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

	<p>Bulletin 140M Motor Protection Circuit Breakers</p> <ul style="list-style-type: none"> • Current Range 0.1...630 A • UL Listed for Motor Loads <ul style="list-style-type: none"> – Short Circuit Protection – Overload Protection • Visible Trip Indication • High Current Limiting • High Switching Capacity <p>The Bulletin 140M Motor Protection Circuit Breakers provide short circuit and overload protection for individual motor loads. Factory-installed internal accessories make installation and wiring easy.</p>	<p>Table of Contents</p> <p>Product Selection — Motor Protection Circuit Breakers..... 2-8</p> <p>Approximate Dimensions..... 2-51</p> <p>Standards Compliance</p> <p>IEC/EN 60947-1, -2, -4-1, -5-1 IEC/EN 60204-1 CSA, C22.2 No.14 UL 508 UL 489 (I-, J-, L-Frame)</p> <p>Certifications</p> <p>CE Marked cULus Listed (File No. E54612, NLRV(7); E205542, NKJH(7); E197878, DIVQ(7);) CCC CSA Certified ATEX</p>
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General Information

Motor Protection Circuit Breakers may provide the following protective and control functions.

- Disconnect for Motor Branch Circuit
- Branch-Circuit, Short-Circuit Protection (Magnetic Protection)
- Overload Protection (Thermal Protection)
- Switching (Manual)

In North America, electrical codes require that an individual Motor Branch Circuit be protected by a UL/CSA Listed Fuse, Circuit Breaker or Self-Protected Combination Motor Controller.

140M-C, D and F Frames:

The 140M-C, D and F frame Motor Protection Circuit Breakers may have 2 cULus Listings – as Manual, Self-Protected Combination Motor Controllers and as Manual Motor Controllers (with optional approvals for Motor Disconnect and Group Installation).

When UL/CSA listed as Manual, Self-Protected Combination Motor Controllers, the 140M Motor Protection Circuit Breakers provide all of the necessary NEC/CEC requirements for the protection and control of individual Motor Branch Circuits without additional protective devices.

At some higher voltages and currents (particularly at 600V), a few of the 140M-C, D and F frame devices are only UL/CSA Listed as Manual Motor Controllers (with optional approvals for Motor Disconnect and Group Installation). In NEC/CEC Group Installations, these devices must be applied per the appropriate rules which require the use of an upstream Branch-Circuit, Short-Circuit Protective Device (BCPD). See the table on page 2-18 for the specific ratings of each Motor Protection Circuit Breaker.

140-CMN Frame:

The 140-CMN frame Motor Protection Circuit Breakers are UL Listed/CSA Certified as Manual Motor Controllers (with optional approvals for Motor Disconnect and Group Installation). In NEC/CEC Group Installations, these devices must be applied per the appropriate rules which require the use of an upstream Branch-Circuit, Short-Circuit Protective Device (BCPD). See the table on page 2-18 for the specific ratings of each Motor Protection Circuit Breaker.

140M-I, J and L Frames:

The 140M-I, J and L frame Motor Protection Circuit Breakers are cULus Listed as Circuit Breakers as shown in the table on page 2-9. In these cases, the 140M Motor Protection Circuit Breakers provide all of the necessary NEC/CEC requirements for the protection and control of individual Motor Branch Circuits without additional protective devices.

For further details on the proper application of Motor Protection Circuit Breakers, please see the diagrams on the following pages.

							
	C-Frame	D-Frame	F-Frame	CMN-Frame	I-Frame	J-Frame	L-Frame
Max. Current I_e	32 A	32 A	45 A	90 A	205 A	250 A	630 A
Current Rating	0.1...32 A	1.6...32 A	6.3...45 A	16...90 A	40...205 A	20...250 A	100...630 A
Short Circuit Protection	✓	✓	✓	✓	✓	✓	✓
Standard Magnetic Trip	✓	✓	✓	✓	✓	✓	✓
High Magnetic Trip	✓	✓	✓	✓	—	—	—
Magnetic Only Trip (MCP)	✓	✓	✓	—	—	✓	✓
Overload Protection	✓	✓	✓	✓	✓	✓	✓
Trip Class	10	10	10	10	5...20	10...30	10...30
Standards Compliance:							
CSA 22.2, No. 14	✓	✓	✓	✓	✓	✓	✓
CSA 22.2, No. 5	—	—	—	—	✓	✓	✓
UL 508 (Group Install.)	✓ (see ratings)	✓ (see ratings)	✓ (see ratings)	✓ (see ratings)	—	—	—
UL 508 Manual, Self Protected (Type E)	✓ (see ratings)	✓ (see ratings)	✓ (see ratings)	—	—	—	—
UL 508 (Overload Protection)	✓	✓	✓	✓	✓	✓	✓
UL 489	—	—	—	—	✓	✓	✓
IEC 60947-1, -2	✓	✓	✓	✓	✓	✓	✓
IEC 60947-4-1	✓	✓	✓	—	✓	✓	✓
CE	✓	✓	✓	✓	✓	✓	✓
ATEX (IEC 60079-14)	✓ (up to 25 A)	✓ (up to 25 A)	—	—	—	—	—
CCC	✓ (up to 25 A)	✓ (up to 25 A)	✓	—	—	—	—
Accessories							
Ext. Rotary Operator	✓	✓	✓	✓	✓	✓	✓
Flex Cable Operator	—	—	—	—	✓	✓	✓
Auxiliary Contacts	✓	✓	✓	✓	✓	✓	✓
Trip Indication Contacts	✓	✓	✓	✓	✓	✓	✓

Motor Protection Circuit Breakers

Catalog Number Explanation

Cat. No. Explanation

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; not all combinations will produce a valid catalog number.

140M - **C** - **2** - **E** - **A63** - **KN** - **CC** - **GJ**
a *b* *c* *d* *e* *f* *g* *h*

2

a

Bulletin Number	
Code	Description
140M	Motor Protection Circuit Breakers (MPCBs)

c

Interrupting Rating / Breaking Capacity	
Code	Description
2	Normal Break
8	High Break

f, g, h

Factory-Installed Options

f

Miscellaneous See page 2-36

b

Frame Size and Rating	
Code	Description
C	32 A
D	32 A
F	45 A
I	205 A
J	250 A
L	400 A and 600 A

d

Protection Type	
Code	Description
E	Adj Thermal/ Fixed Mag (13...14 x I_n)
T	Adj Thermal / Fixed Mag (16...20 x I_n)

g

Aux/Trip Contacts See page 2-36

h

UV and Shunt Trips See page 2-36

e

Current Range		
Code	Description	Example
A	A = .10	A16 = 0.16
B	B = 1.0	B16 = 1.6
C	C = 10	C16 = 16
D	D = 100	D16 = 160
E	E = 1000	E16 = 1600



Group Installation with MPCBs

There is only one Branch Circuit Protective Device (BCPD) for the “Group”

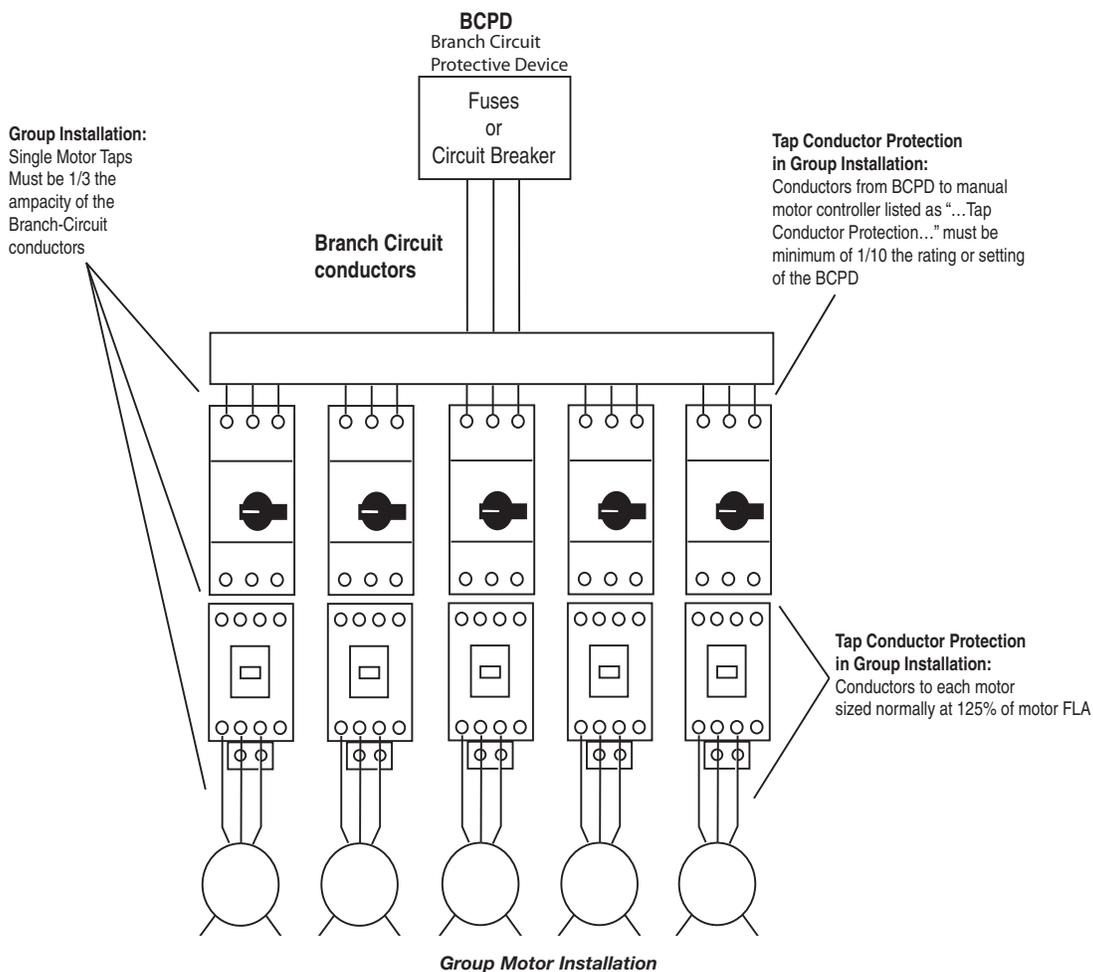
Group installation has been successfully used for many years in the U.S. and Canada. It allows “two or motors or one or more motors and other loads to be connected to the same branch-circuit...”. The most restrictive part of the conditions specified for Group Installation is the requirement for the protection of the conductors for each motor circuit. In the U.S. NEC for 2002, a new rule for the conductor sizing was added for devices that are listed and marked “Suitable for use as Tap Conductor Protection”. Below is an example that illustrates installations involving multiple motors with a single BCPD protecting the entire “Group”.

Bulletin 140M Motor Protection Circuit Breakers UL/CSA Listed for Group Installation

Conductors from the BCPD to each motor must be a minimum of 1/3 the ampacity of the Branch Circuit conductors.

Bulletin 140M Motor Protection Circuit Breakers UL/CSA Listed for Tap conductor Protection in Group Installations

Conductors from the BCPD to manual motor controller listed as “...Tap Conductor Protection...” must be minimum of 1/10 the rating or setting of the BCPD. Conductors from the controller to the motor must be 125% of the motor FLA.



Multiple Motor Installation with MPCBs Each Motor has an Individual Branch Circuit Protective Device

Bulletin 140M Motor Protection Circuit Breakers (MPCBs) UL/CSA Listed as Type E Manual Self-Protected Combination Motor Controllers or UL/CSA Listed as Circuit Breakers

These UL/CSA Listings allow the Bulletin 140M MPCBs to provide the branch-circuit, short-circuit protection (as well as overload protection) for each individual motor circuit. Additional short-circuit protection is not required for the protection of the individual motor circuits, leaving only the requirement for protection of the feeder circuit conductors by an upstream protective device. Below is an example that illustrates installations involving multiple motors, each with its own branch-circuit protection (BCPD).

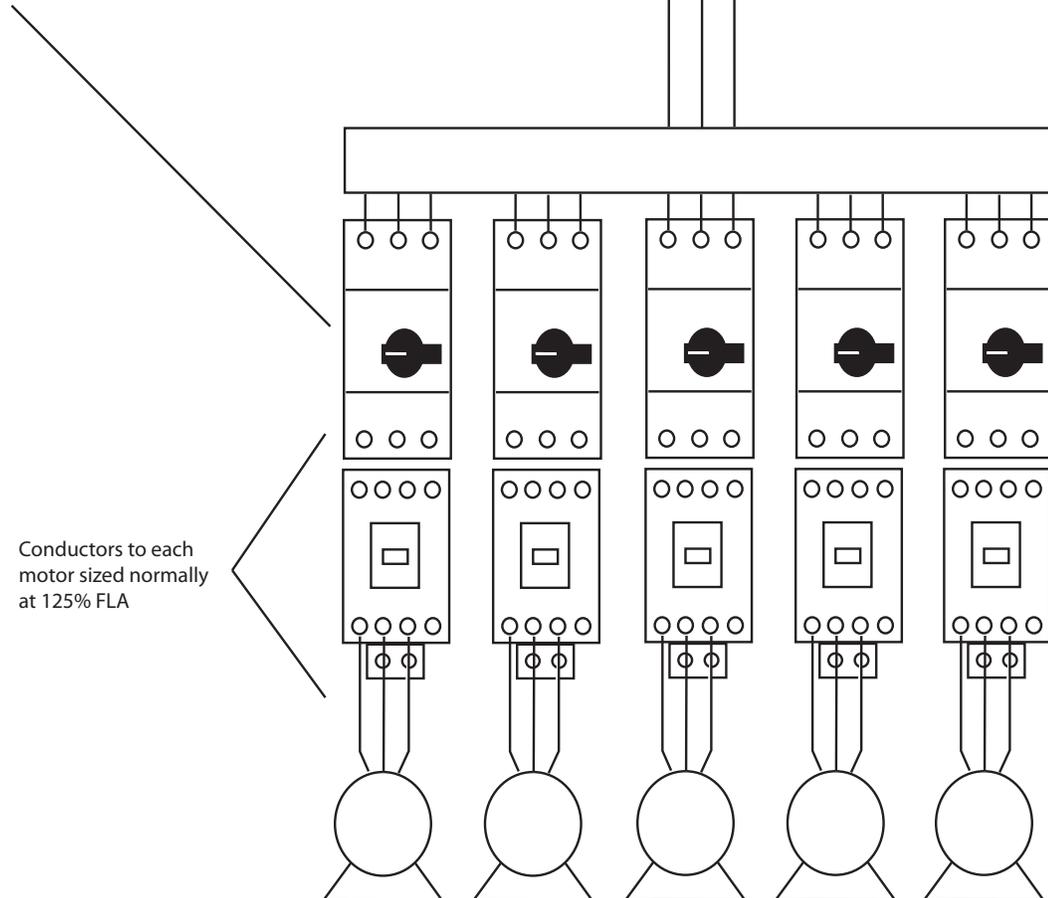
2

Bulletin 140M-J...L (Inverse Time Circuit Breakers)

may provide the branch-circuit protection for each individual motor circuit

Bulletin 140M-C...F (Type E Self-Protected Combination Motor Controllers)

may provide the branch-circuit protection for each individual motor circuit



Type E and Type F Combination Motor Controllers

Most of the 140M-C...F motor protection circuit breakers are UL listed as a manual Type E self-protected combination motor controller. Although there are many tests involved, one of the critical tests a self-protected combination motor controller must pass, is to perform 6000 electrical ops. and an additional 4000 mechanical ops. after a short circuit.

By definition, a **Type F** combination motor controller consists of a Type E manual self protected combination motor controller and a magnetic or solid-state motor controller (such as a Bulletin 100-C contactor or an SMC). As with a manual Type E self-protected combination motor controller, additional short-circuit protection is not required for the individual motor circuits.

A combination of a Bulletin 140M manual self protected combination motor controller and 100-C contactor can be listed as a **Type E** self-protected combination motor controller. In this case, both the 140M and 100-C must pass the additional 6000 electrical and 4000 mechanical operational test. In some cases, this may require over sizing of the Bulletin 140M MPCB or the 100-C contactor to achieve weld free performance and meet the additional life requirements.

Motor Protection Circuit Breakers

Product Selection

Motor Protection Circuit Breakers

- Short Circuit Protection — Standard Magnetic Trip (13...14 x I_e)
- Motor Overload Protection — Trip Class 10

2



Cat. No. 140M-C



Cat. No. 140M-D



Cat. No. 140M-F



Cat. No. 140-CMN

Rated Operational Current (I _e) [A]	Motor Current Adjustment Range [A]	Magnetic Trip Current [A]	Max. Short Circuit Current [kA]		Max. 3-phase Hp Ratings*				Max. kW, 3-Phase — AC-3*				Cat. No.
			400V (I _{cu})	480V (group motor)	200V	230V	460V	575V	230V	400/415V	500V	690V	
C-Frame													
0.16	0.10...0.16	2.1	100	65	—	—	—	—	—	0.02	0.06	0.06	140M-C2E-A16
0.25	0.16...0.25	3.3	100	65	—	—	—	—	—	0.04	0.09	0.09	140M-C2E-A25
0.4	0.25...0.40	5.2	100	65	—	—	—	0.25	0.06	0.09	0.12	0.18	140M-C2E-A40
0.63	0.40...0.63	8.2	100	65	—	—	0.25	0.33	0.09	0.18	0.18	0.25	140M-C2E-A63
1	0.63...1.0	13	100	65	—	—	0.5	0.75	0.18	0.25	0.37	0.55	140M-C2E-B10
1.6	1.0...1.6	21	100	65	0.25	0.33	1	1	0.25	0.55	0.75	1.1	140M-C2E-B16
2.5	1.6...2.5	33	100	65	0.5	0.75	1.5	2	0.37	0.75	1.1	1.8	140M-C2E-B25
4	2.5...4.0	52	100	65	1	1	3	3	0.75	1.5	2.2	3	140M-C2E-B40
6.3	4.0...6.3	82	100	65	1.5	2	5	5	1.5	2.2	3	4	140M-C2E-B63
10	6.3...10	130	100	65	3	3	7.5	10	2.2	4	6.3	7.5	140M-C2E-C10
16	10...16	208	65	30	5	5	10	15	4	7.5	10	13	140M-C2E-C16
20	14.5...20	260	50	30	5	7.5	15	20	5.5	10	11	17	140M-C2E-C20
25	18...25	325	15	25	7.5	7.5	20	20	5.5	11	15	22	140M-C2E-C25
29	24...29	406	15	25	7.5	10	20	25	7.5	13	18.5	25	140M-C2E-C29
32	27...32	448	15	25	7.5	10	25	30	7.5	15	20	25	140M-C2E-C32
D-Frame													
2.5	1.6...2.5	33	100	65	0.5	0.75	1.5	2	0.37	0.75	1.1	1.8	140M-D8E-B25
4	2.5...4.0	52	100	65	1	1	3	3	0.75	1.5	2.2	3	140M-D8E-B40
6.3	4.0...6.3	82	100	65	1.5	2	5	5	1.5	2.2	3	4	140M-D8E-B63
10	6.3...10	130	100	65	3	3	7.5	10	2.2	4	6.3	7.5	140M-D8E-C10
16	10...16	208	100	65	5	5	10	15	4	7.5	10	13	140M-D8E-C16
20	14.5...20	260	100	65	5	7.5	15	20	5.5	10	11	17	140M-D8E-C20
25	18...25	325	65	30	7.5	7.5	20	20	5.5	11	15	22	140M-D8E-C25
29	24...29	406	50	30	7.5	10	20	25	7.5	13	18.5	25	140M-D8E-C29
32	27...32	448	50	30	7.5	10	25	30	7.5	15	20	25	140M-D8E-C32
F-Frame													
10	6.3...10	130	100	65	3	3	7.5	10	2.2	4	6.3	7.5	140M-F8E-C10
16	10...16	208	100	65	5	5	10	15	4	7.5	10	13	140M-F8E-C16
20	14.5...20	260	100	65	5	7.5	15	20	5.5	10	11	17	140M-F8E-C20
25	18...25	325	100	65	7.5	10	20	25	6.3	11	15	22	140M-F8E-C25
32	23...32	416	65	65	7.5	10	25	30	7.5	15	20	30	140M-F8E-C32
45	32...45	585	65	65	10	15	30	40	13	22	30	40	140M-F8E-C45
CMN-Frame													
25	16...25	350	65	65	5	7.5	15	20	7.5	13	15	22	140-CMN-2500
40	25...40	560	65	65	10	10	30	30	11	22	25	30	140-CMN-4000
63	40...63	882	65	42	20	20	40	60	20	32	40	55	140-CMN-6300
90	63...90	1260	50	35	25	30	60	75	25	45	55	75	140-CMN-9000

* Horsepower/kW ratings shown in the table above are for reference. The final selection of the MPCB depends on the actual motor full load current.



Motor Protection Circuit Breakers

- Short Circuit Protection — Standard Magnetic Trip (Fixed at 12...15 x I_e)
- Overload Protection — Trip Class 10...30 (Adjustable)



Cat. No. 140M-I



Cat. No. 140M-J



Cat. No. 140M-L

Rated Operational Current (I_e) [A]	Motor Current Adjustment Range [A]	Magnetic Trip Current [A]	Ultimate Interrupting Current [kA] (I_{cm})		3-phase Hp Ratings*				Max. kW, 3-Phase — AC-3*				Cat. No.
			400V	480V	200V	230V	460V	575V	230V	400/415V	500V	690V	
I-Frame													
80	40...80	1200	70*	65	25	30	60	75	22	37	55	75	140M-I8E-C80‡
100	80...100	1500	70*	65	30	40	75	100	30	55	55	90	140M-I8E-D10‡
160	100...160	2400	70*	65	50	60	125	150	45	75	110	132	140M-I8E-D16‡
205	160...205	2665	70*	65	60	75	150	200	55	110	132	200	140M-I8E-D20§
J-Frame													
50	20...50	700	25	25	25	30	60	75	15	22	30	45	140M-J2E-C50
100	40...100	1400	25	25	30	40	75	100	30	55	55	90	140M-J2E-D10
160	64...160	2240	25	25	50	60	125	150	45	90	110	160	140M-J2E-D16
250	100...250	3500	25	25	75	100	200	250	55	132	160	250	140M-J2E-D25
L-Frame													
50	20...50	700	70	65	25	30	60	75	15	22	30	45	140M-J8E-C50
100	40...100	1400	70	65	30	40	75	100	30	55	55	90	140M-J8E-D10
160	64...160	2240	70	65	50	60	125	150	45	90	110	160	140M-J8E-D16
250	100...250	3500	70	65	75	100	200	250	55	132	160	250	140M-J8E-D25
L-Frame													
250	100...250	3000	40	35	75	100	200	250	55	132	160	250	140M-L2E-D25
400	160...400	4800	40	35	125	150	300	400	132	200	250	400	140M-L2E-D40
630	250...630	7580	40	35	200	250	500	600	200	355	450	630	140M-L2E-D63
L-Frame													
250	100...250	3000	70	65	75	100	200	250	55	132	160	250	140M-L8E-D25
400	160...400	4800	70	65	150	150	350	450	132	200	250	400	140M-L8E-D40
630	250...630	7560	70	65	200	250	500	600	200	355	450	630	140M-L8E-D63

* Horsepower/kW ratings shown in the table above are for reference. **The final selection of the MPCB depends on the actual motor full load current.**

‡ For IEC approvals and CE marking, add an "E" to the end of the Cat. No. Example: 140M-I8E-C80E.

‡ Overload Protection — adjustable Trip Class 5, 10, 15, or 20.

§ Overload Protection — fixed Trip Class 10.

Motor Protection Circuit Breakers

Product Selection

High Inrush Motor Protection Circuit Breakers

- Short Circuit Protection — High Magnetic Trip (Fixed at $16...21 \times I_e$)
- Motor Overload Protection — Trip Class 10

2



Cat. No. 140M-C



Cat. No. 140M-D



Cat. No. 140M-F

Rated Operational Current (I_e) [A]	Motor Current Adjustment Range [A]	Magnetic Trip Current [A]	Max. Short Circuit Current [kA]		Max. 3-phase Hp Ratings*				Max kW, 3-Phase — AC-3*				Cat. No.
			400V (I_{cu})	480V (group motor)	200V	230V	460V	575V	230V	400/415V	500V	690V	
C-Frame													
0.16	0.10...0.16	3.3	100	65	—	—	—	—	—	0.02	0.06	0.06	140M-C2T-A16
0.25	0.16...0.25	5.2	100	65	—	—	—	—	—	0.04	0.09	0.09	140M-C2T-A25
0.4	0.25...0.40	8.2	100	65	—	—	—	0.25	0.06	0.09	0.12	0.18	140M-C2T-A40
0.63	0.40...0.63	13	100	65	—	—	0.25	0.33	0.09	0.18	0.18	0.25	140M-C2T-A63
1	0.63...1.0	21	100	65	—	—	0.5	0.75	0.18	0.25	0.37	0.55	140M-C2T-B10
1.6	1.0...1.6	33	100	65	0.25	0.33	1	1	0.25	0.55	0.75	1.1	140M-C2T-B16
2.5	1.6...2.5	52	100	65	0.5	0.75	1.5	2	0.37	0.75	1.1	1.8	140M-C2T-B25
4	2.5...4	82	100	65	1	1	3	3	0.75	1.5	2.2	3	140M-C2T-B40
6.3	4...6.3	130	100	65	1.5	2	5	5	1.5	2.2	3	4	140M-C2T-B63
10	6.3...10	208	100	30	3	3	7.5	10	2.2	4	6.3	7.5	140M-C2T-C10
16	10...16	260	50	30	5	5	10	15	4	7.5	10	13	140M-C2T-C16
D-Frame													
16	10...16	260	100	65	5	5	10	15	4	7.5	10	13	140M-D8T-C16
20	14.5...20	325	65	30	5	7.5	15	20	5.5	10	11	17	140M-D8T-C20
F-Frame													
25	18...25	416	65	65	7.5	10	20	25	6.3	11	15	22	140M-F8T-C25
32	23...32	585	65	65	7.5	10	25	30	7.5	15	20	30	140M-F8T-C32

* Horsepower/kW ratings shown in the table above are for reference. **The final selection of the MPCB depends on the actual motor full load current.**



Motor Protection Circuit Breakers — Screwless

- Short Circuit Protection — Standard Magnetic Trip (13...14 x I_e)
- Motor Overload Protection — Trip Class 10



Rated Operational Current (I_e) [A]	Motor Current Adjustment Range [A]	Magnetic Trip Current [A]	Max. Short Circuit Current [kA]		Max. 3-phase Hp Ratings*				Max. kW, 3-Phase — AC-3*				Cat. No.
			400V (I_{cu})	480V (group motor)	200V	230V	460V	575V	230V	400/415V	500V	690V	
C-Frame													
0.16	0.10...0.16	2.1	100	65	—	—	—	—	—	0.02	0.06	0.06	140M-RC2E-A16
0.25	0.16...0.25	3.3	100	65	—	—	—	—	—	0.04	0.09	0.09	140M-RC2E-A25
0.4	0.25...0.40	5.2	100	65	—	—	—	0.25	0.06	0.09	0.12	0.18	140M-RC2E-A40
0.63	0.40...0.63	8.2	100	65	—	—	0.25	0.33	0.09	0.18	0.18	0.25	140M-RC2E-A63
1	0.63...1.0	13	100	65	—	—	0.5	0.75	0.18	0.25	0.37	0.55	140M-RC2E-B10
1.6	1.0...1.6	21	100	65	0.25	0.33	1	1	0.25	0.55	0.75	1.1	140M-RC2E-B16
2.5	1.6...2.5	33	100	65	0.5	0.75	1.5	2	0.37	0.75	1.1	1.8	140M-RC2E-B25
4	2.5...4.0	52	100	65	1	1	3	3	0.75	1.5	2.2	3.0	140M-RC2E-B40
6.3	4.0...6.3	82	100	65	1.5	2	5	5	1.5	2.2	3.0	4.0	140M-RC2E-B63
10	6.3...10	130	100	65	3	3	7.5	10	2.2	4.0	6.3	7.5	140M-RC2E-C10
16	10...16	208	65	30	5	5	10	15	4.0	7.5	10	13	140M-RC2E-C16

* Horsepower/kW ratings shown in the table above are for reference. **The final selection of the MPCB depends on the actual motor full load current.**



Bulletin 140M Motor Circuit Protectors

- Current range 0.16...1200 A
- UL Listed/Recognized for motor loads
 - Short-circuit protection
 - Overload protection must be provided separately
- Visible trip indication
- High current limiting
- High switching capacity

The Bulletin 140M Motor Circuit Protectors provide short circuit protection for individual motor loads. Factory-installed internal accessories make installation and wiring easy.

Certifications (0.16...45 A)

CE Marked
 cULus Listed (File No. E54612,
 Guide No. NLRV, NLRV7)
 CCC

Certifications (3...1200 A)

UR Recognized component
 (File No. E224135, Guide
 DKPU2)
 CSA Certified (Class No.
 3211-07)

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Standards Compliance

IEC/EN 60947-1, 2, -4-1, -5-1
 IEC/EN 60204-1
 CSA, C22.2 No.14
 UL 508
 UL 489 (H-, J-, L-, N-Frame)

General Information

Motor Circuit Protectors may provide the following protective and control functions.

- Disconnect for Motor Branch Circuit
- Branch-Circuit, Short-Circuit Protection (Magnetic Protection)
- Switching (Manual)

In North America, electrical codes require that an individual Motor Branch Circuit be protected by a UL/CSA Listed Fuse, Circuit Breaker or Self-Protected Combination Motor Controller.

140M-C, D and F Frames:

The 140M-C, D and F frame Motor Circuit Protectors have one UL/CSA Listing – as Manual Motor Controllers (with optional approvals for Motor Disconnect and Group Installation). In NEC/CEC Group Installations, these devices must be applied per the appropriate rules which require the use of an upstream Branch-Circuit, Short-Circuit Protective Device (BCPD). See the table on page 2-20 for the specific ratings of each Motor Circuit Protector.

The 140M-C, D and F Frame Motor Circuit Protectors are also UL/CSA Listed, together with a Bulletin 100C contactor and Bulletin 193 overload relay, as part of our Bulletin 103T and 107T Self-Protected IEC Combination Starters. These starters are then able to provide all of the necessary NEC/CEC requirements for the protection and control of individual Motor Branch Circuits without additional protective devices.

140M-H, J and L Frames:

The 140M-H, J and L frame Motor Circuit Protectors are UL/CSA Recognized as Circuit Breakers as shown in the table on page 2-20. They are UL/CSA Recognized, rather than UL/CSA Listed, since they only provide short circuit protection and not thermal overload protection for the motor.

140M-H, J and L frame Motor Circuit Protectors (MCPs) are also UL/CSA Listed, together with a Bulletin 100C contactor and Bulletin 193 overload relay, as part of our Bulletin 113 IEC Combination Starters. These starters are then able to provide all of the necessary NEC/CEC requirements for the protection and control of individual Motor Branch Circuits without additional protective devices.



Product Line Overview

							
	C-Frame	D-Frame	F-Frame	H-Frame	J-Frame	L-Frame	N-Frame
Max. Current I_e	25 A	32 A	45 A	100 A	250 A	600 A	1200 A
Current Rating	0.16...2.5 A	2.5...32 A	25...45 A	3...100	70...250	125...600	640...1200
Short Circuit Protection	✓	✓	✓	✓	✓	✓	✓
Standards Compliance:							
CSA 22.2, No. 14	✓	✓	✓				
CSA 22.2, No. 5	—	—	—	✓	✓	✓	✓
UL 508 (Group Install.)	✓	✓	✓				
UL489 (Recognized)	—	—	—	✓	✓	✓	✓
IEC 60947-2	✓	✓	✓	✓	✓	✓	✓
CE	✓	✓	✓	✓	✓	✓	✓
CCC	✓	✓ (up to 25 A)	✓	—	—	—	—
Accessories							
Ext. Rotary Operator	✓	✓	✓	✓	✓	✓	✓
Flex Cable Operator	—	—	—	✓	✓	✓	✓
Auxiliary Contacts	✓	✓	✓	✓	✓	✓	✓
Trip Indication Contacts	✓	✓	✓	✓	✓	✓	✓

2

Cat. No. Explanation

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; not all combinations will produce a valid catalog number.

140M – C – 2 – N – A63 – KN – CC – GJ

a *b* *c* *d* *e* *f* *g* *h*

a

Bulletin Number	
Code	Description
140M	Motor Circuit Protectors (MCPs)

b

Frame Size and Rating	
Code	Description
C	25 A
D	32 A
F	45 A
H	125 A
J	250 A
L	400 A and 600 A
N	800 A and 1200 A

c

Interrupting Rating / Breaking Capacity (I_c at 480V)	
Code	Description
2	Normal Break
8	High Break

d

Protection Type	
Code	Description
N	Fixed Mag Only ($13...14 \times I_n$)
P	Adj Mag Only (less than $13 \times I_n$) - MCPs
R	Adj Mag Only (greater than $13 \times I_n$) - MCP's

e

Current Range		
Code	Description	Example
A	A = .10	A16 = 0.16
B	B = 1.0	B16 = 1.6
C	C = 10	C16 = 16
D	D = 100	D16 = 160
E	E = 1000	E16 = 1600

f, g, h

Factory-Installed Options	
<i>f</i>	
<i>g</i>	
<i>h</i>	

f

Miscellaneous See page 2-36

g

Aux/Trip Contacts See page 2-36

h

UV and Shunt Trips See page 2-36

Group Installation with MCPs

There is only one Branch Circuit Protective Device (BCPD) for the “Group”

Group installation has been successfully used for many years in the U.S. and Canada. It allows “two or motors or one or more motors and other loads to be connected to the same branch-circuit...”. The most restrictive part of the conditions specified for Group Installation is the requirement for the protection of the conductors for each motor circuit.

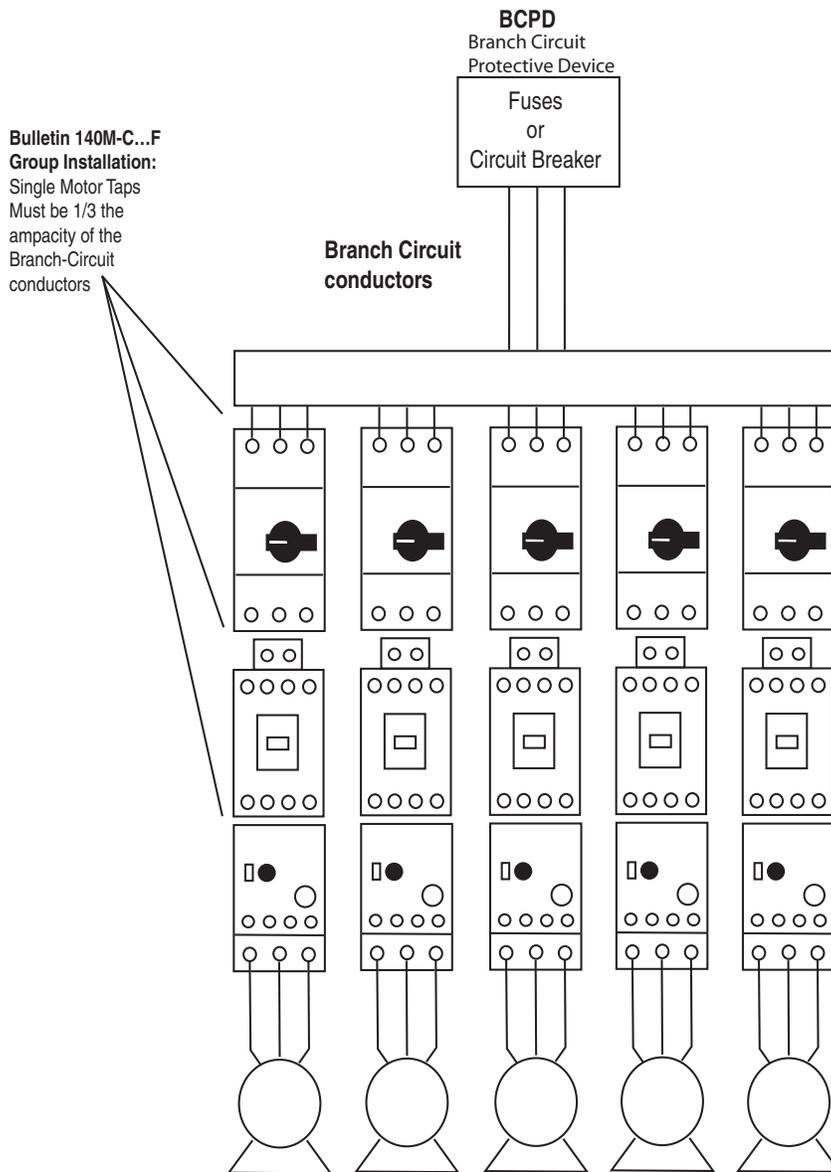
Below is an example that illustrates installations involving multiple motors with a single BCPD protecting the entire “Group”.

Bulletin 140M Motor Circuit Protectors UL/CSA Listed for Group Installation

Conductors from the BCPD to each motor must be a minimum of 1/3 the ampacity of the Branch Circuit conductors.

Motor Circuit Protectors do not provide thermal protection, so a separate overload relay must be used.

Therefore, MCPs cannot be UL/CSA Listed for Tap Conductor Protection in Group Installations.



Group Motor Installation

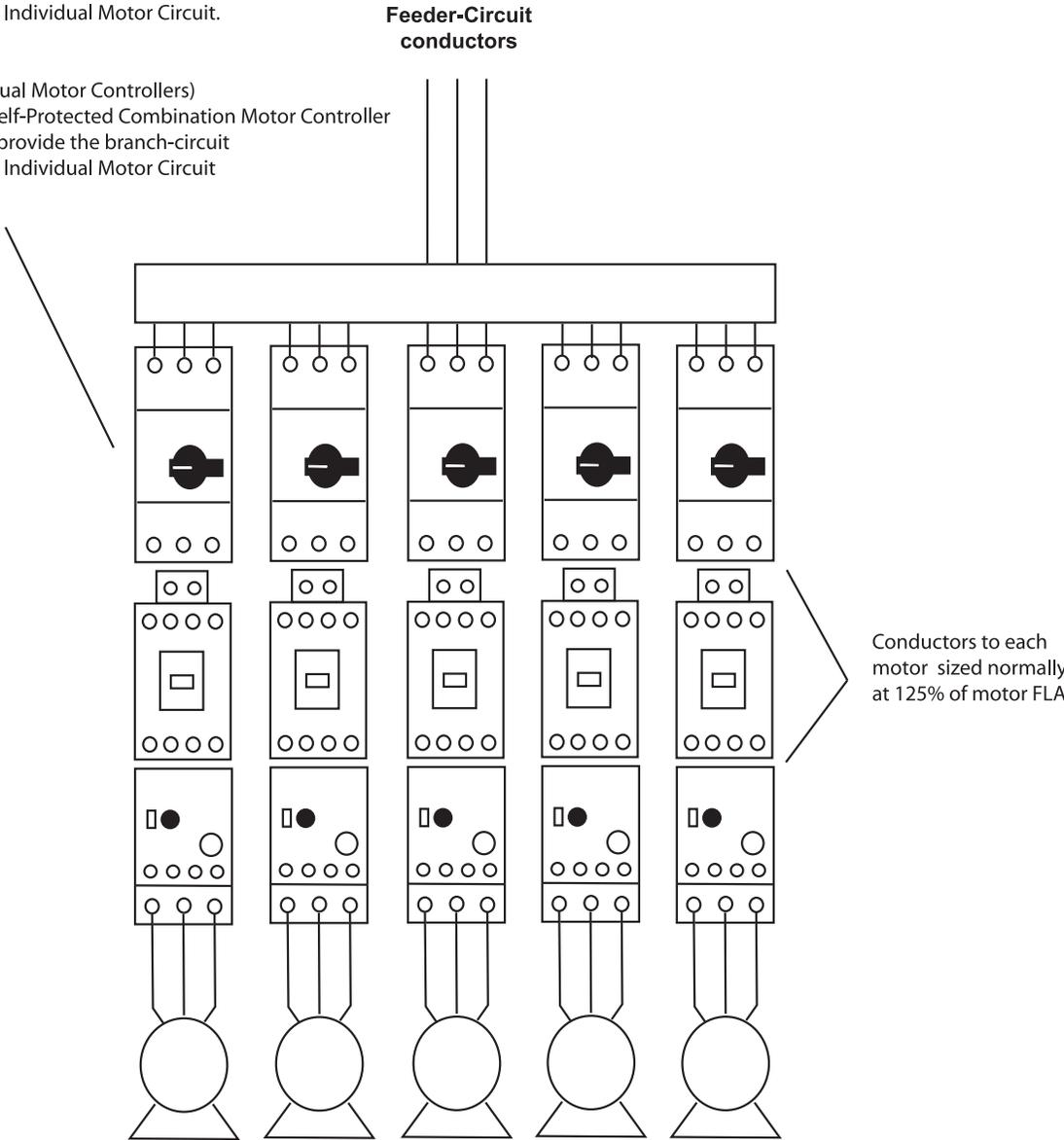
3-Phase Power Supply

Multiple Motor Installation with MCPs
 Each Motor has an Individual Branch Circuit Protective Device (BCPD)

Bulletin140M Motor Circuit Protectors are UL/CSA listed as part of a Combination Motor Controller or a Self-Protected Combination Motor Controller consisting of a 140M Motor Circuit Protector, a 100C Contactor and a 193 Overload Relay. These UL/CSA listings allow the Bulletin 140M MCP's to provide the branch-circuit, short-circuit protection for each individual motor circuit. Additional short-circuit protection is not required for the protection of the individual motor circuits, leaving only the requirement for protection of the Feeder-Circuit conductors by an upstream protective device. Below is an example that illustrates installations involving multiple motors, each with their own branch-circuit protection (BCPD).

Bulletin 140M-H..N
 (UL/CSA recognized Instantaneous Trip Circuit Breakers)
 As part of a listed Combination Motor Controller these devices may provide the branch-circuit protection for each Individual Motor Circuit.

Bulletin 140M-C..F
 (UL/CSA listed Manual Motor Controllers)
 As part of a listed Self-Protected Combination Motor Controller these devices may provide the branch-circuit protection for each Individual Motor Circuit



Multi-Motor Installation

Bulletin 140M
Motor Circuit Protectors
 Product Selection

Motor Circuit Protectors

- Short circuit protection — standard magnetic trip ($13...14 \times I_e$)
- Short circuit protection for 3 component starters — No motor overload protection
 – separate Bulletin 193-E or 193-T product required for overload and installation protection
- For Trip Class 10 motor applications



Cat. No. 140M-C



Cat. No. 140M-D



Cat. No. 140M-F

Rated Operational Current (I_e) [A]	Magnetic Trip Current [A]	Ultimate Interrupting Current [kA]		Max. 3-phase Hp Ratings*				Max. kW, 3-Phase — AC-3*				Cat. No.
		400V (I_{cu})	480V (group motor)	200V	230V	460V	575V	230V	400/415V	500V	690V	
C-Frame												
0.16	2.1	100	65	—	—	—	—	—	0.02	0.06	0.06	140M-C2N-A16
0.25	3.3	100	65	—	—	—	—	—	0.04	0.09	0.09	140M-C2N-A25
0.4	5.2	100	65	—	—	—	0.25	0.06	0.09	0.12	0.18	140M-C2N-A40
0.63	8.2	100	65	—	—	0.25	0.33	0.09	0.18	0.18	0.25	140M-C2N-A63
1	13	100	65	—	—	0.5	0.75	0.18	0.25	0.37	0.55	140M-C2N-B10
1.6	21	100	65	0.25	0.33	1	1	0.25	0.55	0.75	1.1	140M-C2N-B16
2.5	33	100	65	0.5	0.75	1.5	2	0.37	0.75	1.1	1.8	140M-C2N-B25
D-Frame												
2.5	33	100	65	0.5	0.75	1.5	2	0.37	0.75	1.1	1.8	140M-D8N-B25
4	52	100	65	1	1	3	3	0.75	1.5	2.2	3	140M-D8N-B40
6.3	82	100	65	1.5	2	5	5	1.5	2.2	3	4	140M-D8N-B63
10	130	100	65	3	3	7.5	10	2.2	4	6.3	7.5	140M-D8N-C10
16	208	100	65	5	5	10	15	4	7.5	10	13	140M-D8N-C16
25	325	65	30	7.5	7.5	20	20	5.5	11	15	22	140M-D8N-C25
32	448	50	30	7.5	10	25	30	7.5	15	20	25	140M-D8N-C32
F-Frame												
25	325	100	65	7.5	10	20	25	6.3	11	15	22	140M-F8N-C25
32	416	65	65	7.5	10	25	30	7.5	15	20	30	140M-F8N-C32
45	585	65	65	10	15	30	40	13	22	30	40	140M-F8N-C45

* Horsepower/kW ratings shown in the table above are for reference. **The final selection of the manual starter depends on the actual motor full load current.**

Note: In applications with 140M-C_N, 140M-D_N and 140M-F_N as the short circuit protection device of heavy duty starting motors, the rated operational current I_e of the above devices must be over-dimensioned with following factors:

- CLASS 10 = 1.00
- CLASS 15 = 1.22
- CLASS 20 = 1.42
- CLASS 25 = 1.58
- CLASS 30 = 1.73

Motor Circuit Protectors

- Short-Circuit Protection — Magnetic Trip (Adjustable at 3...10 x I_e)
- Overload Protection — None (Magnetic Trip Only)



Cat. No. 140M-H



Cat. No. 140M-J



Cat. No. 140M-L

Rated Operational Current (I_e) [A]	Magnetic Trip Current [A]									3-phase Hp Ratings*				Max. kW, 3-Phase — AC-3*				Cat. No.*
	Cam Setting																	
	A	B	C	D	E	F	G	H	I	200V	230V	460V	575V	230V	400/415V	500V	690V	
H-Frame																		
3	9	15	21	27	30	33	—	—	—	0.5	0.5	1.5	2	0.6	0.75	1.1	1.5	140M-H8P-B30
7	21	35	49	63	70	77	—	—	—	1.5	2	3	5	1.1	2.2	3	4	140M-H8P-B70
15	45	75	100	135	150	165	—	—	—	3	3	10	10	3	5.5	7.5	11	140M-H8P-C15
30	90	150	210	270	300	330	—	—	—	7.5	10	20	25	5.5	11	15	22	140M-H8P-C30
50	150	250	350	450	500	550	—	—	—	15	15	30	40	11	22	22	37	140M-H8P-C50
70	210	350	490	630	700	770	—	—	—	20	25	50	60	15	30	37	55	140M-H8P-C70
100	300	500	700	900	1000	1100	—	—	—	25	30	60	75	22	45	55	75	140M-H8P-D10
100	500	700	900	1100	1300	1500	—	—	—	30	30	75	100	30	55	75	110	140M-H8P-D10
J-Frame																		
100	500	600	700	800	900	1000	—	—	—	30	30	75	100	22	37	45	55	140M-J8P-D10
125	625	750	875	1000	1125	1250	—	—	—	40	40	100	125	22	45	55	90	140M-J8P-D12
150	750	900	1050	1200	1350	1500	—	—	—	50	50	100	150	30	55	75	110	140M-J8P-D15
175	875	1050	1225	1400	1575	1750	—	—	—	50	60	125	150	37	55	90	132	140M-J8P-D17
200	1000	1200	1400	1600	1800	2000	—	—	—	60	75	150	200	45	75	90	132	140M-J8P-D20
225	1125	1350	1575	1800	2025	2250	—	—	—	75	75	150	200	55	90	110	160	140M-J8P-D22
250	1250	1500	1750	2000	2250	2500	—	—	—	75	100	200	250	55	90	132	160	140M-J8P-D25
L-Frame																		
225	1125	1265	1410	1545	1690	1830	1970	2110	2250	50	60	125	150	55	90	110	160	140M-L8P-D22
250	1250	1405	1560	1720	1875	2030	2185	2340	2500	60	75	150	200	55	90	132	160	140M-L8P-D25
300	1500	1690	1875	2060	2250	2440	2625	2810	3000	75	75	150	200	55	110	160	200	140M-L8P-D30
350	1750	1970	2190	2410	2625	2840	3065	3285	3500	75	100	200	250	75	132	160	250	140M-L8P-D35
400	2000	2250	2500	2750	3000	3250	3500	3750	4000	100	100	250	300	90	160	200	250	140M-L8P-D40
450	2250	2530	2810	3098	3375	3660	3940	4220	4500	100	125	250	350	110	160	200	315	140M-L8P-D45
500	2500	2810	3125	3440	3750	4060	4375	4690	5000	125	150	300	400	110	200	250	355	140M-L8P-D50
600	3000	3375	3760	4110	4500	4880	5250	5630	6000	150	150	350	450	132	250	315	450	140M-L8P-D60
N-Frame																		
800	1600	2400	3200	4000	4800	5600	6400	—	—	150	200	400	500	160	250	355	500	140M-N8P-D80
1200	2400	3600	4800	6000	7200	8400	9600	—	—	250	300	600	700	200	250	500	710	140M-N8P-E12

* The Hp and kW ratings shown are for reference only. They allow for a magnetic trip setting of at least up to 13X the motor FLA. However, the final selection of the MCP should be made based on motor full load current and the requirements of local electrical codes.
 * The interrupting rating for MCPs is dependent upon the controller used. Please contact your local Rockwell Automation sales office or Allen-Bradley distributor for further information.

Motor Protection Circuit Breakers and Motor Circuit Protectors

Application Ratings

UL/CSA Listed Application Ratings — Motor Protection Circuit Breaker (MPCB) Only

Cat. No.	UL 508 — Manual Motor Controller								UL 508 Self-Protected (Type E) Combination Motor Controller		UL 489 Inverse Time C.B. w/UL 508 Motor Overload Protection	
	Max. Fuse or C.B. per NEC	Group Motor Installation		Motor Disconnect		Tap Conductor Protection		Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]		
		480V	600V	480V	600V	480V	600V	480Y/277V‡	600Y/347V‡	480V	600V	
C-Frame												
140M-C2E-A16	450	65	47	65	47	65	47	65	47	—	—	
140M-C2E-A25	450	65	47	65	47	65	47	65	47	—	—	
140M-C2E-A40	450	65	47	65	47	65	47	65	47	—	—	
140M-C2E-A63	450	65	47	65	47	65	47	65	47	—	—	
140M-C2E-B10	450	65	47	65	47	65	47	65	47	—	—	
140M-C2E-B16	450	65	47	65	47	65	47	65	47	—	—	
140M-C2E-B25	450	65	30	65	30	65	30	65	30	—	—	
140M-C2E-B40	450	65	25	65	25	65	25	65	25	—	—	
140M-C2E-B63	450	65	30	65	30	65	—	65	—	—	—	
140M-C2E-C10	450	65	30	65	30	65	—	65	—	—	—	
140M-C2E-C16	450	30	30	30	30	30	—	30	—	—	—	
140M-C2E-C20	450	30	30	10	10	10	—	10	—	—	—	
140M-C2E-C25	450	25	10	10	5	—	—	—	—	—	—	
140M-C2E-C29	450	25	5	10	—	—	—	—	—	—	—	
140M-C2E-C32	450	25	5	10	—	—	—	—	—	—	—	
D-Frame												
140M-D8E-B25	450	65	30	65	30	65	30	65	30	—	—	
140M-D8E-B40	450	65	30	65	30	65	30	65	30	—	—	
140M-D8E-B63	450	65	30	65	30	65	30	65	30	—	—	
140M-D8E-C10	450	65	30	65	30	65	30	65	30	—	—	
140M-D8E-C16	450	65	30	65	30	65	30	65	30	—	—	
140M-D8E-C20	450	65	30	65	30	65	—	65	—	—	—	
140M-D8E-C25	450	30	30	30	30	30	—	30	—	—	—	
140M-D8E-C29	450	30	30	30	18	—	—	—	—	—	—	
140M-D8E-C32	450	30	30	30	18	—	—	—	—	—	—	
F-Frame												
140M-F8E-C10	600	65	30	65	30	65	30	65	30	—	—	
140M-F8E-C16	600	65	30	65	30	65	30	65	30	—	—	
140M-F8E-C20	600	65	30	65	30	65	30	65	30	—	—	
140M-F8E-C25	600	65	30	65	30	65	30	65	30	—	—	
140M-F8E-C32	600	65	30	65	30	65	30	65	30	—	—	
140M-F8E-C45	600	65	18	65	18	65	—	65	—	—	—	
CMN-Frame												
140-CMN-2500	1000	65	42	—	—	—	—	—	—	—	—	
140-CMN-4000	1000	65	42	—	—	—	—	—	—	—	—	
140-CMN-6300	1000	42	18	—	—	—	—	—	—	—	—	
140-CMN-9000	1000	35	10	—	—	—	—	—	—	—	—	
I-Frame												
140M-I8E-C80	—	—	—	—	—	—	—	—	—	65	30	
140M-I8E-D10	—	—	—	—	—	—	—	—	—	65	30	
140M-I8E-D16	—	—	—	—	—	—	—	—	—	65	30	
140M-I8E-D20	—	—	—	—	—	—	—	—	—	65	30	
J-Frame												
140M-J2E-C50	—	—	—	—	—	—	—	—	—	25	18	
140M-J2E-D10	—	—	—	—	—	—	—	—	—	25	18	
140M-J2E-D16	—	—	—	—	—	—	—	—	—	25	18	
140M-J2E-D25	—	—	—	—	—	—	—	—	—	25	18	
140M-J8E-C50	—	—	—	—	—	—	—	—	—	65	25	
140M-J8E-D10	—	—	—	—	—	—	—	—	—	65	25	
140M-J8E-D16	—	—	—	—	—	—	—	—	—	65	25	
140M-J8E-D25	—	—	—	—	—	—	—	—	—	65	25	
L-Frame												
140M-L2E-D25	—	—	—	—	—	—	—	—	—	25	18	
140M-L2E-D40	—	—	—	—	—	—	—	—	—	25	18	
140M-L2E-D63	—	—	—	—	—	—	—	—	—	25	18	
140M-L8E-D25	—	—	—	—	—	—	—	—	—	65	35	
140M-L8E-D40	—	—	—	—	—	—	—	—	—	65	35	
140M-L8E-D63	—	—	—	—	—	—	—	—	—	65	35	

‡ For full voltage (delta) ratings above 277V or 347V, follow the NEC or CEC rules for group motor applications.



Motor Protection Circuit Breakers and Motor Circuit Protectors

Application Ratings

UL/CSA Listed Application Ratings — Motor Protection Circuit Breaker (MPCB) Only, Continued

Cat. No.	Max. Fuse or C.B. per NEC	UL 508 Manual Motor Controller						UL 508 Self-Protected (Type E) Combination Motor Controller	
		Group Motor Installation		Motor Disconnect		Tap Conductor Protection		Max. Short Circuit Current [kA]	
		Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]			
		480V	600V	480V	600V	480V	600V	480Y/277V‡	600Y/347V‡
C-Frame									
140M-C2T-A16	450	65	47	65	47	65	47	65	47
140M-C2T-A25	450	65	47	65	47	65	47	65	47
140M-C2T-A40	450	65	47	65	47	65	47	65	47
140M-C2T-A63	450	65	47	65	47	65	47	65	47
140M-C2T-B10	450	65	47	65	47	65	47	65	47
140M-C2T-B16	450	65	47	65	47	65	30	65	30
140M-C2T-B25	450	65	25	65	25	65	25	65	25
140M-C2T-B40	450	65	30	65	30	65	—	65	—
140M-C2T-B63	450	65	30	65	30	65	—	65	—
140M-C2T-C10	450	30	30	30	30	30	—	30	—
140M-C2T-C16	450	30	30	10	10	10	—	10	—
D-Frame									
140M-D8T-C16	450	65	30	65	30	65	30	65	30
140M-D8T-C20	450	30	30	30	30	30	—	30	—
F-Frame									
140M-F8T-C25	600	65	30	65	30	65	30	65	30
140M-F8T-C32	600	65	18	65	18	65	18	65	18

‡ For full voltage (delta) ratings above 277V or 347V, follow the NEC or CEC rules for group motor applications.

Motor Protection Circuit Breakers and Motor Circuit Protectors

Application Ratings

UL Listed Application Ratings — Motor Circuit Protectors Only§

Cat. No.	UL 508 Manual Motor Controller						UL 489 Instantaneous Trip Circuit Breaker (Magnetic Only)	
	Max. Fuse or C.B. per NEC	Group Motor Installation		Motor Disconnect		Motor Circuit Protector		
		Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]‡		
		480V	600V	480V	600V	480V	600V	
C-Frame								
140M-C2N-A16	450	65	47	65	47	—	—	
140M-C2N-A25	450	65	47	65	47	—	—	
140M-C2N-A40	450	65	47	65	47	—	—	
140M-C2N-A63	450	65	47	65	47	—	—	
140M-C2N-B10	450	65	47	65	47	—	—	
140M-C2N-B16	450	65	47	65	47	—	—	
140M-C2N-B25	450	65	30	65	30	—	—	
D-Frame								
140M-D8N-B25	450	65	30	65	30	—	—	
140M-D8N-B40	450	65	30	65	30	—	—	
140M-D8N-B63	450	65	30	65	30	—	—	
140M-D8N-C10	450	65	30	65	30	—	—	
140M-D8N-C16	450	65	30	65	30	—	—	
140M-D8N-C25	450	30	30	30	30	—	—	
140M-D8N-C32	450	30	30	30	18	—	—	
F-Frame								
140M-F8N-C25	600	65	30	65	30	—	—	
140M-F8N-C32	600	65	30	65	30	—	—	
140M-F8N-C45	600	65	18	65	18	—	—	
H-Frame								
140M-H8P-B30	—	—	—	—	—	65	30	
140M-H8P-B70	—	—	—	—	—	65	30	
140M-H8P-C15	—	—	—	—	—	65	30	
140M-H8P-C30	—	—	—	—	—	65	30	
140M-H8P-C50	—	—	—	—	—	65	30	
140M-H8P-C70	—	—	—	—	—	65	30	
140M-H8P-D10	—	—	—	—	—	65	30	
140M-H8R-D10	—	—	—	—	—	65	30	
J-Frame								
140M-J8P-C70	—	—	—	—	—	65	30	
140M-J8P-C90	—	—	—	—	—	65	30	
140M-J8P-D10	—	—	—	—	—	65	30	
140M-J8P-D12	—	—	—	—	—	65	30	
140M-J8P-D15	—	—	—	—	—	65	30	
140M-J8P-D17	—	—	—	—	—	65	30	
140M-J8P-D20	—	—	—	—	—	65	30	
140M-J8P-D22	—	—	—	—	—	65	30	
140M-J8P-D25	—	—	—	—	—	65	30	
L-Frame								
140M-L8P-D22	—	—	—	—	—	65	30	
140M-L8P-D25	—	—	—	—	—	65	30	
140M-L8P-D30	—	—	—	—	—	65	30	
140M-L8P-D35	—	—	—	—	—	65	30	
140M-L8P-D40	—	—	—	—	—	65	30	
140M-L8P-D45	—	—	—	—	—	65	30	
140M-L8P-D50	—	—	—	—	—	65	30	
140M-L8P-D60	—	—	—	—	—	65	30	
N-Frame								
140M-N8P-D80	—	—	—	—	—	65	35	
140M-N8P-E12	—	—	—	—	—	65	35	

§ Separate overload protection is required.

‡ The interrupting rating for MCPs is dependent upon the controller used. Contact your local Rockwell Automation sales office or Allen-Bradley distributor for further information.

Motor Protection Circuit Breakers and Motor Circuit Protectors

Application Ratings

UL Listed Application Ratings - Motor Protection Circuit Breakers with Bulletin 100-K Contactors

Cat. No.	UL 508 Manual Motor Controller						UL 508 Type F Combination Motor Controller			UL 508 Type E Self-Protected Combination Motor Controller		
	Max. Fuse or C.B. per NEC	Minimum Contactor Size	Group Motor Installation		Motor Disconnect		Minimum Contactor Size	Max. Short Circuit Current [kA]		Minimum Contactor Size	Max. Short Circuit Current [kA]	
			Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]			480Y/277V§			600Y/347V§	
			480V	600V	480V	600V		480Y/277V§	600Y/347V§		480Y/277V§	600Y/347V§
C-Frame												
140M-C2E-A16	450	100-K05	65	47	65	47	100-K05	65	47	—	—	—
140M-C2E-A25	450	100-K05	65	47	65	47	100-K05	65	47	—	—	—
140M-C2E-A40	450	100-K05	65	47	65	47	100-K05	65	47	—	—	—
140M-C2E-A63	450	100-K05	65	47	65	47	100-K05	65	47	—	—	—
140M-C2E-B10	450	100-K05	65	47	65	47	100-K05	65	47	—	—	—
140M-C2E-B16	450	100-K05	65	47	65	47	100-K05	65	47	—	—	—
140M-C2E-B25	450	100-K05	65	30	65	30	100-K05	65	30	—	—	—
140M-C2E-B40	450	100-K05	65	30	65	30	100-K05	65	30	—	—	—
140M-C2E-B63	450	100-K05	65	30	65	30	100-K05	65	—	—	—	—
140M-C2E-C10	450	100-K09	65	30	65	30	100-K09	65	—	—	—	—
140M-C2E-C16	450	100-K12	30	30	30	30	100-K12	30	—	—	—	—
D-Frame												
140M-D8E-B25	450	100-K05	65	30	65	30	100-K05	65	30	—	—	—
140M-D8E-B40	450	100-K05	65	30	65	30	100-K05	65	30	—	—	—
140M-D8E-B63	450	100-K05	65	30	65	30	100-K05	65	30	—	—	—
140M-D8E-C10	450	100-K09	65	30	65	30	100-K09	65	30	—	—	—
140M-D8E-C16	450	100-K12	65	30	65	30	100-K12	65	30	—	—	—

§ For full voltage (delta) ratings above 277V or 347V, follow the NEC or CEC rules for group motor applications.

Motor Protection Circuit Breakers and Motor Circuit Protectors

Application Ratings

UL Listed Application Ratings - Motor Protection Circuit Breakers with Bulletin 100-C Contactors

Cat. No.	UL 508 Manual Motor Controller						UL 508 Type F Combination Motor Controller				UL 508 Type E Self-Protected Combination Motor Controller			
	Max. Fuse or C.B. per NEC	Minimum Contactor Size	Group Motor Installation		Motor Disconnect		Minimum Contactor Size	Max. Short Circuit Current [kA]		Minimum Contactor Size	Max. Short Circuit Current [kA]			
			480V	600V	480V	600V		480Y/277V§	600Y/347V§		480Y/277V§	600Y/347V§		
													Max. Short Circuit Current [kA]	Max. Short Circuit Current [kA]
C-Frame														
140M-C2E-A16	450	100-C09	65	47	65	47	100-C09	65	47	100-C09	65	47		
140M-C2E-A25	450	100-C09	65	47	65	47	100-C09	65	47	100-C09	65	47		
140M-C2E-A40	450	100-C09	65	47	65	47	100-C09	65	47	100-C09	65	47		
140M-C2E-A63	450	100-C09	65	47	65	47	100-C09	65	47	100-C09	65	47		
140M-C2E-B10	450	100-C09	65	47	65	47	100-C09	65	47	100-C09	65	47		
140M-C2E-B16	450	100-C09	65	47	65	47	100-C09	65	47	100-C09	65	47		
140M-C2E-B25	450	100-C09	65	30	65	30	100-C09	65	30	100-C09	65	30		
140M-C2E-B40	450	100-C09	65	30	65	30	100-C09	65	30	—	65	25		
140M-C2E-B63	450	100-C09	65	30	65	30	100-C09	65	—	—	65	—		
140M-C2E-C10	450	100-C09	65	30	65	30	100-C09	65	—	—	65	—		
140M-C2E-C16	450	100-C12	30	30	30	25	100-C12	30	—	—	30	—		
140M-C2E-C20	450	100-C16	30	30	30	30	100-C23	10	—	—	10	—		
140M-C2E-C25	450	100-C23	30	30	10	10	—	—	—	—	—	—		
	450	100-C30	30	30	30	30	—	—	—	—	—	—		
140M-C2E-C29	450	100-C30	10	5	10	5	—	—	—	—	—	—		
140M-C2E-C32	450	100-C37	10	5	10	5	—	—	—	—	—	—		
D-Frame														
140M-D8E-B25	450	100-C09	65	30	65	30	100-C09	65	30	100-C09	65	30		
	—	—	—	—	—	—	—	—	—	100-C23	65	30		
140M-D8E-B40	450	100-C09	65	30	65	30	100-C09	65	30	100-C23	65	30		
140M-D8E-B63	450	100-C09	65	30	65	30	100-C09	65	30	100-C30	65	30		
140M-D8E-C10	450	100-C09	65	30	65	30	100-C09	65	30	100-C30	65	30		
140M-D8E-C16	450	100-C12	65	30	65	30	100-C12	65	30	100-C30	65	30		
140M-D8E-C20	450	100-C23	65	30	65	30	100-C23	65	—	100-C30	65	—		
140M-D8E-C25	450	100-C23	65	30	65	30	100-C23	30	—	100-C30	30	—		
140M-D8E-C29	450	100-C30	65	10	65	10	—	—	—	—	—	—		
140M-D8E-C32	450	100-C37	65	10	65	10	—	—	—	—	—	—		
F-Frame														
140M-F8E-C10	600	100-C30	65	30	65	30	100-C30	65	30	100-C30	65	30		
140M-F8E-C16	600	100-C30	65	30	65	30	100-C30	65	30	100-C30	65	30		
140M-F8E-C20	600	100-C30	65	30	65	30	100-C30	65	30	100-C30	65	30		
140M-F8E-C25	600	100-C30	65	30	65	30	100-C30	65	30	100-C30	65	30		
140M-F8E-C32	600	100-C30	65	30	65	30	100-C30	65	30	100-C30	65	30		
140M-F8E-C45	600	100-C37	65	18	65	18	100-C37	65	—	100-C37	65	—		
CMN-Frame														
140-CMN-2500	1000	100-C16	65	42	—	—	—	—	—	—	—	—		
140-CMN-4000	1000	100-C30	65	42	—	—	—	—	—	—	—	—		
140-CMN-6300	1000	100-C43	42	18	—	—	—	—	—	—	—	—		
140-CMN-9000	1000	100-C72	35	10	—	—	—	—	—	—	—	—		

§ For full voltage (delta) ratings above 277V or 347V, follow the NEC or CEC rules for group motor applications.

2



Motor Protection Circuit Breakers and Motor Circuit Protectors

Application Ratings

UL Listed Application Ratings - Motor Circuit Protectors with Bulletin 100-C Contactors§

Cat. No.	UL 508 Manual Motor Controller						UL 508 Type E (Self-Protected) Combination Motor Controller		
	Max. Fuse or C.B. per NEC	Minimum Contactor Size	Group Motor Installation		Motor Disconnect		Minimum Contactor Size	Max. Short Circuit Current [kA] 480Y/277V*	Max. Short Circuit Current [kA] 600Y/347V*
			Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]				
			480V	600V	480V	600V			
C-Frame									
140M-C2N-A16	450	100-C09	65	47	65	47	100-C09	65	47
140M-C2N-A25	450	100-C09	65	47	65	47	100-C09	65	47
140M-C2N-A40	450	100-C09	65	47	65	47	100-C09	65	47
140M-C2N-A63	450	100-C09	65	47	65	47	100-C09	65	47
140M-C2N-B10	450	100-C09	65	47	65	47	100-C09	65	47
140M-C2N-B16	450	100-C09	65	47	65	47	100-C09	65	47
140M-C2N-B25	450	100-C09	65	30	65	30	100-C09	65	—
D-Frame									
140M-D8N-B25	450	100-C09	65	30	65	30	100-C09	65	—
	—	—	—	—	—	—	100-C23	65	30
140M-D8N-B40	450	100-C09	65	30	65	30	100-C23	65	30
140M-D8N-B63	450	100-C09	65	30	65	30	100-C30	65	30
140M-D8N-C10	450	100-C09	65	30	65	30	100-C30	65	30
140M-D8N-C16	450	100-C12	65	30	65	30	100-C30	65	30
140M-D8N-C25	450	100-C23	30	30	30	30	100-C30	65	—
140M-D8N-C32	450	100-C37	65	10	65	10	—	—	—
F-Frame									
140M-F8N-C25	600	100-C23	65	30	65	30	100-C30	65	30
140M-F8N-C32	600	100-C30	65	30	65	30	100-C30	65	30
140M-F8N-C45	600	100-C37	65	18	65	18	100-C37	65	—

§ Separate overload protection is required.

* For full-voltage (delta) ratings above 277V or 347V, follow the NEC or CEC rules for group motor applications.

2

Definition of Type 2 Short Circuit Coordination:

- The contactor or starter must not endanger persons or plant in the event of a short circuit.
- No damage to the motor protection device or other parts may occur with the exception of welding of the contactor or starter contacts if these can be easily separated without appreciable deformation (such as with a screwdriver).

In the event of short circuit, fast-opening, current-limiting Bulletin 140M Motor Protection Circuit Breakers make it possible to build economical, fully short-circuit coordinated starter combinations with Type 2 coordination.

Type 2 Coordination 400V

Cat. No.			Max. Short Circuit Current [kA]	For Use With Contactors Below (or larger)
Standard Motor Protection	High Inrush Motor Protection	Motor Circuit Protection	400V	
C-Frame				
140M-C2E-A16	—	140M-C2N-A16	100	100-C09
140M-C2E-A25	140M-C2T-A16	140M-C2N-A25	100	100-C09
140M-C2E-A40	140M-C2T-A25	140M-C2N-A40	100	100-C09
140M-C2E-A63	140M-C2T-A40	140M-C2N-A63	100	100-C09
140M-C2E-B10	140M-C2T-A63	140M-C2N-B10	100	100-C09
140M-C2E-B16	140M-C2T-B10	140M-C2N-B16	100	100-C09
140M-C2E-B25	140M-C2T-B16	140M-C2N-B25	50	100-C09
140M-C2E-B40	140M-C2T-B25	—	50	100-C09
140M-C2E-B63	140M-C2T-B40	—	50	100-C09
140M-C2E-C10	140M-C2T-B63	—	50	100-C09
140M-C2E-C16	140M-C2T-C10	—	50	100-C12*
140M-C2E-C20	140M-C2T-C16	—	50	100-C23
140M-C2E-C25	—	—	15	100-C30
140M-C2E-C29	—	—	15	100-C30
140M-C2E-C32	—	—	15	100-C37
D-Frame				
140M-D8E-B25	—	140M-D8N-B25	100	100-C09
140M-D8E-B40	—	140M-D8N-B40	100	100-C09
140M-D8E-B63	—	140M-D8N-B63	100	100-C09
140M-D8E-C10	—	140M-D8N-C10	65	100-C09
140M-D8E-C16	—	140M-D8N-C16	65	100-C12
140M-D8E-C20	140M-D8T-C16	—	65	100-C23
140M-D8E-C25	140M-D8T-C20	140M-D8N-C25	50	100-C23
140M-D8E-C29	—	—	65	100-C30
140M-D8E-C32	—	140M-D8N-C32	65	100-C37
F-Frame				
140M-F8E-C10	—	—	100	100-C09
140M-F8E-C16	—	—	100	100-C12
140M-F8E-C20	—	—	100	100-C23
140M-F8E-C25	—	140M-F8N-C25	100	100-C30
140M-F8E-C32	140M-F8T-C25	140M-F8N-C32	100	100-C30
140M-F8E-C45	140M-F8T-C32	140M-F8N-C45	100	100-C37
CMN-Frame				
140-CMN-2500	—	—	65	100-C16
140-CMN-4000	—	—	65	100-C30
140-CMN-6300	—	—	42	100-C43
140-CMN-9000	—	—	35	100-C72

* Cat. No. 100-C16 contactors Type 1 only

Type 2 Coordination 480V

Cat. No.			Max. Short Circuit Current [kA]	For Use With Contactors Below (or larger)
Standard Motor Protection	High Inrush Motor Protection	Motor Circuit Protection		
C-Frame				
140M-C2E-A16	—	140M-C2N-A16	65	100-C09
140M-C2E-A25	140M-C2T-A16	140M-C2N-A25	65	100-C09
140M-C2E-A40	140M-C2T-A25	140M-C2N-A40	65	100-C09
140M-C2E-A63	140M-C2T-A40	140M-C2N-A63	65	100-C09
140M-C2E-B10	140M-C2T-A63	140M-C2N-B10	65	100-C09
140M-C2E-B16	140M-C2T-B10	140M-C2N-B16	65	100-C09
140M-C2E-B25	140M-C2T-B16	140M-C2N-B25	50	100-C16
140M-C2E-B40	140M-C2T-B25	—	50	100-C30
140M-C2E-B63	140M-C2T-B40	—	50	100-C30
140M-C2E-C10	140M-C2T-B63	—	50	100-C30
140M-C2E-C16	140M-C2T-C10	—	10	100-C30
140M-C2E-C20	140M-C2T-C16	—	10	100-C30
140M-C2E-C25	—	—	10	100-C30
140M-C2E-C29	—	—	10	100-C30
140M-C2E-C32	—	—	10	100-C37
D-Frame				
140M-D8E-B25	—	140M-D8N-B25	65	100-C09
140M-D8E-B40	—	140M-D8N-B40	65	100-C09
140M-D8E-B63	—	140M-D8N-B63	65	100-C09
140M-D8E-C10	—	140M-D8N-C10	65	100-C09
140M-D8E-C16	—	140M-D8N-C16	65	100-C12
140M-D8E-C20	140M-D8T-C16	—	65	100-C23
140M-D8E-C25	140M-D8T-C20	140M-D8N-C25	65	100-C23
140M-D8E-C29	—	—	65	100-C30
140M-D8E-C32	—	140M-D8N-C32	65	100-C37
F-Frame				
140M-F8E-C10	—	—	65	100-C09
140M-F8E-C16	—	—	65	100-C12
140M-F8E-C20	—	—	65	100-C23
140M-F8E-C25	—	140M-F8N-C25	65	100-C30
140M-F8E-C32	140M-F8T-C25	140M-F8N-C32	65	100-C30
140M-F8E-C45	140M-F8T-C32	140M-F8N-C45	65	100-C37
CMN-Frame				
140-CMN-2500	—	—	65	100-C16
140-CMN-4000	—	—	65	100-C30
140-CMN-6300	—	—	42	100-C43
140-CMN-9000	—	—	35	100-C72



Motor Circuit Protectors

Application Ratings

Type 2 Coordination 600V

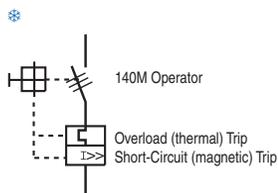
Cat. No.			Max. Short Circuit Current [kA]	For Use With Contactors Below (or larger)
Standard Motor Protection	High Inrush Motor Protection	Motor Circuit Protection		
C-Frame				
140M-C2E-A16	—	140M-C2N-A16	47	100-C09
140M-C2E-A25	140M-C2T-A16	140M-C2N-A25	47	100-C09
140M-C2E-A40	140M-C2T-A25	140M-C2N-A40	47	100-C09
140M-C2E-A63	140M-C2T-A40	140M-C2N-A63	47	100-C09
140M-C2E-B10	140M-C2T-A63	140M-C2N-B10	47	100-C09
140M-C2E-B16	140M-C2T-B10	140M-C2N-B16	47	100-C09
140M-C2E-B25	140M-C2T-B16	140M-C2N-B25	10	100-C16
140M-C2E-B40	140M-C2T-B25	—	10	100-C16
140M-C2E-B63	140M-C2T-B40	—	5	100-C23
140M-C2E-C10	140M-C2T-B63	—	5	100-C30
140M-C2E-C16	140M-C2T-C10	—	5	100-C30
140M-C2E-C20	140M-C2T-C16	—	5	100-C30
140M-C2E-C25	—	—	5	100-C30
140M-C2E-C29	—	—	5	100-C30
140M-C2E-C32	—	—	5	100-C37
D-Frame				
140M-D8E-B25	—	140M-D8N-B25	30	100-C30
140M-D8E-B40	—	140M-D8N-B40	30	100-C30
140M-D8E-B63	—	140M-D8N-B63	30	100-C30
140M-D8E-C10	—	140M-D8N-C10	30	100-C30
140M-D8E-C16	—	140M-D8N-C16	30	100-C30
140M-D8E-C20	140M-D8T-C16	—	5	100-C30
140M-D8E-C25	140M-D8T-C20	140M-D8N-C25	5	100-C30
140M-D8E-C29	—	—	10	100-C30
140M-D8E-C32	—	140M-D8N-C32	10	100-C37
F-Frame				
140M-F8E-C10	—	—	30	100-C30
140M-F8E-C16	—	—	30	100-C30
140M-F8E-C20	—	—	30	100-C30
140M-F8E-C25	—	140M-F8N-C25	30	100-C30
140M-F8E-C32	140M-F8T-C25	140M-F8N-C32	30	100-C30
140M-F8E-C45	140M-F8T-C32	140M-F8N-C45	10	100-C37
CMN-Frame				
140-CMN-2500	—	—	42	100-C16
140-CMN-4000	—	—	42	100-C30
140-CMN-6300	—	—	18	100-C43
140-CMN-9000	—	—	10	100-C72

Motor Protection Circuit Breakers and Motor Circuit Protectors

Accessories

Description		Operator Position *			Term. No.	Description	Connection Diagram *	For Use With	Cat. No.	
		OFF	ON	Tripped						
		O	X	O	13-14	N.O. Aux		140M-C, D, F; 140U-D (UL489 only in combination with 140M-C-AFC)	140M-C-AFA10	
		X	O	X	11-12	N.C. Aux			140M-C-AFA01	
	Front-Mounted Auxiliary Contact • 1-pole or 2-pole • No additional space required • Only 1 per device	O	X	O	13-14	N.O. Aux		140M-C, D, F; 140U-D (UL489 only in combination with 140M-C-AFC)	140M-C-AFA11	
		X	O	X	21-22	N.C. Aux			140M-C-AFA02	
		O	X	O	13-14	N.O. Aux			140M-C-AFA20	
		O	X	O	23-24	N.O. Aux			140M-C-AFA02	
		X	O	X	11-12	N.C. Aux			140M-C-AFA02	
		X	O	X	21-22	N.C. Aux			140M-C-AFA02	
	Right Side-Mounted Auxiliary Contact • 2-pole • Adds 9 mm to the width of the device • Two per MPCB	O	X	O	33-34	N.O. Aux		140M-C, D, F	140M-C-ASA20	
		O	X	O	43-44	N.O. Aux			140M-C-ASA02	
		X	O	X	31-32	N.C. Aux			140M-C-ASA02	
		X	O	X	41-42	N.C. Aux			140M-C-ASA11	
		O	X	O	33-34	N.O. Aux			140M-C, D, F	140M-C-ASA11
		X	O	X	41-42	N.C. Aux			140M-C, D, F	140M-C-ASA11

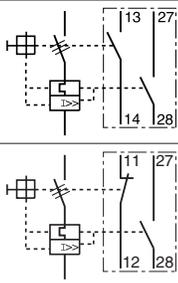
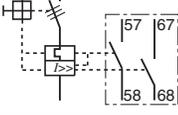
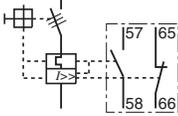
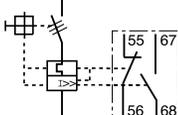
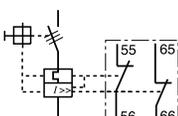
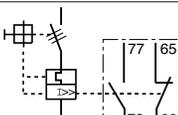
* X = Contact Closed; O = Contact Open



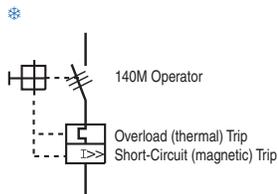
Motor Protection Circuit Breakers and Motor Circuit Protectors

Accessories

2

		Description			Term. No.	Description	Connection Diagram *	For Use With	Cat. No.
		Operator Position *							
		OFF	ON	Tripped					
	Front-Mounted Trip Contact <ul style="list-style-type: none"> • 2-pole • Indicates tripping of device • No additional space required 	O	X	O	13-14	N.O. Aux		140M-C, D, F; 140U-D (UL489 only in combination with 140M-C-AFC)	140M-C-AFAR10A10
		O	O	X	27-28	N.O. Trip (Short-Circuit & Overload)			140M-C-AFAR10A01
		X	O	X	11-12	N.C. Aux			
		O	O	X	27-28	N.O. Trip (Short-Circuit & Overload)			
	Right-Side Mounted Trip Contact <ul style="list-style-type: none"> • 2-pole • Indicates tripping of motor protection circuit breaker • Adds 9 mm to the width of the circuit breaker • One only per MPCB • A right-side mounted auxiliary contact may be tandem mounted on top of this trip contact 	O	O	X	57-58	N.O. Trip (Short-Circuit & Overload)		140M-C, D, F	140M-C-ASAR10M10
		O	O	X	67-68	N.O. Trip (Short-Circuit)			
		O	O	X	57-58	N.O. Trip (Short-Circuit & Overload)		140M-C, D, F	140M-C-ASAR10M01
		X	X	O	65-66	N.C. Trip (Short-Circuit)			
		X	X	O	55-56	N.C. Trip (Short-Circuit & Overload)		140M-C, D, F	140M-C-ASAR01M10
		O	O	X	67-68	N.O. Trip (Short-Circuit)			
		X	X	O	55-56	N.C. Trip (Short-Circuit & Overload)		140M-C, D, F	140M-C-ASAR01M01
		X	X	O	65-66	N.C. Trip (Short-Circuit)			
		O	O	X	77-78	N.O. Trip (Short-Circuit)		140M-C, D, F	140M-C-ASAM11
		X	X	O	65-66	N.C. Trip (Short-Circuit)			

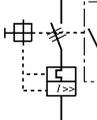
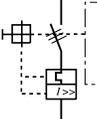
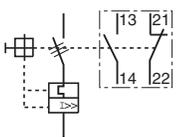
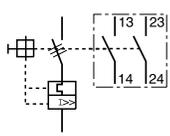
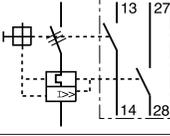
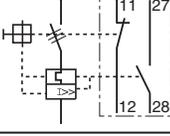
* X = Contact Closed; O = Contact Open



Motor Protection Circuit Breakers and Motor Circuit Protectors

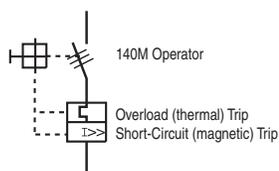
Accessories

Accessories — Screwless

		Description			Term. No.	Description	Connection Diagram *	For Use With	Cat. No.
		Operator Position *							
		OFF	ON	Tripped					
 <p>Front-Mounted Auxiliary Contact 1-pole or 2-pole No additional space required - Only 1 per MPCB</p>	O	X	O	13-14	N.O. Aux		140M-C, D, F; 140M-RC	140M-RC-AFA10	
	X	O	X	11-12	N.C. Aux			140M-RC-AFA01	
	O	X	O	13-14	N.O. Aux		140M-C, D, F; 140M-RC	140M-RC-AFA11	
	X	O	X	21-22	N.C. Aux				
	O	X	O	13-14	N.O. Aux		140M-C, D, F; 140M-RC	140M-RC-AFA20	
	O	X	O	23-24	N.O. Aux				
 <p>Front-Mounted Trip Contact 2-pole Indicates tripping of device No additional space required</p>	O	X	O	13-14	N.O. Aux		140M-C, D, F; 140M-RC	140M-RC-AFAR10A01	
	O	O	X	27-28	N.O. Trip (Short-Circuit & Overload)				
	X	O	X	11-12	N.C. Aux		140M-RC	140M-RC-AFAR10A10	
	O	O	X	27-28	N.O. Trip (Short-Circuit & Overload)				

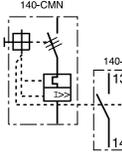
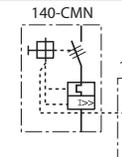
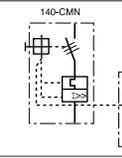
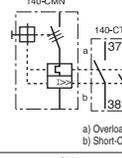
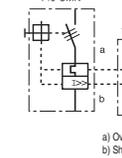
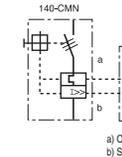
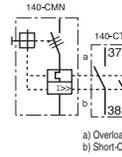
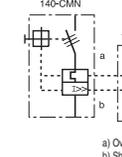
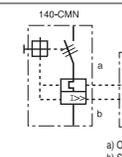
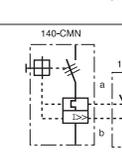
* X = Contact Closed; O = Contact Open

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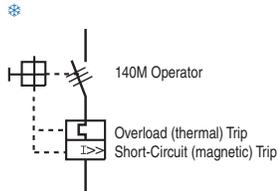


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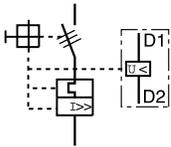
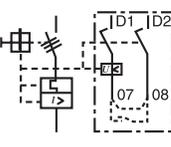
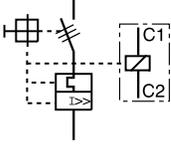
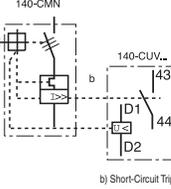
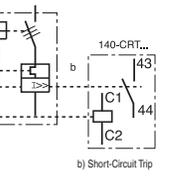
		Description			Term. No.	Description	Connection Diagram*	For Use With	Cat. No.
		Operator Position*							
		OFF	ON	Tripped					
 <p>Front-Mounted Auxiliary Contact</p> <ul style="list-style-type: none"> Internal 2-pole 1 per MPCB 	O	X	O	13-14	N.O. Aux		140-CMN	140-CA20	
	O	X	O	23-24	N.O. Aux		140-CMN	140-CA20	
	X	O	X	11-12	N.C. Aux		140-CMN	140-CA02	
	X	O	X	21-22	N.C. Aux		140-CMN	140-CA02	
	O	X	O	13-14	N.O. Aux		140-CMN	140-CA11	
	X	O	X	21-22	N.C. Aux		140-CMN	140-CA11	
 <p>Front-Mounted Trip-Indicating Auxiliary Contact</p> <ul style="list-style-type: none"> Internal 2-pole 1 per MPCB 	O	O	X	37-38	N.O. Trip (Overload)	 <p>a) Overload Trip b) Short-Circuit Trip</p>	140-CMN	140-CT10-10	
	O	O	X	43-44	N.O. Trip (Short-Circuit)				
	X	X	O	35-36	N.C. Trip (Overload)	 <p>a) Overload Trip b) Short-Circuit Trip</p>	140-CMN	140-CT01-01	
	X	X	O	41-42	N.C. Trip (Short-Circuit)				
	X	X	O	35-36	N.C. Trip (Overload)	 <p>a) Overload Trip b) Short-Circuit Trip</p>	140-CMN	140-CT01-10	
	O	O	X	43-44	N.O. Trip (Short-Circuit)				
	O	O	X	37-38	N.O. Trip (Overload)	 <p>a) Overload Trip b) Short-Circuit Trip</p>	140-CMN	140-CT10-01	
	X	X	O	41-42	N.C. Trip (Short-Circuit)				

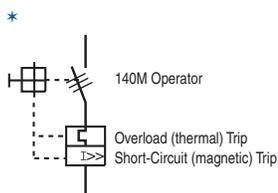
* X = Contact Closed
O = Contact Open



Motor Protection Circuit Breakers and Motor Circuit Protectors

Accessories

Description	Connection Diagram*	Trip Rating	For Use With	Cat. No.
<p>Undervoltage Trip</p> <ul style="list-style-type: none"> Left-side mounted Adds 18 mm to the width of the circuit breaker Automatically trips MPCB/MCP when voltage falls below 35...70% 		24V, 60 Hz	140M-C, D, F	140M-C-UXJ
		24V, 50 Hz		140M-C-UXK
		120V, 60 Hz		140M-C-UXD
		110V, 50 Hz		140M-C-UXC
		208V, 60 Hz		140M-C-UXH
		220...230V, 50 Hz		140M-C-UXF
		240...260V, 60 Hz		140M-C-UXA
		277V, 60 Hz		140M-C-UXT
		380...400V, 50 Hz		140M-C-UXN
		480V, 60 Hz/415V, 50 Hz		140M-C-UXB
		575V, 60 Hz/500V, 50 Hz		140M-C-UXM
		600V, 60 Hz		140M-C-UXVC
		 <p>Undervoltage Trip</p> <ul style="list-style-type: none"> Left-side mounted 2 early make contacts integrated Adds 18 mm to the width of the circuit breaker Automatically trips MPCB/MCP when voltage falls below 35...70% 		
24V, 50 Hz	140M-C-UCK			
120V, 60 Hz	140M-C-UCD			
110V, 50 Hz	140M-C-UCC			
208V, 60 Hz	140M-C-UCH			
220...230V, 50 Hz	140M-C-UCF			
240...260V, 60 Hz	140M-C-UCA			
277V, 60 Hz	140M-C-UCT			
380...400V, 50 Hz	140M-C-UCN			
480V, 60 Hz/415V, 50 Hz	140M-C-UCB			
575V, 60 Hz/500V, 50 Hz	140M-C-UCM			
600V, 60 Hz	140M-C-UCVC			
<p>Shunt Trip</p> <ul style="list-style-type: none"> Left-side mounted Adds 18 mm to the width of the circuit breaker Provides remote tripping of the MPCB/MCP 			24V, 60 Hz	
		24V, 50 Hz	140M-C-SNK	
		110V, 50 Hz/120V, 60 Hz	140M-C-SND	
		208V, 60 Hz	140M-C-SNH	
		220...230V, 50 Hz	140M-C-SNF	
		240...260V, 60 Hz	140M-C-SNA	
		277V, 60 Hz	140M-C-SNT	
		380...400V, 50 Hz	140M-C-SNN	
		480V, 60 Hz/415V, 50 Hz	140M-C-SNB	
		575V, 60 Hz/500V, 50 Hz	140M-C-SNM	
		600V, 60 Hz	140M-C-SNVC	
		24V DC	140M-C-SNZJ	
		 <p>Undervoltage Trip Unit</p> <ul style="list-style-type: none"> Internal, front-mounted Integrated short-circuit trip indication Automatically trips MPCB when voltage falls below 35...70% 	 <p>b) Short-Circuit Trip</p>	24V, 50/60 Hz
110V, 50 Hz/120V, 60 Hz	140-CUV-D			
220V, 50 Hz/240V, 60 Hz	140-CUV-A			
 <p>Shunt Trip Unit</p> <ul style="list-style-type: none"> Internal, front-mounted Integrated short-circuit trip indication Provides remote tripping of the MPCB 	 <p>b) Short-Circuit Trip</p>	24V, 50/60 Hz	140-CMN	140-CRT-KJ
		110V, 50 Hz/120V, 60 Hz		140-CRT-D
		220V, 50 Hz/240V, 60 Hz		140-CRT-A



Motor Protection Circuit Breakers and Motor Circuit Protectors

Accessories

	Description		For Use With	Cat. No.
	Anti-Tamper Shield Provides protection against inadvertent adjustment of the current setting	10 pcs/pkg	140M-C, D, F	140M-C-CA
	Lockable Twist Knob • For one padlock 4...6 mm (3/16 in.) Ø shackle • Can be locked in OFF position	Black	140M-C, D, F; 140U-D	140M-C-KN1
		Red/Yellow		140M-C-KRY1
	Locking Tag • Padlock attachment to the lockable handles • Up to three padlocks 4...8 mm (5/16 in.) Ø shackle		140M-C-KN1, 140M-C-KRY1	140M-C-M3
	Padlockable Operating Knob • Accepts 8 mm (5/16 in.) Ø padlock shackle — up to three padlocks • Permits padlocking in the off position	Black	140-CMN	140-KN
		Red/Yellow		140-KRY
	Door Coupling Handle • For 3 padlocks 4...8 mm (5/16 in.) in diameter • IP66 Protection/Type 1, 4, 4X, 12 • Interlock override capability • Can be modified for locking in ON position • Ships with coupling — order extension shaft and legend plate separately • Mounting depth (front of DIN Rail to front of enclosure door): - 140M-C: 105.5 mm ± 5 mm (4.15 in. ± 3/16 in.) - 140M-D: 114.5 mm ± 5 mm (4.5 in. ± 3/16 in.) - 140M-F: 137.1 mm ± 5 mm (5.4 in. ± 3/16 in.) - 140-CMN: 169 mm +/- 5 mm (6.7 in. +/- 3/16 in.)	Black	140M-C, D, F	140M-C-DN66
		Red/Yellow	140-CMN	140M-C-DRY66
	Legend Plate • Marking: "Hauptschalter" and "Main Switch" • Marking: "Not-Aus" and "Emergency Off"		140-CMN	140-C-DRY66
			140-CMN	140-C-DRY66
	Extension Shaft Cut to required length for mounting depth (front of DIN Rail to front of enclosure door): - 140M-C: 117...338 mm (4.6...13.3 in.) - 140M-D: 126...347 mm (5.0...13.7 in.) - 140M-F: 149...369 mm (5.9...14.5 in.) - 140-CMN: 180...403 mm (7.1...15.9 in.)		140M-C, D, F; 140U-D	140M-C-DS
			140M-C, D, F; 140U-D	140M-C-DS
	Extension Shaft (Extended Length) Cut to required length for mounting depth (front of DIN Rail to front of enclosure door): - 140M-C: 117...488 mm (4.6...19.2 in.) - 140M-D: 126...497 mm (5.0...19.6 in.) - 140M-F: 149...519 mm (5.9...20.4 in.) - 140-CMN: 180...553 mm (7.1...21.8 in.)		140M-C, D, F; 140U-D	140M-C-DSL
			140M-C, D, F; 140U-D	140M-C-DSL
	Coupler Included with Cat. Nos. 140M-C-DN66 and 140M-C-DRY66		140M-C, D, F; 140U-D	140M-C-DNC
	IP65 Non-Metallic Enclosure • Knockouts for M20 and M25 fittings • Suitable for flexible cable with internal ground wire or conduit when externally grounded around the outside of the enclosure (no UL/CSA approval)	Black Handle	140M-C	198E-AYTG2
		Red/Yellow Handle	140M-C	198E-AYTJ2
	Screw Adapter • For screw arrangement of a motor protection circuit breaker	10 pcs/pkg	140M-C, D, F; 140U-D	140M-C-N45

Motor Protection Circuit Breakers and Motor Circuit Protectors

Accessories

	Description	For Use With	Cat. No.
	ECO Connecting Module — 12 A • For DOL and reversing starters • Eco-starters mount on single DIN Rail (140M on DIN Rail) • Electrical and mechanical interconnection of 140M and 100-K contactors	140M-C to 100-K	140M-C-PEK12
	ECO Connecting Modules — 25 A • Eco-starters mount on single DIN Rail (140M on DIN Rail) • Electrical and mechanical interconnection of 140M MPCB and 100-C (with AC coils or 24V DC electronic coils) contactors	140M-C to 100-C09...C23	140M-C-PEC23
		140M-D to 100-C09...C23	140M-D-PEC23
	ECO Connecting Modules — 25 A • Eco-starters mount on single DIN Rail (100-C on DIN Rail) • Electrical and mechanical interconnection of 140M MPCB and 100-C (with AC or DC coils)	140M-C, 140M-D to 100-C09...C23	140M-C-PEC23A
		140M-C to 100-C09...C23	140M-C-PNC23
	Connecting Modules — 25 and 45 A • Contactor and MPCB MUST BE mounted separately on (2) DIN Rails • Electrical and mechanical interconnection of 140M and 100-C (with AC coils)	140M-D to 100-C09...C23	140M-D-PNC23
		140M-D to 100-C30...C37	140M-D-PNC37
		140M-F to 100-C30...C37	140M-F-PNC37
		140M-F to 100-C43	140M-F-PNC43
	Coil Modules — 25 A and 45 A • For use with Bulletin 103T/107T 3-component starters	140M-C, -D to 100-C09...C23	140M-C-PSC23
140M-D, -F to 100-C30...C43		140M-F-PSC43	
	Spacing Adapter • Required for self-protected combination motor controller (Type E) applications of Bul. 140M-C, -D, and -F MPCBs. Not for use with bus bars.	140M-C, -D	140M-C-TE1
		140M-F	140M-F-TE
	Feeder Block for Compact Busbar • Supply of compact busbars • Increases terminal capacity	140M-C	140M-C-WBE
		140M-F	140M-F-WBE
	Feeder Terminal for Compact Busbar • For supply of compact busbars • Top feed — overlaps compact busbar • Meets IEC spacing requirements	140M-C, -D	140M-C-WTN
	Feeder Terminal for Compact Busbar • For supply of compact busbars • Top feed — overlaps compact busbar • Meets UL Type E spacing requirements	140M-C, -D	140M-C-WTEN
	Three-Phase Compact Busbar for 32 A Motor Protection Circuit Breakers — 64 A Max. Continuous Current • 45 mm spacing • For use with front-mounted auxiliary contact	2 connections	140M-C-W452N
		3 connections	140M-C-W453N
		4 connections	140M-C-W454N
		5 connections	140M-C-W455N
	Three-Phase Compact Busbar for 32 A Motor Protection Circuit Breakers — 64 A Max. Continuous Current • 54 mm spacing • For use with side-mounted auxiliary contact	2 connections	140M-C-W542N
		3 connections	140M-C-W543N
		4 connections	140M-C-W544N
		5 connections	140M-C-W545N
	Three-Phase Compact Busbar for 45 A Motor Protection Circuit Breakers — 115 A Max. Continuous Current • 54 mm spacing • For use with front-mounted auxiliary contact	2 connections	140M-F-W542
		3 connections	140M-F-W543
		4 connections	140M-F-W544
		Three-Phase Compact Busbar for 45 A Motor Protection Circuit Breakers — 115 A Max. Continuous Current • 63 mm spacing • For use with side-mounted auxiliary contact	2 connections
3 connections	140M-F-W633		
4 connections	140M-F-W634		
	Terminal Cover • For covering of unused compact bus bar terminals • IP2X finger protection	140M-C, 140M-D	140M-C-WSN
		140M-F	140M-F-WS
	Top Hat Rail Adapter — 10 mm • Adjusts the depth of the 140M-C to the 140M-D • Allows the use of compact busbars across both frame sizes • Must be ordered in multiples of 10	140M-C	140-KBH2

Notes: 1. See Bulletin 140U for Internal and External Accessories for Bulletin 140M-H, J, L and N frames.

