A = Non-Fusible, Fusible 250V - Class H/R, Fusible 600V - Class J
 B = Fusible 600V - Class H/R
 C = Non-fusible
 D = Fusible 250V - Class H/R, Fusible 600V - Class J

* These enclosures have one top mounting hole located on the center line. All other enclosures have two top mounting holes located as shown.



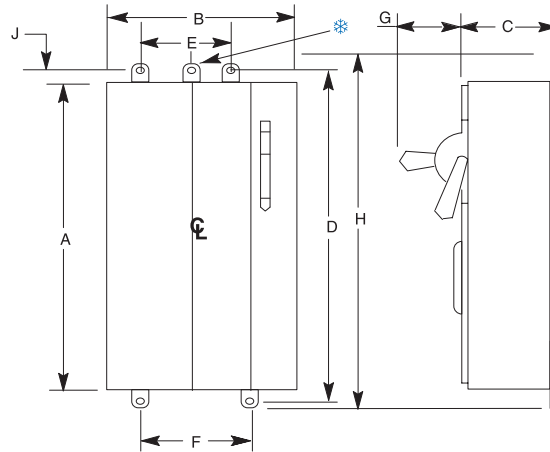
NEMA Disconnect Switches

Approximate Dimensions

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

Bulletin 1494G, 1494GX, 1494GY Enclosed Disconnect Safety Switches

Type 4/4X (Enclosure Code "C") Stainless Steel Enclosure



Size [A]	Fuse Style*	Number of Poles	Bulletin No.	Approximate Dimensions in Inches (Millimeters)									Approx. Shipping Weight [lb (kg)]
				A Height	B Width	C Depth	D Mounting	E Mounting	F Mounting	G Handle Depth	H	J	
30	A	2 or 3	1494G	13-5/16 (338)	10-1/2 (267)	8-9/16 (217)	14-11/16 (373)	*	5-1/4 (133)	5-9/16 (141)	15-21/32 (398)	13/16 (21)	20 (9.07)
30	B	2 or 3	1494G	27-1/2 (698)	10-1/2 (267)	8-1/4 (210)	28-7/8 (733)	*	7 (178)	5-9/16 (141)	29-3/4 (756)	13/16 (21)	60 (27.21)
	C	6											
60	B	2 or 3											
	D	6											
30	A	2 or 3	1494GY	30 (762)	20-1/2 (521)	9-7/8 (251)	31-3/8 (797)	17 (432)	17 (432)	5-9/16 (141)	32-1/4 (819)	13/16 (21)	90 (40.82)
	B												
60	A	2 or 3	1494GX	50 (1270)	22 (559)	11-3/16 (284)	51-3/8 (1305)	18-1/2 (470)	18-1/2 (470)	5-9/16 (141)	52-1/4 (1327)	13/16 (21)	200 (90.7)
	B												
100	A	2 or 3	1494G	56 (1422)	30-1/2 (775)	13-51/64 (350)	57-5/8 (1464)	20 (508)	25-1/4 (641)	7-5/8 (194)	58-5/8 (1489)	1 (25.4)	300 (136.05)
	B												
300	A	2 or 3	1494G	56 (1422)	30-1/2 (775)	13-51/64 (350)	57-5/8 (1464)	20 (508)	25-1/4 (641)	7-5/8 (194)	58-5/8 (1489)	1 (25.4)	300 (136.05)
	B												

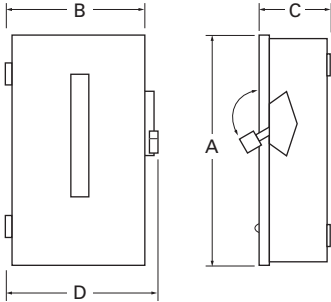
* A = Non-Fusible, Fusible 250V - Class H/R, Fusible 600V - Class J
 B = Fusible 600V - Class H/R
 C = Non-fusible
 D = Fusible 250V - Class H/R, Fusible 600V - Class J

* These enclosures have one top mounting hole located on the center line. All other enclosures have two top mounting holes located as shown.

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

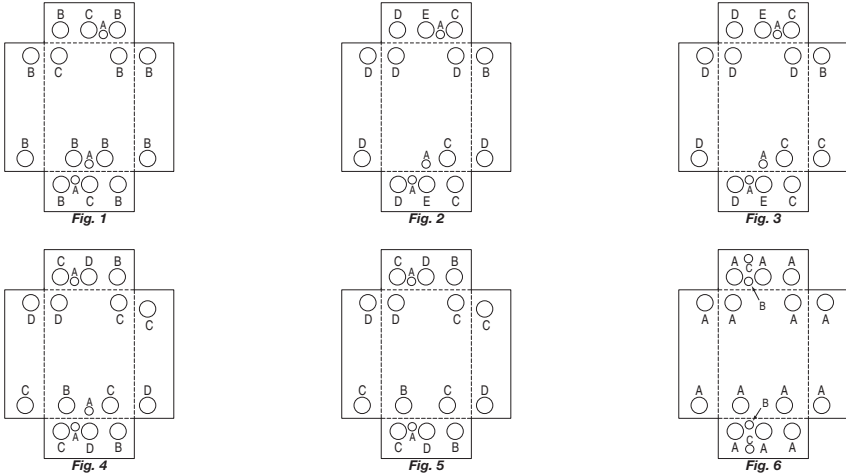
Bulletin 1494H Heavy Duty Safety Switches

Type 1 (Enclosure Code "A") General Purpose Painted Metal Enclosures



Switch Size [A]	Fuse Style	A Height	B Width	C Depth	D Width (with handle)	Knockout Fig. #
30	240V	10-9/32 (261.1)	6-3/8 (162.1)	3-5/16 (84.1)	7-1/8 (181)	1
	600V	12-19/32 (319.8)	8-3/8 (212.9)	4 (101.6)	9-1/2 (241.3)	2
	Non-fusible	10-3/8 (263.7)	8-3/8 (212.9)	4 (101.6)	9-1/4 (235)	3
60	240V	17-19/32 (446.8)	9-3/8 (238.3)	5 (127)	10-3/64 (255.3)	4
	600V	21-11/32 (542)				5
	Non-fusible	17-19/32 (446.8)				4
100	240V	21-11/32 (542)	9-3/8 (238.3)	5 (127)	10-3/64 (255.3)	5
	600V	22-11/32 (567.4)				4
	Non-fusible	17-19/32 (446.8)				4
200	240V	31-5/8 (803.3)	13-7/16 (341.4)	5-1/4 (133.4)	14-7/16 (366)	6
	600V					
	Non-fusible					

Knockouts — Conduit Size



Switch Size [A]	Fuse Style	Knockouts				
		A	B	C	D	E
30	240V	9/32 (7.1)	1/2 x 3/4 (12.7 x 19.1)	3/8 x 1/2 x 3/4 x 1 (9.5 x 12.7 x 19.1 x 25.4)	—	—
	600V			1/2 x 3/4 x 1 (12.7 x 19.1 x 25.4)	1/2 x 3/4 x 1 x 1-1/4 (12.7 x 19.1 x 25.4 x 31.8)	3/4 x 1 x 1-1/4 x 1-1/2 (19.1 x 25.4 x 31.8 x 38.1)
	Non-fusible					
60	240V	9/32 (7.1)	1/2 x 3/4 x 1 x 1-1/4 (12.7 x 19.1 x 25.4 x 31.8)	3/4 x 1 x 1-1/4 x 1-1/2 (19.1 x 25.4 x 31.8 x 38.1)	1 x 1-1/4 x 1-1/2 x 2 (25.4 x 31.8 x 38.1 x 50.8)	—
	600V					
	Non-fusible					
100	240V	9/32 (7.1)	1/2 x 3/4 x 1 x 1-1/4 (12.7 x 19.1 x 25.4 x 31.8)	3/4 x 1 x 1-1/4 x 1-1/2 (19.1 x 25.4 x 31.8 x 38.1)	1 x 1-1/4 x 1-1/2 x 2 (25.4 x 31.8 x 38.1 x 50.8)	—
	600V					
	Non-fusible					
200	240V	1 x 1-1/2 x 2 x 2-1/2 (25.4 x 38.1 x 50.8 x 63.5)	9/32 (7.1)	1/2 (12.7)	—	—
	600V					
	Non-fusible					

NEMA Disconnect Switches

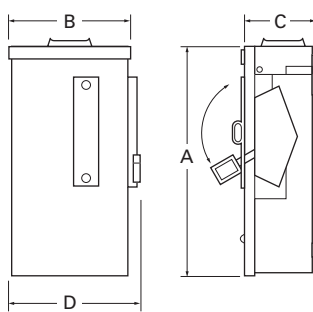
Approximate Dimensions

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

Bulletin 1494H Heavy Duty Safety Switches

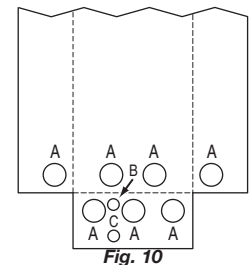
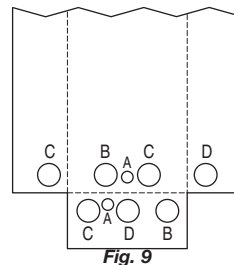
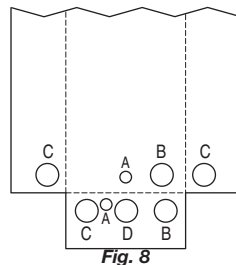
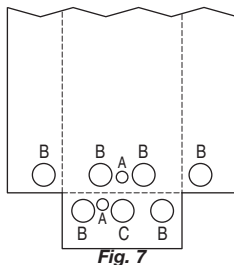
Type 3R (Enclosure Code "N") Rain-Proof Painted Metal Enclosures

1



Switch Size [A]	Fuse Style	A Height	B Width	C Depth	D Width (with handle)	Knockout Fig. #
30	240V	10-5/8 (269.9)	6-3/8 (162.1)	3-5/16 (84.1)	7-1/8 (181)	7
	600V	13-13/64 (335.3)	8-3/8 (212.9)	4 (101.6)	9-13/32 (239)	8
	Non-fusible	13-13/64 (335.3)	8-3/8 (212.9)	4 (101.6)	9-13/32 (239)	8
60	240V	17-7/16 (443)	9-3/8 (238.3)	5 (127)	10-3/64 (255.3)	9
	600V	22-3/16 (563.6)			10-1/2 (267)	
	Non-fusible	17-7/16 (443)			10-3/64 (255.3)	
100	240V	22-3/16 (563.6)	9-3/8 (238.3)	5 (127)	10-1/2 (267)	9
	600V	22-3/16 (563.6)			10-3/64 (255.3)	
	Non-fusible	17-7/16 (443)			10-3/64 (255.3)	
200	240V	31-7/16 (798.6)	13-3/8 (339.9)	5-15/32 (138.9)	14-1/8 (361.9)	10
	600V					
	Non-fusible					

Knockouts — Conduit Size

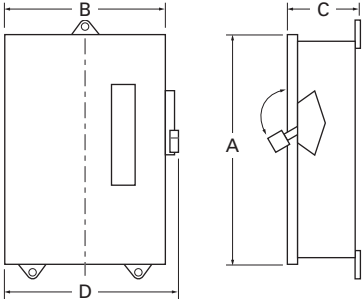


Switch Size [A]	Fuse Style	Knockouts			
		A	B	C	D
30	240V	9/32 (7.1)	1/2 x 3/4 (12.7 x 19.1)	3/8 x 1/2 x 3/4 x 1 (9.5 x 12.7 x 19.1 x 25.4)	—
	600V		1/2 x 3/4 x 1 (12.7 x 19.1 x 25.4)	1/2 x 3/4 x 1 x 1-1/4 (12.7 x 19.1 x 25.4 x 31.8)	3/4 x 1 x 1-1/4 x 1-1/2 (19.1 x 25.4 x 31.8 x 38.1)
	Non-fusible				
60	240V	9/32 (7.1)	1/2 x 3/4 x 1 x 1-1/4 (12.7 x 19.1 x 25.4 x 31.8)	3/4 x 1 x 1-1/4 x 1-1/2 (19.1 x 25.4 x 31.8 x 38.1)	1 x 1-1/4 x 1-1/2 x 2 (25.4 x 31.8 x 38.1 x 50.8)
	600V				
	Non-fusible				
100	240V	9/32 (7.1)	1/2 x 3/4 x 1 x 1-1/4 (12.7 x 19.1 x 25.4 x 31.8)	3/4 x 1 x 1-1/4 x 1-1/2 (19.1 x 25.4 x 31.8 x 38.1)	1 x 1-1/4 x 1-1/2 x 2 (25.4 x 31.8 x 38.1 x 50.8)
	600V				
	Non-fusible				
200	240V	1 x 1-1/2 x 2 x 2-1/2 (25.4 x 38.1 x 50.8 x 63.5)	9/32 (7.1)	1/2 (12.7)	—
	600V				—
	Non-fusible				—



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

Bulletin 1494H Heavy Duty Safety Switches
Type 12 (Enclosure Code "F") Dust-Tight Painted Metal Enclosures



Switch Size [A]	Fuse Style	A Height	B Width	C Depth	D Width (with handle)
30	240V	11-3/8 (288.9)	7-3/8 (187.3)	5-1/16 (128.6)	8-1/8 (206.4)
	600V	13-3/8 (339.7)	9-3/8 (238.1)	5-5/16 (134.9)	10-1/4 (260.4)
	Non-fusible			5-1/16 (128.6)	
60	240V	19-3/8 (492.1)	9-3/8 (238.1)	5-1/16 (128.6)	10-1/4 (260.4)
	600V			5-5/16 (134.9)	
	Non-fusible			5-1/16 (128.6)	
100	240V	25-3/8 (644.5)	13-1/2 (342.9)	5-1/16 (128.6)	14-1/4 (362)
	600V			5-5/16 (134.9)	
	Non-fusible				
200	240V	35-1/8 (892.2)	13-1/2 (342.9)	5-5/16 (134.9)	15-1/4 (387.4)
	600V		14-1/2 (368.3)		
	Non-fusible				

NEMA Disconnect Switches

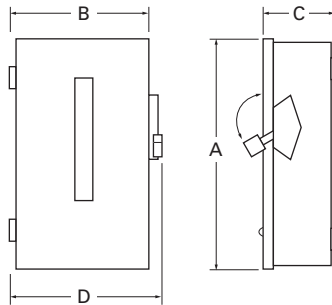
Approximate Dimensions

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

Bulletin 1494HL General Duty Safety Switches

Type 1 (Enclosure Code "A") General Purpose Painted Metal Enclosures

1



Switch Size [A]	Fuse Style	A Height	B Width	C Depth	D Width (with handle)	Knockout Fig. #
30	240V	10-9/32 (261.1)	6-1/2 (165.1)	3-5/16 (84.1)	6-29/32 (175.3)	1
60		13-27/32 (351.5)	8-1/2 (215.9)	4 (101.6)	8-7/8 (225.6)	2
100		21-11/32 (542)	9-1/2 (241.3)	5 (127)	9-7/8 (251)	3
200		29-1/8 (739.6)	13-7/16 (341.4)	5-5/16 (134.9)	13-15/16 (354.1)	4

Knockouts — Conduit Size

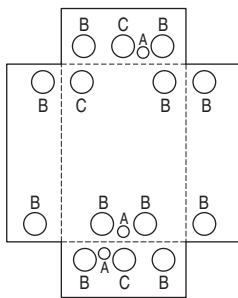


Fig. 1

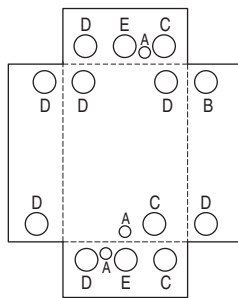


Fig. 2

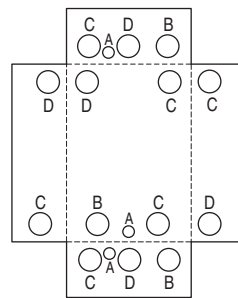


Fig. 3

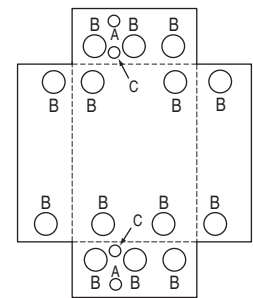


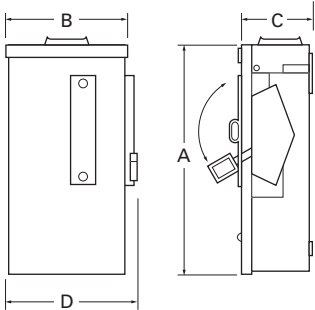
Fig. 4

Switch Size [A]	Knockouts				
	A	B	C	D	E
30	9/32 (7.1)	1/2 x 3/4 (12.7 x 19.1)	3/8 x 1/2 x 3/4 x 1 (9.5 x 12.7 x 19.1 x 25.4)	—	—
60	9/32 (7.1)	1/2 x 3/4 (12.7 x 19.1)	1/2 x 3/4 x 1 (12.7 x 19.1 x 25.4)	1/2 x 3/4 x 1 x 1-1/4 (12.7 x 19.1 x 25.4 x 31.8)	3/4 x 1 x 1-1/4 x 1-1/2 (19.1 x 25.4 x 31.8 x 38.1)
100	9/32 (7.1)	1/2 x 3/4 x 1 x 1-1/4 (12.7 x 19.1 x 25.4 x 31.8)	3/4 x 1 x 1-1/4 x 1-1/2 (19.1 x 25.4 x 31.8 x 38.1)	1 x 1-1/4 x 1-1/2 x 2 (25.4 x 31.8 x 38.1 x 50.8)	—
200	1/2 (12.7)	1 x 1-1/2 x 2 x 2-1/2 (25.4 x 38.1 x 50.8 x 63.5)	9/32 (7.1)	—	—



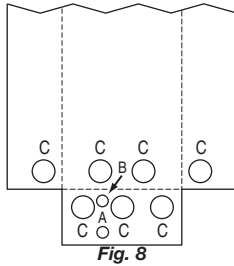
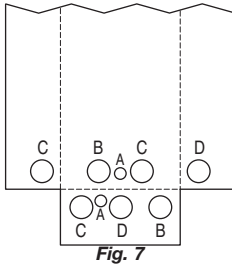
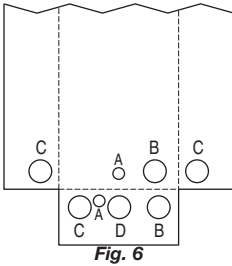
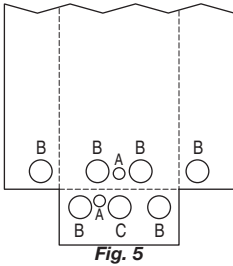
Approximate dimensions are shown in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Type 3R (Enclosure Code "N") Rain-Proof Painted Metal Enclosures



Switch Size [A]	Fuse Style	A Height	B Width	C Depth	D Width (with handle)	Knockout Fig. #
30	240V	10-1/32 (254.8)	6-3/8 (162.1)	3-5/16 (84.1)	7-1/8 (180.8)	5
60		13-15/16 (353.8)	8-3/8 (212.9)	3-7/8 (225.6)	9-3/32 (230.9)	6
100		21-7/16 (544.3)	9-3/8 (238.3)	5 (127)	9-61/64 (252.7)	7
200		28-15/16 (735.1)	13-3/8 (339.9)	5-5/16 (134.9)	14-1/16 (357.1)	8

Knockouts — Conduit Size



Switch Size [A]	Knockouts			
	A	B	C	D
30	9/32 (7.1)	1/2 x 3/4 (12.7 x 19.1)	3/8 x 1/2 x 3/4 x 1 (9.5 x 12.7 x 19.1 x 25.4)	—
60	9/32 (7.1)	1/2 x 3/4 x 1 (12.7 x 19.1 x 25.4)	1/2 x 3/4 x 1 x 1-1/4 (12.7 x 19.1 x 25.4 x 31.8)	3/4 x 1 x 1-1/4 x 1-1/2 (19.1 x 25.4 x 31.8 x 38.1)
100	9/32 (7.1)	1/2 x 3/4 x 1 x 1-1/4 (12.7 x 19.1 x 25.4 x 31.8)	3/4 x 1 x 1-1/4 x 1-1/2 (19.1 x 25.4 x 31.8 x 38.1)	1 x 1-1/4 x 1-1/2 x 2 (25.4 x 31.8 x 38.1 x 50.8)
200	1/2 (12.7)	1 x 1-1/2 x 2 x 2-1/2 (25.4 x 38.1 x 50.8 x 63.5)	1 x 1-1/2 x 2 x 2-1/2 (25.4 x 38.1 x 50.8 x 63.5)	—

General Purpose Enclosures

Product Overview

General Purpose Enclosures

1

Bulletin	598	598	598, 800H
Description	General-Purpose Enclosure	Junction Box	Push Button Enclosure
Features	Designed for use as an automation control box, electrical control housing, and terminal wiring box in industrial and commercial applications	Designed for use as a junction box, terminal wiring box, and small automation control box in industrial and commercial applications	Designed to house 22.5 mm (Bul. 598) and 30.5 mm (Bul. 800H) push buttons (available in grey or yellow colors)
Dimensions [mm]	Available in 11 sizes (Height x Width x Depth) 130 x 80 x 85 180 x 80 x 85 250 x 80 x 85 190 x 190 x 130 280 x 190 x 130 280 x 280 x 130 340 x 280 x 130 380 x 190 x 180 380 x 280 x 180 560 x 280 x 130 560 x 380 x 180	Available in 6 sizes (Height x Width x Depth) 90 x 70 x 50 165 x 85 x 50 130 x 80 x 85 180 x 80 x 85 250 x 80 x 85 190 x 190 x 130	Available in 4 sizes (Height x Width x Depth) 1-Hole (22.5 mm): 110 x 80 x 85 1-Hole (30.5 mm): 110 x 80 x 70 2-Hole: 130 x 80 x 85 3-Hole: 180 x 80 x 85 4-Hole: 250 x 80 x 85
Degree of Protection	Type 1, 3R, 4, 4X, 12, 13 IP66 Indoor/Outdoor	Type 1, 3R, 4, 4X, 12, 13 IP66 Indoor/Outdoor	Type 1, 4, 4X, 12, 13 IP66 Indoor/Outdoor
Storage Temperature Range	-40...+75 °C (-40...+158 °F)	-40...+75 °C (-40...+158 °F)	-40...+75 °C (-40...+158 °F)
Operating Temperature Range	-40...+55 °C (-40...+131 °F)	-40...+55 °C (-40...+131 °F)	-40...+55 °C (-40...+131 °F)
Material			
Enclosure	Thermoplastic polyester blend, UL94-5VA	Thermoplastic polyester blend, UL94-5VA	Thermoplastic polyester blend, UL94-5VA
Gasket	Foam-in-place polyurethane	Foam-in-place polyurethane	Foam-in-place polyurethane
Plastic Mounting Panel	ABS	ABS	—
Metal Mounting Panel	Steel plus zinc with chromate plating	Steel plus zinc with chromate plating	—
Standards	UL 508A and CSA C22.2, No. 14		
Certifications	cULus, CE		
Product Selection	Page 1-245	Page 1-250	Page 1-254 (22.5 mm) Page 1-256 (30.5 mm)

Bulletin	598
Description	Allen-Bradley NEMA Replacement Metal Enclosure
Features	Designed for the Bulletin 500, 509, 520 non-combination starters and the Bulletin 502, 503, 506, 507, 512, 513, 522, and 523 combination starters.
Degree of Protection	Type 1, 3R, 4, 4X, 12, 13 Indoor/Outdoor
Product Selection	Page 1-263





Bulletin 598 — General Purpose Enclosures

- Type 3R, 4, 4X, 12, and 13 rainproof, watertight, corrosion resistant, and dusttight, IP66 protection
- Designed for use as automation control box, electrical control housing, and terminal wiring box in industrial and commercial applications
- Available with optional plastic or metal mounting plates
- Provision for mounting using either AB or DIN Rail
- Enclosure can accommodate both panel mount and rail mount terminal blocks
- Designed for use in both indoor and outdoor applications

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Standards Compliance

UL 508A
 CSA C22.2, No. 14

Certifications

cULus Listed (File No. E54866;
 Guide No. NITW, NITW7)
 CE Marked

Technical Specifications

Product Certification	
Approvals/Certifications	cULus, CE
Degree of Protection	Type 3R, 4, 4X, 12, and 13, IP66
Environmental	
Storage Temperature Range	-40...+75 °C (-40...+158 °F)
Operating Temperature Range	-40...+55 °C (-40...+131 °F)
Material	
Enclosure — Solid Base & Cover	Thermoplastic polyester blend, UL 94 5VA
Enclosure — Clear Cover	Polycarbonate, UL 94 5VA
Gasket	Foam-in-place polyurethane
Plastic Mounting Plate	ABS
Metal Mounting Plate	Steel plus zinc with chromate plating
Mounting Plate Hardware (included with enclosure)	Stainless Steel
Mounting Provision	Brass
External Mounting Bracket	Stainless Steel
Hinges & Latches	Stainless Steel

Note: In applications where there is shock and vibration, use of a metal mounting plate is recommended.