2. Bulletin 140M-I frame Accessories such as auxiliaries, alarms, undervoltage and shunt trips are only available as factory installed modifications. See page 2-37.

Motor Protection Circuit Breakers and Motor Circuit Protectors

Accessories

Description		For Use With	Pkg. Quantity	Cat. No.
	Terminal End Cover — 0.25 in.	140M-I	1	140U-I-TC2
	Terminal End Cover — 0.41 in.			140U-I-TC4
	Terminal Shields (Plastic) IP20 Ingress Protection	140M-I	1	140U-I-TS1
	Padlockable Handle Lock Hasp — Off only Padlocking Hasp Lock-OFF only	140M-I	1	140U-I-PL
	End Cap Kit Provides 3-phase connections for terminal or bolt-on connections Metric Hardware	140M-I	1	140U-I-ECM
	Phase Barriers Provides additional phase clearance when special connections are required	140M-I	2	140U-I-PB
	Terminal Lugs Steel Terminal Copper/Aluminum wire #4-4/0 AWG	140M-I	3	140U-I-TLS1
	Terminal Lugs Stainless Steel Terminal Copper/Aluminum wire #4-4/0 AWG			140U-I-TLS2
	Rotary Close Couple Handle International Black handle	140M-I	1	140U-I-RCB
	Rotary Close Couple Handle International Red/Yellow handle			140U-I-RCR
	Operating Mechanism for External Handles	140M-I	1	198-H2
	External Handles Black/Grey IP66 (Type 3/3R/4/4X/12)	140M-I	1	190-HM4
	Red/Yellow IP66 (Type 3/3R/4/4X/12)			190-HM4E
	Black/Grey IP55 (Type 1)			190-HM1
	Red/Yellow IP55 (Type 1)			190-HM1E
	Overload Pre-trip Auxiliary Contact (AX) Opens contactor coil circuit on overload before MPCB trips (Automatic reset)	140M-J, -L (MPCB only)	1	140U-J-ER1RX

Motor Protection Circuit Breakers and Motor Circuit Protectors

Accessories

Description		For Use With	Pkg. Quantity	Cat. No.			
	Extension Shafts	140M-I	5	194R-R3			
	Standard Enclosure Working Depth [mm (in.)]						
	Minimum 203 (8)						
	Maximum 305 (12)						
	Extended			194R-R4			
	Minimum 203 (8)						
Maximum 508 (20)							
	Flex-Cable Operating Mechanism NEMA Type 1/3/12/4/4X Flange-Mount Handle	3 ft. (0.9 m) Cable	1	140U-I-FCX03			
		4 ft. (1.2 m) Cable		140U-I-FCX04			
		6 ft. (1.9 m) Cable		140U-I-FCX06			
		10 ft. (3.0 m) Cable		140U-I-FCX10			
	Flex-Cable Operating Mechanism Stainless Steel - Type 4/4X Flange Mount Handle	3 ft. (0.9 m) Cable		140U-I-FCS03			
		4 ft. (1.2 m) Cable		140U-I-FCS04			
		6 ft. (1.9 m) Cable		140U-I-FCS06			
		10 ft. (3.0 m) Cable		140U-I-FCS10			
		DIN (#3) symmetrical hat rail 35 x 7.5 x 1 m		140M-D 140M-F 100-C all	10 pcs/kg	199-DR1	
		DIN (#3) Symmetrical Rail 35 mm x 15 mm x 1 m long Top Hat Rail (DIN #3 Symmetrical Rail)		140M-C 140M-D 140M-F 140-CMN	5 pcs/kg	1492-DR9	

Motor Protection Circuit Breakers and Motor Circuit Protectors

Modifications

140M Factory Modifications (Open)

Note: For modifications add (option code _) for desired features to cat. no. Available in North America only.

f

Miscellaneous		
Code	Description	Frame Size
KN(1)	Black Lockable Knob	C, D, F, CMN
KRY(1)	Red/Yellow Lockable Knob	C, D, F, CMN
TE(1)	Spacing Adapter for Self-Protected Starters (Type E)	C, D, F
MT	STD Bus Bar Mount, Top	C, D, F, H, CMN
MU	STD Bus Bar Mount, Universal	J, K, L

g

Aux / Trip Contacts - C, D, F			
1st Code	Description	2nd Code	Description
Bottom Front		Right Side	
X	Placeholder	X	Placeholder
A	1 N.C.	C	1 N.O. + 1 N.C.
B	1 N.O.	D	2 N.O.
C	1 N.O. + 1 N.C.	E	2 N.C.
D	2 N.O.	K	1 N.C. (SC+OL) + 1 N.C. (SC)
E	2 N.C.	L	1 N.O. (SC+OL) + 1 N.O. (SC)
R	1 N.C. + 1 N.O. (SC+OL)	M	1 N.C. (SC+OL) + 1 N.O. (SC)
S	1 N.O. + 1 N.O. (SC+OL)	N	1 N.O. (SC+OL) + 1 N.C. (SC)
		Q	1 N.O. (SC) + 1 N.C. (SC)

g

Aux / Trip Contacts - CMN			
1st Code	Description	2nd Code	Description
Bottom Front		Top Front ‡	
X	Placeholder	X	Placeholder
C	1 N.O. + 1 N.C.	K	1 N.C. (OL) + 1 N.C. (SC)
D	2 N.O.	L	1 N.O. (OL) + 1 NO (SC)
E	2 N.C.	M	1 N.C. (OL) + 1 N.O. (SC)
		N	1 N.O. (OL) + 1 N.C. (SC)

‡ Cannot be combined with option "h".

g

Aux / Trip Contacts - H, J, L			
1st Code	Description	2nd Code	Description
Bottom Front		Right Side	
X	Placeholder	X	Placeholder
		C	1 N.O. + 1 N.C.
		R*‡	1 N.O. + 1 N.C. (Overload Function)
		F*	2 N.O. + 2 N.C.
		N*	1 N.O. (SC+OL) + 1 N.C. (SC)
		T*	1 N.O. + 1 N.C. and 1 N.O. + 1 N.C. (SC+OL)

* Only available on MCPs.
 ‡ J- and L-Frame MPCB only.

g

Aux / Trip Contacts - I, N			
1st Code	Description	2nd Code	Description
Left Side		Right Side	
X	Placeholder	X	Placeholder
C	1 N.O. + 1 N.C.	C	1 N.O. + 1 N.C.
F	2 N.O. + 2 N.C.	F*	2 N.O. + 2 N.C.
N	1 N.O. (SC+OL) + 1 N.C. (SC)	N*	1 N.O. (SC+OL) + 1 N.C. (SC)
T	1 N.O. + 1 N.C. and 1 N.O. + 1 N.C. (SC+OL)	T*	1 N.O. + 1 N.C. and 1 N.O. + 1 N.C. (SC+OL)

* Only available on MCPs.

h

UV and Shunt Trips - C, D, F			
1st Code	Description	2nd Code	Description
Left Side		Voltage	
G	Undervoltage Trip	J	24V AC, 60 Hz
		K	24V AC, 50 Hz
		D	120V AC, 60 Hz
		C	110V AC, 50 Hz
		H	208V AC, 60 Hz
		F	220...230V AC, 50 Hz
		A	240V AC, 60 Hz
		T	277V AC, 60 Hz
		N	380...400V AC, 50 Hz
		B	480V AC, 60 Hz and 415V AC, 50 Hz
		VC	600V AC, 60 Hz
		M	575V AC, 60 Hz and 500V AC, 50 Hz
		ZR	9V DC
		ZQ	12V DC
		ZJ	24V DC
		ZW	36V DC
	ZY	48V DC	
	ZZ	60V DC	
	ZB	64V DC	
	ZG	72V DC	
	ZE	80V DC	



Motor Protection Circuit Breakers and Motor Circuit Protectors

Modifications

140M Factory Modifications (Open)

Note: For modifications add (option code _) for desired features to cat. no. Available in North America only.

h

UV and Shunt Trips - CMN			
1st Code	Description	2nd Code	Description
Top Front‡		Voltage	
G	Undervoltage Trip	KJ	24V AC, 60 Hz and 24V AC, 50 Hz
P	Shunt Trip	D	120V AC, 60 Hz and 110V AC, 50 Hz
		A	240V AC, 60 Hz and 220...230V AC, 50 Hz

‡Cannot be combined with option "g".

h

UV and Shunt Trips - H, J, L			
1st Code	Description	2nd Code	Description
Left Front		UV Voltage	
G	Undervoltage Trip	J	24V AC/DC
		D	110...127V AC
		A	208...240V AC
		B	380...500V AC
P	Shunt Trip	C	525...600V AC
		Shunt Voltage	
		J	12...60V AC/DC
		D	110...240V AC/DC
P	Shunt Trip	B	380...600V AC

h

UV and Shunt Trips - I			
1st Code	Description	2nd Code	Description
Left Front		UV Voltage	
G	Undervoltage Trip	J	24V AC
		D	110...127V AC
		A	208...240V AC
		B	380...480V AC
Left Front		Shunt Voltage	
P	Shunt Trip	J	12...24V AC/DC
		D	48...127V AC and 48...60V DC
		N	208...380V AC and 110...127V DC
		B	415...600V AC and 220...250V DC



h

UV and Shunt Trips - N			
1st Code	Description	2nd Code	Description
Left Front		UV Voltage	
G	Undervoltage Trip	J	24V AC
		D	110...127V AC
		A	208...240V AC
		B	380...480V AC
Left Front		Shunt Voltage	
P	Shunt Trip	J	12...24V AC/DC
		D	110...240V AC and 110...125V DC
		N	380...440V AC and 220...250V DC
		B	480...600V AC

Motor Protection Circuit Breakers and Motor Circuit Protectors

Specifications

IEC Performance Data

		Cat. No. 140M-C2E-															
		A16	A25	A40	A63	B10	B16	B25	B40	B63	C10	C16	C20	C25	C29	C32	
Rated Operational Current, I_e	[A]	0.16	0.25	0.4	0.63	1	1.6	2.5	4	6.3	10	16	20	25	29	32	
Magnetic Release Current	[A]	2.1	3.3	5.2	8.2	13	21	33	52	82	130	208	260	325	406	448	
Switching of Standard Three-Phase Motors																	
AC-3																	
230/240V	[kW]	—	—	0.06	0.09	0.18	0.25	0.37	0.75	1.5	2.2	4.0	5.5	5.5	7.5	7.5	
400/415V	[kW]	0.02	0.04	0.09	0.18	0.25	0.55	0.75	1.5	2.2	4.0	7.5	10	11	13	15	
500V	[kW]	0.06	0.09	0.12	0.18	0.37	0.75	1.1	2.2	3.0	6.3	10	11	15	18.5	20	
690V	[kW]	0.06	0.09	0.18	0.25	0.55	1.1	1.8	3.0	4.0	7.5	13	17	22	25	25	
Back-Up Fuses																	
gG, gL, only if $I_{cc} \geq I_{cu}$																	
230/240V	[A]	*	*	*	*	*	*	*	*	*	*	*	*	100	100	125	125
400/415V	[A]	*	*	*	*	*	*	*	*	*	*	*	80	100	100	125	125
440/460V	[A]	*	*	*	*	*	*	*	*	*	*	63	80	80	80	100	100
500V	[A]	*	*	*	*	*	*	*	*	*	*	80	80	80	80	100	100
690V	[A]	*	*	*	*	*	16	20	35	50	50	63	63	63	80	80	
Ultimate Short Circuit Breaking Capacity																	
I_{cu}																	
230/240V	[kA]	100	100	100	100	100	100	100	100	100	100	100	100	65	65	50	50
400/415V	[kA]	100	100	100	100	100	100	100	100	100	100	100	65	50	15	15	15
440/460V	[kA]	100	100	100	100	100	100	100	100	100	50	10	6	6	6	6	
500V	[kA]	100	100	100	100	100	100	100	100	100	50	10	6	6	6	6	
690V	[kA]	100	100	100	100	100	8	8	8	4	4	3	3	3	3	3	
Rated Service Short Circuit Breaking Capacity																	
I_{cs}																	
230/240V	[kA]	100	100	100	100	100	100	100	100	100	100	100	50	50	25	25	
400/415V	[kA]	100	100	100	100	100	100	100	100	100	100	50	15	15	15	15	
440/460V	[kA]	100	100	100	100	100	100	100	100	100	50	6	6	6	6	6	
500V	[kA]	100	100	100	100	100	100	100	100	100	50	6	6	6	6	6	
690V	[kA]	100	100	100	100	100	8	8	8	4	4	3	3	3	3	3	

* No back-up fuse required.

Motor Protection Circuit Breakers and Motor Circuit Protectors

Specifications

IEC Performance Data, Continued

		Cat. No. 140M-D8E-									Cat. No. 140M-F8E-					
		B25	B40	B63	C10	C16	C20	C25	C29	C32	C10	C16	C20	C25	C32	C45
Rated Operational Current, I_e	[A]	2.5	4.0	6.3	10	16	20	25	29	32	10	16	20	25	32	45
Magnetic Release Current	[A]	33	52	82	130	208	260	325	406	448	130	208	260	325	416	585
Switching of Standard Three-Phase Motors																
AC-3																
230/240V	[kW]	0.37	0.75	1.5	2.2	4.0	5.5	5.5	7.5	7.5	2.2	4.0	5.5	6.3	7.5	13
400/415V	[kW]	0.75	1.5	2.2	4.0	7.5	10	11	13	15	4.0	7.5	10	11	15	22
500V	[kW]	1.1	2.2	3.0	6.3	10	11	15	18.5	20	6.3	10	11	15	20	30
690V	[kW]	1.8	3.0	4.0	7.5	13	17	22	25	25	7.5	13	17	22	30	40
Back-Up Fuses																
gG, gL, only if $I_{cc} \geq I_{cu}$																
230/240V	[A]	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
400/415V	[A]	*	*	*	*	*	100	100	125	125	80	100	100	100	125	125
440/460V	[A]	*	*	*	*	80	100	100	125	125	80	100	100	100	125	125
500V	[A]	*	*	*	*	80	80	80	100	100	80	100	100	100	125	125
690V	[A]	20	35	50	50	63	63	63	80	80	63	80	80	80	100	100
Ultimate Short Circuit Breaking Capacity																
I_{cu}																
230/240V	[kA]	100	100	100	100	100	100	100	65	65	100	100	100	100	100	100
400/415V	[kA]	100	100	100	100	100	100	65	50	50	100	100	100	100	65	65
440/460V	[kA]	100	100	100	100	50	50	50	25	25	65	65	65	65	65	50
500V	[kA]	100	100	100	100	50	50	50	25	25	50	50	50	50	50	50
690V	[kA]	10	10	10	6	6	6	6	6	6	10	10	10	10	10	10
Rated Service Short Circuit Breaking Capacity																
I_{cs}																
230/240V	[kA]	100	100	100	100	100	100	100	50	50	100	100	100	100	100	100
400/415V	[kA]	100	100	100	100	50	25	25	25	25	50	50	50	50	50	50
440/460V	[kA]	100	100	100	100	50	25	25	20	20	50	50	50	50	50	50
500V	[kA]	100	100	100	100	50	25	25	20	20	50	50	50	50	50	50
690V	[kA]	10	10	10	6	4	4	4	4	4	10	10	10	10	6	6

* No back-up fuse required.

Motor Protection Circuit Breakers and Motor Circuit Protectors

Specifications

IEC Performance Data, Continued

Cat. No.	140-CMN-...			
	-2500	-4000	-6300	-9000
Rated Operational Current, I_e [A]	25	40	63	90
Magnetic Release Current [A]	350	560	890	1260
Switching of Standard Three-Phase Motors				
AC-3				
230/240V* [kW]	5.5/7.5	10/11	13/20	22/25
400/415V* [kW]	7.5/13	15/22	25/32	37/45
500V* [kW]	11/15	18.5/25	30/40	45/55
690V* [kW]	15/22	25/30	37/55	63/75
Back-up fuses				
gG, gL, only if $I_{cc} \geq I_{cu}$				
230/240V [A]	*	*	*	*
400/415V [A]	160	160	160	160
500V [A]	160	160	160	160
690V [A]	160	160	160	160
Ultimate short-circuit breaking capacity I_{cu}				
230/240V [kA]	100	100	100	100
400/415V [kA]	65	65	65	50
500V [kA]	50	30	30	25
690V [kA]	15	8	8	6
Rated service short-circuit breaking capacity I_{cs}				
230/240V [kA]	100	100	100	100
400/415V [kA]	65	50	50	25
500V [kA]	50	25	25	13
690V [kA]	15	8	6	6

* No back-up fuse required.

* Power ratings: Preferred values according to IEC 60072-1.

Motor Protection Circuit Breakers and Motor Circuit Protectors

Specifications

IEC Performance Data, Continued

		Cat. No. 140M-C2N-						
		A16	A25	A40	A63	B10	B16	B25
Rated Operational Current, I_e	[A]	0.16	0.25	0.4	0.63	1	1.6	2.5
Magnetic Release Current	[A]	2.1	3.3	5.2	8.2	13	21	32
Switching of Standard Three-Phase Motors								
AC-3								
230/240V	[kW]	—	—	0.06	0.09	0.18	0.25	0.37
400/415V	[kW]	0.02	0.04	0.09	0.18	0.25	0.55	0.75
500V	[kW]	0.06	0.09	0.12	0.18	0.37	0.75	1.1
690V	[kW]	0.06	0.09	0.18	0.25	0.55	1.1	1.8
Back-Up Fuses								
gG, gL, only if $I_{cc} \geq I_{cu}$ *								
230/240V	[A]	*	*	*	*	*	*	*
400/415V	[A]	*	*	*	*	*	*	*
440/460V	[A]	*	*	*	*	*	*	*
500V	[A]	*	*	*	*	*	*	*
690V	[A]	*	*	*	*	*	16	20
Ultimate Short Circuit Breaking Capacity								
I_{cu}								
230/240V	[kA]	100	100	100	100	100	100	100
400/415V	[kA]	100	100	100	100	100	100	100
440/460V	[kA]	100	100	100	100	100	100	100
500V	[kA]	100	100	100	100	100	100	100
690V	[kA]	100	100	100	100	100	10	8
Rated Service Short Circuit Breaking Capacity								
I_{cs}								
230/240V	[kA]	100	100	100	100	100	100	100
400/415V	[kA]	100	100	100	100	100	100	100
440/460V	[kA]	100	100	100	100	100	100	100
500V	[kA]	100	100	100	100	100	100	100
690V	[kA]	100	100	100	100	100	8	8

* No back-up fuse required.

Motor Protection Circuit Breakers and Motor Circuit Protectors

Specifications

IEC Performance Data, Continued

	Cat. No. 140M-D8N-							Cat. No. 140M-F8N-			
	B25	B40	B63	C10	C16	C25	C32	C25	C32	C45	
Rated Operational Current, I_e [A]	2.5	4.0	6.3	10	16	25	32	25	32	45	
Magnetic Release Current [A]	32	52	82	130	208	325	448	325	416	585	
Switching of Standard Three-Phase Motors											
AC-3											
230/240V [kW]	0.37	0.75	1.5	2.2	4.0	5.5	7.5	6.3	7.5	13	
400/415V [kW]	0.75	1.5	2.2	4.0	7.5	11	15	11	15	22	
500V [kW]	1.1	2.2	3.0	6.3	10	15	20	15	20	30	
690V [kW]	1.8	3.0	4.0	7.5	13	22	25	22	30	40	
Back-Up Fuses											
gG, gL, only if $I_{cc} \geq I_{cu}$											
230/240V [A]	*	*	*	*	*	*	*	100	125	125	
400/415V [A]	*	*	*	*	*	100	125	100	125	125	
440/460V [A]	*	*	*	*	80	100	125	100	125	125	
500V [A]	*	*	*	*	80	80	100	100	125	125	
690V [A]	20	35	50	50	63	63	80	80	100	100	
Ultimate Short Circuit Breaking Capacity											
I_{cu}											
230/240V [kA]	100	100	100	100	100	100	65	100	100	100	
400/415V [kA]	100	100	100	100	100	65	50	100	65	65	
440/460V [kA]	100	100	100	100	50	50	25	65	65	50	
500V [kA]	100	100	100	100	50	25	25	50	50	50	
690V [kA]	10	10	10	6	6	6	6	10	10	10	
Rated Service Short Circuit Breaking Capacity											
I_{cs}											
230/240V [kA]	100	100	100	100	100	100	50	100	100	100	
400/415V [kA]	100	100	100	100	50	25	25	50	50	50	
440/460V [kA]	100	100	100	100	50	25	20	50	50	50	
500V [kA]	100	100	100	100	50	25	20	50	50	50	
690V [kA]	10	10	10	6	4	4	4	10	6	6	

* No back-up fuse required.

Motor Protection Circuit Breakers and Motor Circuit Protectors

Specifications

IEC Performance Data, Continued

	Cat. No. 140M-C2T-											
	A16	A25	A40	A63	B10	B16	B25	B40	B63	C10	C16	
Rated Operational Current, I_e [A]	0.16	0.25	0.40	0.63	1.0	1.6	2.5	4.0	6.3	10	16	
Magnetic Release Current [A]	3.2	5.2	8.2	13	21	32	52	82	130	208	260	
Switching of Standard Three-Phase Motors												
AC-3												
230/240V [kW]	—	—	0.06	0.09	0.18	0.25	0.37	0.75	1.5	2.2	4.0	
400/415V [kW]	0.02	0.04	0.09	0.18	0.25	0.55	0.75	1.5	2.2	4.0	7.5	
500V [kW]	0.06	0.09	0.12	0.18	0.37	0.75	1.1	2.2	3.0	6.3	10	
690V [kW]	0.06	0.09	0.18	0.25	0.55	1.1	1.8	3.0	4.0	7.5	13	
Back-Up Fuses												
gG, gL, only if $I_{cc} \geq I_{cu}$												
230/240V [A]	*	*	*	*	*	*	*	*	*	*	*	
400/415V [A]	*	*	*	*	*	*	*	*	*	*	80	
440/460V [A]	*	*	*	*	*	*	*	*	*	*	63	
500V [A]	*	*	*	*	*	*	*	*	*	*	80	
690V [A]	*	*	*	*	*	16	20	35	50	50	63	
Ultimate Short Circuit Breaking Capacity												
I_{cu}												
230/240V [kA]	100	100	100	100	100	100	100	100	100	100	100	
400/415V [kA]	100	100	100	100	100	100	100	100	100	100	50	
440/460V [kA]	100	100	100	100	100	100	100	100	100	100	50	
500V [kA]	100	100	100	100	100	100	100	100	100	100	50	
690V [kA]	100	100	100	100	100	8	8	8	4	4	3	
Rated Service Short Circuit Breaking Capacity												
I_{cs}												
230/240V [kA]	100	100	100	100	100	100	100	100	100	100	100	
400/415V [kA]	100	100	100	100	100	100	100	100	100	100	15	
440/460V [kA]	100	100	100	100	100	100	100	100	100	100	6	
500V [kA]	100	100	100	100	100	100	100	100	100	100	6	
690V [kA]	100	100	100	100	100	8	8	8	4	4	3	

* No back-up fuse required.

Motor Protection Circuit Breakers and Motor Circuit Protectors

Specifications

IEC Performance Data, Continued

	Cat. No. 140M-D8T-		Cat. No. 140M-F8T-	
	C16	C20	C25	C32
Rated Operational Current, I_e [A]	16	20	25	32
Magnetic Release Current [A]	260	325	416	585
Switching of Standard Three-Phase Motors				
AC-3				
230/240V * [kW]	4.0	5.5	6.3	7.5
400/415V * [kW]	7.5	10	11	15
500V * [kW]	10	11	15	20
690V * [kW]	13	17	22	30
Back-up fuses				
gG, gL, only if $I_{cc} \geq I_{cu}$				
230/240V [A]	*	*	*	*
400/415V [A]	80	100	100	125
440/460V [A]	80	100	100	125
500V [A]	80	80	100	125
690V [A]	63	63	80	100
Ultimate short-circuit breaking capacity				
I_{cu}				
230/240V [kA]	100	100	100	100
400/415V [kA]	100	65	65	65
440/460V [kA]	50	25	65	65
500V [kA]	50	25	50	50
690V [kA]	6	6	10	10
Rated service short-circuit breaking capacity I_{cs}				
I_{cs}				
230/240V [kA]	100	100	100	100
400/415V [kA]	25	25	50	50
440/460V [kA]	25	25	50	50
500V [kA]	25	25	50	50
690V [kA]	4	4	6	6

* No back-up fuse required.

* Consult your local Rockwell Automation sales office or Allen-Bradley distributor.

General Data

Cat. No.	140M-C	140M-D	140M-F	140-CMN
Rated Insulation Voltage U_i				
IEC, SEV, VDE 0660	[V]	690		690
UL, CSA	[V]	600		600
Rated Impulse Withstand Voltage U_{imp}				
Pollution degree		3		3
Main circuits U_{imp} /Overvoltage Category		6 kV/III		6 kV/III
Auxiliary circuits U_{imp} /Overvoltage Category		6 kV/III		6 kV/III
Rated Frequency	[Hz]	50/60		40...60
Utilization Category				
IEC 60947-2 (Circuit breaker)		A		A
IEC 60947-4-1 (Motor starter)		AC-3		AC-3
Life Span				
Mechanical	[operations]	100 000	30 000	30 000
Electrical (I_e max.)	[operations]	100 000	30 000	10 000 (up to 63 A) 5 000 (up to 90 A)
Switching Frequency	[operations/h]	max. 25		max. 20
Ambient Temperature				
Storage	[°C]	-40 ... +80		-25... +80
Operation	[°C]	-25... +60		
Climatic resistance				
Moisture change climate (600068-2-30)		23 °C / 83 % relative humidity and 40 °C / 92 % relative humidity, 56 cycles		
Dry heat (60086-2-2)		100 °C, relative humidity <50 %, 7 days		
Moisture heat (60068-2-3)		40 °C, relative humidity 93 %, 56 days		
Site Altitude	[m]	to 2000 N.N.		
Protection Class		IP2X, when wired		
Resistance to Shock , Transport (60068-2-27)		30 g, 11 ms, all axes		30, 11 ms
Resistance to Vibration , Operation (60068-2-6)		5 g		
Rated Thermal Current I_{th}				
up to 40 °C ambient temperature	[A]	0.1...32	1.6...32	6.3...45
up to 60 °C ambient temperature	[A]	0.1...32	1.6...32	6.3...45
Rated Supply Current I_e	[A]	0.1...32	1.6...32	6.3...45
Dependence on Temperature				
40 °C	[A]	no reduction		
50 °C	[A]	no reduction		
60 °C	[A]	no reduction		
70 °C	[A]	15 % current reduction of the upper rated current I_e		
Overload Protection				
Characteristics		IEC 60947-4-1 Motor protection (except Cat. Nos. 140M-C2N, 140M-D8N, 140M-F8N)		IEC 60947
Ambient Temperature Compensation	[°C]	-20 ...+60		
Phase-loss Protection		Differential release		
Trip class		10 (except Cat. Nos. 140M-C2N, 140M-D8N, 140M-F8N) fixed setting		10
Magnetic Release Release current (+/-20 %)		fixed setting 13...14 x I_e max. (for 140M-C2E, 140M-D8E, 140M-F8E, 140M-C2N, 140M-D8N, 140M-F8N) 16...21 x I_e max. (for 140M-C2T, 140M-D8T, 140M-F8T) I_e max. = maximum values of setting ranges		fixed setting 14 x I_e max.
Total Power loss P_v				
Circuit Breaker at rated load operating temperature	[W]	6...11.5	6...11.6	9...16
Main Disconnect Switch Application				
		Yes, with accessories		
Application Conditions		For utilization outside North America, assemblies (of products) shall comply to the IEC 61439-1 requirements		
		140M manual motor starters are intended for use in closed areas without hazardous operating conditions such as dust or explosive or corrosive gases. Enclosures of appropriate manner need to be in place to protect devices in such environments.		

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Motor Protection Circuit Breakers and Motor Circuit Protectors

Specifications

General Data, Continued

Cat. No.	140M-C...	140M-D...	140M-F...	140-CMN
Conformity to Standards	IEC 60947-1; -2; -4-1; EN 60947-1; -2; -4-1; UL 508; CSA 22.2, No. 14			IEC 60947-1; -2; EN 60947-1; -2; UL 508; CSA 22.2, No. 14
Approvals	CE, UL, CSA			CE, UL, CSA
Terminal Parts Type of terminals				
Screwdriver	Pozidriv No. 2/Blade No. 3		Pozidriv No. 2/Blade No. 3	
1. conductor [mm ²]/[AWG] 2. conductor [mm ²]/[AWG]	1...6/No. 16...10 1...4/No. 16...10		2.5...25/No. 14...4 2.5...25/No. 14...4	2.5...35
1. conductor [mm ²]/[AWG] 2. conductor [mm ²]/[AWG]	1...6/No. 16...10 1...6/No. 16...10		2.5...25/No. 14...4 2.5...25/No. 14...4	2.5...35
1. conductor [mm ²]/[AWG] 2. conductor [mm ²]/[AWG]	1.5...6/No. 16...8 1.5...6/No. 16...8		16...25/No. 14...4 16...25/No. 14...4	4...50 / 12...2
1. conductor [mm ²]/[AWG] 2. conductor [mm ²]/[AWG]	1...6/No. 16...10 1...6/No. 16...10		2.5...10/No. 14...8 2.5...10/No. 14...8	4...50 / 12...2
Tightening torque [Nm]/[lb•in]	2...2.5/18...22		3...3.5/27...30	6...10/55...90

Screwless

Cat. No.	140M-RC...
Terminal Parts Type of terminals	
Screwdriver	
1. conductor [mm ²]/[AWG] 2. conductor [mm ²]/[AWG]	0.5...2.5/— 0.5...2.5/—
1. conductor [mm ²]/[AWG] 2. conductor [mm ²]/[AWG]	0.5...2.5/No. 18...12 0.5...2.5/No. 18...12
1. conductor [mm ²]/[AWG] 2. conductor [mm ²]/[AWG]	1...4/No. 16...12 1...4/No. 16...12

Accessories for Bulletin 140M Motor Protection Circuit Breakers

		Auxiliary Contact Blocks for Front Mounting Cat. No. 140M-C-AFA..., 140M-C-AFAR...			Auxiliary Contact Blocks for Right-Side Mounting Cat. No. 140M-C-ASA..., 140M-C-ASAR...				
Rated Thermal Current I_{th} at 40 °C ambient temperature [A]		5			10				
at 60 °C ambient temperature [A]		4			6				
Contact Class Coordination According to NEMA (UL/CSA Standards)	AC	B 300			B 600				
	DC	Q 300			Q 600				
Back-Up Fuses gG, gL [A]		10			10				
Rated Supply Current [V]		24	120	240	24	120	240	415	690
AC-15 [A]		4	3	1.5	6	5	3	2	0.7
DC-13 [V]		24	120	240	24	120	240	415	
	[A]	2	0.5	0.25	2	0.5	0.25	0.15	
Terminal Parts Type of terminals									
Screwdriver		Pozidriv No. 2/Blade No. 3							
1. conductor [mm ²]/[AWG] 2. conductor [mm ²]/[AWG]		0.5...1.5/18...14 0.75...1.5/18...14			0.5...2.5/18...14 0.75...2.5/18...14				
1. conductor [mm ²]/[AWG] 2. conductor [mm ²]/[AWG]		0.75...1.5/18...14 0.75...1.5/18...14			0.75...2.5/18...14 0.75...2.5/18...14				
1. conductor [mm ²]/[AWG] 2. conductor [mm ²]/[AWG]		0.75...1.5/18...14 0.75...1.5/18...14			0.75...2.5/18...14 0.75...2.5/18...14				
Tightening torque [N•m]/[lb•in]		1.2...1.5/10.6...13			1.2...1.5/10.6...13				

Motor Protection Circuit Breakers and Motor Circuit Protectors

Specifications

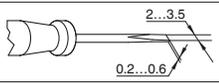
Accessories for Bulletin 140M Motor Protection Circuit Breakers, Continued

		Undervoltage Trip for Left-Side Mounting Cat. No. 140M-C-UX...	Undervoltage Trip with 2 Auxiliary Contacts for Left-Side Mounting Cat. No. 140M-C-UC...	Shunt Trip for Left-Side Mounting Cat. No. 140M-C-SN...
Actuating Voltage				
Pull-in		$0.85 \dots 1.1 \times U_s$	$0.85 \dots 1.1 \times U_s$	$0.7 \dots 1.1 \times U_s$
Drop-out		$0.7 \dots 0.35 \times U_s$	$0.7 \dots 0.35 \times U_s$	
Rated Control Voltage	min. max.	21V 50 Hz, 24V 60 Hz 600V 50 Hz	21V 50 Hz, 24V 60 Hz 600V 50 Hz	21V 50 Hz, 24V 60 Hz 600V 50 Hz
On-Time		100%	100%	100%
Coil Rating	Pull-in Hold	8.5 VA, 8 W 4 VA, 2 W	8.5 VA, 8 W 4 VA, 2 W	8.5 VA, 8 W 4 VA, 2 W
Terminal Parts	Type of terminals			
	Screwdriver	Pozidriv No. 2/Blade No. 3		
	1. conductor [mm ²]/[AWG] 2. conductor [mm ²]/[AWG]	0.5...2.5/No. 18...14 0.75...2.5/No. 18...14		
	1. conductor [mm ²]/[AWG] 2. conductor [mm ²]/[AWG]	0.75...2.5/No. 18...14 0.75...2.5/No. 18...14		
	1. conductor [mm ²]/[AWG] 2. conductor [mm ²]/[AWG]	0.75...2.5/No. 18...14 0.75...2.5/No. 18...14		
Tightening torque	[N•m]/[lb•in]	1.2...1.5/10.6...13.3		

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	Compact Busbar Feeder Terminal		Compact Busbar		Compact Busbar Feeder Block			
	140M-C-WTN 140M-C-WTEN	140M-F-WTE	140M-C -W...	140M-F -W...	140M-C-WBE L1, L2, L3	140M-C-WBE T1, T2, T3	140M-F-WBE L1, L2, L3	140M-F-WBE T1, T2, T3
Rated Thermal Current I_{th} at 60 °C ambient temperature	[A]	64	120	64	120	64	IEC 120/UL 115	
	1. conductor [mm ²]/[AWG] 2. conductor [mm ²]/[AWG]	2.5...25/14...4	—	—	—	4...25/10...4 for use with 140M-C-W	4...50/10...4	for use with 140M-F-W
	1. conductor [mm ²]/[AWG] 2. conductor [mm ²]/[AWG]	2.5...25/14...4	4...50/12...1/0	—	—	4...25/10...4 for use with 140M-C-W	4...25/10...4	for use with 140M-F-W
	1. conductor [mm ²]/[AWG] 2. conductor [mm ²]/[AWG]	2.5...25/14...4	2.5...50/12...1/0	—	—	2.5...25/14...4 for use with 140M-C-W	2.5...25/14...4	for use with 140M-F-W
Tightening torque	[N•m]/[lb•in]	3...3.5/27...31	5...6/45...54	—	—	3...3.5/27...31 2.5...3/23...27	5...6/45...54	

Accessories for Bulletin 140M Screwless

Cat. No.	140M-RC...	
Terminal Parts		
Type of terminals		
Screwdriver		
	1. conductor [mm ²]/[AWG] 2. conductor [mm ²]/[AWG]	0.5...1.5/— 0.5...1.5/—
	1. conductor [mm ²]/[AWG] 2. conductor [mm ²]/[AWG]	0.5...1.5/No. 18...14 0.5...1.5/No. 18...14
	1. conductor [mm ²]/[AWG] 2. conductor [mm ²]/[AWG]	0.5...1.5/No. 18...14 0.5...1.5/No. 18...14



Weights

Description	Weight [g]	Cat.No.
Motor Protection Circuit Breakers	317	140M-C2E-...
	373	140M-D8E-...
	782	140M-F8E-...
	315	140M-C2N-...
	365	140M-D8N-...
	782	140M-F8N-...
	315	140M-C2T-...
	365	140M-D8T-...
	782	140M-F8T-...
Auxiliary Contacts	1845	140-CMN-...
	10	140M-C-AFA10
		140M-C-AFA01
		140M-C-AFA11
		140M-C-AFA20
	15	140M-C-ASA...
		140M-C-AFAR10A...
140M-C-ASAR...M...		
Undervoltage Trip	31	140M-C-ASAM11
	31	140-CA...
	108	140M-C-UX...
	110	140M-C-SN...
Trip Contact Blocks	116	140M-C-UC...
	94	140-CUV...
Shunt Trip	31	140-CT...
	94	140-CRT...

Description	Weight [g]	Cat.No.
Anti-Tamper Cover	2	140M-C-CA
Lockable Twist Knob	5	140M-C-KN1
		140M-C-KRY1
Locking Tag	30	140M-C-M3
Door Coupling Handle	123	140M-C-DN66
		140M-C-NRY66
Extension Shaft	46	140M-C-DS
Legend Plate	4	140M-C-DFC...
Feeder Terminal	51	140M-C-WTEN
	172	140M-F-WT
Compact Busbars	27	140M-C-W452N
	48	140M-C-W453N
	69	140M-C-W454N
	90	140M-C-W455N
	30	140M-C-W542N
	55	140M-C-W543N
	80	140M-C-W544N
Top Hat Rail Adapter	105	140M-C-W545N
	6	140-KBH2

Motor Protection Circuit Breakers and Motor Circuit Protectors

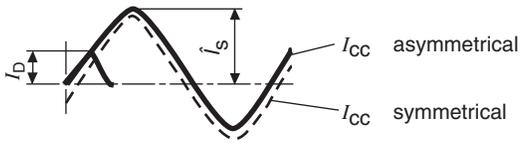
Specifications

Accessories for Bulletin 140-CMN Circuit Breakers

	Cat. No. 140-CT Trip Contact Block for Flush Mounting on Cat. No. 140-CMN Circuit Breakers					Cat. No. 140-CRT, 140-CUV Undervoltage Trip and Shunt Trip for Flush Mounting on Cat. No. 140-CMN Circuit Breakers						
Rated Thermal Current I_{th} up to 40 °C ambient temperature up to 60 °C ambient temperature	[A] [A]	10 6					2 2					
NEMA contact class (UL/CSA-Approval)	AC DC	B 600 Standard Pilot Duty R 300 Light Pilot Duty					Make/Break max. voltage 432 VA72 VA480 V 28 VA28 VA250 V					
Back-Up Fuse gG, gL		16 A					16 A					
Rated Current I_e												
AC-15:	[V] [A]	230 3	400 2.5	500 1.5	690 0.75		AC-14:	24 1.5	110 1.5	230 1.0	400 1.0	500 0.75
DC-13:	[V] [A]	24 2	48 0.6	110 0.2	230 0.1	440 0.04	DC 13:	24 1.5	48 0.5	60 0.4	110 0.2	
Terminals												
Screwdriver												
1.conduct or [mm2]/[AWG] 2.conduct [mm2]/[AWG] or		0.75... 2.5/No. 18... 14 0.75... 2.5/No. 18... 14					0.75... 2.5/No. 18... 14 0.75... 2.5/No. 18... 14					
1.conduct or [mm2]/[AWG] 2.conduct [mm2]/[AWG] or		0.75... 2.5/No. 18... 14 0.75... 2.5/No. 18... 14					0.75... 2.5/No. 18... 14 0.75... 2.5/No. 18... 14					
Tightening torque	[N•m]/[lb•in]	1... 1.5/8.8... 10.3					1... 1.5/8.8... 10.3					

		Cat. No. 140-CUV... Undervoltage Trip Unit for Right-Side Mounting on Cat. No. 140-CMN Circuit Breakers	Cat. No. 140-CRT... Shunt Trip for Flush Mounting on Cat. No. 140-CMN Circuit Breakers
Operating Voltage			
Pick-up		0.8... 1.1 x U_s	0.7... 1.1 x U_s
Drop-out		0.7... 0.35 x U_s	—
Duty cycle		100 % ED	100 % ED
Control Voltage			
	min.	12 V 50 Hz/14 V 60 Hz	12 V 50 Hz/14 V 60 Hz
	max.	600 V 50 Hz	600 V 50 Hz
Coil Performance			
Pick-up	[VA/W]	11 / 8	12 / 7
Drop-out	[VA/W]	4 / 1	6 / 2
Terminals			
Terminal type			
Fine-stranded	[mm2]	2 x 0.75...2.5	2 x 0.75...2.5
Coarse-stranded	[mm2]	2 x 0.75...2.5	2 x 0.75...2.5
Tightening torque	[Nm]	1... 1.5	1... 1.5
Coarse-stranded	[AWG]	No. 18... 14	No. 18... 12
Tightening torque	[lb•in]	8.8... 10.3	8.8... 10.3

Cut-off current

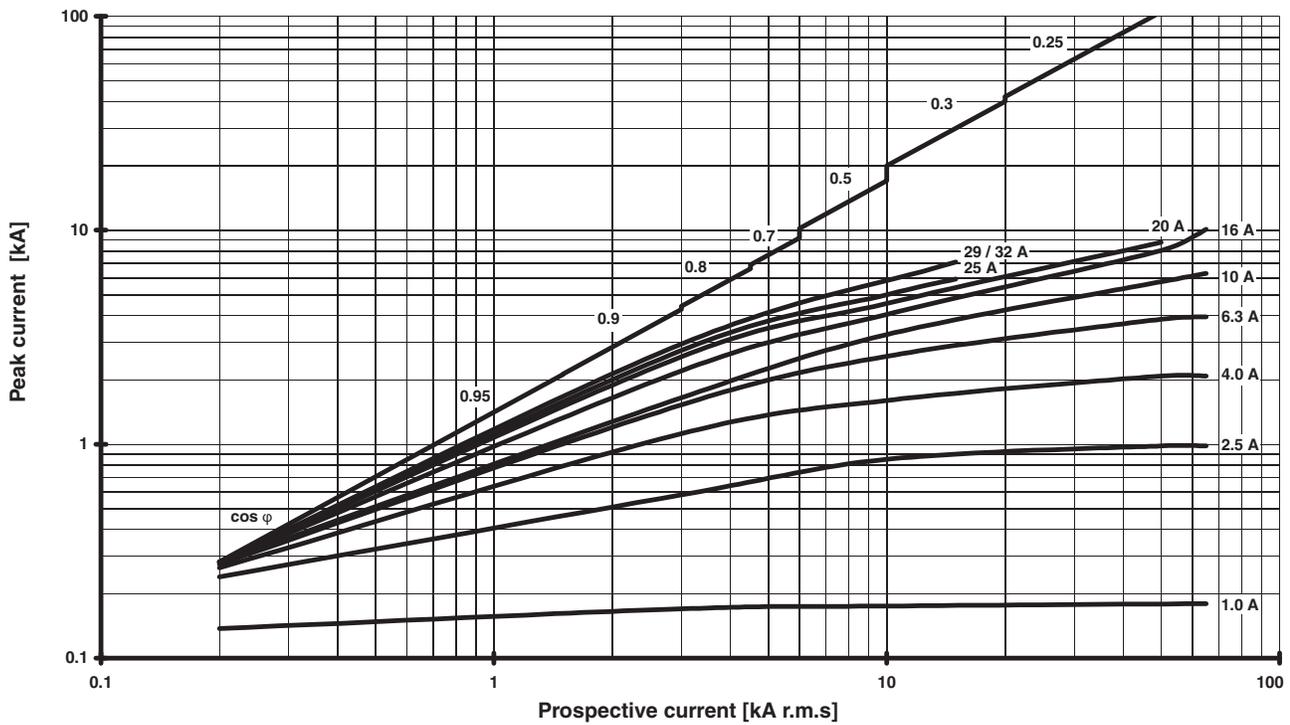


The Bulletin 140-M limits solid short-circuit current I_{CC} (prospective short-circuit current). I_D is the maximum cut-off current (highest instantaneous value of the limited short-circuit current). This value is indicated in the following diagrams as a function of the progressive system short-circuit current.

2

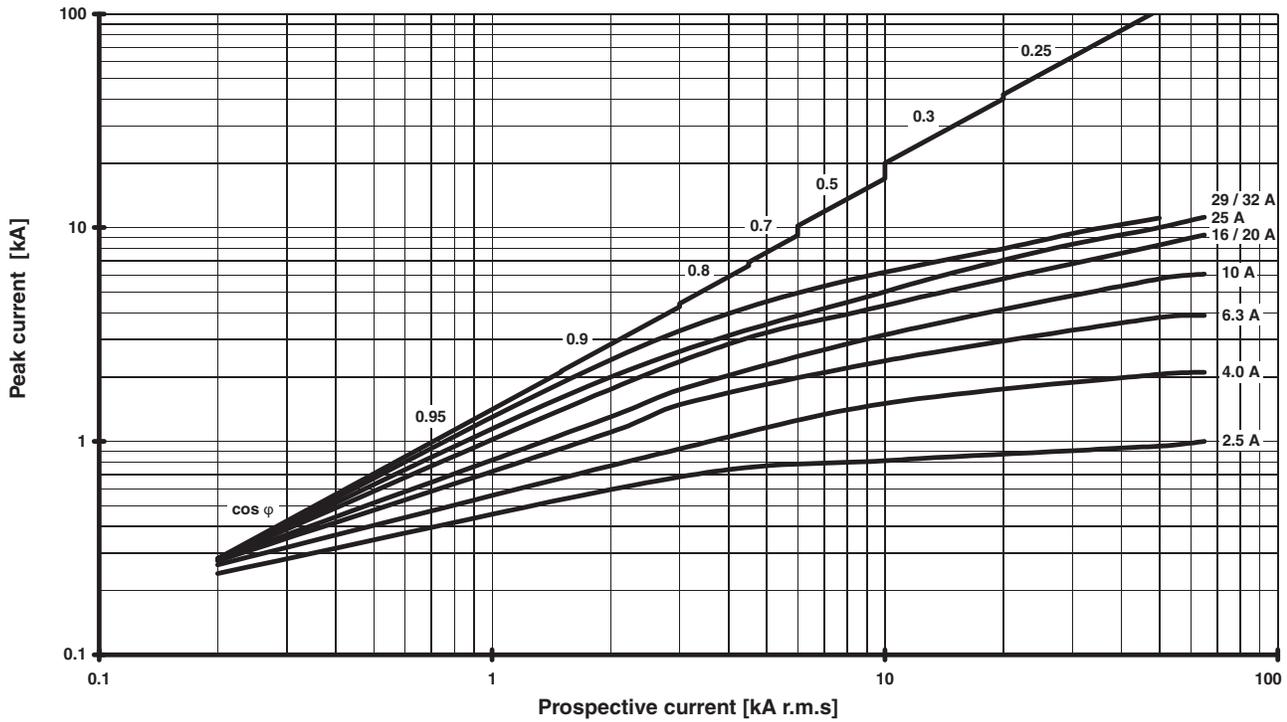
Bulletin 140M-C Circuit Breaker (Maximum Cut-Off Current)

140M-C2E, -C2N, -C2T
 Max. Cut-Off Current, $U_e = 400...415V$



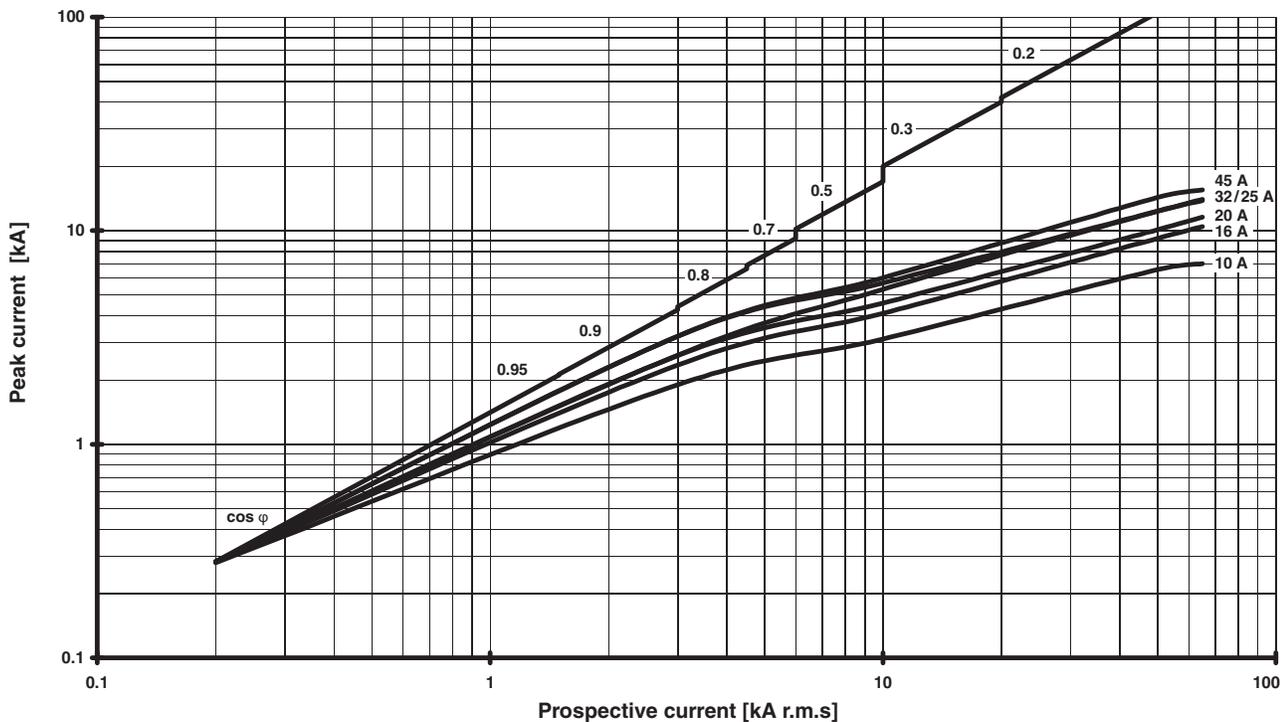
Bulletin 140M-D Circuit Breaker (Maximum Cut-Off Current)

140M-D8E, -D8N, -D8T
 Max. Cut-Off Current, $U_e = 400...415V$



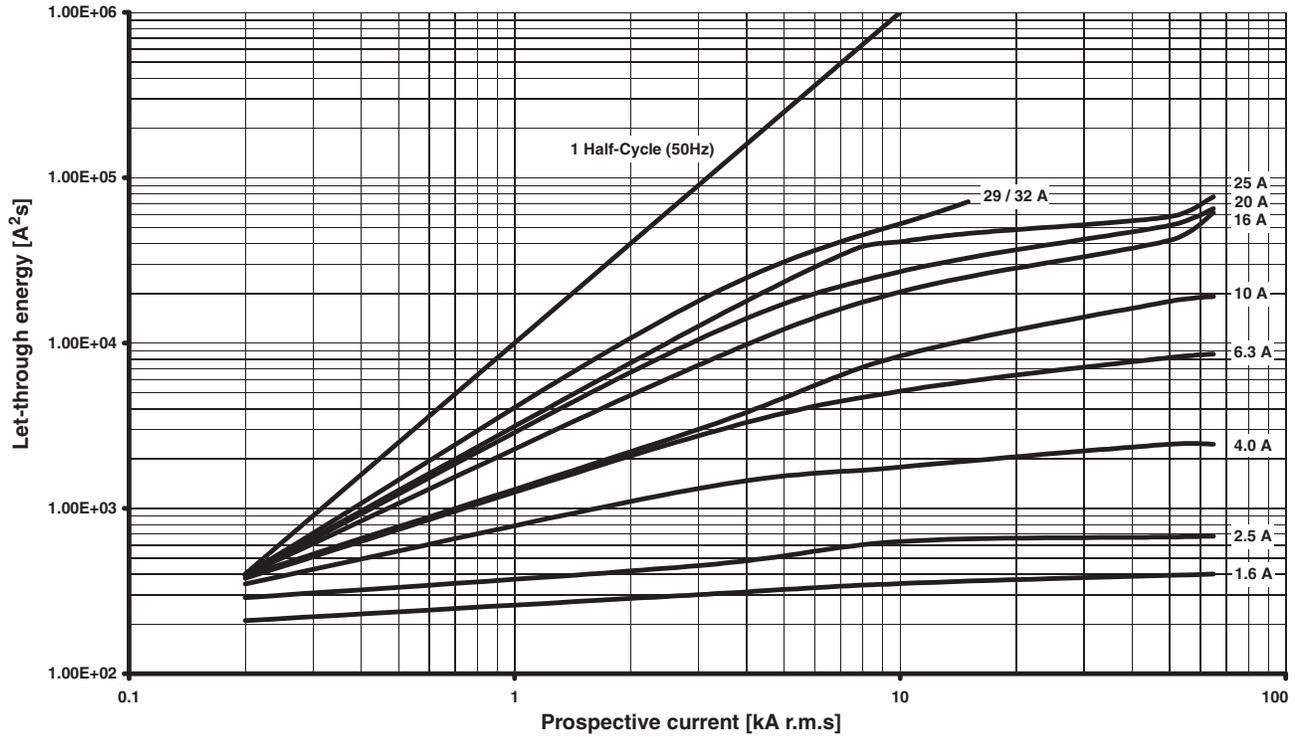
Bulletin 140M-F Circuit Breaker (Maximum Cut-Off Current)

140M-F8E, -F8N, -F8T
 Max. Cut-Off Current, $U_e = 400...415V$



Bulletin 140M-C Circuit Breaker (Maximum Let-Through-Energy)

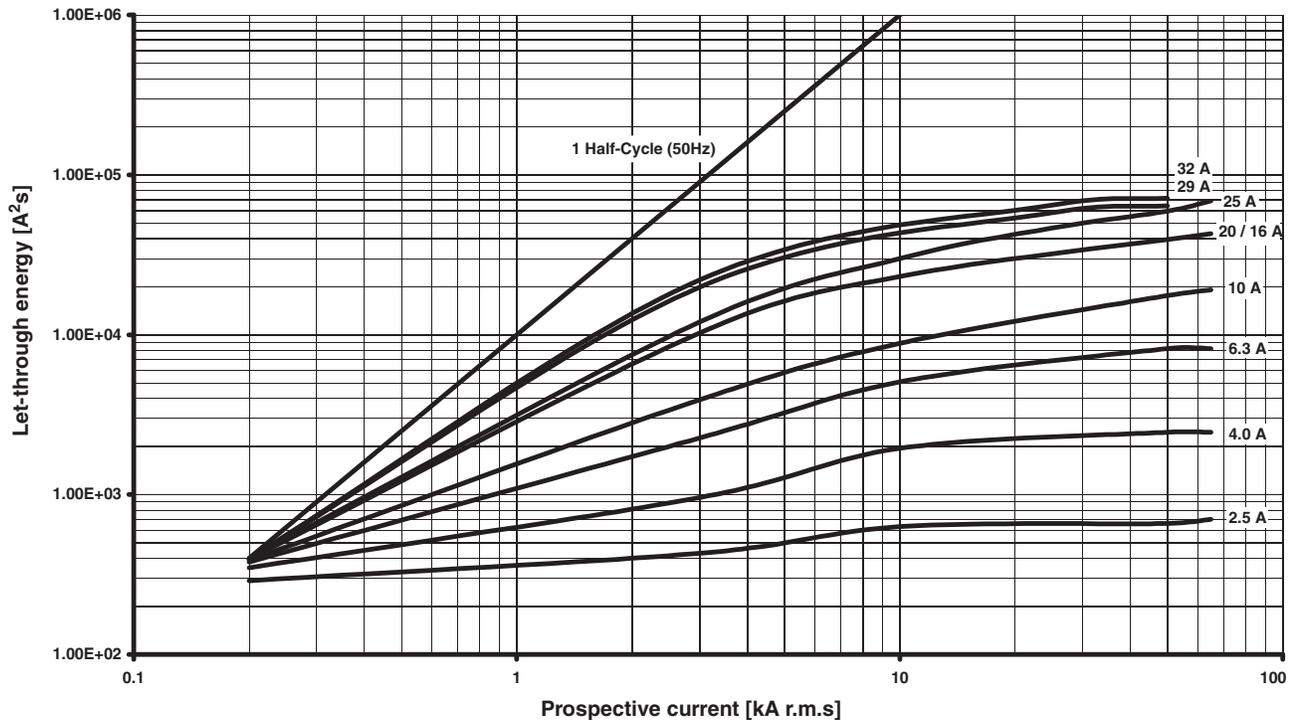
140M-C2E, -C2N, -C2T
 Max. Let-Through-Energy, $U_e = 400...415V$



2

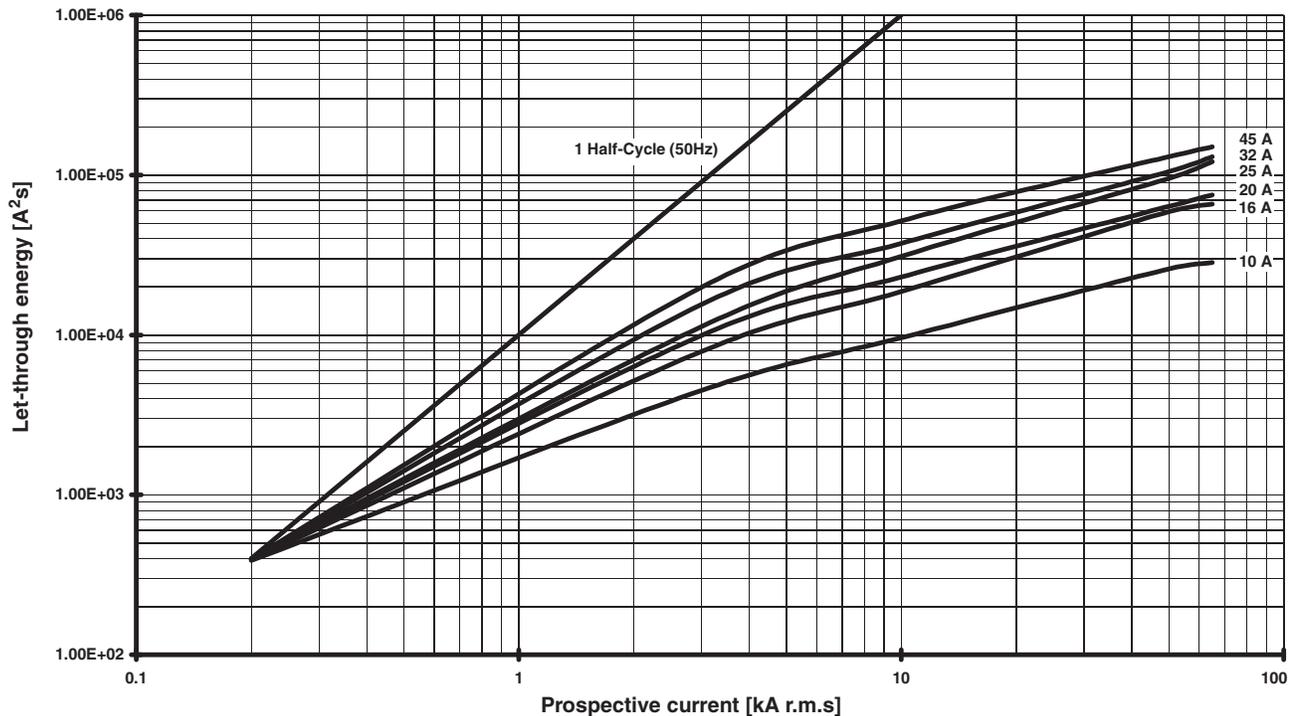
Bulletin 140M-D Circuit Breaker (Maximum Let-Through-Energy)

140M-D8E, -D8N, -D8T
 Max. Let-Through-Energy, $U_e = 400...415V$



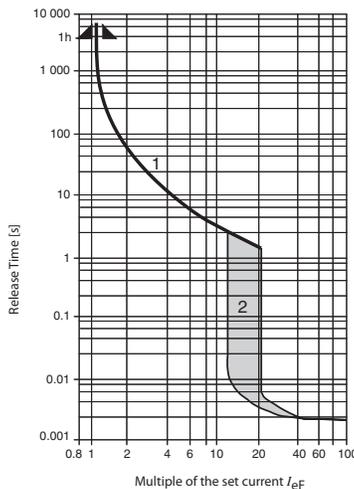
Bulletin 140M-F Circuit Breaker (Maximum Let-Through-Energy)

140M-F8E, -F8N, -F8T
 Max. Let-Through-Energy, $U_e = 400...415V$

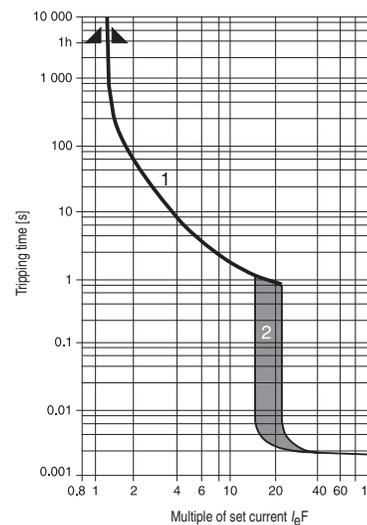


Time-Current Characteristic

Bulletin 140M-C, -D, -F Motor Protection Circuit Breakers



Bulletin 140-CMN Motor Protector



1) Thermal Release Trip Current

The adjustable current-dependent delayed bimetal release protects motors against overload. The curve shows the mean operating current at an ambient temperature of 20 °C starting from the cold state. Careful testing and setting ensures effective motor protection even in the case of single-phasing. The overload characteristic is also valid for transformer protection.

2) Magnetic Release Trip Current

The instantaneous magnetic trip has a fixed operating current setting. This corresponds to 13...14 times the maximum value of setting range. (Transformer protection up to 20 x I_e max.) At a lower setting it is correspondingly higher.

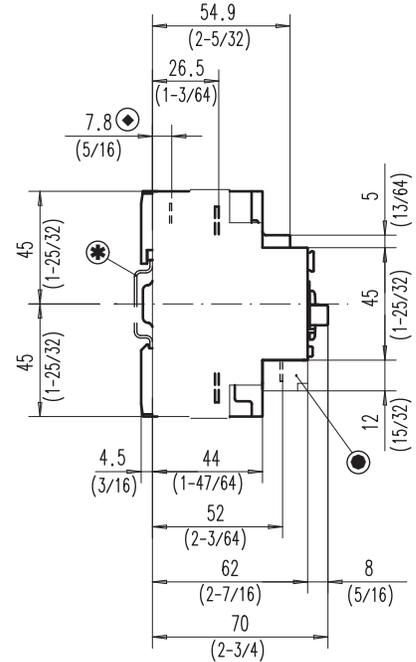
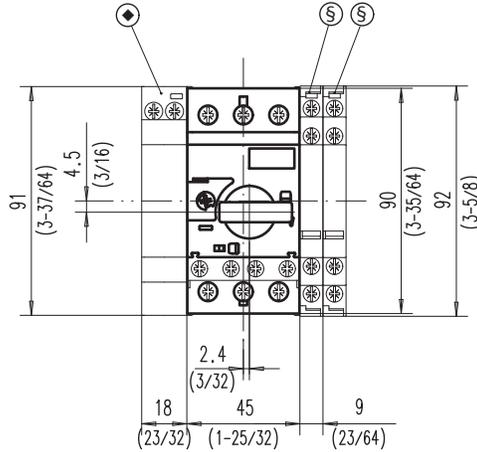
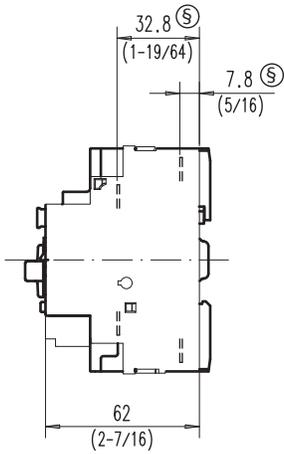
Current Setting I_{eF}

The overload trip corresponds to a thermal overload relay in a motor starter conforming to IEC947-4-1. If a different value is prescribed (e.g., reduced I_e for cooling medium having a temperature higher than 40 °C or a place of installation higher than 2000 m above sea level), the setting current is equal to the reduced rated current I_e of the motor.

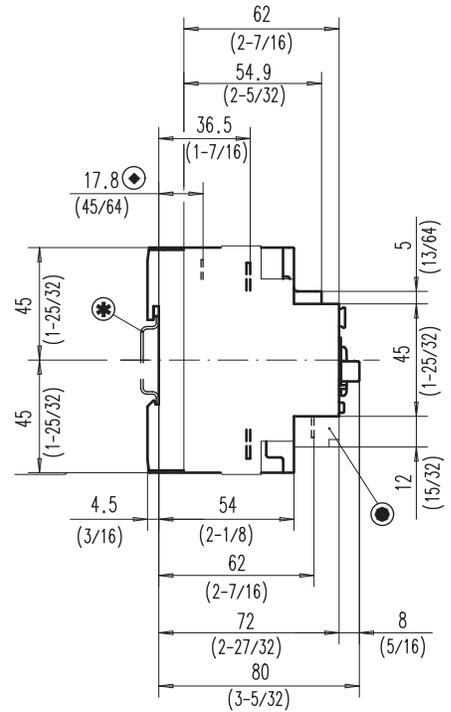
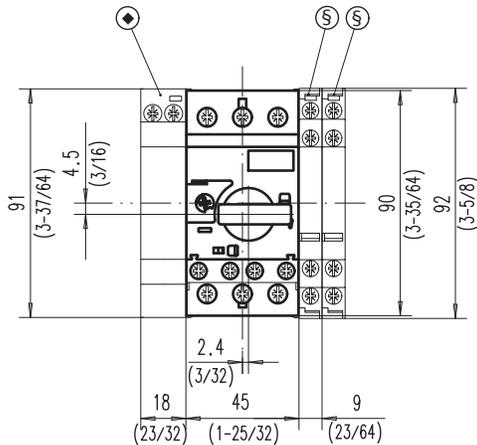
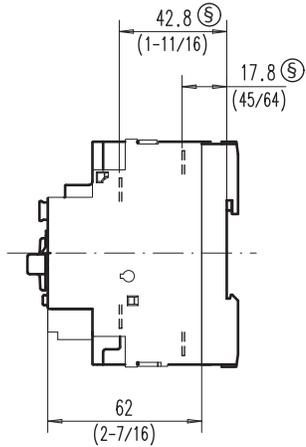
Cat. No. 140M-C, -D, -F

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

Cat. No. 140M-C2...



Cat. No. 140M-D8...



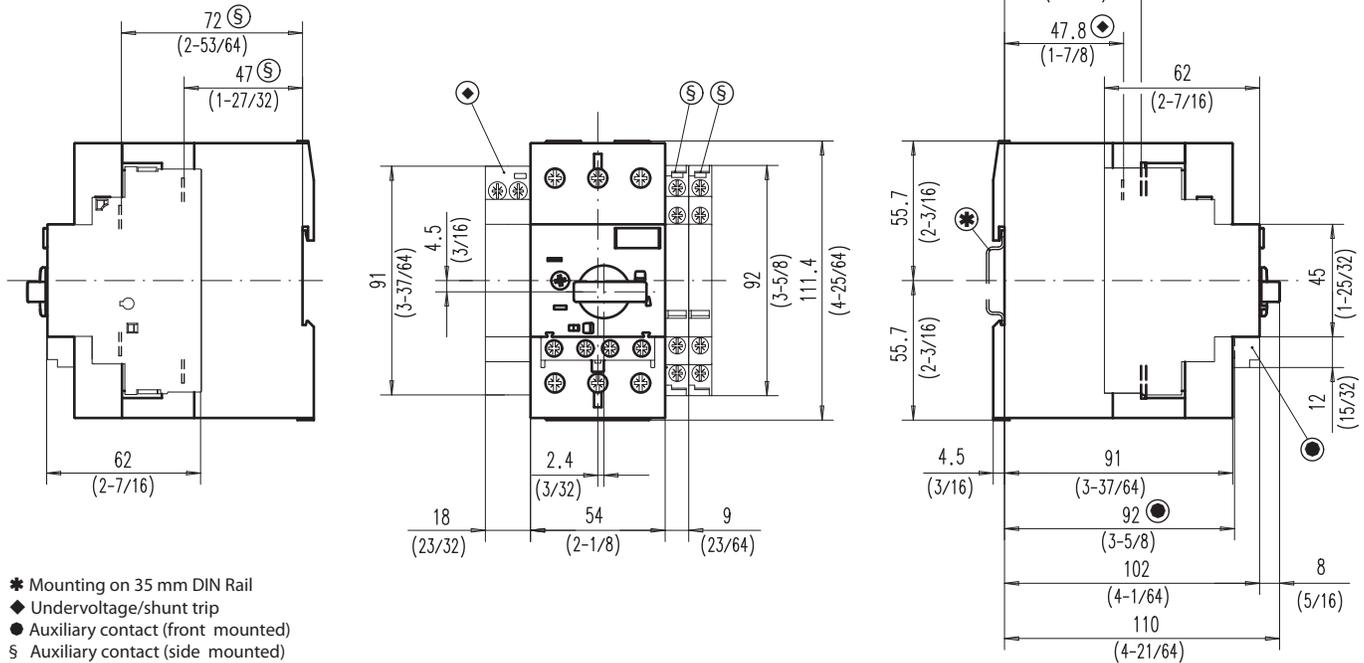
- * Mounting on 35 mm DIN Rail
- ◆ Undervoltage/shunt trip
- Auxiliary contact (front mounted)
- § Auxiliary contact (side mounted)

Motor Protection Circuit Breakers and Motor Circuit Protectors

Approximate Dimensions

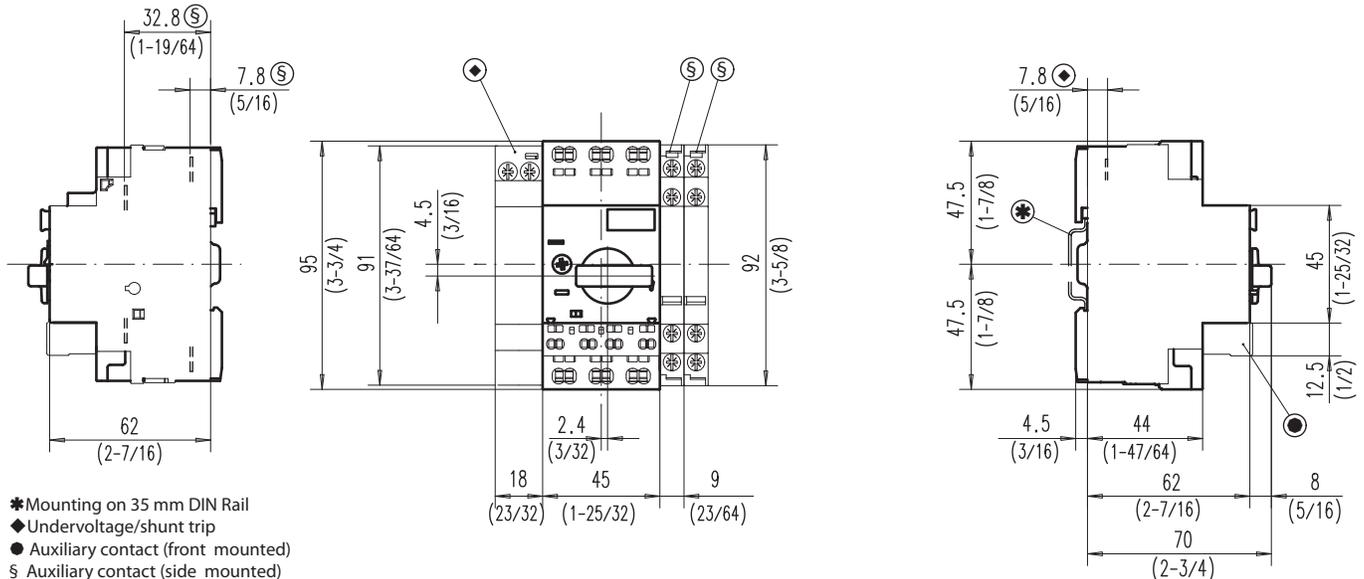
Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Cat. No. 140M-F8...



Cat. No. 140M-RC, Screwless

Cat. No. 140M-RC...



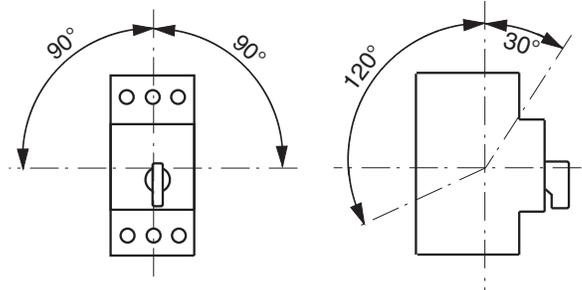
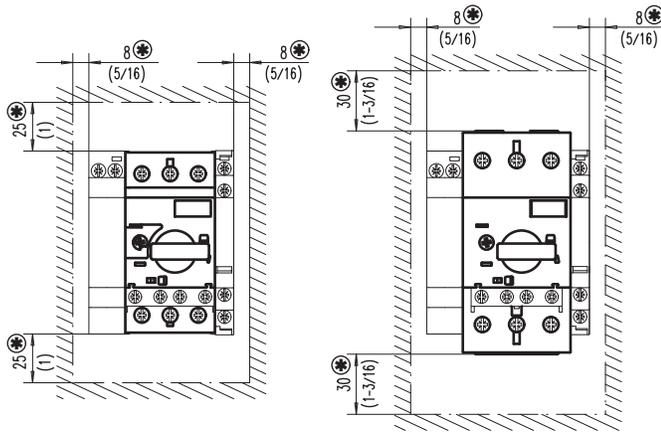
Motor Protection Circuit Breakers and Motor Circuit Protectors

Approximate Dimensions

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

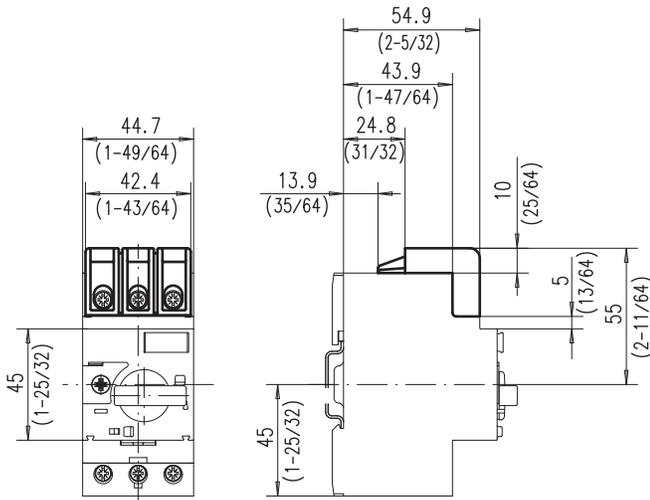
Cat. No. 140M-C/D...

Cat. No. 140M-F...

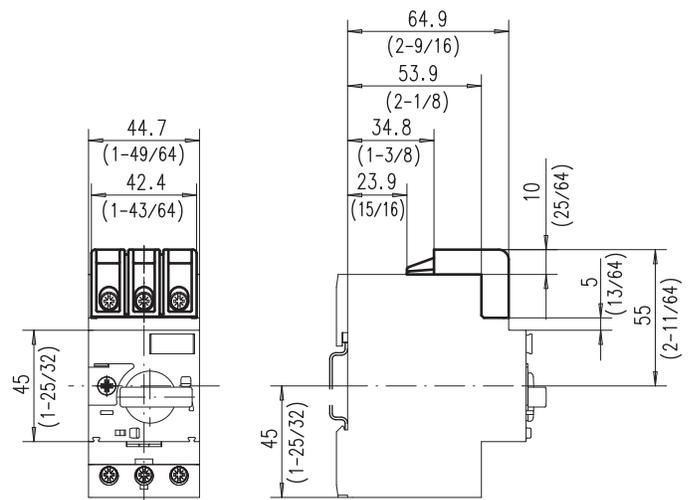


* Minimum distance to grounded parts or walls

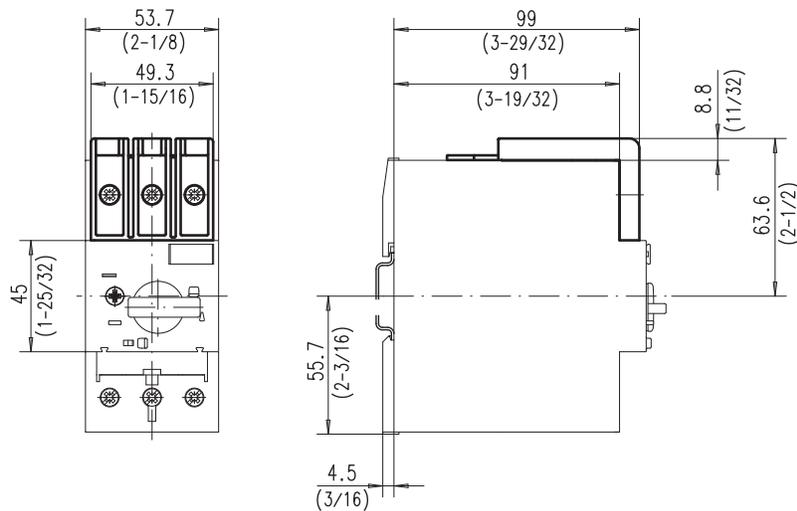
Mounting position/safety clearance of Cat. No. 140M-C..., 140M-D..., 140M-F...



Cat. No. 140M-C-TE1 Type E adapter on Cat. No. 140M-C2E...



Cat. No. 140M-C-TE1 Type E adapter on Cat. No. 140M-D8E...

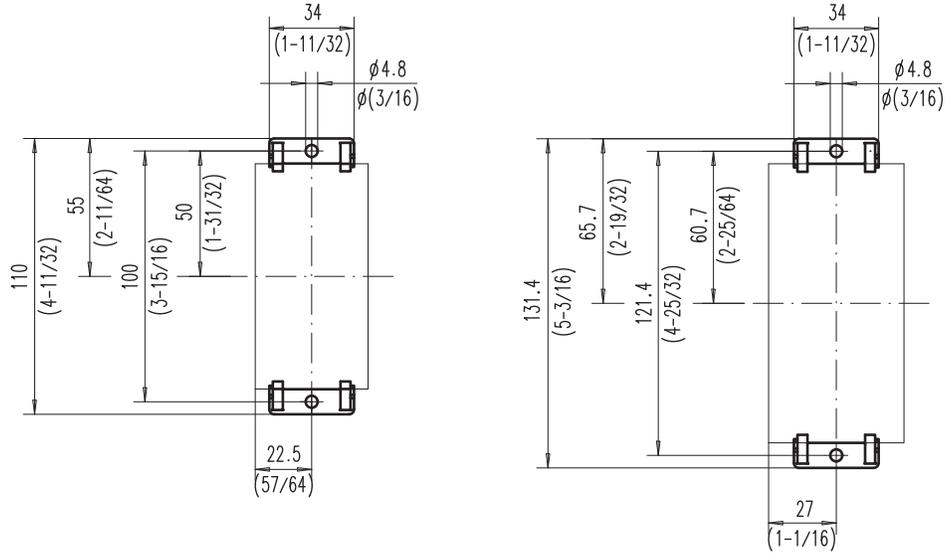


Cat. No. 140M-C-TE1 Type E adapter on Cat. No. 140M-F8E...

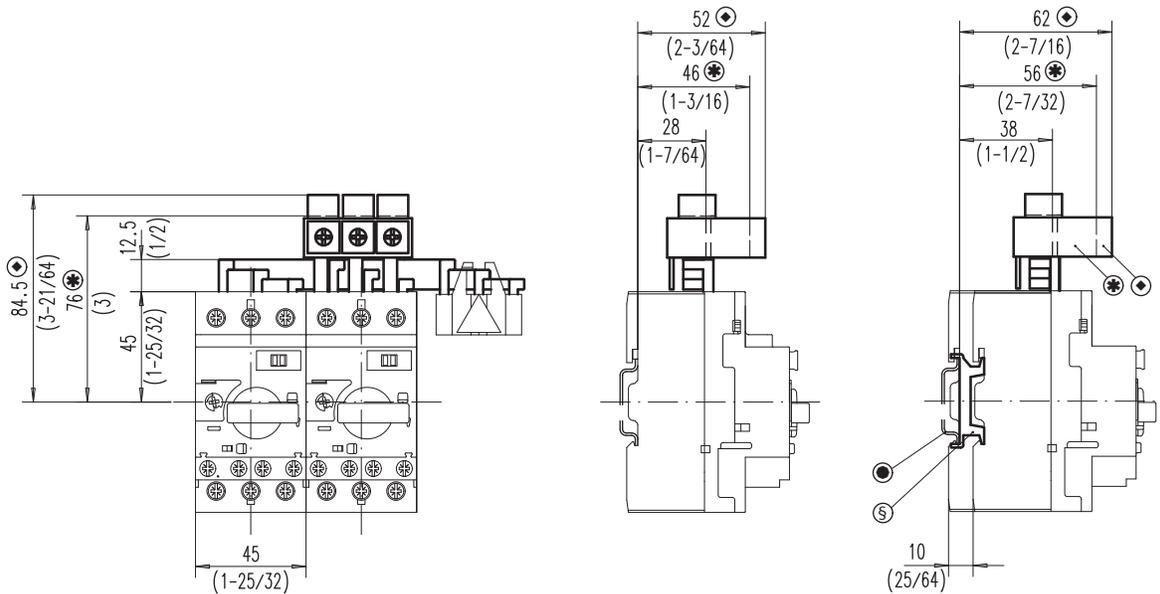
Motor Protection Circuit Breakers and Motor Circuit Protectors

Approximate Dimensions

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



Screw Adapter 140M-C-N45 for 140M-C2/D8 and 140M-F8



- * Compact Busbar Feeder Terminal IEC
- ◆ Compact Busbar Feeder Terminal UL type E and IEC
- Mounting on 35 mm DIN Rail
- § Top Hat Rail Adapter 10 mm

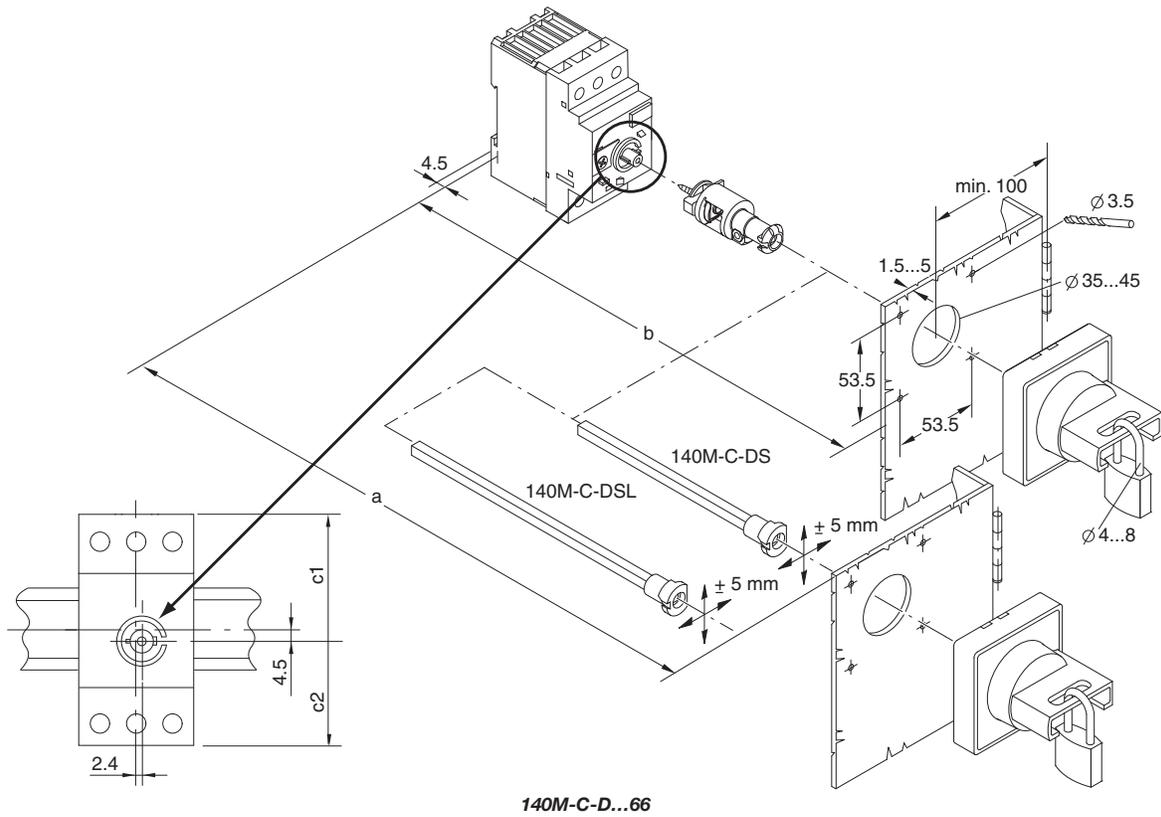
Cat. No. 140M-C with Busbar

Motor Protection Circuit Breakers and Motor Circuit Protectors

Approximate Dimensions

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

2



With Cat. No. 140-M-C-DS Shaft

Cat. No.	a	b	c1	c2
140M-C	117...338	105.5 ±5	49.5	40.5
140M-D	126...347	114.5 ±5	49.5	40.5
140M-F	148.6...369.6	137.1 ±5	59.35	50.35

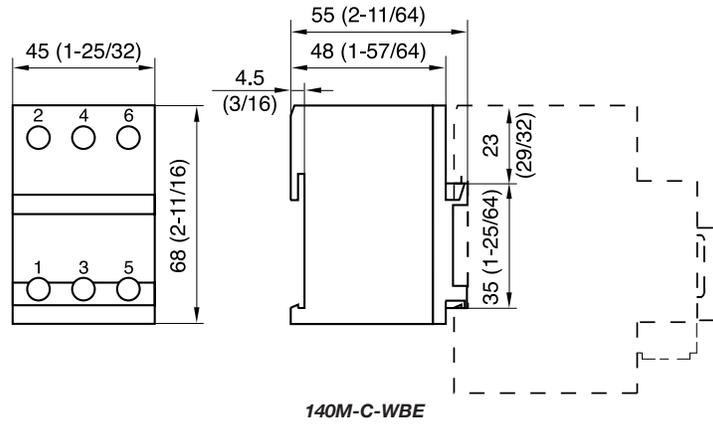
With Cat. No. 140-M-C-DSL Shaft

Cat. No.	a	b	c1	c2
140M-C	117...438	105.5 ±5	49.5	40.5
140M-D	126...497	114.5 ±5	49.5	40.5
140M-F	148.6...519	137.1 ±5	59.35	50.35

Motor Protection Circuit Breakers and Motor Circuit Protectors

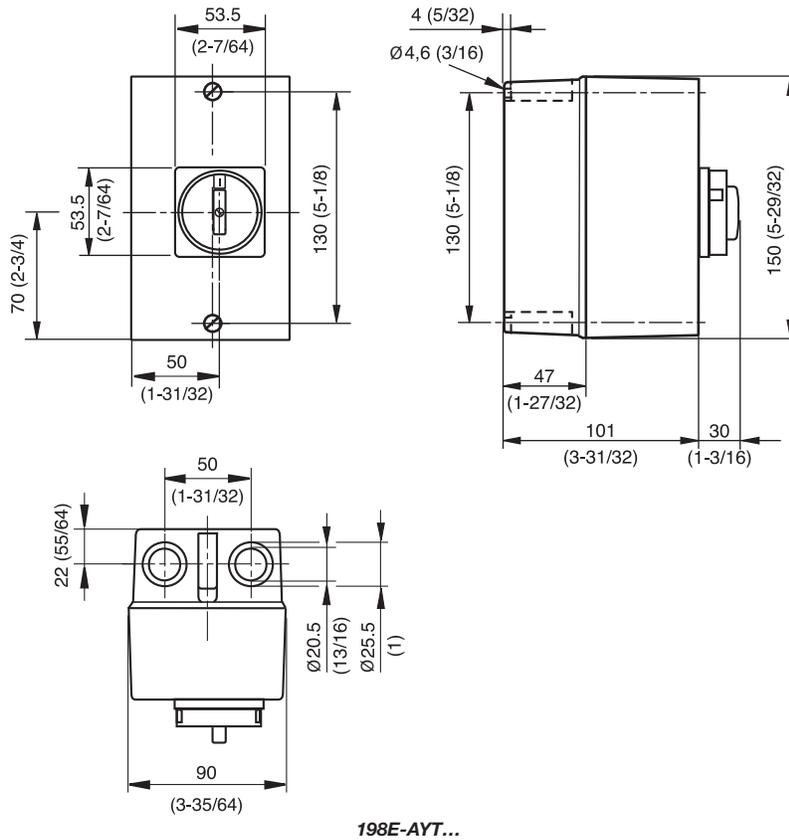
Approximate Dimensions

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



2

Cat. No. 198E...