General Purpose Enclosures

Product Selection

1



Cat. No. 598-BS533



Cat. No. 598-BS733



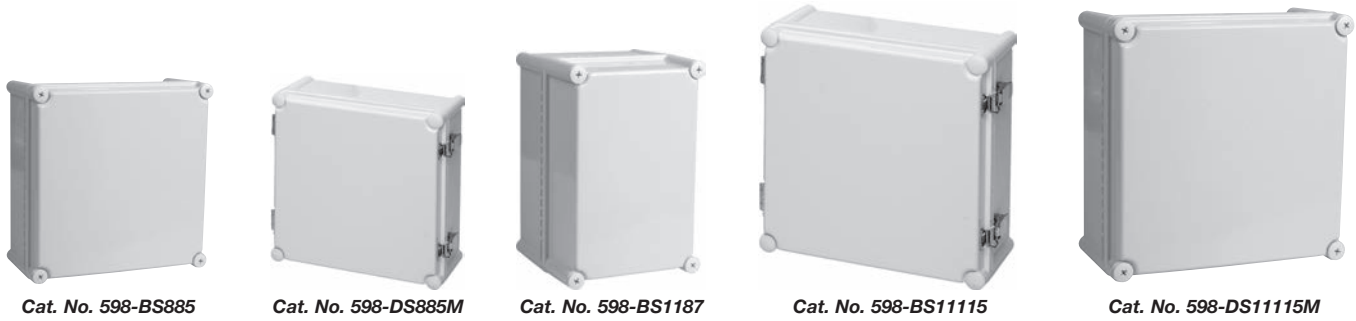
Cat. No. 598-BS933







Enclosure	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
	598-BS533	1	598-BS733	1	598-BS933	1
Outside Dimensions* (H x W x D)	130 x 80 x 85 mm (5.12 x 3.15 x 3.35 in.)		180 x 80 x 85 mm (7.09 x 3.15 x 3.35 in.)		250 x 80 x 85 mm (9.84 x 3.15 x 3.35 in.)	
Base Depth	50 mm (1.97 in.)		50 mm (1.97 in.)		50 mm (1.97 in.)	
Cover Depth	35 mm (1.38 in.)		35 mm (1.38 in.)		35 mm (1.38 in.)	
Cover Screw Material	Glass-reinforced nylon		Glass-reinforced nylon		Glass-reinforced nylon	
Recommended Tightening Torque	1.0...1.2 N•m (9...11 lb•in)		1.0...1.2 N•m (9...11 lb•in)		1.0...1.2 N•m (9...11 lb•in)	
Approx. Ship Weight	271 g (0.60 lb)		357 g (0.79 lb)		435 g (0.96 lb)	
Plastic Mounting Plate	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
	598-PP53	1	598-PP73	1	598-PP93	1
Outside Dimension* (H x W x Thickness)	116 x 68 x 3.5 mm (4.57 x 2.68 x 0.14 in.)		165.5 x 68 x 3.5 mm (6.52 x 2.68 x 0.14 in.)		235 x 68 x 3.5 mm (9.25 x 2.68 x 0.14 in.)	
Recommended hardware for installing components	M4 (#8)		M4 (#8)		M4 (#8)	
Approx. Ship Weight	22.4 g (0.05 lb)		32.0 g (0.07 lb)		45.9 g (0.10 lb)	
Metal Mounting Plate	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
	598-PM53	1	598-PM73	1	598-PM93	1
Outside Dimension* (H x W x Thickness)	116 x 68 x 1.6 mm (4.57 x 2.68 x 0.06 in.)		165.5 x 68 x 1.6 mm (6.52 x 2.68 x 0.06 in.)		235 x 68 x 1.6 mm (9.25 x 2.68 x 0.06 in.)	
Approx. Ship Weight	85.8 g (0.19 lb)		124.8 g (0.28 lb)		181 g (0.40 lb)	

Note: In applications where there is shock and vibration, use of metal mounting plate is recommended.

* Dimensions are not intended to be used for manufacturing purposes.





Enclosure	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
Lift-Off Solid Cover	598-BS885	1	598-BS1187	1	598-BS11115	1
Lift-Off Clear Cover*	598-BS885C		598-BS1187C		598-BS11115C	
Hinged Solid Cover	598-DS885M		598-DS1187M		598-DS11115M	
Hinged Clear Cover*	598-DS885CM		598-DS1187CM		598-DS11115CM	
Outside Dimensions* (H x W x D)	190 x 190 x 130 mm (7.48 x 7.48 x 5.12 in.)		280 x 190 x 180 mm (11.02 x 7.48 x 7.09 in.)		280 x 280 x 130 mm (11.02 x 11.02 x 5.12 in.)	
Base Depth	98 mm (3.86 in.)		98 mm (3.86 in.)		98 mm (3.86 in.)	
Cover Depth	30 mm (1.18 in.)		30 mm (1.18 in.)		30 mm (1.18 in.)	
Cover Screw Material	Glass-reinforced nylon		Glass-reinforced nylon		Glass-reinforced nylon	
Cover Plug Material (for hinged enclosures only)	Polypropylene		Polypropylene		Polypropylene	
Recommended Tightening Torque	1.2...1.7 N•m (11...15 lb•in)		1.2...1.7 N•m (11...15 lb•in)		1.2...1.7 N•m (11...15 lb•in)	
Approx. Ship Weight	801.6 g (1.77 lb)		1261 g (2.78 lb)		1308 g (2.88 lb)	
						
Plastic Mounting Plate	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
	598-PP88	1	598-PP118	1	598-PP1111	1
Outside Dimension* (H x W x Thickness)	160 x 160 x 4 mm (6.3 x 6.3 x 0.16 in.)		252 x 161 x 3.4 mm (9.92 x 6.34 x 0.13 in.)		267 x 267 x 3.4 mm (10.51 x 10.51 x 0.13 in.)	
Thickness at support bracket	12 mm (0.47 in.)		12 mm (0.47 in.)		12 mm (0.47 in.)	
Recommended hardware for installing components	M4 (#8)		M5 (#10)		M5 (#10)	
Approx. Ship Weight	98.5 g (0.22 lb)		124.4 g (0.27 lb)		206.4 g (0.46 lb)	
						
Metal Mounting Plate	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
	598-PM88	1	598-PM118	1	598-PM1111	1
Outside Dimension* (H x W x Thickness)	161 x 161 x 1.6 mm (6.34 x 6.34 x 0.06 in.)		251.5 x 161 x 1.6 mm (9.9 x 6.34 x 0.06 in.)		251 x 251 x 1.6 mm (9.88 x 9.88 x 0.06 in.)	
Approx. Ship Weight	319.3 g (0.70 lb)		500.9 g (1.10 lb)		748.5 g (1.65 lb)	
Stainless Steel External Mounting Bracket Kit (4 brackets and 4 mounting hardware sets per kit)	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
	598-N13	1	598-N13	1	598-N13	1
Approx. Ship Weight	92.5 g (0.20 lb)		92.5 g (0.20 lb)		92.5 g (0.20 lb)	
Stainless Steel Hinge & Latch Kit	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
	598-NHL22M	1	598-NHL22M	1	598-NHL22M	1
Number of Kits to Convert Lift-Off to Hinged	1		1		1	
Approx. Ship Weight	165 g (0.36 lb)		165 g (0.36 lb)		165 g (0.36 lb)	

Note: In applications where there is shock and vibration, use of metal mounting plate is recommended.

* Clear cover material: polycarbonate.

* Dimensions are not intended to be used for manufacturing purposes.

General Purpose Enclosures

Product Selection

1



Enclosure	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
Lift-Off Solid Cover	598-BS13115	1	598-BS1587	1	598-BS15117	1
Lift-Off Clear Cover*	598-BS13115C		598-BS1587C		598-BS15117C	
Hinged Solid Cover	598-DS13115M		598-DS1587M		598-DS15117M	
Hinged Clear Cover*	598-DS13115CM		598-DS1587CM		598-DS15117CM	
Outside Dimensions* (H x W x D)	341x 280 x 130 mm (13.43 x 11.02 x 5.12 in.)		382 x 192 x 180 mm (15.04 x 7.56 x 7.09 in.)		380 x 280 x 180 mm (14.96 x 11.02 x 7.09 in.)	
Base Depth	100 mm (3.94 in.)		98 mm (3.86 in.)		98 mm (3.86 in.)	
Cover Depth	30 mm (1.18 in.)		80 mm (3.15 in.)		80 mm (3.15 in.)	
Cover Screw Material	Glass-reinforced nylon		Glass-reinforced nylon		Glass-reinforced nylon	
Cover Plug Material (for hinged enclosures only)	Polypropylene		Polypropylene		Polypropylene	
Recommended Tightening Torque	1.2...1.7 N•m (11...15 lb•in)		1.2...1.7 N•m (11...15 lb•in)		1.2...1.7 N•m (11...15 lb•in)	
Approx. Ship Weight	1643 g (3.62 lb)		1685 g (3.71 lb)		2069 g (4.56 lb)	
Plastic Mounting Plate	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
	598-PP1311	1	598-PP158	1	598-PP1511	1
Outside Dimension* (H x W x Thickness)	300 x 240 x 4 mm (11.81 x 9.45 x 0.16 in.)		335 x 155 x 4 mm (13.19 x 6.10 x 0.16 in.)		351 x 251 x 4.3 mm (13.82 x 9.88 x 0.17 in.)	
Thickness at support bracket	12 mm (0.47 in.)		12 mm (0.47 in.)		12 mm (0.47 in.)	
Recommended hardware for installing components	M4 (#8)		M4 (#8)		M4 (#8)	
Approx. Ship Weight	268.8 g (0.59 lb)		194.2 g (0.43 lb)		333.1 g (0.73 lb)	
Metal Mounting Plate	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
	598-PM1311	1	598-PM158	1	598-PM1511	1
Outside Dimension* (H x W x Thickness)	312 x 251 x 1.6 mm (12.28 x 9.88 x 0.06 in.)		352.5 x 161 x 1.6 mm (13.88 x 6.34 x 0.06 in.)		351 x 251 x 1.6 mm (13.82 x 9.88 x 0.06 in.)	
Approx. Ship Weight	955.5 g (2.11 lb)		710.1 g (1.57 lb)		1089.8 g (2.40 lb)	
Stainless Steel External Mounting Bracket Kit (4 brackets and 4 mounting hardware sets per kit)	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
	598-N13	1	598-N13	1	598-N13	1
Approx. Ship Weight	92.5 g (0.20 lb)		92.5 g (0.20 lb)		92.5 g (0.20 lb)	
Stainless Steel Hinge & Latch Kit	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
	598-NHL22M	1	598-NHL22M	1	598-NHL22M	1
Number of Kits to Convert Lift-Off to Hinged	1		1		1	
Approx. Ship Weight	165 g (0.36 lb)		165 g (0.36 lb)		165 g (0.36 lb)	

Note: In applications where there is shock and vibration, use of metal mounting plate is recommended.

* Clear cover material: polycarbonate.

* Dimensions are not intended to be used for manufacturing purposes.






Cat. No. 598-BS22115



Cat. No. 598-BS22157



Cat. No. 598-DS22157CM

Enclosure	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
Lift-Off Solid Cover	598-BS22115	1	598-BS22157	1
Lift-Off Clear Cover*	598-BS22115C		598-BS22157C	
Hinged Solid Cover	598-DS22115M		598-DS22157M	
Hinged Clear Cover*	598-DS22115CM		598-DS22157CM	
Outside Dimensions† (H x W x D)	560 mm x 280 mm x 130 mm (22.05 in. x 11.02 in. x 5.12 in.)		560 mm x 380 mm x 180 mm (22.05 in. x 14.96 in. x 7.09 in.)	
Base Depth	98 mm (3.86 in.)		148 mm (5.83 in.)	
Cover Depth	30 mm (1.18 in.)		30 mm (1.18 in.)	
Cover Screw Material	Glass-reinforced nylon		Glass-reinforced nylon	
Cover Plug Material (for hinged enclosures only)	Polypropylene		Polypropylene	
Recommended Tightening Torque	1.2...1.7 N•m (11...15 lb•in)		1.2...1.7 N•m (11...15 lb•in)	
Approx. Ship Weight	2622 g (5.78 lb)		4327 g (9.54 lb)	
				
Plastic Mounting Plate	Cat. No.	Pkg. Quantity	Cat. No.*	Pkg. Quantity
	—	—	598-PP1511	1
Outside Dimension† (H x W x Thickness)	—		351 x 251x 4.3 mm (13.82 x 9.88 x 0.17 in.)	
Thickness at support bracket	—		12 mm (0.47 in.)	
Recommended hardware for installing components	—		M4 (#8)	
Approx. Ship Weight	—		333.1 g (0.73 lb)	
				
Metal Mounting Plate	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
	598-PM2211	1	598-PM2215	1
Outside Dimension† (H x W x Thickness)	532 mm x 254.5 mm x 1.6 mm (20.94 in. x 10.02 in. x 0.06 in.)		532 mm x 354.5 mm x 1.6 mm (20.94 in. x 13.6 in. x 0.06 in.)	
Approx. Ship Weight	1712 g (3.77 lb)		2332 g (5.14 lb)	
Stainless Steel External Mounting Bracket Kit (4 brackets and 4 mounting hardware sets per kit)	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
	598-N13	1	598-N13	1
Approx. Shipping Weight	92.5 g (0.20 lb)		92.5 g (0.20 lb)	
Stainless Steel Hinge & Latch Kit	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
	598-NHL22M	1	598-NHL22M	1
Number of Kits to Convert Lift-Off to Hinged	2		2	
Approx. Ship Weight	165 g (0.36 lb)		165 g (0.36 lb)	

* Clear cover material: polycarbonate.

* Must order two pieces for this enclosure.

† Dimensions are not intended to be used for manufacturing purposes.



Bulletin 598 — Junction Box

- Type 3R, 4, 4X, 12, and 13 rainproof, watertight, corrosion resistant, and dusttight, IP66 protection
- Designed for use as a junction box, terminal wiring box, and small automation control box in industrial and commercial applications
- Available with optional plastic or metal mounting plates
- Provision for mounting using either AB or DIN Rail
- Enclosure can accommodate panel mount or rail mount terminal blocks
- Designed for use in both indoor and outdoor applications

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 Accessories..... 1-253
 Approximate
 Dimensions..... 1-258

Standards Compliance

UL 508A
 CSA C22.2, No. 14

Certifications

cULus Listed (File No. E54866;
 Guide No. NITW, NITW7)
 CE Marked

Technical Specifications

Product Certification	
Approvals/Certifications	cULus, CE
Degree of Protection	Type 3R, 4, 4X, 12, and 13, IP66
Environmental	
Storage Temperature Range	-40...+75 °C (-40...+158 °F)
Operating Temperature Range	-40...+55 °C (-40...+131 °F)
Material	
Enclosure	Thermoplastic polyester blend, UL 94, 5VA
Gasket	Foam-in-place polyurethane
Plastic Mounting Plate	ABS
Metal Mounting Plate	Steel plus zinc with chromate plating
Mounting Plate Hardware (included with enclosure)	Stainless steel
Mounting Provision	Brass
External Mounting Bracket	Stainless steel

Note: In applications where there is shock and vibration, use of metal mounting plate is recommended.

Product Selection



Cat. No. 598-BS332



Cat. No. 598-BS632



Cat. No. 598-BS533

1

Enclosure	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
	598-BS332	1	598-BS632	1	598-BS533	1
Outside Dimensions* (H x W x D)	90 x 70 x 51.5 mm (3.54 x 2.76 x 2.03 in.)		165 x 85 x 51.5 mm (6.5 x 3.35 x 2.03 in.)		130 x 80 x 85 mm (5.12 x 3.15 x 3.35 in.)	
Base Depth	45 mm (1.77 in.)		45 mm (1.77 in.)		50 mm (1.97 in.)	
Cover Depth	6.5 mm (0.26 in.)		6.5 mm (0.26 in.)		35 mm (1.38 in.)	
Cover Screw Material	Stainless steel		Stainless steel		Glass-reinforced nylon	
Recommended Tightening Torque	0.8...1.0 N•m (7...9 lb•in)		0.8...1.0 N•m (7...9 lb•in)		1.0...1.2 N•m (9...11 lb•in)	
Approx. Ship Weight	103 g (0.23 lb)		189 g (0.42 lb)		271 g (0.60 lb)	
Plastic Mounting Plate	Molded-In		Molded-In		Cat. No.	Pkg. Quantity
Outside Dimension* (H x W x Thickness)	64.5 mm x 51.5 mm x 4.9 mm (2.54 in. x 2.03 in. x 0.19 in.)		139.5 mm x 62.5 mm x 4.9 mm (5.49 in. x 2.46 in. x 0.19 in.)		598-PP53	1
Recommended hardware for installing components	M4 (#8)		M4 (#8)		M4 (#8)	
Approx. Ship Weight	—		—		22.4 g (0.05 lb)	
	Not Available		Not Available			
Metal Mounting Plate					Cat. No.	Pkg. Quantity
Outside Dimension (H x W x Thickness)					598-PM53	1
Approx. Ship Weight					116 x 68 x 1.6 mm (4.57 x 2.68 x 0.06 in.) 85.8 g (0.19 lb)	

Note: In applications where there is shock and vibration, use of metal mounting plate is recommended.
 * Dimensions are not intended to be used for manufacturing purposes.

Bulletin 598
Junction Boxes
 Product Selection

1



Cat. No. 598-BS733



Cat. No. 598-BS933



Cat. No. 598-BS885

Enclosure	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity	Cat. No.*	Pkg. Quantity
	598-BS733	1	598-BS933	1	598-BS885	1
Outside Dimensions* (H x W x D)	180 x 80 x 85 mm (7.09 x 3.15 x 3.35 in.)		250 x 80 x 85 mm (9.84 x 3.15 x 3.35 in.)		190 x 190 x 130 mm (7.48 x 7.48 x 5.12 in.)	
Base Depth	50 mm (1.97 in.)		50 mm (1.97 in.)		98 mm (3.86 in.)	
Cover Depth	35 mm (1.38 in.)		35 mm (1.38 in.)		30 mm (1.18 in.)	
Cover Screw Material	Glass-reinforced nylon		Glass-reinforced nylon		Glass-reinforced nylon	
Recommended Tightening Torque	1.0...1.2 N•m (9...11 lb•in)		1.0...1.2 N•m (9...11 lb•in)		1.2...1.7 N•m (11...15 lb•in)	
Approx. Ship Weight	357 g (0.79 lb)		435 g (0.96 lb)		801.6 g (1.77 lb)	
Plastic Mounting Plate	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
	598-PP73	1	598-PP93	1	598-PP88	1
Outside Dimension* (H x W x Thickness)	165.5 x 68 x 3.5 mm (6.52 x 2.68 x 0.14 in.)		235 x 68 x 3.5 mm (9.25 x 2.68 x 0.14 in.)		160 x 160 x 4 mm (6.3 x 6.3 x 0.16 in.)	
Recommended hardware for installing components	M4 (#8)		M4 (#8)		M4 (#8)	
Approx. Ship Weight	32.0 g (0.07 lb)		45.9 g (0.10 lb)		98.5 g (0.22 lb)	
Metal Mounting Plate	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
	598-PM73	1	598-PM93	1	598-PM88	1
Outside Dimension* (H x W x Thickness)	165.5 x 68 x 1.6 mm (6.52 x 2.68 x 0.06 in.)		235 x 68 x 1.6 mm (9.25 x 2.68 x 0.06 in.)		161 x 161 x 1.6 mm (6.34 x 6.34 x 0.06 in.)	
Approx. Ship Weight	124.8 g (0.28 lb)		181 g (0.40 lb)		319.3 g (0.70 lb)	












Note: In applications where there is shock and vibration, use of metal mounting plate is recommended.

* Dimensions are not intended to be used for manufacturing purposes.

* For Cat. No. 598-BS885 clear & hinged covers, see page 1-247.

Terminal Block Compatibility

Note: The table below lists suggested types of terminal blocks suitable for mounting on the plastic grid in the junction box. Items in table are not pre-assembled and are sold separately.

		598-BS332	598-BS632	598-BS533	598-BS733	598-BS933	598-BS885
Junction Box							
	Mounting Options for use with Panel Mount Terminal Blocks	Molded-In	Molded-In	598-PP53	598-PP73	598-PP93	598-PP88
Types of Terminal Blocks Suitable for Mounting on Plastic Grid in Junction Box		Maximum Number of Poles (Approximation)					
Panel Mount Blocks with predefined set of poles	 Barrier Strips ⚙️	2	8	4	8	12	12
	 1492-EC85 & 1492-ED103	—	—	5	5	5	5
	 1492-HC6	—	—	6	6	6	6
	 1492-HJ86 & 1492-HJ812	—	12	6	12	12	12
Panel Mount Interlocking Blocks	 1492-15T & 1492-25T	2	6	4	7	12	7
		—	5	3	5	8	6
Rail Mount Terminal Blocks*	1492-C...	—	—	7	12	18	14
	1492-F...	—	—	7	12	18	14
	1492-H...	—	—	14	24	36	28
	1492-W...	—	—	14	24	36	28
	1492-J...	—	—	14	24	36	28
	1492-L...	—	—	14	24	36	28

* Requires AB or DIN Rail for mounting

⚙️ For barrier strip with typical 0.563 in. pitch spacings.



22.5 mm Push Button Enclosures Specifications

1



Bulletin 598 — 22.5 mm Push Button Enclosure

- Pre-molded 22.5 mm mounting hole
- Available in two colors:
 - Grey enclosures: Type 4, 4X, 12, and 13 watertight, corrosion resistant, and dusttight, IP66 protection
 - Yellow enclosures: Type 4, 4X, 12, and 13 watertight, corrosion resistant, and dusttight, IP66 protection
- Available in these configurations:
 - 1-hole
 - 2-hole
 - 3-hole
 - 4-hole
- Designed for both indoor and outdoor applications

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Standards Compliance

UL 508A
 CSA C22.2, No. 14

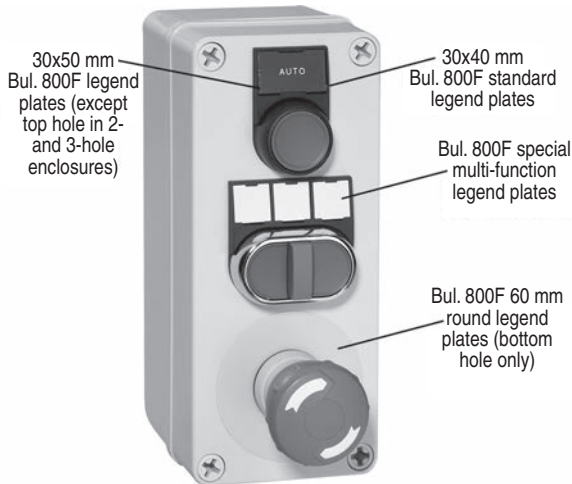
Certifications

cULus Listed (File No. E54866;
 Guide No. NITW, NITW7)
 CE Marked

Technical Specifications

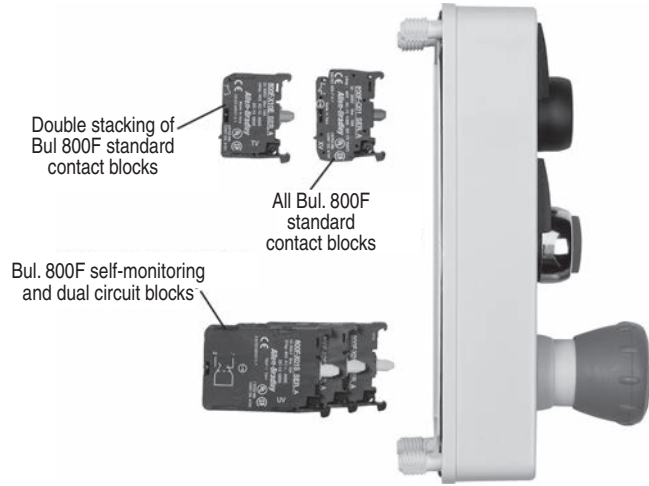
Product Certification	
Approvals/Certifications	cULus, CE
Degree of Protection	Type 4, 4X, 12, and 13, IP66
Environmental	
Storage Temperature Range	-40...+75 °C (-40...+158 °F)
Operating Temperature Range	-40...+55 °C (-40...+131 °F)
Material	
Enclosure	Thermoplastic polyester blend, UL94 5VA
Gasket	Foam-in-place polyurethane

Legend Plate Compatibility/Options



22.5 mm Push Button Enclosure

Contact Block Compatibility/Options



22.5 mm Push Button Enclosure

Note: Pictures are for illustrative purposes only, depicting suitable legend plates and contact blocks that would fit in and on the Bul. 598/800H push button plastic enclosure. Please reference the appropriate selection guides for more dimensional information.