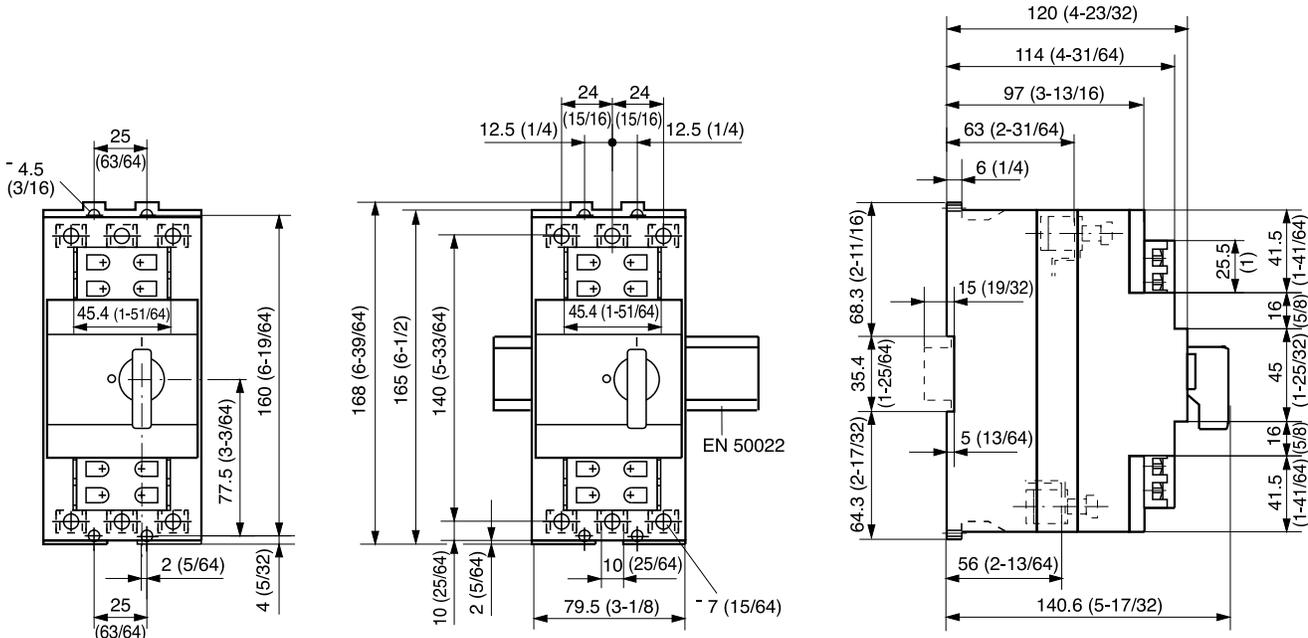
Motor Protection Circuit Breakers and Motor Circuit Protectors

Approximate Dimensions

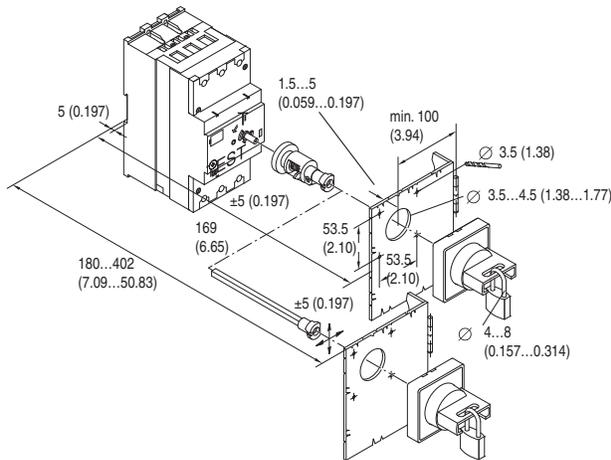
Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Cat. No. 140-CMN...

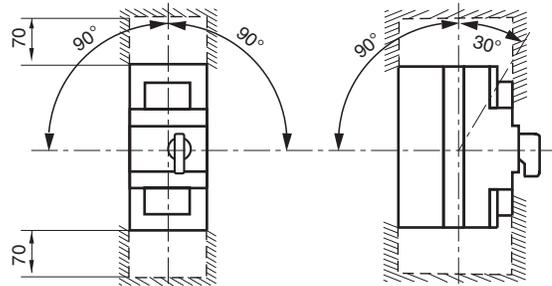
2



140-CMN



140-CD...



Mounting position/safety clearance of Cat. No. 140-CMN

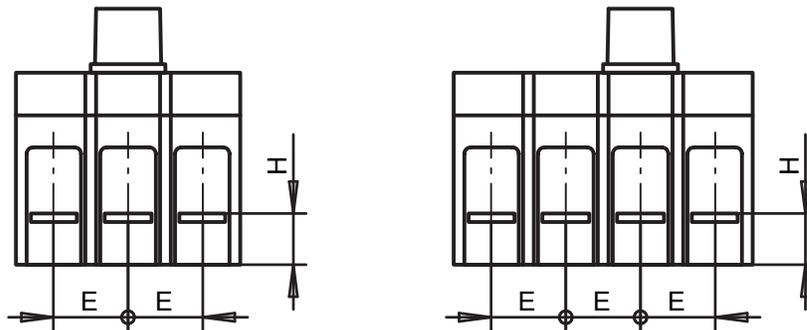
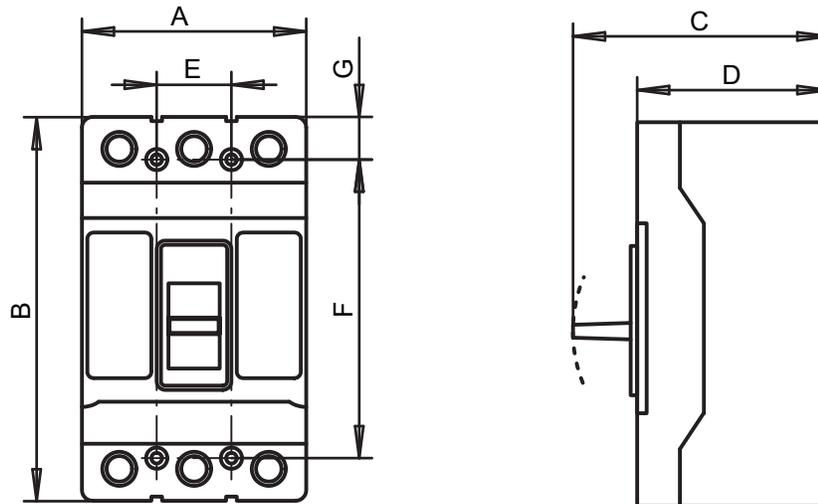
Note: See Bulletin 140U-H, J, L and N for dimensions of 140M-H, J, L and N frames.

Motor Protection Circuit Breakers and Motor Circuit Protectors

Approximate Dimensions

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

Cat. Nos. 140M-H, -I, -J, -L, -N



	A	B	C	D	E	F	G	H
H-Frame	77 (3)	140 (5-1/2)	88 (3-1/2)	75 (3)	25.4 (1)	96.8 (3-13/16)	24.6 (31/32)	22.4 (7/8)
I-Frame	105 (4-1/8)	152 (6)	105 (4-1/8)	88 (3-1/2)	35 (1-3/8)	114 (4-1/2)	19 (3/4)	40 (1-9/10)
J-Frame	105 (4-1/8)	178 (7)	113 (4-29/64)	88 (3-1/2)	35 (1-3/8)	139.7 (5-1/2)	19.8 (25/32)	20.6 (13/16)
L-Frame	140 (5-1/2)	258 (10-5/32)	138 (5-7/16)	110 (4-21/64)	43.7 (1-23/32)	214.4 (8-7/16)	21.3 (27/32)	24.7 (31/32)
N-Frame	210 (8-17/64)	407 (16-1/64)	183 (7-13/64)	140 (5-1/2)	69.9 (2-3/4)	374.7 (14-3/4)	16 (5/8)	29.5 (1-5/32)

Rotary Circuit Breaker Operating Mechanism

Product Overview/Product Selection

2

To obtain a complete Rotary Circuit Breaker Operating Mechanism, order the following:

Rotary Circuit Breaker Operating Mechanism (Circuit Breaker is shown but not supplied with Operating Mechanisms)



Operating Shaft



Operating Handle

Bulletin 198-H Rotary Circuit Breaker Operating Mechanisms

- Rotary circuit breaker operating mechanisms available up to 400 A
- Adaptable to enclosures:
 - IP42 (Type 1)
 - IP66 (Type 3, 3R, 4, 4X, 12)
- Color coded on/off/reset handle indication

The Bulletin 198-H Rotary Circuit Breaker Operating Mechanism permits door-mounted, rotary-operated circuit breaker disconnection of motor loads using Bulletin 190 Disconnect Handles and Cutler-Hammer/Westinghouse G and H frame motor protectors in industrial applications. Operating handles are adaptable to IP42 (Type 1) and IP66 (Type 3, 3R, 4, 4X, 12) enclosures for door-mounted operation. A complete installation consists of operating mechanism, operating handle, operating shaft, plus **user-supplied circuit breaker and enclosure**.

Table of Contents

Product Selection this page
 Accessories..... 2-63

Standards Compliance

IEC 60947-3
 CSA 22.2 No. 5
 UL 489

Certifications

UL Recognized (File no. E 300325, Guide D1HS2)
 CSA Certified

Your order must include: 1) Cat. No. of the rotary circuit breaker operating mechanism, 2) Cat. No. of the operating handle and operating shaft

Product Selection — Circuit Breaker Type

Rotary Circuit Breaker Operating Mechanisms

 Cat. No. 198-H1	 Cat. No. 198-H2, 198-H3	Circuit Breaker			Cat. No.
		Manufacturer	Frame Size	Frame Designation	
		Cutler-Hammer/Westinghouse	63 A	GMCP	198-H1
			150 A	EDH, FD, FDB, FBC, HFD, HMCP	198-H2
			250 A, 400 A	JD, JDB, JDC, HJD, HMCP (250 A Frame) KD, KDB, KDC, HKD, HMCP (400 A Frame)	198-H3

Operating Shafts

 Cat. No. 194R-R3	Description	Circuit Breaker Frame Size	Enclosure Working Depth* [mm (in.)]		Cat. No.
			Minimum	Maximum	
		Standard	63 A	153 (6-1/32)	369 (14-17/32)
	Extended	153 (6-1/32)		563 (22-5/32)	194R-R2
	Standard	150 A	203 (8)	305 (12)	194R-R3
	Extended		203 (8)	508 (20)	194R-R4
	Standard	250/400 A	225 (8-7/8)	327 (12-7/8)	194R-R3
	Extended		225 (8-7/8)	530 (20-7/8)	194R-R4

* Dimensions are shown in millimeters (inches). For handle dimensions, see Bulletin 194R, page 2-471.



Rotary Circuit Breaker Operating Mechanism

Product Selection/Accessories

Operating Handle

Handle Type	Frame Size	Degree of Protection	Handle Color	Cat. No.
 Standard — Cat. No. 190-HS4E	63 A	IP66 (Type 3, 3R, 4, 4X, 12)	Black/Grey	190-HS4
			Red/Yellow	190-HS4E
		IP55 (Type 1)	Black/Grey	190-HS1
			Red/Yellow	190-HS1E
 Long — Cat. No. 190-HM4E	150, 200, 400 A	IP66 (Type 3/3R/4/4X/12)	Black/Grey	190-HM4
			Red/Yellow	190-HM4E
		IP55 (Type 1)	Black/Grey	190-HM1
			Red/Yellow	190-HM1E



Accessories

	Description	Cat. No.
 Cat. No. 198-H4	Mounting Bracket Extension — Provides added support for extended length operating shafts (194R-R2, 194R-R4).	198-H4

3-pole Manual Motor Starter

- For Economical Motor Starter Solutions



2

Rated Operational Current I_e	Motor Current Adjustment Range	Magnetic Release Operating Current	Switching of Standard 3-phase AC Motors, AC-2, AC-3						$I_{cu} = I_{cs}$	Cat. No.	
			3-phase [kW] (50 Hz)*			3-phase [Hp] (60 Hz)*					
			[A]	[A]	[A]	230V	400V	690V	230V		460V
0.16	0.1...0.16	1.8	—	0.02	—	—	—	—	—	65	140A-C2A-A16
0.25	0.16...0.25	2.8	—	0.06	—	—	—	—	—	65	140A-C2A-A25
0.4	0.25...0.4	4.4	—	0.09	—	—	—	—	—	65	140A-C2A-A40
0.63	0.4...0.63	6.9	0.06/0.09	0.12/0.18	0.25	—	—	—	—	65	140A-C2A-A63
1	0.63...1.0	11	0.12	0.25	0.37/0.55	—	1/2	3/4	—	65	140A-C2A-B10
1.6	1.0...1.6	18	0.18/0.25	0.37/0.55	0.75/1.1	—	1	1	—	65	140A-C2A-B16
2.5	1.6...2.5	28	0.37	0.75	1.8	3/4	1-1/2	2	—	50	140A-C2A-B25
4	2.5...4.0	44	0.55/0.75	1.1/1.5	2.2/3.0	1	3	3	—	10	140A-C2A-B40
6.3	4.0...6.3	69	1.1/1.5	2.2	—	2	5	5	—	10	140A-C2A-B63
10	6.3...10	110	2.2	3.0/4.0	—	3	7-1/2	10	—	8	140A-C2A-C10
16	10...16	176	3.0/4.0	5.5/7.5	—	5	10	15	—	6	140A-C2A-C16

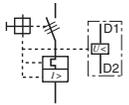
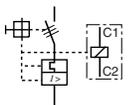
* Power ratings: Preferred values according to IEC 60072-1

* UL 508 approved as manual motor controller. Suitable for use in group motor applications: see page 2-67.

	Description	Connection Diagram	For Use With	Cat. No.
	Auxiliary Contact for Flush Mounting 1-pole No additional space required		140A	140A-C-AEA10
				140A-C-AEA210
				140A-C-AEA01
				140A-C-AEA201
	Auxiliary Contact for Left-side Mounting 2-pole Adds 9 mm to the width of the Manual Motor Starter Use compact bus bars with 54 mm spacing		140A	140A-C-ASA20
				140A-C-ASA11
				140A-C-ASA02

Package Quantity = 1



	Description	Trip Rating	Connection Diagram	For Use With	Cat. No.				
	Undervoltage Trip Release For right-side mounting Adds 18 mm to the width of the Manual Motor Starter	24V 60 Hz		140A	140A-C-UXJ				
		24V 50 Hz			140A-C-UXK				
		48V 60 Hz			140A-C-UXX				
		220...230V 50 Hz			140A-C-UXF				
		240V 50 Hz / 277V 60 Hz			140A-C-UXT				
		400V 50 Hz / 460V 60 Hz			140A-C-UXN				
		415V 50 Hz / 480V 60 Hz			140A-C-UXB				
		500V 50 Hz / 575V 60 Hz			140A-C-UXM				
		110V 50 Hz / 120V 60 Hz			140A-C-UXD				
		240...260V 60 Hz			140A-C-UXA				
		110V 50 / 60 Hz			140A-C-UXKD				
		525V 50 Hz / 600V 60 Hz			140A-C-UXVC				
					Shunt Trip Release For right-side mounting Adds 18 mm to the width of the Manual Motor Starter	24V 60 Hz		140A	140A-C-SXJ
24V 50 Hz	140A-C-SXK								
48V 60 Hz	140A-C-SXX								
220...230V 50 Hz	140A-C-SXF								
240V 50 Hz / 277V 60 Hz	140A-C-SXT								
400V 50 Hz / 460V 60 Hz	140A-C-SXN								
415V 50 Hz / 480V 60 Hz	140A-C-SXB								
500V 50 Hz / 575V 60 Hz	140A-C-SXM								
110V 50 Hz / 120V 60 Hz	140A-C-SXD								
240...260V 60 Hz	140A-C-SXA								
525V 50 Hz / 600V 60 Hz	140A-C-SXVC								
	Compact Bus Bars 45 mm spacing for manual motor starters with flush-mounted auxiliary contact blocks		2 x 3			140A			140A-C-W452
			3 x 3						140A-C-W453
		4 x 3	140A-C-W454						
		5 x 3	140A-C-W455						
		2 x 3	140A-C-W542						
	Compact Bus Bars 54 mm spacing for manual motor starters with side-mounted auxiliary contact blocks	3 x 3		140A	140A-C-W543				
		4 x 3			140A-C-W544				
		5 x 3			140A-C-W545				
					140A-C-W	140A-C-WT			
	Bus Bar Feeder Terminal Supply of compact busbars Increases wiring capacity			140A-C-W	140A-C-WT				
	Blank Space Cover For covering unused terminal links			140A-C-W	140A-C-WS				
	Screw Adapter Hat (DIN) Rail 35 x 7.5 mm, length 44 mm			140A	140A-C-N12				

Package Quantity = 1

Manual Motor Starters

Accessories

2

		Description	For Use With	Cat. No.	
	Enclosures for Surface Mounting With centre marks for two indicator lights Includes protective earth and neutral wire terminals	Protection Class: IP41	140A	140A-C-EA41	
		Protection Class: IP55 (with seal and protective membrane)	140A	140A-C-EA55	
	Enclosures for Flush Mounting Includes protective earth and neutral wire terminals	Protection Class: IP41	140A	140A-C-EE41	
		Protection Class: IP55 (with seal and protective membrane)	140A	140A-C-EE55	
	Button Membrane For IP55 enclosures Replacement part with four screws (mounting frame included)		140A-C-EA55 140A-C-EE55	140A-C-N55	
	Pilot Lights Length of connection leads 180 mm, includes lamp, protection class IP54.	Green	120V	198E-A..., 198E-C..., 140A-C-E...	140-LG120
			240V	198E-A..., 198E-C..., 140A-C-E...	140-LG240
			400V	198E-A..., 198E-C..., 140A-C-E...	140-LG400
			415V	198E-A..., 198E-C..., 140A-C-E...	140-LG415
		Red	480V	198E-A..., 198E-C..., 140A-C-E...	140-LG480
			120V	198E-A..., 198E-C..., 140A-C-E...	140-LR120
			240V	198E-A..., 198E-C..., 140A-C-E...	140-LR240
			400V	198E-A..., 198E-C..., 140A-C-E...	140-LR400
		White	415V	198E-A..., 198E-C..., 140A-C-E...	140-LR415
			480V	198E-A..., 198E-C..., 140A-C-E...	140-LR480
			120V	198E-A..., 198E-C..., 140A-C-E...	140-LW120
			240V	198E-A..., 198E-C..., 140A-C-E...	140-LW240
		Yellow	400V	198E-A..., 198E-C..., 140A-C-E...	140-LW400
			415V	198E-A..., 198E-C..., 140A-C-E...	140-LW415
			480V	198E-A..., 198E-C..., 140A-C-E...	140-LW480
			120V	198E-A..., 198E-C..., 140A-C-E...	140-LY120
	240V	198E-A..., 198E-C..., 140A-C-E...	140-LY240		
	400V	198E-A..., 198E-C..., 140A-C-E...	140-LY400		
	415V	198E-A..., 198E-C..., 140A-C-E...	140-LY415		
	480V	198E-A..., 198E-C..., 140A-C-E...	140-LY480		
	Locking Arrangement For locking ON-button of the Manual Motor Starter For 1...3 padlocks with ø 4...6 mm		140A	140A-C-M3	
	Locking Arrangement Suitable for enclosures 140A-C-E... For 1...3 padlocks with ø 4...8 mm		140A-C-E...	140A-C-M3E	
	Emergency-Stop Push Button Set For use with enclosures Twist to release		140A-C-E...	140A-C-MT	
	Emergency-Stop Push Button Set For use with enclosures Key release		140A-C-E...	140A-C-MK	

Package Quantity = 1

IEC Performance Data

		Cat. No. 140A-C2A-...										
		A16	A25	A40	A63	B10	B16	B25	B40	B63	C10	C16
Rated Operational Current I_e	[A]	0.16	0.25	0.4	0.63	1.0	1.6	2.5	4.0	6.3	10	16
Magnetic Release Current	[A]	1.8	2.8	4.4	6.9	11	18	28	44	69	110	176

Switching of Standard Three-Phase Motors *

AC-2, AC-3												
230/240V	[kW]	—	—	—	0.06/0.09	0.12	0.18/0.25	0.37	0.55/0.75	1.1/1.5	2.2	3.0/4.0
400/415V	[kW]	0.02	0.06	0.09	0.18/0.25	0.25	0.37/0.55	0.75	1.1/1.5	2.2	3.0/4.0	5.5/7.5
500V	[kW]	—	—	—	0.18	0.25/0.37	0.55/0.75	1.1	1.5/2.2	2.5/3.0	4.0/6.3	7.5/10
690V	[kW]	—	—	—	0.25	0.37/0.55	0.75/1.1	1.8	2.2/3.0	—	—	—

Back-Up Fuses

gG, aM, only if $I_{cc} \geq I_{cu}$													
230/240V	[A]	No fuses required										50	
400/415V	[A]											63	
500V	[A]											63	
690V	[A]								25	35	—	—	—

Ultimate- (I_{cu}) and Rated Service (I_{cs}) Short Circuit Breaking Capacity

$I_{cu} = I_{cs}$												
230/240V	[kA]	65	65	65	65	65	65	50	50	50	50	3
400/415V	[kA]	65	65	65	65	65	65	50	10	10	8	6
500V	[kA]	50	50	50	50	50	50	50	3	10	4.5	4.5
690V	[kA]	50	50	50	50	50	50	4.5	2	—	—	—

* Power ratings: Preferred values according to IEC 60072-1

UL / CSA Performance Data

Manual Motor Controller

(UL 508, CSA C22.2 No.14, for group installation, in combination with a short-circuit protection device)

		Cat. No. 140A-C2A-...										
		A16	A25	A40	A63	B10	B16	B25	B40	B63	C10	C16
Max. short-circuit current												
480V	[kA]	42	42	42	42	42	42	42	18	18	10	5
600V	[kA]	42	42	42	42	42	42	10	5	5	5	5
Motor load												
1-phase												
115V	[Hp]	—	—	—	—	—	—	1/10	1/8	1/4	1/2	1
230V	[Hp]	—	—	—	—	—	1/10	1/6	1/3	3/4	1-1/2	3
3-phase												
200V	[Hp]	—	—	—	—	—	—	1/2	3/4	1-1/2	2	3
230V	[Hp]	—	—	—	—	—	—	3/4	1	2	3	5
460V	[Hp]	—	—	—	—	1/2	1	1-1/2	3	5	7-1/2	10
575V	[Hp]	—	—	—	—	3/4	1	2	3	5	10	15
Maximum rated current of protection device												
	[A]	175										

Bulletin 140A
Manual Motor Starters
 Specifications

General Data

Cat. No.		140A-C2A
Rated Insulation Voltage U_i		
EN/IEC	[V]	690
UL, CSA	[V]	600
Overvoltage Category / Pollution degree		III / 3
Rated Impulse Withstand Voltage U_{imp}		
Main circuits		6 kV
Auxiliary circuits		6 kV
Rated Frequency	[Hz]	40...60
Life Span		
Mechanical	[operations]	100000
Electrical (I_e max.)	[operations]	50000
Switching Frequency	[operations/h]	max. 30
Ambient Temperature		
Storage	[°C]	- 25...+ 80
Operation	[°C]	- 25...+ 60
Resistance to Climatic Stress		C IV (according to IEC 68)
Moisture/heat resistance		40 °C, 92 %, 56 days
Moisture/change resistance		23 °C, 83 %/40 °C, 93 %, 56 cycles
Site Altitude	[m]	≤ 2000
Protection Class		IP20, when wired
Resistance to Shock, transport	[g]	30 g, 20 ms
Resistance to Vibration		
Frequency range	[Hz]	10...150
in all directions	[g]	7.5
Rated Thermal Current I_{th}		
IEC		
up to 40°C ambient temperature	[A]	0.1...16
up to 60°C ambient temperature	[A]	0.1...16
Rated Supply Current I_e	[A]	0.1...16
Number of setting ranges		11
Dependence on Temperature		
40 °C	[A]	
50 °C	[A]	no reduction
60 °C	[A]	
70 °C	[A]	15 % current reduction of the upper rated current I_e^e
Overload Protection		
Characteristics		EN/IEC 60947-4-1 Motor protection
Ambient Temperature Compensation	[°C]	-20...+60
Trip Class		10
Magnetic Release		fixed setting
Release current		11 × I_e max. I_e max. = maximum values of setting ranges
Total Power dissipation		
Manual motor starter at rated load	[W]	7
Main Supply Application		Usable as main supply switch according to EN/IEC 60-204 with corresponding accessories

2



Cat. No.	140A-C2A		
Conformity to Standards	IEC 60947-1/ -2/ -4/ -5-1 UL 508; CSA 22.2, Part 1		
Approvals/Markings	CE, cULus Listed		
Terminal Parts			
Type of terminals			
Screwdriver	Pozidriv No. 2/Blade No. 3		
	1 conductor	[mm ²]/[AWG]	1...4/No. 16...12
	2 conductor	[mm ²]/[AWG]	1...4/No. 16...12
	1 conductor	[mm ²]/[AWG]	1...6/No. 16...12
	2 conductor	[mm ²]/[AWG]	1...6/No. 16...12
	1 conductor	[mm ²]/[AWG]	1.5...6/No. 16...12
	2 conductor	[mm ²]/[AWG]	1.5...6/No. 16...12
Tightening torque	[N•m]/[lb•in]	2...2.5/18...22	

Specifications of Accessories

		Cat. No. 140A-C-AEA... Auxiliary Contact Block for Flush Mounting				Cat. No. 140A-C-ASA... Auxiliary Contact Block for Left-side Mounting				
Rated Thermal Current /th										
at 40°C ambient temperature	[A]	6				10				
at 60°C ambient temperature	[A]	4				6				
Contact Class Coordination According to NEMA										
(UL/CSA Standards)	AC	B 600 Standard Pilot Duty				B 600 Standard Pilot Duty				
	DC	R 300 Light Pilot Duty				R 300 Light Pilot Duty				
Back-Up Fuses gG, gL	[A]	16				16				
Rated Supply Current	[V]	230/240	400/415	500	690	230/240	400/415	500	690	
	AC-15	[A]	2	1	0.8	0.5	2	1	0.8	0.5
	DC-13	[V]	24	48	110	220	24	48	110	220
		[A]	2	0.6	0.2	0.1	2	0.6	0.2	0.1
Terminal Parts										
Type of terminals										
Screwdriver		Pozidriv No. 2/Blade No. 3								
	1 conductor	[mm ²]/[AWG]	0.75...2.5/No. 18...14				0.75...2.5/No. 18...14			
	2 conductor	[mm ²]/[AWG]	0.75...2.5/No. 18...14				0.75...2.5/No. 18...14			
	1 conductor	[mm ²]/[AWG]	0.75...4/No. 18...14				0.75...4/No. 18...14			
	2 conductor	[mm ²]/[AWG]	0.75...4/No. 18...14				0.75...4/No. 18...14			
	1 conductor	[mm ²]/[AWG]	0.75...4/No. 18...14				0.75...4/No. 18...14			
	2 conductor	[mm ²]/[AWG]	0.75...4/No. 18...14				0.75...4/No. 18...14			
Tightening torque	[N•m]/[lb•in]	1...1.5/9...13				1...1.5/9...13				

Bulletin 140A
Manual Motor Starters
 Specifications

2

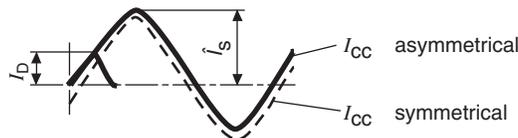
		Cat. No. 140A-C-UX... Undervoltage Release Unit for Right-side Mounting	Cat. No. 140A-C-SX... Shunt Release for Right-side Mounting	Cat. No. 140A-C-WT Supply Block
Actuating Voltage				
Pull-in		$0.8...1.1 \times U_s$	$0.7...1.1 \times U_s$	
Drop-out		$0.7...0.35 \times U_s$	—	
Rated Control Voltage	min.	12V 50 Hz, 14V 60 Hz	12V 50 Hz, 14V 60 Hz	
	max.	600V 50 Hz	600V 50 Hz	
On-Time		100 %	100 %	
Coil Rating	Pull-in	8.5 VA, 6 W	8.5 VA, 6 W	
	Hold	3 VA, 1.2 W	3 VA, 1.2 W	
Terminal Parts				
Type of terminals				
Screwdriver		Pozidriv No. 2/Blade No. 3	Pozidriv No. 2/Blade No. 3	Pozidriv No. 2/Blade No. 3
	1 conductor	[mm ²]/[AWG]	0.75...2.5/No. 18...14	0.75...2.5/No. 18...14
	2 conductor	[mm ²]/[AWG]	0.75...2.5/No. 18...14	0.75...2.5/No. 18...14
	1 conductor	[mm ²]/[AWG]	0.75...4/No. 18...14	0.75...4/No. 18...14
	2 conductor	[mm ²]/[AWG]	0.75...4/No. 18...14	0.75...4/No. 18...14
	1 conductor	[mm ²]/[AWG]	0.75...4/No. 18...14	0.75...4/No. 18...14
	2 conductor	[mm ²]/[AWG]	0.75...4/No. 18...14	0.75...4/No. 18...14
Tightening torque		[N•m]/[lb•in]	1...1.5/9...13	1...1.5/9...13
				4/36

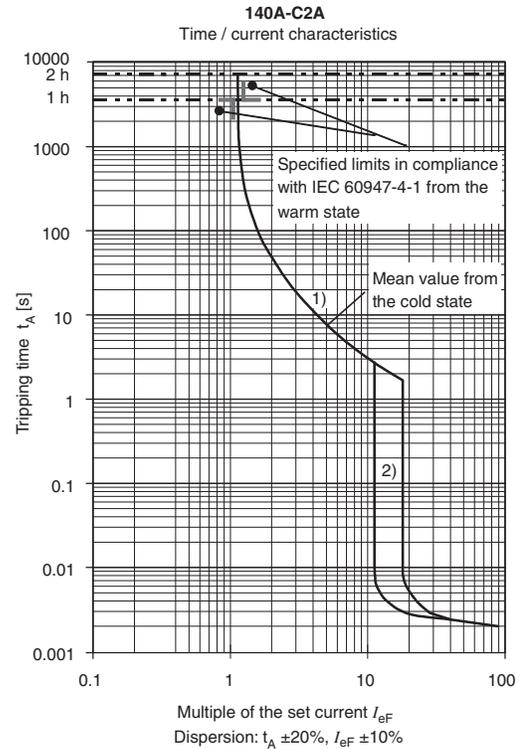
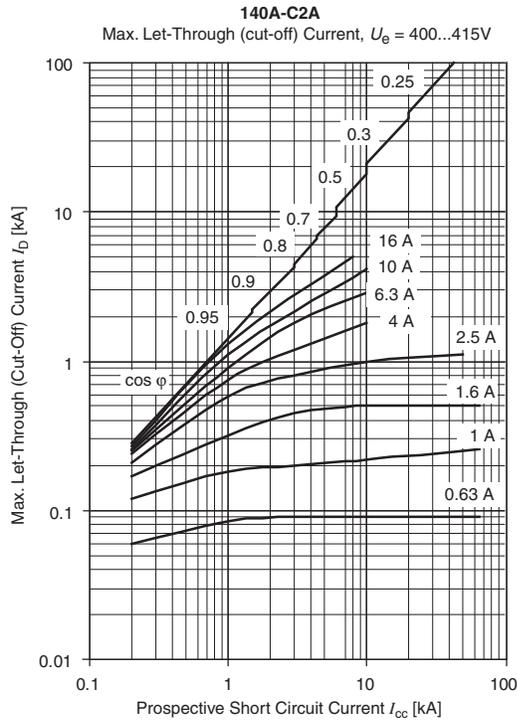
		Cat. No. 140A-C-W45... Compact Bus Bar	Cat. No. 140A-C-W54... Compact Bus Bar
Rated Insulation Voltage U_i	[V]	690	690
Rated Thermal Current I_{th}	[A]	63	63

		Cat. No. 140A-C-EA41 / -EE41 Enclosure	Cat. No. 140A-C-EA55 / -EE55 Enclosure	Cat. No. 140-L... Indicator light
IP Protection		IP41	IP55 (with seal and protective membrane)	IP54
Ambient Temperature	[°C]	-25...+40	-25...+40	—
Rated Operating Voltage	[V]	—	—	120, 240, 415, 480

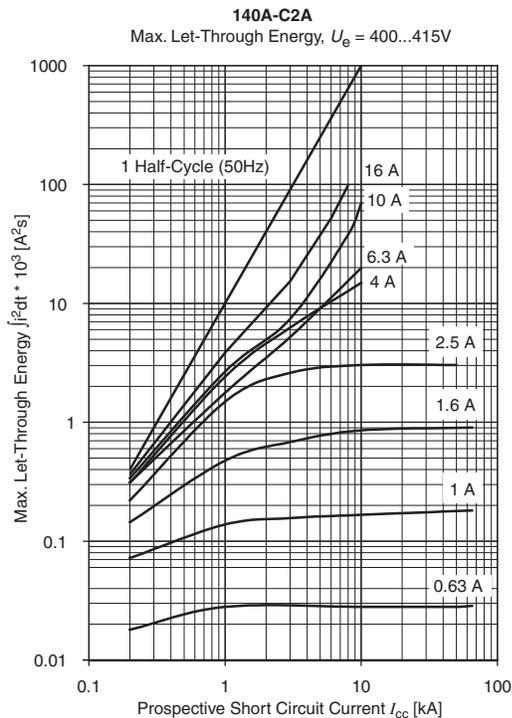
Cut-off current

The Bulletin 140A-C2A manual motor starter limits short-circuit current I_{cc} (prospective short-circuit current). I_D is the maximum cut-off current (highest instantaneous value of the limited short-circuit current). This value is indicated in the following diagram as a function of the system short-circuit current.





Correspondingly the maximum forward $i^2 dt$ energy is limited. This value is indicated in the following diagram as a function of the system short-circuit current.



1) Operating Current of Thermal Releases:

The adjustable inverse bimetal trip reliability protects motors against overloads. The curve shows the mean operating current at an ambient temperature of 20 °C starting from cold.

In equipment at operating temperature, release time is less than or equal to release time from the cold state.

2) Operating Current of Magnetic Releases:

Electromagnetic instantaneous releases react at a fixed tripping current.

At the upper thermal release setting, this tripping current is 11 times the set current.

Current To Be Set:

Thermal releases meet the requirements for a thermal release of a starter in accordance with IEC 60947-4-1 f. If a different value is specified (such as reduced I_e in motors with an ambient temperature higher than 40 °C or a site altitude >2000 m above sea level), the rated operating current I_e must be adjusted.

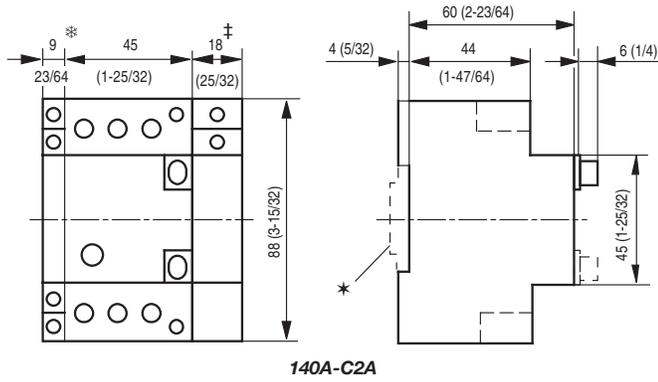
Performance categories per IEC 60947-2:

I_{cu}	Rated short-circuit breaking capacity Operational after completing O-t-CO test sequence	
I_{cs}	Ultimate short-circuit breaking capacity Suitable for normal operation after completing O-t-CO-t-CO test sequence	
	O	= off
	CO	= restart and off
	t	= set delay, 3 min

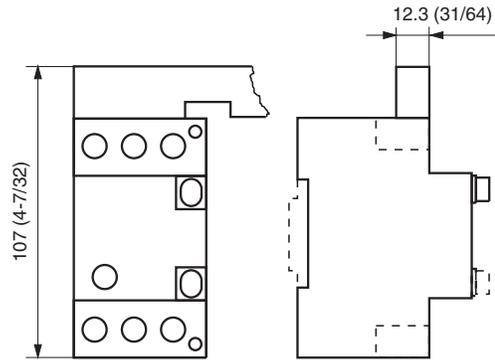
Approximate Dimensions

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

2

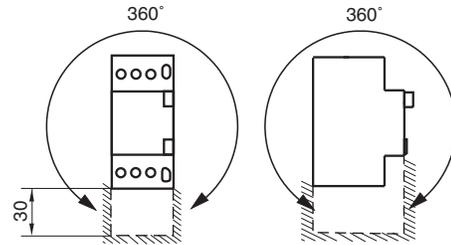


140A-C2A

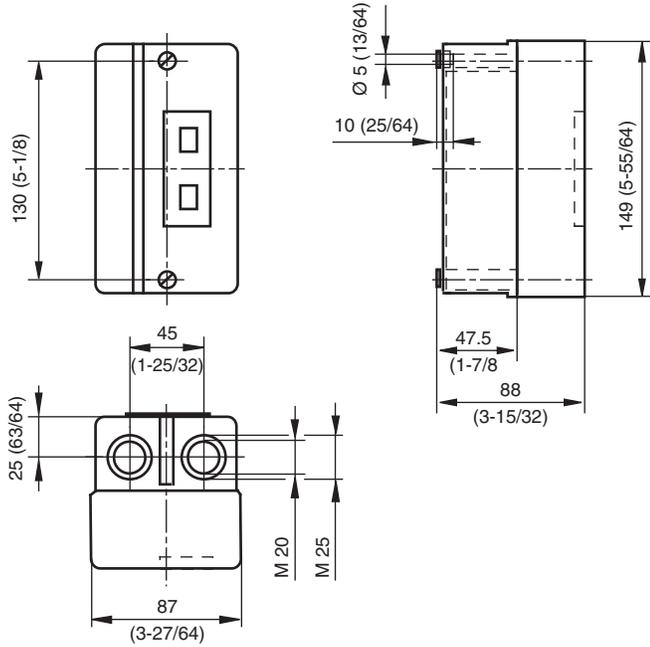


140A-C2A with 140A-C-W...

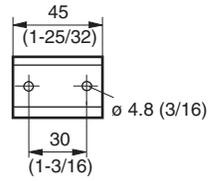
- * Can be mounted on DIN Rail EN 50 022-35
- ※ Auxiliary contact block for side-mounting of 140A-C-ASA...
- ‡ 140A-C-SX... shunt release or 140A-C-UX... undervoltage release



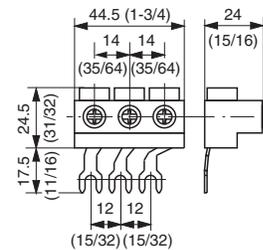
Mounting position/Safety clearance of 140A-C2A



140A-C-EA41 / -EA55

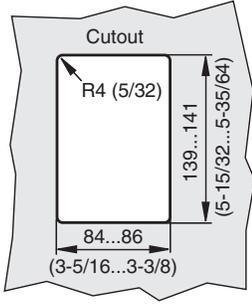
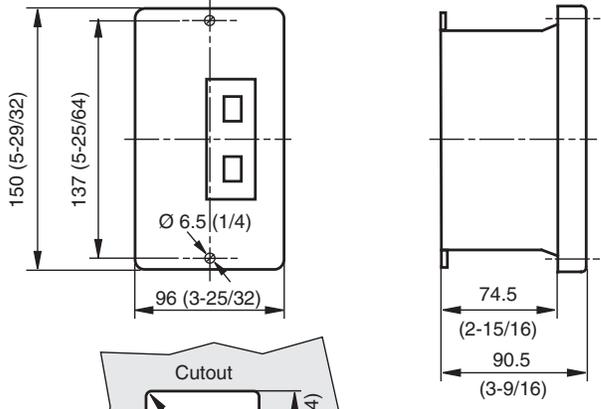
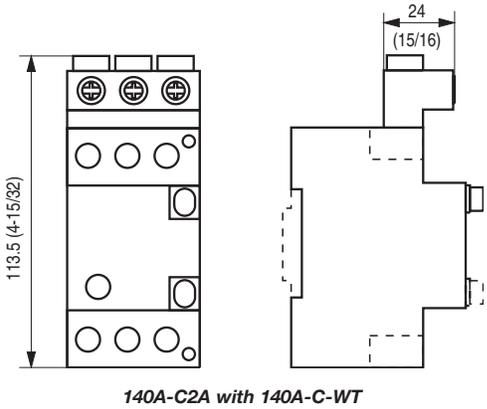


140A-C-N12



140A-C-WT

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



140A-C-EE41 / -EE55

Molded Case Circuit Breakers

Product Overview

2



Bulletin 140U Molded Case Circuit Breakers

- 0.5...1200 A Molded Case Circuit Breakers
 - Thermal-Magnetic 0.5...800 A
 - Electronic 70...1200 A
 - LS — Long Time/Short Time
 - LSI — Long Time/Short Time/High Instantaneous
 - LSG — Long Time/Short Time/Ground Fault
 - LSIG — Long Time/Short Time/High Instantaneous/Ground Fault
 - Molded Case Switches 125...1200 A
- Factory- or field-installed accessories
- Flex cable operating mechanisms
- Rotary variable-depth operating mechanisms
- High interrupting ratings in compact dimensions
- Globally rated and approved product line for worldwide application

Standards Compliance

UL 489
 CSA C22.2, No. 5
 EN/IEC 60947-2
 CCC (most frame sizes)

Certifications

UL Listed
 CSA Certified
 CE Marked
 KEMA

Table of Contents

Product Selection:

— 30 A, D-Frame	2-77
— 100 A, G-Frame	2-83
— 125 A, H-Frame	2-86
— 250 A, J-Frame	2-95
— 400 A, K-Frame	2-100
— 600 A, L-Frame	2-105
— 800 A, M-Frame	2-110
— 1200 A, N-Frame	2-114
— 2500 A, R-Frame	2-117

Product Line Overview

Frame Reference	D-Frame	G-Frame	H-Frame	J-Frame	K-Frame	L-Frame	M-Frame	N-Frame	R-Frame
Max. Current I_n	30 A	100 A	125 A	250 A	400 A	600 A	800 A	1200 A	2500 A
Current Range	0.5...30 A	15...100 A	15...125 A	70...250 A	100...400 A	300...600 A	300...800 A	600...1200 A	800...2500 A
Thermal Magnetic	✓	✓	✓	✓	✓	✓	✓	—	—
Electronic:									
LS	—	—	—	✓	✓	✓	✓	✓	✓
LSI	—	—	—	✓	✓	✓	✓	✓	✓
LSII	—	—	—	—	—	✓	—	✓	—
LSG	—	—	—	✓	✓	✓	✓	✓	✓
LSIG	—	—	—	✓	✓	✓	✓	✓	✓
LSIIG	—	—	—	—	—	✓	—	✓	—
Interrupting Ratings:									
380...415V (I_{cu})	see selection table	14 22	25 40 70	25 40 70 100	40 65 100	45 70 100	50 70	50 70 100	—
480V		14 22	25 35 65 100	25 35 65 100	35 65 100	35 65 100	50 65	50 65 100	65 100
600V		—	18 22 25 35	18 18 25 35	25 35 50	25 35 50	25 35	25 35 50	—
690V (I_{cu})		—	3 4 6	6 6 7 12	10 13 18	20 25 15	20 25	20 25 30	—
Molded Case Switches	—	✓	✓	✓	✓	✓	✓	✓	—
Flex Cable Operators	—	—	✓	✓	✓	✓	✓	✓	✓
Rotary Operators	✓	✓	✓	✓	✓	✓	✓	✓	✓
Internal Control Modules (Field installed)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Standards Compliance (For information regarding specific breakers, please consult www.ab.com. Standards compliance varies by catalog number.)									
UL 489	✓	✓	✓	✓	✓	✓	✓	✓	✓
UL File Nos.	E334037, E33916	E197878, Guide No. DIV Q							
CSA C22.2, No. 5	✓	✓	✓	✓	✓	✓	✓	✓	✓
CSA File Nos.	—	216034, 216035, 219884 Class No. 1432-01							
IEC 60947-2	✓	✓	✓	✓	—	✓	✓	✓	✓
CE	✓	—	✓	✓	—	✓	✓	✓	✓
KEMA	—	—	✓	✓	—	✓	✓	✓	✓
CCC	—	—	✓	✓	—	✓	✓	✓	✓



Examples given in this section are for reference purposes. **This basic explanation should not be used for product selection; not all combinations will produce a valid cat. no.** Refer to the tables on the following pages for descriptions of options.

Complete Circuit Breaker Assemblies

140U – H
6
C
3 – C50 – H

a
b
c
d
e
f
g
h



a

Bulletin No.	
Code	Description
140U	Molded Case Circuit Breaker

b

Frame/Rating	
Code	Description
D	30 A
G	100 A
H	125 A
J	250 A
K	400 A
L	600 A
M	800 A
N	1200 A
R	2500 A

c

Interrupting Rating/Breaking Capacity (based on I_c at 480V)	
Code	Description
2	20...29 kA
3	30...39 kA
5	50...59 kA
6	60...69 kA
8	80...89 kA
0	≥100 kA

d

Protection Type	
Code	Description
C	Fixed thermal/fixed magnetic
D	Fixed thermal/adjust magnetic
E	Adjust thermal/fixed magnetic
F	Adjust thermal/adjust magnetic
G	Electronic (LSG — long, short, ground fault)
H	Electronic (LSI — long, short, high instant)
I	Electronic (LSIG — long, short, high instant, ground fault)
J	Electronic (LSII — long, short, high instant, instantaneous maintenance mode)
K	Electronic (LSIIG — long, short, high instant, instantaneous maintenance mode, ground fault)
L	Electronic (LS — long and short time)
S	Molded case switch (Isolator)

e

Poles	
Code	Description
1	1 poles
2	2 poles
3	3 poles

f

Current Range	
Code	Description
C	10 rr. A
D	100 rr0 A
E	1000 rr00 A

g

Internal Control Modules	
Code	Description
A	1 auxiliary contact
B	2 auxiliary contacts
D	1 alarm contact
F	1 auxiliary + 1 alarm contact
G	Undervoltage release only
P	Shunt trip only
Control Module Combinations	
Code	Description
H	1 auxiliary contact + undervoltage release
J	2 auxiliary contacts + undervoltage release
L	1 auxiliary + 1 alarm contact + undervoltage release
N	1 alarm contact + undervoltage release
Q	1 auxiliary contact + shunt trip
R	2 auxiliary contacts + shunt trip
T	1 auxiliary + 1 alarm contact + shunt trip
V	1 alarm contact + shunt trip

h

Voltage Code	
See the following pages for voltage code descriptions:	
All frame sizes	Page 2-121

Molded Case Circuit Breakers

Catalog Number Explanation

Examples given in this section are for reference purposes. **This basic explanation should not be used for product selection; not all combinations will produce a valid cat. no.** Refer to the tables on the following pages for descriptions of options.

Frames

140U – J 3 X 3

a *b* *c* *d* *e*

2

a

Bulletin No.	
Code	Description
140U	Molded Case Circuit Breaker

b

Frame/Rating	
Code	Description
J	250 A
K	400 A
L	600 A
M	800 A

c

Interrupting Rating/Breaking Capacity (based on I _c at 480V)	
Code	Description
2	20...29 kA
3	30...39 kA
5	50...59 kA
6	60...69 kA
8	80...89 kA
0	≥100 kA

d

Protection Type	
Code	Description
X	Frame Only

e

Poles	
Code	Description
3	3 poles

Trip Units

140U – J T D 3 – D25

a *b* *c* *d* *e* *f*

a

Bulletin No.	
Code	Description
140U	Molded Case Circuit Breaker

b

Frame/Rating	
Code	Description
J	250 A
K	400 A
L	600 A
M	800 A

c

Trip Unit	
Code	Description
T	Trip unit

d

Protection Type	
Code	Description
C	Fixed thermal/fixed magnetic
D	Fixed thermal/adjust magnetic
E	Adjust thermal/adjust magnetic
F	Adjust thermal/adjust magnetic
G	Electronic (LSG — long, short, ground fault)
H	Electronic (LSI — long, short, high instant)
I	Electronic (LSIG — long, short, high instant, ground fault)
J	Electronic (LSII — long, short, high instant, instantaneous maintenance mode)
K	Electronic (LSIIG — long, short, high instant, instantaneous maintenance mode, ground fault)
L	Electronic (LS — long and short time)
S	Molded case switch (isolator)

e

Poles	
Code	Description
3	3 poles

f

Current Range	
Code	Description
C	10 rr. A
D	100 rr0 A
E	1000 rr00 A





Product Selection — 30 A, D-Frame

Standards

- UL 489
- CSA C22.2, No. 5
- IEC / EN 60947-1, -2

Ratings

- HACR

2-Pole Thermal-Magnetic, Fixed Thermal-Fixed Magnetic

Rated Current I_n	Thermal Trip (Fixed) $I_r = I_n$	Magnetic Trip $I_m =$	Breaking Capacity (50 Hz) [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No. *		
			230...240V		400...415V		525V		690V		240V AC	480Y/277V AC	600Y/347V AC			
[A]	[A]	[A]	I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}				
0.5	0.5	15...20 x I_n	100	100	100	65	65	65	50	50	100	100	50	140U-D6D2-A50		
1	1	15...20 x I_n	100	100	100	65	65	65	50	50	100	100	50	140U-D6D2-B10		
2	2	15...20 x I_n	100	100	100	65	65	65	18	10	100	100	50	140U-D6D2-B20		
3	3	15...20 x I_n	100	100	100	65	65	65	18	10	100	100	50	140U-D6D2-B30		
4	4	15...20 x I_n	100	100	100	65	65	65	18	10	100	100	50	140U-D6D2-B40		
5	5	15...20 x I_n	100	100	100	65	65	65	18	10	100	100	50	140U-D6D2-B50		
6	6	15...20 x I_n	100	100	100	65	65	65	18	10	100	100	50	140U-D6D2-B60		
8	8	15...20 x I_n	100	100	100	65	65	65	10	6	100	100	50	140U-D6D2-B80		
10	10	15...20 x I_n	100	100	100	65	65	65	10	6	100	100	50	140U-D6D2-C10		
12	12	15...20 x I_n	100	100	65	50	65	50	10	6	65	65	35	140U-D6D2-C12		
15	15	15...20 x I_n	100	100	65	50	65	50	10	6	65	65	35	140U-D6D2-C15		
20	20	15...20 x I_n	100	100	65	50	65	50	10	6	65	65	35	140U-D6D2-C20		
25	25	15...20 x I_n	100	100	65	50	65	25	10	6	65	65	35	140U-D6D2-C25		
30	30	15...20 x I_n	100	100	65	50	65	25	10	6	65	65	35	140U-D6D2-C30		

* Current limiting

3-Pole Thermal-Magnetic, Fixed Thermal-Fixed Magnetic

Rated Current I_n	Thermal Trip (Fixed) $I_r = I_n$	Magnetic Trip $I_m =$	Breaking Capacity (50 Hz) [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No. *		
			230...240V		400...415V		525V		690V		240V AC	480Y/277V AC	600Y/347V AC			
[A]	[A]	[A]	I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}				
0.5	0.5	15...20 x I_n	100	100	100	65	65	65	50	50	100	100	50	140U-D6D3-A50		
1	1	15...20 x I_n	100	100	100	65	65	65	50	50	100	100	50	140U-D6D3-B10		
2	2	15...20 x I_n	100	100	100	65	65	65	18	10	100	100	50	140U-D6D3-B20		
3	3	15...20 x I_n	100	100	100	65	65	65	18	10	100	100	50	140U-D6D3-B30		
4	4	15...20 x I_n	100	100	100	65	65	65	18	10	100	100	50	140U-D6D3-B40		
5	5	15...20 x I_n	100	100	100	65	65	65	18	10	100	100	50	140U-D6D3-B50		
6	6	15...20 x I_n	100	100	100	65	65	65	18	10	100	100	50	140U-D6D3-B60		
8	8	15...20 x I_n	100	100	100	65	65	65	10	6	100	100	50	140U-D6D3-B80		
10	10	15...20 x I_n	100	100	100	65	65	65	10	6	100	100	50	140U-D6D3-C10		
12	12	15...20 x I_n	100	100	65	50	65	50	10	6	65	65	35	140U-D6D3-C12		
15	15	15...20 x I_n	100	100	65	50	65	50	10	6	65	65	35	140U-D6D3-C15		
20	20	15...20 x I_n	100	100	65	50	65	50	10	6	65	65	35	140U-D6D3-C20		
25	25	15...20 x I_n	100	100	65	50	65	25	10	6	65	65	35	140U-D6D3-C25		
30	30	15...20 x I_n	100	100	65	50	65	25	10	6	65	65	35	140U-D6D3-C30		

* Current limiting

Molded Case Circuit Breakers

Accessories — 30 A, D-Frame

Accessories

	Description		For Use With	Cat. No.
	Load terminal cover <ul style="list-style-type: none"> For UL489 compliance of front mount auxiliary contacts when installed on 140U-D 	10 pcs/pkg	140M-C-AFA	140M-C-AFC
	Three-Phase Compact Busbar 45 mm spacing <ul style="list-style-type: none"> Compliant with UL489 (UL508 Cat. NMTR) and IEC 64 A max. continuous current 45 mm spacing 	2 connections	140U-D_ _3	140U-D-W452
		3 connections	140U-D_ _3	140U-D-W453
		4 connections	140U-D_ _3	140U-D-W454
		5 connections	140U-D_ _3	140U-D-W455
	Feeder Terminal for compact busbar <ul style="list-style-type: none"> Compliant with UL489 (UL508 Cat. NMTR) and IEC 64 A max. continuous current 		140U-D-W	140U-D-WTE
	Eco Connection Module — 25 A <ul style="list-style-type: none"> Eco-loadfeeders mount on single DIN Rail (140U on DIN Rail) Electrical and mechanical interconnection of 140U and 100-C (with AC coils or 12V and 24V DC electronic coils) contactors 		140U-D_ _3 to 100-C09...-C23	140U-D-PEC23
	Flexible Wire Module — 32 A <ul style="list-style-type: none"> Contactors and 140U are separately mounted 		140U-D_ _3 to 100-C09...-C43	140U-D-PF

Note: See page 2-26 for additional accessories suitable for Bul. 140U-D molded case circuit breakers.

2



Specifications
General Data

Cat. No.	140U-D	
Number of Poles	2 and 3	
Rated Insulation Voltage U_i		
IEC / EN [V]	690	
UL, CSA [V]	600	
Ratings	HACR	
Suitable for continuous operation at 100 percent of rating only if used in cubicle space for	0.5...15 A, cubicle space 250 x 175 x 150 mm (10 x 7 x 6 inches).	
Rated Impulse Withstand Voltage U_{imp}		
Pollution degree	3	
Main circuits U_{imp} /Overvoltage Category	6 kV/III	
Auxiliary circuits U_{imp} /Overvoltage Category	6 kV/III	
Safe separation between main and auxiliary circuits	up to 400V	
Rated Frequency [Hz]	50/60	
Utilization Category		
IEC 60947-2 (Circuit breaker)	A	
Life Span		
Mechanical [operations]	100 000	
Electrical (I_e max.) [operations]	10 000	
Switching Frequency [operations/h]	max. 25	
Ambient Temperature		
Storage [°C]	-40...+80	
Operation [°C]	-25...+60 (70 with 15 % I_n current reduction)	
Climatic resistance		
Moisture change climate (60068-2-30)	23 °C / 83 % relative humidity and 40 °C / 92 % relative humidity, 56 cycles	
Dry heat (60086-2-2)	100 °C, relative humidity <50 %, 7 days	
Moisture heat (60068-2-3)	40 °C, relative humidity 93 %, 56 days	
Site Altitude [m]	to 2000 N.N.	
Protection Class	IP2X, when wired	
Overload Protection [°C]	Yes acc. IEC/EN 60947-2, UL489, CSA 22.2, Ambient Temperature Compensation -25...+60	
Phase-loss Protection	No phase loss protection	
Short circuit protection (Magnetic)	fixed setting 10...20 x I_n	
Main Disconnect Switch Application	Yes, with accessories	
Application Conditions	For utilization outside North America, Assemblies (of products) shall comply to the IEC61439-1 requirements 140U circuit breakers are intended for use in closed areas without hazardous operating conditions such as dust or explosive or corrosive gases. Enclosures of appropriate manner need to be in place to protect devices in such environments.	
Standards	UL489; CSA C22.2 No. 5; IEC / EN 60947-1, -2	
Certifications	CE; cULus listed Circuit Breaker, File No. E334037 and E33916 (accessories)	



Terminal specification 140U-D

Cat. No.	140U-D...	
Use 75°C Cu wire only		
Terminal Parts		
Type of terminals	Pozidriv No. 2 / Blade No. 3	
Screwdriver		
 1. conductor [mm ²]/[AWG]	1...6/—	
 2. conductor [mm ²]/[AWG]	1...4/—	
 1. conductor [mm ²]/[AWG]	1...6/—	
 2. conductor [mm ²]/[AWG]	1...6/—	
 1. conductor [mm ²]/[AWG]	—/No. 18...10	
 2. conductor [mm ²]/[AWG]	—/No. 18...10	
 1. conductor [mm ²]/[AWG]	1...6/No. 18...10	
 2. conductor [mm ²]/[AWG]	1...6/No. 18...10	
Tightening torque [Nm]/[lb•in]	2...2.5/18...22	

Cat. No.	140U-D-WTE	140U-D-W
Use 75°C Cu wire only		
Rated Thermal Current I_{th} [A]	64	64
 1. conductor [mm ²]/[AWG]	2.5...25/14...4	—
 1. conductor [mm ²]/[AWG]	2.5...25/14...4	—
 1. conductor [mm ²]/[AWG]	2.5...25/14...4	—
 1. conductor [mm ²]/[AWG]	2.5...25/14...4	—
Tightening torque [N•m]/[lb•in]	3...3.5/27...31	—

Weights

Description	Weight [g]	Cat.No.
Circuit Breakers	395	140U-D...

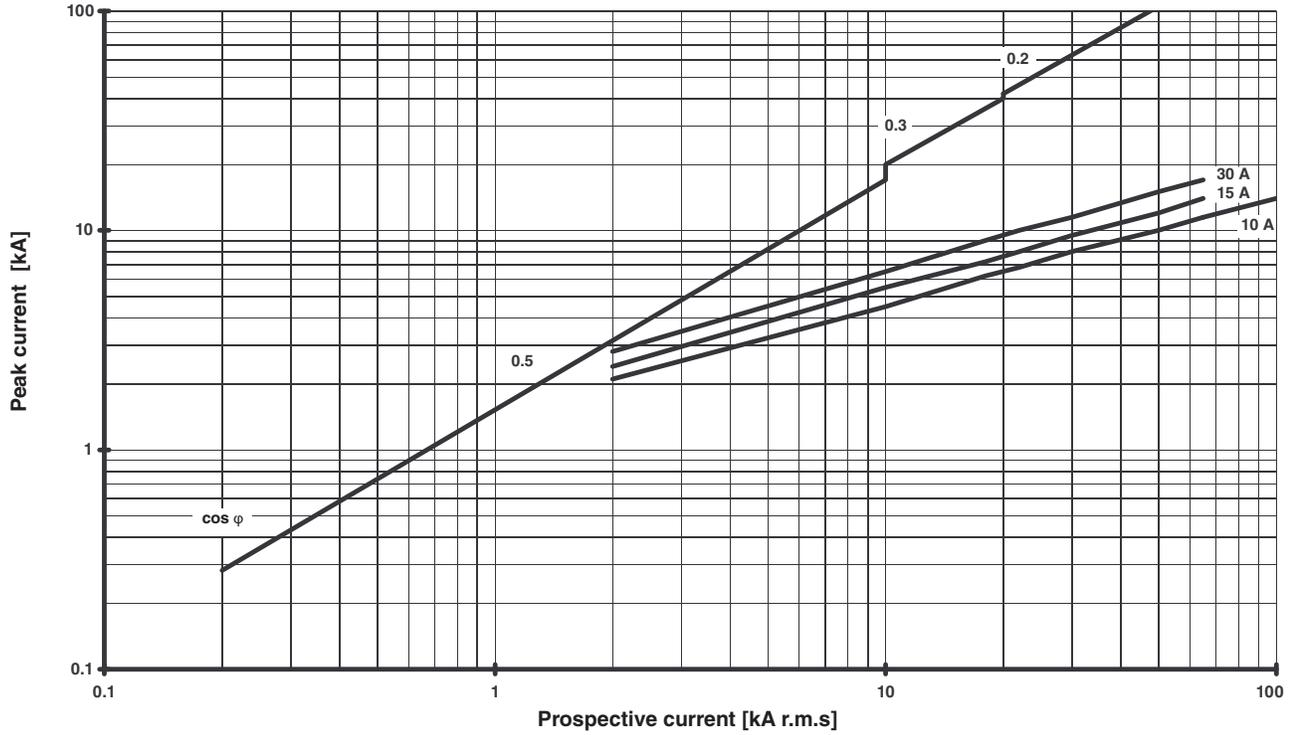
Molded Case Circuit Breakers

Specifications — 30 A, D-Frame

2

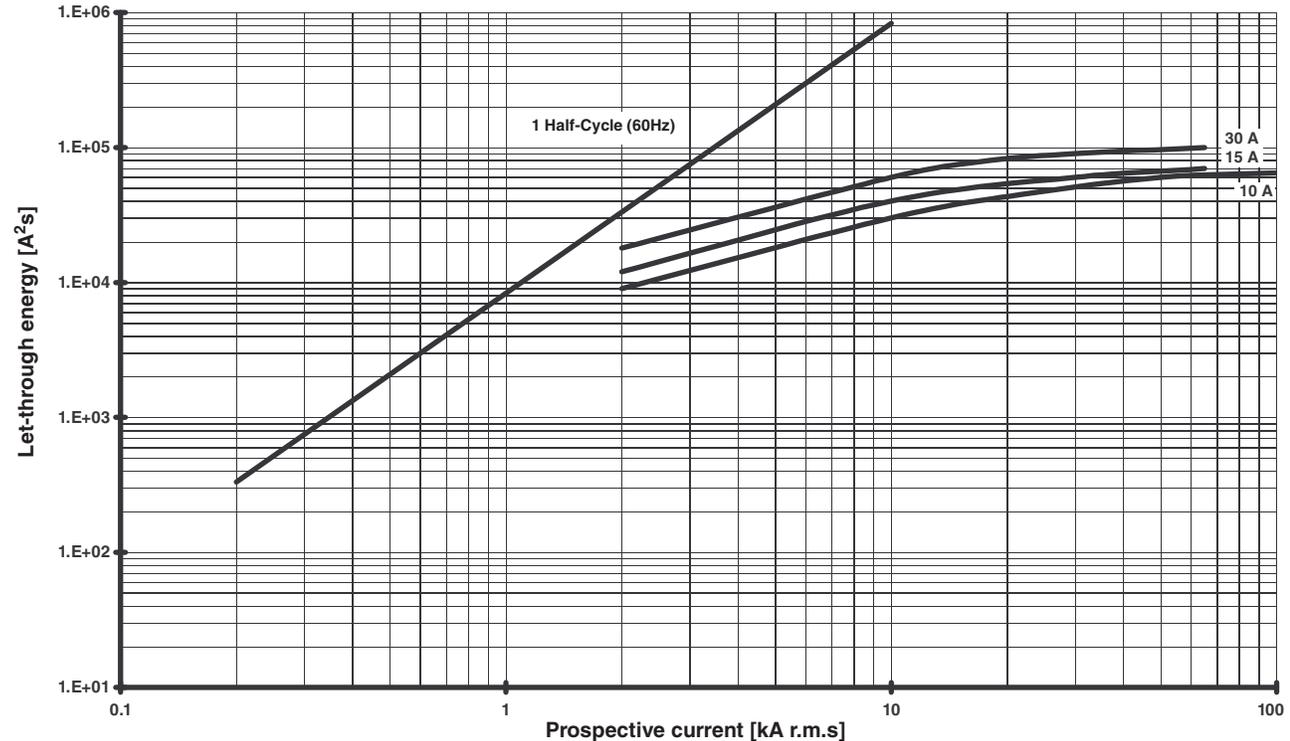
Bulletin 140U-D Molded Case Circuit Breakers (Maximum Cut-Off Current)

140U-D6D...
 Max. Cut-Off Current, $U_e = 480V$ at 60 Hz

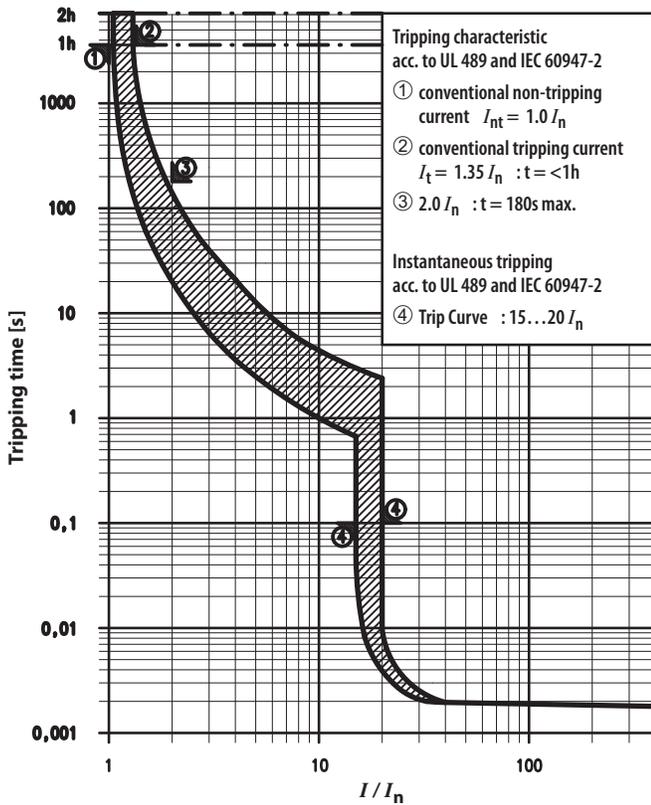


Bulletin 140U-D Molded Case Circuit Breakers (Maximum Let-Through-Energy)

140U-D6D...
 Max. Let-Through-Energy, $U_e = 480V$

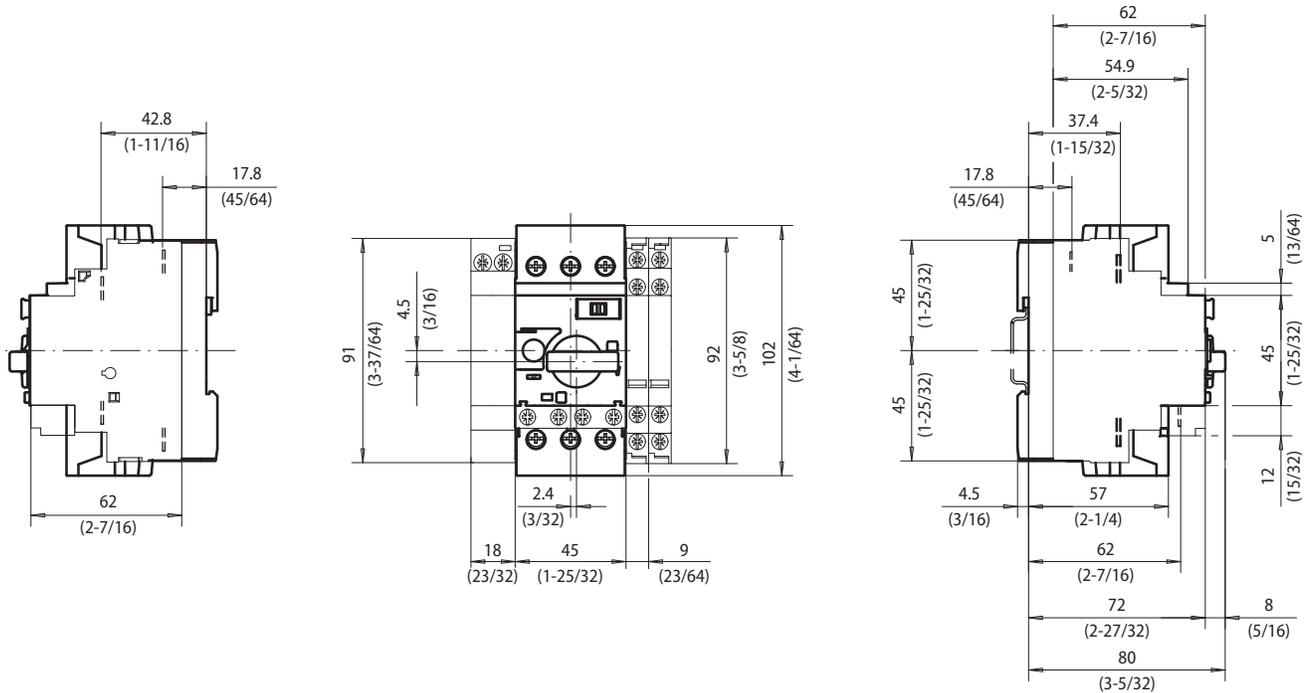


Time-Current Characteristic



Approximate Dimensions, Cat. No. 140U-D

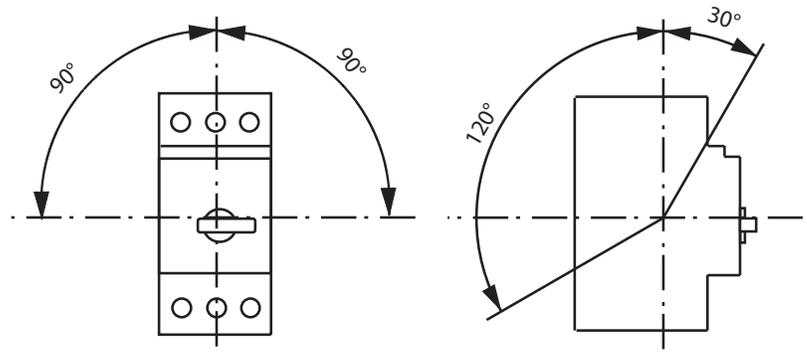
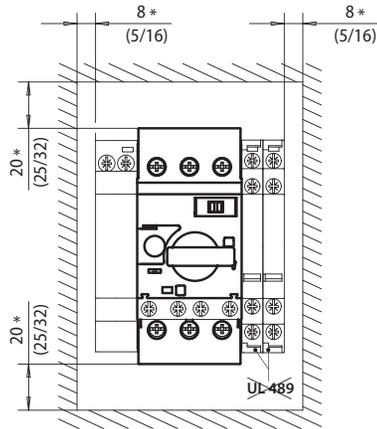
Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.



Molded Case Circuit Breakers

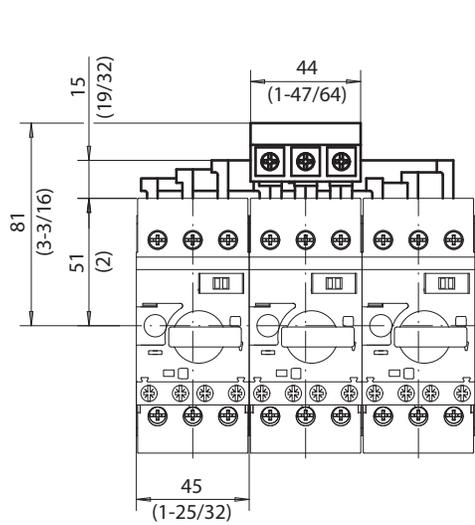
Approximate Dimensions — 30 A, D-Frame

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

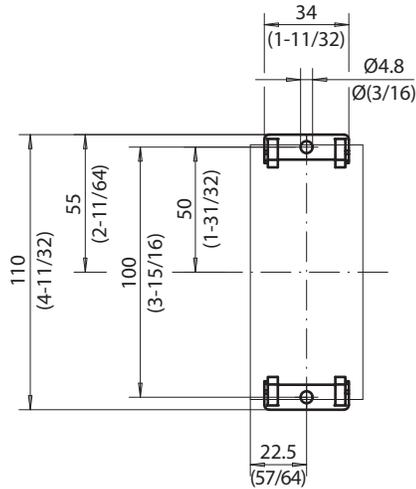
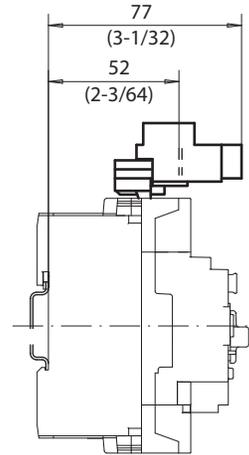


Mounting position

* Minimum distance to grounded parts or walls



Cat. No. 140U-D with Busbar



Screw Adapter 140M-C-N45 for 140U-D

Molded Case Circuit Breakers

Product Selection/Accessories — 100 A, G-Frame

- UL 489
- CSA 22.2, No. 5

Note: Terminal box lugs provided as standard**Note:** Accessories cannot be field installed to the G-Frame circuit breakers. Circuit breakers with one auxiliary contact are also available.

14 kA, Thermal-Magnetic, Fixed Thermal-Fixed Magnetic

Rated Current I_n [A]	Thermal Trip [A] $I_r = I_n$ (Fixed)	Magnetic Trip [A] $I_m = 10 \times I_n$	Interrupt Rating (50/60 Hz) I_{cu} / I_{cs} [kA]			Interrupt Rating [kA] *	2 Poles
			208V AC	240V AC	480V AC		125/250V DC
15	15	150	65	65	14	10	140U-G1C2-C15
20	20	200	65	65	14	10	140U-G1C2-C20
25	25	250	65	65	14	10	140U-G1C2-C25
30	30	300	65	65	14	10	140U-G1C2-C30
35	35	350	65	65	14	10	140U-G1C2-C35
40	40	400	65	65	14	10	140U-G1C2-C40
45	45	450	65	65	14	10	140U-G1C2-C45
50	50	500	65	65	14	10	140U-G1C2-C50

* Time constant is 8 ms min.

22 kA, Thermal-Magnetic, Fixed Thermal-Fixed Magnetic

Rated Current I_n [A]	Thermal Trip [A] $I_r = I_n$ (Fixed)	Magnetic Trip [A] $I_m = 10 \times I_n$	Interrupt Rating (50/60 Hz) I_{cu} / I_{cs} [kA]			Interrupt Rating [kA] *	3 Poles
			208V AC	240V AC	480V AC		125/250V DC
15	15	150	65	65	22	10	140U-G2C3-C15
20	20	200	65	65	22	10	140U-G2C3-C20
25	25	250	65	65	22	10	140U-G2C3-C25
30	30	300	65	65	22	10	140U-G2C3-C30
35	35	350	65	65	22	10	140U-G2C3-C35
40	40	400	65	65	22	10	140U-G2C3-C40
45	45	450	65	65	22	10	140U-G2C3-C45
50	50	500	65	65	22	10	140U-G2C3-C50
60	60	600	65	65	22	10	140U-G2C3-C60
70	70	700	65	65	22	10	140U-G2C3-C70
80	80	800	65	65	22	10	140U-G2C3-C80
90	90	900	65	65	22	10	140U-G2C3-C90
100	100	1000	65	65	22	10	140U-G2C3-D10

* Time constant is 8 ms min. and 2 poles of a 3-pole circuit breaker.

Accessories

External Accessories

	Description		Cat. No.
	Rotary, Variable-Depth Operating Mechanism UL Type 3/12/4/4X, IP 66 Rotary handle 12 in. (30.48 cm) operating rod	Black Handle	140U-G-RVM12B
		Red/Yellow Handle	140U-G-RVM12R
	DIN Rail Adapter Allows 2-pole G-frame MCCB to mount to 35 mm DIN Rail	Qty: 1	140U-G-DRA2
	DIN Rail Adapter Allows 3-pole G-frame MCCB to mount to 35 mm DIN Rail	Qty: 1	140U-G-DRA3
	Padlockable Handle Block Padlocking Hasp Lock-OFF only	Qty: 1	140U-G-PL
	Replacement Mounting Hardware (4) M4 - 0.7 x 75 mm §	Qty: 1	140U-G-MHM

§ Supplied with breaker.

Molded Case Circuit Breakers

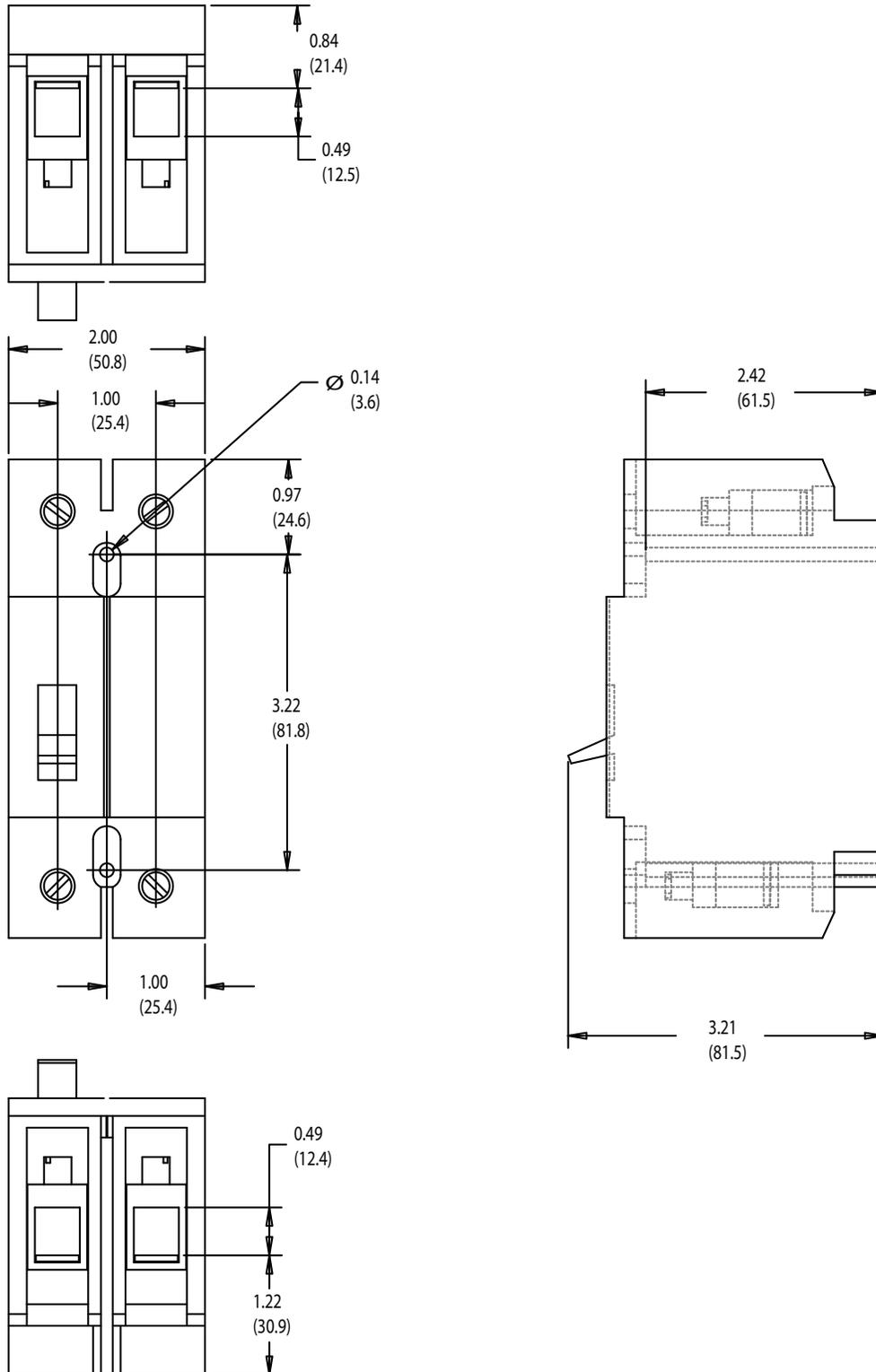
Approximate Dimensions — 100 A, G-Frame

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

2-Pole Dimensions

15...100 A, PRESSURE COLLAR TERMINALS

2

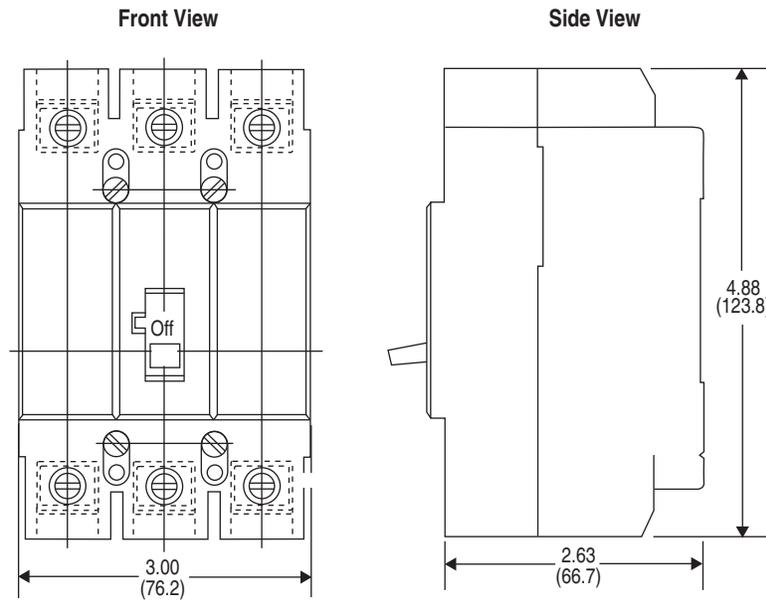


Molded Case Circuit Breakers

Approximate Dimensions — 100 A, G-Frame

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

3-Pole Dimensions



2

Molded Case Circuit Breakers

Product Selection — 125 A, H-Frame

- UL 489
- CSA 22.2, No. 5
- IEC 60947-2
- CE
- KEMA (3-pole MCCBs)
- CCC (3-pole MCCBs)

Note: Terminal box lugs provided as standard



1-Pole 25/18 kA, Thermal-Magnetic, Fixed Thermal-Fixed Magnetic

Rated Current I_n [A]	Magnetic Trip [A] $I_m = 10 \times I_n$	Breaking Capacity (50 Hz) I_{cu} / I_{cs} [kA]		Interrupting Rating (60 Hz) [kA]		Cat. No.
		220...240V		240V	277V	
15	500	25	25	25	18	140U-H1C1-C15
20	500	25	25	25	18	140U-H1C1-C20
25	500	25	25	25	18	140U-H1C1-C25
30	500	25	25	25	18	140U-H1C1-C30
35	500	25	25	25	18	140U-H1C1-C35
40	500	25	25	25	18	140U-H1C1-C40
45	500	25	25	25	18	140U-H1C1-C45
50	500	25	25	25	18	140U-H1C1-C50
60	600	25	25	25	18	140U-H1C1-C60
70	700	25	25	25	18	140U-H1C1-C70
80	800	25	25	25	18	140U-H1C1-C80
90	900	25	25	25	18	140U-H1C1-C90
100	1000	25	25	25	18	140U-H1C1-D10
110	1100	25	25	25	18	140U-H1C1-D11
125	1250	25	25	25	18	140U-H1C1-D12

2-Pole 25/25 kA, Thermal-Magnetic, Fixed Thermal-Fixed Magnetic

Rated Current I_n [A]	Magnetic Trip [A] $I_m = 10 \times I_n$	Breaking Capacity (50 Hz) I_{cu} / I_{cs} [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No.
		220...240V		380...415V		500V		690V		240V	480V	600/347V	
15	500	35	35	25	25	—	—	—	—	35	25	18	140U-H2C2-C15
20	500	35	35	25	25	—	—	—	—	35	25	18	140U-H2C2-C20
25	500	35	35	25	25	—	—	—	—	35	25	18	140U-H2C2-C25
30	500	35	35	25	25	—	—	—	—	35	25	18	140U-H2C2-C30
35	500	35	35	25	25	—	—	—	—	35	25	18	140U-H2C2-C35
40	500	35	35	25	25	—	—	—	—	35	25	18	140U-H2C2-C40
45	500	35	35	25	25	—	—	—	—	35	25	18	140U-H2C2-C45
50	500	35	35	25	25	—	—	—	—	35	25	18	140U-H2C2-C50
60	600	35	35	25	25	—	—	—	—	35	25	18	140U-H2C2-C60
70	700	35	35	25	25	—	—	—	—	35	25	18	140U-H2C2-C70
80	800	35	35	25	25	—	—	—	—	35	25	18	140U-H2C2-C80
90	900	35	35	25	25	—	—	—	—	35	25	18	140U-H2C2-C90
100	1000	35	35	25	25	—	—	—	—	35	25	18	140U-H2C2-D10
110	1100	35	35	25	25	—	—	—	—	35	25	18	140U-H2C2-D11
125	1250	35	35	25	25	—	—	—	—	35	25	18	140U-H2C2-D12

2



2-Pole 40/35 kA, Thermal-Magnetic, Fixed Thermal-Fixed Magnetic

Rated Current I_n [A]	Thermal Trip [A] $I_t = I_n$ (Fixed)	Magnetic Trip [A] $I_m = 10 \times I_n$	Breaking Capacity (50 Hz) I_{cu} / I_{cs} [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No.
			220...240V		380...415V		500V		690V		240V	480V	600/347V	
15	Fixed	500	85	43	40	30	—	—	—	—	85	35	22	140U-H3C2-C15
20	Fixed	500	85	43	40	30	—	—	—	—	85	35	22	140U-H3C2-C20
25	Fixed	500	85	43	40	30	—	—	—	—	85	35	22	140U-H3C2-C25
30	Fixed	500	85	43	40	30	—	—	—	—	85	35	22	140U-H3C2-C30
35	Fixed	500	85	43	40	30	—	—	—	—	85	35	22	140U-H3C2-C35
40	Fixed	500	85	43	40	30	—	—	—	—	85	35	22	140U-H3C2-C40
45	Fixed	500	85	43	40	30	—	—	—	—	85	35	22	140U-H3C2-C45
50	Fixed	500	85	43	40	30	—	—	—	—	85	35	22	140U-H3C2-C50
60	Fixed	600	85	43	40	30	—	—	—	—	85	35	22	140U-H3C2-C60
70	Fixed	700	85	43	40	30	—	—	—	—	85	35	22	140U-H3C2-C70
80	Fixed	800	85	43	40	30	—	—	—	—	85	35	22	140U-H3C2-C80
90	Fixed	900	85	43	40	30	—	—	—	—	85	35	22	140U-H3C2-C90
100	Fixed	1000	85	43	40	30	—	—	—	—	85	35	22	140U-H3C2-D10
110	Fixed	1100	85	43	40	30	—	—	—	—	85	35	22	140U-H3C2-D11
125	Fixed	1250	85	43	40	30	—	—	—	—	85	35	22	140U-H3C2-D12

2-Pole 70/65 kA, Thermal-Magnetic, Fixed Thermal-Fixed Magnetic

Rated Current I_n [A]	Thermal Trip [A] $I_t = I_n$ (Fixed)	Magnetic Trip [A] $I_m = 10 \times I_n$	Breaking Capacity (50 Hz) I_{cu} / I_{cs} [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No.
			220...240V		380...415V		500V		690V		240V	480V	600/347V	
15	Fixed	500	100	50	70	35	—	—	—	—	100	65	25	140U-H6C2-C15
20	Fixed	500	100	50	70	35	—	—	—	—	100	65	25	140U-H6C2-C20
25	Fixed	500	100	50	70	35	—	—	—	—	100	65	25	140U-H6C2-C25
30	Fixed	500	100	50	70	35	—	—	—	—	100	65	25	140U-H6C2-C30
35	Fixed	500	100	50	70	35	—	—	—	—	100	65	25	140U-H6C2-C35
40	Fixed	500	100	50	70	35	—	—	—	—	100	65	25	140U-H6C2-C40
45	Fixed	500	100	50	70	35	—	—	—	—	100	65	25	140U-H6C2-C45
50	Fixed	500	100	50	70	35	—	—	—	—	100	65	25	140U-H6C2-C50
60	Fixed	600	100	50	70	35	—	—	—	—	100	65	25	140U-H6C2-C60
70	Fixed	700	100	50	70	35	—	—	—	—	100	65	25	140U-H6C2-C70
80	Fixed	800	100	50	70	35	—	—	—	—	100	65	25	140U-H6C2-C80
90	Fixed	900	100	50	70	35	—	—	—	—	100	65	25	140U-H6C2-C90
100	Fixed	1000	100	50	70	35	—	—	—	—	100	65	25	140U-H6C2-D10
110	Fixed	1100	100	50	70	35	—	—	—	—	100	65	25	140U-H6C2-D11
125	Fixed	1250	100	50	70	35	—	—	—	—	100	65	25	140U-H6C2-D12

3-Pole 25/25 kA, Thermal-Magnetic, Fixed Thermal-Fixed Magnetic

Rated Current I_n [A]	Thermal Trip [A] $I_t = I_n$ (Fixed)	Magnetic Trip [A] $I_m = 10 \times I_n$	Breaking Capacity (50 Hz) I_{cu} / I_{cs} [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No.
			220...240V		380...415V		525V		690V		240V	480V	600/347V	
15	15	500	35	35	25	25	22	17	3	3	35	25	18	140U-H2C3-C15
20	20	500	35	35	25	25	22	17	3	3	35	25	18	140U-H2C3-C20
25	25	500	35	35	25	25	22	17	3	3	35	25	18	140U-H2C3-C25
30	30	500	35	35	25	25	22	17	3	3	35	25	18	140U-H2C3-C30
35	35	500	35	35	25	25	22	17	3	3	35	25	18	140U-H2C3-C35
40	40	500	35	35	25	25	22	17	3	3	35	25	18	140U-H2C3-C40
45	45	500	35	35	25	25	22	17	3	3	35	25	18	140U-H2C3-C45
50	50	500	35	35	25	25	22	17	3	3	35	25	18	140U-H2C3-C50
60	60	600	35	35	25	25	22	17	3	3	35	25	18	140U-H2C3-C60
70	70	700	35	35	25	25	22	17	3	3	35	25	18	140U-H2C3-C70
80	80	800	35	35	25	25	22	17	3	3	35	25	18	140U-H2C3-C80
90	90	900	35	35	25	25	22	17	3	3	35	25	18	140U-H2C3-C90
100	100	1000	35	35	25	25	22	17	3	3	35	25	18	140U-H2C3-D10
110	110	1100	35	35	25	25	22	17	3	3	35	25	18	140U-H2C3-D11
125	125	1250	35	35	25	25	18	17	3	3	35	25	18	140U-H2C3-D12

Molded Case Circuit Breakers

Product Selection — 125 A, H-Frame

2

3-Pole 40/35 kA, Thermal-Magnetic, Fixed Thermal-Fixed Magnetic

Rated Current I_n [A]	Thermal Trip [A] $I_T = I_n$ (Fixed)	Magnetic Trip [A] $I_m = 10 \times I_n$	Breaking Capacity (50 Hz) I_{cu} / I_{cs} [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No.
			220...240V		380...415V		525V		690V		240V	480V	600/347V	
15	15	500	85	43	40	30	25	18	4	3	85	35	22	140U-H3C3-C15
20	20	500	85	43	40	30	25	18	4	3	85	35	22	140U-H3C3-C20
25	25	500	85	43	40	30	25	18	4	3	85	35	22	140U-H3C3-C25
30	30	500	85	43	40	30	25	18	4	3	85	35	22	140U-H3C3-C30
35	35	500	85	43	40	30	25	18	4	3	85	35	22	140U-H3C3-C35
40	40	500	85	43	40	30	25	18	4	3	85	35	22	140U-H3C3-C40
45	45	500	85	43	40	30	25	18	4	3	85	35	22	140U-H3C3-C45
50	50	500	85	43	40	30	25	18	4	3	85	35	22	140U-H3C3-C50
60	60	600	85	43	40	30	25	18	4	3	85	35	22	140U-H3C3-C60
70	70	700	85	43	40	30	25	18	4	3	85	35	22	140U-H3C3-C70
80	80	800	85	43	40	30	25	18	4	3	85	35	22	140U-H3C3-C80
90	90	900	85	43	40	30	25	18	4	3	85	35	22	140U-H3C3-C90
100	100	1000	85	43	40	30	25	18	4	3	85	35	22	140U-H3C3-D10
110	110	1100	85	43	40	30	25	18	4	3	85	35	22	140U-H3C3-D11
125	125	1250	85	43	40	30	25	18	4	3	85	35	22	140U-H3C3-D12

3-Pole 70/65 kA, Thermal-Magnetic, Fixed Thermal-Fixed Magnetic

Rated Current I_n [A]	Thermal Trip [A] $I_T = I_n$ (Fixed)	Magnetic Trip [A] $I_m = 10 \times I_n$	Breaking Capacity (50 Hz) I_{cu} / I_{cs} [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No.‡
			220...240V		380...415V		525V		690V		240V	480V	600/347V	
15	Fixed	500	100	100	70	70	25	13	6	3	100	65	25	140U-H6C3-C15
20	Fixed	500	100	100	70	70	25	13	6	3	100	65	25	140U-H6C3-C20
25	Fixed	500	100	100	70	70	25	13	6	3	100	65	25	140U-H6C3-C25
30	Fixed	500	100	100	70	70	25	13	6	3	100	65	25	140U-H6C3-C30
40	Fixed	500	100	100	70	70	25	13	6	3	100	65	25	140U-H6C3-C40
50	Fixed	500	100	100	70	70	25	13	6	3	100	65	25	140U-H6C3-C50
60	Fixed	600	100	100	70	70	25	13	6	3	100	65	25	140U-H6C3-C60
70	Fixed	700	100	100	70	70	25	13	6	3	100	65	25	140U-H6C3-C70
80	Fixed	800	100	100	70	70	25	13	6	3	100	65	25	140U-H6C3-C80
90	Fixed	900	100	100	70	70	25	13	6	3	100	65	25	140U-H6C3-C90
100	Fixed	1000	100	100	70	70	25	13	6	3	100	65	25	140U-H6C3-D10
110	Fixed	1100	100	100	70	70	25	13	6	3	100	65	25	140U-H6C3-D11
125	Fixed	1250	100	100	70	70	25	13	6	3	100	65	25	140U-H6C3-D12

‡ Current limiting

3-Pole 100/100 kA, Thermal-Magnetic, Fixed Thermal-Fixed Magnetic

Rated Current I_n [A]	Thermal Trip [A] $I_T = I_n$ (Fixed)	Magnetic Trip [A] $I_m = 10 \times I_n$	Breaking Capacity (50 Hz) I_{cu} / I_{cs} [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No.‡
			220...240V		380...415V		525V		690V		240V	480V	600/347V	
15	Fixed	500	200	200	100	100	35	18	8	6	200	100	35	140U-H0C3-C15
20	Fixed	500	200	200	100	100	35	18	8	6	200	100	35	140U-H0C3-C20
25	Fixed	500	200	200	100	100	35	18	8	6	200	100	35	140U-H0C3-C25
30	Fixed	500	200	200	100	100	35	18	8	6	200	100	35	140U-H0C3-C30
40	Fixed	500	200	200	100	100	35	18	8	6	200	100	35	140U-H0C3-C40
50	Fixed	500	200	200	100	100	35	18	8	6	200	100	35	140U-H0C3-C50
60	Fixed	600	200	200	100	100	35	18	8	6	200	100	35	140U-H0C3-C60
70	Fixed	700	200	200	100	100	35	18	8	6	200	100	35	140U-H0C3-C70
80	Fixed	800	200	200	100	100	35	18	8	6	200	100	35	140U-H0C3-C80
90	Fixed	900	200	200	100	100	35	18	8	6	200	100	35	140U-H0C3-C90
100	Fixed	1000	200	200	100	100	35	18	8	6	200	100	35	140U-H0C3-D10
110	Fixed	1100	200	200	100	100	35	18	8	6	200	100	35	140U-H0C3-D11
125	Fixed	1250	200	200	100	100	35	18	8	6	200	100	35	140U-H0C3-D12

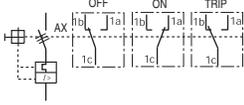
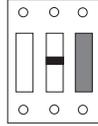
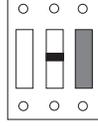
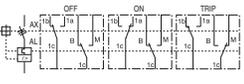
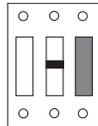
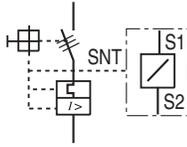
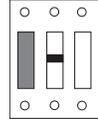
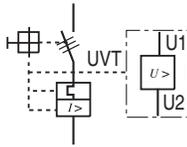
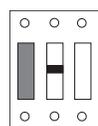
‡ Current limiting

Molded Case Switch — UL 489

Rated Current I_n [A]	Thermal Trip [A] $I_T = I_n$ (Fixed)	Magnetic Trip [A] $I_m = 10 \times I_n$	Breaking Capacity (50 Hz) I_{cu} / I_{cs} [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No.
			220...240V		380...415V		525V		690V		240V	480V	600/347V	
125	—	1250	100	50	70	35	35	18	6	3	100	65	25	140U-H6S3-D12



Internal Control Modules — Field Installed

Description		Diagram	Mounting Location	Cat. No.	
	Auxiliary Contact (AX) Electrically indicates "ON/OFF" status of breakers (1) 1a-1b			140U-H-EA1	
	(2) 1a-1b		Right side ONLY	140U-H-EA2	
	Alarm Contact (AL) Electrically indicates when the breaker is in the "TRIPPED" state (1) 1M (make)-1B (break)			140U-H-ER1	
			Right side ONLY		
	Auxiliary/Alarm Contact (AX/AL) Combination Combination of auxiliary contact and alarm contact (1) 1a-1b (1) 1M (make)-1B (break)			140U-H-EA1R1	
			Right side ONLY		
	Shunt Trip (SNT) Provides remote tripping of the circuit breaker Undervoltage trip not available when shunt trip is used			12V DC	140U-H-SNZQ
	24...60 V, 50/60/DC			140U-H-SNJ	
	110...240V, 50/60/DC			140U-H-SND	
	380...600V, 50/60 Hz			140U-H-SNB	
	Undervoltage Release (UVT) Automatically trips breaker when voltage falls between preset value, 35...70% Shunt trip is not available when undervoltage release is used			24V, 50/60 Hz	140U-H-UJ
	24V DC			140U-H-UZJ	
110...127V, 50/60 Hz	140U-H-UD				
208...240V, 50/60 Hz	140U-H-UA				
380...500V, 50/60 Hz	140U-H-UB				
525...600V, 50/60 Hz	140U-H-UC				

Note: For Factory-Installed internal control modules, please see page 2-121.