22.5 mm Push Button Enclosures

Product Selection



Cat. No. 598-1PB22



Cat. No. 598-2PB22

Enclosure	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
Grey Enclosure	598-1PB22G	1	598-2PB22G	1
Yellow Enclosure	598-1PB22Y		598-2PB22Y	
Outside Dimensions* (H x W x D)	110 mm x 80 mm x 85 mm (4.33 in. x 3.15 in. x 3.35 in.)		130 mm x 80 mm x 85 mm (5.12 in. x 3.15 in. x 3.35 in.)	
Base Depth	50 mm (1.97 in.)		50 mm (1.97 in.)	
Cover Depth	35 mm (1.38 in.)		35 mm (1.38 in.)	
Cover Screw Material	Glass-reinforced nylon		Glass-reinforced nylon	
Recommended Tightening Torque	1.0...1.2 N•m (9...11 lb•in)		1.0...1.2 N•m (9...11 lb•in)	
Approx. Ship Weight	232 g (0.51 lb)		271 g (0.60 lb)	



Cat. No. 598-3PB22



Cat. No. 598-4PB22

Enclosure	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
Grey Enclosure	598-3PB22G	1	598-4PB22G	1
Yellow Enclosure	598-3PB22Y		598-4PB22Y	
Outside Dimensions* (H x W x D)	180 mm x 80 mm x 85 mm (7.09 in. x 3.15 in. x 3.35 in.)		250 mm x 80 mm x 85 mm (9.84 in. x 3.15 in. x 3.35 in.)	
Base Depth	50 mm (1.97 in.)		50 mm (1.97 in.)	
Cover Depth	35 mm (1.38 in.)		35 mm (1.38 in.)	
Cover Screw Material	Glass-reinforced nylon		Glass-reinforced nylon	
Recommended Tightening Torque	1.0...1.2 N•m (9...11 lb•in)		1.0...1.2 N•m (9...11 lb•in)	
Approx. Ship Weight	357 g (0.79 lb)		435 g (0.96 lb)	

Note: Holes are pre-molded to fit 22.5 mm push buttons, such as the Allen-Bradley Bulletin 800F.

* Dimensions are not intended to be used for manufacturing purposes.

For information on legend plates and contact blocks, see Legend Plate Compatibility/Options and Contact Block Compatibility/Options on page 1-256.

30.5 mm Push Button Enclosures

Specifications

1



Bulletin 800H — 30.5 mm Push Button Enclosures

- Pre-molded 30.5 mm mounting hole
- Available in two colors:
 - Grey enclosures: Type 4, 4X, 12, and 13 watertight, corrosion resistant, and dusttight, IP66 protection
 - Yellow enclosures: Type 4, 4X, 12, and 13 watertight, corrosion resistant, and dusttight, IP66 protection
- Available in these configurations:
 - 1-hole
 - 2-hole
 - 3-hole
 - 4-hole
- Designed for both indoor and outdoor applications.

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Standards Compliance

UL 508A
 CSA C22.2, No. 14

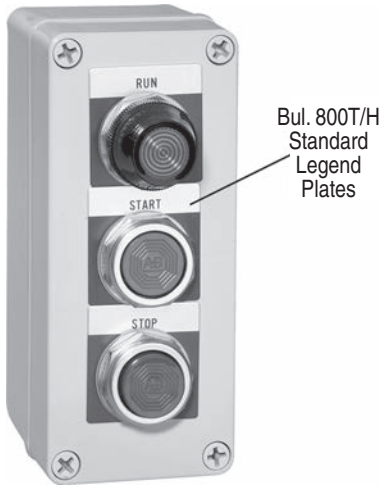
Certifications

cULus Listed (File No. E54866;
 Guide No. NITW, NITW7)
 CE Marked

Technical Specifications

Product Certification	
Approvals/Certifications	cULus, CE
Degree of Protection	Type 4, 4X, 12, and 13, IP66
Environmental	
Storage Temperature Range	-40...+75 °C (-40...+158 °F)
Operating Temperature Range	-40...+55 °C (-40...+131 °F)
Material	
Enclosure	Thermoplastic polyester blend, UL 94, 5VA
Gasket	Foam-in-place polyurethane

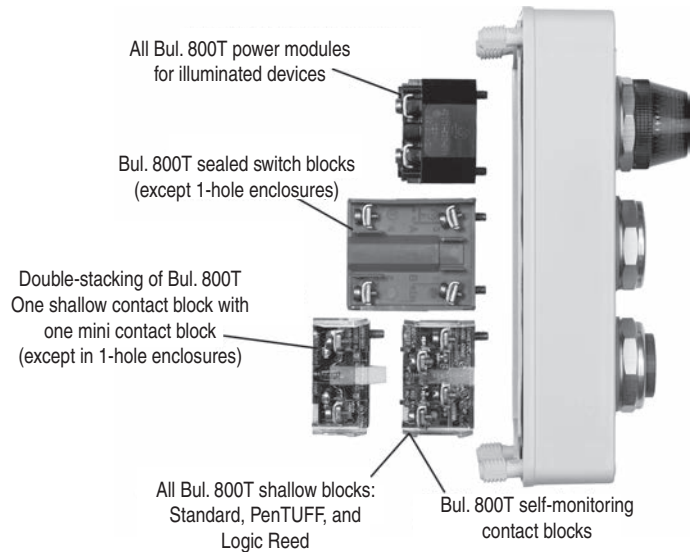
Legend Plate Compatibility/Options



Bul. 800T/H Standard Legend Plates

30.5 mm Push Button Enclosure

Contact Block Compatibility/Options



All Bul. 800T power modules for illuminated devices

Bul. 800T sealed switch blocks (except 1-hole enclosures)

Double-stacking of Bul. 800T
 One shallow contact block with one mini contact block (except in 1-hole enclosures)

All Bul. 800T shallow blocks: Standard, PentUFF, and Logic Reed

Bul. 800T self-monitoring contact blocks

30.5 mm Push Button Enclosure

Note: Pictures are for illustrative purposes only, depicting suitable legend plates and contact blocks that would fit in and on the Bul. 598/800H push button plastic enclosure. Please reference the appropriate selection guides for more dimensional information.

Product Selection



Cat. No. 800H-1HZ4



Cat. No. 800H-2HZ4



Enclosure	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
Grey Enclosure	800H-1HZ4C	1	800H-2HZ4C	1
Yellow Enclosure	800H-1HZ4CY		800H-2HZ4CY	
Outside Dimensions* (H x W x D)	110 mm x 80 mm x 70 mm (4.33 in. x 3.15 in. x 2.76 in.)		130 mm x 80 mm x 85 mm (5.12 in. x 3.15 in. x 3.35 in.)	
Base Depth	50 mm (1.97 in.)		50 mm (1.97 in.)	
Cover Depth	20 mm (0.79 in.)		35 mm (1.38 in.)	
Cover Screw Material	Glass-reinforced nylon		Glass-reinforced nylon	
Recommended Tightening Torque	1.0...1.2 N•m (9...11 lb•in)		1.0...1.2 N•m (9...11 lb•in)	
Approx. Ship Weight	213 g (0.47 lb)		271 g (0.60 lb)	



Cat. No. 800H-3HZ4



Cat. No. 800H-4HZ4

Enclosure	Cat. No.	Pkg. Quantity	Cat. No.	Pkg. Quantity
Gray Enclosure	800H-3HZ4C	1	800H-4HZ4C	1
Yellow Enclosure	800H-3HZ4CY		800H-4HZ4CY	
Outside Dimensions* (H x W x D)	180 mm x 80 mm x 85 mm (7.09 in. x 3.15 in. x 3.35 in.)		250 mm x 80 mm x 85 mm (9.84 in. x 3.15 in. x 3.35 in.)	
Base Depth	50 mm (1.97 in.)		50 mm (1.97 in.)	
Cover Depth	35 mm (1.38 in.)		35 mm (1.38 in.)	
Cover Screw Material	Glass-reinforced nylon		Glass-reinforced nylon	
Recommended Tightening Torque	1.0...1.2 N•m (9...11 lb•in)		1.0...1.2 N•m (9...11 lb•in)	
Approx. Ship Weight	357 g (0.79 lb)		435 g (0.96 lb)	

Note: Holes are pre-molded to fit 30.5 mm push buttons, such as the Allen-Bradley Bulletin 800T and 800H.

* Dimensions are not intended to be used for manufacturing purposes.

For information on legend plates and contact blocks, see Legend Plate Compatibility/Options and Contact Block Compatibility/Options on page 1-256.

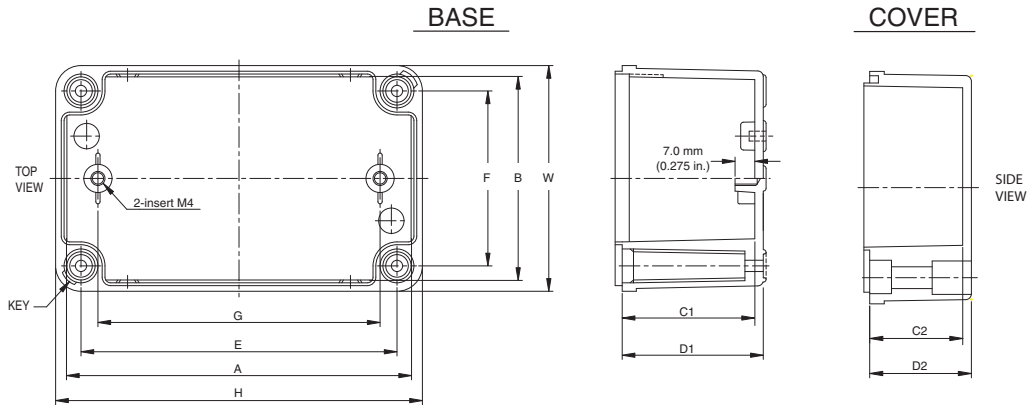
Approximate Dimensions

For General Purpose Enclosures

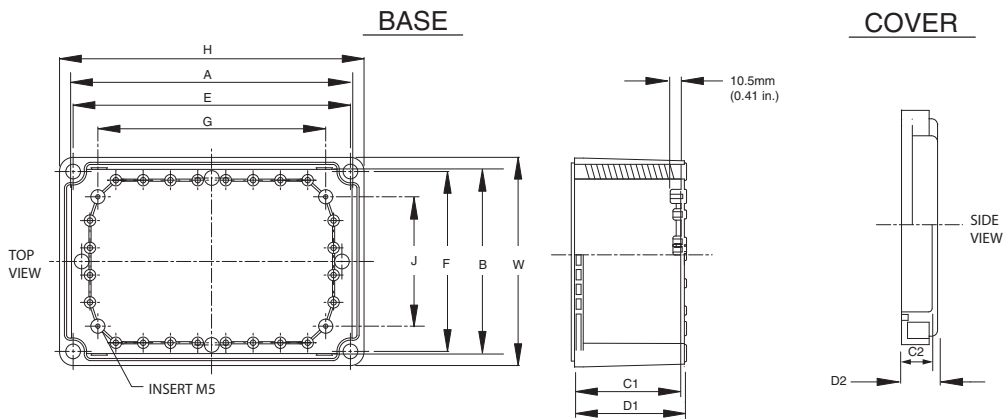
Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

General Purpose Enclosures

1



Cat. No.	Overall Dimension				Inside Dimension				Enclosure Mounting Dimension		Mounting Plate Mounting Dim.
	H	W	D1	D2	A	B	C1	C2	E	F	
598-BS533	130 (5.12)	80 (3.15)	50 (1.97)	35 (1.38)	120 (4.72)	70 (2.76)	46.5 (1.83)	31.5 (1.24)	112 (4.41)	62 (2.44)	100 (3.94)
598-BS733	180 (7.09)	80 (3.15)	50 (1.97)	35 (1.38)	170 (6.69)	70 (2.76)	46.5 (1.83)	31.5 (1.24)	162 (6.38)	62 (2.44)	150 (5.91)
598-BS933	250 (9.84)	80 (3.15)	50 (1.97)	35 (1.38)	240 (9.45)	70 (2.76)	46.5 (1.83)	31.5 (1.24)	232 (9.13)	62 (2.44)	220 (8.66)



Cat. No.	Overall Dimension				Inside Dimension				Enclosure Mounting Dimension		Mounting Plate Mounting Dim.	
	H	W	D1	D2	A	B	C1	C2	E	F	G	J
598-BS885	190	190	98	30	174	174	94	26	165	165	120	120
598-DS885	(7.48)	(7.48)	(3.86)	(1.18)	(6.85)	(6.85)	(3.70)	(1.02)	(6.50)	(6.50)	(4.72)	(4.72)
598-BS1187	280	190	98	80	266	170	94	76	255	165	210	120
598-DS1187	(11.02)	(7.48)	(3.86)	(3.15)	(10.47)	(6.69)	(3.70)	(2.99)	(10.04)	(6.50)	(8.27)	(4.72)
598-BS1587	382	192	98	80	366	172	94	76	355	165	310	120
598-DS1587	(15.04)	(7.56)	(3.86)	(3.15)	(14.41)	(6.77)	(3.70)	(2.99)	(13.98)	(6.50)	(12.20)	(4.72)
598-BS11115	280	280	98	30	260	260	94	26	255	255	210	210
598-DS11115	(11.02)	(11.02)	(3.86)	(1.18)	(10.24)	(10.24)	(3.70)	(1.02)	(10.04)	(10.04)	(8.27)	(8.27)
598-BS13115	341	280	100	30	320	260	96	26	316	256	270	210
598-DS13115	(13.43)	(11.02)	(3.94)	(1.18)	(12.60)	(10.24)	(3.78)	(1.02)	(12.44)	(10.08)	(10.63)	(8.27)
598-BS15117	380	280	98	80	359	259	94	76	355	255	310	210
598-DS15117	(14.96)	(11.02)	(3.86)	(3.15)	(14.13)	(10.20)	(3.70)	(2.99)	(13.98)	(10.04)	(12.20)	(8.27)
598-BS22115	560	280	98	30	540	260	94	26	535	255	490	220
598-DS22115	(22.05)	(11.02)	(3.86)	(1.18)	(21.26)	(10.24)	(3.70)	(1.02)	(21.06)	(10.04)	(19.29)	(8.66)
598-BS22157	560	380	148	30	540	360	144	26	535	355	490	311
598-DS22157	(22.05)	(14.96)	(5.83)	(1.18)	(21.26)	(14.17)	(5.67)	(1.02)	(21.06)	(13.98)	(19.29)	(12.24)

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

General Purpose External Mounting Dimensions for use with External Mounting Bracket

Mounting Bracket

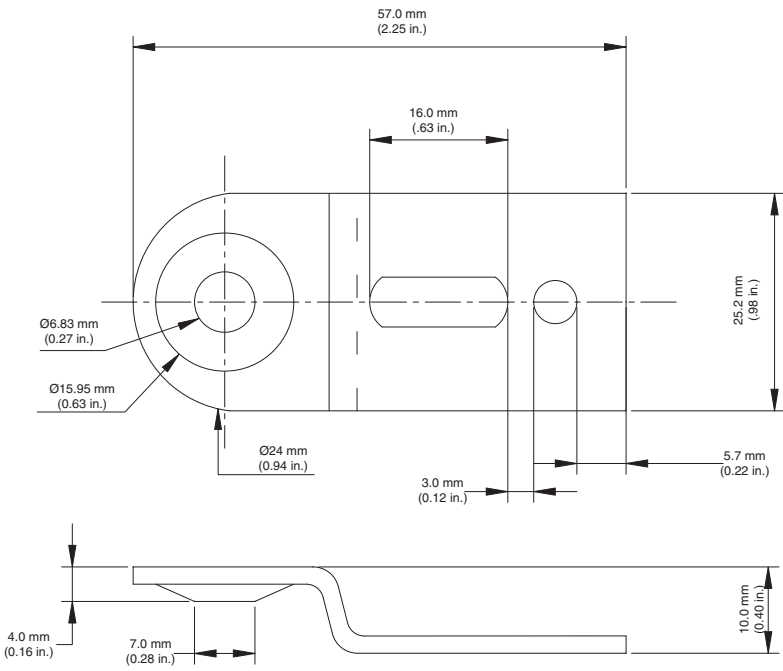


Fig. 1 – Base (Bottom View)

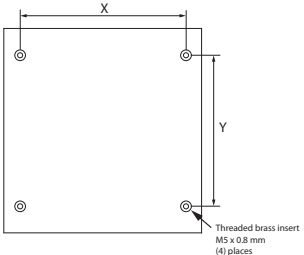


Fig. 2 – Base (Bottom View)

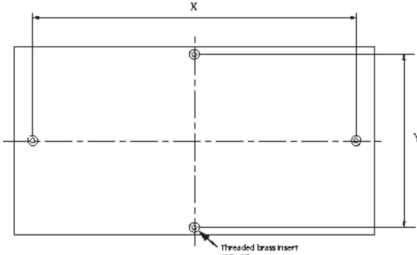


Fig. 3 – Base (Bottom View)

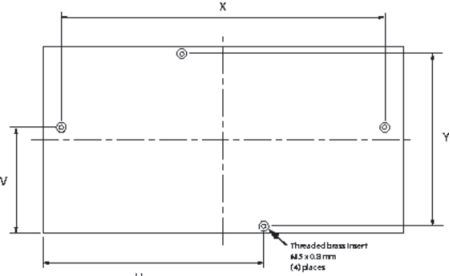
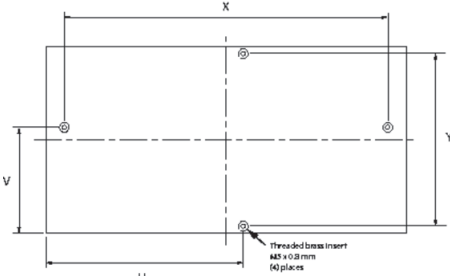


Fig. 4 – Base (Bottom View)



Cat. No.		Figure No.	U	V	X	Y
598-BS885	598-DS885	1	—	—	156 (6.13)	98 (3.88)
598-BS1187	598-DS1187	2	—	—	251 (9.88)	152 (6.00)
598-BS11115	598-DS11115		—	—	238 (9.38)	238 (9.38)
598-BS13115	598-DS13115		—	—	295 (11.63)	235 (9.25)
598-BS1587	598-DS1587		—	—	349 (13.78)	152 (6.00)
598-BS15117	598-DS15117		—	—	340 (13.38)	241 (9.50)
598-BS22115	598-DS22115	3	329 (12.94)	148 (5.81)	519 (20.44)	267 (10.50)
598-BS22157	598-DS22157	4	292 (11.50)	195 (7.69)	519 (20.44)	340 (13.38)



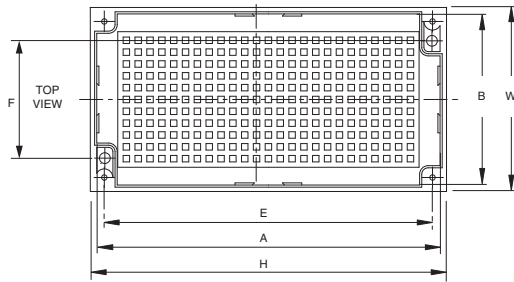
Approximate Dimensions

For Junction Boxes

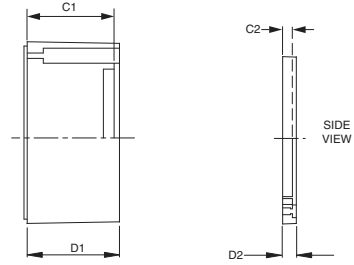
Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Junction Boxes

BASE

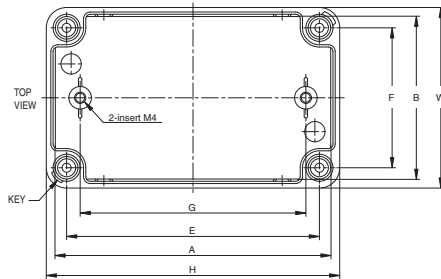


COVER

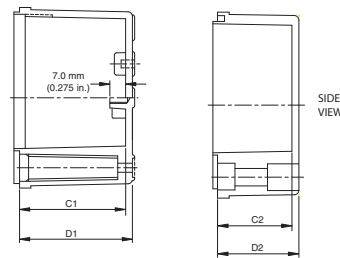


Cat. No.	Overall Dimension				Inside Dimension				Enclosure Mounting Dimension	
	H	W	D1	D2	A	B	C1	C2	E	F
598-BS332	90 (3.54)	70 (2.76)	45 (1.77)	6.5 (0.26)	84 (3.31)	64 (2.52)	42 (1.79)	3.5 (0.14)	78 (3.07)	39 (1.54)
598-BS632	165 (6.50)	85 (3.35)	45 (1.77)	6.5 (0.26)	159 (6.26)	79 (3.11)	42 (1.79)	3.5 (0.14)	153 (6.02)	55 (2.17)

BASE

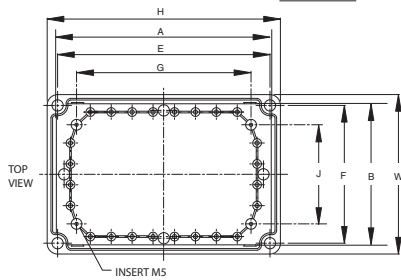


COVER

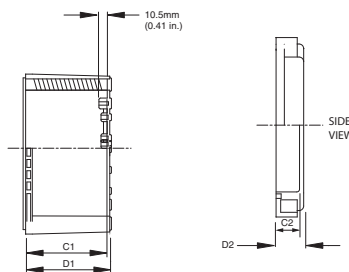


Cat. No.	Overall Dimension				Inside Dimension				Enclosure Mounting Dimension		Mounting Plate Mounting Dim.
	H	W	D1	D2	A	B	C1	C2	E	F	
598-BS533	130 (5.12)	80 (3.15)	50 (1.97)	35 (1.38)	120 (4.72)	70 (2.76)	46.5 (1.83)	31.5 (1.24)	112 (4.41)	62 (2.44)	100 (3.94)
598-BS733	180 (7.09)	80 (3.15)	50 (1.97)	35 (1.38)	170 (6.69)	70 (2.76)	46.5 (1.83)	31.5 (1.24)	162 (6.38)	62 (2.44)	150 (5.91)
598-BS933	250 (9.84)	80 (3.15)	50 (1.97)	35 (1.38)	240 (9.45)	70 (2.76)	46.5 (1.83)	31.5 (1.24)	232 (9.13)	62 (2.44)	220 (8.66)

BASE



COVER



Cat. No.	Overall Dimension				Inside Dimension				Enclosure Mounting Dimension		Mounting Plate Mounting Dim.	
	H	W	D1	D2	A	B	C1	C2	E	F	G	J
598-BS885	190 (7.48)	190 (7.48)	98 (3.86)	30 (1.18)	174 (6.85)	174 (6.85)	94 (3.70)	26 (1.02)	165 (6.50)	165 (6.50)	120 (4.72)	120 (4.72)