External Accessories

	Description	Cat. No.
	Terminal End Cover 6.4 mm (0.25 in.) diameter cable entry	140U-H-TC2
	Terminal End Cover 10.4 mm (0.41 in.) diameter cable entry	140U-H-TC4
	Terminal Shields IP20 Ingress Protection Rating	For use with 1-pole MCCBs, line side 140U-H-TS1LI For use with 1-pole MCCBs, load side 140U-H-TS1LO For use with 2-pole MCCBs 140U-H-TS2 For use with 3-pole MCCBs 140U-H-TS
	Flex-Cable Operating Mechanism Includes handle, cable, operating, and bail mechanism Pre-assembled and adjusted Non-Metallic - UL IP66, Type 1/3/12/4/4X Flange Mount Operating Handle Flex-Cable Operating Mechanism Includes handle, cable, operating, and bail mechanism Pre-assembled and adjusted Stainless Steel - Type 4/4X Flange Mount Operating Handle Flex-Cable Operating Mechanism Includes handle, cable, operating, and bail mechanism Pre-assembled and adjusted Painted metal — Type 1/12 Flange mount operating handle	3 ft (0.9 m) Cable 140U-H-FCX03 4 ft (1.3 m) Cable 140U-H-FCX04 6 ft (1.9 m) Cable 140U-H-FCX06 10 ft (3.0 m) Cable 140U-H-FCX10 3 ft (0.9 m) Cable 140U-H-FCS03 4 ft (1.2 m) Cable 140U-H-FCS04 6 ft (1.9 m) Cable 140U-H-FCS06 10 ft (3.0 m) Cable 140U-H-FCS10 1 ft (0.3 m) Cable 140U-H-FMX01 3 ft (0.9 m) Cable 140U-H-FMX03 4 ft (1.2 m) Cable 140U-H-FMX04 6 ft (1.9 m) Cable 140U-H-FMX06 8ft (2.4 m) Cable 140U-H-FMX08 10 ft (3.0 m) Cable 140U-H-FMX10
	Rotary, Variable-Depth Operating Mechanism UL Type 3/12/4/4X, IP 66 Rotary handle 12 in. (30.48 cm) operating rod Rotary, Variable-Depth Operating Mechanism UL Type 3/12/4/4X, IP 66 Rotary handle 21 in. (53.34 cm) operating rod	Black Handle 140U-H-RVM12B Red/Yellow Handle 140U-H-RVM12R Black Handle 140U-H-RVM21B Red/Yellow Handle 140U-H-RVM21R
	Rotary, Variable-Depth Operating Mechanism with Internal NFPA 79 Operating Handle External Type 3/4/4X/12 IP66 Rotary Handle 12 in. (30.48 cm) operating rod Rotary, Variable-Depth Operating Mechanism with Internal NFPA 79 Operating Handle External Type 3/4/4X/12 IP66 Rotary Handle 21 in. (53.34 cm) operating rod	Black Handle 140U-H-NVM12B Red/Yellow Handle 140U-H-NVM12R Black Handle 140U-H-NVM21B Red/Yellow Handle 140U-H-NVM21R
	Motor Operator Remotely opens, closes, and resets the circuit breaker 110...240V AC Motor Operator Remotely opens, closes, and resets the circuit breaker 24V DC	For use with 3- or 4-pole MCCBs, 110...240V AC/DC 140U-H-EOPD For use with 3- or 4-pole MCCBs, 24V DC 140U-H-EOPZ
	Replacement Mounting Hardware (4) M4 - 0.7 x 75 mm §	For use with 3- or 4-pole MCCBs 140U-H-MHM

§ Supplied with breaker.

		Description		Cat. No.	
	Rotary, Direct Couple Operating Mechanism Rotary handle - IP42 UL Type 1 Breaker mounted	Black Handle		140U-H-RCB	
		Red/Yellow Handle		140U-H-RCR	
	End Cap Kit Provides three-phase connections for terminal or bolt-on connections Metric hardware provided	For use with 1-pole MCCBs	Qty: 1	140U-H-ECM1	
		For use with 2-pole MCCBs	Qty: 1	140U-H-ECM2	
		For use with 3-pole MCCBs	Qty: 1	140U-H-ECM	
	Phase Barriers Provides additional phase clearance when special connections that extend past the circuit breaker housing are required		Qty: 2	140U-H-PB	
	Padlock Kit Padlocking hasp Lock-OFF only		Qty: 1	140U-H-PL	
	Plug-in Base Adapters Plug-in provides power terminations and adapter for applications where the ability to quickly remove or replace the circuit breakers is required	For use with 3-pole MCCBs	Qty: 1	140U-H-PAD3	
	Plug-in Base Auxiliary Contacts Provides auxiliary contact functions to detect breaker installation status	For use with 3- or 4-pole MCCBs	Qty: 1	140U-H-PDK	
	DIN Rail Adapter Allows MCCB to mount to 35 mm DIN Rail	For use with 1-pole MCCBs	Qty: 1	140U-H-DRA1	
		For use with 2-pole MCCBs	Qty: 1	140U-H-DRA2	
		For use with 3-pole MCCBs	Qty: 1	140U-H-DRA	
	Multi-Tap Terminal Lug Kit — with IP20 terminal cover	(3) #14...2 AWG or (3) 2.5...35 mm ²	Qty: 3 with terminal shield	140U-H-MTL3A	
			Qty: 3	140U-H-MTL3AN	
	Multi-Tap Terminal Lug Kit — with IP20 terminal cover	(6) #14...6 AWG or (6) 2.5...10 mm ²	Qty: 3 with terminal shield	140U-H-MTL6A	
		(6) #14...6 AWG or (6) 2.5...10 mm ²	Qty: 3	140U-H-MTL6AN	

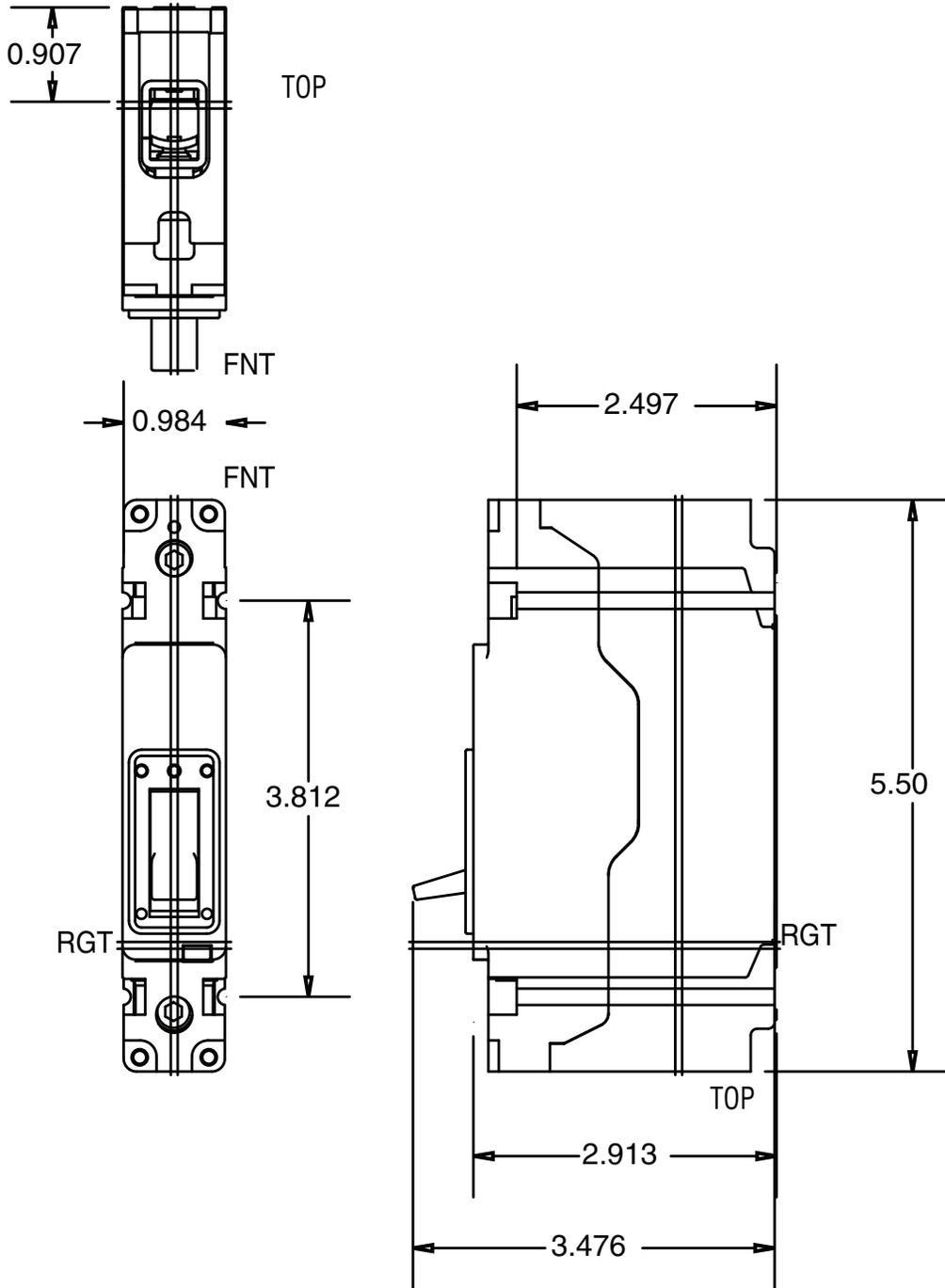
Cat. No. 140U-H-MTL3AN

Molded Case Circuit Breakers

Approximate Dimensions — 125 A, H-Frame

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

1-Pole Molded Case Circuit Breakers



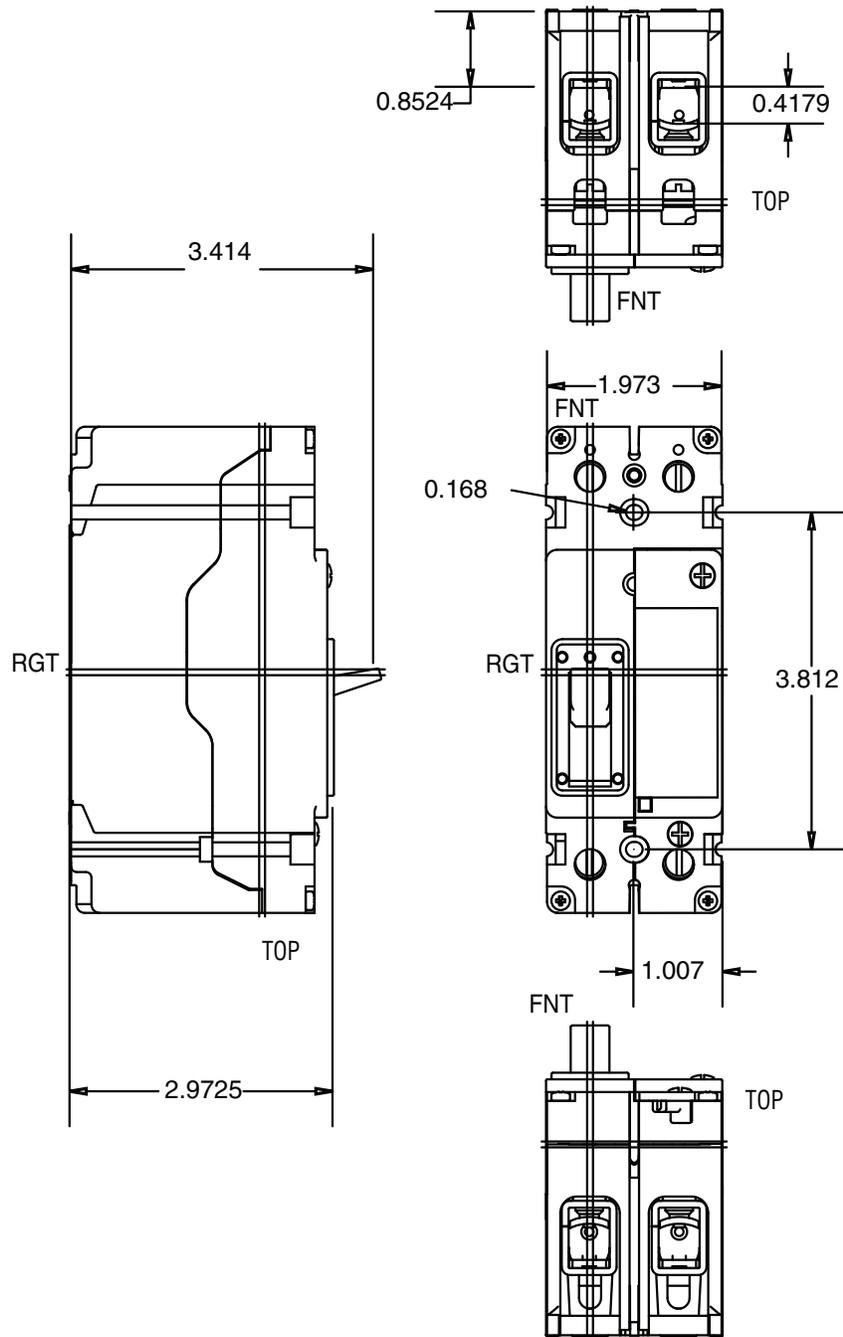
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Molded Case Circuit Breakers

Approximate Dimensions — 125 A, H-Frame

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

2-Pole Molded Case Circuit Breakers



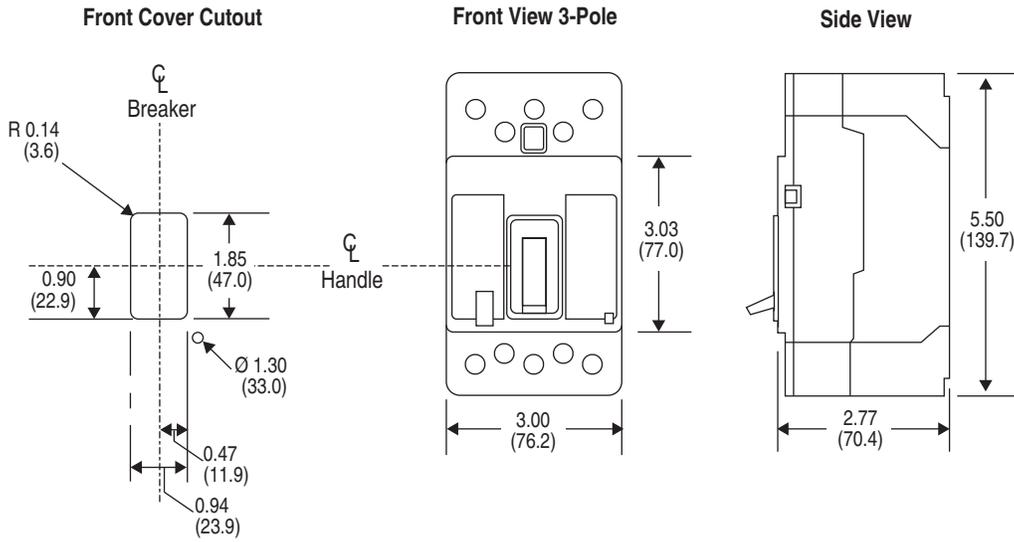
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Molded Case Circuit Breakers

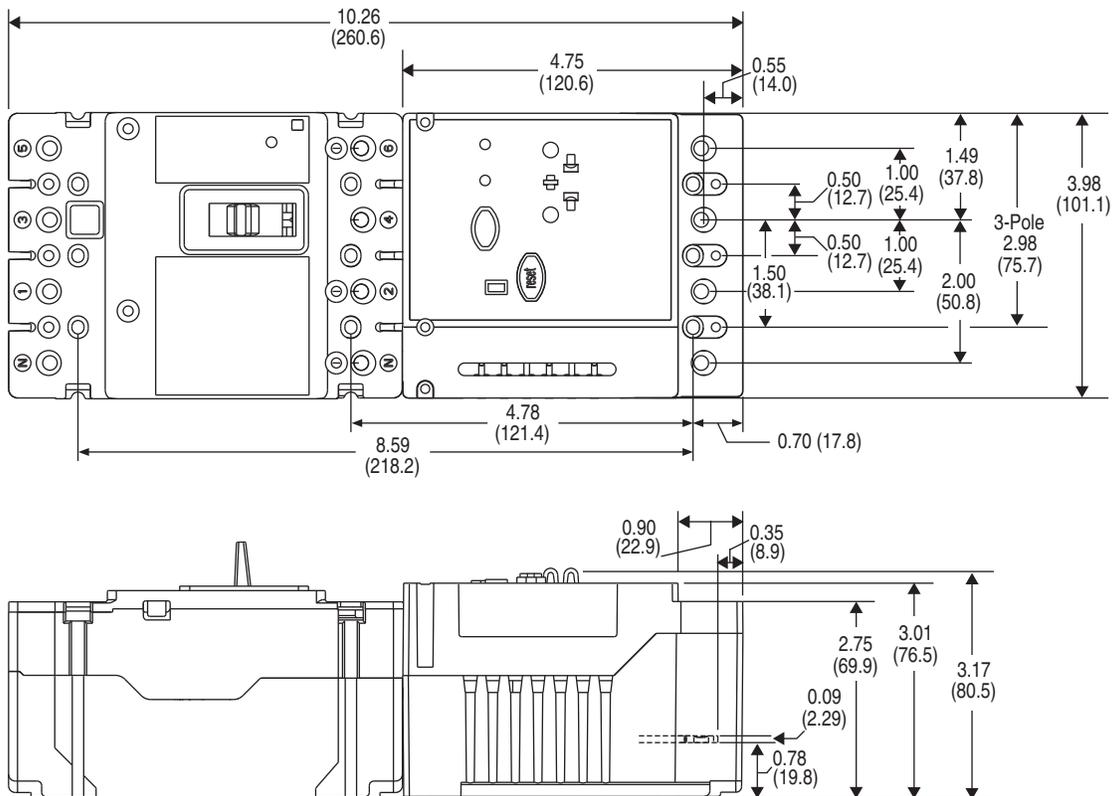
Approximate Dimensions — 125 A, H-Frame

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

3-Pole Molded Case Circuit Breakers



H-Frame with Earth Leakage Module



- UL 489
 - CSA 22.2, No. 5
 - IEC 60947-2
 - CE
 - KEMA
- CCC (Pending)

Note: Terminal box lugs must be ordered separately. See page 2-97



Breaker Frames

Rated Current I_n [A]	Breaking Capacity (50 Hz) I_{cu} / I_{cs} [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No.
	220...240V		380...415V		525V		690V		240V	480V	600V	
250	65	65	25	25	18	12	12	6	65	25	18	140U-J2X3
	85	85	45	45	18	12	12	6	85	35	18	140U-J3X3
	100	100	70	70	25	13	14	7	100	65	25	‡ 140U-J6X3
	200	200	100	100	35	18	16	12	200	100	35	‡ 140U-J0X3

‡ Current limiting

Trip Units

Rated Current I_n [A]	Thermal-Magnetic		Cat. No.
	Adjustment Range [A]		
	Thermal Trip $I_r = I_n$ (Fixed)	Magnetic Trip $I_m = 5...10 \times I_r$	
90	90	450...900	140U-JTD3-C90
100	100	500...1000	140U-JTD3-D10
125	125	600...1250	140U-JTD3-D12
150	150	750...1500	140U-JTD3-D15
175	175	875...1750	140U-JTD3-D17
200	200	1000...2000	140U-JTD3-D20
225	225	1125...2250	140U-JTD3-D22
250	250	1250...2500	140U-JTD3-D25

Rated Current I_n [A]	Electronic		Protection Type	Cat. No.
	Adjustment Range [A]			
	Thermal Trip $I_r = 0.4...1.0 \times I_n$	Magnetic Trip $I_m = 2...14 \times I_r$		
50	20...50	40...700	LS	140U-JTL3-C50
50	20...50	40...700	LSI	140U-JTH3-C50
50	20...50	40...700	LSG	140U-JTG3-C50
50	20...50	40...700	LSIG	140U-JTI3-C50
100	40...100	80...1400	LS	140U-JTL3-D10
100	40...100	80...1400	LSI	140U-JTH3-D10
100	40...100	80...1400	LSG	140U-JTG3-D10
100	40...100	80...1400	LSIG	140U-JTI3-D10
160	63...160	126...2240	LS	140U-JTL3-D16
160	63...160	126...2240	LSI	140U-JTH3-D16
160	63...160	126...2240	LSG	140U-JTG3-D16
160	63...160	126...2240	LSIG	140U-JTI3-D16
250	100...250	200...3500	LS	140U-JTL3-D25
250	100...250	200...3500	LSI	140U-JTH3-D25
250	100...250	200...3500	LSG	140U-JTG3-D25
250	100...250	200...3500	LSIG	140U-JTI3-D25

Assembled Circuit Breakers with Thermal-Magnetic Trip Units

Rated Current I_n [A]	Breaking Capacity/ Interrupting Rating [kA]*		Cat. No.	Breaking Capacity/ Interrupting Rating [kA]*		Cat. No.	Breaking Capacity/ Interrupting Rating [kA]*		Cat. No.
	400V	480V		400V	480V		400V	480V	
90	25	25	140U-J2D3-C90	40	35	140U-J3D3-C90	70	65	140U-J6D3-C90
100	25	25	140U-J2D3-D10	40	35	140U-J3D3-D10	70	65	140U-J6D3-D10
125	25	25	140U-J2D3-D12	40	35	140U-J3D3-D12	70	65	140U-J6D3-D12
150	25	25	140U-J2D3-D15	40	35	140U-J3D3-D15	70	65	140U-J6D3-D15
175	25	25	140U-J2D3-D17	40	35	140U-J3D3-D17	70	65	140U-J6D3-D17
200	25	25	140U-J2D3-D20	40	35	140U-J3D3-D20	70	65	140U-J6D3-D20
225	25	25	140U-J2D3-D22	40	35	140U-J3D3-D22	70	65	140U-J6D3-D22
250	25	25	140U-J2D3-D25	40	35	140U-J3D3-D25	70	65	140U-J6D3-D25

* Interrupting ratings shown are for 400V and 480V, respectively. The complete range of ratings can be found in the frame rating table on this page.

Molded Case Circuit Breakers

Product Selection — 250 A, J-Frame

Assembled Circuit Breakers with Electronic Trip Units

Rated Current I_n [A]	Protection Type	Breaking Capacity/ Interrupting Rating [kA]*		Cat. No.	Breaking Capacity/ Interrupting Rating [kA]*		Cat. No.	Breaking Capacity/ Interrupting Rating [kA]*		Cat. No.
		400V	480V		400V	480V		400V	480V	
50	LS	25	25	140U-J2L3-C50	40	35	140U-J3L3-C50	70	65	140U-J6L3-C50
50	LSI	25	25	140U-J2H3-C50	40	35	140U-J3H3-C50	70	65	140U-J6H3-C50
50	LSG	25	25	140U-J2G3-C50	40	35	140U-J3G3-C50	70	65	140U-J6G3-C50
50	LSIG	25	25	140U-J2I3-C50	40	35	140U-J3I3-C50	70	65	140U-J6I3-C50
100	LS	25	25	140U-J2L3-D10	40	35	140U-J3L3-D10	70	65	140U-J6L3-D10
100	LSI	25	25	140U-J2H3-D10	40	35	140U-J3H3-D10	70	65	140U-J6H3-D10
100	LSG	25	25	140U-J2G3-D10	40	35	140U-J3G3-D10	70	65	140U-J6G3-D10
100	LSIG	25	25	140U-J2I3-D10	40	35	140U-J3I3-D10	70	65	140U-J6I3-D10
160	LS	25	25	140U-J2L3-D16	40	35	140U-J3L3-D16	70	65	140U-J6L3-D16
160	LSI	25	25	140U-J2H3-D16	40	35	140U-J3H3-D16	70	65	140U-J6H3-D16
160	LSG	25	25	140U-J2G3-D16	40	35	140U-J3G3-D16	70	65	140U-J6G3-D16
160	LSIG	25	25	140U-J2I3-D16	40	35	140U-J3I3-D16	70	65	140U-J6I3-D16
250	LS	25	25	140U-J2L3-D25	40	35	140U-J3L3-D25	70	65	140U-J6L3-D25
250	LSI	25	25	140U-J2H3-D25	40	35	140U-J3H3-D25	70	65	140U-J6H3-D25
250	LSI	25	25	140U-J2G3-D25	40	35	140U-J3H3-D25	70	65	140U-J6G3-D25
250	LSIG	25	25	140U-J2I3-D25	40	35	140U-J3I3-D25	70	65	140U-J6I3-D25

* Interrupting ratings shown are for 400V and 480V, respectively. The complete range of ratings can be found in the frame rating table on page 2-95.

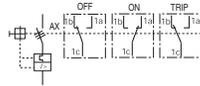
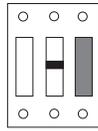
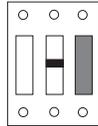
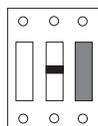
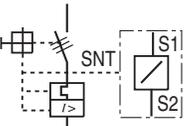
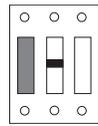
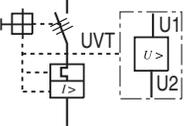
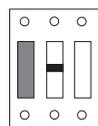
Molded Case Switch — UL 489

Rated Current I_n [A]	Thermal Trip $I_r = I_n$ [A]	Magnetic Trip [A] $I_m = 10 \times I_n$	Breaking Capacity (50 Hz) I_{cu} / I_{cs} [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No.
			220...240V		380...415V		500V		690V		240V	480V	600V	
250	—	2500	100	100	70	70	42	20	7	3	100	65	25	140U-J6S3-D25



Pictures shown are representative. Actual product may differ from product shown.

Internal Control Modules — Field Installed

	Description		Diagram	Mounting Location	Cat. No.
		(1) 1a-1b			140U-H-EA1
		(2) 1a-1b			140U-H-EA2
		(1) 1M (make)-1B (break)			140U-J-ER1
		(1) 1a-1b (1) 1M (make)-1B (break)			140U-J-EA1R1
		12V DC			140U-H-SNZQ
		24...60 V, 50/60/DC			140U-H-SNJ
		110...240V, 50/60/DC			140U-H-SND
		380...600V, 50/60 Hz			140U-H-SNB
		24V, 50/60 Hz			140U-H-UJ
		110...127V, 50/60 Hz			140U-H-UD
208...240V, 50/60 Hz	140U-H-UA				
		380...500V, 50/60 Hz			140U-H-UB
		525...600V, 50/60 Hz			140U-H-UC

Note: For Factory-Installed internal control modules, please see page 2-121.

Terminal Lugs

	Description		Frame Size	Cat. No.
	Terminal Lugs	Aluminum lugs, Al or Cu wire (1) 4...350 MCM or (1) 25...185 mm ²	J	140U-J-TLA1
		Stainless steel box lugs, Cu wire only (1) 4...350 MCM or (1) 25...185 mm ²	J	140U-J-TLS1



Molded Case Circuit Breakers

Accessories — 250 A, J-Frame

Pictures shown are representative. Actual product may differ from product shown.

External Accessories

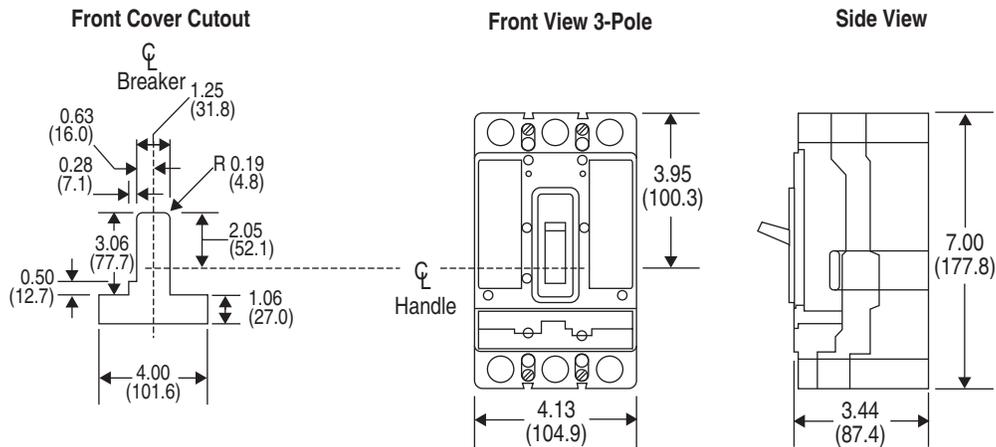
	Description		Cat. No.
	Terminal Shields IP20 Ingress Protection Rating		140U-J-TS
	Flex-Cable Operating Mechanism Includes handle, cable, operating, and bail mechanism Pre-assembled and adjusted Non-Metallic - UL IP66, Type 1/3/12/4/4X Flange Mount Operating Handle	3 ft (0.9 m) Cable	140U-J-FCX03
		4 ft (1.3 m) Cable	140U-J-FCX04
		6 ft (1.9 m) Cable	140U-J-FCX06
		10 ft (3.0 m) Cable	140U-J-FCX10
	Flex-Cable Operating Mechanism Stainless Steel IP66/ UL Type 1/3/12/4/4X Flange-Mount Operating Handle	3 ft (0.9 m) Cable	140U-J-FCS03
		4 ft (1.2 m) Cable	140U-J-FCS04
		6 ft (1.9 m) Cable	140U-J-FCS06
		10 ft (3.0 m) Cable	140U-J-FCS10
	Flex-Cable Operating Mechanism Includes handle, cable, operating, and bail mechanism Pre-assembled and adjusted Painted metal — Type 1/12 Flange mount operating handle	3 ft (0.9 m) Cable	140U-J-FMX03
		4 ft (1.2 m) Cable	140U-J-FMX04
		6 ft (1.9 m) Cable	140U-J-FMX06
		10 ft (3.0 m) Cable	140U-J-FMX10
	Rotary, Variable-Depth Operating Mechanism UL Type 3/12/4/4X, IP 66 Rotary handle 12 in. (30.48 cm) operating rod	Black Handle	140U-J-RVM12B
		Red/Yellow Handle	140U-J-RVM12R
	Rotary, Variable-Depth Operating Mechanism UL Type 3/12/4/4X, IP 66 Rotary handle 21 in. (53.34 cm) operating rod	Black Handle	140U-J-RVM21B
		Red/Yellow Handle	140U-J-RVM21R
	Rotary, Variable-Depth Operating Mechanism with Internal NFPA 79 Operating Handle External Type 3/4/4X/12 IP66 Rotary Handle 12 in. (30.48 cm) operating rod	Black Handle	140U-J-NVM12B
		Red/Yellow Handle	140U-J-NVM12R
	Rotary, Variable-Depth Operating Mechanism with Internal NFPA 79 Operating Handle External Type 3/4/4X/12 IP66 Rotary Handle 21 in. (53.34 cm) operating rod	Black Handle	140U-J-NVM21B
		Red/Yellow Handle	140U-J-NVM21R
	Rotary, Direct Couple Operating Mechanism Breaker mounted	Black Handle	140U-J-RCB
		Red/Yellow Handle	140U-J-RCR
	End Cap Kit Provides 3-phase connections for terminal or bolt-on connections Metric hardware		140U-J-ECM
	Phase Barriers Provides additional phase clearance when special connections that extend past the circuit breaker housing are required	Qty: 2	140U-J-PB
	Padlock Kit Padlocking hasp Lock-OFF only	Qty: 1	140U-J-PL
	Multi-Tap Terminal Lug Kit — with IP20 terminal cover	(3) #14...2 AWG or (3) 2.5...25 mm ²	Qty: 3 140U-J-MTL3A
		(6) #14...6 AWG or (6) 2.5...10 mm ²	Qty: 3 140U-J-MTL6A
	Ground Fault Leakage Module Current pickup settings are selectable from 0.03...10 A with time delays up to. Time delays are also selectable from Instantaneous...1.0 s for 0.10 A settings and above. A current pickup setting of 0.03 A defaults to an Instantaneous time setting regardless of the time dial's position. Two alarm contacts come as standard: a 50% pretrip and a 100% after trip contact, both based only on earth leakage current levels.	150 A	For use with J-Frame 3-pole MCCBs up to 150 A 140U-J-GFP1503
		250 A	For use with J-Frame 3-pole MCCBs up to 250 A 140U-J-GFP2503
	Motor Operator Remotely opens, closes, and resets the circuit breaker 110...240V AC	For use with 3- or 4-Pole MCCBs, 110...240V AC/DC	140U-J-EOPD
		For use with 3- or 4-Pole MCCBs, 24V DC	140U-J-EOPZ
	Replacement Mounting Hardware (4) M4 - 0.7 x 90 mm §	For use with 3- or 4-Pole MCCBs	140U-J-MHM

§ Supplied with breaker.

Molded Case Circuit Breakers

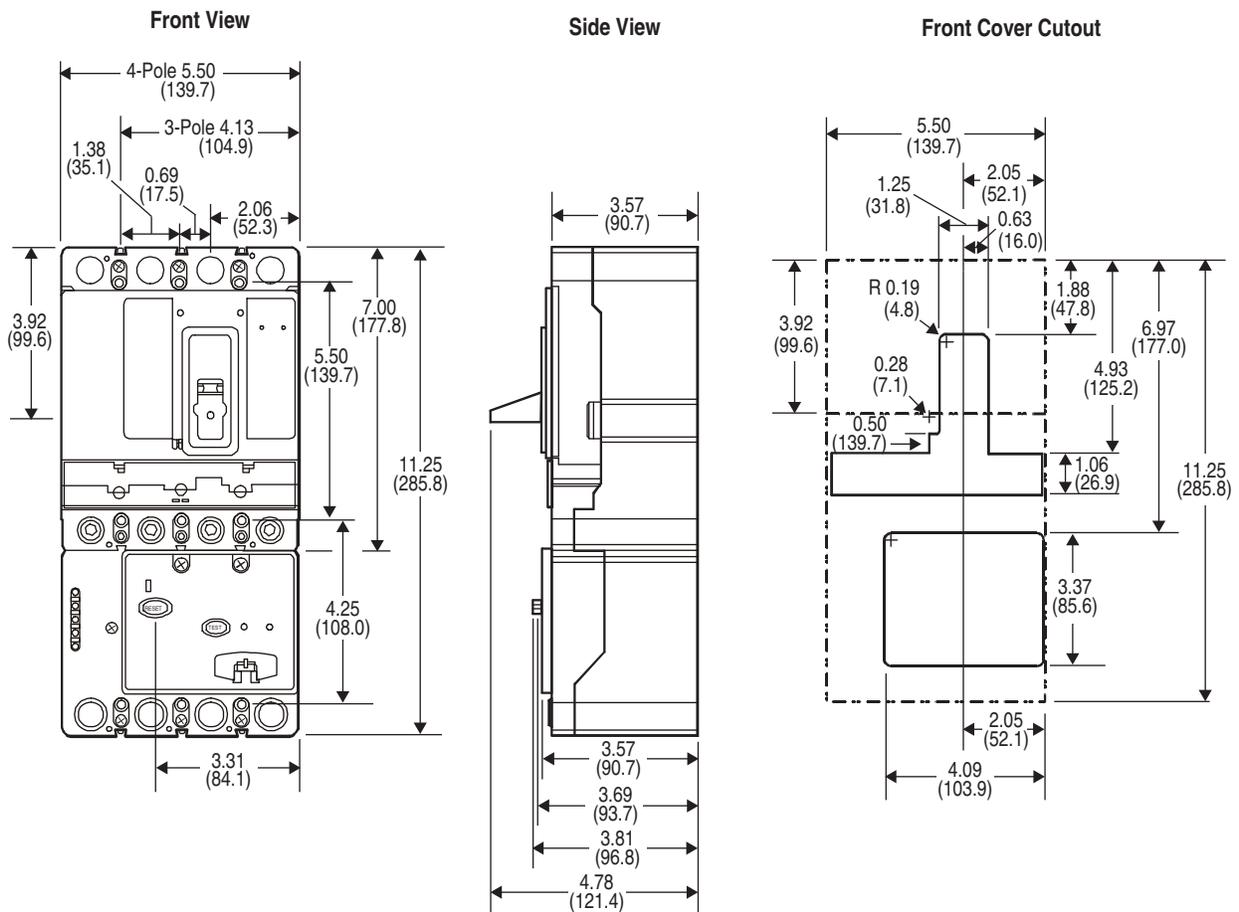
Approximate Dimensions — 250 A, J-Frame

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



2

J-Frame with Earth Leakage Module



Bulletin 140U
Molded Case Circuit Breakers
 Product Selection — 400 A, K-Frame

- UL 489
- CSA 22.2, No. 5

Note: Terminal lugs must be ordered separately. See page 2-101



Breaker Frames

Rated Current I_n [A]	Breaking Capacity (50 Hz) I_{cu} / I_{cs} [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No.
	220...240V		380...415V		500V		690V		240V	480V	600V	
400	65	65	40	40	30	30	10	5	65	35	25	140U-K3X3
	100	100	35	35	50	38	13	6	100	65	35	140U-K6X3
	200	200	100	100	65	49	18	9	200	100	65	‡ 140U-K0X3

‡ Current limiting.

Trip Units and Rating Plugs

Thermal-Magnetic			
Rated Current I_n [A]	Adjustment Range [A]		Cat. No.
	Thermal Trip [A] $I_r = I_n$ (Fixed)	Magnetic Trip $I_m = 5...10 \times I_n$	
100	100	500...1000	140U-KTD3-D10
125	125	625...1250	140U-KTD3-D12
150	150	750...1500	140U-KTD3-D15
175	175	895...1750	140U-KTD3-D17
200	200	1000...2000	140U-KTD3-D20
225	225	1125...2250	140U-KTD3-D22
250	250	1250...2500	140U-KTD3-D25
300	300	1500...3000	140U-KTD3-D30
350	350	1750...3500	140U-KTD3-D35
400	400	2000...4000	140U-KTD3-D40

Electronic				
Rated Current I_n [A]	Thermal Trip* $I_r = 0.5...1.0 \times I_n$	Magnetic Trip $I_m = 2...8 \times I_r$	Protection Type	Cat. No.
400	200...400	400...3200	LS	140U-KTL3-D40
			LSI	140U-KTH3-D40
			LSG	140U-KTG3-D40
			LSIG	140U-KT3-D40

* Electronic trip units require the use of a rating plug. Thermal trip rating is determined by the rating plug selection and is not adjustable.

Rating Plugs			
Thermal Trip I_n [A]	Cat. No.	Thermal Trip I_n [A]	Cat. No.
200	140U-KRP3-D20	300	140U-KRP3-D30
225	140U-KRP3-D22	350	140U-KRP3-D35
250	140U-KRP3-D25	400	140U-KRP3-D40

Assembled Circuit Breakers, Thermal-Magnetic Trip Units

Rated Current I_n [A]	Breaking Capacity/ Interrupting Rating [kA]‡		Cat. No.	Breaking Capacity/ Interrupting Rating [kA]‡		Cat. No.	Breaking Capacity/ Interrupting Rating [kA]‡		Cat. No.
	400V	480V		400V	480V		400V	480V	
100	40	35	140U-K3D3-D10	65	65	140U-K6D3-D10	100	100	140U-K0D3-D10
125	40	35	140U-K3D3-D12	65	65	140U-K6D3-D12	100	100	140U-K0D3-D12
150	40	35	140U-K3D3-D15	65	65	140U-K6D3-D15	100	100	140U-K0D3-D15
175	40	35	140U-K3D3-D17	65	65	140U-K6D3-D17	100	100	140U-K0D3-D17
200	40	35	140U-K3D3-D20	65	65	140U-K6D3-D20	100	100	140U-K0D3-D20
225	40	35	140U-K3D3-D22	65	65	140U-K6D3-D22	100	100	140U-K0D3-D22
250	40	35	140U-K3D3-D25	65	65	140U-K6D3-D25	100	100	140U-K0D3-D25
300	40	35	140U-K3D3-D30	65	65	140U-K6D3-D30	100	100	140U-K0D3-D30
350	40	35	140U-K3D3-D35	65	65	140U-K6D3-D35	100	100	140U-K0D3-D35
400	40	35	140U-K3D3-D40	65	65	140U-K6D3-D40	100	100	140U-K0D3-D40

Assembled circuit breakers can be created by adding a trip unit and rating plugs (electronic only) to a circuit breaker frame. Example: Cat. No. **140U-K3X3 + 140U-KTL3-D40 + 140U-KRP3-D35**

‡ Interrupting ratings shown are for 400V and 480V, respectively. The complete range of ratings can be found in the frame rating table on this page.

Assembled Circuit Breakers, Electronic Trip Units

Rated Current I_n [A]	Thermal Trip* $I_r = 0.5...1.0 \times I_n$	Protection Type	Breaking Capacity/ Interrupting Rating [kA]*		Cat. No.	Breaking Capacity/ Interrupting Rating [kA]*		Cat. No.	Breaking Capacity/ Interrupting Rating [kA]*		Cat. No.
			400V	480V		400V	480V		400V	480V	
400	200...400	LS	40	35	140U-K3L3-D40	65	65	140U-K6L3-D40	100	100	140U-K0L3-D40
		LSI	40	35	140U-K3H3-D40	65	65	140U-K6H3-D40	100	100	140U-K0H3-D40
		LSG	40	35	140U-K3G3-D40	65	65	140U-K6G3-D40	100	100	140U-K0G3-D40

* Electronic trip units require the use of a rating plug. Thermal trip rating is determined by the rating plug selection and is not adjustable.
 * Interrupting ratings shown are for 400V and 480V, respectively. The complete range of ratings can be found in the frame rating table on page 2-100

Molded Case Switch — UL 489

Rated Current I_n [A]	Magnetic Trip $10 \times I_n$	Breaking Capacity (50 Hz) I_{cu} / I_{cs} [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No.
		220...240V		380...415V		500V		690V		240V	480V	600V	
400	4000	100	100	65	65	50	38	13	6	100	65	35	140U-K6S3-D40

Optional Terminal Lug Kits

Pictures shown are representative. Actual product may differ from product shown.

	Description	Pkg. Quantity	Cat. No.	
	Terminal Lugs	Aluminum lug, Al or Cu wire (1) 3...350 MCM or (1) 30...185 mm ²	1	140U-K-TLA1A
		Aluminum lug, Al or Cu wire (1) 250...500 MCM or (1) 120...240 mm ²		140U-K-TLA1
		Aluminum lug, Al or Cu wire (2) 3/0...250 MCM or (2) 95...120 mm ²	3 (includes shield)	140U-K-TLA2
	Terminal Lugs	Copper lug, Cu wire only (1) 3...350 MCM or (1) 30...185 mm ²	1	140U-K-TLC1A
		Copper lug, Cu wire only (1) 250...500 MCM or (1) 120...240 mm ²		140U-K-TLC1
		Copper lug, Cu wire only (2) 3/0...250 MCM or (2) 95...120 mm ²	3 (includes shield)	140U-K-TLC2
		Aluminum lug, Al or Cu wire (2) 2/0...250 MCM or (1) 2/0...500 MCM, (2) 70...120 mm ² or (1) 70...240 mm ²	3 (includes shield)	140U-K-TLA2A
		Aluminum lug, Al or Cu wire (1) 500...750 MCM or (1) 300...400 mm ²		140U-K-TLA1B
	Terminal Lugs	Copper lug, Cu wire only (1) 500...750 MCM or (1) 300...400 mm ²	3 (includes shield)	140U-K-TLC1B
		Multi-Tap Terminal Lug Kit — with IP20 terminal cover	(3) #14...2/0 AWG or (3) 4...67 mm ²	3
(6) #14...3 AWG or (6) 2.5...33 mm ²	3		140U-K-MTL6A	

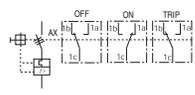
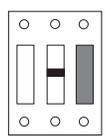
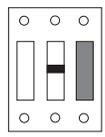
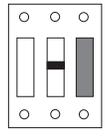
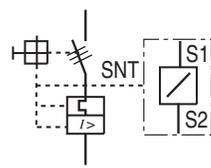
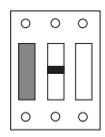
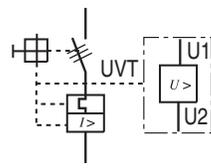
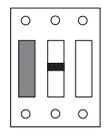
Molded Case Circuit Breakers

Accessories — 400 A, K-Frame

Pictures shown are representative. Actual product may differ from product shown.

Internal Control Modules — Field Installed

2

	Description		Diagram	Mounting Location	Cat. No.
	Auxiliary Contact (AX) Electrically indicates "ON/OFF" status of breakers	(1) 1a-1b			140U-K-EA1
		(2) 1a-1b			Right side ONLY
	Alarm Contact (AL) Electrically indicates when the breaker is in the "TRIPPED" state	(1) 1M (make)-1B (break)			140U-K-ER1
					Right side ONLY
	Auxiliary/Alarm Contact (AX/AL) Combination Combination of auxiliary contact and alarm contact	(1) 1a-1b (1) 1M (make)-1B (break)			140U-K-EA1R1
	Shunt Trip (SNT) Provides remote tripping of the circuit breaker Undervoltage trip not available when shunt trip is used	12...24V, 50/60/DC			140U-K-SNJ
		110...240V AC, 110...125V DC			140U-K-SND
		380...440V AC, 220...250V DC			140U-K-SNN
		480...600V, 50/60 Hz			140U-K-SNB
	Undervoltage Release (UVT) Automatically trips breaker when voltage falls between preset value, 35...70% Shunt trip is not available when undervoltage release is used	24V, 50/60 Hz			140U-K-UJ
		24V DC			140U-K-UZJ
		110...127V, 50/60 Hz			140U-K-UD
		208...240V, 50/60 Hz			140U-K-UA
380...500V, 50/60 Hz	140U-K-UB				



Pictures shown are representative. Actual product may differ from product shown.

External Accessories

	Description	Cat. No.
	Terminal Shields IP20 Ingress Protection Rating	140U-K-TS
	Flex-Cable Operating Mechanism Includes handle, cable, operating, and bail mechanism Pre-assembled and adjusted UL Type 1/3/12/4/4X Flange-Mount Operating Handle Non-Metallic	4 ft (1.3 m) Cable 140U-K-FCX04
		6 ft (1.9 m) Cable 140U-K-FCX06
		10 ft (3.0 m) Cable 140U-K-FCX10
	Flex-Cable Operating Mechanism Includes handle, cable, operating, and bail mechanism Pre-assembled and adjusted UL Type 4/4X Flange-Mount Operating Handle Stainless Steel	4 ft (1.2 m) Cable 140U-K-FCS04
		6 ft (1.9 m) Cable 140U-K-FCS06
		10 ft (3.0 m) Cable 140U-K-FCS10
	Rotary, Variable-Depth Operating Mechanism UL Type 3/12/4/4X, IP 66 Rotary handle 12 in. (30.48 cm) operating rod	Black Handle 140U-K-RVM12B
		Red/Yellow Handle 140U-K-RVM12R
	Rotary, Variable-Depth Operating Mechanism UL Type 3/12/4/4X, IP 66 Rotary handle 21 in. (53.34 cm) operating rod	Black Handle 140U-K-RVM21B
		Red/Yellow Handle 140U-K-RVM21R
	Rotary, Variable-Depth Operating Mechanism with Internal NFPA 79 Operating Handle External UL Type 3/12/4/4X, IP 66 Rotary Handle 12 in. (30.48 cm) operating rod	Black Handle 140U-K-NVM12B
		Red/Yellow Handle 140U-K-NVM12R
	Rotary, Variable-Depth Operating Mechanism with Internal NFPA 79 Operating Handle External UL Type 3/12/4/4X, IP 66 Rotary Handle 21 in. (53.34 cm) operating rod	Black Handle 140U-K-NVM21B
Red/Yellow Handle 140U-K-NVM21R		
	Rotary, Direct Couple Operating Mechanism Type 1 Rotary Handle Breaker Mounted	Black Handle 140U-K-RCG
		Red/Yellow Handle 140U-K-RCR
	End Cap Kit Provides 3-phase connections for terminal or bolt-on connections Metric Hardware	Qty: 1 140U-K-ECM
	Padlock Kit Padlocking Hasp Lock-OFF only	Qty: 1 140U-K-PL
	Phase Barriers Provides additional phase clearance when special connections that extend past the circuit breaker housing are required	Qty: 2 140U-K-PB
	Replacement Mounting Hardware (4) M6 - 1.0 x 45 mm §	1 140U-K-MHM

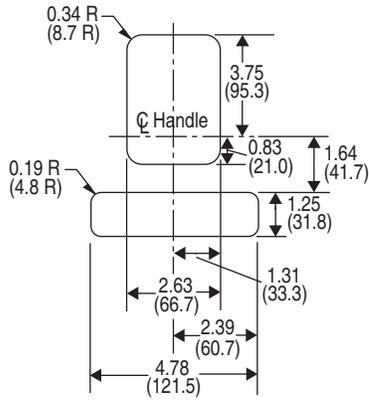
§ Supplied with breaker.

Molded Case Circuit Breakers

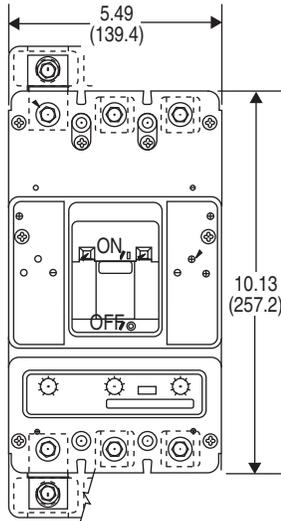
Appropriate Dimensions — 400 A, K-Frame

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

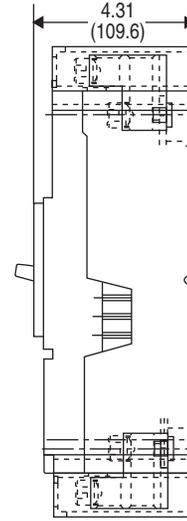
Front Cover Cutout



Front View



Side View



2

- UL 489
- CSA 22.2, No. 5
- IEC 60947-2
- CE
- KEMA
- CCC



Note: Terminal box lugs must be ordered separately. See page 2-106

Breaker Frames

Rated Current I_n [A]	Breaking Capacity (50 Hz) I_{cu} / I_{cs} [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No.
	220...240V		380...415V		525V		690V		240V	480V	600V	
600	65	65	35	35	25	13	12	6	65	35	18	140U-L3X3
	100	100	70	70	35	18	25	13	100	65	35	‡ 140U-L6X3
	200	200	100	100	50	25	30	15	200	100	50	‡ 140U-L0X3

‡ Current limiting



Trip Units and Rating Plugs

Rated Current I_n [A]	Thermal-Magnetic		Cat. No.
	Adjustment Range [A]		
	Thermal Trip $I_r = I_n$ (Fixed)	Magnetic Trip $I_m = 5...10 \times I_n$	
250	250	1250...2500	140U-LTD3-D25
300	300	1500...3000	140U-LTD3-D30
350	350	1750...3500	140U-LTD3-D35
400	400	2000...4000	140U-LTD3-D40
500	500	2500...5000	140U-LTD3-D50
600	600	3000...6000	140U-LTD3-D60

Rated Current I_n [A]	Rated Current, Instant. Maintenance Mode $2.5...4.0 \times I_n$ [A]	Electronic		Protection Type	Cat. No.
		Adjustment Range [A]			
		Thermal Trip $I_r = 0.5...1.0 \times I_n$	Magnetic Trip $I_m = 2...10 \times I_n$		
250	—	100...250	200...2500	LS	140U-LTL3-D25
	—			LSI	140U-LTH3-D25
	750...1000			LSII	140U-LTJ3-D25
	—			LSG	140U-LTG3-D25
	—			LSIG	140U-LTI3-D25
	750...1000			LSIIG	140U-LTK3-D25
400	—	160...400	320...4000	LS	140U-LTL3-D40
	—			LSI	140U-LTH3-D40
	1000...1600			LSII	140U-LTJ3-D40
	—			LSG	140U-LTG3-D40
	—			LSIG	140U-LTI3-D40
	1000...1600			LSIIG	140U-LTK3-D40
600	—	250...600	480...6000	LS	140U-LTL3-D60
	—			LSI	140U-LTH3-D60
	1500...2400			LSII	140U-LTJ3-D60
	—			LSG	140U-LTG3-D60
	—			LSIG	140U-LTI3-D60
	1500...2400			LSIIG	140U-LTK3-D60

Assembled Circuit Breakers, Thermal-Magnetic Trip Units

Rated Current I_n [A]	Thermal Trip $I_r = I_n$	Breaking Capacity/Interrupting Rating [kA]*		Cat. No.	Breaking Capacity/Interrupting Rating [kA]*		Cat. No.
		400V	480V		400V	480V	
250	250	45	35	140U-L3D3-D25	70	65	140U-L6D3-D25
300	300	45	35	140U-L3D3-D30	70	65	140U-L6D3-D30
350	350	45	35	140U-L3D3-D35	70	65	140U-L6D3-D35
400	400	45	35	140U-L3D3-D40	70	65	140U-L6D3-D40
500	500	45	35	140U-L3D3-D50	70	65	140U-L6D3-D50
600	600	45	35	140U-L3D3-D60	70	65	140U-L6D3-D60

* Interrupting ratings shown are for 400V and 480V, respectively. The complete range of ratings can be found in the frame rating table on this page.

Molded Case Circuit Breakers

Product Selection — 600 A, L-Frame

Assembled Circuit Breakers, Electronic Trip Units

Rated Current I_n [A]	Rated Current, Instant. Maint. Mode $2.5...4.0 \times I_n$ [A]	Thermal Trip $I_r = 0.5...1.0 \times I_n$	Protection Type	Breaking Capacity/ Interrupting Rating [kA]*		Cat. No.	Breaking Capacity/ Interrupting Rating [kA]*		Cat. No.
				400V	480V		400V	480V	
250	—	100...250	LS	45	35	140U-L3L3-D25	70	65	140U-L6L3-D25
	—		LSI			140U-L3H3-D25			140U-L6H3-D25
	750...1000		LSII‡			140U-L3J3-D25			140U-L6J3-D25
	—		LSG			140U-L3G3-D25			140U-L6G3-D25
	—		LSIG			140U-L3I3-D25			140U-L6I3-D25
	750...1000		LSIIG‡			140U-L3K3-D25			140U-L6K3-D25
400	—	160...400	LS	45	35	140U-L3L3-D40	70	65	140U-L6L3-D40
	—		LSI			140U-L3H3-D40			140U-L6H3-D40
	1000...1600		LSII‡			140U-L3J3-D40			140U-L6J3-D40
	—		LSG			140U-L3G3-D40			140U-L6G3-D40
	—		LSIG			140U-L3I3-D40			140U-L6I3-D40
	1000...1600		LSIIG‡			140U-L3K3-D40			140U-L6K3-D40
600	—	250...600	LS	45	35	140U-L3L3-D60	70	65	140U-L6L3-D60
	—		LSI			140U-L3H3-D60			140U-L6H3-D60
	1500...2400		LSII‡			140U-L3J3-D60			140U-L6J3-D60
	—		LSG			140U-L3G3-D60			140U-L6G3-D60
	—		LSIG			140U-L3I3-D60			140U-L6I3-D60
	1500...2400		LSIIG‡			140U-L3K3-D60			140U-L6K3-D60

* Interrupting ratings shown are for 400V and 480V, respectively. The complete range of ratings can be found in the frame rating table on page 2-105.

‡ Rating plug not required with IMM trip module.

Molded Case Switch — UL 489

Rated Current I_n [A]	Magnetic Trip $I_m = 10 \times I_n$ [A]	Breaking Capacity (50 Hz) I_{cu} / I_{cs} [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No.
		220...240V		380...415V		500V		690V		240V	480V	600V	
600	6000	100	100	70	70	50	38	25	13	100	65	35	140U-L6S3-D63

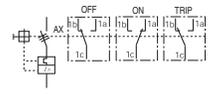
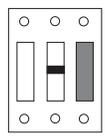
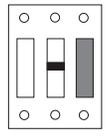
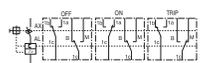
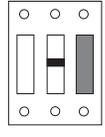
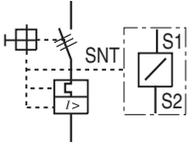
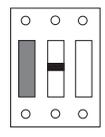
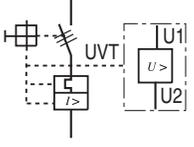
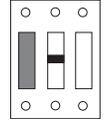
Terminal Lugs

Pictures shown are representative. Actual product may differ from product shown.

	Description	Cat. No.
	Aluminum lug, Al or Cu wire (1) 500...750 MCM or (1) 240...380 mm ²	Qty: 3 (includes shield) 140U-L-TL6A1
	Copper lug, Cu wire only (1) 500...750 MCM or (1) 240...380 mm ²	Qty: 3 (includes shield) 140U-L-TL6C1
	Aluminum lug, Al or Cu wire (2) 2...500 MCM or (2) 35...240 mm ²	Qty: 3 (includes shield) 140U-L-TL6A2
	Copper lug, Cu wire only (2) 2...500 MCM or (2) 35...240 mm ²	Qty: 3 (includes shield) 140U-L-TL6C2
	Aluminum lug, Al or Cu wire (1) 2...500 MCM or (1) 35...240 mm ²	Qty: 1 140U-L-TL4A1
	Copper lug, Cu wire only (1) 2...500 MCM or (1) 35...240 mm ²	Qty: 1 140U-L-TL4C1

Pictures shown are representative. Actual product may differ from product shown.

Internal Control Modules — Field Installed

	Description		Diagram	Mounting Location	Cat. No.
	Auxiliary Contact (AX) Electrically indicates "ON/OFF" status of breakers	(1) 1a-1b		 Right side ONLY	140U-H-EA1
		(2) 1a-1b			140U-H-EA2
	Alarm Contact (AL) Electrically indicates when the breaker is in the "TRIPPED" state	(1) 1M (make)-1B (break)		 Right side ONLY	140U-J-ER1
	Auxiliary/Alarm Contact (AX/AL) Combination Combination of auxiliary contact and alarm contact	(1) 1a-1b (1) 1M (make)-1B (break)		 Right side ONLY	140U-J-EA1R1
	Shunt Trip (SNT) Provides remote tripping of the circuit breaker Undervoltage trip not available when shunt trip is used	24...60 V, 50/60/DC		 Left side ONLY	140U-H-SNJ
		110...240V, 50/60/DC			140U-H-SND
		380...600V, 50/60 Hz			140U-H-SNB
	Undervoltage Release (UVT) Automatically trips breaker when voltage falls between preset value, 35...70% Shunt trip is not available when undervoltage release is used	24V, 50/60 Hz		 Left side ONLY	140U-H-UJ
		110...127V, 50/60 Hz			140U-H-UD
208...240V, 50/60 Hz		140U-H-UA			
380...500V, 50/60 Hz		140U-H-UB			
525...600V, 50/60 Hz	140U-H-UC				

Note: For Factory-Installed internal control modules, please see page 2-121.

Molded Case Circuit Breakers

Accessories — 600 A, L-Frame

Pictures shown are representative. Actual product may differ from product shown.

External Accessories

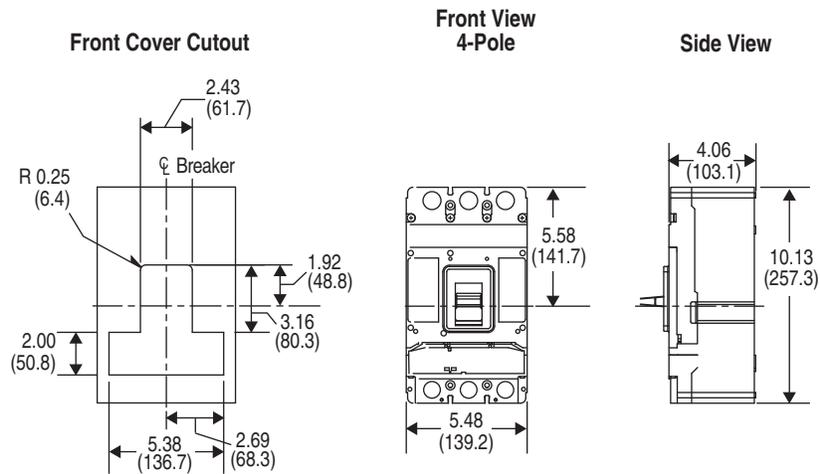
	Description		Cat. No.
	Terminal Shields IP20 Ingress Protection Rating		140U-L-TS
	Flex-Cable Operating Mechanism Includes handle, cable, operating, and bail mechanism Pre-assembled and adjusted UL Type 1/3/12/4/4X Flange-Mount Operating Handle Non-Metallic	4 ft (1.3 m) Cable	140U-L-FCX04
		6 ft (1.9 m) Cable	140U-L-FCX06
		10 ft (3.0 m) Cable	140U-L-FCX10
	Flex-Cable Operating Mechanism Includes handle, cable, operating, and bail mechanism Pre-assembled and adjusted UL Type 4/4X Flange-Mount Operating Handle Stainless Steel	4 ft (1.2 m) Cable	140U-L-FCS04
		6 ft (1.9 m) Cable	140U-L-FCS06
		10 ft (3.0 m) Cable	140U-L-FCS10
	Rotary, Variable-Depth Operating Mechanism UL Type 3/12/4/4X, IP 66 Rotary handle 12 in. (30.48 cm) operating rod	Black Handle	140U-L-RVM12B
		Red/Yellow Handle	140U-L-RVM12R
	Rotary, Variable-Depth Operating Mechanism UL Type 3/12/4/4X, IP 66 Rotary handle 21 in. (53.34 cm) operating rod	Black Handle	140U-L-RVM21B
		Red/Yellow Handle	140U-L-RVM21R
	Rotary, Variable-Depth Operating Mechanism with Internal NFPA79 Operating Handle External UL Type 3/12/4/4X, IP 66 Rotary Handle 12 in. (30.48 cm) operating rod	Black Handle	140U-L-NVM12B
		Red/Yellow Handle	140U-L-NVM12R
Rotary, Variable-Depth Operating Mechanism with Internal NFPA79 Operating Handle External UL Type 3/12/4/4X, IP 66 Rotary Handle 21 in. (53.34 cm) operating rod	Black Handle	140U-L-NVM21B	
	Red/Yellow Handle	140U-L-NVM21R	
	Rotary, Direct Couple Operating Mechanism Breaker Mounted	Black Handle	140U-L-RMX
	End Cap Kit Provides 3-phase connections for terminal or bolt-on connections Metric hardware provided	Qty: 1	140U-L-ECM
	Padlock Kit Padlocking Hasp Lock-OFF only	Qty: 1	140U-L-PL
	Phase Barriers Provides additional phase clearance when special connections that extend past the circuit breaker housing are required	Qty: 2	140U-K-PB
	Ground Fault Leakage Module Current pickup settings are selectable from 0.03...30 A with time delays up to 1.0 s. Time delays are also selectable from Instantaneous...1.0 s for 0.10 A settings and above. A current pickup setting of 0.03 A defaults to an Instantaneous time setting regardless of the time dial's position. Two alarm contacts come as standard: a 50% pretrip and a 100% after trip contact, both based only on earth leakage current levels.	400 A	For use with L-Frame 3-pole MCCBs up to 400 A 140U-L-GFP4003
		600 A	For use with L-Frame 3-pole MCCBs up to 600 A 140U-L-GFP6003
	Motor Operator Remotely opens, closes, and resets the circuit breaker 110...240V AC	For use with 3- or 4-pole MCCBs, 110...240V AC/DC	140U-L-EOPD
		For use with 3- or 4-pole MCCBs, 24V DC	140U-L-EOPZ
	Replacement Mounting Hardware (4) M5 - 0.8 x 100 mm §	For use with 3- or 4-pole MCCBs	140U-L-MHM

§ Supplied with breaker.

Molded Case Circuit Breakers

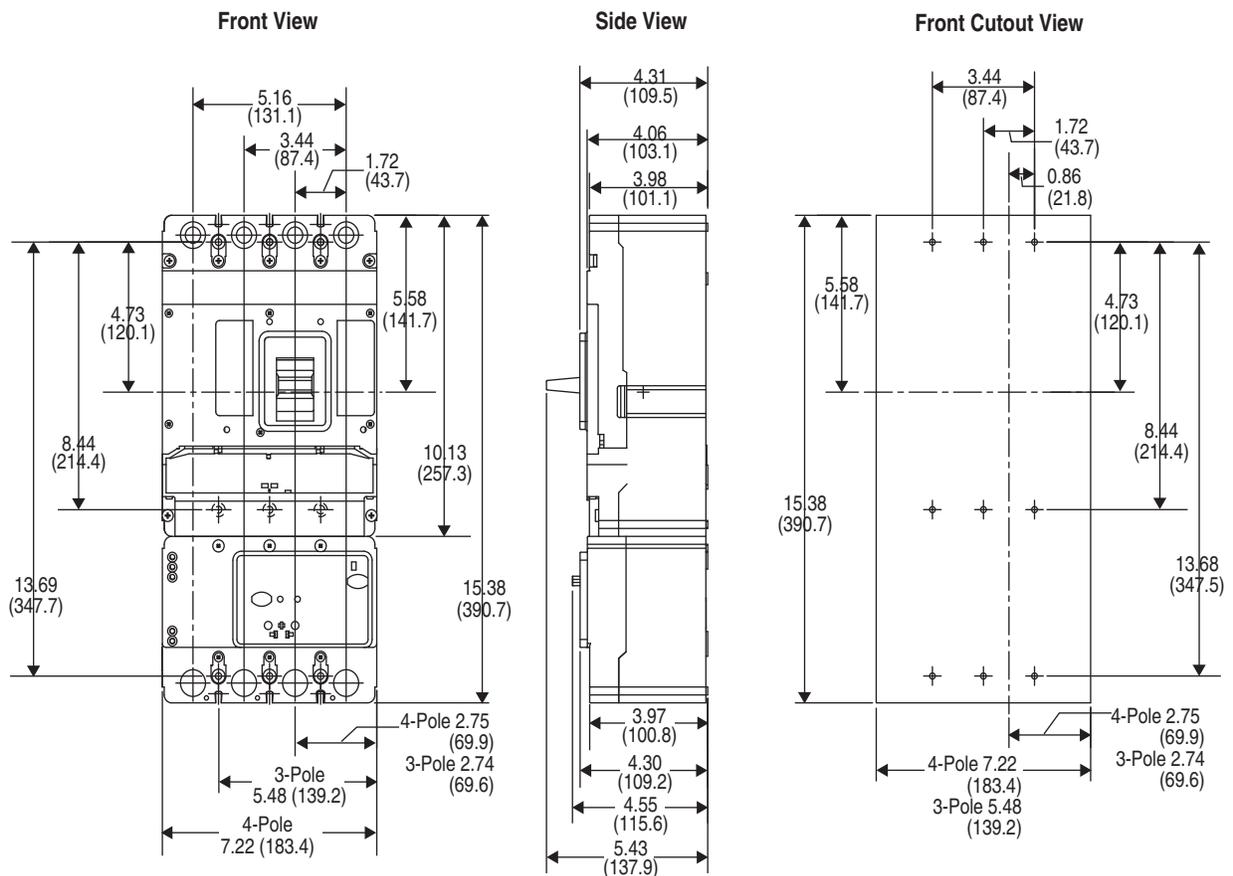
Approximate Dimensions — 600 A, L-Frame

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



2

L-Frame with Earth Leakage Module



Bulletin 140U
Molded Case Circuit Breakers
 Product Selection — 800 A, M-Frame

- UL 489
- CSA 22.2, No. 5
- IEC 60947-2
- CE
- KEMA
- CCC

Note: Terminal box lugs must be ordered separately. See page 2-112



Breaker Frames

Rated Current I_n [A]	Breaking Capacity (50 Hz) I_{cu}/I_{cs} [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No.
	220...240V		380...415V		525V		690V		240V	480V	600V	
800	65	65	50	50	50	25	20	10	65	50	25	140U-M5X3
	100	100	70	70	70	50	25	13	100	65	35	140U-M6X3

Trip Units and Rating Plugs

Rated Current I_n [A]	Thermal-Magnetic		Cat. No.
	Adjustment Range [A]		
	Thermal Trip $I_r = I_n$	Magnetic Trip $I_m = 5...10 \times I_n$	
300	300	1500...3000	140U-MTD3-D30
350	350	1750...3500	140U-MTD3-D35
400	400	2000...4000	140U-MTD3-D40
450	450	2250...4500	140U-MTD3-D45
500	500	2500...5000	140U-MTD3-D50
600	600	3000...6000	140U-MTD3-D60
700	700	3500...7000	140U-MTD3-D70
800	800	4000...8000	140U-MTD3-D80

Rated Current I_n [A]	Electronic		Protection Type	Cat. No.
	Adjustment Range [A]			
	Thermal Trip $I_r = 0.5...1.0 \times I_n$	Magnetic Trip $I_m = 2...8 \times I_n$		
800A	400...800*	800...6400	400...800 A LS Electronic Trip Unit	140U-MTL3-D80
			400...800 A LSI Electronic Trip Unit	140U-MTH3-D80
			400...800 A LSG Electronic Trip Unit	140U-MTG3-D80
			400...800 A LSIG Electronic Trip Unit	140U-MTI3-D80

Rating Plugs			
Thermal Trip I_n [A]	Cat. No.	Thermal Trip I_n [A]	Cat. No.
400	140U-MRP3-D40	700	140U-MRP3-D70
500	140U-MRP3-D50	800	140U-MRP3-D80
600	140U-MRP3-D60	—	—

Assembled Circuit Breakers, Thermal-Magnetic Trip Units

Rated Current I_n [A]	Thermal Trip $I_r = I_n$	Breaking Capacity/Interrupting Rating [kA]*		Cat. No.	Breaking Capacity/Interrupting Rating [kA]*		Cat. No.
		400V	480V		400V	480V	
300	300	50	50	140U-M5D3-D30	70	65	140U-M6D3-D30
350	350	50	50	140U-M5D3-D35	70	65	140U-M6D3-D35
400	400	50	50	140U-M5D3-D40	70	65	140U-M6D3-D40
450	450	50	50	140U-M5D3-D45	70	65	140U-M6D3-D45
500	500	50	50	140U-M5D3-D50	70	65	140U-M6D3-D50
600	600	50	50	140U-M5D3-D60	70	65	140U-M6D3-D60
700	700	50	50	140U-M5D3-D70	70	65	140U-M6D3-D70
800	800	50	50	140U-M5D3-D80	70	65	140U-M6D3-D80

* Interrupting ratings shown are for 400V and 480V, respectively. The complete range of ratings can be found in the frame rating table on this page

Assembled Circuit Breakers, Electronic Trip Units

Rated Current I_n [A]	Thermal Trip $I_r = 0.5...1.0 \times I_n$	Protection Type	Breaking Capacity/Interrupting Rating [kA]*		Cat. No.	Breaking Capacity/Interrupting Rating [kA]*		Cat. No.
			400V	480V		400V	480V	
800	400...800*	LS	50	50	140U-M5L3-D80	70	65	140U-M6L3-D80
		LSI	50	50	140U-M5H3-D80	70	65	140U-M6H3-D80
		LSG	50	50	140U-M5G3-D80	70	65	140U-M6G3-D80

* Select proper rating plug to cover thermal trip requirement.

* Interrupting ratings shown are for 400V and 480V, respectively. The complete range of ratings can be found in the frame rating table on this page.

Molded Case Circuit Breakers

Product Selection/Accessories — 800 A, M-Frame

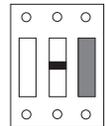
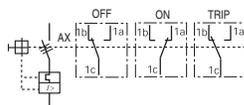
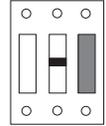
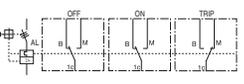
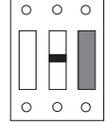
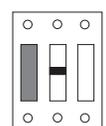
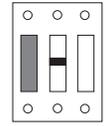
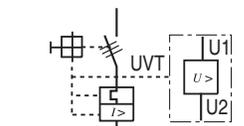
Molded Case Switch — UL 489

Rated Current I_n [A]	Magnetic Trip [A] $I_m = 10 \times I_n$	Breaking Capacity (50 Hz) I_{cu} / I_{cs} [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No.
		220...240V		380...415V		500V		690V		240V	480V	600V	
800	8000	100	100	70	70	70	50	25	13	100	65	35	140U-M6S3-D80

Accessories — 800 A, M-Frame

Pictures shown are representative. Actual product may differ from product shown.

Internal Control Modules — Field Installed

	Description	Mounting Location	Diagram	Cat. No.
	Auxiliary Contact (AX) Electrically indicates "ON/OFF" status of breakers	(1) 1a-1b		140U-M-EA1
		(2) 1a-1b	Right Side ONLY	
	Alarm Contact (AL) Electrically indicates when the breaker is in the "TRIPPED" state	(1) 1M (make)-1B (break)		140U-M-ER1
			Right Side ONLY	
	Auxiliary/Alarm Contact (AX/AL) Combination Combination of auxiliary contact and alarm contact	(1) 1a-1b (1) 1M (make)-1B (break)		140U-M-EA1R1
	Shunt Trip (SNT) Provides remote tripping of the circuit breaker Undervoltage trip not available when shunt trip is used	12...24V, 50/60/DC		140U-M-SNJ
		110...240V AC, 110...125V DC		140U-M-SND
		380...440V AC, 220...250V DC		140U-M-SNN
		480...600V, 50/60 Hz		140U-M-SNB
	Undervoltage Release (UVT) Automatically trips breaker when voltage falls between preset value, 35...70% Shunt trip is not available when undervoltage release is used	24V, 50/60 Hz		140U-M-UJ
		110...127V, 50/60 Hz		140U-M-UD
	208...240V, 50/60 Hz		140U-M-UA	
	380...500V, 50/60 Hz		140U-M-UB	

2

Note: For Factory-Installed internal control modules, please see page 2-121

Molded Case Circuit Breakers

Accessories — 800 A, M-Frame

Pictures shown are representative. Actual product may differ from product shown.

External Accessories

2

	Description		Cat. No.
	Flex-Cable Operating Mechanism Includes handle, cable, operating, and bail mechanism Pre-assembled and adjusted UL Type 1/3/12/4/4X Flange-Mount Operating Handle Non-Metallic	4 ft (1.3 m) Cable	140U-M-FCX04
		6 ft (1.8 m) Cable	140U-M-FCX06
		10 ft (3.0 m) Cable	140U-M-FCX10
	Flex-Cable Operating Mechanism Includes handle, cable, operating, and bail mechanism Pre-assembled and adjusted UL Type 4/4X Flange-Mount Operating Handle Stainless Steel	4 ft (1.3 m) Cable	140U-M-FCS04
		6 ft (1.8 m) Cable	140U-M-FCS06
		10 ft (3.0 m) Cable	140U-M-FCS10
	Flex-Cable Operating Mechanism Includes handle, cable, operating, and bail mechanism Pre-assembled and adjusted Painted metal — Type 1/12 Flange mount operating handle	4 ft (1.2 m) Cable	140U-M-FMX04
		6 ft (1.9 m) Cable	140U-M-FMX06
		10 ft (3.0 m) Cable	140U-M-FMX10
	Rotary, Variable-Depth Operating Mechanism UL Type 3/12/4/4X, IP 66 Rotary Handle 12 in. (30.48 cm) operating rod	Black Handle	140U-M-RVM12B
		Red/Yellow Handle	140U-M-RVM12R
	Rotary, Variable-Depth Operating Mechanism UL Type 3/12/4/4X, IP 66 Rotary Handle 21 in. (53.34 cm) operating rod	Black Handle	140U-M-RVM21B
		Red/Yellow Handle	140U-M-RVM21R
	Rotary, Variable-Depth Operating Mechanism with Internal NFPA79 Operating Handle External UL Type 3/12/4/4X, IP 66 Rotary Handle 12 in. (30.48 cm) operating rod	Black Handle	140U-M-NVM12B
		Red/Yellow Handle	140U-M-NVM12R
Rotary, Variable-Depth Operating Mechanism with Internal NFPA79 Operating Handle External UL Type 3/12/4/4X, IP 66 Rotary Handle 21 in. (53.34 cm) operating rod	Black Handle	140U-M-NVM21B	
	Red/Yellow Handle	140U-M-NVM21R	
	Terminal Lugs	Copper lug, Cu wire Only (3) 3/0...300 MCM or (3) 95...135 mm ²	Qty: 1 140U-M-TLC3
		Aluminum lug, Al or Cu wire (3) 3/0...400 MCM or (3) 95...185 mm ²	Qty: 1 140U-M-TLA3
	Terminal Lugs	Aluminum lug, Al or Cu wire (2) 1...500 MCM or (2) 50...240 mm ²	Qty: 1 140U-M-TLA2
			Aluminum lug, Al or Cu wire (2) 500...750 MCM or (2) 240...400 mm ²
			Copper lug, Cu wire only (2) 2/0...500 MCM or (2) 70...240 mm ²
			Phase Barriers Provides additional phase clearance when special connections that extend past the circuit breaker housing are required
	Padlock Kit Padlocking Hasp Lock-OFF only	Qty: 1	140U-M-PL
	Replacement Mounting Hardware (4) M8 - 1 x 35 mm §	For use with 3- or 4-Pole MCCBs	140U-M-MHM

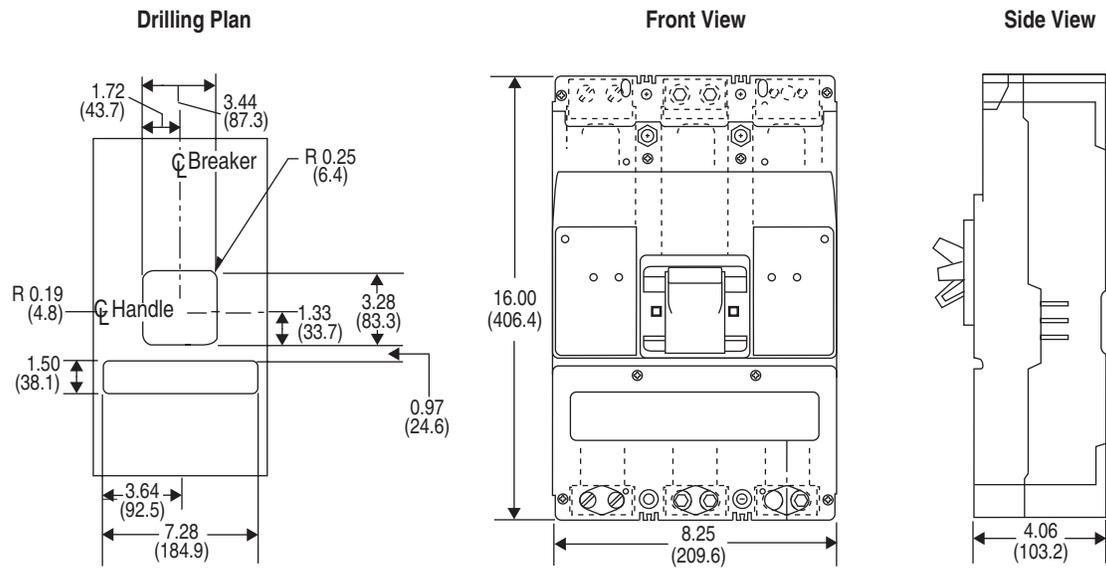
§ Supplied with breaker.



Molded Case Circuit Breakers

Approximate Dimensions — 800 A, M-Frame

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



- UL 489
- CSA 22.2, No. 5
- IEC 60947-2
- CE
- KEMA
- CCC

Note: Terminal box lugs must be ordered separately. See page 2-115



Assembled Circuit Breakers, Electronic Trip Units

Rated Current	Adjustment Range I_r [A]			Protect. Type	Breaking Capacity (50 Hz)								Interrupting Rating (60 Hz)			Cat. No.
	Instant. Maint. Mode $2.5...4.0 \times I_n$ [A]	Thermal Trip $I_r = 0.5...1.0 \times I_n$	Magnetic Trip $I_m = 2...8 \times I_n$		I_{cu} / I_{cs} [kA]								[kA]			
					220...240V	380...415V		500V		690V		240V	480V	600V		
1200	—	600...1200*	2400...9600	LS	85	85	50	50	40	20	20	10	65	50	25	140U-N5L3-E12
1200	—	600...1200*	2400...9600	LS	100	100	70	50	50	25	25	13	100	65	35	140U-N6L3-E12
	LSI			100	100	70	50	50	25	25	13	100	65	35	140U-N6H3-E12	
	3000...4800		2400...10800 §	LSII‡	100	100	70	50	50	25	25	13	100	65	35	140U-N6J3-E12
	—			LSG	100	100	70	50	50	25	25	13	100	65	35	140U-N6G3-E12
	—			LSIG	100	100	70	50	50	25	25	13	100	65	35	140U-N6I3-E12
	3000...4800			LSIIG‡	100	100	70	50	50	25	25	13	100	65	35	140U-N6K3-E12
1200	—	600...1200*	2400...9600	LS	200	100	100	50	65	33	35	18	200	100	50	140U-N0L3-E12
	—			LSI	200	100	100	50	65	33	35	18	200	100	50	140U-N0H3-E12
	3000...4800		2400...10800 §	LSII‡	200	100	100	50	65	33	35	18	200	100	50	140U-N0J3-E12
	—			LSG	200	100	100	50	65	33	35	18	200	100	50	140U-N0G3-E12
	—			LSIG	200	100	100	50	65	33	35	18	200	100	50	140U-N0I3-E12
	3000...4800			LSIIG‡	200	100	100	50	65	33	35	18	200	100	50	140U-N0K3-E12

* Select proper rating plug to cover thermal trip equipment.

‡ Rating plug not required with IMM trip module.

§ Magnetic trip adjustment range for MCCBs with IMM trip modules is $2...9 \times I_n$.

Rating Plugs

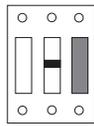
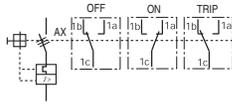
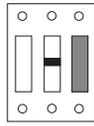
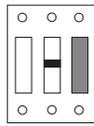
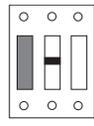
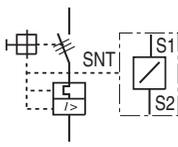
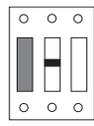
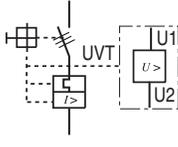
Rated Current I_n [A]	Cat. No.	Rated Operational Current I_n [A]	Cat. No.
600	140U-NRP3-D60	900	140U-NRP3-D90
700	140U-NRP3-D70	1000	140U-NRP3-E10
800	140U-NRP3-D80	1200	140U-NRP3-E12

Molded Case Switch — UL 489

Rated Current I_n [A]	Magnetic Trip $10 \times I_n$	Breaking Capacity (50 Hz) I_{cu} / I_{cs} [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No.
		220...240V	380...415V		500V		690V		240V	480V	600V		
1200	12000	100	100	70	50	50	25	25	13	100	65	35	140U-N6S3-E12

Pictures shown are representative. Actual product may differ from product shown.

Internal Control Modules — Field Installed

	Description		Mounting Location	Diagram	Cat. No.
	Auxiliary Contact (AX) Electrically indicates "ON/OFF" status of breakers	(1) 1a-1b	 Right side ONLY		140U-N-EA1
		(2) 1a-1b	Right side ONLY		140U-N-EA2
	Alarm Contact (AL) Electrically indicates when the breaker is in the "TRIPPED" state	(1) 1M (make)-1B (break)	 Right side ONLY		140U-N-ER1
	Auxiliary/Alarm Contact (AX/AL) Combination Combination of auxiliary contact and alarm contact	(1) 1a-1b (1) 1M (make)-1B (break)	 Right side ONLY		140U-N-EA1R1
	Shunt Trip (SNT) Provides remote tripping of the circuit breaker Undervoltage trip not available when shunt trip is used	12...24V, 50/60/DC	 Left side ONLY		140U-N-SNJ
		110...240V AC			140U-N-SND
		380...440V AC, 220...250V DC			140U-N-SNN
	Undervoltage Release (UVT) Automatically trips breaker when voltage falls between preset value, 35...70% Shunt trip is not available when undervoltage release is used	480...600V, 50/60 Hz	 Left side ONLY		140U-N-SNB
		24V, 50/60 Hz			140U-N-UJ
		110...127V, 50/60 Hz			140U-N-UD
	208...240V, 50/60 Hz			140U-N-UA	
	380...500V, 50/60 Hz			140U-N-UB	

2

Note: For Factory-Installed internal control modules, please see page 2-121.

Terminal Lugs

	Description	Pkg. Quantity	Cat. No.
	Aluminum lug, Al or Cu wire (2) 1...500 MCM or (2) 50...240 mm ²	Qty: 1	140U-N-TLA2
	Aluminum lug, Al or Cu wire (3) 3/0...400 MCM or (3) 95...185 mm ²	Qty: 1	140U-N-TLA3
	Aluminum lug, Al or Cu wire (4) 4/0...500 MCM or (4) 120...300 mm ²	Qty: 1	140U-N-TLA4
	Aluminum lug, Al or Cu wire (3) 500...750 MCM or (3) 300...400 mm ²	Qty: 1	140U-N-TLA3A
	Copper lug, Cu wire only (2) 2/0...500 MCM or (2) 70...240 mm ²	Qty: 1	140U-N-TLC2
	Copper lug, Cu wire only (3) 3/0...500 MCM or (3) 95...240 mm ²	Qty: 1	140U-N-TLC3
	Copper lug, Cu wire only (4) 3/0...400 MCM or (4) 95...185 mm ²	Qty: 1	140U-N-TLC4

Molded Case Circuit Breakers

Accessories/Approximate Dimensions — 1200 A, N-Frame

Pictures shown are representative. Actual product may differ from product shown.

External Accessories

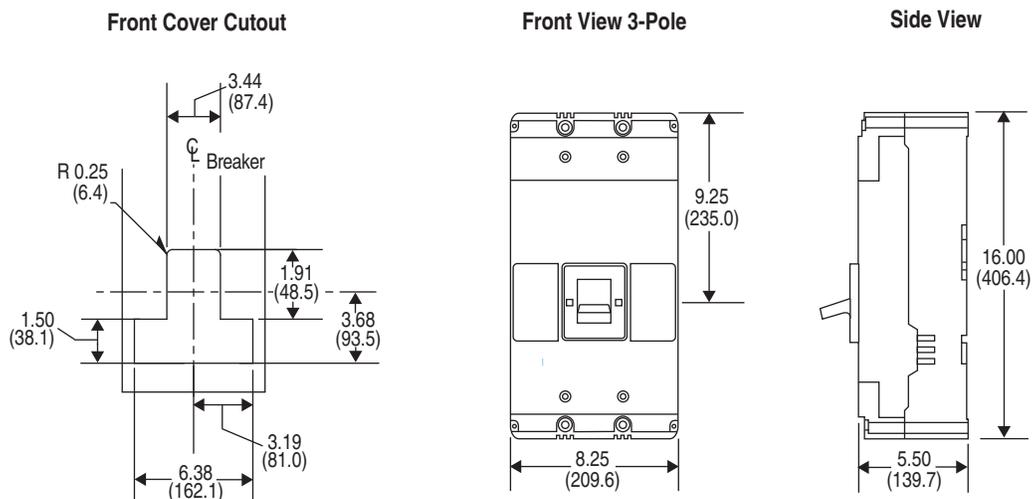
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	Description		Cat. No.
	Flex-Cable Operating Mechanism NEMA Type 1/3/12/4/4X Flange-Mount Handle	4 ft. (1.2 m) cable	140U-N-FCX04
		6 ft. (1.9 m) cable	140U-N-FCX06
		10 ft. (3.0 m) cable	140U-N-FCX10
	Rotary, Variable-Depth Operating Mechanism Type 1/12 Rotary Handle 24 in. (60.96 cm) operating rod	Black handle	140U-N-RM12B
	Phase Barriers Provides additional phase clearance when special connections that extend past the circuit breaker housing are required	Qty: 2	140U-N-PB
	Padlock Kit Padlocking Hasp Lock-OFF only	Qty: 1	140U-N-PL
	Motor Operator Remotely opens, closes, and resets the circuit breaker 110...240V AC	Qty: 1	140U-N-EOPD
	Motor Operator, 230..240V AC	Qty: 1	140U-N-EOPA
	Replacement Mounting Hardware (4) M8 - 1 x 35 mm §	For use with 3- or 4-pole MCCBs	140U-M-MHM

§ Supplied with breaker.

Approximate Dimensions

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





- UL 489
- CSA 22.2, No. 5
- IEC 60947-2
- CE
- KEMA
- CCC

Note: Terminal box lugs must be ordered separately. See page 2-119.

Assembled Circuit Breakers, Electronic Trip Units

Rated Current I_n [A]	Adjustment Range I_r [A]	Protection Type	Breaking Capacity (50 Hz)								Interrupting Rating (60 Hz) [kA]			Cat. No.
			I_{cu} / I_{cs} [kA]								240V	480V	600V	
			220...240V	380...415V	500V	690V								
1600	Select Rating Plug*	LS	135	100	70	50	—	—	25	13	125	65	50	140U-R6L3-E16
		LSI	135	100	70	50	—	—	25	13	125	65	50	140U-R6H3-E16
		LSG	135	100	70	50	—	—	25	13	125	65	50	140U-R6G3-E16
		LSIG	135	100	70	50	—	—	25	13	125	65	50	140U-R6I3-E16
2000	Select Rating Plug*	LS	135	100	70	50	—	—	25	13	125	65	50	140U-R6L3-E20
		LSI	135	100	70	50	—	—	25	13	125	65	50	140U-R6H3-E20
		LSG	135	100	70	50	—	—	25	13	125	65	50	140U-R6G3-E20
		LSIG	135	100	70	50	—	—	25	13	125	65	50	140U-R6I3-E20
2500	Select Rating Plug*	LS	135	100	70	50	—	—	25	13	125	65	50	140U-R6L3-E25
		LSI	135	100	70	50	—	—	25	13	125	65	50	140U-R6H3-E25
		LSG	135	100	70	50	—	—	25	13	125	65	50	140U-R6G3-E25
		LSIG	135	100	70	50	—	—	25	13	125	65	50	140U-R6I3-E25

100 kA @ 480V

1600	Select Rating Plug*	LS	200	100	100	50	—	—	35	18	200	100	65	140U-R0L3-E16
		LSI	200	100	100	50	—	—	35	18	200	100	65	140U-R0H3-E16
		LSG	200	100	100	50	—	—	35	18	200	100	65	140U-R0G3-E16
		LSIG	200	100	100	50	—	—	35	18	200	100	65	140U-R0I3-E16
2000	Select Rating Plug*	LS	200	100	100	50	—	—	35	18	200	100	65	140U-R0L3-E20
		LSI	200	100	100	50	—	—	35	18	200	100	65	140U-R0H3-E20
		LSG	200	100	100	50	—	—	35	18	200	100	65	140U-R0G3-E20
		LSIG	200	100	100	50	—	—	35	18	200	100	65	140U-R0I3-E20
2500	Select Rating Plug*	LS	200	100	100	50	—	—	35	18	200	100	65	140U-R0L3-E25
		LSI	200	100	100	50	—	—	35	18	200	100	65	140U-R0H3-E25
		LSG	200	100	100	50	—	—	35	18	200	100	65	140U-R0G3-E25
		LSIG	200	100	100	50	—	—	35	18	200	100	65	140U-R0I3-E25

* Select proper rating plug to cover thermal trip equipment.

Rating Plugs

1600 A Frame		2000 A Frame		2500 A Frame	
Rated Operational Current I_n [A]	Cat. No.	Rated Operational Current I_n [A]	Cat. No.	Rated Operational Current I_n [A]	Cat. No.
800	140U-R16RP3-E80	1000	140U-R20RP3-E10	1200	140U-R25RP3-E12
1000	140U-R16RP3-E10	1200	140U-R20RP3-E12	1250	140U-R25RP3-E125
1200	140U-R16RP3-E12	1250	140U-R20RP3-E125	1600	140U-R25RP3-E16
1250	140U-R16RP3-E125	1400	140U-R20RP3-E14	2000	140U-R25RP3-E20
1400	140U-R16RP3-E14	1600	140U-R20RP3-E16	2500	140U-R25RP3-E25
1500	140U-R16RP3-E15	2000	140U-R20RP3-E20	—	—
1600	140U-R16RP3-E16	—	—	—	—

Protection Type

	Protection Type*			
	LS	LSI	LSG	LSIG
Short Time Range	$2...8 \times I_n$	$2...8 \times I_n$	$2...8 \times I_n$	$2...8 \times I_n$
Short Time Delay	—	1...300 ms	—	1...300 ms
Ground Fault Pickup	—	—	200...1200 A	200...1200 A
Ground Fault Delay	—	—	1...500 ms	1...500 ms

*Protection Type Definitions

- L: Adjustable long delay pickup (by adjustable rating plug)
- S: Adjustable short delay pickup with fixed short delay time (I^2t response) or adjustable short delay time (flat response)
- I: Adjustable instantaneous pickup by setting short delay time to instantaneous
- G: Adjustable ground fault pickup with adjustable ground fault delay (flat response)



Molded Case Circuit Breakers

Accessories — 2500 A, R-Frame

Internal Control Modules — Field Installed

	Description		Cat. No.
	Auxiliary Contact (AX) Electrically indicates "ON/OFF" status of breakers	(2) N.O-N.C.	140U-R-EA2
	Auxiliary/Alarm Contact (AX/AL) Combination Combination of auxiliary contact and alarm contact	(1) 1a, 1b (1) 1 Make, 1 Break	140U-R-EA1R1
	Shunt Trip (SNT) Provides remote tripping of the circuit breaker Undervoltage trip not available when shunt trip is used	220...250V DC or 380...440V AC	140U-R-SNN
		480...600V AC	140U-R-SNB
	Undervoltage Release (UVT) Automatically trips breaker when voltage falls between preset value, 35...70% Shunt trip is not available when undervoltage release is used	208...240V AC Right hand only	140U-R-UVA
		24V DC Right hand only	140U-R-UVZJ
		48...60V DC Right hand only	140U-R-UVZZ
		120V DC Right hand only	140U-R-UVZS
		220...250V DC Right hand only	140U-R-UVZA
		380...480V AC Right hand only	140U-R-UVN
		12V DC Right hand only	140U-R-UVZQ
110...127 V AC Right hand only	140U-R-UVD		

Note: For Factory-Installed internal control modules, please see www.ab.com/catalogs.

2

External Accessories

	Description		Cat. No.	
	<p style="text-align: center;">Flex-Cable Operating Mechanism Includes handle, cable, operating, and bail mechanism Pre-assembled and adjusted Non-Metallic - UL IP66, Type 1/3/12/4/4X Flange Mount Operating Handle</p>	4 ft (1.3 m) Cable	140U-R-FCX04	
		6 ft (1.8 m) Cable	140U-R-FCX06	
	<p style="text-align: center;">Rotary, Variable-Depth Operating Mechanism Type 1/12 Rotary Handle 12 in. (30.48 cm) operating rod</p>	Black Handle	140U-R-RM12B	
	<p style="text-align: center;">Terminal Lugs</p>	1600 A size Aluminum lug, Al or Cu wire (4) 500...1000 MCM or (4) 300...500 mm ²	Qty: 1	140U-R-TLA4
		1600 A size Copper lug, Cu wire only (4) 1...600 MCM or (4) 50...300 mm ²	Qty: 1	140U-R-TLC4
	<p style="text-align: center;">Terminal Lugs</p>	2000 A size Aluminum lug, Al or Cu wire (6) 2...600 MCM or (6) 35...300 mm ²	Qty: 1	140U-R-TLA6
	<p style="text-align: center;">Rear Connector</p>	1600 A size copper rear connector	Qty: 1	140U-R-RCC16
		2000 A size copper rear connector	Qty: 1	140U-R-RCC20
		2500 A size copper rear connector	Qty: 1	140U-R-RCC25

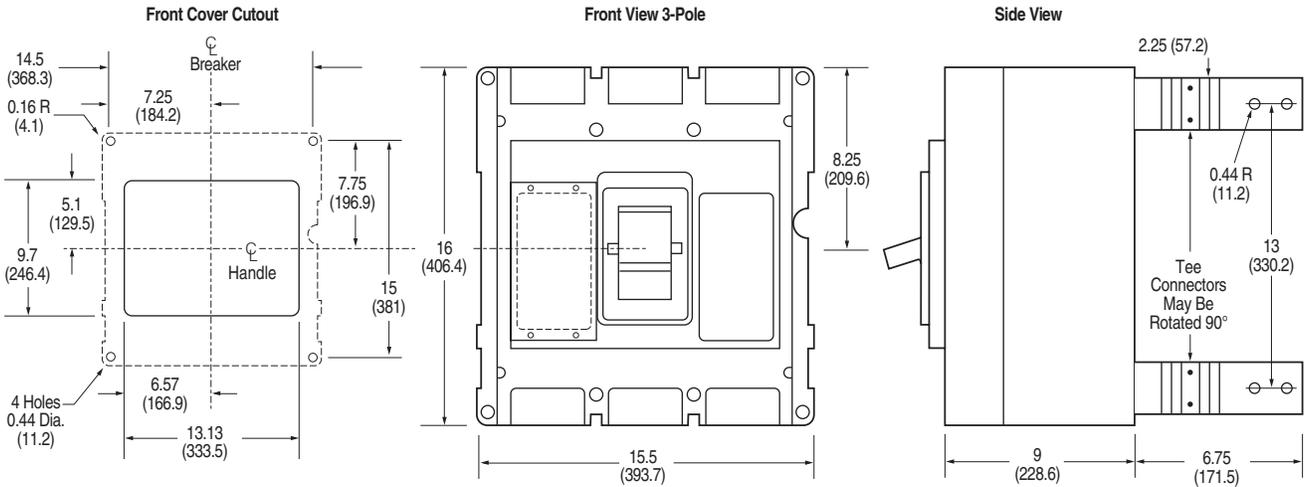
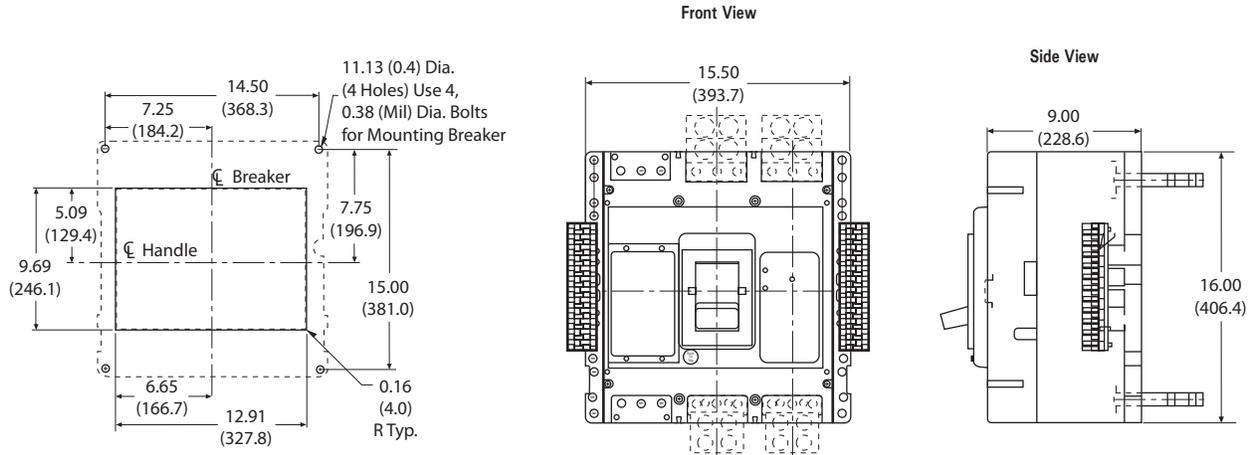


Molded Case Circuit Breakers

Approximate Dimensions — 2500 A, R-Frame

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

2



Approximate Weights

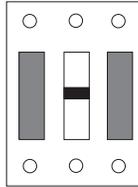
Cat. No.	Weight
140U-R1600...	102 lbs
140U-R2000...	102 lbs
140U-R2500...	135 lbs

Internal Control Modules — Factory Installed
 For use with H-, J-, K-, L-, M-, and N-Frame Molded Case Circuit Breakers

Mounting Location

Left side only

(1) *Shunt Trip (SNT)*
 or
 (1) *Undervoltage Release (UVT)*



Right side only

(1) *Auxiliary contact (AX)*
 or
 (2) *Auxiliary contacts (AX)*
 or
 (1) *Alarm contact (AL)*
 or
 (1) *Alarm contact (AL) + Auxiliary contact (AX)*

Auxiliary and Alarm Contacts	Suffix
(1) AX	- A
(2) AX	- B
(1) AL	- D
(1) AX + (1) AL	- F

Undervoltage Release Combinations	Suffix
(1) UVT only	- G⊗
(1) AX + (1) UVT	- H⊗
(2) AX + (1) UVT	- J⊗
(1) AX + (1) AL + (1) UVT	- L⊗
(1) AL + (1) UVT	- N⊗

⊗Standard Voltage Suffix Codes*

Voltage [V]	24	110...127 7	208...240 0	380...480 0
AC, 50/60 Hz	J	D	A	B
Voltage [V]	—	—	—	—
DC	—	—	—	—

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

Undervoltage Release Combinations	Suffix
(1) UVT only	- G⊗
(1) AX + (1) UVT	- H⊗
(2) AX + (1) UVT	- J⊗
(1) AX + (1) AL + (1) UVT	- L⊗
(1) AL + (1) UVT	- N⊗

⊗Standard Voltage Suffix Codes*

Voltage [V]	24	110...127	208...240	380...480
AC, 50/60 Hz	J	D	A	B
Voltage [V]	—	—	—	—
DC	—	—	—	—



Contactors

2

						
	Bulletin	100-K/104-K	100-C/104-C	100Q-C	100-D/104-D	100-G
Screw Terminals	✓	✓	✓	Thru-hole Threaded (630...860 A)	Thru-hole	
Spring Terminals	✓ (5...9 A)	✓ (9...16 A)	—	—	—	
Max. Current I_e	12 A	97 A	37 A	860 A	1200 A	
Current Rating	5...12 A	9...97 A	16, 32 A	115...860 A	550...1200 A	
Features	<ul style="list-style-type: none"> Mini-contactors Uniform panel mounting dimensions Panel mounting or mounting on 35 mm DIN Rail AC or DC coil control Made of environmentally friendly materials 	<ul style="list-style-type: none"> Panel mounting or mounting on 35 mm DIN Rail AC or DC coil control Reversible coil terminals (line or load side) Common accessories Made of environmentally friendly materials 	<ul style="list-style-type: none"> Panel mounting or mounting on 35 mm DIN Rail AC or DC coil control Reversible coil terminals (line or load side) Common accessories Made of environmentally friendly materials 	<ul style="list-style-type: none"> Panel mounting only Made of environmentally friendly materials AC or DC coil control (conventional or electronic) Integrated PLC interface (electronic coil) 	<ul style="list-style-type: none"> Panel mounting AC or DC coil control Horizontal or vertical interlock Latching 4th pole 	
Contacts	3 power poles with internal N.O. or N.C. auxiliary contact, or 4 power poles. Optional front-mounted 2- or 4-pole external auxiliary contact block.	3 power poles with internal N.O. or N.C. auxiliary contact or 4 power poles. Optional front- or side-mounted 1-, 2- or 4-pole external auxiliary contact block.	3 main poles with front-mount resistor elements. Optional side-mounted 1-, 2- or 4-pole external auxiliary contact block.	3 power poles with external N.O. and N.C. side-mounted auxiliary contact. Optional side-mounted 2-pole external auxiliary contact blocks	3 power poles with N.O. and N.C. front-mounted auxiliary contact. Optional 4th pole and auxiliary contacts	
Coil Voltages	AC = 24...600V, 50/60Hz DC = 12...250V	AC = 12...600V, 50/60Hz DC = 9...250V	AC = 12...600V, 50/60Hz DC = 12...250V	Conventional Coils Cat. Nos. 100-D115...D180 AC: 24...550V 50 Hz, 24...600V 60Hz, 100...277V 50/60Hz DC: 24...250V DC Electronic Coils Cat. Nos. 100-D115...D300 AC: 24...500V 50/60 Hz DC: 24...255V DC Cat. Nos. 100-D420 AC: 42...500V 50/60 Hz DC: 48...255V DC Cat. Nos. 100-D630...D860 AC: 100...600V 50/60 Hz DC: 110...255V DC	AC = 110...480V, 50/60Hz DC = 100...440V	
Optional Overload Relays	Electronic or bimetallic	Electronic or bimetallic	—	Electronic	Electronic	
Optional Accessories	<ul style="list-style-type: none"> Front-mount auxiliary contacts Surge suppressors Electronic timers Mechanical interlocks 	<ul style="list-style-type: none"> Front or side-mount auxiliary contacts Surge suppressors Electronic or pneumatic timers Mechanical interlocks Mechanical latches 	<ul style="list-style-type: none"> Side-mount auxiliary contacts Surge suppressors Electronic timers 	<ul style="list-style-type: none"> Side-mount auxiliary contacts Surge suppressors IP20 terminal blocks Terminal shields Terminal covers Connecting components Terminal lugs Mechanical/electrical interlocks 	<ul style="list-style-type: none"> Auxiliary contact 4th pole Vertical interlock Horizontal interlock Mechanical latch 	
Standards/Certifications	<ul style="list-style-type: none"> UL CSA IEC CE Marked CCC 	<ul style="list-style-type: none"> UL CSA IEC CE Marked CCC 	<ul style="list-style-type: none"> UL CSA IEC CE Marked 	<ul style="list-style-type: none"> UL CSA IEC CE Marked CCC (115...180 A - conventional coil; 140...420 A - electronic coil) 	<ul style="list-style-type: none"> UL CSA IEC CE Marked 	
Product Selection	Page 2-124	Page 2-129	Page 2-141	Page 2-147	Page 2-156	



Safety Contactors

		
Bulletin	100S-C/104S-C	100S-D
Screw Terminals	✓	Thru-hole Threaded (630...860 A)
Max. Current I_e	97 A	860 A
Current Rating	9...97 A	115...860 A
Features	<ul style="list-style-type: none"> • Positively guided/mechanically linked auxiliary contacts • Front-mounted auxiliary contacts: <ul style="list-style-type: none"> - Permanently fixed - Protective cover to prevent manual operation - Red contact housing for easy identification - Incorporates IEC 947-5-1 "Mechanically Linked" symbol - Optional gold-plated bifurcated versions • AC and DC operating coils • SUVA third-party certification 	<ul style="list-style-type: none"> • Mirror contact performance on auxiliary contacts, which are required in feedback circuit for modern safety applications. • The N.C. auxiliary contacts will not change state when a power contact welds. • SUVA third-party certification • AC and DC operating coils • "Mirror Contact" symbol
Contacts	3 main poles with N.C. mechanically linked feedback contacts	3 main poles with N.C. mechanically linked feedback contacts
Coil Voltages	AC = 12...600V, 50/60Hz DC = 12...250V	<p>Conventional Coils Cat. Nos. 100S-D115...D180 AC: 24...550V, 50 Hz; 24...600V, 60Hz; 100...277V, 50/60Hz DC: 24...250V</p> <p>Electronic Coils Cat. Nos. 100S-D115...D300 AC: 24...500V, 50/60 Hz DC: 24...255V</p> <p>Cat. Nos. 100S-D420 AC: 42...500V 50/60 Hz DC: 48...255V</p> <p>Cat. Nos. 100S-D630...D860 AC: 100...600V, 50/60 Hz DC: 110...255V</p>
Optional Accessories	<ul style="list-style-type: none"> • Side-mount auxiliary contacts • Surge suppressors • Electronic timers • Mechanical interlocks 	<ul style="list-style-type: none"> • Side-mount auxiliary contacts • Surge suppressors • IP20 terminal blocks • Terminal shields • Terminal covers • Connecting components • Terminal lugs • Mechanical/electrical interlocks
Standards Compliance	EN/IEC 60947-4 IEC 60947-5-1 Annex L — Mechanically Linked Contacts IEC 60947-4-1 Annex H — Mirror Contacts UL 508 CSA C22.2 No. 14 EN50205	EN/IEC 60947-4 IEC 60947-4-1, Annex H — Mirror Contacts IEC 60947-4-1/A1: 2002-09, Annex F UL 508 CSA C22.2, No. 14
Certifications	<ul style="list-style-type: none"> • cULus Listed (File No. E3125; Guide NLDX, NLDX7) • SUVA Third-Party Certified • CE Marked 	<ul style="list-style-type: none"> • cULus Listed (File No. E3125; Guide No. NLDX, NLDX7) • SUVA Third-Party Certified • CE Marked • CCC (115...180 A - conventional coil; 140...420 A - electronic coil)
Product Selection	Page 2-134	Page 2-151

IEC Miniature Contactors

Overview/Product Selection



Bulletin 100-K/104-K — IEC Miniature Contactors

- Compact size
- Same dimensions for AC and DC
- Full-voltage non-reversing and reversing contactors
- 5, 9, and 12 A contactors rated at 690V
- IP2X finger protection
- Optional integrated surge suppressor
- Compatible with Bulletin 193-K bimetallic overload relay
- Mirror contacts per IEC 60947-4-1 and mechanically linked contacts per IEC 60947-5-1 on main unit

Your order must include: cat. no. (with coil voltage code) of the mini contactor specified and, if required, cat. no. of any accessories

Allen-Bradley Bulletin 100-K miniature contactors are designed for commercial and light industrial applications where panel space is at a premium. These miniature devices, while 45 mm wide, are shallower and have less panel depth requirements than standard IEC contactors.

The miniature contactors have been designed with flexibility in mind. They are available with AC or DC operating coils, several contact ratings, and optional 2- or 4-pole adder decks in a variety of auxiliary contact configurations.

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 Accessories..... 2-127
 Specifications..... 2-158
 Approximate Dimensions..... 2-193

Standards Compliance

IEC/EN 60947-1,-4-1,-5-1,-5-4
 UL 508
 CSA 22.2. No. 14
 NF F 62-000
 Meets the material restrictions for European Directive 2002/95/IEC-EU-RoHS

Certifications

CE Marked
 cULus Listed (File No. E41850, Guide NLDX, NLDX7)
 CCC

Product Selection

3-Pole AC- and DC-Operated Contactors

Rated Operational Current I_e [A]		Ratings for switching AC motors - AC-2, AC-3, AC-4										Auxiliary Contacts		Pkg. Qty.*	Cat. No.
		3-Phase kW (50 Hz)				Hp (60 Hz)						N.O.	N.C.		
		40 °C				1-Phase		3-Phase							
AC-3	AC-1	230V	400/415V	500V	690V	115V	230V	200V	230V	460V	575V				
Screw Terminals															
5	20	1.5	2.2	2.2	2.2	1/2	1	1-1/2	1-1/2	3	3	1	0	1	100-K05⊗10
												0	1	1	100-K05⊗01
9	20	3	4	4	4	1/2	1-1/2	2	2	5	5	1	0	1	100-K09⊗10
												0	1	1	100-K09⊗01
12	20	3	5.5	5.5	5.5	3/4	2	3	3	7-1/2	7-1/2	1	0	1	100-K12⊗10
												0	1	1	100-K12⊗01
Spring Clamp Terminals															
5	10	1.5	2.2	2.2	2.2	1/3	3/4	1-1/2	1-1/2	3	3	1	0	1	100-KR05⊗10
												0	1	1	100-KR05⊗01
9	10	2.2	4	4	4	1/3	1	2	2	5	5	1	0	1	100-KR09⊗10
												0	1	1	100-KR09⊗01

* May be ordered in package quantities of 20. Add letter M to the end of the cat. no. Example: **100-K09ZJ10M**.

⊗ The Cat. No. as listed is incomplete. Select a Coil Voltage Code from page 2-125 to complete the Cat. No.

Example: 24V DC: Cat. No. **100-K05⊗10** becomes Cat. No. **100-K05ZJ10**.

4-Pole AC- and DC-Operated Contactors

Rated Operational Current I_e [A]		Ratings for switching AC motors - AC-2, AC-3										Contact Configuration, Main Pole		Pkg. Qty.*	Cat. No.
		3-Phase kW (50 Hz)				Hp (60 Hz)						N.O.	N.C.		
		40 °C				1-Phase		3-Phase							
AC-3	AC-1	230V	400/415V	500V	690V	115V	230V	200V	230V	460V	575V				
5	20	1.5	2.2	2.2	2.2	1/2	1	1-1/2	1-1/2	3	3	4	0	1	100-K05⊗400
												3	1	1	100-K05⊗300
												2	2	1	100-K05⊗200
9	20	3	4	4	4	1/2	1-1/2	2	2	5	5	4	0	1	100-K09⊗400
												3	1	1	100-K09⊗300
												2	2	1	100-K09⊗200
12	20	3	5.5	5.5	5.5	3/4	2	3	3	7-1/2	7-1/2	4	0	1	100-K12⊗400
												3	1	1	100-K12⊗300
												2	2	1	100-K12⊗200

* May be ordered in package quantities of 20. Add letter M to the end of the cat. no. Example: **100-K09ZJ400M**.

⊗ The Cat. No. as listed is incomplete. Select a Coil Voltage Code from page 2-125 to complete the Cat. No.

Example: 24V DC: Cat. No. **100-K05⊗400** becomes Cat. No. **100-K05ZJ400**.



Reversing AC- and DC-Operated Contactors

Rated Operational Current I_e [A]		Ratings for switching AC motors - AC-2, AC-3, AC-4										Auxiliary Contacts per Contactor *		Cat. No.
		3-Phase kW (50 Hz)				Hp (60 Hz)								
		40 °C		230V	400/415V	500V	690V	1-Phase		3-Phase				
AC-3	AC-1	115V	230V					200V	230V	460V	575V	N.O.	N.C.	
5	20	1.5	2.2	2.2	2.2	—	—	1-1/2	1-1/2	3	3	0	1	104-K05002
9	20	3	4	4	4	—	—	2	2	5	5	0	1	104-K09002
12	20	3	5.5	5.5	5.5	—	—	3	3	7-1/2	7-1/2	0	1	104-K12002

* Used for electrical interlocking

⊗ The Cat. No. as listed is incomplete. Select a standard Coil Voltage Code from this page to complete the Cat. No.

Example: 230V, 50/60 Hz: Cat. No. **104-K05002** becomes Cat. No. **104-K05KF02**.

Bulletin 104-K reversing contactors are factory assembled and include contactors, mechanical interlock (Cat. No. 100-KMCH) and wiring kit (Cat. No. 100-KPR) for power and control circuit (electrical interlock). Wiring schematic see 100-KPR.



⊗ Coil Voltage Code for screw type terminal versions

The Cat. No. as listed is incomplete. Select a coil voltage code from the table below to complete the Cat. No. Example: 120V, 60 Hz:

Cat. No. 100-K09010 becomes **Cat. No. 100-K09D10**.

AC Voltages [V]	24	110	120	230	240	400	480	600
50 Hz	—	D	—	—	—	—	—	—
60 Hz	—	—	D	—	—	—	B	VC
50/60 Hz	KJ	—	—	KF	KA	KN	—	—

DC Voltages [V]	12	24	110	125	220	250
Standard	ZQ	ZJ	ZD	ZS	ZA	ZT
with Integrated Diode	—	DJ	—	—	—	—

⊗ Coil Voltage Code for spring clamp type terminal versions

The Cat. No. as listed is incomplete. Select a coil voltage code from the table below to complete the Cat. No. Example: 120V, 60 Hz:

Cat. No. 100-K09010 becomes **Cat. No. 100-K09D10**.

AC Voltages [V]	24	110	120	230
50 Hz	—	D	—	—
60 Hz	—	—	D	—
50/60 Hz	KJ	—	—	KF

DC Voltages [V]	24	110
Standard	ZJ	ZD
with Integrated Diode	DJ	—

Bulletin 100-K, 104-K
IEC Miniature Contactors
 Assignment of Contacts

Assignment of Contacts

Device Combinations in Accordance with IEC 60947-1 / -4-1

Table valid for : AC / DC = 0.85...1.1 x U_s , $T_{amb.} = -25\text{ }^\circ\text{C} \dots +60\text{ }^\circ\text{C}$, normal position (horizontal rail mounting) *

Auxiliary Contact Blocks		Miniature Contactors 100-K (AC and DC Control)					
Circuit Diagram	Control	100-K05⊗10 100-K09⊗10 100-K12⊗10	100-K05⊗01 100-K09⊗01 100-K12⊗01	100-K05⊗400 100-K09⊗400 100-K12⊗400	100-K05⊗300 100-K09⊗300 100-K12⊗300	100-K05⊗200 100-K09⊗200 100-K12⊗200	
Front Mounting							
100-KFA02E		AC/DC	*	01 + 02 = 03 ‡	*	* ‡	—
100-KFC02		AC/DC	10 + 02 = 12	—	00 + 02 = 02	00 + 02 = 02 ‡	—
100-KFA11E		AC/DC	*	01 + 11 = 12	*	*	*
100-KFB11		AC/DC	10 + 11 = 21	—	00 + 11 = 11	00 + 11 = 11	00 + 11 = 11
100-KFC11		AC/DC	10 + 11 = 21	*	00 + 11 = 11	00 + 11 = 11	00 + 11 = 11
100-KFA20E		AC/DC	*	01 + 20 = 21	*	*	*
100-KFC20		AC/DC	10 + 20 = 30	*	00 + 20 = 20	00 + 20 = 20	00 + 20 = 20
100-KFA04E		AC/DC	* ‡	—	* ‡	—	—
100-KFC04		AC/DC	10 + 04 = 14 ‡	—	00 + 04 = 04 ‡	—	—
100-KFA13E		AC/DC	*	01 + 13 = 14 ‡	*	* ‡	—
100-KFC13		AC/DC	10 + 13 = 23	* ‡	00 + 13 = 13	00 + 13 = 13 ‡	—
100-KFA22Z		AC/DC	*	01 + 22 = 23 ‡	*	* ‡	—
100-KFB22		AC/DC	10 + 22 = 32	—	00 + 22 = 22	00 + 22 = 22 ‡	—
100-KFC22		AC/DC	10 + 22 = 32	* ‡	00 + 22 = 22	00 + 22 = 22 ‡	—
100-KFA31Z		AC/DC	* §	—	* §	—	—
100-KFC31		AC/DC	10 + 31 = 41 §	—	00 + 31 = 31 §	—	—
100-KFA40E		AC/DC	*	01 + 40 = 41	*	*	*
100-KFC40		AC/DC	10 + 40 = 50	*	00 + 40 = 40	00 + 40 = 40	00 + 40 = 40

* For other operating limits, please contact our technical consultant.

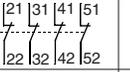
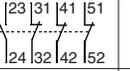
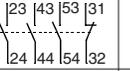
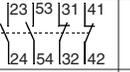
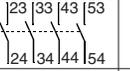
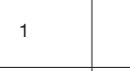
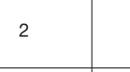
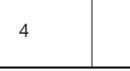
* Combination possible but not recommended, due to repeating or not consecutive sequence numbering

‡ $T_{amb.}$ max. +40 °C

§ $T_{amb.}$ max. +40 °C and only allowed for coil voltage 24V DC or 230V AC

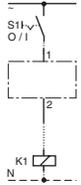
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Auxiliary Contact Blocks

	Description	Connection Diagrams			For Use With	Pkg. Qty.	Screw Type Terminals	Spring Clamp Terminals
			N.O.	N.C.			Cat. No.	Cat. No.
			0	2	100-K05...K12	1	100-KFC02	100-KRFC02
			1	1	100-K05...K12	1	100-KFC11	100-KRFC11
			2	0	100-K05...K12	1	100-KFC20	100-KRFC20
	Front-Mounted Auxiliary Contacts <ul style="list-style-type: none"> • Auxiliary contact blocks • 2- and 4-pole versions • Choice of contact configurations • Snap on, no tools required • Electronically-compatible bifurcated contacts for signals down to 15V/2 mA • Mirror Contact performance per IEC 60947-4-1 with DC coil contactors only 		0	4	100-K05...K12	1	100-KFC04	100-KRFC04
			1	3	100-K05...K12	1	100-KFC13	100-KRFC13
			3	1	100-K05...K12	1	100-KFC31	100-KRFC31
			2	2	100-K05...K12	1	100-KFC22	100-KRFC22
			4	0	100-K05...K12	1	100-KFC40	100-KRFC40
			0	2	100/104-K, 700-K	1	100-KFA02E	100-KRFA02E
			1	1	100/104-K, 700-K	1	100-KFA11E	100-KRFA11E
			2	0	100/104-K, 700-K	1	100-KFA20E	100-KRFA20E
			0	4	100/104-K, 700-K	1	100-KFA04E	100-KRFA04E
			1	3	100/104-K, 700-K	1	100-KFA13E	100-KRFA13E
			2	2	100/104-K, 700-K	1	100-KFA22Z	100-KRFA22Z
			3	1	100/104-K, 700-K	1	100-KFA31Z	100-KRFA31Z
			4	0	100/104-K, 700-K	1	100-KFA40E	100-KRFA40E

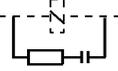
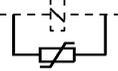


Timers

	Description	On-Delay	Connection Diagrams	For Use With	Pkg. Qty.	Cat. No.
	Solid-State Timing Element <ul style="list-style-type: none"> • 110...250V AC or DC • Includes 35 mm Hat Rail adapter 	On-Delay, 0.1...3 s		100/104-K, 700-K	10	100-KT3S
		On-Delay, 1...30 s				100-KT30S

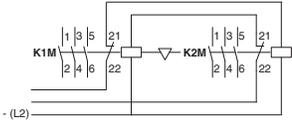
Control Modules

2

	Description		Connection Diagrams	For Use With	Pkg. Qty.	Cat. No.	
	Mechanical Interlock <ul style="list-style-type: none"> For interlocking of two adjacent contactors No added width to contactor assembly Front mount plug-in type Optional auxiliary contact blocks and suppressor modules mount onto the interlock 			100-K, 700-K (AC & DC Control)	1	100-KMCH	
	RC Suppressor	24...48V AC		100/104-K, 700-K	1 *	100-KFSC50	
		110...280V AC			1 *	100-KFSC280	
		380...480V AC			1 *	100-KFSC480	
	MOV Suppressor	12...55V AC, 12...77V DC		100/104-K, 700-K	1 *	100-KFSV55	
		56...136V AC, 78...180V DC				1 *	100-KFSV136
		137...277V AC, 181...250V DC				1 *	100-KFSV277
Diode Suppressor	12...250V DC		100/104-K, 700-K	1 *	100-KFSD250		

* May be ordered in package quantities of 10. Add letter M to the end of the cat. no. Example: **100-KFSC50M**.

Connecting Components

	Description		For Use With	Pkg. Qty.	Cat. No.	
	ECO Connecting Module — 12 A <ul style="list-style-type: none"> For DOL and reversing starters Eco-starters mount on single DIN Rail (140M on DIN Rail) Electrical and mechanical interconnection of 140M MPCB and 100-K contactors 		Connects: 140M-C circuit breakers with 100-K contactors	140M-C to 100-K	1 *	140M-C-PEK12
	Power Wiring Kit For Reversing and Star/Delta combinations. Star-point bridge not included. Min. interruption time 50 ms			100-K	1	100-KPR
	Feeder Terminal for Compact Bus Bars Max. current 34 A		Supply of compact bus bars	100-K	1	100-KWT
	Three-Phase Compact Bus Bars Max. current 34 A		For 100-K, 5...12 A contactors 45 mm spacing (3 connections)*	100-K	1	100-KW453
			For 100-K, 5...12 A contactors 45 mm spacing (4 connections)*	100-K	1	100-KW454

* May be ordered in package quantities of 10. Add letter M to the end of the cat. no. Example: **140M-C-PEK12M**.

* Combinations possible. Example: For 6 contactor connections use one cat. no. 100-KW453 and one cat. no. 100-KW454.

Marking Systems

	Description	Pkg. Qty.	Cat. No.
	Label Sheet 105 self-adhesive paper labels each, 6 x 17 mm	10	100-FMS
	Snap-In Marker Card	5	1492-M6X12



Bulletin 100-C/104-C — IEC Contactors

- Compact sizes from 4...55 kW/5...75 Hp (9...97 A)
- AC and DC coil control
- Common accessories for all contactor sizes
- Front and side mounting of auxiliary contacts
- Electronic and pneumatic timing modules
- Space-saving coil-mounted control modules
- Reversible coil terminations (line or load side)
- All devices can be attached to 35 mm DIN mounting Rail
- Environmentally friendly materials

The Bulletin 100-C/104-C IEC contactor family, along with a wide range of common accessories and Bulletin 193 solid-state overload relays, provides the most compact and flexible starter component system available.

Your order must include: cat. no. of the contactor specified with coil voltage code and, if required, cat. no. of any accessories and/or replacement coils.

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 Accessories..... 2-142
 Approximate
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Standards Compliance

EN/IEC 60947-4-1, 60947-5-1
 IEC 60947 Type “2”
 Coordination
 CSA C22.2 No. 14
 UL 508
 Meets the material restrictions
 for European Directive
 2002/95/IEC-EU-RoHS

Certifications

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

Product Selection

3-Pole AC- and DC-Operated Contactors

I _e [A]		Ratings for Switching AC Motors — AC-2, AC-3, AC-4										Aux. Contacts		Cat. No.	
		3-Phase kW (50 Hz)				Hp (60 Hz)						N.O.	N.C.		
AC-3	AC-1	230V	400V/415V	500V	690V	1-Phase		3-Phase							
						115V	230V	200V	230V	460V	575V				
9	32	3	4	4	4	1/2	1-1/2	2	2	5	7-1/2	1	0	‡	100-C09⊗10
												0	1	‡	100-C09⊗01
12	32	4	5.5	5.5	5.5	1/2	2	3	3	7-1/2	10	1	0	‡	100-C12⊗10
												0	1	‡	100-C12⊗01
16	32	5.5	7.5	7.5	7.5	1	3	5	5	10	15	1	0	‡	100-C16⊗10
												0	1	‡	100-C16⊗01
23	32	7.5	11	13	10	2	3	5	7-1/2	15	15	1	0	‡	100-C23⊗10
												0	1	‡	100-C23⊗01
30	65	10	15	15	15	2	5	7-1/2	10	20	25	0	0		100-C30⊗00
												1	0		100-C30⊗10
37	65	11	18.5/20	20	18.5	3	5	10	10	25	30	0	1		100-C30⊗01
												1	0		100-C37⊗10
43	85	13	22	25	22	3	7-1/2	10	15	30	30	0	0		100-C37⊗01
												1	0		100-C43⊗00
60	100	18.5	32	37	32	5	10	15	20	40	50	1	0		100-C43⊗10
												0	1		100-C43⊗01
72	100	22	40	45	40	5	15	20	25	50	60	0	0		100-C60⊗00
												1	0		100-C60⊗10
85	100	25	45	55	45	7-1/2	15	25	30	60	60	0	1		100-C60⊗01
												1	0		100-C72⊗00
97	130	30	55	55	55	10	15	30	30	75	75	0	0		100-C72⊗10
												0	1		100-C72⊗01
97	130	30	55	55	55	10	15	30	30	75	75	0	0		100-C85⊗00
												1	0		100-C85⊗10
97	130	30	55	55	55	10	15	30	30	75	75	0	1		100-C85⊗01
												1	0		100-C97⊗00
97	130	30	55	55	55	10	15	30	30	75	75	1	0		100-C97⊗10
												0	1		100-C97⊗01

‡ For screwless terminals, add an "R" after the letter "C" in the catalog number. Example: **Cat. No. 100-C09⊗10** becomes **Cat. No. 100-CR09⊗10**.

⊗ Coil voltage code and terminal position—see page 2-131

4-Pole AC- and DC-Operated Contactors

I_e [A]		Ratings for Switching AC Motors — AC-2, AC-3										Contact Configuration, Main Pole		Cat. No.	
		3-Phase kW (50 Hz)*				Hp (60 Hz)									
AC-3	AC-1	230V	400V/415V	500V	690V	1-Phase		3-Phase *						N.O.	N.C.
						115V	230V	200V	230V	460V	575V				
9	32	3	4	4	4	1/2	1-1/2	2	2	5	7-1/2	4	0	‡	100-C09Ⓞ400
												3	1	‡	100-C09Ⓞ300
												2	2	‡	100-C09Ⓞ200
12	32	4	5.5	5.5	5.5	1/2	2	3	3	7-1/2	10	4	0	‡	100-C12Ⓞ400
												3	1	‡	100-C12Ⓞ300
												2	2	‡	100-C12Ⓞ200
16	32	5.5	7.5	7.5	7.5	1	3	5	5	10	15	4	0	‡	100-C16Ⓞ400
												3	1	‡	100-C16Ⓞ300
												2	2	‡	100-C16Ⓞ200
23	32	7.5	11	13	10	2	3	5	7-1/2	15	15	4	0		100-C23Ⓞ400
												3	1		100-C23Ⓞ300
												2	2		100-C23Ⓞ200
37	75	11	18.5/20	20	18.5	3	5	10	10	25	30	4	0		100-C40Ⓞ400
												2	2		100-C40Ⓞ200
85	130	25	45	55	45	7-1/2	15	25	30	60	50	4	0		100-C90Ⓞ400
												2	2		100-C90Ⓞ200

* Three-phase ratings apply only to contactors with at least three N.O. power poles.

‡ For screwless terminals, add an "R" after the letter "C" in the catalog number. Example: **Cat. No. 100-C09Ⓞ400** becomes **Cat. No. 100-CR09Ⓞ400**.

Ⓞ Coil voltage code and terminal position—see page 2-131

Reversing AC- and DC-Operated Contactors



Cat. No. 104-C09D22



Cat. No. 104-C30ZJ22



Cat. No. 104-C85D22

I _e [A]		Ratings for Switching AC Motors — AC-2, AC-3, AC-4										Auxiliary Contacts Installed per Contactor		Cat. No.
		3-Phase kW (50 Hz)					Hp (60 Hz)					N.O.	N.C.*	
		AC-3	AC-1	230V	400V/415V	500V	690V	1-Phase		3-Phase				
						115V	230V	200V	230V	460V	575V			
9	32	3	4	4	4	1/2	1-1/2	2	2	5	7-1/2	1	1	104-C09⊗22
12	32	4	5.5	5.5	5.5	1/2	2	3	3	7-1/2	10	1	1	104-C12⊗22
16	32	5.5	7.5	7.5	7.5	1	3	5	5	10	15	1	1	104-C16⊗22
23	32	7.5	11	13	10	2	3	5	7-1/2	15	15	1	1	104-C23⊗22
30	65	10	15	15	15	2	5	7-1/2	10	20	25	0	1	104-C30⊗02
												1	1	104-C30⊗22
37	65	11	18.5/20	20	18.5	3	5	10	10	25	30	0	1	104-C37⊗02
												1	1	104-C37⊗22
43	85	13	22	25	22	3	7.5	10	15	30	30	0	1	104-C43⊗02
												1	1	104-C43⊗22
60	100	18.5	32	37	32	5	10	15	20	40	50	0	1	104-C60⊗02
												1	1	104-C60⊗22
72	100	22	40	45	40	5	15	20	25	50	60	0	1	104-C72⊗02
												1	1	104-C72⊗22
85	100	25	45	55	45	7-1/2	15	25	30	60	60	0	1	104-C85⊗02
												1	1	104-C85⊗22
97	130	30	55	55	55	10	15	30	30	75	75	0	1	104-C97⊗02
												1	1	104-C97⊗22

* The N.C. auxiliary contact is supplied as part of the mechanical/electrical interlock.

⊗ Coil Voltage Code and Terminal Position

The Cat. No. as listed is incomplete. Select a coil voltage code from the table below to complete the Cat. No. Example: 120V, 60Hz:

Cat. No. 100-C09⊗10 becomes Cat. No. 100-C09D10.

[M]	12	24	32	36	42	48	100	100-110	110	120	127	200	200-220	208	208-240	220-230	230	230-240	240	277	347	380	380-400	400	400-415	440	480	500	550	600
50 Hz	R	K	V	W	X	Y	KP	—	D	P	S	KG	L	—	—	F	—	VA	T	—	—	—	N	—	G	B	—	M	C	—
60 Hz	Q	J	—	V	—	X	—	KP	—	D	—	—	KG	H	L	—	—	—	A	T	I	E	—	—	N	B	—	—	C	—
50/60 Hz	—	KJ	—	—	—	KY	KP	—	KD	—	—	KG	KL‡	—	—	KL‡	KF	—	KA	—	—	—	—	—	KN	—	KB	—	—	—

‡ Not available on 100/104-C90 or -C97 contactors.

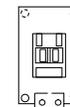
DC Voltages [V]		9	12	24	36	48	48-72	60	64	72	80	110	110-125	115	125	220	220-250	230	250
100-C09...C43	Standard	ZR	ZQ	ZJ	ZW	ZY	—	ZZ	ZB	ZG	ZE	ZD	—	ZP	ZS	ZA	—	ZF	ZT
	with Integrated Diode	—	—	DJ	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Electronic with Integrated Diode	—	EQ	EJ	—	—	EY	—	—	—	—	—	ED	—	—	—	EA	—	—
100-C60...C97	with Integrated Diode	DR	DQ	DJ	DW	DY	—	DZ	DB	DG	DE	DD	—	DP	DS	DA	—	DF	DT

Coil Terminal Position

- All contactors are delivered with the coil terminals located on the **line side**.
- For **load side** coil terminations, insert a “U” prior to the coil voltage code. Ordering example: **Cat. No. 100-C09UD10**.



Cat. No. 100-C09⊗10
Line Side



Cat. No. 100-C09U⊗10
Load Side

Assignment of Contacts

Auxiliary Contact Blocks		Contactors 100-C (AC and DC Control)							
			100-C09_@10 100-C12_@10 100-C16_@10 100-C23_@10	100-C09_@01 100-C12_@01 100-C16_@01 100-C23_@01	100-C30_@00 100-C37_@00 100-C43_@00 100-C60_@00 100-C72_@00 100-C85_@00 100-C97_@00	100-C09_@400 100-C12_@400 100-C16_@400 100-C23_@400 100-C40_@400 100-C90_@400		100-C09_@300 100-C12_@300 100-C16_@300 100-C23_@300	100-C09_@200 100-C12_@200 100-C16_@200 100-C23_@200 100-C40_@200 100-C90_@200
	Circuit Diagram	Control							

2

Side Mounting *								
100-SB01		AC/DC	10 + 01 = 11	01 + 01 = 02 ‡	00 + 01 = 01	00 + 01 = 01	00 + 01 = 01	00 + 01 = 01
100-SB10		AC/DC	10 + 10 = 20 ‡	01 + 10 = 11	00 + 10 = 10	00 + 10 = 10	00 + 10 = 10	00 + 10 = 10
100-SB02		AC/DC	10 + 02 = 12 ‡	—	00 + 02 = 02	00 + 02 = 02	00 + 02 = 02	00 + 02 = 02
100-SB11		AC/DC	10 + 11 = 21 ‡	01 + 11 = 12 ‡	00 + 11 = 11	00 + 11 = 11	00 + 11 = 11	00 + 11 = 11
100-SB20		AC/DC	10 + 20 = 30 ‡	01 + 20 = 21 ‡	00 + 20 = 20	00 + 20 = 20	00 + 20 = 20	00 + 20 = 20
100-SBL11 * ‡		AC/DC	10 + L11 = L21 ‡	01 + L11 = L12 ‡	00 + L11 = L11			

* Up to 8 auxiliary contacts possible: contactor + front mounted (AC max. 4 N.C. / DC max. 4 N.C.), side mounted (AC max. 2 N.O. / DC max. 2 N.O. and max. 2 N.C.).
 ‡ Early make and/or late break.
 ‡ Double numbering: because of double numbering only left-side mounting is recommended.

Device Combinations in Accordance with IEC 60947-1 / -4-1

Auxiliary Contact Blocks		Contactors 100-C (AC and DC Control)							
			100-C09_⊗10 100-C12_⊗10 100-C16_⊗10 100-C23_⊗10	100-C09_⊗01 100-C12_⊗01 100-C16_⊗01 100-C23_⊗01	100-C30_⊗00 100-C37_⊗00 100-C43_⊗00 100-C60_⊗00 100-C72_⊗00 100-C85_⊗00 100-C97_⊗00	100-C09_⊗400 100-C12_⊗400 100-C16_⊗400 100-C23_⊗400 100-C40_⊗400 100-C90_⊗400	100-C09_⊗300 100-C12_⊗300 100-C16_⊗300 100-C23_⊗300	100-C09_⊗200 100-C12_⊗200 100-C16_⊗200 100-C23_⊗200 100-C40_⊗200 100-C90_⊗200	
Circuit Diagram	Control								
Front Mounting *									
100-FA02, 100-FAB02		AC/DC	10 + 02 = 12	01 + 02 = 03	00 + 02 = 02	00 + 02 = 02	00 + 02 = 02	00 + 02 = 02	
100-FA11, 100-FAB11		AC/DC	10 + 11 = 21	01 + 11 = 12	00 + 11 = 11	00 + 11 = 11	00 + 11 = 11	00 + 11 = 11	
100-FB11, 100-FBB11		AC/DC	—	—	00 + 11 = 11	00 + 11 = 11	00 + 11 = 11	00 + 11 = 11	
100-FC11, 100-FCB11		AC/DC	10 + 11 = 21	—	—	—	—	—	
100-FA20, 100-FAB20		AC/DC	10 + 20 = 30	01 + 20 = 21	00 + 20 = 20	00 + 20 = 20	00 + 20 = 20	00 + 20 = 20	
100-FBL11 †		AC/DC	—	—	00 + L11 = L11	00 + L11 = L11	00 + L11 = L11	00 + L11 = L11	
100-FA22, 100-FAB22		AC/DC	10 + 22 = 32	01 + 22 = 23	00 + 22 = 22	00 + 22 = 22	00 + 22 = 22	00 + 22 = 22	
100-FB22, 100-FBB22		AC/DC	—	—	00 + 22 = 22	00 + 22 = 22	00 + 22 = 22	00 + 22 = 22	
100-FC22, 100-FCB22		AC/DC	10 + 22 = 32	—	—	—	—	—	
100-FA31, 100-FAB31		AC/DC	10 + 31 = 41	01 + 31 = 32	00 + 31 = 31	00 + 31 = 31	00 + 31 = 31	00 + 31 = 31	
100-FA40, 100-FAB40		AC/DC	10 + 40 = 50	01 + 40 = 41	00 + 40 = 40	00 + 40 = 40	00 + 40 = 40	00 + 40 = 40	
100-FAL22 †		AC/DC	10 + L22 = L32	01 + L22 = L23	00 + L22 = L22	00 + L22 = L22	00 + L22 = L22	00 + L22 = L22	
100-FA04, 100-FAB04		AC/DC	10 + 04 = 14	01 + 04 = 05	00 + 04 = 04	00 + 04 = 04	00 + 04 = 04	00 + 04 = 04	
100-FA13, 100-FAB13		AC/DC	10 + 13 = 23	01 + 13 = 14	00 + 13 = 13	00 + 13 = 13	00 + 13 = 13	00 + 13 = 13	
100-FB02, 100-FBB02		AC/DC	10 + 02 = 12	01 + 02 = 03	00 + 02 = 02	00 + 02 = 02	00 + 02 = 02	00 + 02 = 02	
100-FB20, 100-FBB20		AC/DC	10 + 20 = 30	01 + 20 = 21	00 + 20 = 20	00 + 20 = 20	00 + 20 = 20	00 + 20 = 20	
100-FC31, 100-FCB31		AC/DC	10 + 31 = 41	01 + 31 = 32	00 + 31 = 31	00 + 31 = 31	00 + 31 = 31	00 + 31 = 31	

* Up to 8 auxiliary contacts possible: contactor + front mounted (AC max. 4 N.C. / DC max. 4 N.C.), side mounted (AC max. 2 N.O. / DC max. 2 N.O. and max. 2 N.C.).

† Early make and/or late break.

‡ Double numbering: because of double numbering only left-side mounting is recommended.



Bulletin 100S-C/104S-C — IEC Safety Contactors

- Mechanically linked N.C. auxiliary contacts
- Front-mounted auxiliary contacts
 - Gold bifurcated
 - Permanently fixed
 - Protective cover to prevent manual operation
 - Red contact housing foreasy identification
 - Incorporates IEC 60947-5-1 “Mechanically Linked” symbol
- AC and DC operating coils
- SUVA Third-Party certification

Bulletin 100S-C/104S-C safety contactors provide mechanically linked positively guided contacts, required in feedback circuits of modern safety applications. The mechanically linked N.C. auxiliary contacts will not change state when a power pole welds. In addition, the gold-plated bifurcated auxiliary contacts are ideally suited for low-energy applications or feedback control circuits with multiple series-connected N.C. auxiliary contacts.

Your order must include: cat. no. of the contactor specified with coil voltage code and, if required, cat. no. of any accessories and/or replacement coils.

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 Approximate
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Standards Compliance

EN50205
 CSA C22.2 No. 14
 UL 508
 EN/IEC 60947-4
 IEC 60947-4-1 Annex H — Mirror
 Contacts
 IEC 60947-5-1 Annex L —
 Mechanically Linked Contacts
 Meets the material restrictions for
 European Directive
 2002/95/IEC-EU-RoHS

Certifications

SUVA Third-Party Certified
 CE Marked
 cULus Listed (File No. E3125;
 Guide NLDX, NLDX7)

Product Selection
3-Pole AC- and DC-Operated Contactors

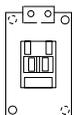
I_e [A]		Ratings for Switching AC Motors — AC-2, AC-3, AC-4										Aux. Contacts		Cat. No.*
		3-Phase kW (50 Hz)				Hp (60 Hz)								
		AC-3	AC-1	230V	400V/ 415V	500V	690V	1-Phase		3-Phase				
						115V	230V	200V	230V	460V	575V	N.O.	N.C.	
9	32	3	4	4	4	1/2	1-1/2	2	2	5	7-1/2	0	5	100S-C09@05BC
												1	4	100S-C09@14BC
12	32	4	5.5	5.5	5.5	1/2	2	3	3	7-1/2	10	0	5	100S-C12@05BC
												1	4	100S-C12@14BC
16	32	5.5	7.5	7.5	7.5	1	3	5	5	10	15	0	5	100S-C16@05BC
												1	4	100S-C16@14BC
23	32	7.5	11	13	10	2	3	5	7-1/2	15	15	0	5	100S-C23@05BC
												1	4	100S-C23@14BC
30	65	10	15	15	15	2	5	7-1/2	10	20	25	0	4	100S-C30@04BC
												1	4	100S-C30@14BC
37	65	11	18.5/20	20	18.5	3	5	10	10	25	30	0	4	100S-C37@04BC
												1	4	100S-C37@14BC
43	85	13	22	25	22	3	7-1/2	10	15	30	30	0	4	100S-C43@04BC
												1	4	100S-C43@14BC
60	100	18.5	32	37	32	5	10	15	20	40	50	0	4	‡ 100S-C60@04BC
												1	4	‡ 100S-C60@14BC
72	100	22	40	45	40	5	15	20	25	50	60	0	4	‡ 100S-C72@04BC
												1	4	‡ 100S-C72@14BC
85	100	25	45	55	45	7-1/2	15	25	30	60	60	0	4	‡ 100S-C85@04BC
												1	4	‡ 100S-C85@14BC
97	130	30	55	55	55	10	15	30	30	75	75	0	4	‡ 100S-C97@04BC
												1	4	‡ 100S-C97@14BC

* For other contact configurations and full product details, please contact your local Rockwell Automation sales office or Allen-Bradley distributor.

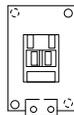
‡ If standard cross-stamped front-mount auxiliary contacts are required, remove the letter "B" before the letter "C" in the cat. no. Example: Cat. No. **100S-C09@05BC** becomes Cat. No. **100S-C09@05C**.

‡ Bifurcated front-mount auxiliary contacts on Cat. Nos. **100S-C60...C97** conform to mirror contact performance only.

⊗ Coil voltage code and terminal position—see page 2-137



Cat. No.
100S-C09@05C
Line Side



Cat. No.
100S-C09U@05C
Load Side

4-Pole AC- and DC-Operated Contactors

I_e [A]		Ratings for Switching AC Motors										Contact Configuration				Cat. No.*‡
		AC-2, AC-3, AC-4					Hp (60 Hz)					Main Pole		Auxiliary Contacts		
		3-Phase kW (50 Hz)*										1-Phase		3-Phase *		
AC-3	AC-1	230V	400V/ 415V	500V	690V	115V	230V	200V	230V	460V	575V	N.O.	N.C.	N.O.	N.C.	
9	32	3	4	4	4	1/2	1-1/2	2	2	5	7-1/2	4	0	0	4	100S-C09⊗404BC
												3	1	0	4	100S-C09⊗304BC
12	32	4	5.5	5.5	5.5	1/2	2	3	3	7-1/2	10	4	0	0	4	100S-C12⊗404BC
												3	1	0	4	100S-C12⊗304BC
16	32	5.5	7.5	7.5	7.5	1	3	5	5	10	15	4	0	0	4	100S-C16⊗404BC
												3	1	0	4	100S-C16⊗304BC
23	32	7.5	11	13	10	2	3	5	7-1/2	15	15	4	0	0	4	100S-C23⊗404BC
												3	1	0	4	100S-C23⊗304BC

* For other contact configurations, please contact your local Rockwell Automation sales office or Allen-Bradley distributor.

* Three-phase ratings only apply to contactors with at least three N.O. power poles.

‡ If standard cross-stamped front-mount auxiliary contacts are required, remove the letter "B" before the letter "C" in the cat. no. Example: Cat. No. **100S-C09⊗404BC** becomes Cat. No. **100S-C09⊗404C**.

⊗ Coil voltage code and terminal position—see page 2-137



Bulletin 100S-C/104S-C
IEC Safety Contactors
 Product Selection

Reversing AC- and DC-Operated Contactors

- 3 Main Contacts
- Includes Mechanical/Electrical Interlock
- Includes Reversing Power Wiring



2

I_e [A]		Ratings for Switching AC Motors										Aux. Contacts Installed per Contactor		Cat. No.*
		AC-2, AC-3, AC-4												
		3-Phase kW (50 Hz)				Hp (60 Hz)								
AC-3	AC-1	230V	400V/ 415V	500V	690V	1-Phase		3-Phase				N.O.	N.C. ‡	
						115V	230V	200V	230V	460V	575V			
9	32	3	4	4	4	1/2	1-1/2	2	2	5	7-1/2	0	6	104S-C090012BC
												1	5	104S-C090210BC
12	32	4	5.5	5.5	5.5	1/2	2	3	3	7-1/2	10	0	6	104S-C120012BC
												1	5	104S-C120210BC
16	32	5.5	7.5	7.5	7.5	1	3	5	5	10	15	0	6	104S-C160012BC
												1	5	104S-C160210BC
23	32	7.5	11	13	10	2	3	5	7-1/2	15	15	0	6	104S-C230012BC
												1	5	104S-C230210BC
30	65	10	15	15	15	2	5	7-1/2	10	20	25	0	5	104S-C300010BC
												1	5	104S-C300210BC
37	65	11	18.5/20	20	18.5	3	5	10	10	25	30	0	5	104S-C370010BC
												1	5	104S-C370210BC
43	85	13	22	25	22	3	7-1/2	10	15	30	30	0	5	104S-C430010BC
												1	5	104S-C430210BC
60	100	18.5	32	37	32	5	10	15	20	40	50	0	5	§ 104S-C600010BC
												1	5	§ 104S-C600210BC
72	100	22	40	45	40	5	15	20	25	50	60	0	5	§ 104S-C720010BC
												1	5	§ 104S-C720210BC
85	100	25	45	55	45	7-1/2	15	25	30	60	60	0	5	§ 104S-C850010BC
												1	5	§ 104S-C850210BC
97	130	30	55	55	55	10	15	30	30	75	75	0	5	§ 104S-C970010BC
												1	5	§ 104S-C970210BC

* For other contact configurations, please contact your local Rockwell Automation sales office or Allen-Bradley distributor.

‡ If standard cross-stamped front-mount auxiliary contacts are required, remove the letter "B" before the letter "C" in the cat. no. Example: Cat. No. **104S-C09005BC** becomes Cat. No. **104S-C09005C**.

‡ One of the N.C. auxiliary contacts is supplied as part of the mechanical/electrical interlock.

§ Bifurcated front-mount auxiliary contacts on Cat. Nos. **104S-C60...C97** conform to mirror contact performance only.



⊗ **Coil Voltage Code and Terminal Position**

The Cat. No. as listed is incomplete. Select a coil voltage code from the table below to complete the Cat. No. Example: 120V, 60Hz: **Cat. No. 100S-C09⊗05BC** becomes **Cat. No.100S-C09D05BC**.

[V]	12	24	32	36	42	48	100	100-110	110	120	127	200	200-220	208	208-240	220-230
AC, 50 Hz	R	K	V	W	X	Y	KP	—	D	P	S	KG	L	—	—	F
AC, 60 Hz	Q	J	—	V	—	X	—	KP	—	D	—	—	KG	H	L	—
AC, 50/60 Hz	—	KJ	—	—	—	KY	KP	—	KD	—	—	KG	KL‡	—	—	KL‡

‡ Not available on 100S/104S-C97 contactors.

[V]	230	230-240	240	277	347	380	380-400	400	400-415	440	480	500	550	600
AC, 50 Hz	—	VA	T	—	—	—	N	—	G	B	—	M	C	—
AC, 60 Hz	—	—	A	T	I	E	—	—	—	N	B	—	—	C
AC, 50/60 Hz	KF	—	KA	—	—	—	—	KN	—	KB	—	—	—	—

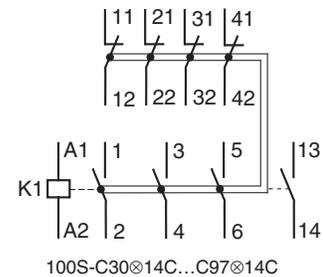
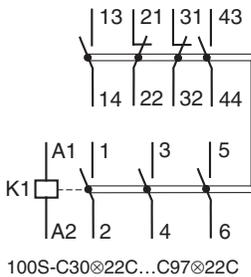
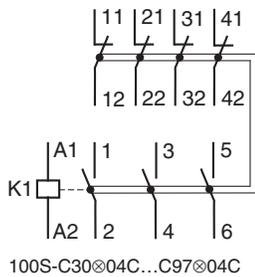
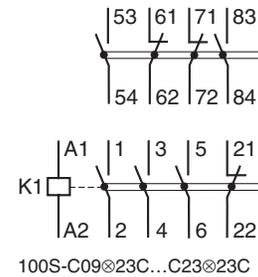
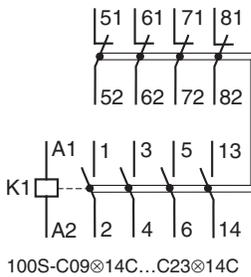
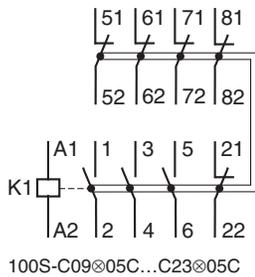
[V]		9	12	24	36	48	48-72	60	64	72	80	110	110-125	115	125	220	220-250	230	250
100S-C09...C43	Standard	ZR	ZQ	ZJ	ZW	ZY	—	ZZ	ZB	ZG	ZE	ZD	—	ZP	ZS	ZA	—	ZF	ZT
	with Integrated Diode	—	—	DJ	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Electronic with Integrated Diode	—	EQ	EJ	—	—	EY	—	—	—	—	—	ED	—	—	—	EA	—	—
100S-C60...C97	with Integrated Diode	DR	DQ	DJ	DW	DY	—	DZ	DB	DG	DE	DD	—	DP	DS	DA	—	DF	DT

Coil Terminal Position

- All contactors are delivered with the coil terminals located on the **line side**.
- For **load side** coil terminations, insert a “**U**” prior to the coil voltage code. Example: **Cat. No. 100S-C09UD05BC**.

Assignment of Contacts

Safety Contactors with 3 Main Contacts and Standard Front-Mount Auxiliary Contacts

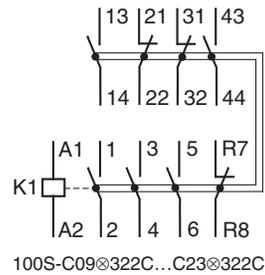
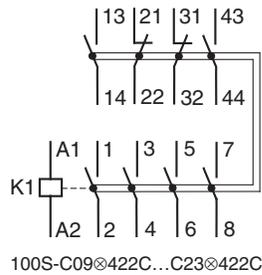
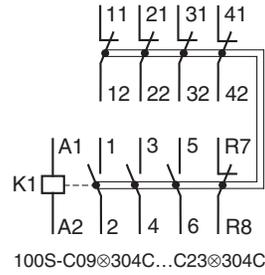
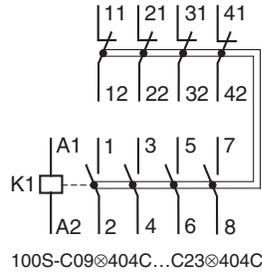


IEC Safety Contactors

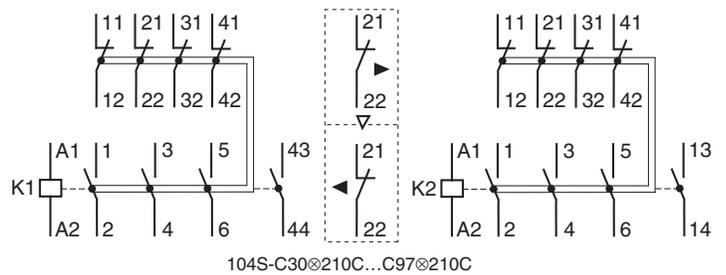
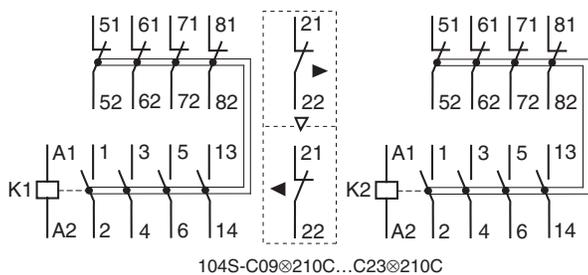
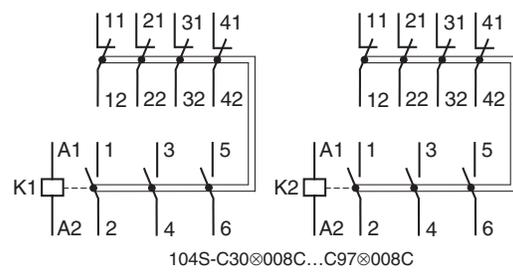
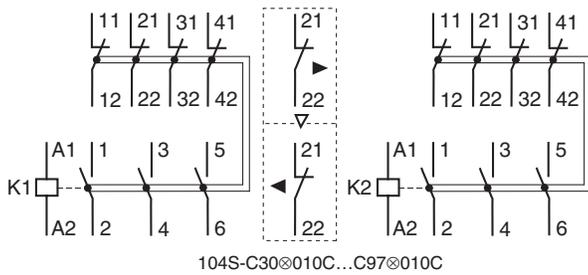
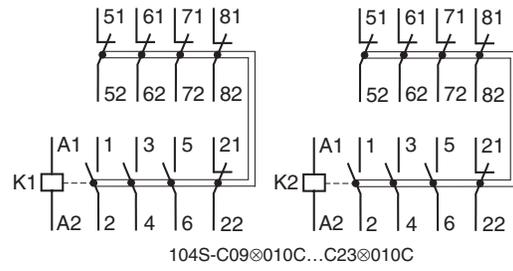
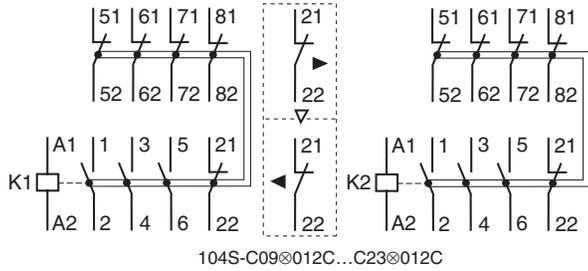
Assignment of Contacts

Safety Contactors with 4 Main Contacts and Standard Front-Mount Auxiliary Contacts

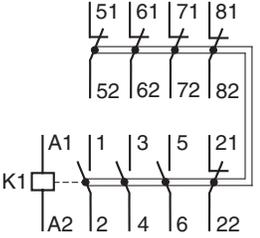
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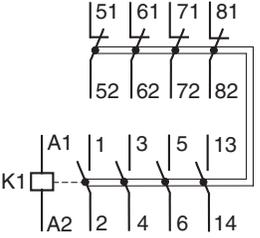
Safety Reversing Contactors with 3 Main Contacts and Standard Front-Mount Auxiliary Contacts



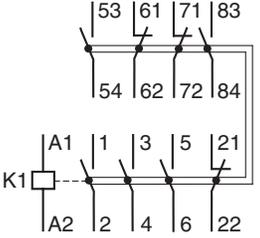
Safety Contactors with 3 Main Contacts and Bifurcated Front-Mount Auxiliary Contacts



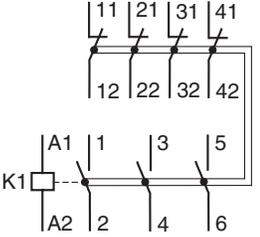
100S-C09@05BC...C23@05BC



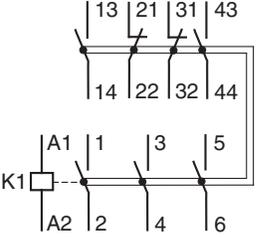
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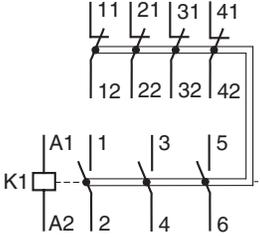
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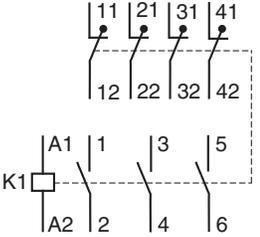
100S-C30@04BC...C43@04BC



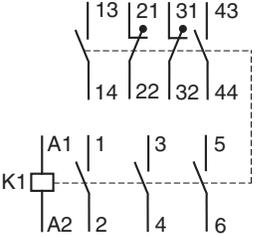
100S-C30@22BC...C43@22BC



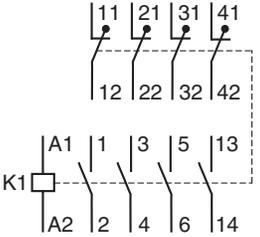
100S-C30@14BC...C43@14BC



100S-C60@04BC...C97@04BC

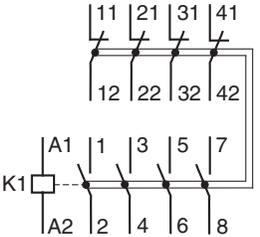


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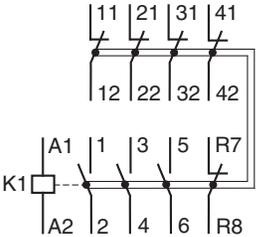


100S-C60@14BC...C97@14BC

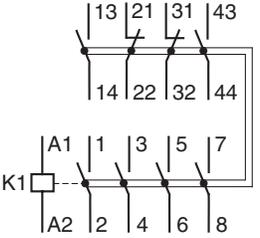
Safety Contactors with 4 Main Contacts and Bifurcated Front-Mount Auxiliary Contacts



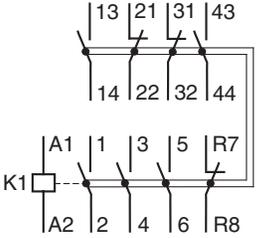
100S-C09@404BC...C23@404BC



100S-C09@304BC...C23@304BC



100S-C09@422BC...C23@422BC

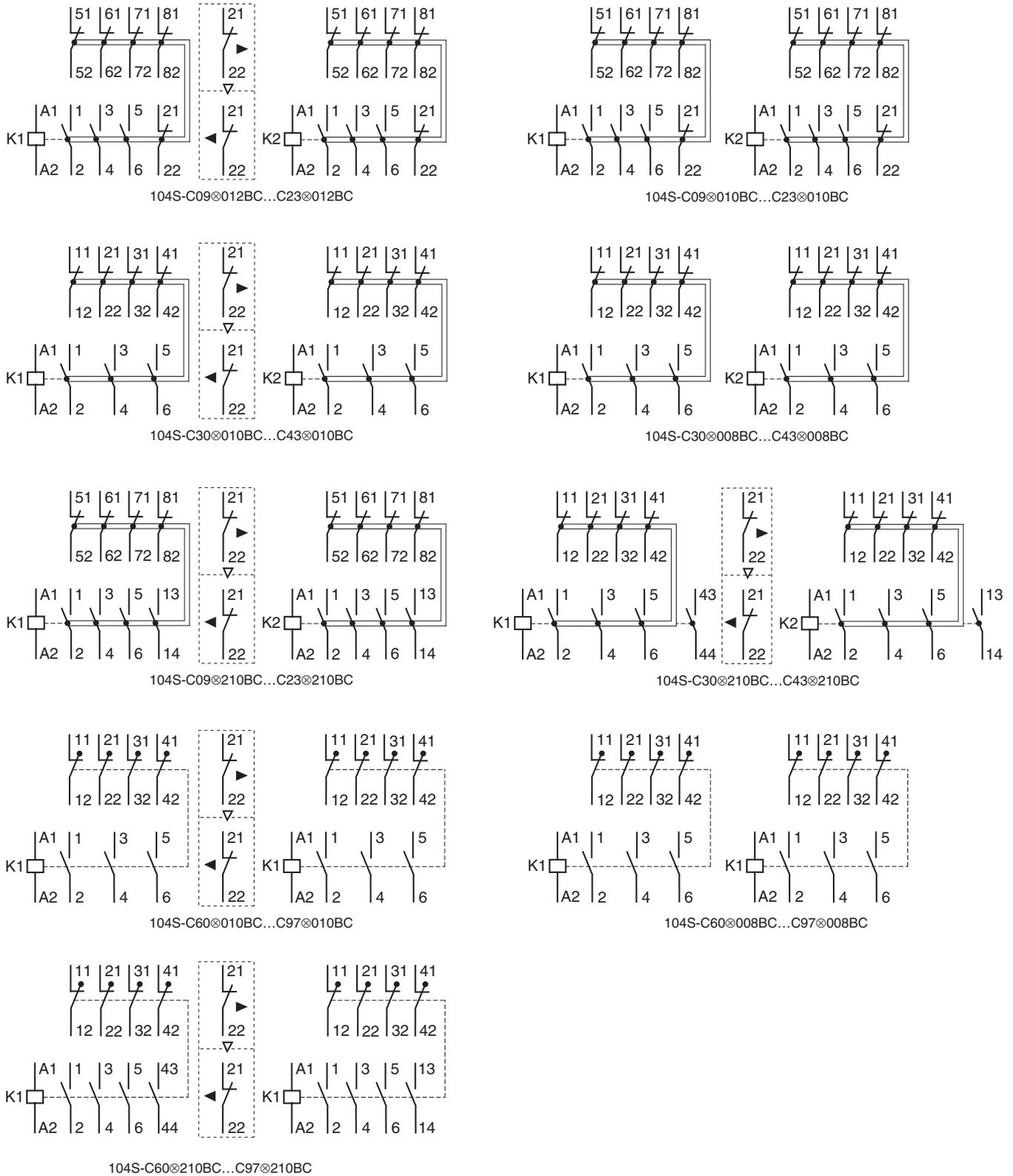


100S-C09@322BC...C23@322BC

IEC Safety Contactors

Assignment of Contacts

Safety Reversing Contactors with 3 Main Contacts and Bifurcated Front-Mount Auxiliary Contacts



2



Cat. No. 100Q-C37A11

Bulletin 100Q-C — Capacitor-Switching Contactors

- Compact sizes
- Limits high inrush currents
- AC and DC coil control
- Reversible coil terminals
- Panel or 35 mm DIN Rail mounting
- Environmentally friendly materials

The Bulletin 100Q-C Capacitor-Switching contactors are designed for switching banks of capacitors. The unique design uses front-mounted resistor elements that limit the severely high inrush currents seen in these applications. This reduces stress to the contactors and the capacitors, as well as allowing a more compact and economical design without the use of air-core reactors.

Your order must include: cat. no. of the contactor specified with coil voltage code and, if required, cat. no. of any accessories.

Table of Contents

Product Selection this page
 Approximate Dimensions..... 2-196

Standards Compliance

IEC 60947-4
 CSA C22.2 No. 14
 UL 508
 Meets the material restrictions for European Directive 2002/95/IEC-EU-RoHS

Certifications

CE Marked
 cULus Listed (File No. E 41850, Guide NLDX, NLDX7)



Product Selection
 For Applications per IEC 60947-4 (AC-6b)

Ratings for Switching Capacitor Banks @ 40 °C

1-Phase 50 Hz (kVar)						3-Phase 50 Hz (kVar)						Aux. Contacts		Cat. No.
230V	240V	400V	415V	500V	690V	230V	240V	400V	415V	500V	690V	N.O.	N.C.	
5	5	8.5	9	10.5	15	8.5	8.5	15	15.5	18.5	25	1	1	100Q-C16®11
												2	0	100Q-C16®20
8	8.5	14	14.5	17.5	24	14	14	25	25	30	40	1	1	100Q-C37®11
												2	0	100Q-C37®20

Ratings for Switching Capacitor Banks @ 60 °C

1-Phase 50 Hz (kVar)						3-Phase 50 Hz (kVar)						Aux. Contacts		Cat. No.
230V	240V	400V	415V	500V	690V	230V	240V	400V	415V	500V	690V	N.O.	N.C.	
5	5	8.5	9	10.5	15	8.5	8.5	15	15.5	18.5	25	1	1	100Q-C16®11
												2	0	100Q-C16®20
8	8.5	14	14.5	17.5	24	14	14	25	25	30	40	1	1	100Q-C37®11
												2	0	100Q-C37®20

For Applications per UL/CSA

Ratings for Switching Capacitor Banks

1-Phase 60 Hz (kVar)		3-Phase 60 Hz (kVar)				Aux. Contacts		Cat. No.
115V	230V	200V	230V	460V	600V	N.O.	N.C.	
2.2	4.5	6.5	7.5	15	18.5	1	1	100Q-C16®11
						2	0	100Q-C16®20
3.6	7.5	11	12.5	20	25	1	1	100Q-C37®11
						2	0	100Q-C37®20

⊗ **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: 120V, 60 Hz:
Cat. No. 100Q-C16®11 becomes **Cat. No.100Q-C16D11**.

[V]	12	24	32	36	42	48	100	100-110	110	120	127	200	200-220	208	220-240	230	230-240	240	277	347	380	380-400	400	400-415	440	480	500	550	600	
50 Hz	R	K	V	W	X	Y	KP	—	D	P	S	KG	L	—	—	F	—	VA	T	—	—	—	N	—	G	B	—	M	C	—
60 Hz	Q	J	—	V	—	X	—	KP	—	D	—	—	KG	H	L	—	—	A	T	I	E	—	—	—	N	B	—	—	C	—
50/60 Hz	—	KJ	—	—	—	KY	KP	—	KD	—	—	KG	KL	—	—	KL	KF	—	KA	—	—	—	—	KN	—	KB	—	—	—	—

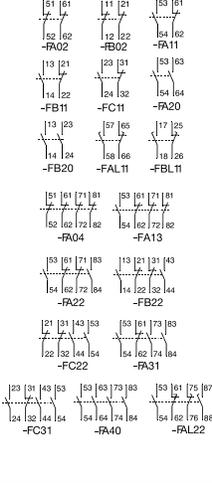
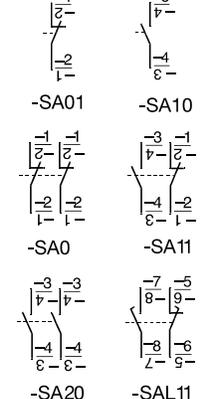
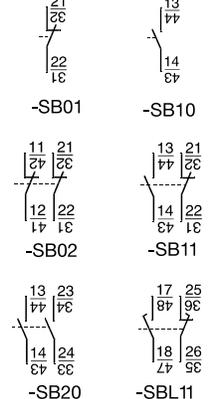
DC Voltages [V]	9	12	24	36	48	60	64	72	80	110	110-125	115	125	220	220-250	230	250
Standard	ZR	ZQ	ZJ	ZW	ZY	ZZ	ZB	ZG	ZE	ZD	—	ZP	ZS	ZA	—	ZF	ZT
with Integrated Diode	—	—	DJ	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Electronic with Integrated Diode	—	EQ	EJ	—	—	—	—	—	—	—	ED	—	—	—	EA	—	—

Maximum Operational Rates

100Q-C16 200 operations/hour
 100Q-C37 100 operations/hour

Auxiliary Contacts (For 100-C09...C97 contactors)

2

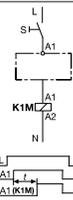
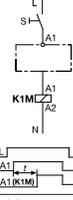
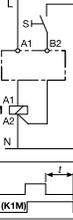
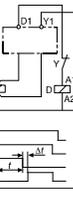
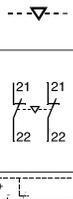
	Description			Connection Diagrams	For Use With	Standard Auxiliary Contact Cat. No. ‡	Bifurcated Auxiliary Contact Cat. No.	
		N.O.	N.C.					
 <p>Auxiliary Contact Blocks for Front Mounting*</p> <ul style="list-style-type: none"> • 2- and 4-pole • Quick and easy mounting without tools • Electronic-compatible 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 • 1L = Late break N.C./early make N.O. • Bifurcated version for switching down to 5V, 3 mA also available 	0	2		100-C all	100-FA02	100-FAB02		
	1	1		C30®00...C97®00	100-FB02	100-FBB02		
	2	0		100-C all	100-FA11	100-FAB11		
	1L	1L		C30®00...C97®00	100-FB11	100-FBB11		
	0	4		C09®10...C23®10	100-FC11	100-FCB11		
	1	3		100-C all	100-FA20	100-FAB20		
	2	2		C30®00...C97®00	100-FB20	100-FBB20		
	3	1		100-C all	100-FAL11	—		
	4	0		C30®00...C97®00	100-FBL11	—		
	1+1L	1+1L		100-C all	100-FA04	100-FAB04		
	 <p>Auxiliary Contact Blocks for Side Mounting without Sequence Terminal Designations*</p> <ul style="list-style-type: none"> • 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 • 1L = Late break N.C./early make N.O. 	0		1		100-C all	100-SA01	—
		1		0		100-C all	100-SA10	—
0		2	100-C all	100-SA02		—		
1		1	100-C all	100-SA11		—		
2		0	100-C all	100-SA20		—		
1L		1L	100-C all	100-SAL11		—		
 <p>Auxiliary Contact Blocks for Side Mounting with Sequence Terminal Designations*</p> <ul style="list-style-type: none"> • 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 • 1L = Late break N.C./early make N.O. 	0	1		100-C	100-SB01	—		
	1	0		100-C*	100-SB10	—		
	0	2		100-C*	100-SB02	—		
	1	1		100-C*	100-SB11	—		
	2	0		100-C*	100-SB20	—		
	1L	1L		100-C*	100-SBL11	—		

* Max. number of auxiliary contacts that may be mounted:
 AC and 24V DC electronic 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.

⊛ Double numbering — Left-side mounting only is recommended for **Cat. No. 100-C09...100-C23** due to double numbering.

‡ For screwless terminals (front mount only), insert "CR" after the "100-" in the catalog number. Example: **Cat. No. 100-FA02** becomes **Cat. No. 100-CRFA02**.

Control Modules (For 100-C09...C97 contactors)

	Description	Connection Diagrams	For Use With	Cat. No.			
	Pneumatic Timing Modules • Pneumatic timing element contacts switch after the delay time. The contacts on the main contactor relay continue to operate without delay.	On-Delay 0.3...30 s Range 1.8...180 s Range		100-C or 700-CF with AC or 24V DC electronic coils†	100-FPTA30 100-FPTA180		
		Off-Delay 0.3...30 s Range 1.8...180 s Range			100-C all, 700-CF all	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.		0.1...3 s Range 1...30 s Range 10...180 s Range		100-C or 700-CF with 110...240V, 50/60 Hz or 110...250V DC coils
				0.1...3 s Range 1...30 s Range 10...180 s Range			
	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 deenergized at the end of the delay time.			0.3...3 s Range 1...30 s Range 10...180 s Range			100-C09...C37 or 700-CF with 24V 50/60 Hz coils
				0.3...3 s Range 1...30 s Range 10...180 s Range			
		0.3...3 s Range 1...30 s Range 10...180 s Range		100-C with 110...240V, 50/60 Hz coils			
		0.3...3 s Range 1...30 s Range 10...180 s Range				100-C (except 100-C40, -C90)	100-MCA00
		0.3...3 s Range 1...30 s Range 10...180 s Range			100-C (except 100-C40, -C90)		100-MCA02
		0.3...3 s Range 1...30 s Range 10...180 s Range	100-C with AC or 24V DC electronic coils (except 100-C90)	100-FL11⊗			

† Cannot be used with side-mounted auxiliary contacts on 700-CF DC relays.

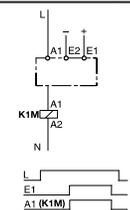
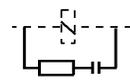
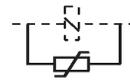
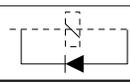
⊗ **Coil Voltage Code**

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* [V]	24	48	100	110	120	230...240	240	277	380...400	400...415	440	480
50 Hz	K	Y	KP	D	—	VA	KA	—	N	G	B	—
60 Hz	J	—	—	—	D	—	KA	T	—	—	N	B

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

Control Modules (For 100-C09...C97 contactors), Continued

	Description	Voltage Range	Connection Diagrams	For Use With	Cat. No.	
	DC Interface (Electronic) <ul style="list-style-type: none"> Interface between the DC control signal (PLC) and the AC operating mechanism of the contactor. Requires no additional surge suppression on the relay coils 	Input: 12V DC Output: 110...240V AC		100-C with AC coils 110...240V AC	100-JE12	
		Input: 18...30V DC Output: 110...240V AC			100-JE	
		Input: 48V DC Output: 110...240V AC			100-JE48	
	Surge Suppressors <ul style="list-style-type: none"> For limitation of coil switching transients. Plug-in, coil mounted. Suitable for 100-C contactor sizes, 9...97 A. RC, varistor, and diode versions. 	24...48V AC, 50/60 Hz		100-C with AC coils	‡ 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		100-C with AC coils or 100-C09...-C43 with DC coils	‡ 100-FSV55
			56...136V AC/ 78...180V DC			‡ 100-FSV136
			137...277V AC/ 181...350V DC			‡ 100-FSV277
			278...575V AC			‡ 100-FSV575
		Diode Module DC operating mechanism	12...250V DC		100-C09...-C43 with DC coils	‡ 100-FSD250

‡ For screwless terminals, insert "CR" after the "100-" in the catalog number. Example: **Cat. No. 100-FSC48** becomes **Cat. No. 100-CR-FSC48**.

Assembly Components (For 100-C09...C97 contactors)

	Description	For Use With	Pkg. Quantity	Cat. No.
 Cat. No. 100-S0	Dovetail Connectors <ul style="list-style-type: none"> For use in contactor and starter assemblies. Single Connector — 0 mm Spacing 	100-C	10	100-S0
	Dovetail Connectors <ul style="list-style-type: none"> For use in contactor and starter assemblies. Dual Connector — 9 mm Spacing 			100-S9
 Cat. No. 100-SCCA	Protective Covers <ul style="list-style-type: none"> Provides protection against unintended manual operation For contactors and front-mounted auxiliary contacts, pneumatic timers, and latches 	100-C all	1	100-SCCA
 Cat. No. 100-SCFA		100-FA, -FB, -FC, -FP, -FL;	10	100-SCFA
 Cat. No. 105-PW23	Reversing Power Wiring Kits <ul style="list-style-type: none"> For reversing connection with a solid-state or thermal overload relay 	100-C09...C23	1	105-PW23
		100-C30...C37	1	105-PW37
		100-C43	1	105-PW43
		100-C60...C97	1	105-PW85
	DIN (#3) symmetrical hat rail 35 x 7.5 x 1 m	140M-D 140M-F 100-C all	10	199-DR1

Wye-Delta/Star-Delta Starter Kits

Wye-Delta power wiring kits were designed to aid in the field assembly of open-transition wye-delta starters that use Bulletin 100-C contactors. These kits include line, load, and start-point (shorting) connections. Assembling a wye-delta starter requires the use of the following additional components:

- Contactors
- Overload Relay
- Cat. No. 100-MCA02 Mechanical/Electrical Interlock
- Cat. No. 100-ETY30 Electronic Y-Δ Timer
- Cat. No. 100-S9 Base Coupler for 1M to 2M contactor (optional)



Cat. No. 170-PW23

3-Phase Rating											Pkg. Qty.	Cat. No.
kW (50 Hz)				Hp (60 Hz)				Use with Cat. No. 100-				
230V	380/415V	500V	690V	200V	230V	460V	575V	Delta	Wye			
								1M	2M	1S		
5.5	8	8	8	5	5	10	10	C09	C09	C09	1	170-PW23
7.5	11	11	11	5	7.5	15	15	C12	C12	C09	1	170-PW23
10	14	15	14	7.5	10	20	20	C16	C16	C12	1	170-PW23
14	21	21	19	7.5	10	25	25	C23	C23	C12	1	170-PW23
18	28	28	28	10	15	30	30	C30	C30	C16	1	170-PW37
19	35	35	32	15	20	40	40	C37	C37	C23	1	170-PW37
23	40	40	41	20	25	50	50	C43	C43	C30	1	170-PW43
33	58	60	56	30	40	75	75	C60	C60	C37	1	170-PW72
39	69	67	70	40	50	100	100	C72	C72	C43	1	170-PW72
47	82	82	81	50	60	125	125	C85	C85	C60	1	170-PW85
50	90	90	90	50	60	125	125	C97	C97	C60	1	170-PW85

Package Quantity = 1

Marking Systems (For 100-C09...C97 contactors)

	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.

Terminal Kits (For 100-C09...C97 contactors)

	Description	Max. Current Ratings and Wire Sizes	Pkg. Qty.*	Cat. No.
	Stab Connector Kit Dual stab (0.250 in.) for 100-C coil terminals For 100-C09...C97 contactors		20	199-SC2
	Stab Connector Kit Dual stab (0.250 in.) for 100-C power terminals For 100-C09...C23 contactors		100	199-SC10
	3-Pole Terminal Lug Kit For Cat. No. 100-C09...C23 (Line side)	IEC @ 40 °C IEC @ 40 °C UL/CSA (Encl.)	45 A (4...16 mm ² *, fine stranded w/ ferrule) 45 A (4...25 mm ² , coarse stranded/solid) 40 A (#10...4 AWG, stranded/solid)	1 100-CTN23
	3-Pole Terminal Lug Kit For Cat. No. 100-C09...C23 (Load side)	IEC @ 40 °C IEC @ 40 °C UL/CSA (Encl.)	45 A (4...16 mm ² *, fine stranded w/ ferrule) 45 A (4...25 mm ² , coarse stranded/solid) 40 A (#10...4 AWG, stranded/solid)	1 100-CTL23
	3-Pole Terminal Lug Kit For Cat. No. 100-C30...C37 (Line and load side)	IEC @ 40 °C IEC @ 40 °C UL/CSA (Encl.)	60 A (4...16 mm ² *, fine stranded w/ ferrule) 60 A (4...25 mm ² , coarse stranded/solid) 55 A (#10...4 AWG, stranded/solid)	1 100-CT37
	1-Pole Terminal Lug Kit For Cat. No. 100-C43	IEC @ 40 °C IEC @ 40 °C UL/CSA (Encl.)	90 A (6...35 mm ² , fine stranded w/ ferrule) 90 A (6...50 mm ² , coarse stranded/solid) 75 A (#8...2 AWG, stranded/solid)	3 100-CT43
	1-Pole Terminal Lug Kit For Cat. No. 100-C60...C97	IEC @ 40 °C IEC @ 40 °C UL/CSA (Encl.)	130 A (10...70 mm ² , fine stranded w/ ferrule) 130 A (10...95 mm ² , coarse stranded/solid) 130 A (#8...2/0 AWG, stranded/solid)	3 100-CT85
	3-Pole Paralleling Kit For Cat. No. 100-C09...C23	IEC @ 40 °C IEC @ 40 °C UL/CSA (Encl.)	100 A (35...70 mm ² , fine stranded w/ ferrule) 100 A (35...95 mm ² , coarse stranded/solid) 100 A (#0...2/0 AWG, stranded/solid)	2 100-CP23
	3-Pole Paralleling Kit For Cat. No. 100-C30...C37	IEC @ 40 °C IEC @ 40 °C UL/CSA (Encl.)	150 A (35...70 mm ² , fine stranded w/ ferrule) 150 A (35...95 mm ² , coarse stranded/solid) 150 A (#0...2/0 AWG, stranded/solid)	2 100-CP37

* Must be ordered in multiples of the package quantity.
 * 16 mm² max. according to IEC 60947; actual max. 25 mm².