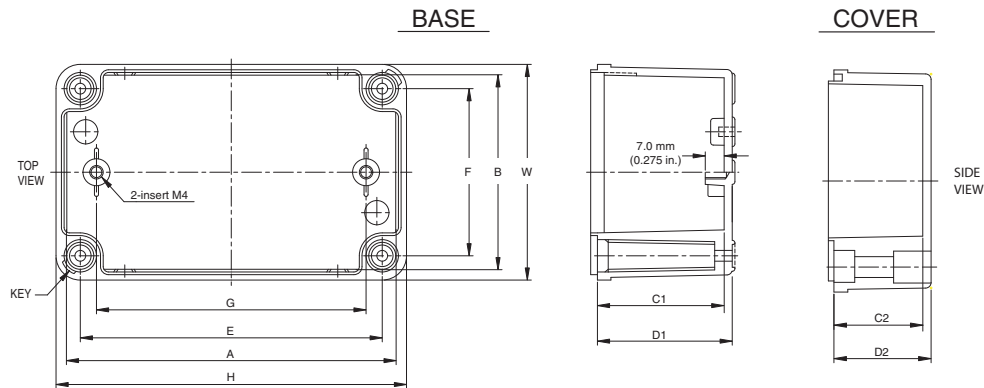


Approximate Dimensions

For 22.5 and 30 mm Push Button Enclosures

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

Push Button Enclosures



1

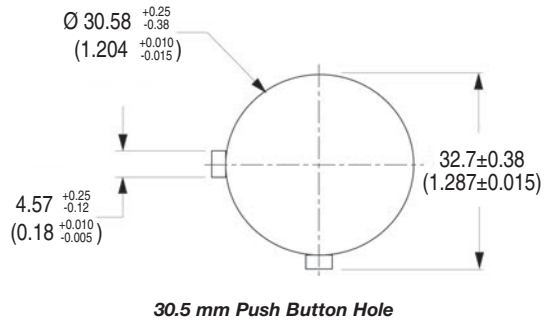
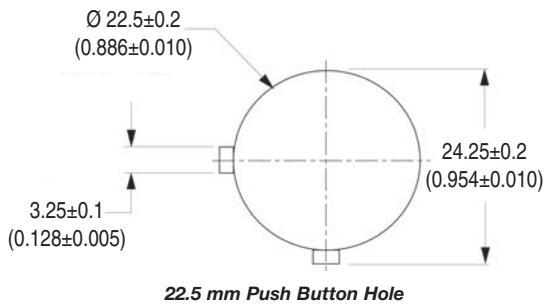
Cat. No.	Overall Dimension				Inside Dimension				Enclosure Mounting Dimension		Mounting Plate Mounting Dim.
	H	W	D1	D2	A	B	C1	C2	E	F	G
22.5 mm Push Button Enclosures											
598-1PB22__	110 (4.33)	80 (3.15)	50 (1.97)	35 (1.38)	104 (4.09)	74 (2.91)	46.5 (1.83)	31.5 (1.24)	92 (3.62)	62 (2.44)	80 (3.15)
598-2PB22__	130 (5.12)	80 (3.15)	50 (1.97)	35 (1.38)	120 (4.72)	70 (2.76)	46.5 (1.83)	31.5 (1.24)	112 (4.41)	62 (2.44)	100 (3.94)
598-3PB22__	180 (7.09)	80 (3.15)	50 (1.97)	35 (1.38)	170 (6.69)	70 (2.76)	46.5 (1.83)	31.5 (1.24)	162 (6.38)	62 (2.44)	150 (5.91)
598-4PB22__	250 (9.84)	80 (3.15)	50 (1.97)	35 (1.38)	240 (9.45)	70 (2.76)	46.5 (1.83)	31.5 (1.24)	232 (9.13)	62 (2.44)	220 (8.66)
30.5 mm Push Button Enclosures											
800H-1HZ4__	110 (4.33)	80 (3.15)	50 (1.97)	20 (0.79)	104 (4.09)	74 (2.91)	46.5 (1.83)	16.5 (0.65)	92 (3.62)	62 (2.44)	80 (3.15)
800H-2HZ4__	130 (5.12)	80 (3.15)	50 (1.97)	35 (1.38)	120 (4.72)	70 (2.76)	46.5 (1.83)	31.5 (1.24)	112 (4.41)	62 (2.44)	100 (3.94)
800H-3HZ4__	180 (7.09)	80 (3.15)	50 (1.97)	35 (1.38)	170 (6.69)	70 (2.76)	46.5 (1.83)	31.5 (1.24)	162 (6.38)	62 (2.44)	150 (5.91)
800H-4HZ4__	250 (9.84)	80 (3.15)	50 (1.97)	35 (1.38)	240 (9.45)	70 (2.76)	46.5 (1.83)	31.5 (1.24)	232 (9.13)	62 (2.44)	220 (8.66)

Approximate Dimensions

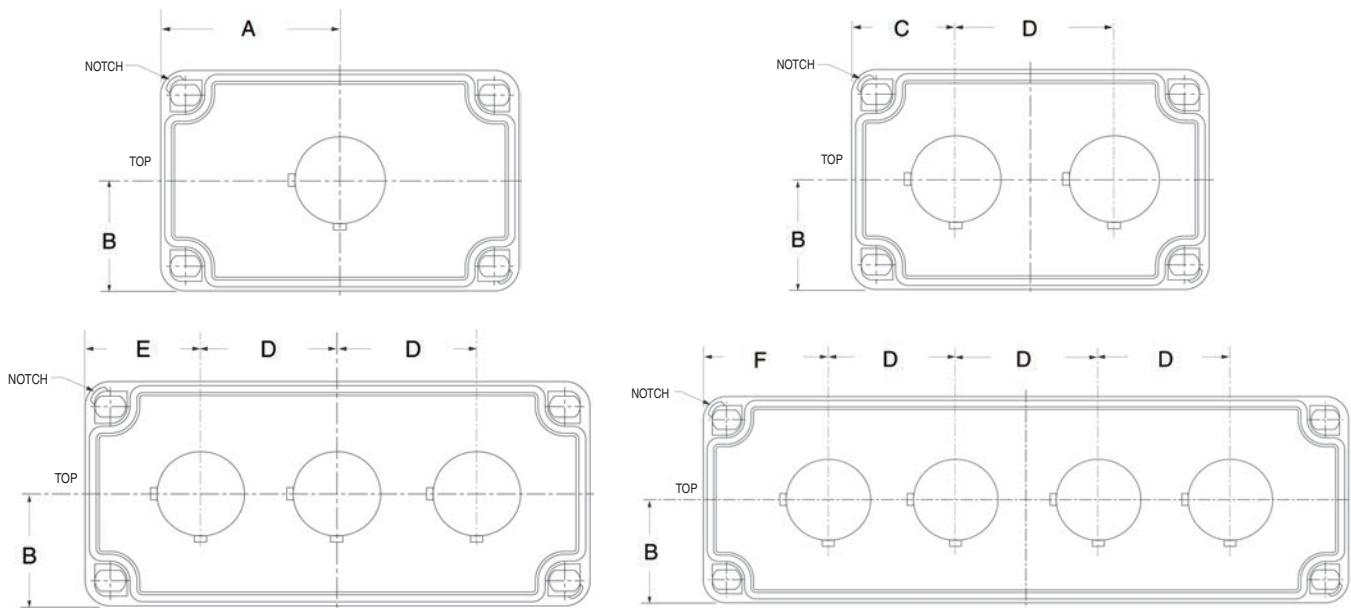
For 22.5 and 30 mm Push Button Enclosures

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


Push Button Hole



Push Button Hole Spacing



Cat. No.	Type	A	B	C	D	E	F
22.5 mm Push Button Enclosure							
598-1PB22G	1-Hole	55±0.216 (2.165±0.0085)	40±0.5 (1.57±0.020)	—	50.0±0.191 (1.968±0.0075)	—	—
598-2PB22G	2-Hole	—		40±0.175 (1.57±0.0069)		—	—
598-3PB22G	3-Hole	—		—		40 +0.32/-0.18 (1.57 +0.0126/-0.0071)	—
598-4PB22G	4-Hole	—		—		—	50±0.216 (1.968±0.0085)
30.5 mm Push Button Enclosure							
800H-1HZ4C	1-Hole	55±.216 (2.165±0.0085)	40±0.5 (1.57±0.020)	—	46.8±0.191 (1.843±0.0075)	—	—
800H-2HZ4C	2-Hole	—		41.6±0.175 (1.64±0.0069)		—	—
800H-3HZ4C	3-Hole	—		—		43.2 +0.32/-0.18 (1.7 +0.0126/-0.0071)	—
800H-4HZ4C	4-Hole	—		—		—	54.8±0.216 (2.16±0.0085)

	<p>Bulletin 598 — NEMA Replacement Enclosure</p> <ul style="list-style-type: none"> • Metal enclosures designed for a multitude of Allen-Bradley NEMA starter configurations • UL Type 1, 3R, 4, 4X, 12 • NEMA Sizes 1...5 • Designed for use in both indoor and outdoor applications 	<p>Standards Compliance UL 508A CSA C22.2, No. 14</p> <p>Certifications cULus Listed (File No. E54866; Guide No. NITW, NITW7)</p>
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Bul. 598 Contactor/Starter Replacement Enclosures

For Contactor/Starter product information see NEMA Combination and Pump Controls on page 1-77.

For NEMA Non-Combination Starters (Type 1, 4/12, 4/4X with transformer and pilot device options)(Series N design)

NEMA Size	Used for Bulletin	Approximate Enclosure Dimension [in.] H x W x D	Enclosure Type	Enclosures			Mounting Plate
				Type 1	Type 4/12	Type 4/4X	
				Cat. No.♣	Cat. No.♣	Cat. No.♣	Cat. No.
0, 1	500, 509	15 x 10 x 6	Hinged	598-DA15106	598-DF15106	598-DC15106	598-P1510
0, 1	505, 520	18 x 14 x 6	Hinged	598-DA18146	598-DF18146	598-DC18146	598-P1814
2	500, 509						
2	505, 520	22 x 13 x 9	Hinged	598-DA22138	598-DF22138	598-DC22138	598-P2213
3	500, 509						
3	505, 520	30 x 20 x 10	Hinged	♣ 598-DA302010T	♣ 598-DF302010T	♣ 598-DC302010T	598-P302010T2
4	500, 509						
4, 5	505, 520	50 x 22 x 11	Hinged	♣ 598-DA502211T	♣ 598-DF502211T	♣ 598-DC502211T	598-P502211T1
5	500, 509						

♣ The replacement external overload reset button for this type of enclosure is **Cat. No. 1493-N21**. (Bulletin 520 enclosed starters require a quantity of two resets.)

♣ The replacement external overload reset button for this type of enclosure is **Cat. No. 1493-N22**. (Bulletin 520 enclosed starters require a quantity of two resets.)

♣ Requires closing plate kit, **Cat. No. 598-N14**, to cover the hole used for the disconnect handle in combination starters.

♣ Requires closing plate kit, **Cat. No. 598-N15**, to cover the hole used for the disconnect handle in combination starters.

For NEMA Non-Combination Lift-off Starters (Type 1, with no transformer and limited pilot device options)(Series N design)

NEMA Size	Used for Bulletin	Approximate Enclosure Dimension [in.] H x W x D	Enclosure Type	Enclosure Type 1
				Cat. No.♣
0	505	10 x 7 x 6	Lift-Off	598-BA1076
0, 1	500, 509			
2	500, 509	13 x 7 x 6	Lift-Off	598-BA1376

♣ The replacement overload reset button for this type is **Cat. No. 1493-N31**.

Enclosures for use with Bulletins 502, 502L, 503, 503L Combination Contactors (Series One design)

Each enclosure assembly includes the enclosure cover, enclosure base, and external overload relay reset button mounted in the enclosure cover. A mounting plate must be ordered separately where indicated. Enclosures will accept a standard or 100 W extra capacity control circuit transformer.