SEMI-F47 Voltage Sag Immunity Module

	Description	Input Voltage	For Use With‡	Options	Cat. No.
	SEMI-F47 Module • Meets SEMI-F47 voltage sag immunity requirements • Direct mounting to coil terminals of 100-C contactors and 700-CF control relays • Requires DC coil contactor • Optional 1...30 s ON-delay timer version	24...240V AC	100-C09...C97 700-CF	without timer	100-CSF47
		110...240V AC	100-C09...C97 700-CF	with 1...30 s ON-delay timer	100-CSF47A30

‡ Contactor must have DC coil at the same voltage as AC input. Example: for 24V AC control, select **Cat. No. 100-C09ZJ10** (24V DC coil).

2



Bulletin 100-D — IEC Contactors

- 63...500 kW @ 400V
- 75...600 Hp @ 460V
- 100...700 Hp @ 575V
- Electronic and conventional coils
 - AC & DC
 - Integrated PLC interface
 - Low power pick-up & hold-in
 - Wide voltage ranges
- Complete range of accessories
- Environmentally friendly
- Compact dimensions

The Bulletin 100-D/104-D contactor family, along with a wide range of common accessories and Bulletin 193 electronic overload relays, provides the most compact and flexible starter component system available.

Your order must include: cat. no. of the contactor specified with coil voltage code and, if required, cat. no. of any accessories and/or replacement coils.

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 Accessories..... 2-153
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Standards Compliance

IEC 60947-4-1
 IEC 60947 Type “2”
 Coordination
 CSA C22.2 No. 14
 UL 508

Certifications

CE Marked
 cULus Listed (File No. E
 41850, Guide NLDX, NLDX7)
 CCC (115...180 A -
 conventional coil;
 140...420 A - electronic coil)

3-Pole AC-Operated Contactors

- Conventional and Electronic AC Coils
- 3 Main Contacts
- Non-Reversing or Reversing



Cat. No. 100-D180...



Cat. No. 100-D420...

2

I_e [A] 60 °C	I_e [A] 40 °C	Switching of 3-phase motors — AC-2, AC-3										Auxiliary contacts		Non-Reversing Contactor Cat. No.	Reversing Contactor Cat. No.
		kW (50 Hz)						Hp (60 Hz)				N.O.	N.C.		
AC-3	AC-1	230V	400V	415V	500V	690V	1000V	200V	230V	460V	575V				
115	250	37	63	66	80	110	63	40	40	75	100	0	0	100-D115⊗00	—
												1	1	100-D115⊗11	—
												2	4	—	104-D115⊗24
140	250	45	78	82	80	111	75	40	50	100	125	0	0	100-D140⊗00	—
												1	1	100-D140⊗11	—
												2	4	—	104-D140⊗24
180	250	57	101	105	100	135	90	50	60	150	150	0	0	100-D180⊗00	—
												1	1	100-D180⊗11	—
												2	4	—	104-D180⊗24
210	350	63	118	125	205	200	110	60	75	150	200	0	0	100-D210⊗00	—
												1	1	100-D210⊗11	—
												2	4	—	104-D210⊗24
250	350	80	140	150	250	250	132	75	100	200	250	0	0	100-D250⊗00	—
												1	1	100-D250⊗11	—
												2	4	—	104-D250⊗24
300	450	90	170	160	290	300	160	100	125	250	300	0	0	100-D300⊗00	—
												1	1	100-D300⊗11	—
												2	4	—	104-D300⊗24
420	540	132	238	250	420	425	220	150	175	350	400	0	0	100-D420⊗00	—
												1	1	100-D420⊗11	—
												2	4	—	104-D420⊗24
630	800	200	355	355	500	500	—	200	250	500	600	0	0	100-D630⊗00	—
												1	1	100-D630⊗11	—
												2	4	—	104-D630⊗24
860	1000	250	500	500	500	600	—	250	300	600	700	0	0	100-D860⊗00	—
												1	1	100-D860⊗11	—
												2	4	—	104-D860⊗24

⊗ Coil Voltage Codes for AC Control

Conventional Coil	[V]	24	48	100	110	120	200	208	220... 230	230	240	277	380... 400	415	440	480	500	550	600
100-D115... 100-D180	50 Hz	K	Y	—	D	—	—	—	A	—	T	—	N	B	G	—	M	C	—
	60 Hz	J	X	—	—	D	—	H	—	—	A	T	—	—	N	B	—	—	C
100-D115	50/60 Hz	—	—	KP	KN	—	KG	—	KL	KF	KA	KT	—	—	—	—	—	—	—

Electronic Coil w/ El. Interface §	[V]	24	42...64	100	110...130	200	208...277	200...220	230...250	277	380...415	380...500	440...480	500
100-D95...100-D300	50/60 Hz	EJ♣	EY	EP	ED	EG	EA	—	—	—	—	EN	—	—
100-D420	50/60 Hz	—	—	EP	ED	EG	EA	—	—	—	—	EN	—	—
100-D630... 100-D860	50/60 Hz	—	—	EP	ED	EG	—	EG	EA	ET	EN	—	EB	EM

§ Signal voltage of the Cat. No. 100-D... electronic interface: nominal U_e : 24V DC/ I_e : 15 mA

Pickup voltage: 13.0V DC...30.2V DC

Dropout Voltage: -3.0V DC...+5.0V DC

♣ Not available with 100/104-D300.



3-Pole DC-Operated Contactors

- Conventional and Electronic DC Coils
- 3 Main Contacts
- Non-Reversing or Reversing



Cat. No. 100-D180...



Cat. No. 100-D420...

I_e [A]		Switching of 3-phase motors AC-2, AC-3											Auxiliary contacts		Non-Reversing Contactor Cat. No.	Reversing Contactor Cat. No.
60 °C	40 °C	kW (50 Hz)						Hp (60 Hz)					N.O.	N.C.		
AC-3	AC-1	230V	400V	415V	500V	690V	1000V	200V	230V	460V	575V					
115	250	37	63	66	80	110	63	40	40	75	100	0	0	100-D115⊗00	—	
												1	1	100-D115⊗11	—	
												2	1/1L	100-D115⊗22L*	—	
												2	4	—	104-D115⊗24	
												2	2/2L	—	104-D115⊗24L*	
140	250	45	78	82	80	111	75	40	50	100	125	0	0	100-D140⊗00	—	
												1	1	100-D140⊗11	—	
												2	1/1L	100-D140⊗22L*	—	
												2	4	—	104-D140⊗24	
180	250	57	101	105	100	135	90	50	60	150	150	0	0	100-D180⊗00	—	
												1	1	100-D180⊗11	—	
												—	—	100-D180⊗22L*	—	
												2	4	—	104-D180⊗24	
210	350	63	118	125	205	200	110	60	75	150	200	0	0	100-D210⊗00	—	
												1	1	100-D210⊗11	—	
												2	4	—	104-D210⊗24	
												2	2/2L	—	104-D180⊗24L*	
250	350	80	140	150	250	250	132	75	100	200	250	0	0	100-D250⊗00	—	
												1	1	100-D250⊗11	—	
												2	4	—	104-D250⊗24	
300	450	90	170	160	290	300	160	100	125	250	300	0	0	100-D300⊗00	—	
												1	1	100-D300⊗11	—	
												2	4	—	104-D300⊗24	
420	540	132	238	250	420	425	220	150	175	350	400	0	0	100-D420⊗00	—	
												1	1	100-D420⊗11	—	
												2	4	—	104-D420⊗24	
630	800	200	355	355	500	500	—	200	250	500	600	0	0	100-D630⊗00	—	
												1	1	100-D630⊗11	—	
												2	4	—	104-D630⊗24	
860	1000	250	500	500	500	600	—	250	300	600	700	0	0	100-D860⊗00	—	
												1	1	100-D860⊗11	—	
												2	4	—	104-D860⊗24	



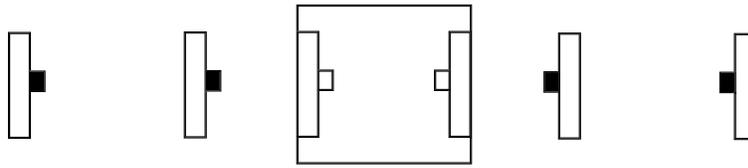
⊗ Coil Voltage Codes for DC Control

Conventional Coil	[V]	24	48	110	125	220
100-D115...100-D180*	DC	ZJ	ZY	ZD	ZS	ZA

Electronic Coil w/ EI Interface *	[V]	24	48...72	110...130	200...255
100-D115...100-D300	DC	EZJ	EZY	EZD	EZA
100-D420	DC	—	—	EZD	EZA
100-D630...100-D860	DC	—	—	ED	EA

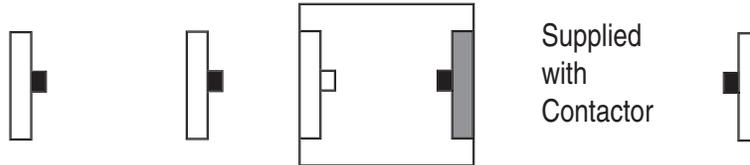
* For conventional DC coils, the pickup winding must be interconnected with the N.C. late-breaking auxiliary contact(s).
 * Signal voltage of the Cat. No. 100-D... electronic interface: nominal U_e : 24V DC/ I_e : 15 mA
 Pickup voltage: 13.0V DC...30.2V DC, Dropout Voltage: -3.0V DC...+5.0V DC.

Auxiliary contacts with sequence numbering.
 Cat. Nos. 100-D115...D420 — Electronic and Conventional AC Coils, Electronic DC Coils



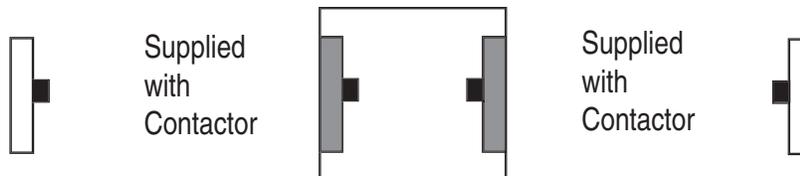
Contact Configuration		Auxiliary contact configurations				
N.O.	N.C.	Left Side Mounting		For Use With	Right Side Mounting	
		Outside Cat. No.	Inside Cat. No.		Inside Cat. No.	Outside Cat. No.
8	0	100-DS2-20	100-DS1-20	100-D...00	100-DS1-20	100-DS2-20
Sequence starts with...		7/8	3/4		1/2	5/6
7	1	100-DS2-20	100-DS1-20	100-D...00	100-DS1-11	100-DS2-20
Sequence starts with...		7/8	3/4		1/2	5/6
6	2	100-DS2-20	100-DS1-11	100-D...00	100-DS1-11	100-DS2-20
Sequence starts with...		7/8	3/4		1/2	5/6
5	3	100-DS2-20	100-DS1-11	100-D...00	100-DS1-11	100-DS2-11
Sequence starts with...		7/8	3/4		1/2	5/6
4	4	100-DS2-11	100-DS1-11	100-D...00	100-DS1-11	100-DS2-11
Sequence starts with...		7/8	3/4		1/2	5/6

Cat. Nos. 100-D115...D420 — Electronic and Conventional AC Coils, Electronic DC coils



Contact Configuration		Auxiliary contact configurations				
N.O.	N.C.	Left Side Mounting		For Use With	Right Side Mounting	
		Outside Cat. No.	Inside Cat. No.		Inside Cat. No.	Outside Cat. No.
8	0	—	—	100-D...11	—	—
Sequence starts with...		—	—	—	—	—
7	1	100-DS2-20	100-DS1-20	100-D...11	100-DS1-11	100-DS2-20
Sequence starts with...		7/8	3/4		1/2	5/6
6	2	100-DS2-20	100-DS1-11	100-D...11	100-DS1-11	100-DS2-20
Sequence starts with...		7/8	3/4		1/2	5/6
5	3	100-DS2-20	100-DS1-11	100-D...11	100-DS1-11	100-DS2-11
Sequence starts with...		7/8	3/4		1/2	5/6
4	4	100-DS2-11	100-DS1-11	100-D...11	100-DS1-11	100-DS2-11
Sequence starts with...		7/8	3/4		1/2	5/6

Contactor cat. nos. 100-D115...D180 — Conventional DC coils



Contact Configuration		Auxiliary contact configurations				
N.O.	N.C.	Left Side Mounting		For Use With	Right Side Mounting	
		Outside Cat. No.	Inside Cat. No.		Inside Cat. No.	Outside Cat. No.
8	0	—	—	100-D...22L	—	—
Sequence starts with...		—	—		—	—
7	1	—	—	100-D...22L	—	—
Sequence starts with...		—	—		—	—
6	2	100-DS2-20	100-DS1-11	100-D...22L	100-DS1-L11*	100-DS2-20
Sequence starts with...		7/8	3/4		1/2	5/6
5	3	100-DS2-20	100-DS1-11	100-D...22L	100-DS1-L11*	100-DS2-11
Sequence starts with...		7/8	3/4		1/2	5/6
4	4	100-DS2-11	100-DS1-11	100-D...22L	100-DS1-L11*	100-DS2-11
Sequence starts with...		7/8	3/4		1/2	5/6

* With conventional DC control, the pickup winding must be interconnected with the N.C. late-breaking auxiliary contacts.



Bulletin 100S-D — Safety Contactors

- 63...500 kW @ 400V
- 75...600 Hp @ 460V
- 100...700 Hp @ 575V
- Electronic and conventional coils
 - AC & DC
 - Integrated PLC interface
 - Low power pick-up & hold-in
 - Wide voltage ranges
- Complete range of accessories
- Environmentally friendly
- Compact dimensions

Bulletin 100S-D safety contactors were designed to address the needs of modern safety applications requiring feedback and monitoring of the energy isolating switchgear used in hazardous motion loads. The

100S-D meets these needs through its "mirror contact" design. If a power contact welds, the N.C. auxiliary contacts will not change state. This feature provides reliable indication about the open/closed status of the main power poles. In addition, the gold-plated bifurcated auxiliary contacts are ideally suited for low-energy applications or feedback control circuits with multiple series-connected N.C. auxiliary contacts.

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- Product Selection this page
- Accessories..... 2-153
- Approximate Dimensions..... 2-198

Standards Compliance

- IEC 60947-4-1
- IEC 60947-4 Annex F
- IEC 60947 Type "2"
- Coordination
- CSA C22.2 No. 14
- UL 508

Certifications

- CE Marked
- cULus Listed (File No. E 41850, Guide NLDX, NLDX7)
- SUVA Certified
- CCC (115...180 conventional coil; 140...420 electronic coil)

Your order must include: cat. no. of the contactor specified with coil voltage code and, if required, cat. no. of any accessories and/or replacement coils.

Product Selection
3-Pole AC-Operated Contactors

I_e [A]		Switching of 3-phase motors AC-2, AC-3										Auxiliary contacts		Cat. No. ➤
60 °C	40 °C	kW (50 Hz)*						Hp (60 Hz)				N.O.	N.C.*	
AC-3	AC-1	230V	400V	415V	500V	690V	1000V	200V	230V	460V	575V			
115	250	37	63	66/75	80	111	63	40	40	75	100	2	2	100S-D115Ⓢ22BC
140	250	45	78	82/90	80/100‡	110/132‡	75	40	50	100	125	2	2	100S-D140Ⓢ22BC
180	250	55	101	100	90/125‡	132/160‡	90	50	60	150	150	2	2	100S-D180Ⓢ22BC
210	350	63	118	110	205	200	110	60	75	150	200	2	2	100S-D210Ⓢ22BC
250	350	80	140	150	250	250	133	75	100	200	250	2	2	100S-D250Ⓢ22BC
300	450	90	170	160	290	300	160	100	125	250	300	2	2	100S-D300Ⓢ22BC
420	540	132	238	250	420	425	220	150	175	350	400	2	2	100S-D420Ⓢ22BC
630	800	200	355	355	500	500	—	200	250	500	600	2	2	100S-D630Ⓢ22BC
860	1000	250	500	500	500	600	—	250	300	600	700	2	2	100S-D860Ⓢ22BC

* Preferred values according to IEC 60072-1.

Ⓢ The N.C. contacts meet IEC 60947-4 Annex F requirements for mirror contact performance. The N.C. mirror contacts are wired in series or parallel and must be used as monitoring contacts with feedback to the safety circuit.

‡ Higher kW rating only applies to contactors with electronic coil.

➤ If standard cross-stamped auxiliary contacts are required, remove the letter "B" before the letter "C" in the cat. no. Example: Cat. No. **100S-D115Ⓢ22BC** becomes Cat. No. **100S-D115Ⓢ22C**.

ⓈCoil voltage code—see page 2-152

⊗ Coil Voltage Codes for AC Control

Conventional Coil	[V]	24	48	100	110	120	200	208	220 ...230	230	240	277	380 ...400	415	440	480	500	550	600
100S-D115...100S-D180	AC, 50 Hz	K	Y	—	D	—	—	—	A	—	T	—	N	B	G	—	M	C	—
	AC, 60 Hz	J	X	—	—	D	—	H	—	—	A	T	—	—	N	B	—	—	C
100S-D115	AC, 50/60 Hz	—	—	KP	KN	—	KG	—	KL	KF	KA	KT	—	—	—	—	—	—	—

Electronic Coil w/ PLC Interface§	[V]	24	42...64	100	110... 130	200	208... 277	200... 220	230... 250	277	380... 415	380... 440	440... 480	380... 500	500
100S-D95...100S-D300	AC, 50/60 Hz	EJ♣	EY	EP	ED	EG	EA	—	—	—	—	VN	—	EN	—
100S-D420	AC, 50/60 Hz	—	—	EP	ED	EG	EA	—	—	—	—	—	—	EN	—
100S-D630...100S-D860	AC, 50/60 Hz	—	—	EP	ED	EG	—	EG	EA	ET	EN	—	EB	—	EM

§ Signal voltage of the Cat. No. 100S-D... electronic interface U_g : 24V DC/ I_g : 15 mA
 Pick-up voltage: 13.0V DC...30.2V DC
 Drop-out voltage: -3.0V DC...+5.0V DC
 ♣ Not available with 100S-D300.

3-Pole DC-Operated Contactors

I_e [A]		Switching of 3-phase motors AC-2, AC-3										Auxiliary contacts		Conventional Coil Cat. No.	Electronic Coil Cat. No. ▶
60 °C	40 °C	kW (50 Hz) *						Hp (60 Hz)				N.O.	N.C. ※ *		
AC-3	AC-1	230V	400V	415V	500V	690V	1000V	200V	230V	460V	575V				
115	250	37	63	66/75	80	111	63	40	40	75	100	2	2	100S-D115⊗33LC‡	100S-D115⊗22BC
140	250	45	78	75	80/100§	110/132§	75	40	50	100	125	3	2/1L	100S-D140⊗33LC‡	100S-D140⊗22BC
180	250	55	101	100	90/125§	132/160§	90	50	60	150	150	3	2/1L	100S-D180⊗33LC‡	100S-D180⊗22BC
210	350	63	118	110	205	200	110	60	75	150	200	2	2	—	100S-D210⊗22BC
250	350	80	140	150	250	250	133	75	100	200	250	2	2	—	100S-D250⊗22BC
300	450	90	170	160	290	300	160	100	125	250	300	2	2	—	100S-D300⊗22BC
420	540	132	238	250	420	425	220	150	175	350	400	2	2	—	100S-D420⊗22BC
630	800	200	355	355	500	500	—	200	250	500	600	2	2	—	100S-D630⊗22BC
860	1000	250	500	500	500	600	—	250	300	600	700	2	2	—	100S-D860⊗22BC

* Preferred values according to IEC 60072-1.
 ※ The N.C. contacts meet IEC 60947-4 Annex F requirements for mirror contact performance. The N.C. mirror contacts are wired in series or parallel and must be used as monitoring contacts with feedback to the safety circuit.
 ‡ For conventional DC coil only. The pickup winding must be interconnected with the N.C. late-breaking auxiliary contacts.
 § Higher kW rating only applies to contactors with electronic coil.
 ▶ If standard cross-stamped front-mount auxiliary contacts are required, remove the letter "B" before the letter "C" in the Cat. No. Example: Cat. No. **100S-D115⊗22BC** becomes Cat. No. **100S-D115⊗22C**.

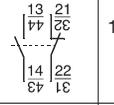
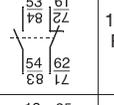
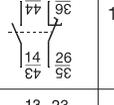
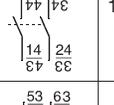
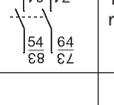
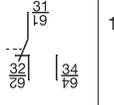
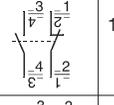
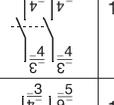
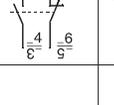
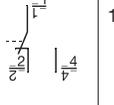
⊗ Coil Voltage Codes for DC Control

Conventional Coil	[V]	24	48	110	125	220	250
100S-D115...100S-D180	DC	ZJ	ZY	ZD	ZS	ZA	ZT

Electronic Coil w/ EI Interface ♣	[V]	24	48...72	110...130	200...255
100S-D115...100S-D300	DC	EZJ	EZY	EZD	EZA
100S-D420	DC	—	—	EZD	EZA
100S-D630...860	DC	—	—	ED	EA

♣ Signal voltage of the cat. no. 100S-S... electronic interface U_g : 24V DC/ I_g : 15 mA
 Pick-up voltage: 13.0V DC...30.2V DC
 Drop-out voltage: -3.0V DC...+5.0V DC

Auxiliary Contacts

Description			Connection Diagram	For Use With	Standard Auxiliary Contact Cat. No.	Bifurcated Cat. No.
	No. of N.O. Contacts	No. of N.C. Contacts				
Auxiliary Contacts <ul style="list-style-type: none"> • Side-mounted • Without IEC sequence terminal designations • Standard contacts 17V/10 mA • Bifurcated contacts for signals down to 5V/2 mA 	1	1		100-D left or right inside mounting	100-DS1-11	100-DS1-B11H
	1	1		100-D Left or Right Inside Mounting	100-DS2-11	100-DS2-B11H
	1	1L		100-D left or right inside mounting	100-DS1-L11	—
	2	0		100-D left or right inside mounting	100-DS1-20	100-DS1-B20H
	2	0		100-D left or right outside mounting	100-DS2-20	100-DS2-B20H
Auxiliary Contacts <ul style="list-style-type: none"> • Electronic-compatible auxiliary contacts • Ideal for use when switching low-power control circuits • With IEC sequence terminal designations • Contact ratings: AC-12, 250V, 0.1 A AC-15, DC-13, 3...125V, 1...100 mA 	1	1		100-D left or right inside mounting	100-DS1-B11	—
Auxiliary Contacts <ul style="list-style-type: none"> • Side-mounted • Without IEC sequence terminal designations • Standard contacts 17V/10 mA • Bifurcated contacts for signals down to 5V/2 mA 	1	1		100-D left or right inside mounting	100-DS0-11	100-DS0-B11H
	2	0		100-D left or right inside mounting	100-DS0-20	100-DS0-B20H
	1	1L		100-D left or right inside mounting	100-DS0-L11	—
Auxiliary Contacts <ul style="list-style-type: none"> • Electronic-compatible auxiliary contacts • Ideal for use when switching low-power control circuits • Without IEC sequence terminal designations • Contact ratings: AC-12, 250V, 0.1 A AC-15, DC-13, 3...125V, 1...100 mA 	1	1		100-D left or right inside mounting	100-DS0-B11	—



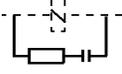
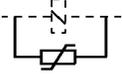
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Marking Systems (For 100-D115...D860 contactors)

	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	Connection Diagram	Suppressor Rating	For Use With	Cat. No.
 <p>Suppressor Module for Bul. 100-D Contactors</p> <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) 		<p>RC Module (AC control) for contactors with conventional coil 21...48V, 50 Hz; 24...55V, 60 Hz 95...110V, 50 Hz; 110...127V, 60 Hz 180...277V, 50 Hz; 208...277V, 60 Hz 380...550V, 50 Hz; 440...600V, 60 Hz</p>	100-D115...100-D180	100-DFSC48	
				100-DFSC110	
				100-DFSC240	
				100-DFSC550	
		<p>Varistor Module for contactors with conventional coil 55V AC 56...136V AC 137...277V AC 278...600V AC</p>	100-D115...100-D420	100-DFSV55	
				100-DFSV136	
				100-DFSV277	
				100-DFSV575	
	<p>Varistor Module for contactors with electronic coil 208...277V AC* 380...500V AC*</p>	100-D115...100-D420	100-DFSV550		
			100-D115E... 100-D420E	100-DFSV500	

* For overvoltage category IV (IEC 947 for 100-D...-EI) e.g., lightning protection requirements.
 * For surge pulse >1 kV
 Package Quantity = 1

Connecting Components

	Description	Output Connection	For Use With			Terminal Connection	Cat. No.
			100-D115...180	100-D210...420	100-D630...860		
	Reversing: Input Connection Wye-Delta: Main-Delta connection	50 mm ²	X			Lugs, 100-DL...	100-D180-VLTB
		120 mm ²		X			100-D420-VL
		350 mm ²			X		100-D860-VL
			Reversing: Output Connection Wye-Delta: Delta-Wye connection	50 mm ²	X		
120 mm ²				X		100-D420-VLTB	
350 mm ²					X	100-D860-VT	
	Delta-Wye connection if 100-D115...180 is used as a Wye contactor			50 mm ²	X		
		80 mm ²	—	X		100-D420-VYTB	
	Wye-Delta: Neutral bridge	—	X			—	100-D180-VYU
		—		X			100-D420-VYU
		—			X		100-D860-VYU
	Power Wiring Kits (for contactors using 100-DL lug kits)	For 100-D115...D100-D180			100-DPW180 100-D180-VL 100-DPY180		
		• Reversing • Two-speed, or changeover • Wye-Delta/Star-Delta					
		For 100-D210...100-D420					
• Reversing • Two-speed, or changeover • Wye-Delta/Star-Delta			100-DPW420 100-D420-VL 100-DPY420				
For 100-D630...100-D860							
• Reversing • Two-speed, or changeover			100-DPW860 100-D860-VL				

Package Quantity = 1

Connecting Components, Continued

2

	Description	For Use With	Cat. No.	
	Terminal Lugs • Set of two • Protection class IP2X per IEC 60529 and DIN 40 050	100-D115, 100-D140, 100-D180, 100-D115E...D180E, 193-EC_F, 193-EE_F	100-DTB180	
		100-D210...100-D420, 193-EC_G, 193-EF2C, 193-EE_G	100-DTB420	
	Terminal Lugs (UL/CSA), Copper Frame Set of three	100-D115, 100-D140, 100-D180, 193-EC_F, 193-EE_F	100-DL180	
		100-D210...100-D420, 193-EC_G, 193-EE_G	100-DL420	
		100-D630, 100-D860, 193-EC_H, 193-EE_H	100-DL630	
		100-D630, 100-D860, 193-EC_H, 193-EE_H	100-DL860	
	Control Circuit Terminal 2 x 2.5 mm ²	Connects to Cat. Nos. 100-D115...D180	100-DAT1	
		Connects to Cat. Nos. 100-D210...D420	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	100-D115, 100-D140, 100-D180, 100-D115-E...100-D180-E	100-DTS180	
		100-D210...100-D420	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	100-D115...100-D180, 193-EC_F, 193-EE_F	100-DTC180	
		100-D210...100-D420, 193-EC_G, 193-EE_G	100-DTC420	
		100-D630...100-D860, 193-EC_H, 193-EE_H	100-DTC860	
	Terminal Covers Line-side panel relay and reversing cover		100-DTCE860	
	Terminal Covers Reversing starter/relay cover	100-D630...100-D860, 193-EC_H, 193-EE_H	100-DTCR860	
	Terminal Covers DOL Starter/relay cover		100-DTCS860	
	Mounting Plate • Galvanized steel plate for starter combinations • For direct-on-line, reversing, two-speed, wye-delta/star-delta, and Dahlander assemblies	100-D115...100-D180	Direct-on-line	100-DMS180
			Reversing, two-speed or changeover	100-DMU180
			Y-Δ or Dahlander	100-DMY180
		100-D210...100-D420	Direct-on-line	100-DMS420
			Reversing, two-speed or changeover	100-DMU420
			Y-Δ or Dahlander	100-DMY420
		100-D630...100-D860	Direct-on-line	100-DMS860
			Reversing, two-speed or changeover	100-DMU860
			Y-Δ or Dahlander	100-DMY860
Mounting Plate • For two-speed or changeover switches	For interlocking between 100-C60...C97 and 100-D115...D180 contactors	100-DMU85		

Package Quantity = 2

Interlocks

	Description	Circuit Diagram	For Use With	Cat. No.
	Interlock — Mechanical Only • No additional space required	---∇---	100-D115...100-D420	100-DMA00
	Interlock — Dual Electrical/Mechanical • No additional space required • Two N.C. auxiliary contacts	22 NC 21 ▶ --∇-- ◀ 21 NC 22	100-D115...100-D860	100-DMD02
		Interlock — Mechanical Only • No additional space required	---∇---	100-D115...100-D860
	Interlock — Mechanical Only • Provides interlocking between Bul. 100-C and Bul. 100-D contactors	---∇---	100-C60...100-C97 between 100-D115...100-D180	100-DMC00
	Interlock — Dual Electrical/Mechanical • Provides interlocking between Bul. 100-C and Bul. 100-D contactors • Two N.C. auxiliary contacts	22 NC 21 ▶ --∇-- ◀ 21 NC 22	100-C60...100-C97 between 100-D115...100-D180	100-DMC02

Package Quantity = 1



Bulletin 100-G — IEC Contactors

- 315...710 kW, 400V
- 350...900 Hp, 460/575V
- 3-Pole contactors
- 4th add-on neutral switching pole
- AC and DC control
- Horizontal and vertical interlocking
- Mechanical latching
- Meets IEC, CE, and cULus Standards and Certifications

Your order must include: cat. no. of the contactor selected, coil voltage code, overload relay suffix code, and, if required, cat. no. of any accessories.

The Bulletin 100-G contactor product family provides reliable switching of motor loads up to 1200 A. A complete range of accessories including auxiliary contacts, mechanical latches, horizontal and vertical interlocks, and 4th add-on neutral switching poles provides maximum flexibility to meet a wide variety of application requirements.

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Standards Compliance

EN/IEC 60947-4-1
 IEC 60947 Type “1”
 Coordination
 CSA C22.2 No. 14
 UL 508

Certifications

CE Marked
 cULus Listed (File No. E 3125,
 Guide NLDX, NLDX7)

Product Selection

AC and DC Control

AC-1	Switching of 3-phase motors—AC-2, AC-3									Auxiliary Contacts		Cat. No.
	kW (50 Hz)‡				Hp (60 Hz)				kW (50 Hz)			
<i>I_e</i> [A]	230V	400V	500V	690V	200V	230V	460V	575V	400V	N.O.	N.C.	
40 °C	230V	400V	500V	690V	200V	230V	460V	575V	400V	N.O.	N.C.	
760	160	315	400	500	150	150	350	350	315	2	2	100-G550®22
1000	220	400	500	630	200	250	500	500	400	2	2	100-G700®22
1100	280	500	630	710	250	300	600	600	500	2	2	100-G860®22
1200	315	560	750	850	—	—	—	—	560	2*	2	* 100-G1000®12
1350	375	710	900	1000	450	450	900	900	710	2*	2	100-G1200®12

* 1 N.O. contact used in control circuit.

® No UL/cUL

‡ Preferred value according to IEC 60072-1.

⊗ Coil Voltage Code

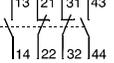
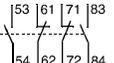
The Cat. No. as listed is incomplete. Select a coil voltage code from the table below to complete the Cat. No. Example: 120V, 50/60Hz: **Cat. No. 100-G550®22** becomes **Cat. No. 100-G550KD22**.

For Use With:	[V]	100...110	110...120	200...220	220...240	345...380	380...415	400...440	440...480
100-G550...100-G860	50/60 Hz	—	KD	—	KF	—	KN	—	KB
	DC	KD	—	KF	—	KN	—	KB	—
For Use With:	[V]	110...115	110	220...230	220	240	380...400	440	480V
100-G1000...100-G1200	50/60 Hz	KD	—	KF	—	KA	KN	KB	KU
	DC	—	ZD§	—	ZA§	—	—	—	—

§ Consult your local Rockwell Automation sales office or Allen-Bradley distributor.

Price Adder For	Type	Available Control Voltages	No Surcharge
Special control voltages	100-G550...100-G860	24...600V 50/60 Hz, 24...440V DC	>25 pieces
	100-G1000...100-G1200	48...600V 50/60 Hz, 48...440V DC	

Control Modules

	Description	For Use With	Cat. No.
 4-Pole	Auxiliary Contact Block <ul style="list-style-type: none"> For mounting between T1 & T2 or between T2 & T3 Adjustable; provides normal, delayed, or overlapping contacts Max. two blocks/contactor Alternate terminal marking tags included 2 N.O. and 2 N.C. contacts <div style="text-align: center;">  Standard terminal marking for mounting between T1 & T2 </div> <div style="text-align: center;">  Alternate terminal marking for mounting between T2 & T3 </div>	100-G550...100-G860	100-EF22
 2-Pole	Auxiliary Contact Block <ul style="list-style-type: none"> For side mounting on either side of the contactor Max. four blocks/contactor Alternate terminal marking tags included 1 N.O. and 1 N.C. contact <div style="text-align: center;">  Standard terminal marking </div> <div style="text-align: center;">  Alternate terminal markings </div>	100-G1000...100-G1200	100-EB11
	Fourth Add-On Neutral Switching Pole <ul style="list-style-type: none"> Left- or right-side mountable Note: no UL/cUL 	I_{th} AC-1 500 A 100-G550	100-NP500-5
		I_{th} AC-1 1000A 100-G700, 100-G860	100-NP500-6
	Mechanical Latch <ul style="list-style-type: none"> Mechanical life: 0.5 million operations Direct and Impulse Control 	Direct and Impulse Contact control 100-G550	100-FLAM5⊗
		Direct and Impulse Contact control 100-G700, 100-G860	100-FLAM6⊗
	Mechanical Interlock — Horizontal	100-G550 to 100-G550	100-MC00-5H
		100-G550 to 100-G700 or 100-G860	100-MC00-56H
		100-G700 or 100-G860 to 100-G700 or 100-G860	100-MC00-6H
		100-G700 or 100-G860 to 100-G1000 or 100-G1200	100-MC00-67H
		100-G1000 or 100-G1200 to 100-G1000 or 100-G1200	100-MC00-7H
	Mechanical Interlock — Vertical	100-G550 to 100-G550	100-MC00-5V
		100-G550 to 100-G700 or 100-G860	100-MC00-56V
		100-G700 or 100-G860 to 100-G700 or 100-G860	100-MC00-6V
		100-G700 or 100-G860 to 100-G1000 or 100-G1200	100-MC00-67V
		100-G1000 or 100-G1200 to 100-G1000 or 100-G1200	100-MC00-7V

Package Quantity = 1

⊗ **Coil Voltage Codes***

The Cat. No. as listed is incomplete. Select a coil voltage code from the table below to complete the Cat. No. Example: **Cat. No. 100-FLAM5⊗** becomes **Cat. No. 100-FLAM5KD**.

For use with	[V]	110...120	220...240	380...415	440...480
100-G550... 100-G860	50-60 Hz	KD	KF	KN	KB

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

IEC Contactors

Specifications

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Coil Type :	Conventional Electronic — EI	100-KR		100/104-K			100/104-C, 100S/104S-C									
		05	09	05	09	12	09	12	16	23	30	37	40*200	40*400	43	60
		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

**AC-1 Active Power Load (50 Hz);
Ambient temperature 40 °C**

<i>I_e</i>	≤ 500V	[A]	10	10	20	20	20	32	32	32	32 (40)*	65	65	75	75	85	100
	690V	[A]	10	10	20	20	20	32	32	32	32 (40)*	65	65	75	75	85	100
	1000V	[A]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	230V	[kW]	4	4	8	8	8	13	13	13	13	26	26	30	30	34	40
	240V	[kW]	4	4	8.3	8.3	8.3	13	13	13	13	27	27	31	31	35	42
	400V	[kW]	6.9	6.9	14	14	14	22	22	22	22	45	45	52	52	59	69
	415V	[kW]	7	7	14	14	14	23	23	23	23	47	47	54	54	61	72
	500V	[kW]	8.7	8.7	17	17	17	28	28	28	28	56	56	65	65	74	87
	690V	[kW]	12	12	24	24	24	38	38	38	38	78	78	90	90	102	120
	1000V	[kW]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Ambient temperature 60 °C

<i>I_e</i>	≤ 500V	[A]	10	10	16	16	16	32	32	32	32	65	65	60	60	80	100
	690V	[A]	10	10	16	16	16	32	32	32	32	65	65	60	60	80	100
	1000V	[A]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	230V	[kW]	4	4	6.4	6.4	6.4	13	13	13	13	26	26	24	24	25	40
	240V	[kW]	4	4	6.7	6.7	6.7	13	13	13	13	27	27	25	25	26	42
	400V	[kW]	6.9	6.9	11	11	11	22	22	22	22	45	45	42	42	44	69
	415V	[kW]	7	7	12	12	12	23	23	23	23	47	47	43	43	45	72
	500V	[kW]	8.7	8.7	14	14	14	28	28	28	28	56	56	52	52	55	87
	690V	[kW]	12	12	19	19	19	38	38	38	38	78	78	72	72	75	120
	1000V	[kW]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Switching of 3-phase Motors; (50 Hz)

Ambient temperature 60 °C, AC-2, AC-3

	230V	[A]	6.3	8.5	6.3	11.3	11.3	12	15	20	26.5	35	38	38	38	44	62
	240V	[A]	6.3	8.5	6.3	11.3	11.3	12	15	20	26.5	35	38	38	38	44	62
	400V	[A]	4.9	8.5	4.9	8.5	11.5	9	12	16	23	30	37	37	37	43	60
	415V	[A]	4.9	8.5	4.9	8.5	11.5	9	12	16	23	30	37	37	37	43	60
	500V	[A]	3.9	6.8	3.9	6.8	9.2	7	10	14	20	25	30	29	30	38	55
	690V	[A]	2.8	4.9	2.8	4.9	6.7	5	7	9	12	18	21	9	21	25	34
	1000V	[A]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	230V	[kW]	1.5	2.2	1.5	3	3	3	4	5.5	7.5	10	11	11	11	13	18.5
	240V	[kW]	1.5	2.2	1.5	3	3	3	4	5.5	7.5	10	11	11	11	13	18.5
	400V	[kW]	2.2	4	2.2	4	5.5	4	5.5	7.5	11	15	18.5	18.5	18.5	22	32
	415V	[kW]	2.2	4	2.2	4	5.5	4	5.5	7.5	11	15	20	20	20	22	32
	500V	[kW]	2.2	4	2.2	4	5.5	4	5.5	7.5	13	15	20	18.5	20	25	37
	690V	[kW]	2.2	4	2.2	4	5.5	4	5.5	7.5	10	15	18.5	7.5	18.5	22	32
	1000V	[kW]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Load Carrying Capacity per UL/CSA

General Purpose Current (enclosed)

	[A]	9	9	12	15	18	25	25	30	30	55	60	60	60	75	90
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Rated power (enclosed)

1-phase	115V	[A]	7.2	7.2	9.8	9.8	13.8	9.8	9.8	16	24	24	34	34	34	34	56
	230V	[A]	6.9	8	8	10	12	10	12	17	17	28	28	28	28	40	50
	115V	[Hp]	1/3	1/3	0.5	0.5	0.75	0.5	0.5	1	2	2	3	3	3	3	5
	230V	[Hp]	3/4	1	1	1.5	2	1.5	2	3	3	5	5	5	5	7.5	10
3-phase	200V	[A]	6.9	7.8	6.9	7.8	11	7.8	11	17.5	17.5	25.3	32.2	32.2	32.2	32.2	48.3
	230V	[A]	6	6.8	6	6.8	9.6	6.8	9.6	15.2	22	28	28	28	28	42	54
	460V	[A]	4.8	7.6	4.8	7.6	11	7.6	11	14	21	27	34	34	34	40	52
	575V	[A]	3.9	6.1	3.9	6.1	9	9	11	17	17	27	32	17	32	32	52
	200V	[Hp]	1.5	2	1.5	2	3	2	3	5	5	7.5	10	10	10	10	15
	230V	[Hp]	1.5	2	1.5	2	3	2	3	5	5	7.5	10	10	10	10	15
	460V	[Hp]	3	5	3	5	7.5	5	7.5	10	15	20	25	25	25	30	40
575V	[Hp]	3	5	3	5	7.5	7.5	10	15	15	25	30	15	30	30	50	



100/104-C, 100S/104S-C					100/104-D, 100S-D										
72	85	90*200	90*400	97	115	140	140	180	180	210	250	300	420	630	860
X	X	X	X	X	X	X	—	X	—	—	—	—	—	—	—
—	—	—	—	—	X	—	X	—	X	X	X	X	X	X	X

AC-1 Active Power Load (50 Hz); Ambient temperature 40 °C

100	100	130	130	130	250	250	250	250	250	350	350	450	540	800	1000
100	100	130	130	130	250	250	250	250	250	350	350	450	540	800	1000
—	—	—	—	—	250	250	250	250	250	350	350	450	540	—	—
40	40	52	52	52	100	100	100	100	100	139	139	179	199	319	398
42	42	54	54	54	104	104	104	104	104	145	145	187	208	333	416
69	69	90	90	90	173	173	173	173	173	242	242	312	346	554	693
72	72	93	93	93	180	180	180	180	180	252	252	323	359	575	719
87	87	113	113	113	217	217	217	217	217	303	303	390	433	693	866
120	120	155	155	155	299	299	299	299	299	418	418	538	598	956	1195
—	—	—	—	—	433	433	433	433	433	606	606	779	866	—	—

Ambient temperature 60 °C

100	100	110	110	110	210	210	210	210	210	300	300	380	425	—	—
100	100	110	110	110	210	210	210	210	210	300	300	380	425	—	—
—	—	—	—	—	210	210	210	210	210	300	300	380	425	—	—
40	40	44	44	44	84	84	84	84	84	120	120	151	169	—	—
42	42	46	46	46	87	87	87	87	87	125	125	158	177	—	—
69	69	76	76	76	145	145	145	145	145	208	208	263	294	—	—
72	72	79	79	79	151	151	151	151	151	216	216	273	305	—	—
87	87	95	95	95	182	182	182	182	182	260	260	329	368	—	—
120	120	131	131	131	251	251	251	251	251	359	359	454	508	—	—
—	—	—	—	—	364	364	364	364	364	520	520	658	736	—	—

Switching of 3-phase Motors; (50 Hz) Ambient temperature 60 °C, AC-2, AC-3

72	85	85	85	96	115	140	140	180	180	210	250	300	420	630	860
72	85	85	85	95	115	140	140	180	180	210	250	300	420	630	860
72	85	85	85	97	115	140	140	180	180	210	250	300	420	630	860
72	85	85	85	97	115 (130)‡	140 (155)‡	140 (155)‡	180 (189)‡	180 (189)‡	210 (227)‡	250 (258)‡	300 (315)‡	420	630	860
67	80	80	80	78	115	115	140	140	180	210	250	300	420	630	753
42	49	22	49	57	115	115	140	140	180	210	250	300	420	492	—
—	—	—	—	—	46	55	55	65	65	80	95	115	160	—	—
22	25	25	25	30	37	45	45	57	57	67	80	97	135	200	250
22	25	25	25	30	38	47	47	60	60	70	83	101	141	200	250
40	45	45	45	55	64	78	78	101	101	118	140	170	238	355	500
40	45	45	45	55	66 (75)‡	82 (90)‡	82 (90)‡	105 (110)‡	105 (110)‡	122 (132)‡	145 (150)‡	176 (185)‡	250	355	500
45	55	55	55	55	80	80	98	98	126	147	177	213	298	450	560
40	45	18.5	45	55	111	111	135	135	176	205	250	293	424	500	—
—	—	—	—	—	63	75	75	90	90	110	132	160	225	—	—

Load Carrying Capacity per UL/CSA

General Purpose Current (enclosed)															
90	100	125	130	120	160	220	220	220	220	300	300	340	420	630	860

Rated power (enclosed)															
56	80	80	80	100	100	135	135	—	—	—	—	—	—	—	—
68	68	68	68	88	110	136	136	176	176	216	—	—	—	—	—
5	7.5	7.5	7.5	10	10	15	15	—	—	—	—	—	—	—	—
15	15	15	15	20	25	30	30	40	40	50	—	—	—	—	—
62.1	78.2	78.2	78.2	92	120	120	120	150	150	177	221	285	414	552	692
68	80	80	80	80	104	130	130	154	154	192	248	312	420	602	720
65	77	65	77	96	96	124	124	180	180	180	240	302	414	590	702
62	62	22	52	77	99	125	125	144	144	192	242	289	382	562	651
20	25	25	25	30	40	40	40	50	50	60	75	100	150	200	250
25	30	30	30	30	40	50	50	60	60	75	100	125	175	250	300
50	60	50	60	75	75	100	100	150	150	150	200	250	350	500	600
60	60	20	50	75	100	125	125	150	150	200	250	300	400	600	700

‡ 415 V: values in () AC-2 and AC-3 lifespan -25 %

IEC Contactors

Specifications

2

		100/104-K			100/104-C, 100S/104S-C								
		05	09	12	09	12	16	23	30	37	43	60	
Coil Type :	Conventional	X	X	X	X	X	X	X	X	X	X	X	X
	Electronic — EI	—	—	—	—	—	—	—	—	—	—	—	—
Switching of 3-phase Motors, (50Hz); Ambient temperature 60 °C, AC-4													
	230V [A]	6.3	11.3	11.3	12	15	20	26.5	35	38	44	62	
	240V [A]	6.3	11.3	11.3	12	15	20	26.5	35	38	44	62	
	400V [A]	4.9	8.5	11.5	9	12	16	23	30	37	43	60	
	415V [A]	4.9	8.5	11.5	9	12	16	23	30	37	43	60	
	500V [A]	3.9	6.8	9.2	7	10	14	20	25	30	38	55	
	690V [A]	2.8	4.9	6.7	5	7	9	12	18	21	25	34	
	1000V [A]	—	—	—	—	—	—	—	—	—	—	—	
	230V [kW]	1.5	3	3	3	4	5.5	7.5	10	11	13	18.5	
	240V [kW]	1.5	3	3	3	4	5.5	7.5	10	11	13	18.5	
	400V [kW]	2.2	4	5.5	4	5.5	7.5	11	15	18.5	22	32	
	415V [kW]	2.2	4	5.5	4	5.5	7.5	11	15	20	22	32	
	500V [kW]	2.2	4	5.5	4	5.5	7.5	13	15	20	25	37	
	690V [kW]	2.2	4	5.5	4	5.5	7.5	10	15	18.5	22	32	
	1000V [kW]	—	—	—	—	—	—	—	—	—	—	—	
AC-4 at approximately 200,000 operations													
	230V [A]	2.3	3.9	3.9	4.3	6.6	9	9	12	14	16.5	25.5	
	240V [A]	2.3	3.9	3.9	4.3	6.6	9	9	12	14	16.5	25.5	
	400/415V [A]	2	3.6	3.6	4.3	6.6	9	9	12	14	16.5	25.5	
	500V [A]	1.9	3.2	3.2	4.3	6.6	9	9	12	14	16.5	25.5	
	690V [A]	—	—	—	4.3	6.6	9	9	12	14	16.5	25.5	
	1000V [A]	—	—	—	—	—	—	—	—	—	—	—	
	230V* [kW]	0.37	0.75	0.75	0.75	1.5	2.2	2.2	3	3.7	4	6.3	
	240V* [kW]	0.37	0.75	0.75	0.75	1.5	2.2	2.2	3	4	4	7.5	
	400V* [kW]	0.75	1.5	1.5	1.8	3	4	4	5.5	6.3	7.5	13	
	415V* [kW]	0.75	1.5	1.5	1.8	3	4	4	5.5	6.3	7.5	13	
	500V* [kW]	0.75	1.5	1.5	2.2	3.7	5.5	5.5	7.5	7.5	10	15	
	690V* [kW]	—	—	—	3	5.5	7.5	7.5	10	11	15	22	
	1000V* [kW]	—	—	—	—	—	—	—	—	—	—	—	
Max. switching frequency	Ops/h	250	250	250	250	250	220	200	200	200	200	200	120
Wye-Delta (60 Hz)													
	200V [Hp]	2.2	3	5	5	5	7½	7½	10	15	20	30	
	230V [Hp]	2.2	3	5	5	7½	10	10	15	20	25	40	
	460V [Hp]	5	7.5	10	10	15	20	25	30	40	50	75	
	575V [Hp]	5	7.5	10	10	15	20	25	30	40	50	75	
UL/CSA Elevator Duty†													
	200V [A]	—	—	—	7.8	11.0	11.0	17.5	25.3	25.3	32.2	32.2	
	230V [A]	—	—	—	6.8	9.6	15.2	15.2	22.0	28.0	28.0	42.0	
	460V [A]	—	—	—	7.6	11.0	14.0	21.0	27.0	27.0	34.0	40.0	
	575V [A]	—	—	—	6.1	9.0	11.0	17.0	22.0	27.0	32.0	41.0	
	200V [Hp]	—	—	—	2	3	3	5	7½	7½	10	10	
	230V [Hp]	—	—	—	2	3	5	5	7½	10	10	15	
	460V [Hp]	—	—	—	5	7½	10	15	20	20	25	30	
	575V [Hp]	—	—	—	5	7½	10	15	20	25	30	40	
Star-Delta Starting (50 Hz)													
	≤ 230V [A]	11.3	20	20	21	26	35	46	61	66	76	107	
	≤ 240V [A]	11.3	20	20	21	26	35	46	61	66	76	107	
	400V [A]	8.5	15.5	15.5	16	21	28	40	52	64	74	104	
	415V [A]	8.5	15.5	15.5	16	21	28	40	52	64	74	104	
	500V [A]	6.8	12.4	12.4	12	17	24	35	43	52	66	95	
	690V [A]	4.9	8.9	8.9	8.6	12	16	21	31	36	43	59	
	1000V [A]	—	—	—	—	—	—	—	—	—	—	—	
	230V* [kW]	3	5.5	5.5	5.5	7.5	10	13	17	20	22	32	
	240V* [kW]	3	5.5	5.5	5.5	7.5	10	13	18.5	20	22	32	
	400V* [kW]	4	7.5	10	7.5	10	13	20	25	32	40	55	
	415V* [kW]	4	7.5	11	7.5	11	15	22	25	37	40	55	
	500V* [kW]	4	7.5	7.5	7.5	11	15	22	25	32	45	63	
	690V* [kW]	4	7.5	7.5	7.5	10	13	18.5	25	32	40	55	
	1000V* [kW]	—	—	—	—	—	—	—	—	—	—	—	

* Power ratings at 50 Hz: Preferred values according to IEC 60072-1

† Approval pending on Cat. No. 100-D210...D860.

100/104-C, 100S/104S-C			100/104-D, 100S-D										
72	85	97	115	140	140	180	180	210	250	300	420	630	860
X	X	X	X	X	—	X	—	—	—	—	—	—	—
—	—	—	X	—	X	—	X	X	X	X	X	X	X
Switching of 3-phase Motors, (50 Hz); Ambient temperature 60 °C, AC-4													
72	85	96	115	140	140	180	180	210	250	300	420	—	—
72	85	95	115	140	140	180	180	210	250	300	420	—	—
72	85	97	115	140	140	180	180	210	250	300	420	—	—
72	85	97	115 (130)*	140 (155)*	140 (155)*	180 (189)‡	180 (189)‡	210 (227)*	250 (258)*	300 (315)*	420	—	—
67	80	78	115	115	140	140	170	210	250	300	360	—	—
42	49	57	115	115	140	140	170	210	250	300	360	—	—
—	—	—	46	55	55	65	65	80	95	115	160	—	—
22	25	30	37	45	45	57	57	67	80	97	135	—	—
22	25	30	39	47	47	60	60	70	83	101	141	—	—
40	45	55	63	78	78	100	100	118	140	170	238	—	—
40	45	55	66 (75)*	82 (90)*	82 (90)*	105 (110)*	105 (110)*	125 (132)*	145 (150)*	176 (185)*	250	—	—
45	55	55	80	80	98	98	119	147	177	213	255	—	—
40	45	55	110	110	135	135	167	205	250	293	356	—	—
—	—	—	63	75	75	90	90	110	132	160	225	—	—
AC-4 at approximately 200,000 operations													
31	38	44	53	60	60	67	67	85	105	140	170	—	—
31	38	44	53	60	60	67	67	85	105	140	170	—	—
31	38	44	53	60	60	67	67	85	105	140	170	—	—
31	38	44	53	60	60	67	67	85	105	140	170	—	—
31	38	44	53	60	60	67	67	85	105	140	170	—	—
—	—	—	25	37	37	43	43	60	72	85	105	—	—
7.5	11	11	15	17	17	20	20	25	32	45	55	—	—
7.5	11	11	15	18.5	18.5	22	22	25	32	45	55	—	—
15	20	22	25	32	32	37	37	45	55	75	90	—	—
17	20	22	25	32	32	37	37	50	55	80	100	—	—
20	25	30	32	40	40	45	45	55	75	100	110	—	—
25	32	37	45	55	55	63	63	80	100	132	160	—	—
—	—	—	30	50	50	55	55	80	100	110	150	—	—
120	120	120	120	120	120	100	100	120	100	70	70	—	—
Wye-Delta (60 Hz)													
40	50	50	60	60	60	75	75	100	125	175	250	—	—
50	60	60	60	75	75	100	100	125	175	200	250	—	—
100	125	125	125	175	175	200	200	250	350	450	600	—	—
100	125	125	150	200	200	250	250	300	450	500	650	—	—
UL/CSA Elevator Duty‡													
48.3	62.1	TBD	78	92	92	120	120	150	150	177	221	—	—
54.0	68.0	TBD	80	104	104	130	130	130	154	192	248	—	—
52.0	65.0	TBD	77	96	96	124	124	156	180	180	240	—	—
52.0	62.0	TBD	77	77	77	99	99	125	144	192	242	—	—
15	20	TBD	25	30	30	40	40	50	50	60	75	—	—
20	25	TBD	30	40	40	50	50	50	60	75	100	—	—
40	50	TBD	60	75	75	100	100	125	150	150	200	—	—
50	60	TBD	75	75	75	100	100	125	150	200	250	—	—
Star-Delta Starting (50 Hz)													
125	147	166	199	242	242	312	312	364	433	520	727	—	—
125	147	165	199	242	242	312	312	364	433	520	727	—	—
125	147	168	199	242	242	312	312	364	433	520	727	—	—
125	147	168	199 (225)*	242 (268)*	242 (268)*	312 (332)*	312 (332)*	364 (393)*	433 (447)*	520 (546)*	727	—	—
116	139	135	199	199	242	312	312	364	433	520	727	—	—
73	85	99	199	199	242	312	312	364	433	520	727	—	—
—	—	—	80	95	95	113	113	139	165	200	277	—	—
37	45	50	63	75	75	90	90	110	132	160	220	—	—
40	50	50	66	80	80	100	100	125	150	160	250	—	—
63	80	90	110	132	132	160	160	200	250	300	425	—	—
63	80	90	114 (132)*	132 (160)*	132 (160)*	160	160	220	250	315 (335)*	425	—	—
80	90	90	132	132	160	200	200	250	315	375	530	—	—
63	80	90	192	200	220	300	300	355	425	530	750	—	—
—	—	—	110	132	132	160	160	200	220	280	400	—	—

* 415V: Values in () AC-3 and AC-4 lifespan -25%

‡ Approval pending on Cat. No. 100-D210...D860.

IEC Contactors

Specifications

Conventional Coil Type : Electronic — EI	100/104-K			100/104-C, 100S/104S-C							
	05	09	12	09	12	16	23	30	37	43	60
	X	X	X	X	X	X	X	X	X	X	X
	—	—	—	—	—	—	—	—	—	—	—

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

Inrush Current

Rated transformer current = n

Rated transformer current	n = 30	Peak Inrush/peak rated transformer current													
		≤ 230V [A]	≤ 240V [A]	≤ 400V [A]	≤ 415V [A]	≤ 500V [A]	≤ 690V [A]	≤ 1000V [A]	230V [kVA]	240V [kVA]	400V [kVA]	415V [kVA]	500V [kVA]	690V [kVA]	1000V [kVA]
		2.9	2.9	2.4	2.4	1.8	—	—	1.2	1.2	1.7	1.7	1.7	2	—
		5.4	5.4	4.1	4.1	3.2	—	—	2	2	2.8	2.8	2.8	4	—
		5.4	5.4	5.4	5.4	3.2	—	—	2	2	3.4	3.4	3.4	5	—
		10.9	10.9	10.9	10.9	10.9	10.9	10.9	4.3	4.5	7.5	7.8	9.4	13	—
		10.9	10.9	10.9	10.9	10.9	10.9	10.9	4.3	4.5	7.5	7.8	9.4	13	—
		10.9	10.9	10.9	10.9	10.9	10.9	10.9	4.3	4.5	7.5	7.8	9.4	13	—
		20	20	20	20	20	20	20	8	8.3	14	14	17	24	—
		20	20	20	20	20	20	20	8	8.3	14	14	17	24	—
		23	23	23	23	23	23	23	9.2	10	16	17	20	27	—
		40.8	40.8	40.8	40.8	40.8	40.8	40.8	16	17	28	29	35	49	—
		—	—	—	—	—	—	—	—	—	—	—	—	—	—
	n = 20	—	—	—	—	16.3	—	—	—	—	—	—	—	—	—
	n = 15	—	—	—	—	22	22	22	22	22	40	40	40	40	40

60 Hz Peak Inrush/peak rated transformer current

n = 30 [A]	—	—	—	10.9	10.9	10.9	10.9	20	20	23	40.8
200V [kVA]	—	—	—	3.8	3.8	3.8	3.8	6.9	6.9	8.0	14.1
208V [kVA]	—	—	—	3.9	3.9	3.9	3.9	7.2	7.2	8.3	14.7
240V [kVA]	—	—	—	4.5	4.5	4.5	4.5	8.3	8.3	9.6	17.0
480V [kVA]	—	—	—	9.1	9.1	9.1	9.1	16.6	16.6	19.1	33.9
600V [kVA]	—	—	—	11.3	11.3	11.3	11.3	20.8	20.8	23.9	42.4
660V [kVA]	—	—	—	12.5	12.5	12.5	12.5	22.9	22.9	26.3	46.6

60 Hz Peak Inrush/peak rated transformer current

n = 20 [A]	—	—	—	16.3	16.3	16.3	16.3	30	30	34.5	61.3
200V [kVA]	—	—	—	5.6	5.6	5.6	5.6	10.4	10.4	12.0	21.2
208V [kVA]	—	—	—	5.9	5.9	5.9	5.9	10.8	10.8	12.4	22.1
240V [kVA]	—	—	—	6.8	6.8	6.8	6.8	12.5	12.5	14.3	25.5
480V [kVA]	—	—	—	13.6	13.6	13.6	13.6	24.9	24.9	28.7	51.0
600V [kVA]	—	—	—	16.9	16.9	16.9	16.9	31.2	31.2	35.9	63.7
660V [kVA]	—	—	—	18.6	18.6	18.6	18.6	34.3	34.3	39.4	70.1

60 Hz Peak Inrush/peak rated transformer current

n=15 [A]	—	—	—	22	22	22	22	40	40	46	82
200V [kVA]	—	—	—	7.5	7.5	7.5	7.5	13.9	13.9	15.9	28.4
208V [kVA]	—	—	—	7.8	7.8	7.8	7.8	14.4	14.4	16.6	29.5
240V [kVA]	—	—	—	9.0	9.0	9.0	9.0	16.6	16.6	19.1	34.1
480V [kVA]	—	—	—	18.1	18.1	18.1	18.1	33.3	33.3	38.2	68.2
600V [kVA]	—	—	—	22.6	22.6	22.6	22.6	41.6	41.6	47.8	85.2
660V [kVA]	—	—	—	24.9	24.9	24.9	24.9	45.7	45.7	52.6	93.7



100/104-C, 100S/104S-C			100/104-D, 100S-D										
72	85	97	115	140	140	180	180	210	250	300	420	630	860
X	X	X	X	X	—	X	—	—	—	—	—	—	—
—	—	—	X	—	X	—	X	X	X	X	X	X	X

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

40.8	40.8	48.5	60	70	70	85	85	105	125	150	210	—	—
40.8	40.8	48.5	60	70	70	85	85	105	125	150	210	—	—
40.8	40.8	48.5	60	70	70	85	85	105	125	150	210	—	—
40.8	40.8	48.5	60	70	70	85	85	105	125	150	210	—	—
40.8	40.8	48.5	60	70	70	85	85	105	125	150	210	—	—
—	—	—	46	70	70	85	85	105	125	150	210	—	—
16	16	19.3	24	28	28	34	34	42	50	60	84	—	—
17	17	20.2	26	29	29	35	35	44	52	62	87	—	—
28	28	33.6	42	48	48	59	59	73	87	104	145	—	—
29	29	34.9	43	50	50	61	61	75	90	108	151	—	—
35	35	42	52	61	61	74	74	91	108	130	182	—	—
49	49	58	72	84	84	102	102	125	149	179	251	—	—
—	—	—	80	121	121	147	147	182	217	260	364	—	—
61.3	61.3	72.8	90	105	105	128	128	158	188	225	315	—	—
82	82	97	120	140	140	170	170	210	250	300	420	—	—

60 Hz Peak Inrush/peak rated transformer current

40.8	40.8	48.5	60	70	70	85	85	105	125	150	210	—	—
14.4	14.4	16.8	20.8	24.2	24.2	29.4	29.4	36.4	43.3	52.0	72.7	—	—
14.7	14.7	17.5	21.6	25.2	25.2	30.6	30.6	37.8	45.0	54.0	75.7	—	—
17.0	17.0	20.2	24.9	29.1	29.1	35.3	35.3	43.6	52.0	62.4	87.3	—	—
33.9	33.9	40.3	49.9	58.2	58.2	70.7	70.7	87.3	104	125	175	—	—
42.4	42.4	50.4	62.4	72.7	72.7	88.3	88.3	109	130	156	218	—	—
46.6	46.6	55.4	68.6	80.0	80.0	97.2	97.2	120	143	171	240	—	—

60 Hz Peak Inrush/peak rated transformer current

61.3	61.3	72.8	90	105	105	128	128	158	188	225	315	—	—
21.2	21.2	25.2	31.2	36.4	36.4	44.3	44.3	54.7	65.1	77.9	109	—	—
22.1	22.1	26.2	32.4	37.8	37.8	46.1	46.1	56.9	67.7	81.1	113	—	—
25.5	25.5	30.3	37.4	43.6	43.6	53.2	53.2	65.7	78.2	93.5	131	—	—
51.0	51.0	60.5	74.8	87.3	87.3	106	106	131	156	187	262	—	—
63.7	63.7	75.7	93.5	109	109	133	133	164	195	234	327	—	—
70.1	70.1	83.2	103	120	120	146	146	181	215	257	360	—	—

60 Hz Peak Inrush/peak rated transformer current

82	82	97	120	140	140	170	170	210	250	300	420	—	—
28.4	28.4	33.6	41.6	48.5	48.5	58.9	58.9	72.7	86.6	104	145	—	—
29.5	29.5	34.9	43.2	50.4	50.4	61.2	61.2	75.7	90.1	108	151	—	—
34.1	34.1	40.3	49.9	58.2	58.2	70.7	70.7	87.3	104	125	175	—	—
68.2	68.2	80.6	99.8	116	116	141	141	175	208	249	349	—	—
85.2	85.2	100.8	125	145	145	177	177	218	260	312	436	—	—
93.7	93.7	110.9	137	160	160	194	194	240	286	343	480	—	—

2

IEC Contactors

Specifications

2

		100/104-K			100/104-C, 100S/104S-C									
		05	09	12	09	12	16	23	30	37	40*200	40*400	43	60
Coil Type :	Conventional	X	X	X	X	X	X	X	X	X	X	X	X	X
	Electronic — EI	—	—	—	—	—	—	—	—	—	—	—	—	
Switching of 3-phase Capacitors, AC-6b (50 Hz)*														
Single capacitor 40 °C	230V [kVar]	—	—	—	8	8	8.5	9	14	14	—	—	24	28
	240V [kVar]	—	—	—	8	8	8.5	9	14	14	—	—	25	29
	400V [kVar]	—	—	—	8	8	10	12.5	20	24	—	—	35	48
	415V [kVar]	—	—	—	8	8	10	12.5	20	25	—	—	35	50
	500V [kVar]	—	—	—	8	8	10	12.5	20	25	—	—	35	50
	690V [kVar]	—	—	—	8	8	10	12.5	20	25	—	—	35	50
	1000V [kVar]	—	—	—	—	—	—	—	—	—	—	—	—	—
60 °C	230V [kVar]	—	—	—	8	8	8.5	9	12.5	12.5	—	—	18	28
	240V [kVar]	—	—	—	8	8	8.5	9	12.5	12.5	—	—	18	29
	400V [kVar]	—	—	—	8	8	10	12.5	20	21.5	—	—	30	42
	415V [kVar]	—	—	—	8	8	10	12.5	20	22	—	—	30	42
	500V [kVar]	—	—	—	8	8	10	12.5	20	25	—	—	30	42
	690V [kVar]	—	—	—	8	8	10	12.5	20	25	—	—	30	42
	1000V [kVar]	—	—	—	—	—	—	—	—	—	—	—	—	—
Group capacitors 40 °C	230V [kVar]	—	—	—	5	5	8	9	12.5	14	—	—	20	28
	240V [kVar]	—	—	—	5	5	8	9	12.5	14	—	—	20	29
	400V [kVar]	—	—	—	5	5	8	10	15	20	—	—	25	40
	415V [kVar]	—	—	—	5	5	8	10	15	20	—	—	25	40
	500V [kVar]	—	—	—	5	5	8	10	15	20	—	—	25	40
	690V [kVar]	—	—	—	5	5	8	10	15	20	—	—	25	40
	1000V [kVar]	—	—	—	—	—	—	—	—	—	—	—	—	—
60 °C	230V [kVar]	—	—	—	5	5	8	9	12.5	12.5	—	—	18	28
	240V [kVar]	—	—	—	5	5	8	9	12.5	12.5	—	—	18	29
	400V [kVar]	—	—	—	5	5	8	10	15	20	—	—	25	40
	415V [kVar]	—	—	—	5	5	8	10	15	20	—	—	25	40
	500V [kVar]	—	—	—	5	5	8	10	15	20	—	—	25	40
	690V [kVar]	—	—	—	5	5	8	10	15	20	—	—	25	40
	1000V [kVar]	—	—	—	—	—	—	—	—	—	—	—	—	—
60 Hz Single Capacitor — 40 °C														
	200V [kVar]	—	—	—	5	5	8	9	12.5	14	—	—	20	28
	230V [kVar]	—	—	—	5	5	8	9	12.5	14	—	—	20	29
	460V [kVar]	—	—	—	5	5	8	10	15	20	—	—	25	40
	600V [kVar]	—	—	—	5	5	8	10	15	20	—	—	25	40
60 Hz Group Capacitors — 40 °C														
	200V [kVar]	—	—	—	5	5	8	9	12.5	12.5	—	—	18	28
	230V [kVar]	—	—	—	5	5	8	9	12.5	12.5	—	—	18	29
	460V [kVar]	—	—	—	5	5	8	10	15	20	—	—	25	40
	600V [kVar]	—	—	—	5	5	8	10	15	20	—	—	25	40
Switching of Lamps														
Gas discharge lamps AC-5a, 40 °C	open [A]	18	18	18	22.5	25	28	29	40.5	45	65	65	77	81
	enclosed [A]	14.5	14.5	14.5	22.5	25	28	29	37	41	54	54	57	77
Individually compensated:														
Max. capacitance at expected														
Short-circuit current of	10 kA [μF]	750	750	750	1 000	1 000	1 000	1 000	2 700	2 700	—	—	3 200	4 000
	20 kA [μF]	400	400	400	500	500	500	500	1 350	1 350	—	—	1 600	2 000
	50 kA [μF]	—	—	—	200	200	200	200	540	540	—	—	640	800
Filament AC-5b	230/240V [A]	5	9	9	12	16	18	22	30	37	18	25	43	60
Switching of Low Inductive Loads in Home Appliances and Similar Applications per IEC 61095 (50 Hz)														
AC-7a	230V [A]	20	20	20	32	32	32	32	45	45	—	—	63	—
	400V [A]	20	20	20	32	32	32	32	45	45	—	—	63	—
	440V [A]	—	—	—	32	32	32	32	45	45	—	—	63	—
Switching of Motor Load for Home Appliances (50 Hz)														
AC-7b	230V [A]	6	11	11	10.5	14	19	23	30	—	—	—	—	—
	400V [A]	6	11	11	9	12	16	20	30	—	—	—	—	—
	440V [A]	—	—	—	7.5	10	13.5	18	27	—	—	—	—	—

* Inductance of leads between capacitors in parallel: min. 6 μH (100-C09...C30 contactors: min 30 μH)



100/104-C, 100S/104S-C					100/104-D, 100S-D										
72	85	90*200	90*400	97	115	140	140	180	180	210	250	300	420	630	860
X	X	X	X	X	X	X	—	X	—	—	—	—	—	—	—
—	—	—	—	—	X	—	X	—	X	X	X	X	X	X	X

Switching of 3-phase Capacitors, AC-6b (50 Hz)

28	28	—	—	28	45	70	70	70	70	98	98	125	139	—	—
29	29	—	—	29	47	73	73	73	73	102	102	131	145	—	—
48	48	—	—	48	78	121	121	121	121	170	170	218	242	—	—
50	50	—	—	50	81	126	126	126	126	176	176	226	252	—	—
55	60	—	—	60	97	152	152	152	152	212	212	273	303	—	—
55	60	—	—	60	134	209	209	209	209	293	293	376	418	—	—
—	—	—	—	—	194	303	303	303	303	424	424	546	606	—	—
28	28	—	—	28	38	59	59	59	59	84	84	106	119	—	—
29	29	—	—	29	39	61	61	61	61	87	87	111	124	—	—
48	48	—	—	48	65	102	102	102	102	145	145	184	206	—	—
50	50	—	—	50	68	106	106	106	106	151	151	191	214	—	—
50	55	—	—	55	82	127	127	127	127	182	182	230	258	—	—
50	55	—	—	55	113	176	176	176	176	251	251	318	356	—	—
—	—	—	—	—	164	255	255	255	255	364	364	461	515	—	—
28	28	—	—	28	45	70	70	70	70	98	98	125	139	—	—
29	29	—	—	29	47	73	73	73	73	102	102	131	145	—	—
48	48	—	—	48	56	76	76	111	111	170	170	218	242	—	—
50	50	—	—	50	56	76	76	112	112	170	176	226	252	—	—
50	50	—	—	50	56	76	76	113	113	172	212	273	303	—	—
50	50	—	—	50	57	78	78	114	114	174	247	356	418	—	—
—	—	—	—	—	58	79	79	116	116	177	251	361	606	—	—
28	28	—	—	28	38	59	59	59	59	84	84	106	119	—	—
29	29	—	—	29	39	61	61	61	61	87	87	111	124	—	—
48	48	—	—	48	56	76	76	102	102	145	145	184	206	—	—
50	50	—	—	50	56	76	76	106	106	151	151	191	214	—	—
50	50	—	—	50	56	76	76	113	113	172	182	230	258	—	—
50	50	—	—	50	57	78	78	114	114	174	247	318	356	—	—
—	—	—	—	—	58	79	79	116	116	177	251	361	515	—	—

60 Hz Single Capacitor — 40 °C

28	28	—	—	28	39	61	61	61	61	85	85	109	121	—	—
29	29	—	—	29	45	70	70	70	70	98	98	125	139	—	—
50	50	—	—	50	89	139	139	139	139	195	195	251	279	—	—
50	50	—	—	50	116	182	182	182	182	255	255	327	364	—	—

60 Hz Group Capacitor — 40 °C

28	28	—	—	28	39	61	61	61	61	85	85	109	121	—	—
29	29	—	—	29	45	70	70	70	70	98	98	125	139	—	—
50	50	—	—	50	56	76	76	112	112	171	195	251	279	—	—
50	50	—	—	50	57	77	77	114	114	173	246	327	364	—	—

Switching of Lamps

85	90	115	115	115	144	225	225	225	225	315	315	405	450	—	—
81	90	95	95	100	122	189	189	189	189	270	270	342	383	—	—

Individually compensated:

Max. capacitance at expected

4 000	4 700	—	—	4 700	—	—	—	—	—	—	—	—	—	—	—
2 000	2 350	—	—	2 350	—	—	—	—	—	—	—	—	—	—	—
800	940	—	—	940	—	—	—	—	—	—	—	—	—	—	—
70	76	60	75	90	120	140	140	170	170	210	250	300	420	—	—

Switching of Low Inductive Loads in Home Appliances and Similar Applications per IEC 61095 (50 Hz)

—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Switching of Motor Load for Home Appliances (50 Hz)

—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

IEC Contactors

Specifications

2

Coil Type :		100/104-K			100/104-C, 100S/104S-C										
		05	09	12	09	12	16	23	30	37	40*200	40*400	43	60	
		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Conventional		X	X	X	X	X	X	X	X	X	X	X	X	X	
Electronic — EI		—	—	—	—	—	—	—	—	—	—	—	—	—	
Switching of Hermetically Sealed Cooling Compressor Motors - manual reset of overload release (50 Hz)															
AC-8a	400V	[A]	11	18	18	12	16	22	32	38	45	—	—	63	72
	500V	[A]	10	15	15	12	16	22	32	38	45	—	—	63	72
	690V	[A]	—	—	—	8	10	14	20	28	35	—	—	42	56
- automatic reset of overload release															
AC-8b	400V	[A]	—	—	—	5.5	7	9.3	12	13	14	—	—	16	24
	500V	[A]	—	—	—	5.5	7	9.3	12	13	14	—	—	16	24
	690V	[A]	—	—	—	5.5	7	9.3	12	13	14	—	—	16	24
Switching of DC Loads															
Non-inductive or slightly inductive loads or resistance furnaces DC-1, 60 °C															
1 pole	24V	[A]	6	9	9	25	25	32	32	45	45	45	45	50	70
	48/60V	[A]	4/1	6/1.5	6/1.5	20	20	20	20	25	25	25	25	30	40
	110V	[A]	0.6	1	1	6	6	6	6	8	8	10	10	9	11
	220V	[A]	0.2	0.3	0.3	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2
	440V	[A]	0.08	0.1	0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5
2 poles in series	24V	[A]	6	9	9	25	25	32	32	45	45	45	45	50	70
	48/60V	[A]	6	8	8	25	25	32	32	45	45	45	45	50	70
	110V	[A]	4	6	6	25	25	32	32	45	45	45	45	50	70
	220V	[A]	0.8	1.2	1.2	8	8	8	10	10	10	10	10	10	15
3 poles in series	440V	[A]	0.2	0.3	0.3	1	1	1	1	1	1	1	1	1	1.5
	24V	[A]	6	9	9	25	25	32	32	45	45	—	45	63	90
	48/60V	[A]	6	9	9	25	25	32	32	45	45	—	45	63	90
	110V	[A]	6	9	9	25	25	32	32	45	45	—	45	63	90
3 poles in series	220V	[A]	3	4	4	25	25	32	32	45	45	—	45	50	70
	440V	[A]	0.4	0.6	0.6	3	3	3	3	3.5	3.5	—	3.5	4	5
	Shunt-wound Motors														
Starting, reverse current braking, reversing, stepping DC-3, 60 °C															
3 poles in series	24V	[A]	5	9	9	25	25	32	32	45	45	—	—	63	90
	48/60V	[A]	4	6	6	25	25	32	32	45	45	—	—	50	70
	110V	[A]	2	3	3	20	20	25	25	30	30	—	—	35	70
	220V	[A]	0.8	1.2	1.2	6	6	6	10	15	15	—	—	20	25
	440V	[A]	0.15	0.2	0.2	0.6	0.6	0.6	0.6	0.6	0.6	—	—	0.6	0.6
Series-wound Motors															
Starting, reverse current braking, reversing, stepping DC-5, 60 °C															
3 poles in series	24V	[A]	5	9	9	25	25	32	32	45	45	—	—	63	90
	48/60V	[A]	2	3	3	25	25	32	32	45	45	—	—	50	70
	110V	[A]	0.6	1	1	20	20	25	25	30	30	—	—	35	70
	220V	[A]	0.1	0.1	0.1	6	6	6	10	15	15	—	—	20	25
	440V	[A]	—	—	—	0.6	0.6	0.6	0.6	0.6	0.6	—	—	0.6	0.6
Short Time Withstand I_{cw}, 60 °C															
10 s		[A]	60	96	96	170	170	170	215	300	304	304	304	375	700
Resistance and Power Dissipation															
Main current circuit resistance		[mΩ]	2.2	2.2	2.2	2.7	2.7	2.7	2	2	2	2	1.5	1.5	0.9
Power dissipation by all circuits at I_e AC-3/400V		[W]	0.3	0.9	0.9	0.66	1.2	2.1	3.2	5.4	8.2	11.3	8.4	8.3	9.7
Total power dissipation															
At I_e AC-3/400V	AC	[W]	2.1	2.7	2.7	3.3	3.8	4.7	6.2	8.4	11.2	26.1	37.4	11.5	11
	DC	[W]	2.9	3.5	3.5	6.7	7.2	8.1	12.4	14.6	17.4	32.6	43.9	18.4	11
Lifespan															
Mechanical AC control		[Mil. operations]	15	15	15	13	13	13	13	13	13	10	10	12	6
Mechanical DC control		[Mil. operations]	15	15	15	13	13	13	13	13	13	10	10	13	6
Electrical AC-3 (400 V)		[Mil. operations]	0.7	0.7	0.7	1.3	1.3	1.3	1.3	1.3	1.3	—	—	1	1
Weight															
AC	Non-Rev.	kg (lbs.)	0.16 (0.35)	0.16 (0.35)	0.16 (0.35)	0.39 (0.86)	0.39 (0.86)	0.39 (0.86)	0.39 (0.86)	0.48 (1.06)	0.49 (1.08)	0.63 (1.39)	0.63 (1.39)	0.51 (1.12)	1.45 (3.20)
	Rev.	kg (lbs.)	—	—	—	0.85 (1.89)	0.85 (1.89)	0.85 (1.89)	0.85 (1.89)	1.08 (2.39)	1.08 (2.39)	—	—	1.15 (2.54)	3.14 (6.92)
DC	Non-Rev.	kg (lbs.)	0.2 (0.44)	0.2 (0.44)	0.2 (0.44)	0.6 (1.32)	0.6 (1.32)	0.6 (1.32)	0.73 (1.61)	0.85 (1.87)	0.85 (1.87)	1.12 (2.46)	1.12 (2.46)	1.0 (2.20)	1.47 (3.24)
	Rev.	kg (lbs.)	—	—	—	1.27 (2.81)	1.27 (2.81)	1.27 (2.81)	1.53 (3.39)	1.81 (4.0)	1.81 (4.0)	—	—	2.13 (4.7)	3.22 (7.1)

100/104-C, 100S/104S-C					100/104-D, 100S-D										
72	85	90*200	90*400	97	115	140	140	180	180	210	250	300	420	630	860
X	X	X	X	X	X	X	—	X	—	—	—	—	—	—	—
—	—	—	—	—	X	—	X	—	X	X	X	X	X	X	X
Switching of Hermetically Sealed Cooling Compressor Motors - manual reset of overload release (50 Hz)															
85	100	—	—	115	192	210	210	—	—	—	—	—	—	—	—
85	100	—	—	115	192	192	210	—	—	—	—	—	—	—	—
67	80	—	—	90	192	192	210	—	—	—	—	—	—	—	—
- automatic reset of overload release															
30	35	—	—	35	—	—	—	—	—	—	—	—	—	—	—
30	35	—	—	35	—	—	—	—	—	—	—	—	—	—	—
30	35	—	—	35	—	—	—	—	—	—	—	—	—	—	—
Switching of DC Loads															
Non-inductive or slightly inductive loads or resistance furnaces DC-1, 60 °C															
80	80	80	80	80	135	210	210	210	210	300	300	380	425	—	—
40	40	40	40	40	135	210	210	210	210	300	300	380	425	—	—
11	11	11	11	11	135	210	210	210	210	300	300	380	425	—	—
2	2	1.8	1.8	2	3	3.3	3.3	3.3	3.3	4.9	4.9	4.9	5.2	—	—
0.5	0.5	0.5	0.5	0.5	0.6	0.75	0.75	0.75	0.75	1	1	1	1.2	—	—
80	80	80	80	80	135	210	210	210	210	300	300	380	425	—	—
80	80	80	80	80	135	210	210	210	210	300	300	380	425	—	—
80	80	80	80	80	135	210	210	210	210	300	300	380	425	—	—
15	15	15	15	15	135	210	210	210	210	300	300	380	425	—	—
1.5	1.5	1.5	1.5	1.5	3	3.3	3.3	3.3	3.3	4.9	4.9	4.9	5.2	—	—
90	100	—	100	100	135	210	210	210	210	300	300	380	425	—	—
90	100	—	100	100	135	210	210	210	210	300	300	380	425	—	—
90	100	—	100	100	135	210	210	210	210	300	300	380	425	—	—
80	80	—	80	80	135	210	210	210	210	300	300	380	425	—	—
5	5	—	5	5	11	11	11	11	11	14	14	14	15	—	—
Shunt-wound Motors															
Starting, reverse current braking, reversing, stepping DC-3, 60 °C															
90	100	—	—	100	135	210	210	210	210	300	300	380	425	—	—
70	80	—	—	80	135	210	210	210	210	300	300	380	425	—	—
70	80	—	—	80	135	210	210	210	210	300	300	380	425	—	—
25	30	—	—	30	135	210	210	210	210	300	300	380	425	—	—
0.6	0.6	—	—	0.6	3	3.5	3.5	3.5	3.5	4.1	4.1	4.1	5.8	—	—
Series-wound Motors															
Starting, reverse current braking, reversing, stepping DC-5, 60 °C															
90	100	—	—	100	135	210	210	210	210	300	300	380	425	—	—
70	80	—	—	80	135	210	210	210	210	300	300	380	425	—	—
70	80	—	—	80	135	210	210	210	210	300	300	380	425	—	—
25	30	—	—	30	135	210	210	210	210	300	300	380	425	—	—
0.6	0.6	—	—	0.6	1.2	2.1	2.1	2.1	2.1	2.4	2.4	2.4	3	—	—
Short Time Withstand I_{CW} , 60 °C															
700	700	700	700	840	1040	1240	1360	1480	1480	2360	2520	2840	4700	6300	7000
Resistance and Power Dissipation															
0.9	0.9	0.8	0.7	0.6	0.4	0.42	0.42	0.42	0.42	0.22	0.22	0.18	0.15	0.19	0.14
14	19.5	13.5	11.8	17	14.5	24.6	24.6	40.8	40.8	29.4	41.7	48.6	79.5	78.4	103.2
Total power dissipation															
13.8	17.5	36	56.3	26	24.5 (20.5)	34.6	30.6	50.8	46.8	35.4	47.7	54.6	86.5	105.4	133.2
13.8	17.5	32.5	52.8	23	22.5 (20.5)	32.6	30.6	48.8	46.8	35.4	47.7	54.6	86.5	105.4	133.2
Lifespan															
6	6	6	6	6	10	10	10	10	10	10	10	10	10	2	2
6	6	6	6	6	10	10	10	10	10	10	10	10	10	2	2
1	1	—	—	1	1	1	1	1	1	1	1	1	1	—	—
Weight															
1.45 (3.2)	1.45 (3.2)	—	—	1.45 (3.2)	3.3 (7.28) [3.8 (8.38)]*	3.3 (7.28)	3.8 (8.38)	3.3 (7.28)	3.8 (8.38)	7.5 (16.53)	7.5 (16.53)	7.5 (16.53)	7.5 (16.53)	28.6 (63)	28.6 (63)
3.14 (6.92)	3.14 (6.92)	—	—	3.14 (6.92)	—	—	—	—	—	—	—	—	—	—	—
1.47 (3.24)	1.47 (3.24)	—	—	1.47 (3.24)	3.3 (7.28) [3.8 (8.38)]*	3.3 (7.28)	3.8 (8.38)	3.3 (7.28)	3.8 (8.38)	7.5 (16.53)	7.5 (16.53)	7.5 (16.53)	7.5 (16.53)	28.6 (63)	28.6 (63)
3.22 (7.1)	3.22 (7.1)	—	—	3.22 (7.1)	—	—	—	—	—	—	—	—	—	—	—

* Values in brackets refer to electronic coil (EI) version.

IEC Contactors

Specifications

Coil Type :	Conventional Electr. — EI	100-KR		100/104-K			100/104-C, 100S/104S-C											
		05	09	05	09	12	09	12	16	23	30	37	40	43	60	72	85	97
		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Conductor Cross Sections - Main Contacts				 *			 *			 †				 †				
	(1) conductor [mm ²]	0.50...2.5		0.75...2.5			1...4			2.5...10		2.5...16		2.5...35		2.5...35		
	(2) conductors [mm ²]	0.50...2.5		0.75...2.5			1...4			2.5...10		2.5...10		2.5...25		2.5...35		
	(1) conductor [mm ²]	0.75...2.5§		1...4			1.5...6			2.5...16		2.5...25		2.5...50		2.5...50		
	(2) conductors [mm ²]	0.75...2.5§		1...2.5+ 1...4			1.5...6			2.5...16		2.5...16		2.5...35		2.5...50		
	b max. [mm]	—		—			—			—		—		—		—		
	c max. [mm]	—		—			—			—		—		—		—		
	s max. [mm]	—		—			—			—		—		—		—		
	Ø min. [mm]	—		—			—			—		—		—		—		
	Recommended torque [N•m]	—		1.2			1.5...2.0			2.5...3.5		2.5...3.5		4.5...6		—		
	Cross section per UL/CSA [AWG]	18...14§		18...12			16...10			14...6		14...6 14...4		14...1		—		
	Recommended torque [lb-in]	—		10.6			13.3...17.7			22...31		22...31		40...53		—		
With terminal lug kit		—		—			—			—		—		—		—		
	Cross section per UL/CSA [AWG]	—		—			—			—		—		—		—		
	Recommended torque [lb-in]	—		—			—			—		—		—		—		
With Frame Terminal Block		—		—			—			—		—		—		—		
	top opening [mm ²]	—		—			—			—		—		—		—		
	bottom opening [mm ²]	—		—			—			—		—		—		—		
	top opening [mm ²]	—		—			—			—		—		—		—		
	bott. opening [mm ²]	—		—			—			—		—		—		—		
	b max. [mm ²]	—		—			—			—		—		—		—		
	s top [mm ²]	—		—			—			—		—		—		—		
	s bottom [mm ²]	—		—			—			—		—		—		—		
	Recommended torque [N•m]	—		—			—			—		—		—		—		
	Cross section per UL/CSA top [AWG]	—		—			—			—		—		—		—		
	bottom [AWG]	—		—			—			—		—		—		—		
	Recommended torque [lb-in]	—		—			—			—		—		—		—		

* Pozidriv No. 2 / Blade No. 3 screw

† Pozidriv No. 2 / Blade No. 4 screw

‡ Hexagonal socket screw

§ Fine- or coarse-stranded only

100/104-D, 100S-D								
115	140	180	210	250	300	420	630	860
X	X	X	—	—	—	—	—	—
X	X	X	X	X	X	X	X	X
								
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
25	—	—	—	30	—	—	52	52
12.5	—	—	—	15	—	—	22	22
5	—	—	—	6	—	—	2 x 8	2 x 8
8.3	—	—	—	10.5	—	—	13	13
22	—	—	—	43	—	—	68	68
—	—	—	—	—	—	—	—	—
195	—	—	—	380	—	—	600	600
100-DL180‡	—	—	—	100-DL420‡	—	—	100-DL630	100-DL860
6...300 MCM	—	—	—	(2x) 4...350 MCM	—	—	(2X) 2/0...500MCM	(4X) 2/0...500MCM
88...106	—	—	—	375	—	—	400	400
100-DTB180‡	—	—	—	100-DTB420*	—	—	—	—
16...35	—	—	—	25...185*	—	—	—	—
16...95	—	—	—	25...185	—	—	—	—
16...50	—	—	—	25...240	—	—	—	—
16...120	—	—	—	25...240	—	—	—	—
20	—	—	—	25	—	—	—	—
3...9	—	—	—	6...20	—	—	—	—
3...14	—	—	—	6...20	—	—	—	—
14	—	—	—	25	—	—	—	—
6...1 / 0 AWG	—	—	—	4 AWG...600 MCM	—	—	—	—
6 AWG...250 MCM	—	—	—	4 AWG...600 MCM	—	—	—	—
124	—	—	—	220	—	—	—	—

* Pozidriv No. 2 / Blade No. 3 screw
 * Pozidriv No. 2 / Blade No. 4 screw
 ‡ Hexagonal socket screw
 § Hexagonal screw



IEC Contactors

Specifications

Short-Circuit Coordination Data†

Coil Type :	Conventional Electronic - EI	100/104-K						100/104-C, 100S/104S-C												
		05	09	12	09	12	16	23	30	37	40*200	40*400	43	60	72	85	90*200	90*400	97	
		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		

Short Circuit Coordination (Max. Fuse or Circuit Breaker Rating)

Per IEC 60947-4-1 (contactor and fuses only)

DIN Fuses - gG, gL		50 kA Available Fault Current																	
Type "1" (690V)	[A]	35	35	35	50	50	50	80	125	125	160	160	160	250	250	250	250	250	250
Type "2" (400V)	[A]	16	20	20	25	35	35	40	80	80	63	80	100	160	160	160	160	100	200
Type "2" (690V)	[A]	—	—	—	25	35	35	40	80	80	63	80	100	160	160	160	160	100	200
BS88 Fuses		65 kA Available Fault Current																	
Type "1" (415V)	[A]	—	—	—	25	32	40	50	63	80	—	—	80	100	160	160	—	—	TBD
Type "2" (415V)	[A]	—	—	—	20	25	32	50	63	80	—	—	80	100	125	160	—	—	TBD

Per UL 508 and CSA 22.2 No. 14 (contactor and fuses or circuit breaker only)

UL Class K5 and RK5 Fuses		5 kA Available Fault Current																	
UL Listed Combination (600V)	[A]	40	40	40	35	40	70	90	110	125	125	125	150	200	—	—	—	—	—
UL Class K5 and RK5 Fuses		10 kA Available Fault Current																	
UL Listed Combination (600V)	[A]	—	—	—	—	—	—	—	—	—	—	—	—	—	250	300	300	300	350
UL Class L Fuses		18 kA Available Fault Current																	
UL Listed Combination (600V)	[A]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
UL Class L Fuses		30 kA Available Fault Current																	
UL Listed Combination (600V)	[A]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
UL Class L Fuses		42 kA Available Fault Current																	
UL Listed Combination (600V)	[A]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
UL Class CC and CSA HRCI-MISC Fuses		50 kA Available Fault Current																	
UL Listed Combination (600V)	[A]	30	30	30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
UL Class J and CSA HRCI-J Fuses		50 kA Available Fault Current																	
UL Listed Combination (600V)	[A]	30	30	30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
UL Class CC and CSA HRCI-MISC Fuses		100 kA Available Fault Current																	
UL verified combination to IEC 60947-4-1 "Type 2"	[A]	—	—	—	20§	20	30	40	—	—	—	—	—	—	—	—	—	—	—
UL Class J and CSA HRCI-J Fuses		100 kA Available Fault Current																	
UL verified combination to IEC 60947-4-1 "Type 2"	[A]	—	—	—	20§	20	30	40	50	50	—	—	70	80	100	150	—	—	TBD
UL Inverse-Time Circuit Breaker		5 kA Available Fault Current																	
UL Listed Combination (480V)	[A]	—	—	—	30	30	50	50	125	125	—	—	125	250	—	—	—	—	—
UL Listed Combination (600V)	[A]	—	—	—	—	—	—	—	125	125	—	—	125	250	—	—	—	—	—
UL Inverse-Time Circuit Breaker		10 kA Available Fault Current																	
UL Listed Combination (600V)	[A]	—	—	—	—	—	—	—	—	—	—	—	—	—	250	250	—	—	250
UL Inverse-Time Circuit Breaker		18 kA Available Fault Current																	
UL Listed Combination (600V)	[A]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
UL Inverse-Time Circuit Breaker		30 kA Available Fault Current																	
UL Listed Combination (600V)	[A]	—	—	—	—	—	—	—	50	50	—	—	50	110	110	110	—	—	TBD
UL Inverse-Time Circuit Breaker		42 kA Available Fault Current																	
UL Listed Combination (600V)	[A]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
UL Inverse-Time Circuit Breaker		50 kA Available Fault Current																	
UL Listed Combination (480V)	[A]	—	—	—	—	—	—	—	50	50	—	—	50	—	—	—	—	—	—
UL Inverse-Time Circuit Breaker		65 kA Available Fault Current																	
UL Listed Combination (480V)	[A]	—	—	—	—	—	—	—	—	—	—	—	—	110	110	110	—	—	TBD

§ 15 A max. fuse for Type 2 coordination.

† See www.ab.com/certifications/ul508a for complete short-circuit current ratings.



100/104-D, 100S-D									
115	140/180	140	180	210	250	300	420	630	860
X	X	—	—	—	—	—	—	—	—
X	—	X	X	X	X	X	X	X	X

50 kA Available Fault Current									
250	315	315	355	500	500	630	630	*	*
200	250	250	315	400	400	500	500	*	*
200	250	250	315	400	400	500	500	*	*

65 kA Available Fault Current									
200	250	250	250	355	355	450	630	*	*
200	250	250	250	355	355	450	560	*	*

5 kA Available Fault Current									
—	—	—	—	—	—	—	—	—	—

10 kA Available Fault Current									
250	350/450	350	450	500	—	—	—	—	—

18 kA Available Fault Current									
—	—	—	—	—	700	700	1000	—	—

30 kA Available Fault Current									
—	—	—	—	—	—	—	—	2000	—

42 kA Available Fault Current									
—	—	—	—	—	—	—	—	—	2500

50 kA Available Fault Current									
—	—	—	—	—	—	—	—	—	—

50 kA Available Fault Current									
—	—	—	—	—	—	—	—	—	—

100 kA Available Fault Current									
—	—	—	—	—	—	—	—	—	—

100 kA Available Fault Current									
200	250/300	250	300	400	400	500	600	*	*

5 kA Available Fault Current									
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—

10 kA Available Fault Current									
150	200/250	200	250	300	—	—	—	—	—

18 kA Available Fault Current									
—	—	—	—	—	400	400	600	—	—

30 kA Available Fault Current									
125	200	200	200	250	400	400	600	1200	—

42 kA Available Fault Current									
—	—	—	—	—	—	—	—	—	1200

50 kA Available Fault Current									
—	—	—	—	—	—	—	—	—	—

65 kA Available Fault Current									
125	200	200	200	250	400	400	600	*	*

* To be determined.

IEC Contactors

Specifications

2

Coil Type			100/104-K			100/104-C, 100S/104S-C																				
			05	09	12	09	12	16	23	30	37	40*200	40*400	43	60	72	85	90*200	90*400	97						
			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X					
Conventional			Electronic — EI																							
Coil Type			Electronic — EI																							
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			0.85...1.1														
	dropout	[x Us]	0.2...0.75			0.3...0.6			0.3...0.6			0.3...0.6														
DC (conventional)	pick-up	[x Us]	0.8...1.1 0.7...1.25§			0.8...1.1			0.8...1.1			0.8...1.1														
	dropout	[x Us]	0.1...0.75			0.1...0.6			0.1...0.6			0.1...0.6														
DC (electronic)	pick-up	[x Us]	—			0.7...1.25			—																	
	dropout	[x Us]	—			0.4			—																	
Coil Consumption																										
50 Hz, 60 Hz, 50/60 Hz	pick-up	[VA/W]	35/32			70/50			70/50			80/60			130/90			130/90			200/110			400/240		
	hold-in	[VA/W]	5/1.8			8/2.6			9/3			9/3			12/3.6			10/3.2			16/4.5			24/9		
DC (conventional)	pick-up	[W]	cold 3.0, warm 2.6			6.5			9.2			9.2			10.1			10.1			200			325		
	hold-in	[W]	cold 3.0, warm 2.6			6.5			9.2			9.2			10.1			10.1			4.5			5.5		
DC (electronic)	pick-up (avg/peak)	[W]	—			10/17			10/17			16/25			—			—								
	hold-in	[W]	—			1.7			1.7			2.5			—			—								
Operating Times																										
AC	closing delay	[ms]	15...40			15...30			15...30			15...30			15...30			20...40			20...40					
	opening delay	[ms]	15...33			10...60			10...60			10...60			10...60			10...60			20...40					
With RC module	opening delay	[ms]	15...28			10...60			10...60			10...60			10...60			10...60			20...40					
DC (conventional)	closing delay	[ms]	18...40			40...70			40...70			50...80			50...80			20...40			15...25 20...25 20...25					
	opening delay	[ms]	6...12			7...15			7...15			7...15			7...15			—			—					
With integ. diode	opening delay	[ms]	8...12			14...20			17...23			17...23			—			17...23			≤ 220V 20...35 ≤ 220V 20...35					
With external diode	opening delay	[ms]	35...50			70...95			80...125			80...125			—			80...125			—					
DC (electronic)	closing delay	[ms]	—			—			25...50			—			—			—								
	opening delay	[ms]	—			—			25...50			—			—			—								
Max. Ripple		—			—			± 15%			—			—			—									
Min. OFF time	[ms]	—			—			200			—			—			—									

§ For 9, 12, 24, and 110V DC coils

Coil Type			100/104-D, 100S-D											
			95/110	140/180	115	140	180	210	250	300	420	630	860	
			X	X	—	—	—	—	—	—	—	—	—	—
Conventional			Electronic — EI											
Coil Type			Electronic — EI											
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			0.8...1.1		
	dropout	[x Us]	0.3...0.6			0.3...0.5			0.3...0.5			0.1...0.8		
DC control	pick-up	[x Us]	0.85...1.1			0.85...1.1			0.85...1.1			0.85...1.1		
	dropout	[x Us]	0.3...0.6			0.3...0.5			0.3...0.5			0.1...0.8		
Coil Consumption														
50 Hz, 60 Hz, 50/60 Hz	pick-up	[VA/W]	650/310			380/240*			490/270*			1915/1720		
	hold-in	[VA/W]	50/10			13/6			18/7			33/30		
DC control	pick-up	[W]	540			265*			340*			1980*		
	hold-in	[W]	8			6			7			30		
Operating Times														
AC	closing delay	[ms]	20...47			20...45			20...45			60...100		
	opening delay	[ms]	6...12			25...110			25...110			70...145		
With RC module	opening delay	[ms]	9...18			—			—			—		
DC	closing delay	[ms]	27...47			25...50			25...50			60...100		
	opening delay	[ms]	12...20			35...110			35...110			70...145		
Integrated diode	opening delay	[ms]	12...20			—			—			—		
External diode	opening delay	[ms]	—			—			—			—		

* 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, Auxiliary Contact Blocks, and Pneumatic Timers

	100-K		100-C, 100S-C				100-D, 100S-D			
	Internal	Front-mounted	Internal	Front-mounted	Front-mounted (Bifurcated)	Side-mounted	Side-mounted			
							Convent'l	Bifurcated	Electronically compatible	
Switching of AC Loads										
AC-12 I _{th}	at 40 °C [A]	10	10	20	10	10	10	16	10	0.1
	at 60 °C [A]	6	6	20	6	6	6	12	6	at 250V
AC-15 at rated voltage of										
24V [A]	6	3	10	6	3	6	5.5	3	(1...100 mA) at 3...125V	
42/48V [A]	6	3	10	6	3	6	5.5	3		
120V [A]	6	3	10	6	3	6	5.5	3		
230V [A]	3	2	10	5.5	3	5.5	5.5	3		
240V [A]	3	2	10	5	3	5	5	3		
400V [A]	1.8	1.2	6	3	2	3	3	2		
415V [A]	1.8	1.2	6	3	2	3	2.5	2		
500V [A]	1.4	1.0	2.5	1.6	1.2	1.6	1.6	1.2		
690V [A]	1.0	0.6	1	1	0.7	1	1	0.7		
Switching of DC Loads										
DC-12 L/R < 1 ms resistive loads at										
24V DC [A]	6	—	12	12	6	6	16	16	—	
48V DC [A]	4	—	9	9	3.2	3.2	9	9	—	
110V DC [A]	0.6	—	3.5	3.5	0.45	0.45	3.5	3.5	—	
220V DC [A]	0.2	—	0.55	0.55	0.18	0.18	0.55	0.55	—	
440V DC [A]	0.08	—	0.2	0.2	0.1	0.1	0.2	0.2	—	
DC-14 L/R < 15 ms inductive loads with economy resistor in series at										
24V DC [A]	4	—	9	9	2	2	9	9	—	
48V DC [A]	2.5	—	5	5	1.6	1.6	5	5	—	
110V DC [A]	0.4	—	2	2	0.3	0.3	2	2	—	
220V DC [A]	0.12	—	0.4	0.4	0.12	0.12	0.4	0.4	—	
440V DC [A]	0.05	—	0.16	0.16	0.05	0.05	0.16	0.1	—	
DC-13 switching electromagnets at										
24V DC [A]	2.8	2.3	5	5	2.5	5	5	5	(1...100 mA) at 3...125V	
48V DC [A]	1.2	1	3	3	1.5	2.5	2	2		
110V DC [A]	0.55	0.55	1.2	1.2	0.6	0.68	0.7	0.7		
220V DC [A]	0.27	0.27	0.6	0.6	0.3	0.32	0.25	0.25		
440V DC [A]	0.15	0.15	0.3	0.15	0.15	0.15	0.12	0.12		
Fuse gG										
Short-circuit protection with no welding of contacts per IEC 60947-5-1										
 [A]	10	10	20	10	10	10	16	16	—	
 [A]	10	10	20	10	10	10	16	16	—	
Protective Separation per IEC 60947-1, Annex N	—	—	between load and auxiliary circuit 320V	between load and auxiliary circuit 440V	between load and auxiliary circuit 440V					
Min. switching capacity according to IEC 60947-5-4	15V/10 mA	15V/2 mA	17V/10 mA	17V/5 mA	5V/3 mA	17V/10 mA	17V/10 mA	5V/2 mA (1 Mio. ops.)	3V/1 mA	
Failure rate	—	—	—	—	—	—	—	<10-8 (less than 1 failure to 100 Mio. operations)	—	
Load Carrying Capacity per UL/CSA										
Rated voltage AC [V]	max. 600		max. 600				max. 600		max. 250	
Continuous rating 40 °C [A]	10		10	10	10	10	10 General purpose		0.1	
Switching capacity AC [A]	A 600	B 600	A 600				Heavy pilot duty (A 600)		0.1	
Rated voltage DC [V]	max. 600		max. 600				max. 600		max. 250	
Switching capacity DC [A]	Q 600		P 600	Q 600	Q 600		Standard pilot duty (P 600)	Standard pilot duty (Q 600)	0.1	

IEC Contactors

Specifications

General

	100-K	100-C, 100S-C	100-D, 100S-D
	05...12	09...97	95...420
Rated Isolation Voltage U_i			
IEC [V]	690	690	1000
UL, CSA [V]	600	600	600
Rated Impulse Voltage Withstand U_{imp} [kV]	6	6	12
Rated Voltage U_e			
AC 50/60 Hz [V]	230, 240, 400, 415, 460, 500, 575, 690	115, 200, 230, 240, 400, 415, 460, 500, 575, 690	230, 240, 400, 415, 500, 690, 1000
DC [V]	24, 48, 110, 220, 440	24, 48, 110, 220, 440	24, 48, 110, 220, 440
Insulation Class of the Coil	Class F per IEC 60085 Class 105 insulation system per UL 508	Class F per IEC 60085	Class B per VDE 0660, Table 22
Rated coil frequency	AC 50/60 Hz, DC	AC 50/60 Hz, DC	AC 50 Hz, 50/60 Hz, DC
Ambient Temperature			
Storage [°C]	-55...+80	-55...+80	-40...+80
Operation at rated voltage [°C]	-25...+60	-25...+60	-25...+60
at 70 °C	15% current reduction against 60°C values		
Climatic Withstand	IEC 60068-2-30	IEC 60068-2-1 / -2 / -30	IEC 60068-2-30
Max. Altitude of Installation Site [m]	2000 NN, per IEC 60947-4	2000 NN, per IEC 60947-1	2000 NN, per IEC 60947-4
Protection Class	IP2X	IP2X	IP00 IEC 60529 / DIN 40 050
Single contactor cover	—	—	IP10 IEC 60529 / DIN 40 050
Contactors with frame terminal block	—	—	IP20 IEC 60529 / DIN 40 050
Auxiliary contact	IP2X	—	IP20 IEC 60529 / DIN 40 050
Protection against Accidental Contact	—	Finger and back-of-hand proof per VDE 0106, part 100	Finger and back-of-hand proof per VDE 0106, part 100
Resistance to Shock	IEC 60068-2	IEC 60068-2-27	IEC 60068-2-27
Resistance to Vibration	IEC 60068-2	IEC 60068-2-6	IEC 60068-2-6
Mechanically Linked Contacts IEC 60947-5-1, Annex L	100-K... (on main device)	100- / 100S-C09...C97 + 100-FA/-FB/-FC, (except L11, L22), 100- / 100S-C09...C43 + 100-FAB/-FBB/-FCB	—
Mirror Contacts IEC 60947-4 Annex F	100-K... + 100-KF...	100- / 100S-C09...C97 + 100-FA/-FB/-FC, (except L11, L22), 100- / 100S-C09...C97 + 100-SA/SB, 100- / 100S-C09...C97 + 100-FAB/-FBB/-FCB	100-D... + 2 x 100-DS1-11 100S-D... + 2 x 100S-DS1-11
Standards Compliance	IEC/EN 60947-1/-4-1/-5-1; UL 508; CSA 22.2. No. 14	IEC/EN 60947-1/-4-1/-5-1; UL 508; CSA 22.2. No. 14	IEC/EN 60947-1/-4-1/-5-1; UL 508; CSA 22.2. No. 14
Certifications	CE, cULus CCC	CE, cULus, CCC	CE, cULus, CCC

2



Bulletin 100-G Specifications
 Electrical Data

2

Cat. No.		100-G550...	100-G700...	100-G860...	100-G1000	100-G1200	
AC-1, Three-phase Switching - IEC							
Ambient temperature: 40 °C							
I_e	≤ 690V	[A]	760	1000	1100	1200	1350
	230V	[kW]	303	398	438	478	538
	240V	[kW]	316	416	457	499	561
	400V	[kW]	527	693	762	831	935
	415V	[kW]	546	719	791	863	970
	500V	[kW]	658	866	953	1039	1169
	690V	[kW]	908	1195	1315	1434	1613
Ambient temperature: 60 °C							
I_e	≤ 690V	[A]	605	800	870	960	1,085
	230V	[kW]	241	319	347	382	432
	240V	[kW]	251	333	362	399	451
	400V	[kW]	419	554	603	665	752
	415V	[kW]	435	575	625	690	780
	500V	[kW]	524	693	753	831	940
	690V	[kW]	723	956	1040	1147	1297
Continuous Current - UL/CSA		[A]	520	700	810	—	1215
General Purpose Rating 40 °C							
Switching of 3-phase Motors - IEC							
AC-2, AC-3	230/240V	[A]	550	700	860	1000	1200
	400/415V	[A]	550	700	860	1000	1200
	500V	[A]	550	700	860	1000	1200
	690V	[A]	500	630	700	860	1000
50 Hz/60 °C	230V	[kW]	179	228	280	326	391
	240V	[kW]	187	238	293	340	408
	400V	[kW]	312	414	509	592	710
	415V	[kW]	324	430	528	628	737
	500V	[kW]	407	518	636	756	888
	690V	[kW]	510	657	730	897	1043
AC-4 at 200000 operations							
50 Hz	230/240V	[A]	140	180	210	260	300
	400/415V	[A]	140	180	210	260	300
	230V	[kW]	45	57	67	83	97
	240V	[kW]	47	60	70	87	101
	400V	[kW]	78	101	118	146	170
	415V	[kW]	81	105	122	151	176
AC-4, Squirrel-cage motors with reversing and jogging at 20,000 (25,000), operations							
	230/240V	[A]	360	430	520	(630)	(700)
	400/415V*	[A]	350	420	520	(630)	(700)
	230V	[kW]	116	139	170	(205)	(228)
	240V	[kW]	120	151	177	(214)	(245)
	400V	[kW]	198	238	295	(357)	(414)
	415V	[kW]	206	247	300	(359)	(424)

* At rated Voltage 415V and rated current: Life span - 25%.

IEC Contactors

Specifications

Electrical Data, Continued

Cat. No.			100-G550	100-G700	100-G860	100-G1000...	100-G1200...	
Switching of 3-phase Motors - UL/CSA								
60 Hz/60 °C	200V	[A]	414	552	692	—	1185	
	230V	[A]	360	602	722	—	1130	
	460V	[A]	414	590	708	—	1062	
	575V	[A]	336	472	576	—	864	
	200V	[Hp]	150	200	250	—	450	
	230V	[Hp]	150	250	300	—	450	
	460V	[Hp]	350	500	600	—	900	
	575V	[Hp]	350	500	600	—	900	
Rated making capacity								
AC-3 I _e	≤ 415V	[A]	5500	7000	8600	10000	12000	
	500V	[A]	5500	7000	8600	10000	12000	
	690V	[A]	5500	7000	8600	10000	12000	
Rated Breaking capacity								
AC-3 I _e	≤ 240V	[A]	4400	5600	6900	8000	9600	
	400V	[A]	4400	5600	6900	8000	9600	
	415V	[A]	4400	5600	6900	8000	9600	
	500V	[A]	4400	5600	6900	8000	9600	
	690V	[A]	4000	5100	5600	6900	8000	
Star-Delta Starting								
50 Hz	230V	[A]	953	1212	1490	1732	2078	
	240V	[A]	953	1212	1490	1732	2078	
	400V	[A]	953	1212	1490	1732	2078	
	415V	[A]	953	1212	1490	1732	2078	
	500V	[A]	953	1212	1490	1732	2078	
	690V	[A]	831	1091	1195	1490	1732	
	230V	[kW]	310	395	485	565	677	
	240V	[kW]	324	412	507	589	707	
	400V	[kW]	540	717	882	1025	1250	
	415V	[kW]	561	745	915	1088	1278	
	500V	[kW]	705	897	1102	1309	1538	
	690V	[kW]	883	1138	1247	1554	2078	
	Wye-Delta Starting							
	60 Hz	230V	[Hp]	250	400	500	650	750
460V		[Hp]	600	800	1000	1300	1500	
575V		[Hp]	600	800	1000	1500	1500	
Short-circuit Protection of Contactors without Overload Relay								
Fuse gG (aM) Type 1 coordination (per IEC 60947-4-1)	500V	[A]	(630)	800	1000	1000	1250	
	690V	[A]	(630)	800	1000	1000	1000	
Switching of Three-phase Capacitor								
Inductivity of dispatching between parallel switched capacitor: min. 6 pH								
Single capacitors	40 °C	230V	[kVar]	180	220	250	290	330
		240V	[kVar]	200	250	300	325	360
		400V	[kVar]	320	400	450	500	575
		415V	[kVar]	350	430	500	550	630
		500V	[kVar]	450	520	600	660	750
		690V	[kVar]	580	700	800	875	1000
	55 °C	230V	[kVar]	150	180	220	275	325
		240V	[kVar]	170	200	260	300	350
		400V	[kVar]	280	330	400	460	550
		415V	[kVar]	300	360	450	500	600
		500V	[kVar]	360	420	540	600	720
		690V	[kVar]	500	580	720	800	950

Electrical Data, Continued

Cat. No.			100-G550...	100-G700...	100-G860...	100-G1000...	100-G1200...
Capacitor Banks	40 °C	230V [kVar]	180	220	250	290	330
		240V [kVar]	200	250	300	325	360
		400V [kVar]	320	400	450	500	575
		415V [kVar]	350	430	500	550	430
		500V [kVar]	450	520	600	660	750
	55 °C	690V [kVar]	580	700	800	875	1000
		230V [kVar]	150	180	220	275	325
		240V [kVar]	170	200	260	300	350
		400V [kVar]	280	330	400	460	550
		415V [kVar]	300	360	450	500	600
	500V [kVar]	360	420	540	600	720	
	690V [kVar]	500	580	720	800	950	
DC Switching Switching of non- or slightly inductive loads, resistance furnaces DC-1 at 60 °C							
1 Pole	24/48V [A]	645	760	930	1020	1150	
2 Poles in series	24/48V [A]	645	760	930	1020	1150	
3 Poles in series	24/48V [A]	645	760	930	1020	1150	
	110V [A]	480	560	630	800	900	
	220V [A]	315	400	450	500	600	
Shunt-Wound Motors Starting, plugging, reversing, plugging DC-3 at 60 °C							
3 Poles in series	24/48V [A]	605	800	870	960	1085	
Series-Wound Motors Starting, plugging, reversing, plugging DC-5 at 60 °C							
3 Poles in series	24/48V [A]	605	800	870	960	1085	
Lighting Loads Elec. Discharge. Lamps - AC - 5a, Non-Compensated [A]			450	570	700	850	1000
	Compensated [A]	360	460	550	660	800	
	Incandescent Lamps - AC - 5b, Electrical Endurance @ 100 000 ops [A]	315	440	500	560	630	
Switching Power Transformers AC - 6a							
Inrush = $n \cdot I_e$	[A]	7440	9450	11700	13500	16200	
I_e Rated transformer current	[A]	248	315	390	450	540	
n = 30	400V AC [kVA]	172	218	270	312	374	
	500V AC [kVA]	215	273	338	390	468	
	690V AC [kVA]	269	339	376	538	645	
n = 20	[A]	371	472	580	675	810	
n = 15	[A]	435	630	774	900	1080	
Rated Short-Time Withstand ICW, 60 °C							
1 s	[A]	5500	7000	8000	10000	12000	
4 s	[A]	5500	7000	8000	10000	12000	
10 s	[A]	4400	5600	6900	8000	9600	
15 s	[A]	3800	5000	6000	7400	8500	
60 s	[A]	2300	2800	3400	4000	4800	
240 s	[A]	1300	1800	2000	2300	2700	
900 s	[A]	850	1150	1350	1600	1900	
Minimum cooling time at zero current	[Min.]	60	60	60	60	60	
Resistance and Energy Dissipation							
Main circuit resistance	[mΩ]	0.11	0.1	0.08	0.06	0.05	
Total energy dissipation at I_e AC-3	[W]	99	147	177	180	216	
Excess energy dissipation at I_e AC-3							
AC Control	[W]	110	172	202	250	286	
DC Control	[W]	109	169	199	240	276	

IEC Contactors

Specifications

Mechanical Data

Cat. No.			100-G550...	100-G700...	100-G860...	100-G1000...	100-G1200...
Life Span in Millions of Operations							
Mechanical	AC Control	[Mil.]	5	5	5	1	1
	DC Control	[Mil.]	5	5	5	1	1
Shipping Weights	AC Control	[kg]	13.8	26.4	28.4	50.3	53.4
		[lb]	30.4	58.1	62.5	110.8	117.6
	DC Control	[kg]	13.8	26.4	28.4	50.3	53.4
		[lb]	30.4	58.1	62.5	110.8	117.6
Terminals*							
Terminal Dimensions		[mm]	6 x 40	8 x 50	8 x 50	10 x 50	10 x 60
Terminal screw hole size		[mm]	(1) x Ø 13	(1) x Ø 13	(1) x Ø 15	(2) x Ø 13	(2) x Ø 13
Terminations - Power Type			Hexagonal Bolt				
Direct Connection							
	b max.	[mm]	50	60	60	60	60
	c max.	[mm]	20	20	25	25	25
	s max.	[mm]	2 x 5	2 x 5	2 x 6	2 x 6	2 x 8
	Ø min.	[mm]	12.5	13	15	2 x 13	2 x 13
Recommended Torque		[N•m] [ft.-lb]	50 37	60 44	75 55	60 44	60 44
Conductor/Wire Terminations*							
Bus bar (Width)		[mm]	40	50	50	50	60
Hex screw		[in]	1/2	3/8	3/8	3/8	3/8
Recommended Torque		[N•m] [lb•in]	42 375	62 550	62 550	56 500	56 500
Auxiliary Contact		[mm ²]	(2) x 2.5	(2) x 2.5	(2) x 2.5	(2) x 2.5	(2) x 2.5
Coils		[mm ²]	(2) x 2.5	(2) x 2.5	(2) x 2.5	(2) x 2.5	(2) x 2.5

* Quantity indicated in ().

Coil Data

Cat. No.			100-G550...	100-G700...	100-G860...	100-G1000...	100-G1200...	
Operating Limits								
AC- 50 Hz	Pick-up	[x U _s]	0.85...1.1					
	Drop-out	[x U _s]	0.2...0.5	0.2...0.75		0.1...0.6		
AC- 60 Hz	Pick-up	[x U _s]	0.85...1.1					
	Drop-out	[x U _s]	0.2...0.5	0.2...0.75		0.1...0.6		
DC Control	Pick-up	[x U _s]	0.85...1.1					
	Drop-out	[x U _s]	0.2...0.5	0.2...0.75		0.1...0.6		
Pickup and Holding Power								
AC- 50 Hz	Pick-up	[VA]	800...950	1350...1600			2400	
	Hold-in	[VA]	9...11	21...25			70	
AC- 60 Hz	Pick-up	[VA]	800...950	1350...1600			2400	
	Hold-in	[VA]	9...11	21...25			70	
DC Control	Pick-up	[W]	700...850	1300...1550			2100	
	Hold-in	[W]	8...10	18...22			60	
Operating Times: Switching Delay								
AC	Making delay	[ms]	50...100				50...100	
	Breaking delay	[ms]	20...50*/150...200/500...1000‡				25...50	
DC	Making delay	[ms]	50...100				50...100	
	Breaking delay	[ms]	20...50*/150...200/500...1000‡				25...50	

* Accelerates

‡ Delays

Auxiliary Contacts

Cat. No.			100-G550...	100-G700...	100-G860...	100-G1000...	100-G1200...
AC Switching							
AC-1	I_{th}	at 40 °C [A]		16		16	
		at 60 °C [A]		12		12	
AC- 15 at rated voltage		120V [A]		6		6	
		230V [A]		3		3	
		240V [A]		3		3	
		400V [A]		2		2	
		415V [A]		2		2	
		500V [A]		1.5		1.5	
		690V [A]		1		1	
DC Switching							
DC-13 control of electromagnets		24V DC [A]		6		6	
		48V DC [A]		3		3	
		110V DC [A]		1		1	
		220V DC [A]		0.5		0.5	
Back-up Fuse							
Short-circuit protection without contact welding per IEC 60947-5							
Fuse gG		[A]		10		16	

2

General Data

Cat. No.			100-G550...	100-G700...	100-G860...	100-G1000...*	100-G1200...
Rated Isolation Voltage U_i							
IEC, AS, BS, SEV, VDE, 0660 UL/CSA		[V]	1,000V 600V			690V 600V	
Impulse Voltage U_{imp}							
1 minute per IEC 947-4		[KV]	8 kV			2,5 kV	
Rated Voltage - Main Control U_e							
AC	50/60 Hz	[V]	230, 240, 400, 415, 460, 500, 575, 690V			230, 240, 400, 415, 460, 500, 575, 690V	
DC		[V]	24, 48, 110, 220, 440V				
Operating Frequency for AC Loads							
50/60 Hz		[Hz]	180/hr. for 0.25s start time - 42/hr. for 1s start time				
Insulation Class of the Magnetic Coil			Class B per VDE 0660, table 22				
Rated frequency of the Coil			AC 50/60 Hz, DC				
Ambient Temperature							
Storage			-40 °C...+80 °C				
Operation at rated current			-25 °C...+70 °C				
Climatic Withstand			Damp alternating conditions cyclical, per DIN 50 016 and 40 046, part 38, IEC 60068				
Altitude			2000 m above sea level, per IEC 60947-1				
Type of Protection			IP00 IEC 60529/DIN 40 050				
Standards Compliance			IEC 60947, UL 508, CSA C22.2, No. 14				
Certifications			cULus, CE				

* Cat. No. 100-G1000... is not cULus certified.

IEC Contactors

Specifications

Electrical Life in Utilization Category

Bulletin 100-C/104-C IEC contactors are designed for superior performance in a wide variety of applications. When selecting IEC products, the user must give consideration to the specific load, utilization category and required electrical life of the application. The life-load curves shown here are based on Rockwell Automation tests according to the requirements defined in IEC 60947-4-1. Since contact life in application is dependent on environmental conditions and duty cycle, actual application contact life may vary from that indicated by the curves shown here.

To find the contactor's estimated electrical life, follow these guidelines:

1. Identify the appropriate utilization category from the table below.
2. Choose the graph for the utilization category selected.
3. Locate the intersection of the life-load curve for the appropriate contactor with the application's operational current (I_e) found on the horizontal axis.
4. Read the estimated contact life along the vertical axis.

Contact Life for Mixed Utilization Categories AC-3 and AC-4:

In many applications, the utilization category cannot be defined as either purely AC-3 or AC-4. In those applications, the electrical life of the contactor can be estimated from the following equation:

$L_{mixed} = Lac3/[1 + Pac4*(Lac3/Lac4 - 1)]$, where:

L_{mixed} = Approximate contact life in operations for a mixed AC-3/AC-4 utilization category application

$Lac3$ = Approximate contact life in operations for a pure AC-3 utilization category (from the AC-3 life-load curves)

$Lac4$ = Approximate contact life in operations for a pure AC-4 utilization category (from the AC-4 life-load curves)

$Pac4$ = Percentage of AC-4 operations

Test Conditions		Making			Breaking			
		I/I_e	U/U_e	$\cos\phi$	I_c/I_e	U_r/U_e	$\cos\phi$	
AC-1	Resistance Furnaces: Non inductive or slightly inductive loads	1	1	0.95	1	1	0.95	
AC-2	Slip-ring motors: Starting and reversing	2.5	1	0.65	2.5	1	0.65	
AC-3	Squirrel-cage motors: Starting and stopping of running motors	$I_e < 17\text{ A}$	6	1	0.65	1	0.17	0.65
		$I_e > 17\text{ A}$	6	1	0.35	1	0.17	0.35
AC-4	Squirrel-cage motors: Starting, plugging*, inching*	$I_e < 17\text{ A}$	6	1	0.65	6	1	0.65
		$I_e > 17\text{ A}$	6	1	0.35	6	1	0.35
AC-15	Solenoids: Contactors, valves and lifting magnets	10	1	0.7	1	1	0.4	

I_e Rated operational current / Making Current

U_e Rated voltage / I_c Breaking Current

U_r Recovery voltage / U Off-load voltage

* Plugging is understood as stopping or reversing the motor rapidly by reversing motor primary connections while the motor is running.

* Inching (jogging) is understood as energizing a motor once or repeatedly for short periods to obtain small movements of the driven mechanism.

Bulletin 100-K/104-K Life-Load Curves

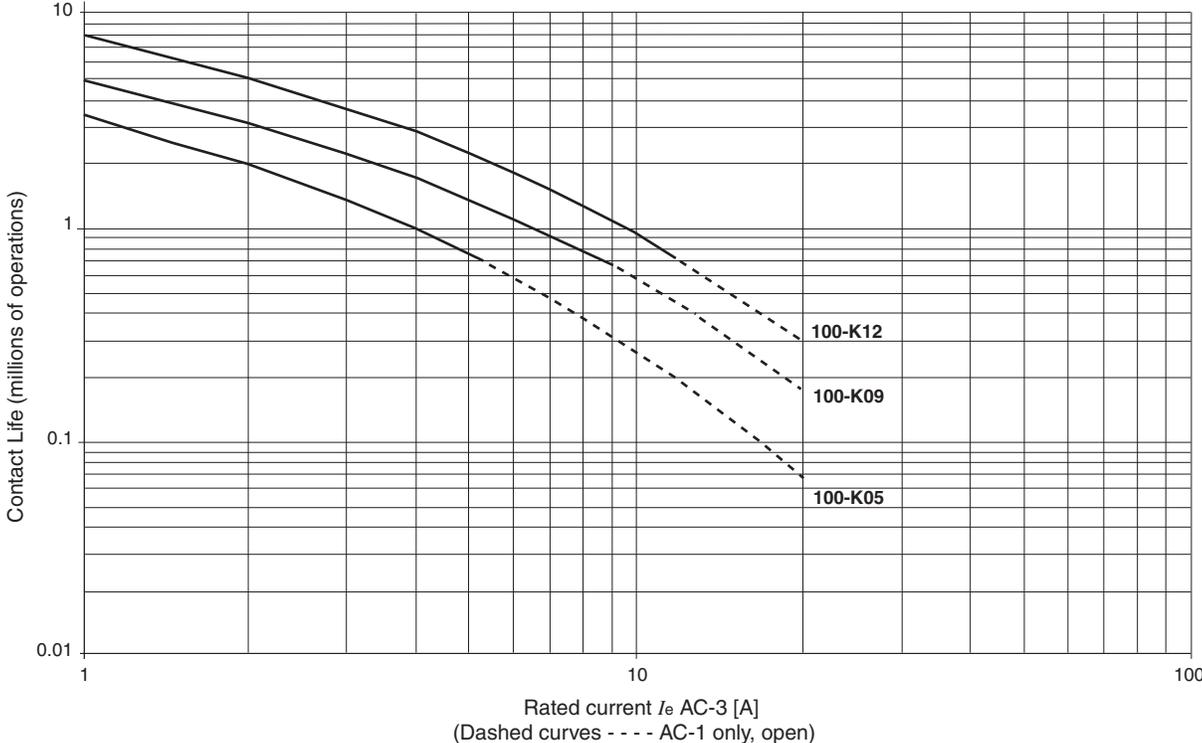
Electrical life; $U_e = 400...460V$ AC

AC-3

Switching of squirrel-cage motors while starting

AC-1

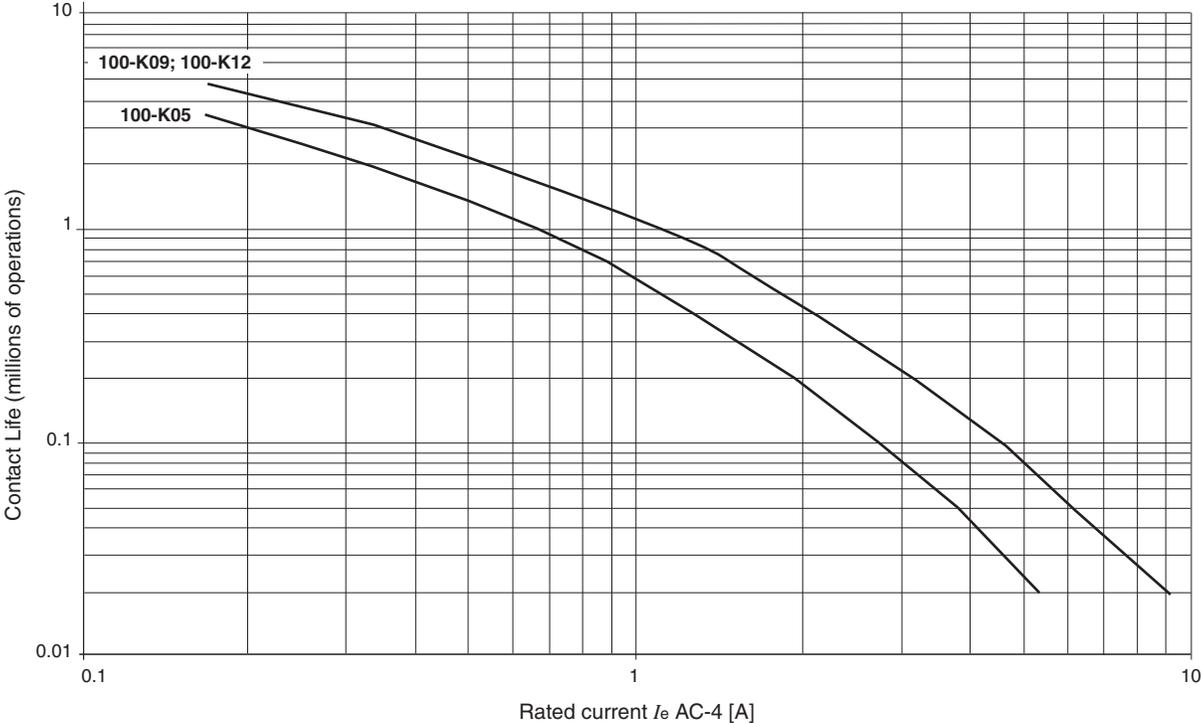
Non- or slightly inductive loads, resistance furnaces



Electrical life; $U_e = 400...460V$ AC

AC-4

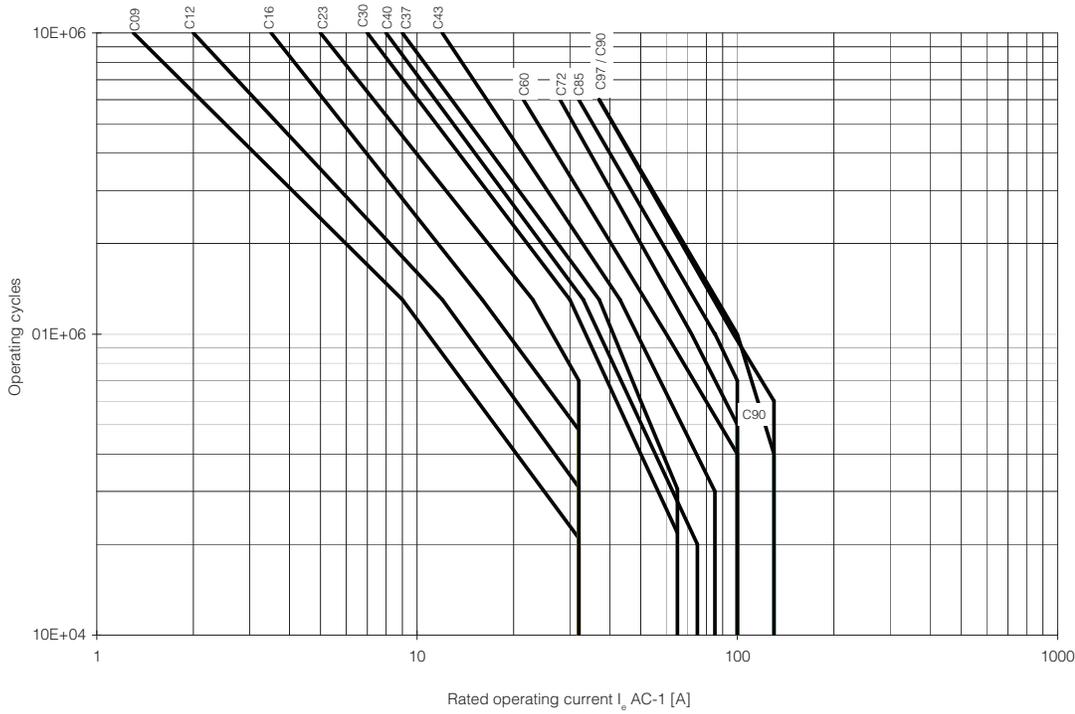
Stepping of squirrel-cage motors



Life-Load Curves

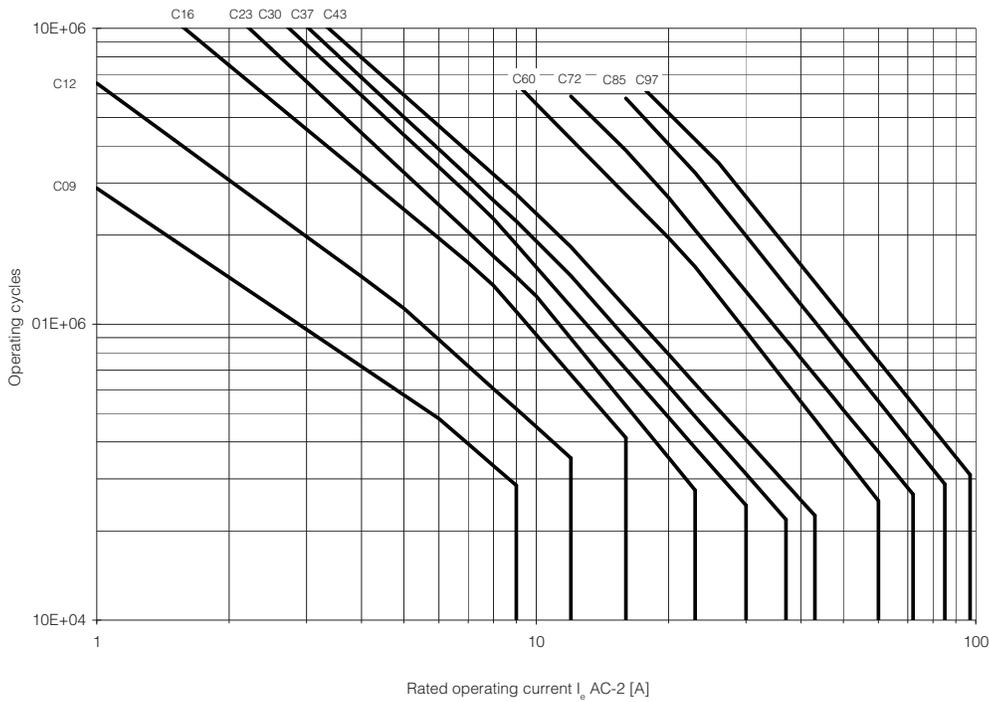
AC-1

40 °C Non- or slightly inductive loads, resistance furnaces; $U_e = 230...690V$



AC-2

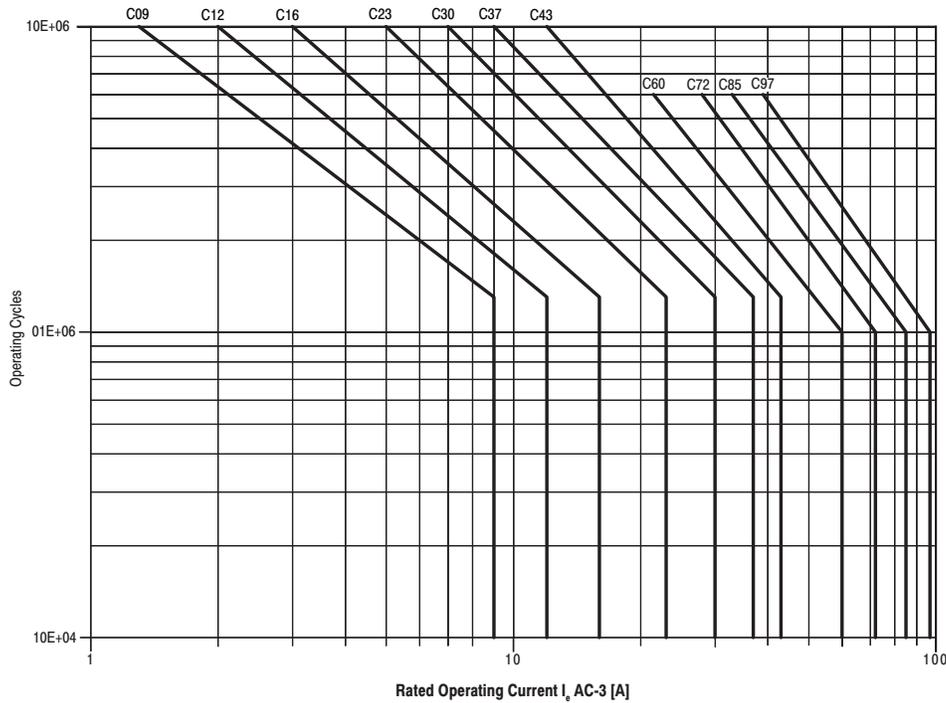
Switching of slip-ring motors; $U_e = 230...400...460V$



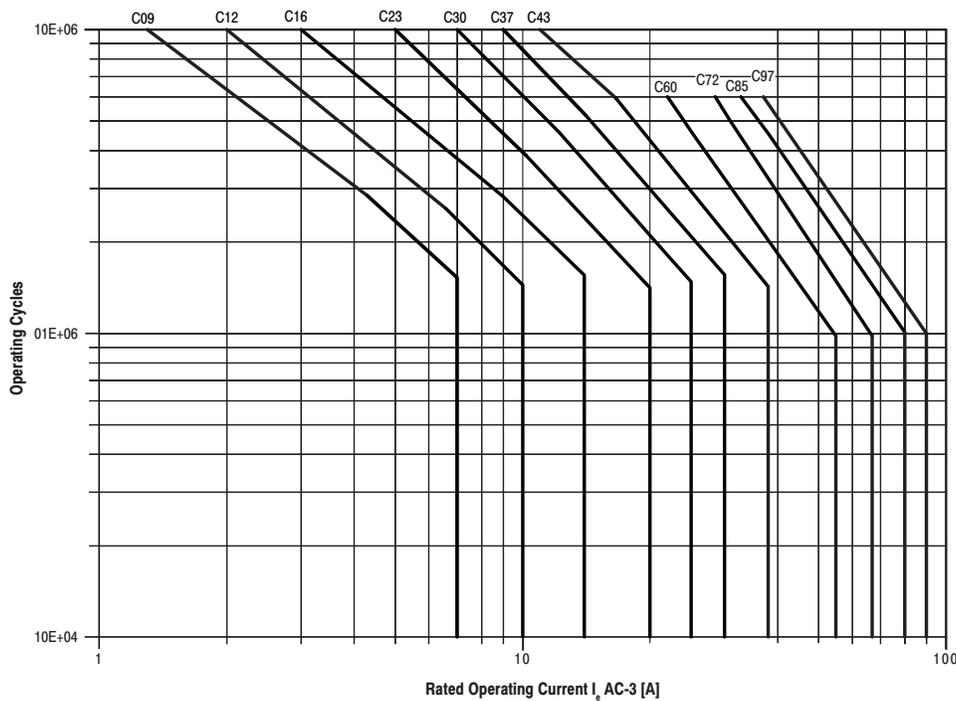
Life-Load Curves

AC-3

Switching of squirrel-cage motors while starting; $U_e = 230...400...460V$



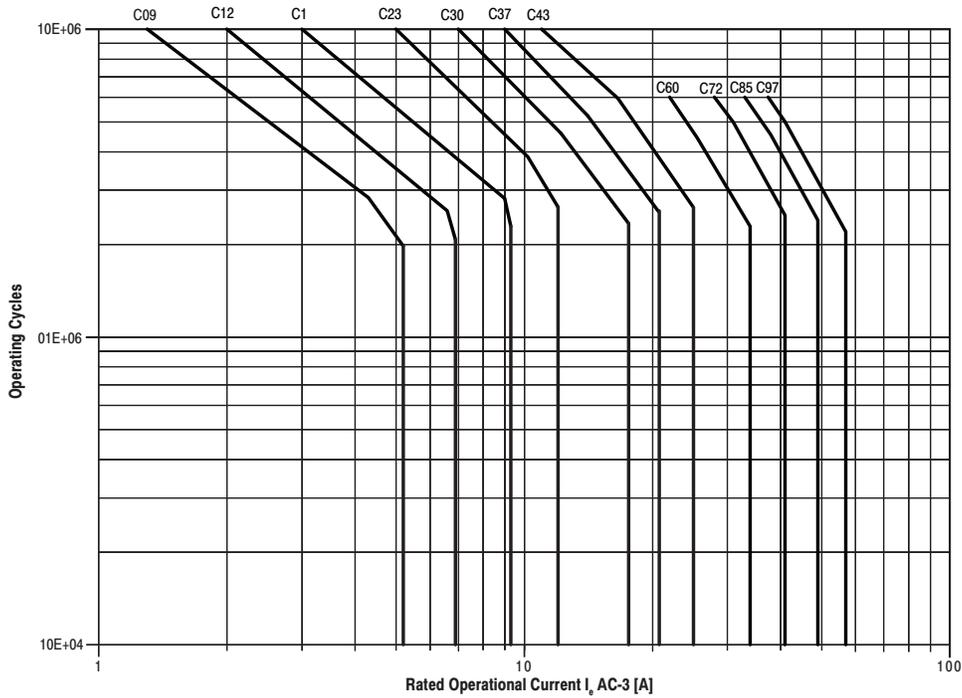
Switching of squirrel-cage motors while starting; $U_e = 500...575V$



Life-Load Curves

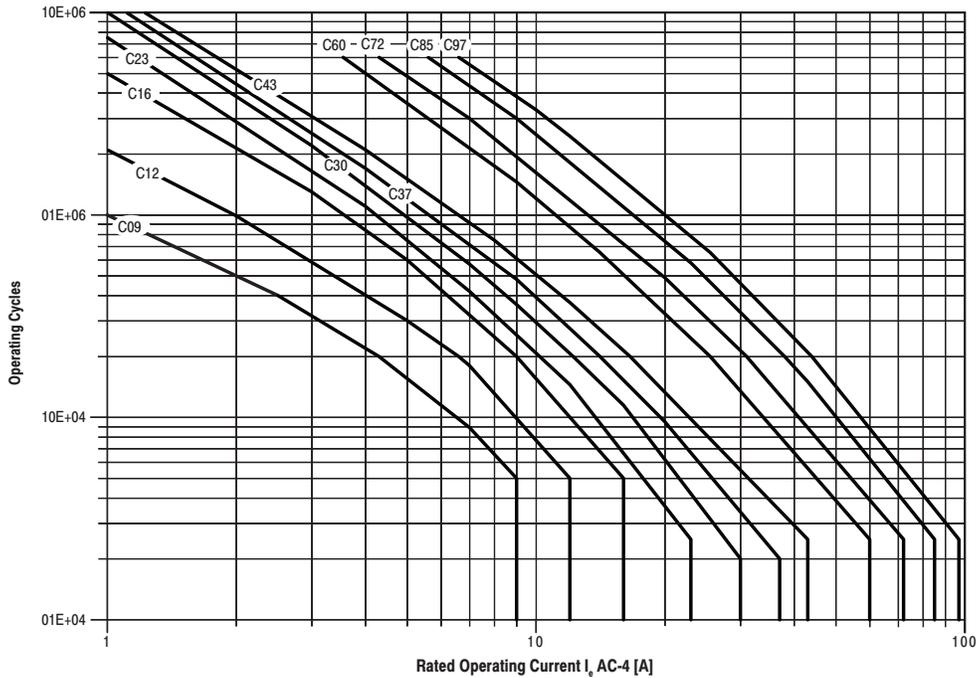
AC-3

Switching of squirrel-cage motors while starting; $U_e = 690V$



AC-4

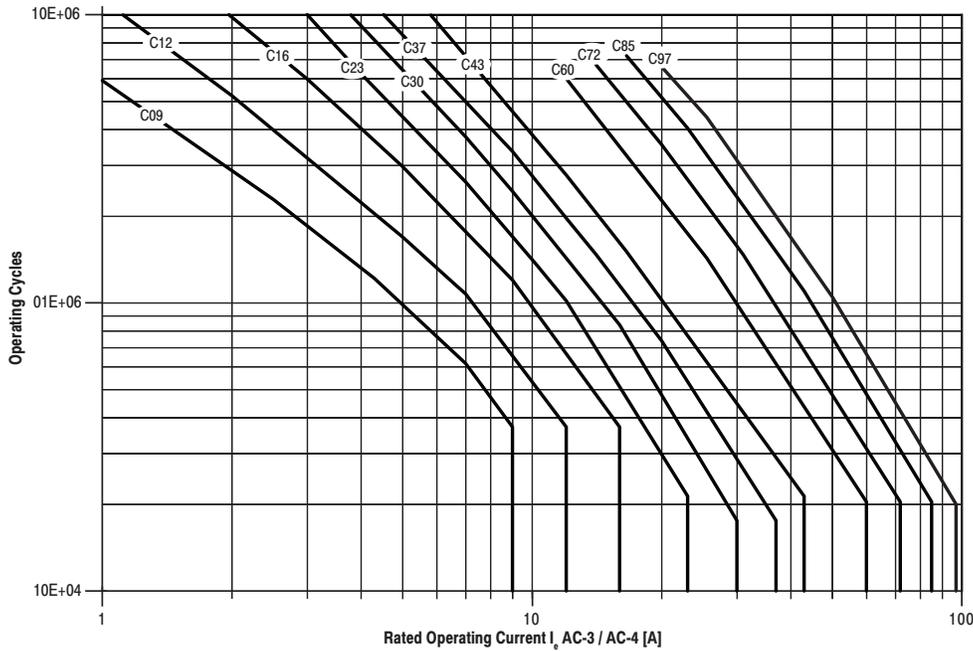
Switching of squirrel-cage motors; $U_e = 230...690V$



Life-Load Curves

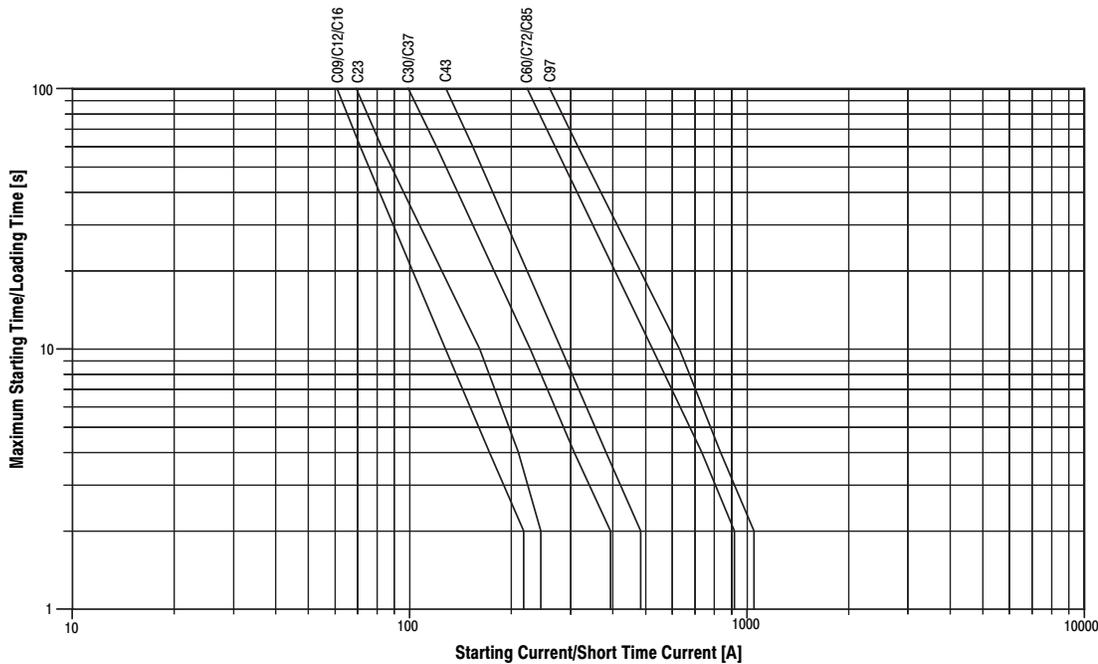
AC-3 & AC-4

10% AC-4 Mixed operation of squirrel-cage motors; $U_e = 230...400...460V$



Heavy Duty Starting and Regular Short-time Operation

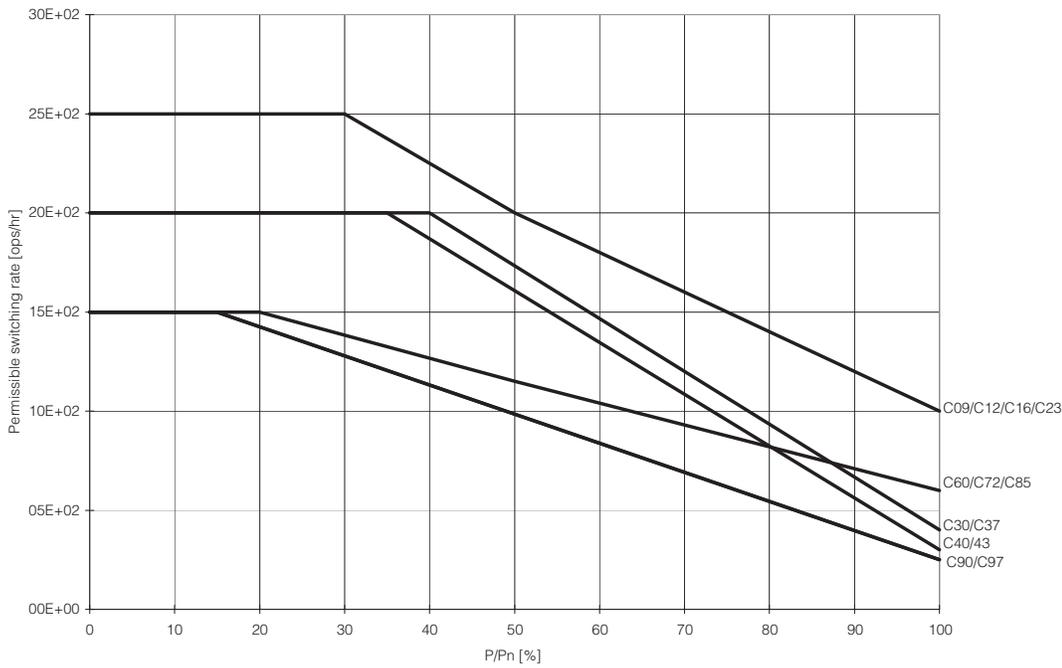
Bulletin 100-C Contactors



Maximum Operating Rates

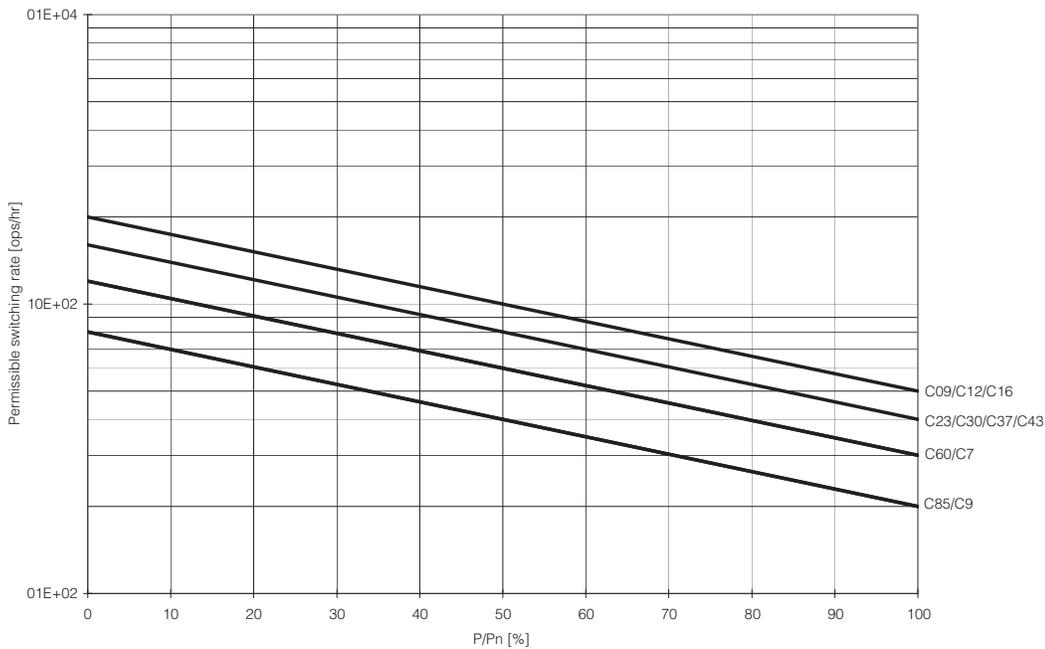
AC-1

40 °C Non- or slightly inductive loads, resistance furnaces; $U_e = 230...690V$



AC-2

Stepping of slip-ring motors; $U_e = 230...460V$

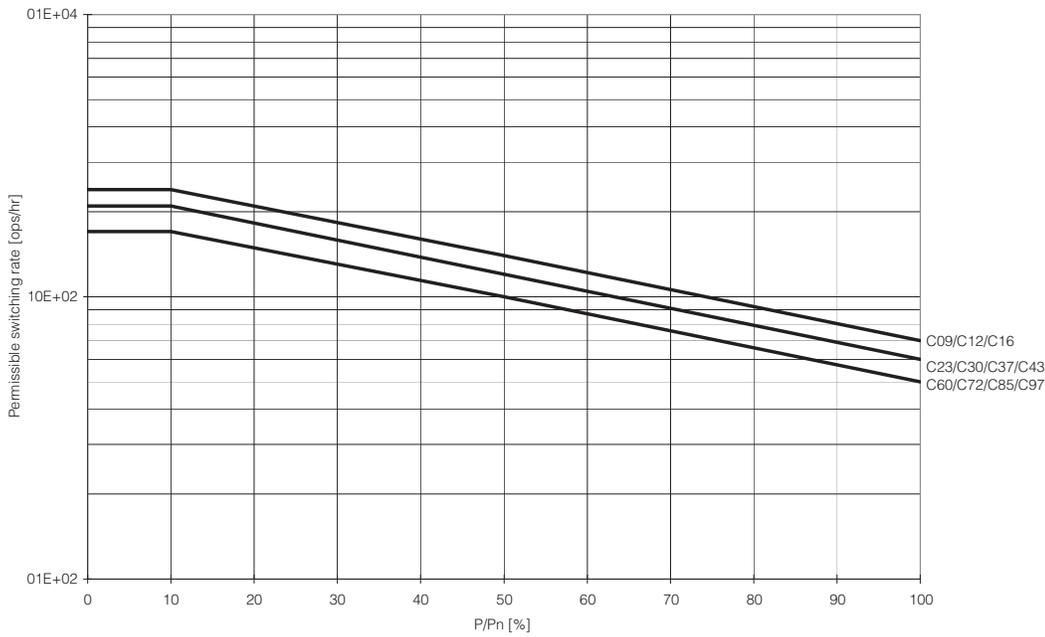


Maximum Operating Rates

AC-3

Switching of squirrel-cage motors while starting; $U_e = 230...460V$

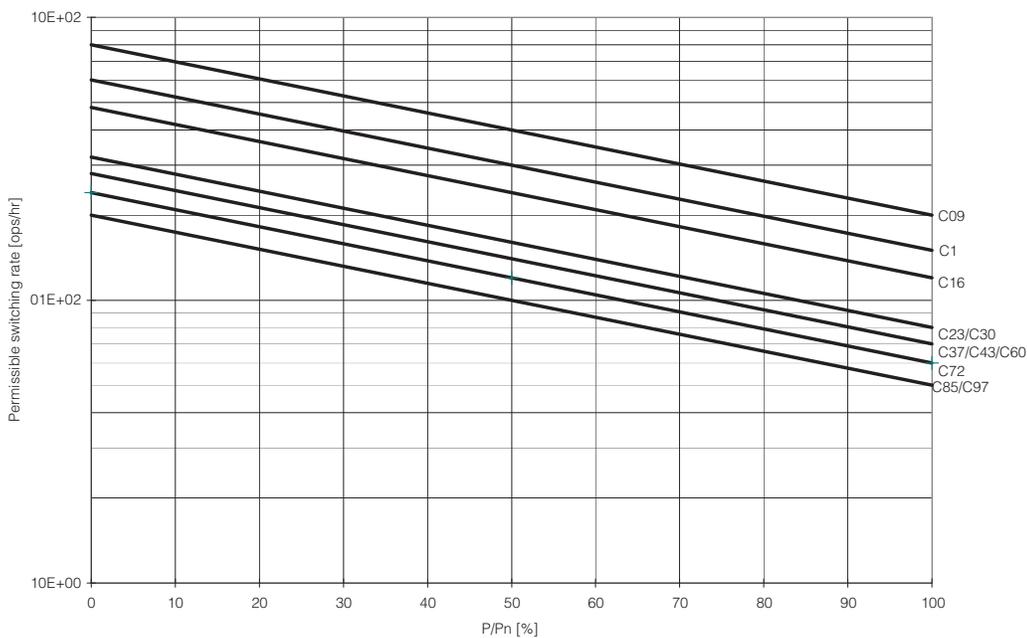
Relative operating time 40%, Starting time $t_A = 0.25\text{ s}$



AC-4

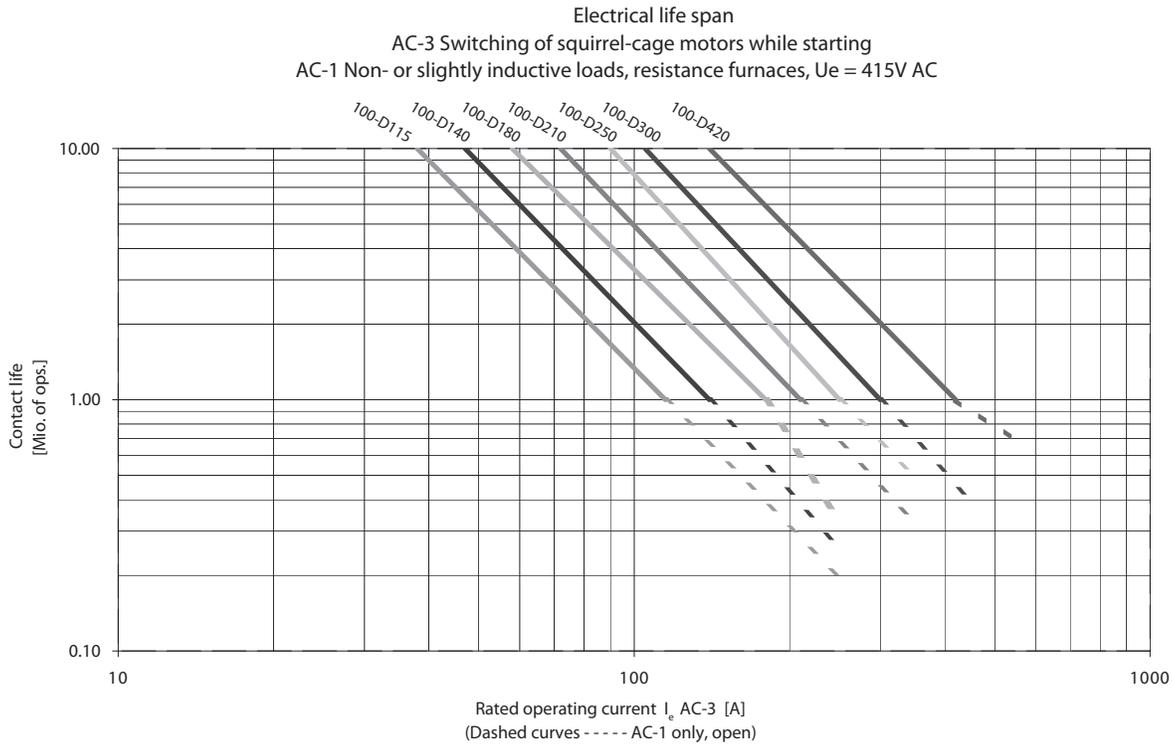
Inching of squirrel-cage motors; $U_e = 230...460V$

Starting time $t_A = 0.25\text{ s}$

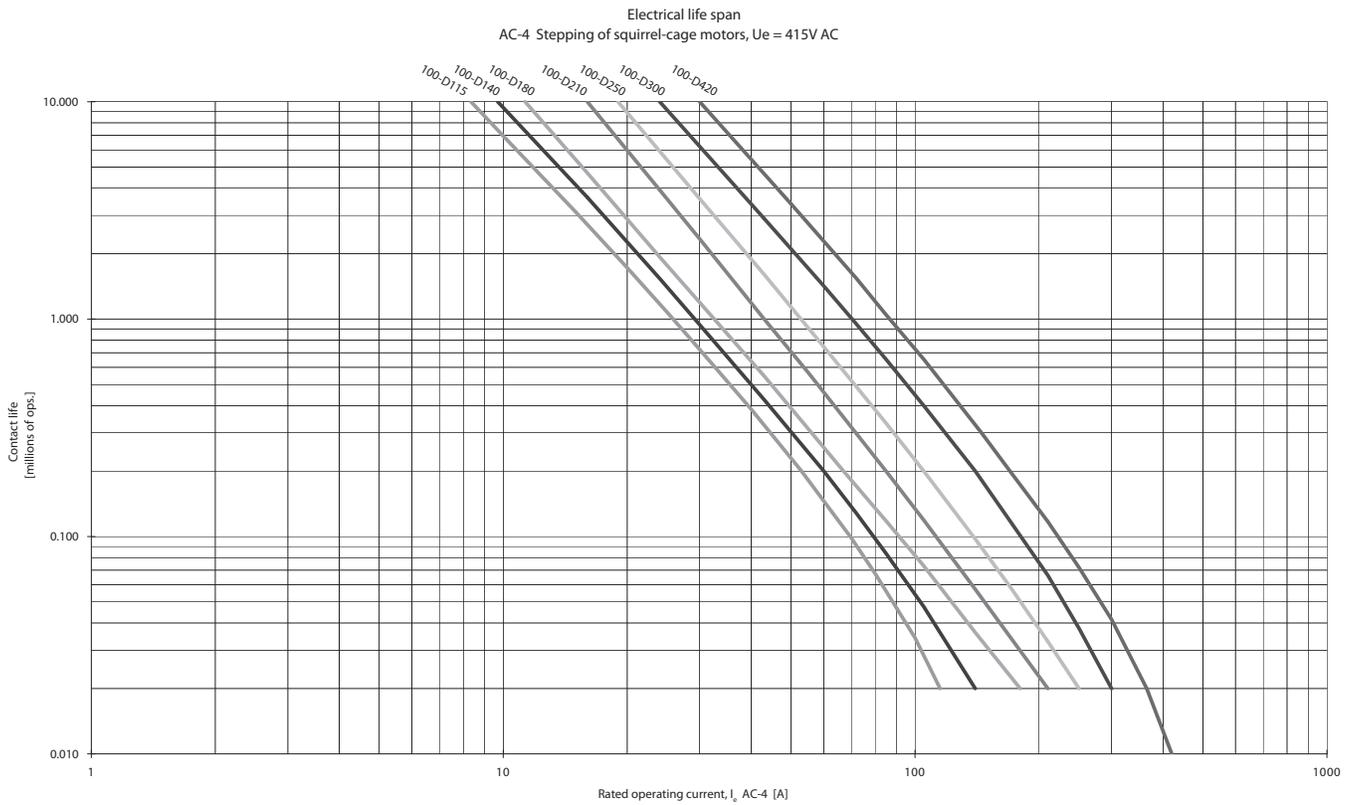


Bulletin 100-D/104-D Life-Load Curves
 AC-3, AC-1

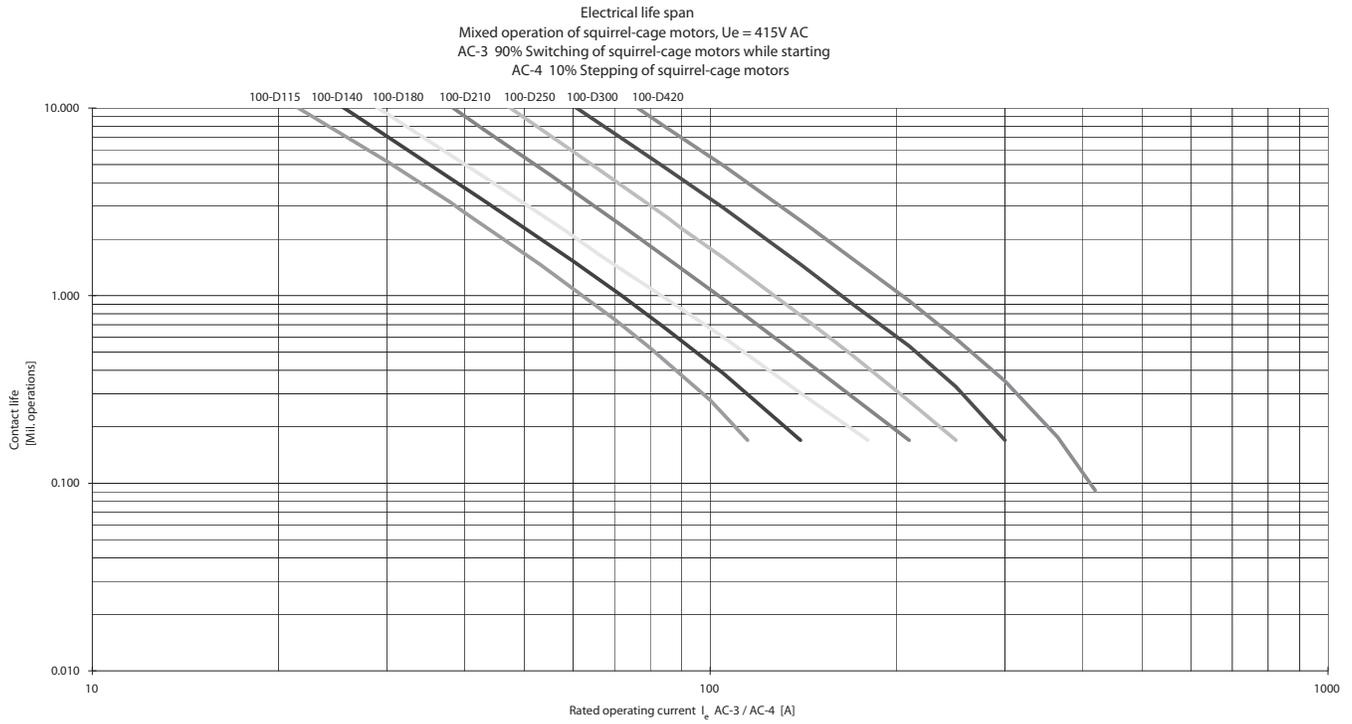
2



AC-4



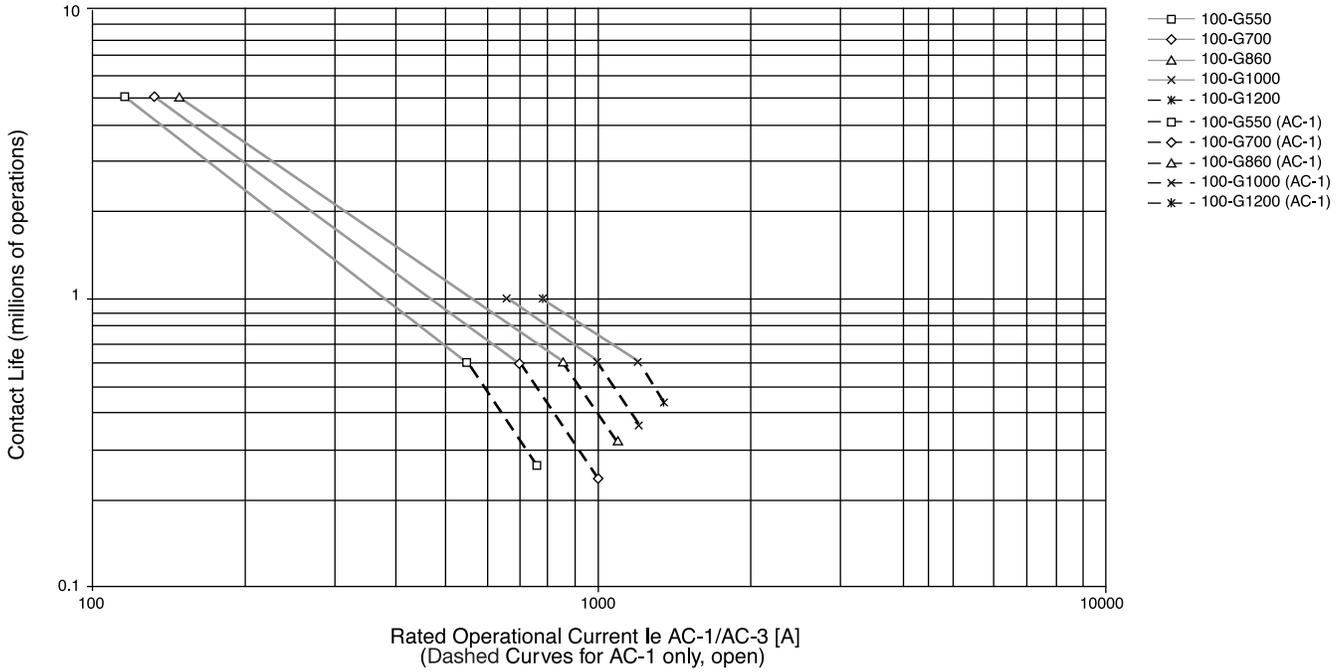
Life-Load Curves
 AC-3 90% & AC-4 10%



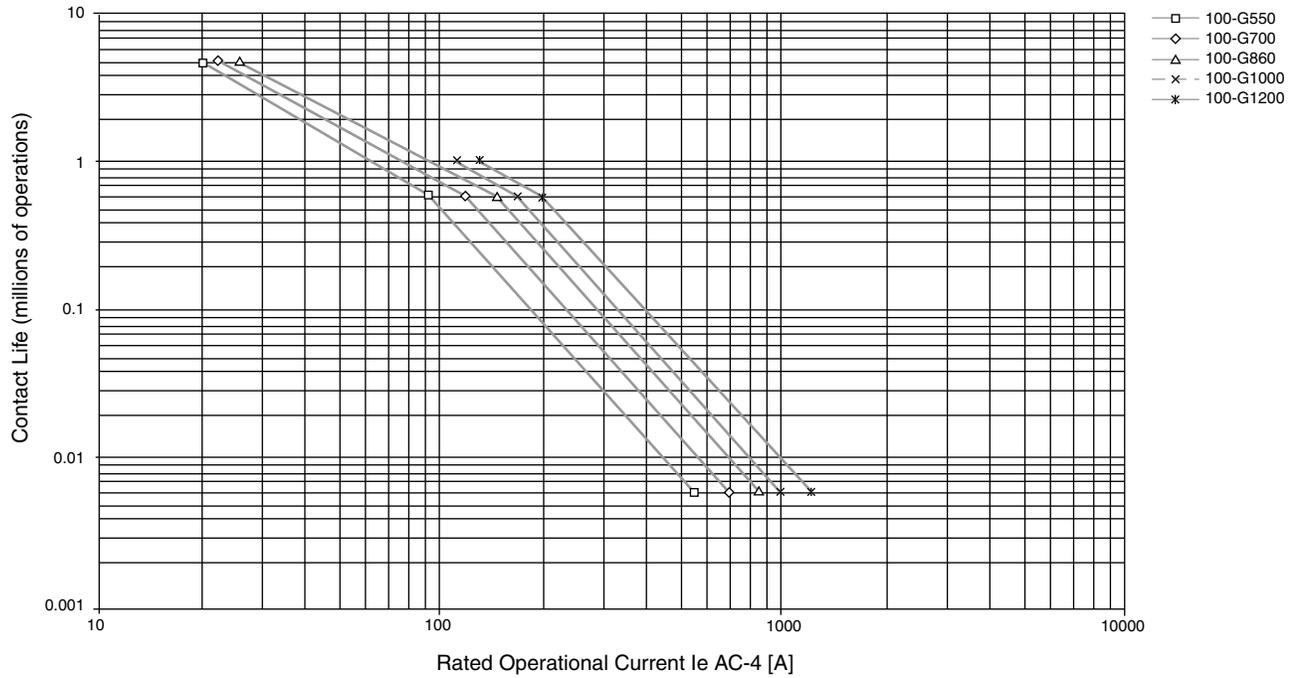
Life-Load Curves

100-G550...100-G1200

AC-3 Switching of Running Three-phase Motors, $U_e = 380...460V$ AC
 AC-1 Non or Slightly Inductive Loads, Resistance Furnaces



AC-4 Jogging of Squirrel-cage Motors, $U_e = 380...460V$ AC

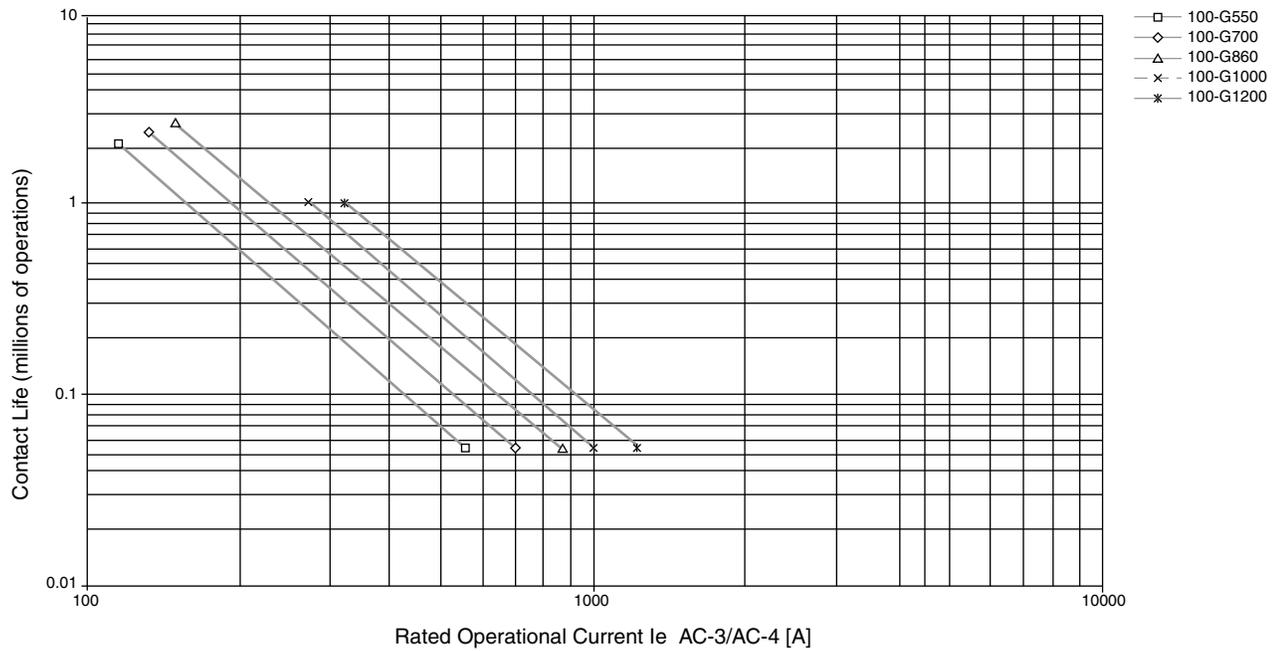


Life-Load Curves

100-G550...100-G1200

AC-3 90% Switching of Running Motors, $U_e = 380...460V$ AC

AC-4 10% Jogging

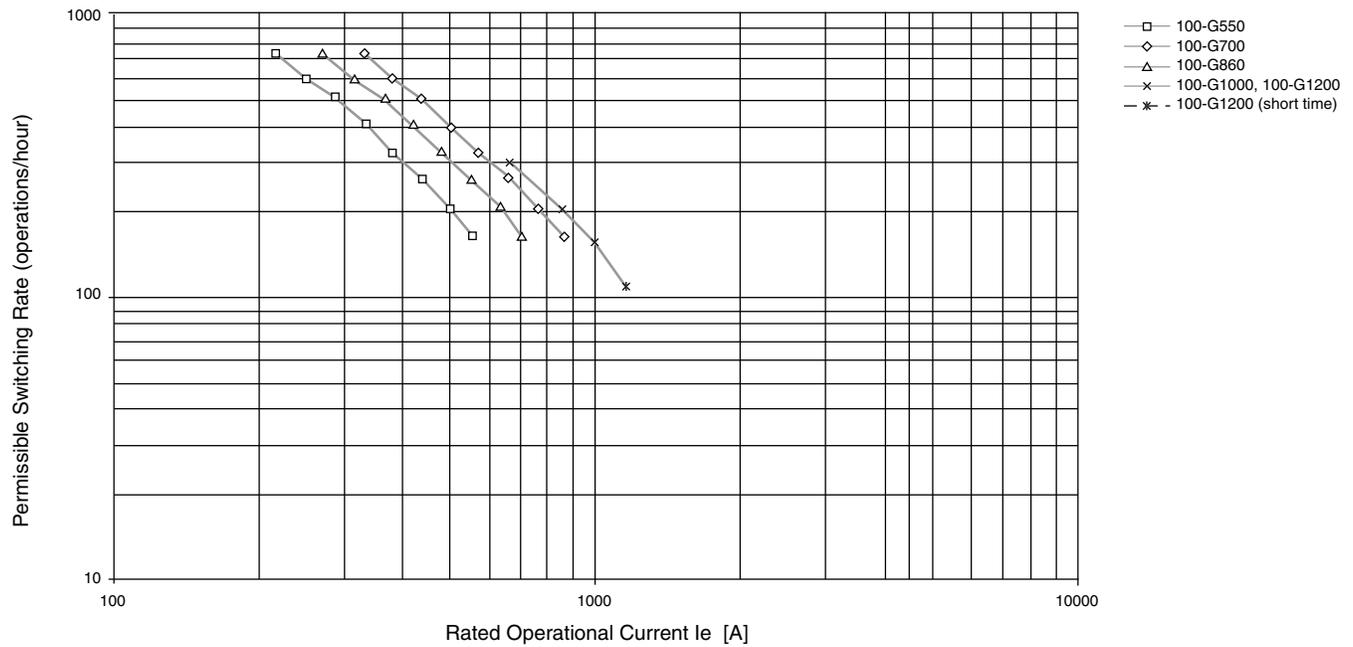


Permissible Switching Rate

100-G550...100-G1200

Switching of Running Squirrel-cage Motors AC-3, $U_e = 380...460V$ AC

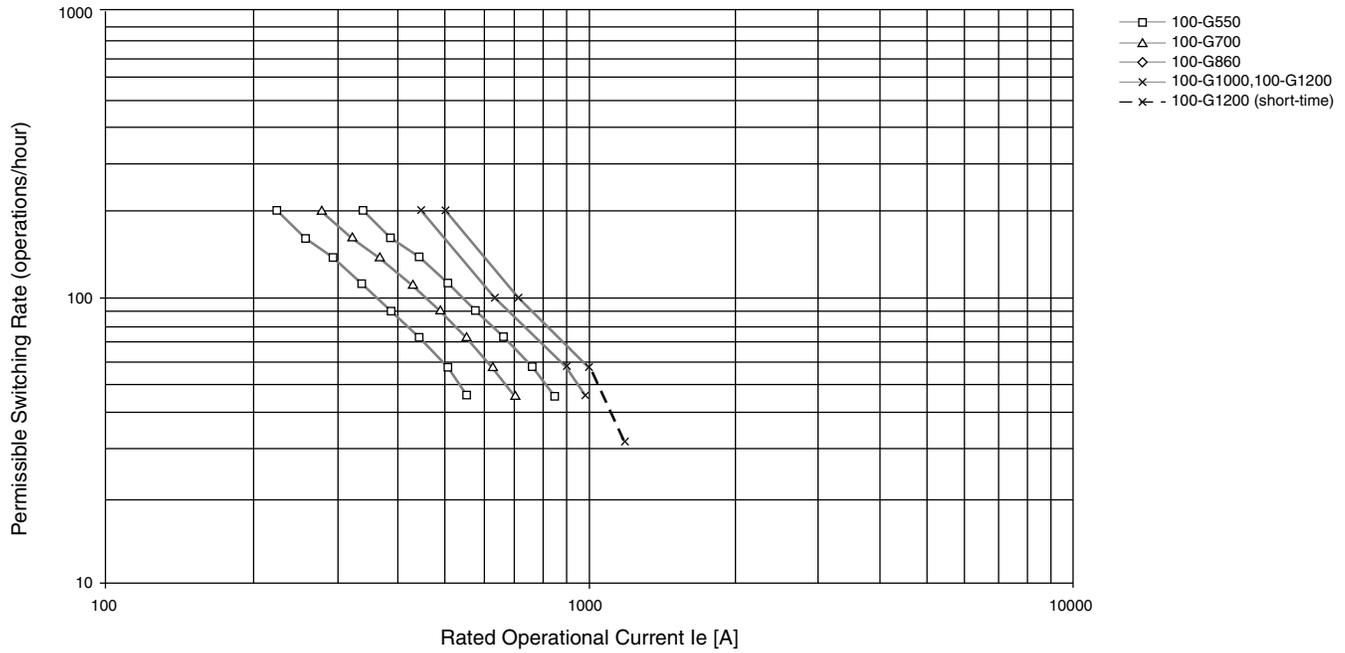
Starting Time $t_s = 0.25$ s, Relative Running Time 40%



Permissible Switching Rate, Continued

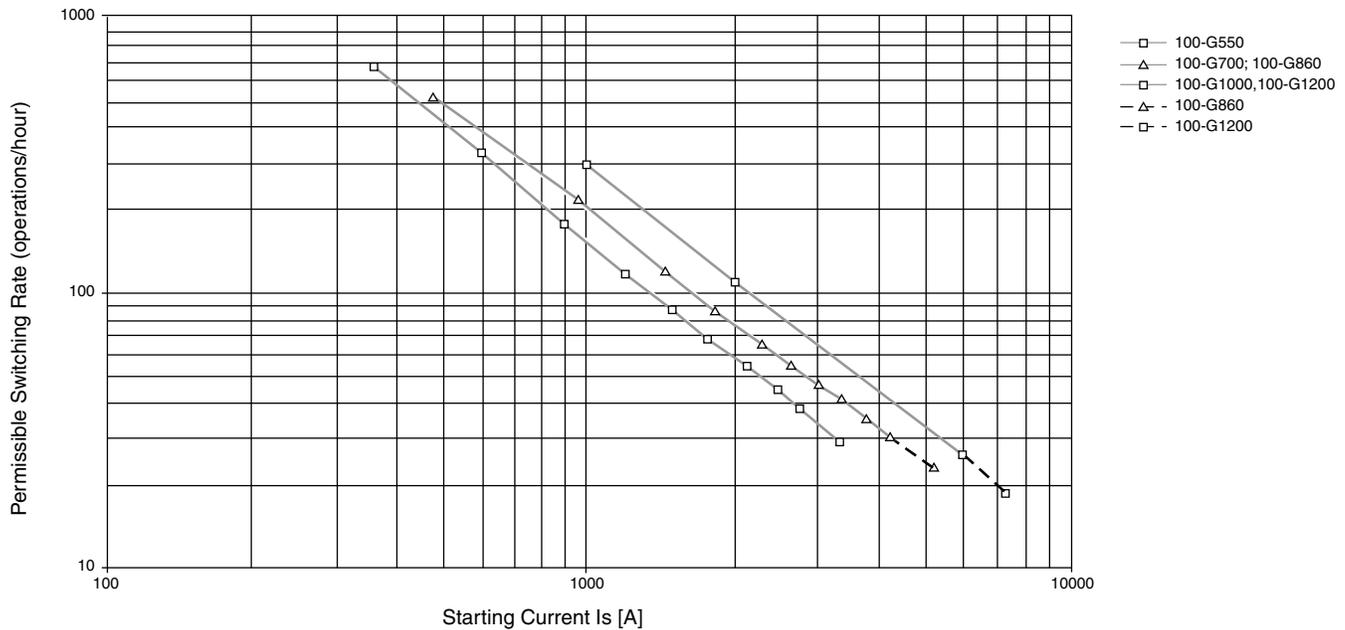
100-G550...100-G1200

Switching of Running Squirrel-cage Motors AC-3, $U_e = 380...460V$ AC
 Starting Time $t_s = 1$ s, Relative Running Time 40%



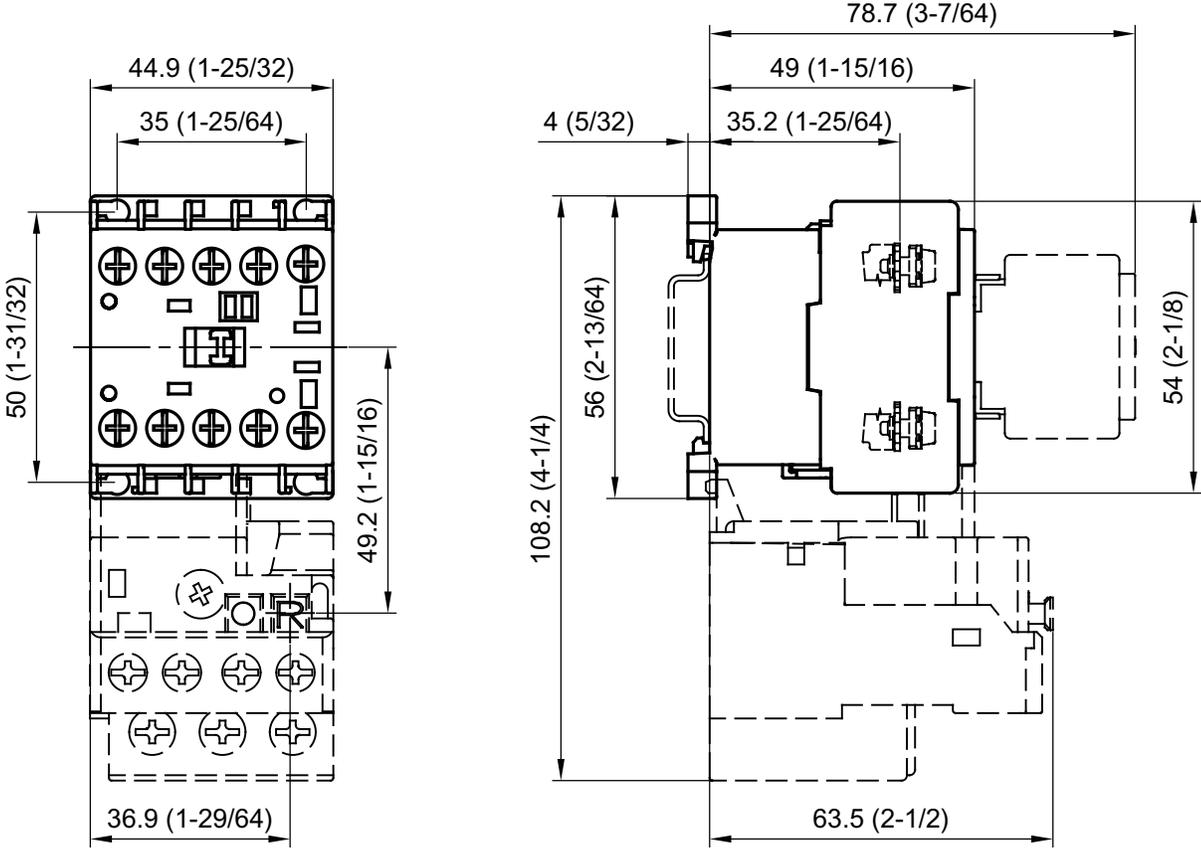
100-G550...100-G1200

Switching of Starting Motors (AC-2, and AC4) $U_z = 380...460V$ AC
 Starting Time $t_{ed} = 1$ s, ($<t_s$)