Cat. No. Prefix of the Complete Device	NEMA Size	NEMA Type Enclosure	Enclosure Assembly		Mounting Plate	
			Cat. No.		Cat. No.	
502- or 502L- or 503- or 503L-AA⊗	0	1	598-DA27108T		598-P27108T1	
502- or 502L- or 503- or 503L-BA⊗	1	1	598-DA27108T		598-P27108T1	
502- or 502L- or 503- or 503L-CA⊗	2	1	598-DA27108T		598-P27108T1	
502- or 502L- or 503- or 503L-DA⊗	3	1	598-DA302010T		598-P302010T2	
502- or 502L- or 503- or 503L-EA⊗	4	1	598-DA502211T		598-P502211T2	
502- or 502L- or 503- or 503L-FA⊗	5	1	598-DA563014T		598-P5630T1	
502- or 502L- or 503- or 503L-AF⊗	0	3R/4/12	598-DF27108T		598-P27108T1	
502- or 502L- or 503- or 503L-BF⊗	1	3R/4/12	598-DF27108T		598-P27108T1	
502- or 502L- or 503- or 503L-CF⊗	2	3R/4/12	598-DF27108T		598-P27108T1	
502- or 502L- or 503- or 503L-DF⊗	3	3R/4/12	598-DF302010T		598-P302010T2	
502- or 502L- or 503- or 503L-EF⊗	4	3R/4/12	598-DF502211T		598-P502211T2	
502- or 502L- or 503- or 503L-FF⊗	5	3R/4/12	598-DF563014T		598-P5630T1	
502- or 502L- or 503- or 503L-AJ⊗	0	3R/4/12	* 598-DF27108T		598-P27108T1	
502- or 502L- or 503- or 503L-BJ⊗	1	3R/4/12	* 598-DF27108T		598-P27108T1	
502- or 502L- or 503- or 503L-CJ⊗	2	3R/4/12	* 598-DF27108T		598-P27108T1	
502- or 502L- or 503- or 503L-DJ⊗	3	3R/4/12	⊗ 598-DF302010T		598-P302010T2	
502- or 502L- or 503- or 503L-EJ⊗	4	3R/4/12	‡ 598-DF502211T		598-P502211T2	
502- or 502L- or 503- or 503L-FJ⊗	5	3R/4/12	§ 598-DF563014T		598-P5630T1	
502- or 502L- or 503- or 503L-AC⊗	0	4/4X (stainless steel)	598-DC27108T		598-P27108T1	
502- or 502L- or 503- or 503L-BC⊗	1	4/4X (stainless steel)	598-DC27108T		598-P27108T1	
502- or 502L- or 503- or 503L-CC⊗	2	4/4X (stainless steel)	598-DC27108T		598-P27108T1	
502- or 502L- or 503- or 503L-DC⊗	3	4/4X (stainless steel)	598-DC302010T		598-P302010T2	
502- or 502L- or 503- or 503L-EC⊗	4	4/4X (stainless steel)	598-DC502211T		598-P502211T2	
502- or 502L- or 503- or 503L-FC⊗	5	4/4X (stainless steel)	598-DC563014T		598-P5630T1	

⊗ Indicates the coil voltage code.

* Does not include door safety hardware. Order **Cat. No. 1494F-V1**.

⊗ Does not include door safety hardware. Order **Cat. No. 1494F-V2**.

‡ Does not include door safety hardware. Order **Cat. No. 1494F-V3**.

§ Does not include door safety hardware. Order **Cat. No. 1494F-V4**.

Enclosures for use with Bulletins 512M, 513M Combination Starters (Series One design)

Each enclosure assembly includes the enclosure cover, enclosure base, and external overload relay reset button mounted in the enclosure cover. A mounting plate must be ordered separately where indicated. Enclosures will accept a standard or 100 W extra capacity control circuit transformer.

Cat. No. Prefix of the Complete Device	NEMA Size	NEMA Type Enclosure	Enclosure Assembly		Mounting Plate	
			Cat. No.		Cat. No.	
512M- or 513M-BF⊗	1	3R/4/12	598-DF302010T		598-P302010T1	
512M- or 513M-CF⊗	2	3R/4/12	598-DF302010T		598-P302010T1	
512M- or 513M-BJ⊗	1	3R/4/12	⊗ 598-DF302010T		598-P302010T1	
512M- or 513M-CJ⊗	2	3R/4/12	⊗ 598-DF302010T		598-P302010T1	
512M- or 513M-BD⊗	1	3R/4/12	⊗ 598-DF302010T		598-P302010T1	
512M- or 513M-CD⊗	2	3R/4/12	⊗ 598-DF302010T		598-P302010T1	

⊗ Indicates the coil voltage code.

⊗ Does not include door safety hardware. Order **Cat. No. 1494F-V2**.

Enclosures for use with Bulletin 506, 507 Reversing Combination Starters (Series One design)

Each enclosure assembly includes the enclosure cover, enclosure base, and external overload relay reset button mounted in the enclosure cover. A mounting plate must be ordered separately where indicated. Enclosures will accept a standard or 100 W extra capacity control circuit transformer.

Cat. No. Prefix of the Complete Device	NEMA Size	NEMA Type Enclosure	Enclosure Assembly		Mounting Plate
			Cat. No.		Cat. No.
506- or 507-AA⊗	0	1	598-DA302010T		598-P302010T1
506- or 507-BA⊗	1	1	598-DA302010T		598-P302010T1
506- or 507-CA⊗	2	1	598-DA302010T		598-P302010T1
506- or 507-DA⊗	3	1	598-DA502211T		598-P5022T1
506- or 507-EA⊗	4	1	598-DA502211T		598-P5022T1
506- or 507-FA⊗	5	1	598-DA563014T		598-P5630T1
506- or 507-AF⊗	0	3R/4/12	598-DF302010T		598-P302010T1
506- or 507-BF⊗	1	3R/4/12	598-DF302010T		598-P302010T1
506- or 507-CF⊗	2	3R/4/12	598-DF302010T		598-P302010T1
506- or 507-DF⊗	3	3R/4/12	598-DF502211T1		598-P5022T1
506- or 507-EF⊗	4	3R/4/12	598-DF502211T1		598-P5022T1
506- or 507-FF⊗	5	3R/4/12	598-DF563014T		598-P5630T1
506- or 507-AJ⊗	0	3R/4/12	* 598-DF302010T		598-P302010T1
506- or 507-BJ⊗	1	3R/4/12	* 598-DF302010T		598-P302010T1
506- or 507-CJ⊗	2	3R/4/12	* 598-DF302010T		598-P302010T1
506- or 507-DJ⊗	3	3R/4/12	‡ 598-DF502211T1		598-P5022T1
506- or 507-EJ⊗	4	3R/4/12	‡ 598-DF502211T1		598-P5022T1
506- or 507-FJ⊗	5	3R/4/12	§ 598-DF563014T		598-P5630T1
506- or 507-AD⊗	0	3R/4/12	* 598-DF302010T		598-P302010T1
506- or 507-BD⊗	1	3R/4/12	* 598-DF302010T		598-P302010T1
506- or 507-CD⊗	2	3R/4/12	* 598-DF302010T		598-P302010T1
506- or 507-DD⊗	3	3R/4/12	‡ 598-DF502211T1		598-P5022T1
506- or 507-ED⊗	4	3R/4/12	‡ 598-DF502211T1		598-P5022T1
506- or 507-FD⊗	5	3R/4/12	§ 598-DF563014T		598-P5630T1
506- or 507-AC⊗	0	4/4X (stainless steel)	598-DC302010T		598-P302010T1
506- or 507-BC⊗	1	4/4X (stainless steel)	598-DC302010T		598-P302010T1
506- or 507-CC⊗	2	4/4X (stainless steel)	598-DC302010T		598-P302010T1
506- or 507-DC⊗	3	4/4X (stainless steel)	598-DC502211T1		598-P5022T1
506- or 507-EC⊗	4	4/4X (stainless steel)	598-DC502211T1		598-P5022T1
506- or 507-FC⊗	5	4/4X (stainless steel)	598-DC563014T		598-P5630T1

⊗ Indicates the coil voltage code.

* Does not include door safety hardware. Order **Cat. No. 1494F-V2**.

‡ Does not include door safety hardware. Order **Cat. No. 1494F-V3**.

§ Does not include door safety hardware. Order **Cat. No. 1494F-V4**.



NEMA Replacement Enclosures

Product Selection

Enclosures for use with Bulletins 522E, 522F, 522G, 523E, 523F, 523G Multi-Speed Starters (Series One design)

Each enclosure assembly includes the enclosure cover, enclosure base, and external overload relay reset button mounted in the enclosure cover. A mounting plate must be ordered separately where indicated. Enclosures will accept a standard or 100 W extra capacity control circuit transformer.

Cat. No. Prefix of the Complete Device	NEMA Size	NEMA Type Enclosure	Enclosure Assembly		Mounting Plate
			Cat. No.	Cat. No.	Cat. No.
522E- or 522F- or 522G-BA⊗	1	1		598-DA302010T	598-P302010T1
522E- or 522F- or 522G-CA⊗	2	1		598-DA302010T	598-P302010T1
522E- or 522F- or 522G-DA⊗	3	1		598-DA502211T1	598-P502211T1
522E- or 522F- or 522G-EA⊗	4	1		598-DA502211T1	598-P502211T1
522E- or 522F- or 522G-FA⊗	5	1		598-DA563014T	598-P5630T1
522E- or 522F- or 522G-BF⊗	1	3R/4/12		598-DF302010T	598-P302010T1
522E- or 522F- or 522G-CF⊗	2	3R/4/12		598-DF302010T	598-P302010T1
522E- or 522F- or 522G-DF⊗	3	3R/4/12		598-DF502211T1	598-P502211T1
522E- or 522F- or 522G-EF⊗	4	3R/4/12		598-DF502211T1	598-P502211T1
522E- or 522F- or 522G-FF⊗	5	3R/4/12		598-DF563014T	598-P5630T1
522E- or 522F- or 522G-BJ⊗	1	3R/4/12	*	598-DF302010T	598-P302010T1
522E- or 522F- or 522G-CJ⊗	2	3R/4/12	*	598-DF302010T	598-P302010T1
522E- or 522F- or 522G-DJ⊗	3	3R/4/12	‡	598-DF502211T1	598-P502211T1
522E- or 522F- or 522G-EJ⊗	4	3R/4/12	‡	598-DF502211T1	598-P502211T1
522E- or 522F- or 522G-FJ⊗	5	3R/4/12	§	598-DF563014T	598-P5630T1
522E- or 522F- or 522G-BC⊗	1	4/4X (stainless steel)		598-DC302010T	598-P302010T1
522E- or 522F- or 522G-CC⊗	2	4/4X (stainless steel)		598-DC302010T	598-P302010T1
522E- or 522F- or 522G-DC⊗	3	4/4X (stainless steel)		598-DC502211T1	598-P502211T1
522E- or 522F- or 522G-EC⊗	4	4/4X (stainless steel)		598-DC502211T1	598-P502211T1
522E-FC⊗	5	4/4X (stainless steel)		598-DC563014T	598-P5630T1
523E- or 523F- or 523G-BA⊗	1	1		598-DA302010T	598-P302010T1
523E- or 523F- or 523G-CA⊗	2	1		598-DA302010T	598-P302010T1
523E- or 523F- or 523G-DA⊗	3	1		598-DA502211T1	598-P502211T1
523E- or 523F- or 523G-EA⊗	4	1		598-DA502211T1	598-P502211T1
523E- or 523F- or 523G-FA⊗	5	1		598-DA563014T	598-P5630T1
523E- or 523F- or 523G-BF⊗	1	3R/4/12		598-DF302010T	598-P302010T1
523E- or 523F- or 523G-CF⊗	2	3R/4/12		598-DF302010T	598-P302010T1
523E- or 523F- or 523G-DF⊗	3	3R/4/12		598-DF502211T1	598-P502211T1
523E- or 523F- or 523G-EF⊗	4	3R/4/12		598-DF502211T1	598-P502211T1
523E- or 523F- or 523G-FF⊗	5	3R/4/12		598-DF563014T	598-P5630T1
523E- or 523F- or 523G-BJ⊗	1	3R/4/12	*	598-DF302010T	598-P302010T1
523E- or 523F- or 523G-CJ⊗	2	3R/4/12	*	598-DF302010T	598-P302010T1
523E- or 523F- or 523G-DJ⊗	3	3R/4/12	‡	598-DF502211T1	598-P502211T1
523E- or 523F- or 523G-EJ⊗	4	3R/4/12	‡	598-DF502211T1	598-P502211T1
523E- or 523F- or 523G-FJ⊗	5	3R/4/12	§	598-DF563014T	598-P5630T1
523E- or 523F- or 523G-BC⊗	1	4/4X (stainless steel)		598-DC302010T	598-P302010T1
523E- or 523F- or 523G-CC⊗	2	4/4X (stainless steel)		598-DC302010T	598-P302010T1
523E- or 523F- or 523G-DC⊗	3	4/4X (stainless steel)		598-DC502211T1	598-P502211T1
523E- or 523F- or 523G-EC⊗	4	4/4X (stainless steel)		598-DC502211T1	598-P502211T1
523E- or 523F- or 523G-FC⊗	5	4/4X (stainless steel)		598-DC563014T	598-P5630T1

⊗ Indicates the coil voltage code.

* Does not include door safety hardware. Order **Cat. No. 1494F-V2**.

‡ Does not include door safety hardware. Order **Cat. No. 1494F-V3**.

§ Does not include door safety hardware. Order **Cat. No. 1494F-V4**.