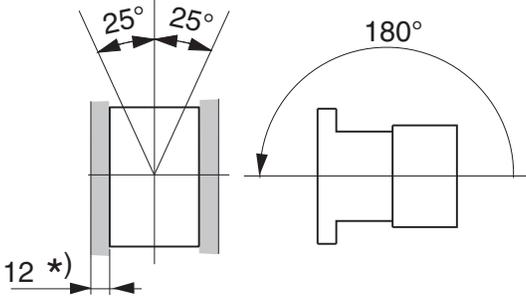


Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Bulletin 100-K Contactors and Accessories, Bulletin 193-K Overload Relays



Mounting Position
 With Accessories

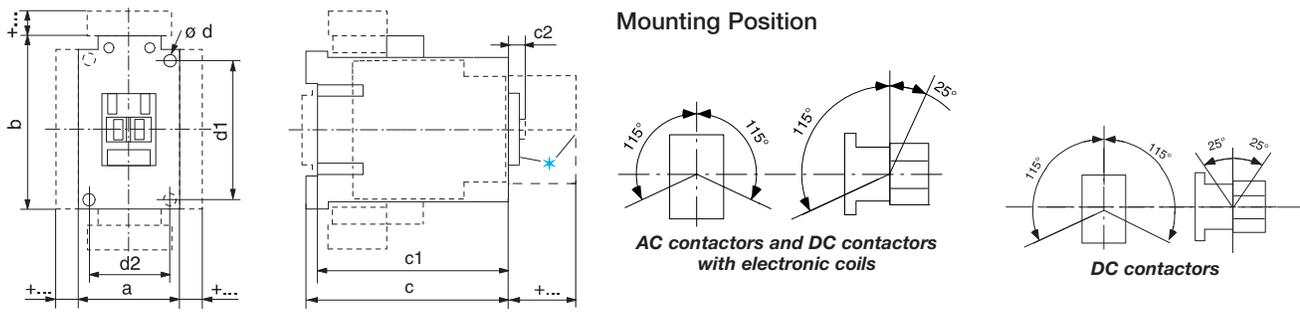


* - Minimum distance to grounded parts or walls

Bulletin 100-C/104-C
IEC Contactors
 Approximate Dimensions

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

Bulletin 100-C Contactors and Accessories



2

AC Contactors and DC Contactors with 12V or 24V Electronic Coils

Cat. No.	a	b	c	c1	c2	Ød	d1	d2
100-C09...100-C23	45 (1-25/32)	81 (3-3/16)	80.5 (3-11/64)	75.5 (2-31/32)	6 (15/64)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)
100-C30, 100-C37	45 (1-25/32)	81 (3-3/16)	97.5 (4)	92.5 (3-41/64)	6.5 (1/4)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)
100-C40	59 (2-21/64)	81 (3-3/16)	100.5 (3-61/64)	95.5 (3-49/64)	6.5 (1/4)	2 - 4.5 (2 -3/16)	60 (2-23/64)	45 (1-25/32)
100-C43	54 (2-1/8)	81 (3-3/16)	100.5 (3-61/64)	95.5 (3-49/64)	6.5 (1/4)	2 - 4.5 (2 -3/16)	60 (2-23/64)	45 (1-25/32)
100-C60...100-C97	72 (2-53/64)	122 (4-51/64)	117 (4-39/64)	111.5 (4-25/64)	8.5 (21/64)	4 - 5.4 (4 - 7/32)	100 (3-15/16)	55 (2-11/64)
100-C90	95 (3-47/64)	122 (4-51/64)	117 (4-39/64)	111.5 (4-25/64)	8.5 (21/64)	4 - 5.4 (4 - 7/32)	100 (3-15/16)	55 (2-11/64)

DC Contactors with Conventional Coils

Cat. No.	a	b	c	c1	c2	Ød	d1	d2
100-C09Z...100-C16Z	45 (1-25/32)	81 (3-3/16)	106.5 (4-3/16)	101.5 (4)	6 (15/64)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)
100-C23Z	45 (1-25/32)	81 (3-3/16)	123.5 (4-55/64)	119 (4-43/64)	6 (15/64)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)
100-C30Z...100-C37Z	45 (1-25/32)	81 (3-3/16)	141.5 (5-37/64)	136.5 (5-3/8)	6.5 (1/4)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)
100-C40Z	59 (2-21/64)	81 (3-3/16)	144.5 (5-11/16)	139.5 (5-1/2)	6.5 (1/4)	2 - 4.5 (2 -3/16)	60 (2-23/64)	45 (1-25/32)
100-C43Z	54 (2-1/8)	81 (3-3/16)	144.5 (5-11/16)	139.5 (5-1/2)	6.5 (1/4)	2 - 4.5 (2 -3/16)	60 (2-23/64)	45 (1-25/32)
100-C60D...100-C97D	72 (2-53/64)	122 (4-51/64)	117 (4-39/64)	111.5 (4-25/64)	8.5 (21/64)	4 - 5.4 (4 - 7/32)	100 (3-15/16)	55 (2-11/64)
100-C90D	95 (3-47/64)	81 (3-3/16)	117 (4-39/64)	111.5 (4-25/64)	8.5 (21/64)	4 - 5.4 (4 - 7/32)	100 (3-15/16)	55 (2-11/64)

DC Contactors with 110V or 220V DC Electronic Coils

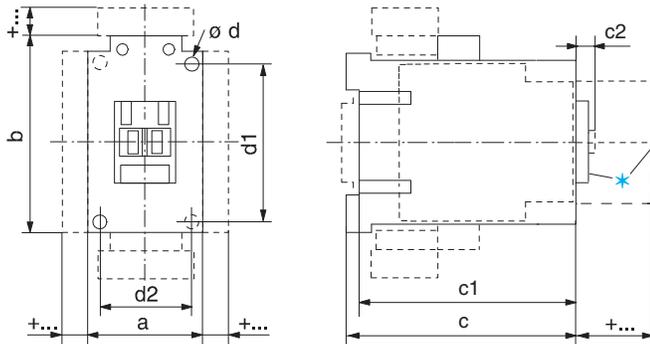
Cat. No.	a	b	c	c1	c2	Ød	d1	d2
100-C09E...100-C23E	45 (1-25/32)	105 (4-1/8)	80.5 (3-11/64)	75.5 (2-31/32)	6 (15/64)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)
100-C30E...100-C37E	45 (1-25/32)	105 (4-1/8)	97.5 (4)	92.5 (3-41/64)	6.5 (1/4)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)
100-C40EA...100-C40ED	59 (2-21/64)	105 (4-1/8)	100.5 (3-61/64)	95.5 (3-49/64)	6.5 (1/4)	2 - 4.5 (2 -3/16)	60 (2-23/64)	45 (1-25/32)
100-C43EA...100-C43ED	54 (2-1/8)	105 (4-1/8)	100.5 (3-61/64)	95.5 (3-49/64)	6.5 (1/4)	2 - 4.5 (2 -3/16)	60 (2-23/64)	45 (1-25/32)

Accessories

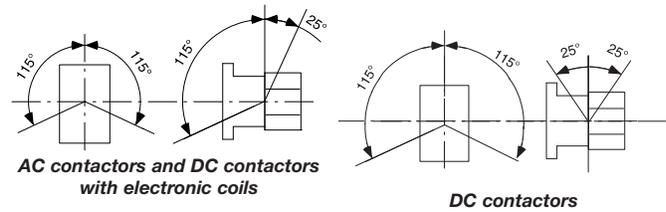
	Contactors with	mm	(inches)
Auxiliary contact block for front mounting	2- or 4-pole	c/c1 + 39	(c/c1 + 1-37/64)
Auxiliary contact block for side mounting	1- or 2-pole	a + 9	(a + 23/64)
Pneumatic Timing Module		c/c1 + 58	(c/c1 + 2-23/64)
Electronic Timing Module	on coil terminal side	b + 24	(b + 15/16)
Mechanical Interlock	on side of contactor	a + 9	(a + 23/64)
Mechanical Latch		c/c1 + 61	(c/c1 + 2-31/64)
Interface Module	on coil terminal side	b + 9	(b + 23/64)
Surge Suppressor	on coil terminal side	b + 3	(b + 1/8)
Labeling with *	label sheet	+ 0	(+ 0)
	marking tag sheet with clear cover	+ 0	(+ 0)
	marking tag adapter for System V4 / V5	+ 5.5	(+ 7/32)
	marking tag adapter for System Bul. 1492W	+ 5.5	(+ 7/32)
Terminal Lug Kit	100-C09...C23	b + 53	(b + 2-3/32)
	100-C30...37	b + 44	(b + 1-47/64)
	100-C43	b + 52	(b + 2-3/64)
	100-C60...C97	b + 99	(b + 3-7/8)
Paralleling Links	100-C09...C23	b + 78	(b + 3-1/16)
	100-C30...C37	c + 9/5	(c + 3/8)
		b + 85	(b + 3-11/32)

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

Bulletin 100S-C/104S-C Contactors and Accessories



Mounting Position



AC Contactors and DC Contactors with 12V or 24V Electronic Coils

Cat. No.	a	b	c	c1	c2	Ød	d1	d2
100S-C09...100S-C23	45 (1-25/32)	81 (3-3/16)	119.5 (4-3/4)	114.5 (4-43/64)	6 (15/64)	2-4.5 (2-3/16)	60 (2-23/64)	35 (1-3/8)
100S-C30, 100S-C37	45 (1-25/32)	81 (3-3/16)	136.5 (5-37/64)	131.6 (5-11/32)	6.5 (1/4)	2-4.5 (2-3/16)	60 (2-23/64)	35 (1-3/8)
100S-C43	54 (2-1/8)	81 (3-3/16)	139.5 (5-11/16)	134.6 (5-29/64)	6.5 (1/4)	2-4.5 (2-3/16)	60 (2-23/64)	45 (1-25/32)
100S-C60...100S-C97	72 (2-53/64)	122 (4-51/64)	156 (6-11/32)	150.5 (6-1/8)	8.5 (21/64)	4-5.4 (4-7/32)	100 (3-15/16)	55 (2-11/64)

DC Contactors with Conventional Coils

Cat. No.	a	b	c	c1	c2	Ød	d1	d2
100S-C09Z...100S-C16Z	45 (1-25/32)	81 (3-3/16)	145.5 (5-49/64)	140.5 (5-37/64)	6 (15/64)	2-4.5 (2-3/16)	60 (2-23/64)	35 (1-3/8)
100S-C23Z	45 (1-25/32)	81 (3-3/16)	162.5 (6-7/16)	158 (6-1/4)	6 (15/64)	2-4.5 (2-3/16)	60 (2-23/64)	35 (1-3/8)
100S-C30Z...100S-C37Z	45 (1-25/32)	81 (3-3/16)	180.5 (7-5/32)	175.5 (6-61/64)	6.5 (1/4)	2-4.5 (2-3/16)	60 (2-23/64)	35 (1-3/8)
100S-C43Z	54 (2-1/8)	81 (3-3/16)	183.5 (7-17/64)	179 (7-3/32)	6.5 (1/4)	2-4.5 (2-3/16)	60 (2-23/64)	45 (1-25/32)
100S-C60D...100S-C97D	72 (2-53/64)	122 (4-51/64)	156 (6-11/32)	150.5 (6-1/8)	8.5 (21/64)	4-5.4 (4-7/32)	100 (3-15/16)	55 (2-11/64)

DC Contactors with 110V or 220V DC Electronic Coils

Cat. No.	a	b	c	c1	c2	Ød	d1	d2
100S-C09E...100S-C23E	45 (1-25/32)	105 (4-1/8)	119.5 (4-3/4)	114.5 (4-43/64)	6 (15/64)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)
100S-C30E...100S-C37E	45 (1-25/32)	105 (4-1/8)	136.5 (5-37/64)	131.6 (5-11/32)	6.5 (1/4)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)
100S-C43EA...100S-C43ED	54 (2-1/8)	105 (4-1/8)	139.5 (5-11/16)	134.6 (5-29/64)	6.5 (1/4)	2 - 4.5 (2 -3/16)	60 (2-23/64)	45 (1-25/32)

Accessories

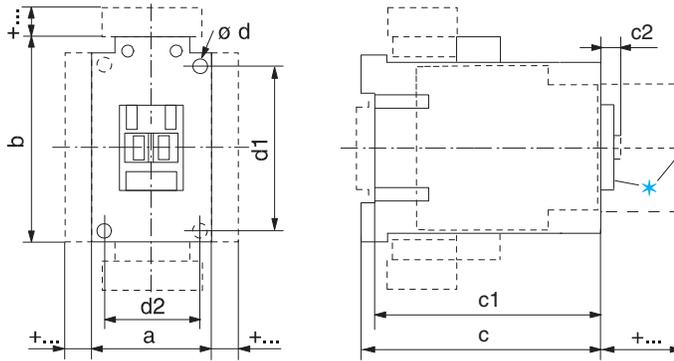
Contactors with		mm	(inches)
Auxiliary contact block for side mounting	1- or 2-pole	a + 9	(a + 23/64)
Electronic Timing Module	on coil terminal side	b + 24	(b + 15/16)
Mechanical Interlock	on side of contactor	a + 9	(a + 23/64)
Interface Module	on coil terminal side	b + 9	(b + 23/64)
Surge Suppressor	on coil terminal side	b + 3	(b + 1/8)
Labeling with *	label sheet	+ 0	(+ 0)
	marking tag sheet with clear cover	+ 0	(+ 0)
	marking tag adapter for System V4 / V5	+ 5.5	(+ 7/32)
	marking tag adapter for System Bul. 1492W	+ 5.5	(+ 7/32)

IEC Capacitor-Switching Contactors

Approximate Dimensions

Bulletin 100Q-C Contactors

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



2

AC Contactors and DC Contactors with 12V or 24V Electronic Coils

Cat. No.	a	b	c	c1	c2	Ød	d1	d2
100Q-C16	45 (1-25/32)	81 (3-3/16)	119.5 (4-3/4)	114.5 (4-43/64)	6 (15/64)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)
100Q-C37	45 (1-25/32)	81 (3-3/16)	136.5 (5-37/64)	131.6 (5-11/32)	6.5 (1/4)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)

DC Contactors with Conventional Coils

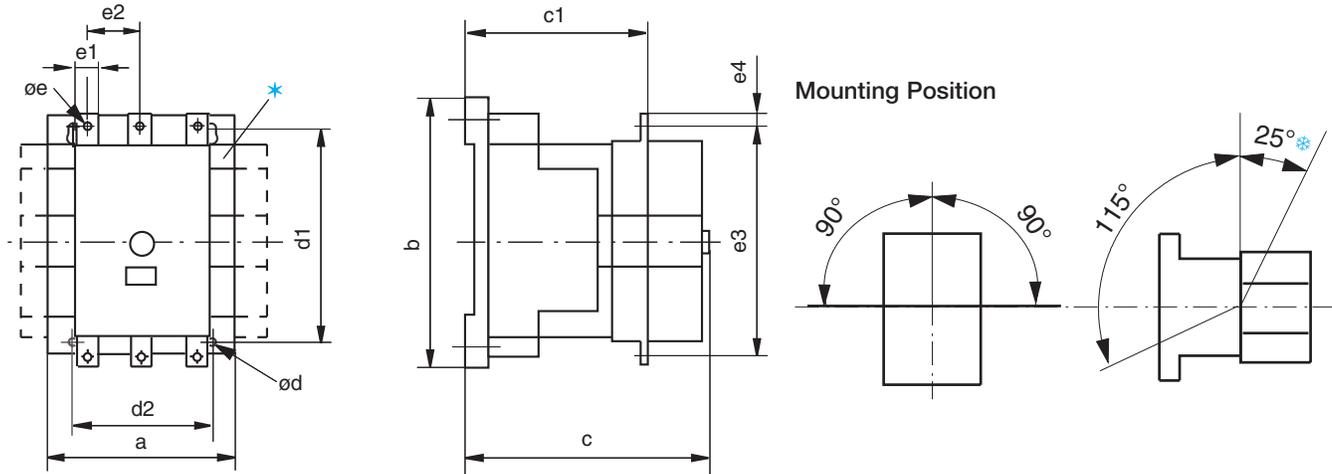
Cat. No.	a	b	c	c1	c2	Ød	d1	d2
100Q-C16Z	45 (1-25/32)	81 (3-3/16)	145.5 (5-49/64)	140.5 (5-37/64)	6 (15/64)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)
100Q-C37Z	45 (1-25/32)	81 (3-3/16)	180.5 (7-5/32)	175.5 (6-61/64)	6.5 (1/4)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)

DC Contactors with 110V or 220V DC Electronic Coils

Cat. No.	a	b	c	c1	c2	Ød	d1	d2
100Q-C16EA, 100Q-C16ED	45 (1-25/32)	105 (4-1/8)	119.5 (4-3/4)	114.5 (4-43/64)	6 (15/64)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)
100Q-C37EA, 100Q-C37ED	45 (1-25/32)	105 (4-1/8)	136.5 (5-37/64)	131.6 (5-11/32)	6.5 (1/4)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)

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

Bulletin 100-D Contactors and Accessories



2

Cat. No.	a	b	c	c1	Ød	d1	d2	Øe	e1	e2	e3	e4
100-D115E...100-D180E, 100-D115, 100-D140, 100-D180	120	170	156	110.5	5.2	145	100	8.5	20	39	160	10
100-D210E...100-D420E	155	205	180	110.5	6.5	180	130	10.4	25	48	193	12.5
100-D630E...100-D860E	255	310	265	110.5	10	230	225	M12	40	70	291	22

Contactor with		mm
Auxiliary contact block *	100-DS1... 100-DS2...	a a + 13.5 each
Mechanical Interlock	100-DM...	a + a
Frame terminal block	100-DTB110 100-DTB180 100-DTB420	b + 7 each b + 7 each b + 8.5 each
Label holder		c...+ 5

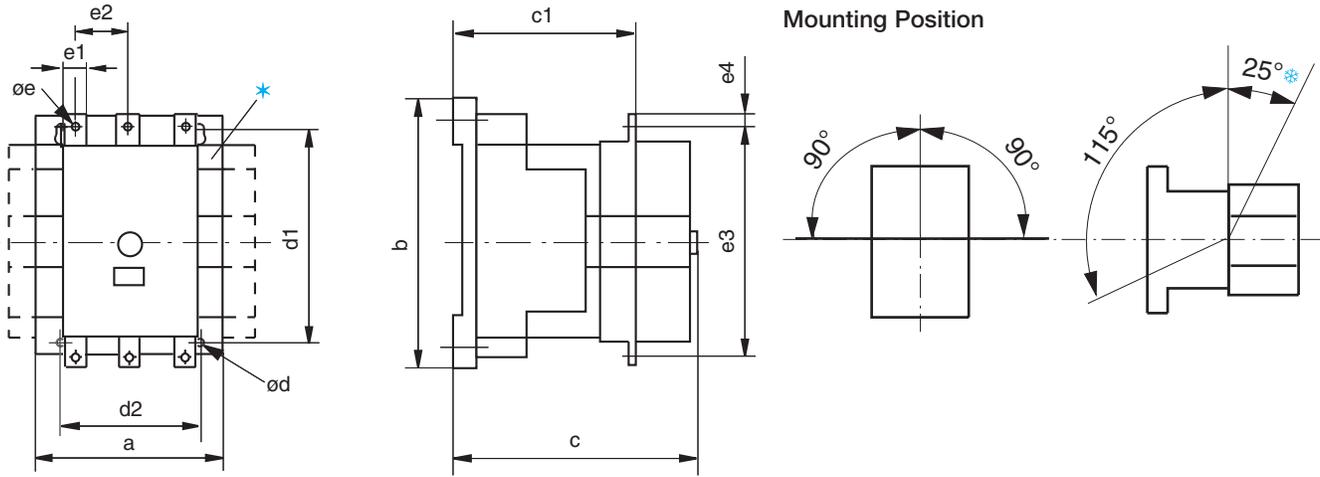
* Conventional DC coil contactors will have an additional auxiliary contact block that will add 13.5 mm to the "a" dimension on the right-hand side.
 * Applies only to conventional single frequency, conventional DC and electronic coils.

Bulletin 100S-D
IEC Safety Contactors
 Approximate Dimensions

Bulletin 100S-D Contactors and Accessories

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

2



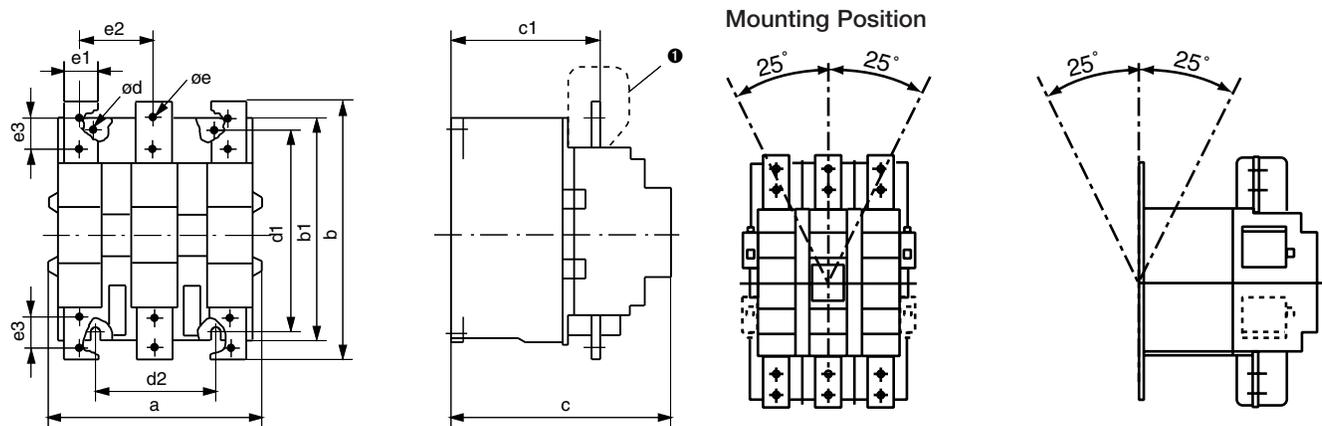
Cat. No.	a	b	c	c1	Ød	d1	d2	Øe	e1	e2	e3	e4
100S-D115E...100S-D180E, 100S-D115, 100S-D140, 100S-D180	120	170	156	110.5	5.2	145	100	8.5	20	39	160	10
100S-D210E...100S-D420E	155	205	180	110.5	6.5	180	130	10.5	25	48	193	12.5
100S-D630E...100S-D860E	255	310	265	110.5	10	230	225	M12	40	70	291	22

Contactor with		mm
Auxiliary contact block *	100-DS1... 100-DS2...	a a + 13.5 each
Mechanical Interlock	100-DM...	a + a
Frame terminal block	100-DTB110 100-DTB180 100-DTB420	b + 7 each b + 7 each b + 8.5 each
Label holder		c...+ 5

* Conventional DC coil contactors will have an additional auxiliary contact block that will add 13.5 mm to the "a" dimension on the right-hand side.
 * Applies only to conventional single frequency, conventional DC and electronic coils.

Bulletin 100-G Contactors and Accessories

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



Cat. No.	a	b	b1	c	c1	Ød	d1	d2	Øe	e1	e2	e3
100-G550	220	258	228	225	164	9	220	110	12.5	40	79	—
100-G700	280	307	277	291	203	11	280	175	13	50	101	—
100-G860	280	361	325	291	203	11	280	175	15	50	101	—
100-G1000	334	490	434	345	231	13.5	380	120	2x13	50	100	40
100-G1200	334	490	434	345	231	13.5	380	120	2x13	60	100	40

Contactor with		mm	
Auxiliary contact block		a	
Mechanical Interlock	side by side	100-G550/100-G550 100-G700, -860/100-G700, -860 100-G1000, -1200/100-G1000, -1200 100-G550/100-G700, -860 100-G700, -860/100-G1000, -1200	a+42+a a+32+a a+46+a a+37+a a+73+a
	stacked vertically	100-G550/100-G550 100-G700, -860/100-G700, -860 100-G1000, -1200/100-G1000, -1200 100-G550/100-G700, -860 100-G700, -860/100-G1000, -1200	b+56 + b b/2+380...480+b/2 b+120...170+b b/2+400+b/2 b/2+570+b/2
4th add-on neutral switching pole	100-G550 100-G700, -860 100-G1000, -1200	a+74 a+68 a+76	
Mechanical latch	100-G550 100-G700 100-G860	b+59 b+64 b+37	

Bulletin 100-C Replacement Coils



2

AC Standard Control Voltages [V]			AC Coil Code	100-C09...100-C16	100-C23...100-C37, 100L-C20	100-C40, -C43	100-C60...100-C85	100-C90...100-C97
50 Hz	60 Hz	50/60 Hz		Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
—	12	—	Q	TA006	TC006	TD006	TE006	TF006
12	—	—	R	TA404	TC404	TD404	TE404	TF404
—	24	—	J	TA013	TC013	TD013	TE013	TF013
24	—	—	K	TA407	TC407	TD407	TE407	TF407
—	—	24	KJ	TA855	TC855	TD855	TE855	TF855
32	36	—	V	TA481	TC481	TD481	TE481	TF481
36	42	—	W	TA410	TC410	TD410	TE410	TF410
42	48	—	X	TA482	TC482	TD482	TE482	TF482
48	—	—	Y	TA414	TC414	TD414	TE414	TF414
—	—	48	KY	TA860	TC860	TD860	TE860	TF860
100	100...110	100	KP	TA861	TC861	TD861	TE861	TF861
110	120	—	D	TA473	TC473	TD473	TE473	TF473
—	—	110	KD	TA856	TC856	TD856	TE856	TF856
120	—	—	P	TA425	TC425	TD425	TE425	TF425
127	—	—	S	TA428	TC428	TD428	TE428	TF428
200	200...220	200	KG	TA862	TC862	TD862	TE862	TF862
—	208	—	H	TA049	TC049	TD049	TE049	TF049
200...220	208...240	—	L	TA296	TC296	TD296	TE296	TF296
—	—	200...230	KL	TA864	TC864	TD864	TE864	—
220	240	—	A	TA474	TC474	TD474	TE474	TF474
220...230	260	—	F	TA441	TC441	TD441	TE441	TF441
—	—	230	KF	TA851	TC851	TD851	TE851	TF851
230...240	—	—	VA	TA440	TC440	TD440	TE440	TF440
240	277	—	T	TA480	TC480	TD480	TE480	TF480
—	—	240	KA	TA858	TC858	TD858	TE858	TF858
—	347	—	I	TA065	TC065	TD065	TE065	TF065
—	380	—	E	TA067	TC067	TD067	TE067	TF067
380...400	440	—	N	TA071	TC071	TD071	TE071	TF071
—	—	400	KN	TA863	TC863	TD863	TE863	TF863
400...415	—	—	G	TA457	TC457	TD457	TE457	TF457
440	480	—	B	TA475	TC475	TD475	TE475	TF475
—	—	440	KB	TA859	TC859	TD859	TE859	TF859
500	—	—	M	TA479	TC479	TD479	TE479	TF479
550	600	—	C	TA476	TC476	TD476	TE476	TF476



Coils, Continued



2

DC Standard Control Voltage [V]	DC Coil Code	100-C09...100-C16	100-C23...100-C37, 100L-C20	100-C40, -C43	100-C60...100-C85	100-C90...100-C97
		Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
9*	ZR	TA766	TC766	TD766	—	—
9V Diode*	DR	—	—	—	TE766M	TF766M
12	ZQ	TA708	TC708	TD708	—	—
12V Diode	DQ	—	—	—	TE708M	TF708M
24*	ZJ	TA714	TC714	TD714	—	—
24 Diode*	DJ	TA714M	TC714M	TD714M	TE714M	TF714M
36	ZW	TA719	TC719	TD719	—	—
36V Diode	DW	—	—	—	TE719M	TF719M
48	ZY	TA724	TC724	TD724	—	—
48V Diode	DY	—	—	—	TE724M	TF724M
60	ZZ	TA774	TC774	TD774	—	—
60V Diode	DZ	—	—	—	TE774M	TF774M
64	ZB	TA727	TC727	TD727	—	—
64V Diode	DB	—	—	—	TE727M	TF727M
72	ZG	TA728	TC728	TD728	—	—
72V Diode	DG	—	—	—	TE728M	TF728M
80	ZE	TA729	TC729	TD729	—	—
80V Diode	DE	—	—	—	TE729M	TF729M
110	ZD	TA733	TC733	TD733	—	—
110V Diode	DD	—	—	—	TE733M	TF733M
115	ZP	TA734	TC734	TD734	—	—
115V Diode	DP	—	—	—	TE734M	TF734M
125	ZS	TA737	TC737	TD737	—	—
125V Diode	DS	—	—	—	TE737M	TF737M
220	ZA	TA747	TC747	TD747	—	—
220V Diode	DA	—	—	—	TE747M	TF747M
230	ZF	TA749	TC749	TD749	—	—
230V Diode	DF	—	—	—	TE749F	TF749F
250	ZT	TA751	TC751	TD751	—	—
250V Diode	DT	—	—	—	TE751F	TF751F

* Voltage operating range: 0.65...1.3 x Us.

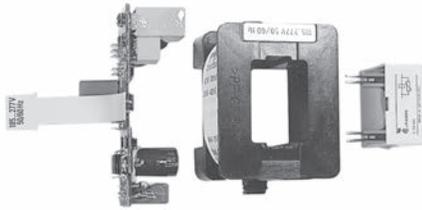
* Voltage operating range: 0.7...1.25 x Us.

Bulletin 100-D Line
IEC Contactors
 Renewal Parts

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	Description	Coil Type	For Use With	Cat. No.		
	Arc Chambers for Contactors For 3-pole 100-D Contactors	Conventional	100-D115	100-DA-115		
			100-D180	100-DA-180		
		Electronic	100-D115	100-DAE-115		
			100-D140	100-DAE-140		
			100-D180	100-DAE-180		
			100-D210	100-DAE-210		
			100-D250	100-DAE-250		
			100-D300	100-DAE-300		
100-D420	100-DAE-420					
	Main Contacts for Contactors 3 complete sets for 3-pole 100-D Contactors	Conventional	100-D115	100-DC-115		
			100-D140	100-DC-140		
			100-D180	100-DC-180		
		Electronic	100-D115	100-DCE-115		
			100-D140	100-DCE-140		
			100-D180	100-DCE-180		
			100-D210	100-DCE-210		
			100-D250	100-DCE-250		
			100-D300	100-DCE-300		
			100-D420	100-DCE-420		
			100-D630	100-DCE-630		
			100-D860	100-DCE-860		
			Terminal Hardware Set of 6	Conventional	100-D115...D180	100-DHF180
					100-D115E...D180	100-DHF180
Electronic	100-D210...D420	100-DHF420				
	100-D630...D860	100-DHF860				

Bulletin 100-D Replacement coils



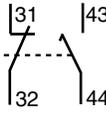
Conventional AC							Conventional DC				
AC Standard Control Voltages			AC Coil Code	100-D115...D180	100-D210...D420	100-D630...D860	DC Standard Control Voltages	DC Coil Code	100-D95...D180	100-D210...D420	100-D630...D860
50 Hz	60 Hz	50/60 Hz		Cat. No.	Cat. No.	Cat. No.			Cat. No.	Cat. No.	Cat. No.
24V	—	—	K	TG407	—	—	12V	ZQ	TG708	—	—
—	24V	—	J	TG013	—	—	24V	ZJ	TG714	—	—
32V	36V	—	V	TG481	—	—	36V	ZW	TG719	—	—
36V	42V	—	W	TG410	—	—	48V	ZY	TG724	—	—
48V	—	—	Y	TG414	—	—	60V	ZZ	TG774	—	—
42V	48V	—	X	TG482	—	—	110V	ZD	TG733	—	—
—	—	100V*	KP	TG861	—	—	125V	ZS	TG737	—	—
110V	120V	—	D	TG473	—	—	130V	ZF	TG738	—	—
—	—	110V*	KN	TG856	—	—	220V	ZA	TG761	—	—
—	208V	—	H	TG049	—	—	240V	ZL	TG750	—	—
—	—	200V*	KG	TG862	—	—	250V	ZT	TG751	—	—
—	—	220V*	KL	TG857	—	—					
220...230V	240V	—	A	TG441	—	—					
240V	277V	—	T	TG480	—	—					
—	—	277V*	KT	TG060	—	—					
—	—	230V*	KF	TG851	—	—					
—	—	240V*	KA	TG858	—	—					
380...400V	440V	—	N	TG071	—	—					
415V	480V	—	B	TG475	—	—					
440V	—	—	G	TG478	—	—					
500V	—	—	M	TG479	—	—					
550V	600V	—	C	TG476	—	—					

Electronic AC							Electronic DC				
AC Standard Control Voltages			AC Coil Code	100-D115...D300	100-D420	100-D630...D860	DC Standard Control Voltage	DC Coil Code	100-D115...D300	100-D420	100-D630...D860
50 Hz	60 Hz	50/60 Hz		Cat. No.	Cat. No.	Cat. No.			Cat. No.	Cat. No.	Cat. No.
—	—	24V	EJ*	TGE855	—	—	24V	EZJ	TGE708	—	—
—	—	42...64V	EY	TGE864	—	—	48...72V	EZY	TGE779	—	—
—	—	100V	EP	TGE861	THE861	TJE861	110...130V	EZD	TGE780	THE780	—
—	—	110...130V	ED	TGE865	THE865	TJE865		ED	—	—	TJE865
—	—	200V	EG	TGE862	THE862	—	200...255V	EZA	TGE781	THE781	—
—	—	208...277V	EA	TGE866	THE866	—		EA	—	—	TJE879
—	—	200...220V	EG	—	—	TJE878					
—	—	230...250V	EA	—	—	TJE879					
—	—	277V	ET	—	—	TJE880					
—	—	380...500V	EN	TGE867	THE867	—					
—	—	380...415V	EN	—	—	TJE867					
—	—	440...480V	EB	—	—	TJE868					
—	—	500V	EM	—	—	TJE869					

* Applies to 100-D115...-D110 contactors only. Not available with 100-D140...-D180 contactors.
 * Not available on 100/104-D300.

Bulletin 100-G Renewal Parts

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	Description	For Use With	Cat. No.
	Arcing Chamber For 3 poles	100-G550	100-AC550
		100-G700, 100-G860	100-AC860
	Main Contact Set Set for 1 pole	100-G550	100-CP550
		100-G700	100-CP700
		100-G860	100-CP860
		100-G1000	100-CP1000
	Auxiliary Contact Block Special 2-pole design: 1 N.O. delayed make, 1 N.C. contact N.O. delayed make contact used for operation of the Feeder/Group Coil mechanism One contact block supplied standard with contactor		100-G1000, 100-G1200 100-EB11DC

Coils and Supply Modules



AC Standard Control Voltages 50/60 Hz	DC Standard Control Voltage	Coil Code	100-G550		100-G700...100-G860	
			Coil Cat. No.*	Supply Module Cat. No.	Coil Cat. No.*	Supply Module Cat. No.
110...120V	100...110V	KD	TX734	TXS734	TY734	TYS734
220...240V	200...220V	KF	TX747	TXS747	TY747	TYS747
380...415V	345...380V	KN	TX779	TXS779	TY779	TYS779
440...480V	400...440V	KB	TX780	TXS780	TY780	TYS780

* Coils sold in pairs.

AC Standard Control Voltages 50/60 Hz	Coil Code	100-G1000...100-G1200	
		Coil Cat. No.*	Supply Module Cat. No.
110...115V	KD	TZ734	TZS734
220...230V	KF	TZ747	TZS747
380...400V	KN	TZ779	TZS779
440V	KB	TZ780	TZS780

**Bulletin 193 E1 Plus electronic overload relay for 3-phase applications:
 Selectable Trip Class 10, 15, 20, 30, selectable manual/auto reset**

For use with: Bulletin 105, 106, 109, 112, 113, 120E, 132, and 133										Full Load Current Range [A]	3-Phase Overload Relay Code						
C85	C72	C60			C30	C23	C16	C12	C09	0.10...0.5	E1A						
										0.2...1.0	E1B						
										1.0...5.0	E1C						
										3.2...16	E1D						
										5.4...27	E1E						
					C43					C37	C30					5.4...27	E1E
																9.0...45	E1F
							18...90	E1G									

**Bulletin 193 E1 Plus electronic overload relay for 3-phase applications:
 Trip Class 10 only, manual reset**

For use with: Bulletin 105, 106, 109, 112, 113, 120E, 132, and 133					Full Load Current Range [A]	3-Phase Overload Relay Code
C30	C23	C16	C12	C09	0.10...0.5	D1A
					0.2...1.0	D1B
					1.0...5.0	D1C
					3.2...16	D1D
					5.4...27	D1E

**Bulletin 193 E1 Plus electronic overload relay for 1-phase applications:
 Selectable Trip Class 10, 15, 20, 30; selectable manual/auto reset**

For use with: Bulletin 109										Full Load Current Range [A]	1-Phase Overload Relay Code					
C85	C72	C60			C30*	C23	C16	C12	C09	0.1...0.5	E1P					
										3.2...16	E1R					
										5.4...27	E1S					
					C43					C37					9.0...45	E1T
											C30					18...90

* For Bulletin 113 combination starters and Bulletin 133 circuit breaker-type pump control panels only.

Consult your local Rockwell Automation sales office or Allen-Bradley distributor for availability and dimensions.

Bulletin 100 IEC Enclosed Starters

Electronic Overload Relay Code Selection

Bulletin 193-T1 Bimetallic Overload Relays: Auto/Manual Reset, Class 10

For use with: Bulletin 105, 106, 112, 113, 120E, 132, and 133										Full Load Current Range [A]‡		Overload Relay Code		
Starter Size										Min.	Max.			
C85	C72	C60	C43	C37	C30	C23	C16	C12	C09					
				§	§					0.10	0.16	AA16		
												0.16	0.25	AA25
												0.25	0.40	AA40
												0.35	0.50	AA50
												0.45	0.63	AA63
												0.55	0.80	AA80
												0.75	1.00	AB10
												0.90	1.30	AB13
												1.10	1.60	AB16
												1.40	2.00	AB20
												1.80	2.50	AB25
												2.30	3.20	AB32
												2.90	4.00	AB40
												3.50	4.80	AB48
												4.50	6.30	AB63
										5.50	7.50	AB75		
										7.20	10.00	AC10		
										9.00	12.50	AC12		
										11.30	16.00	AC16		
										15.00	20.00	AC20		
										17.50	21.50	AC21		
										21.00	25.00	AC25		
										15.00	20.00	BC20		
										17.50	21.50	BC21		
										21.00	25.00	BC25		
										24.50	30.00	BC30		
										29.00	36.00	BC36		
										33.00	38.00	BC38		
										17.00	25.00	CC25		
										24.50	36.00	CC36		
										35.00	47.00	CC47		
										35.00	47.00	DC47		
										45.00	60.00	DC60		
										58.00	75.00	DC75		
										72.00	90.00	DC90		
All sizes - No overload relay												XXX		

‡ For motors with a service factor of 1.15 or greater, use the motor nameplate full load current. For motors with a service factor of 1.0, use 90% of the motor nameplate full load current.
 § For Bulletin 113 combination starters and circuit breaker-type pump control panels only; Bulletin 193-T1 bimetallic overload relays will be mounted separately.
 > Not available for Bulletin 112 combination starters.

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IEC Overload Relays & Modular Protection System

Product Overview

Overload Relays

Bulletin	193-ED	193-EE	193-EC1	193-EC2/EC3	193-EC5	193-EC4
Type	E1 Plus Electronic Overload Relay	E1 Plus Electronic Overload Relay	E3 Electronic Overload Relay	E3 Plus Electronic Overload Relay		E3 Plus Current Monitoring Relay
Rated Current (Range)	0.1...45 A	0.1...800 A	0.4...5000 A			
NEMA Operating Voltage, Nominal	—	600V	600V			
IEC Operating Voltage, Nominal	690V	690/1000V	690/1000V			
Overload Type	Electronic Overload	Electronic Overload	Microprocessor-Based			
Trip Class (Fixed)	10	—	—			
Trip Class (Adjustable)	—	10, 15, 20, 30	5...30		—	
Ambient Temperature Compensated	✓	✓	✓		—	
Reset Type	Manual Only	Automatic and Manual	Automatic and Manual			
Adjustment Range	5:1	5:1	5:1			
Phase Loss	3 s	3 s	Adjustable Delay			—
Ground (Earth) Fault	—	Optional	—	Sensitive	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	✓	✓	—	—	—	—
No. of Outputs	—	—	1	2	2	2
No. of Inputs	—	—	2	4	6	4
ODVA (DeviceNet) Conformance	—	Optional	✓	✓	✓	✓
Variable Frequency Drive (VFD) Compatible	—	—	✓	✓	✓	✓
Product Selection	Page 2-208	Page 2-208	Page 2-222	Page 2-222	Page 2-222	Page 2-222

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Overload Relays & Modular Protection System

Bulletin	193-K	193-T1	825-P
Type	Bimetallic Overload Relay		Modular Protection System
Rated Current (Range)	0.1...12.5 A	0.1...90 A	0.5...5000 A
Operating Voltage, Nominal	600V		120...240V AC/DC, 24...48V DC
Overload Type	Bimetallic		Microprocessor based
Trip Class (Fixed)	10	10	—
Ambient Temperature Compensated	✓	✓	✓
Reset Type	Automatic and Manual	Automatic and Manual	Automatic and Manual
Adjustment Range	1.5:1	1.5:1	—
Phase Loss	Normal Sensing	Normal Sensing	Adjustable delay
N.C. Trip Contact	✓	✓	✓
N.O. Alarm Contact	✓	✓	✓
Variable Frequency Drive (VFD) Compatible	✓	✓	✓
Product Selection	Page 2-246	Page 2-249	Page 2-260

E1 Plus Electronic Overload Relays

Product Overview

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E1 Plus Solid-State Overload Relays

193-ED/EE versions offer:

- Self-powered
- Phase loss protection
- Wide adjustment range (5:1)
- Over-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

193-ED version offers:

- 0.1...45 A current range
- Fixed Trip Class 10
- Manual reset

193-EE version offers:

- 0.1...800 A current range
- Selectable Trip Class (10, 15, 20, or 30)
- Selectable manual/auto-manual reset
- Single- and three-phase devices

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Standards Compliance

IEC/EN 60947-4-1
 IEC/EN 60947-5-1
 CSA 22.2 No. 14
 UL 508

Certifications

CE
 cULus Listed
 C-Tick
 CCC

Your order must include 1) the Cat. No. of overload relay selected, and 2) if required, Cat. No. of any accessories.

Product Overview

Accurate, Reliable Performance

Current measurement-based protection

While electromechanical overload relays pass motor current through heating elements to provide an indirect simulation of motor heating, the E1 Plus Overload Relay directly measures motor current. Current measurement-based overload protection more accurately models a motor's thermal condition. Furthermore, ambient temperature does not impact the performance of current measurement-based designs over the specified temperature operating range.

Electronic design

Thermal modeling is performed electronically with precision solid-state components, where at the heart of the E1 Plus Overload Relay is an application-specific integrated circuit (ASIC). The ASIC continually processes motor current data to accurately maintain the time-current status of the motor thermal capacity utilization value.

Thermal memory

A thermal memory circuit allows the E1 Plus Overload Relay to model the heating and cooling effects of motor on and off periods. This ensures accurate protection for both hot and cold motors.

Enhanced phase loss protection

A separate phase loss detection circuit incorporated into the E1 Plus Overload Relay allows it to respond quickly to phase loss conditions; typical reaction time is 3 seconds.

Easy to Select and Apply

Straightforward installation

The self-powered design means that the E1 Plus Overload Relay installs in the same manner as traditional overload relays. Device setup is accomplished by simply dialing the setting potentiometer to the motor FLA rating. The low energy consumption of the electronic design minimizes temperature rise issues inside control cabinets.

Wide adjustment range

A wide 5:1 adjustment range results in the need for half as many catalog numbers as the bimetallic alternative in order to cover the same current range. This helps to reduce inventory carrying costs and affords greater installation flexibility for dual voltage machines. Evenly spaced setting tick marks enhance the ease of installation setup.

Rugged Construction

Over-molded power connections

The unique line-side over-molded power connections make for a sturdy two-component starter assembly that is unmatched in the industry. The pre-formed power connections allow easy starter assembly — every time.

Current transformers

The current transformers are secured separately in the overload housing to ensure the greatest degree of resistance to shock and vibration conditions. Varnished laminations ensure consistent performance and provide additional protection against corrosion.

Latching relay

The robust design of the bi-polar latching relay provides reliable trip and reset performance for the most demanding of applications. The self-enclosed relay offers additional environmental protection for use in industrial applications.

Application Flexibility

Isolated Contacts

The isolated contact configuration allows the N.C. and N.O. contacts to be applied in circuits operating at different voltage levels and without polarity restrictions. The B600 contact rating affords application in circuits rated to 600V.

DIP switch settings

Bul. 193-EE devices offer DIP switch settings to select the trip class (10, 15, 20 or 30) and the reset mode (manual or automatic), making these devices extremely versatile.

Pass-Thru Option

The E1 Plus Pass-Thru consumes 48% less panel space compared to a standard E1 Plus mounted in a panel mount adapter. The design provides an integrated DIN Rail mount and panel mounting holes and is intended for the following applications: DIN Rail and Panel Mount Applications, Bulletin 100-K mini contactor, external current transformers, and for use with non Allen-Bradley Contactors. The E1 Plus Pass-Thru Electronic Overload Relay provides all of the same expandable protection & communication capabilities as a standard E1 Plus, and eliminates the need for a separate panel mount adapter, which saves money and valuable panel space.



Side-Mount Expansion Modules

Through the use of optional side-mount expansion modules, functionality of the E1 Plus overload relays can be cost effectively expanded and machine operation and protection enhanced. Direct mounting to the left side of the 193-EE and 592-EE E1 Plus overload relays means that only 18 mm is added to the overall product width. The side-mounted accessory modules electronically interface with the E1 Plus overload relay so that all control circuit connections are made at the E1 Plus overload relay terminals.

E1 Plus DeviceNet™ Communication Module

The Bul. 193-EDN DeviceNet Communication Side-Mount Module provides a cost-effective, seamless deployment of motor starters onto the Integrated Architecture™ as an accessory for the E1 Plus electronic overload relay. The DeviceNet module provides Integrated I/O (2 inputs and 1 output) providing local connection of motor starter-related I/O. The DeviceNet module offers expanded protective functions including overload warning, jam protection, and underload warning. The DeviceNet module also allows access to average motor current (percentage of FLA setting), percentage of thermal capacity usage, device status, trip & warning identification, and trip history which allows continual monitoring of motor performance.

E1 Plus Remote Reset Module

The Bul. 193-ERR Remote Reset Module is available for applications that require remote reset of the E1 Plus overload relays after a trip occurs.

E1 Plus Jam Protection Module with Remote Reset

The Bul. 193-EJM Jam Protection Module provides front-accessible DIP switches which offers flexibility to provide jam protection to match application requirements. Selections are available for enabling or disabling the jam protection function and remote reset operation. Jam trip level settings are available at 150%, 200%, 300%, and 400% of full load current setting. Trip delay settings of 1/2, 1, 2, and 4 seconds are available to minimize nuisance tripping in applications where intermittent short-duration overloading is permissible.

E1 Plus Ground Fault Module with Remote Reset

The Bul. 193-EGF Ground Fault Protection Module offers front-accessible DIP switches providing flexibility to configure ground fault protection to match application requirements. Selections are available for enabling or disabling the ground fault protection function and remote reset operation. Ground fault trip level settings are available in four ranges: 20...100 mA (resistive loads only, for motor loads consult your local Rockwell Automation sales office or Allen-Bradley distributor), 100...500 mA, 0.2...1 A, and 1...5 A. Within each range, the specific ground fault trip level can be set (20%, 35%, 50%, 65%, 80%, 90%, or 100% of the maximum ground fault setting). Trip delay is fixed at 50 ms ± 20 ms.

E1 Plus Ground Fault/Jam Module with Remote Reset

The Bul. 193-EGJ Ground Fault/Jam Protection Module offers front-accessible DIP switches to provide flexibility to configure ground fault and jam protection to match application requirements. The ground fault selections are the same as the Bul. 193-EGF Ground Fault Protection Module. In addition to ground fault, this module offers selectable fixed jam protection. The user can enable or disable jam protection from the DIP switches. The jam protection is fixed at 400% of the full load current setting with a 0.5 second trip delay.

E1 Plus PTC Module with Remote Reset

The Bul. 193-EPT PTC Side-Mount Module provides two terminals for the connection of positive temperature coefficient (PTC) thermistor sensors. PTC sensors are commonly embedded in the motor stator windings to monitor winding temperature. PTC sensors react to actual temperature, so enhanced motor protection can be provided to address conditions like obstructed cooling and high ambient temperature.

E1 Plus EtherNet/IP Module

The Bul. 193-ETN EtherNet/IP network communication module delivers seamless control and direct access to motor performance and diagnostic data on an Ethernet-based network. It supports I/O and explicit messaging for data access by a programmable automation controller, and contains predefined ControlLogix® style tags for direct software access. The integrated web and e-mail server contains a web server to allow users to read information and configure parameters via a web browser. The device also uses a simple mail transfer protocol (SMTP) server to send e-mail or text messages in the event of a warning or trip condition.

E1 Plus Profibus Module

The Bul. 193-EPRB PROFIBUS network communication module delivers direct access to motor performance and diagnostic data on a field bus based network in addition to seamless control. The PROFIBUS communication module supports both PROFIBUS DP-V0 and DP-V1. Protective functions include overload warning, jam protection, and underload warning. The PROFIBUS network communication module monitors the motor current by electronically interfacing to the E1 Plus overload relay's current-sensing circuit. As a result, the side-mount module is able to identify the cause of the trip and provides warnings for overload, underload, phase loss, and jam. The module continuously monitors the motor's performance for average motor current, thermal capacity usage, and device status, and also provides a trip history for the five previous trips. Integrated I/O provides convenient local termination of motor-related inputs and outputs, simplifying the control architecture.

E1 Plus Electronic Overload Relays

Catalog Number Explanation/Product Selection

193 – EE C B
a b c d

2

a

Bulletin Number	
Code	Description
193	IEC Three-Phase
193S	IEC Single-Phase
592	NEMA Three-Phase
592S	NEMA Single-Phase

b

Type	
Code	Description
ED1*	Fixed Trip Class 10
EE	Selectable Trip Class

* Bulletin 193 overload relays only

c

Adjustment Range [A]			
Three-Phase		Single-Phase	
Code	Description	Code	Description
A	0.1...0.5	P	1.0...5.0
B	0.2...1.0	R	3.2...16
C	1.0...5.0	S	5.4...27
D	3.2...16	T	9...45
E	5.4...27	U	18...90
F	9...45	V	60...120
G	18...90	—	—
H	30...150	—	—
J	40...200	—	—
K	60...300	—	—
L	100...500	—	—
M	120...600	—	—
N	160...800	—	—

d

Bulletin 100 Contactor Size	
Code	Description
B	C09...C23
D	C30...C43
E	C60...C85, C60...C97
F	D95...D180, D115...D180
G	D210...D420
H	D630...D860
Bulletin 500 NEMA Contactor Size	
Code	Description
T	Size 00
C	Size 0...2
D	Size 3
Panel/DIN Rail Mount	
Code	Description
P	Integrated panel mount and pass-through wiring
Z	Panel mount with external current transformers

Product Selection

Bulletin 193-ED – Three-Phase Devices

- Fixed Trip Class 10
- Manual reset
- Screw-type control terminals

Mounts to Contactor	Adjustment Range [A]	Cat. No.
100-C09...100-C23	0.1...0.5	193-ED1AB
	0.2...1.0	193-ED1BB
	1.0...5.0	193-ED1CB
	3.2...16	193-ED1DB
	5.4...27	193-ED1EB
100-C30...100-C43	5.4...27	193-ED1ED
	9...45	193-ED1FD
	1.0...5.0	193-ED1CP
Integrated panel/DIN Rail mount and pass-thru wiring	3.2...16	193-ED1DP
	5.4...27	193-ED1EP

Bulletin 193-EE – Three-Phase Devices

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

Mounts to Contactor	Adjustment Range [A]	Cat. No.
100-C09...100-C23	0.1...0.5	193-EEAB
	0.2...1.0	193-EEBB
	1.0...5.0	193-EECB
	3.2...16	193-EEDB
	5.4...27	193-EEEB
100-C30...100-C43	5.4...27	193-EEED
	9...45	193-EEFD
100-C60...100-C97	18...90	193-EEGE
	60...120	193-EEVE
100-D95...100-D180	18...90	* 193-EEGF
	30...150	* 193-EEHF
	40...200	* 193-EEJF
	60...120	* 193-EEVF
100-D210...100-D420	40...200	* 193-EEJG
	60...300	* 193-EEKG
	100...500	* 193-EELG
100-D630...100-D860	120...600	* 193-EEMH
	160...800	* 193-EENH
Integrated panel/DIN Rail mount and pass-thru wiring	1.0...5.0	193-EECP
	3.2...16	193-EEDP
	5.4...27	193-EEEP

Package Quantity = 1

* Does not include terminal lugs. See page 2-212.

Bulletin 193S-EE – Single-Phase Devices

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

Mounts to Contactor	Adjustment Range [A]	Cat. No.
100-C09...100-C23	1.0...5.0	193S-EEPB
	3.2...16	193S-EERB
	5.4...27	193S-EESB
100-C30...100-C43	9...45	193S-EETD
100-C60...100-C85	18...90	193S-EEUE
Integrated panel/DIN Rail mount and pass-thru wiring	1.0...5.0	193S-EEPP
	3.2...16	193S-EERP
	5.4...27	193S-EESP

Bulletin 193 Panel Mount Devices for use with External Current Transformers §*

- Selectable Trip Class (10, 15, 20, 30)
- Selectable manual/auto-manual reset

CT Ratio	Adjustment Range [A]	Cat. No.
150:5	30...150	193-EEHZ
200:5	40...200	193-EEJZ
300:5	60...300	193-EEKZ
400:5	80...400	193-EEWZ
500:5	100...500	193-EELZ
600:5	120...600	193-EEMZ
800:5	160...800	193-EENZ

* Current Transformers supplied by customer, refer to page 2-216 for proper current transformer selection.
 § Order panel adapter, **Cat. No. 193-EPB**, separately.

Side-Mount Expansion Modules*

Function	E1 Plus‡ (Cat. No. 193/592-EE_)	E1 Plus w/ Jam Module (Cat. No. 193-EJM)	E1 Plus w/ Ground Fault Module* (Cat. No. 193-EGF)	E1 Plus w/ Ground Fault/Jam Module* (Cat. No. 193-EGJ)	E1 Plus w/ PTC Module (Cat. No. 193-EPT)	E1 Plus w/ Remote Reset Module (Cat. No. 193-ERR)	E1 Plus w/ DeviceNet Module (Cat. No. 193-EDN)	E1 Plus w/ EtherNet/IP Module (Cat. No. 193-ETN)	E1 Plus w/ Profibus Module (Cat. No. 193-EPRB)
Manual/Automatic Reset	X	X	X	X	X	X	X	X	X
Selectable Trip Class	10	X	X	X	X	X	X	X	X
	15	X	X	X	X	X	X	X	X
	20	X	X	X	X	X	X	X	X
	30	X	X	X	X	X	X	X	X
Jam Protection	On or Off	—	X	—	X	—	—	X	X
	Trip Level	—	Adjustable 150/200/300/400%	—	Fixed @ 400%	—	—	Adjustable 150...600% FLA	Adjustable 150...600% FLA
	Trip Delay	—	Adjustable 0.5/1.0/2.0/4.0 s	—	Fixed @ 0.5 s	—	—	Adjustable 0.5...25 s	Adjustable 0.5...25 s
	Inhibit	—	Dynamic Inhibit‡	—	Dynamic Inhibit‡	—	—	Dynamic Inhibit‡	Dynamic Inhibit‡
Ground Fault Protection	Type	—	—	Core-Balanced Ground Fault Protection*	Core-Balanced Ground Fault Protection*	—	—	—	—
	On or Off	—	—	X	X	—	—	—	—
	Trip Level	—	—	Adjustable 20 mA...5 A❖	Adjustable 20 mA...5 A❖	—	—	—	—
	Trip Delay	—	—	Fixed @ 50 ms ± 20 ms	Fixed @ 50 ms ± 20 ms	—	—	—	—
	Inhibit	—	—	Dynamic Inhibit‡	Dynamic Inhibit‡	—	—	—	—
PTC Protection	PTC Overtemperature Trip	—	—	—	—	X	—	—	—
	PTC Open Circuit	—	—	—	—	X	—	—	—
	PTC Short Circuit	—	—	—	—	X	—	—	—
Remote Reset Capability	—	X	X	X	X	X	X	X	X
Fault Indication	—	—	X	X	X	—	X	X	X

‡ Dynamic Inhibit: Protective function is enabled after the motor current goes above 150% and then falls to below 125%.
 * Requires use of an external ground fault sensor, **Cat. No. 193-CBCT_**.
 ❖ From 20...100 mA for resistive loads only.

E1 Plus Electronic Overload Relays

Accessories

	Description	For Use With	Pkg. Quantity	Cat. No.
	DIN Rail/Panel Adapter For separate mounting – can be mounted to top-hat rail EN 50 022-35	193-ED1_B, 193-EE_B, 193S-EE_B, 193-EE_Z, 592-EE_T	1	193-EPB
		193-ED1_D, 193-EE_D, 193S-EE_D		193-EPD
		193-EE_E, 193S-EE_E		193-EPE
	Current Adjustment Shield Prevents inadvertent adjustment of the current setting. Must be ordered in multiples of package quantities.	193-ED (all) 193-EE (all) 592-EE (all)	10	193-BC8
	External Reset Adapter For enclosed, through-the-door reset applications. Use with external reset button.	193-ED (all) 193-EE_B, 193-EE_D, 193-EE_E 193-EE_Z	1	193-ERA
	External Reset Button for Enclosed Devices	193-E all	1	800FM-R611 (Button)
				800F-ATR08 (Rod)
	Terminal Lugs • Set of two • Protection class IP2X per IEC 60529 and DIN 40 050	100-D115, 100-D140, 100-D180, 100-D115E...D180E, 193-EC_F, 193-EE_F	2	100-DTB180
		100-D210...100-D420, 193-EC_G, 193-EF2C, 193-EE_G	2	100-DTB420
	Terminal Lugs, Copper Frame Set of three	100-D115E, 193-EC_F, 193-EE_F	3	100-DLE110
		100-D210...100-D420, 193-EC_G, 193-EE_G	3	100-DL180
		100-D210...100-D420, 193-EC_G, 193-EE_G	3	100-DL420
		100-D630, 100-D860, 193-EC_H, 193-EE_H	3	100-DL630
		100-D630, 100-D860, 193-EC_H, 193-EE_H	3	100-DL860
	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	100-D115...100-D180, 193-EC_F, 193-EE_F	1	100-DTC180
		100-D210...100-D420, 193-EC_G, 193-EE_G	1	100-DTC420
		100-D630...100-D860, 193-EC_H, 193-EE_H	1	100-DTC860
	DeviceNet Configuration Terminal Used to interface with objects on a DeviceNet network. Includes 1 m communications cable (193-CB1).	193-EDN, 193-EC (all), 592-EC (all); 280/281/283/284 ArmorStart, 825-P	1	193-DNCT
	1 meter communication cable, color-coded bare leads	193-DNCT	1	193-CB1
	1 meter communication cable, microconnector (male)	193-DNCT	1	193-CM1
	Panel Mount Adapter/Door Mount Bezel Kit	193-DNCT	1	193-DNCT-BZ1

	Description	For Use With	Pkg. Quantity	Cat. No.
	E1 Plus DeviceNet and Protection Module Communicates motor diagnostic data via DeviceNet, includes additional I/O, and provides enhanced motor protection options.*	193-EE (all), 592-EE (all), 193S-EE (all), 592S-EE (all)	1	193-EDN
	E1 Plus EtherNet/IP and Protection Module Communicates motor diagnostic data via EtherNet/IP, includes additional I/O, and provides enhanced motor protection options.*	193-EE (all), 592-EE (all), 193S-EE (all), 592S-EE (all)	1	193-ETN
	E1 Plus PROFIBUS & Protection Module Communicates motor diagnostic data via PROFIBUS, includes additional I/O, and provides enhanced motor protection options.*	193-EE (all), 592-EE (all), 193S-EE (all), 592S-EE (all)	1	193-EPRB
	E1 Plus Jam Protection Module Provides Jam protection with adjustable trip level and trip delay setting. The module also provides an input to allow remote reset of a trip.*	193-EE (all), 592-EE (all), 193S-EE (all), 592S-EE (all)	1	193-EJM
	E1 Plus Ground Fault Module Provides adjustable 20 mA...5 A ground fault protection. The module also provides an input to allow remote reset of a trip.*	193-EE (all), 592-EE (all), 193S-EE (all), 592S-EE (all)	1	‡ 193-EGF
	E1 Plus Ground Fault/Jam Module Provides adjustable 20 mA...5 A ground fault and fixed jam protection. The module also provides an input to allow remote reset of a trip.*	193-EE (all), 592-EE (all), 193S-EE (all), 592S-EE (all)	1	‡ 193-EGJ
	E1 Plus PTC Module Provides terminals for connection up to six PTC thermistor sensors. Sensors react to actual temperature and therefore provide enhanced motor protection. Module also provides an input to allow remote reset of a trip.*	193-EE (all), 592-EE (all), 193S-EE (all), 592S-EE (all)	1	193-EPT
	E1 Plus Remote Reset Module Provides an input to allow remote reset of a trip.*	193-EE (all), 592-EE (all), 193S-EE (all), 592S-EE (all)	1	193-ERR
	E1 Plus Remote Indicator Display Displays the status of an E1 Plus from the front of a panel and features a reset button. Mounts in a standard 22 mm push button cutout.*	193-EGF, 193-EJM, 193-EGJ, 193-PTC, 193-ERR (Ser. B or later)	1	193-ERID
	Module Adjustment Cover Prevents inadvertent adjustment of setting. Must be ordered in multiples of package quantity.	193-EJM	25	193-EMC

* Only one module may be added.

‡ Requires use of an external ground fault sensor (Cat. No. 193-CBCT_).

E1 Plus Electronic Overload Relays

Accessories

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	Description	Size	For Use With	Pkg. Quantity	Cat. No.
	Core Balanced Ground Fault Sensor <ul style="list-style-type: none"> Required when using either an E1 Plus Ground Fault Protection or Ground Fault/Jam Module Required for ground fault protection with the Cat. No. 193-EC3_ _ overload relay 	20 mm (0.79 in.)	100-C09...100-C37 NEMA size 00...2	1	193-CBCT1
		40 mm (1.57 in.)	100-C09...100-C85 NEMA size 00...3	1	193-CBCT2
		63 mm (2.5 in.)	100-C09...100-C85, 100-D95...100-D180 NEMA size 00...4	1	193-CBCT3
		82 mm (3.25 in.)	100-C09...100-C85, 100-D95...100-D420 NEMA size 00...5	1	193-CBCT4

	Description	For Use With	Cat. No.	
	Remote Reset Solenoid	E1 Plus (Series C and later)	24V AC, 50/60 Hz	193-EMRJ
			110/120V AC, 50/60 Hz	193-EMRD
			220/240V AC, 50/60 Hz	193-EMRA
			24V DC	193-EMRZ24
			48V DC	193-EMRZ48
			115V DC	193-EMRZ01

Marking Systems

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

	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 1492 W	100	100-FMA2

* Must be ordered in multiples of package quantities.

		Cat. No. 193-ED1_B, 193-EE_B, and 592-EE_T	Cat. No. 193-EE_D, and 592-EE_C	Cat. No. 193-EE_E, and 592-EE_D	Cat. No. 193-EE_F†	Cat. No. 193-EE_G	Cat. No. 193-EE_H
Main Circuits							
Rated Insulation Voltage (U _i)		690V AC			1000V AC		
Rated Impulse Strength (U _{imp})		6 kV AC			6 kV AC		
Rated Operating Voltage (U _o) IEC/UL		690V AC/600V AC			1000V AC/600V AC		
Rated Operating Frequency		50/60 Hz (sinusoidal)			50/60 Hz (sinusoidal)		
Terminal Cross-Sections	Terminal Type						
	Terminal Screws	M5		M8	Lug		
Flexible-Stranded with Ferrule	Single Conductor Torque	2.5...16 mm ² 2.5 N•m	2.5...16 mm ² 2.5 N•m	4...35 mm ² 24 N•m	—	—	—
	Two Conductor Torque	2.5...10 mm ² * 3.4 N•m	2.5...10 mm ² * 3.4 N•m	4...25 mm ² 4 N•m	—	—	—
Coarse-Stranded/Solid	Single Conductor Torque	2.5...25 mm ² 2.5 N•m	2.5...25 mm ² 2.5 N•m	4...50 mm ² 4 N•m	16...150 mm ² 28 N•m	—	—
	Two Conductor Torque	6...16 mm ² * 3.4 N•m	6...16 mm ² * 3.4 N•m	4...35 mm ² 4 N•m	—	25...185 mm ² 28 N•m	70...240 mm ² 45 N•m
	Four Conductor Torque	6...16 mm ² * 3.4 N•m	6...16 mm ² * 3.4 N•m	4...35 mm ² 4 N•m	—	—	70...240 mm ² 45 N•m
Stranded/Solid	Single Conductor Torque	14...6 AWG 22 lb•in	14...6 AWG 22 lb•in	12...1 AWG 35 lb•in	6...300 MCM 250 lb•in	—	—
	Two Conductor Torque	14...6 AWG* 30 lb•in	14...6 AWG* 30 lb•in	6...2 AWG 35 lb•in	—	4...350 MCM 250 lb•in	2/0...500 MCM 400 lb•in
	Four Conductor Torque	14...6 AWG* 30 lb•in	14...6 AWG* 30 lb•in	6...2 AWG 35 lb•in	—	—	2/0...500 MCM 400 lb•in
Pozi driv Screwdriver Size		2	2	—	—	—	—
Slotted Screwdriver (mm)		1 x 6	1 x 6	—	—	—	—
Hexagon Socket Size (mm)		—	—	4	8	8	8
Control Circuits							
Rated Insulation Voltage (U _i)		690V AC					
Rated Impulse Strength (U _{imp})		6 kV AC					
Rated Operating Voltage (U _o) IEC/UL		690V AC / 600V AC					
Rating Designation		B600					
Rated Operating Current I _e		N.O./N.C.					
AC-15	12...120V	3/2					
	220...240V	1.5/1.5					
	380...480V	0.75/0.75					
	500...600V	0.6/0.6					
Thermal Current I _{the}		5 A					
Contact Reliability		17V, 5 mA					
Screw Terminal Cross Sections	Terminal Screw	M3					
	Terminal Type	M3					
Flexible-Stranded with Ferrule	Single Conductor Torque	0.5...2.5 mm ² 0.55 N•m					
	Two Conductor Torque	0.25...1.5 mm ² 0.55 N•m				0.2...0.75 mm ² 0.55 N•m	
Coarse-Stranded/Solid	Single Conductor Torque	0.5...4 mm ² 0.55 N•m					
	Two Conductor Torque	0.2...2.5 mm ² 0.55 N•m				0.2...1.5 mm ² 0.55 N•m	
Stranded/Solid	Single Conductor Torque	24...10 AWG 5 lb•in					
	Two Conductor Torque	24...12 AWG 5 lb•in				22...16 AWG 5 lb•in	
Screwdriver Size (mm)		#1 Pozidriv/0.6 x 3.5 slotted					
Cage Clamp Cross-Sections							
Flexible-Stranded with Ferrule		0.25...1 mm ²					
Coarse-Stranded/Solid		0.2...1.5 mm ²					
Stranded/Solid		24...14 AWG					

* For multiple conductor applications, the same style and size of wire must be used.
 † Cat. Nos. 193-EEGF and 193-EEVF follow Cat. No. 193-EE_E specifications.

E1 Plus Electronic Overload Relays

Specifications

3-Pole Terminal Blocks

Cat. No. 100-DTB180	Cat. No. 100-DTB420
(A) 6...1/0 AWG, 16...50 mm ² (B) 6 AWG...250 MCM, 16...120 mm ² 90...110 lb•in, 10...12 N•m	(2) 4 AWG...600 MCM, 25...240 mm ² 180...220 lb•in, 20...25 N•m

Terminal Lug Kits

Cat. No. 100-DLE110	Cat. No. 100-DL180	Cat. No. 100-DL420	Cat. No. 100-DL630	Cat. No. 100-DL860
Lug: 6...2/0 AWG, 16...70 mm ² 90...110 lb•in, 10...12 N•m Terminal: 13/32 in., 10 mm 150 lb•in, 17 N•m	Lug: 6 AWG...250 MCM, 16...120 mm ² 90...110 lb•in, 10...12 N•m Terminal: 1/2 in., 13 mm 275 lb•in, 16 N•m	Lug: 2 AWG...350 MCM, 375 lb•in, 42 N•m Terminal: 11/16 in., 17 mm 140 lb•in, 16 N•m	Lug: 2/0 AWG...500 MCM, 70...240 mm ² 400 lb•in, 45 N•m Terminal: 3/4 in., 19 mm 600 lb•in, 68 N•m	Lug: 2/0 AWG...500 MCM, 70...240 mm ² 400 lb•in, 45 N•m Terminal: 3/4 in., 19 mm 600 lb•in, 68 N•m

Environmental Ratings

Ambient Temperature	Storage Operating	-40...+85 °C (-40...+185 °F) -20...+60 °C (-4...+140 °F)
Humidity	Operating Damp Heat	5...95% Non-condensing per IEC 68-2-3 and IEC 68-2-30
Vibration (per IEC 68-2-6)		3 G
Shock (per IEC 68-2-27)		30 G
Max. Altitude		2000 m
Pollution Environment		Pollution Degree 3
Degree of Protection		IP20

Protection

Type of Relay	Ambient Compensated, Time Delay, Phase Loss Sensitive	
Nature of Relay	Solid-State	
Trip Rating	120% FLA	
Trip Class	Type ED	10
	Type EE	10, 15, 20, 30
Reset Mode	Type ED	Manual
	Type EE	Automatic or Manual

Electromagnetic Compatibility

Electrostatic Discharge Immunity	Test Level	8 kV Air Discharge, 6 kV Contact Discharge
	Performance Level	1 ‡*
RF Immunity	Test Level	10 V/m
	Performance Level	1 ‡*
Electrical Fast Transient/Burst Immunity	Test Level	4 kV
	Performance Level	1 ‡*
Surge Immunity	Test Level	2 kV (L-E), 1 kV (L-L)
	Performance Level	1 ‡*

‡ Performance Criteria 1 requires the device under test (DUT) to experience no degradation or loss of performance.

* Environment 2.

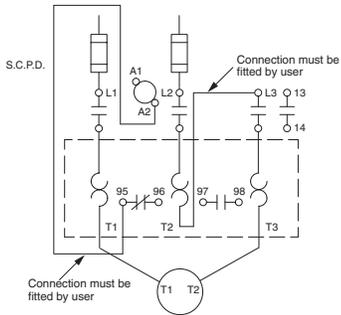
General

	Cat. No. 193-ED1_B, 193-EE_B	Cat. No. 193-EE_D	Cat. No. 193-EE_E
Standards	UL508, CSA C22.2 No. 14, NEMA ICS 2-1993 Part 4, EN 60947-4-1, EN 60947-5-1		
Certifications	CE, cULus, C-Tick, CCC		
Approximate Weights (unpackaged)	0.25 kg (0.55 lb)	0.25 kg (0.55 lb)	0.52 kg (1.06 lb)

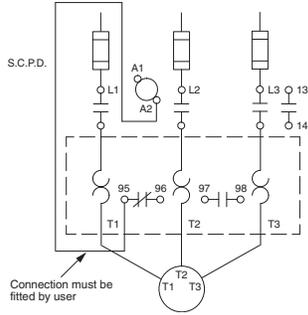
External Current Transformers (for use with cat. nos. 193-EE_Z)

The user shall provide one current transformer (CT) for each motor phase, and shall connect the CT's secondary leads to the appropriate E1 Plus overload relay power terminals, as shown in current transformer's wiring diagrams. The CT shall have the appropriate ratio (refer to the product nameplate or product description). Additionally, the CT shall be selected to be capable of providing the required VA to the secondary load, which includes the E1 Plus overload relay burden at the rated secondary current and the wiring burden. Finally, the CT shall be rated for protective relaying to accommodate the high inrush currents associated with motor startup, and shall have an accuracy of $\pm 2\%$ over its normal operating range. Typical CT ratings include (Instrument Transformers, Inc. — Model #23 or equivalent):

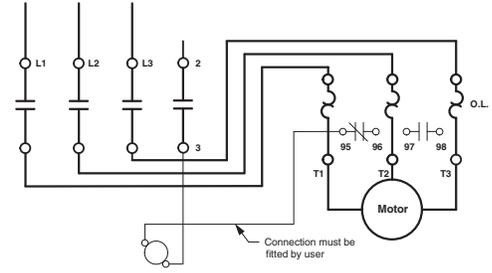
ANSI (USA)	Class C5B0.1
CSA (Canada)	Class 10L5
IEC (Europe)	5 VA Class 5P10



Typical Wiring for 1-Phase IEC Applications



Typical Wiring for 3-Phase IEC Applications

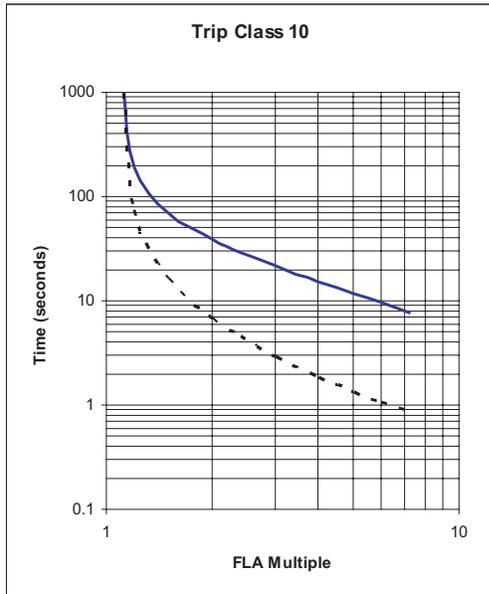


Typical Wiring for NEMA Applications

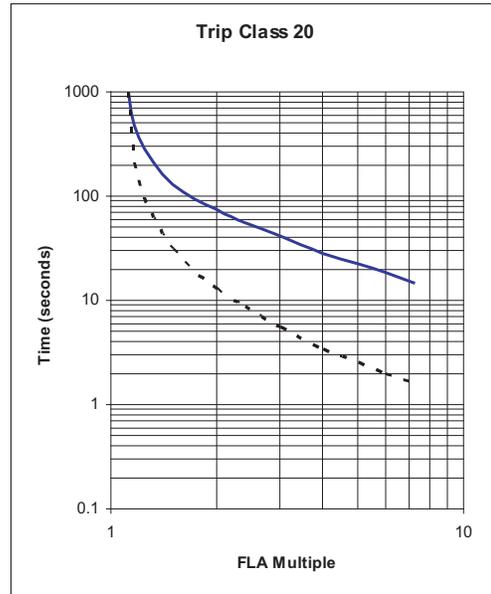
Trip Curves

Typical reset time for 193-EE devices set to automatic reset mode is 120 seconds.

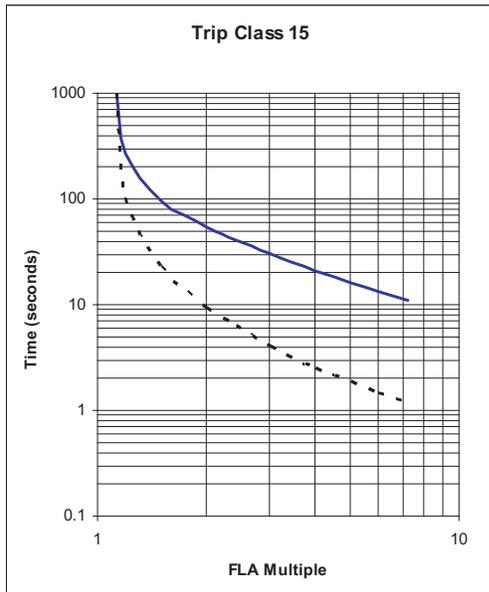
Trip Class 10



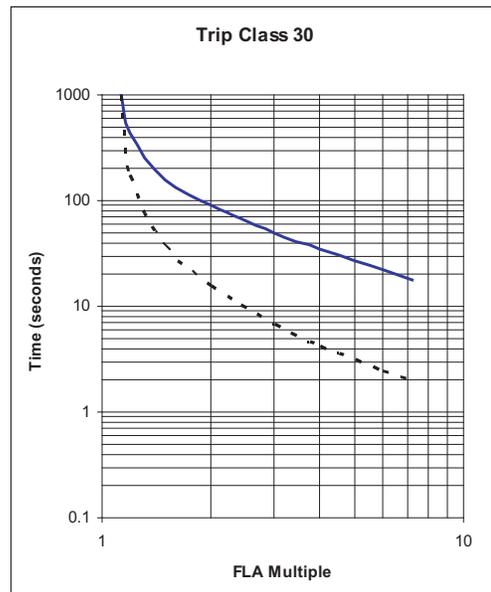
Trip Class 20



Trip Class 15



Trip Class 30



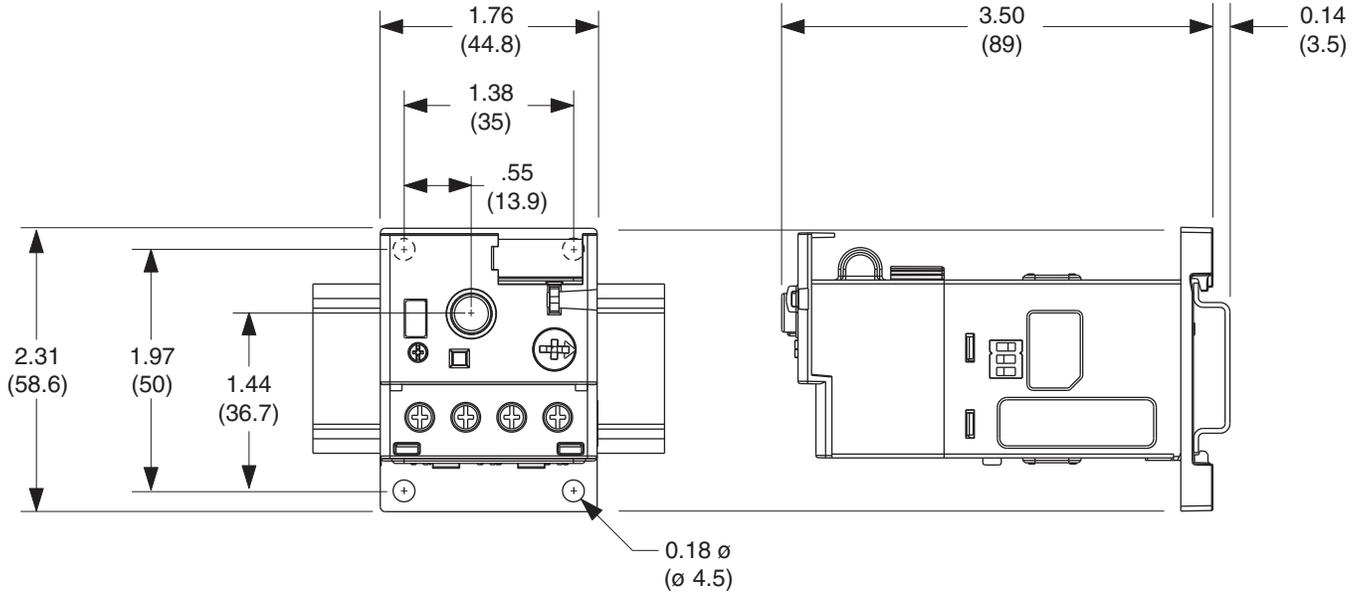
Trip Curve Legend: Cold Trip ———
 Hot Trip - - - - -

E1 Plus Electronic Overload Relays

Approximate Dimensions

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

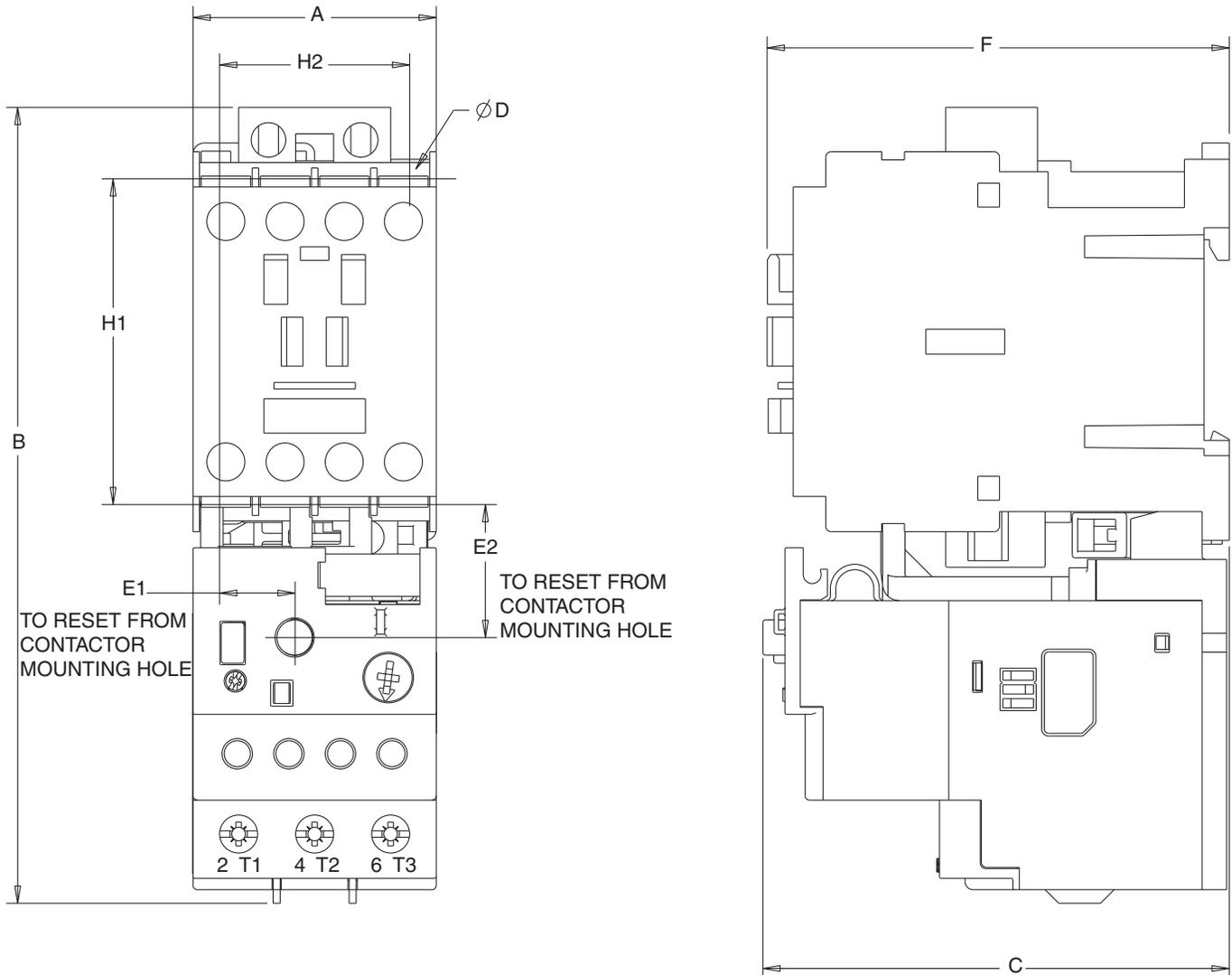
E1 Plus Pass-thru Style



2

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

Bulletin 100-C Contactor Mounted



Overload Cat. No.	Contactors Cat. No.	Width A	Height B	Depth C	D	E1	E2	F	H1	H2
193-ED_B 193-EE_B 193R-EE_B 193S-EE_B	100-C09, -C12, -C16, -C23	45 (1-25/32)	146.6 (5-25/32)	85.2 (3-23/64)	4.5 (3/16)	13.9 (35/64)	24.5 (31/32)	86.5 (3-13/32)	60 (2-23/64)	35 (1-3/8)
193-EE_D 193R-EE_D 193S-EE_D	100-C30, -C37	45 (1-25/32)	146.6 (5-25/32)	101.2 (3-63/64)	4.5 (3/16)	13.9 (35/64)	24.5 (31/32)	104 (4-3/32)	60 (2-23/64)	35 (1-3/8)
193-EE_D 193R-EE_D 193S-EE_D	100-C43	54 (2-1/8)	146.6 (5-25/32)	101.2 (3-63/64)	4.5 (3/16)	18.9 (3/4)	24.5 (31/32)	104 (4-3/32)	60 (2-23/64)	45 (1-25/32)
193-EE_E 193R-EE_E 193S-EE_E	100-C60, -C72, -C85	72 (2-53/64)	192.3 (7-37/64)	120.4 (4-3/4)	5.4 (7/32)	23.8 (15/16)	29 (1-9/64)	125.5 (4-15/16)	100 (3-15/16)	55 (2-11/64)

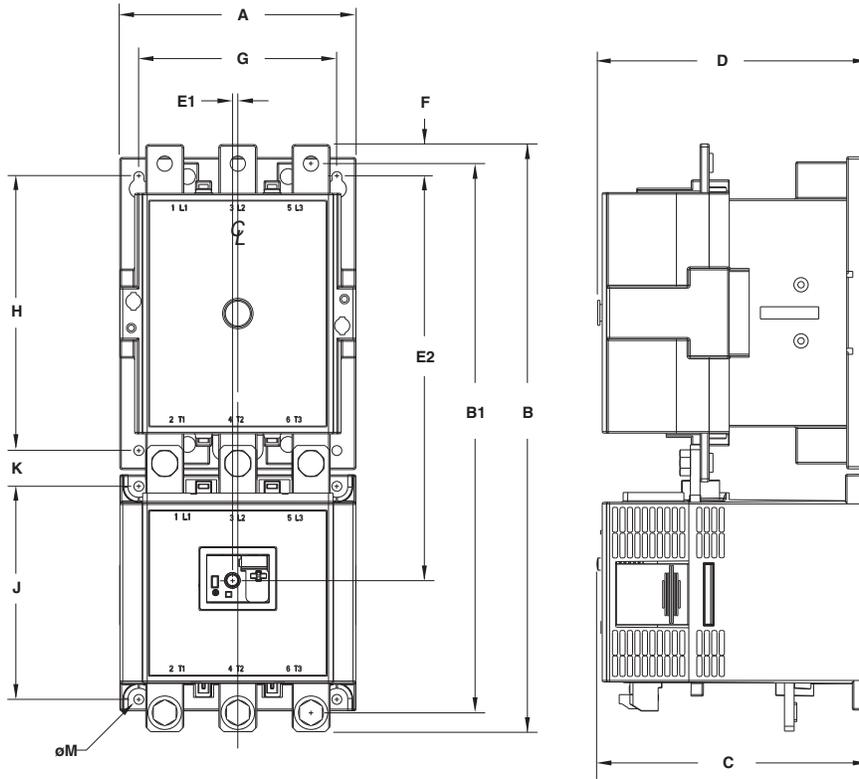
E1 Plus Electronic Overload Relays

Approximate Dimensions

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

Bulletin 100-D Contactor Mounted

2



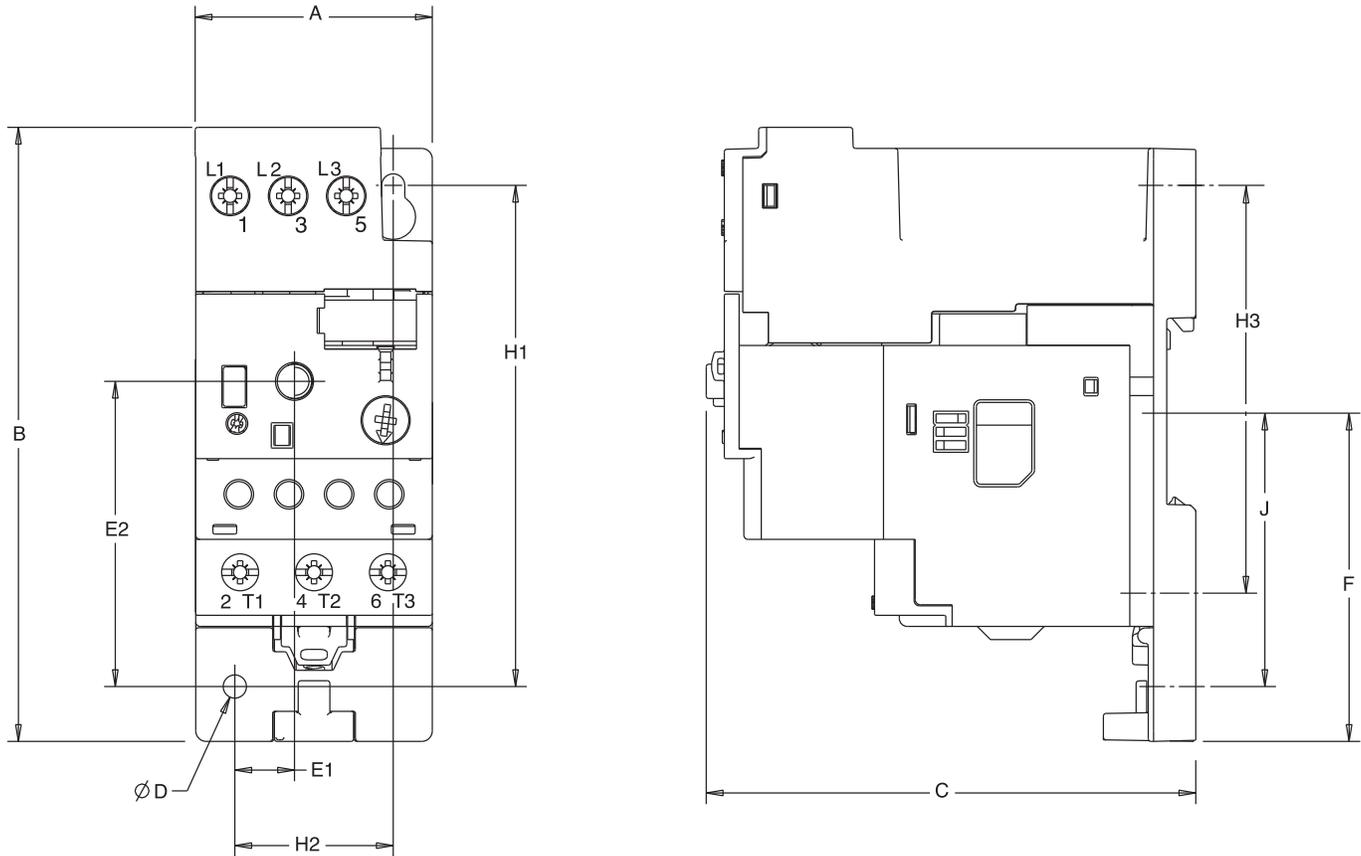
Overload Cat. No.	Contactor Cat. No.	Width A	Height B		Height B1	Depth C		E1	E2
			Without Terminal Covers	With Terminal Covers		(Reset)	D		
193-EE_F	100-D95, -D110	120 (4.72)	336.3 (13.24)	418 (16.46)	311.8 (12.27)	152.7 (6.01)	156 (6.14)	3.6 (0.14)	226.3 (8.91)
193-EE_F	100-D140, -D180	120 (4.72)	339.8 (13.38)	418 (16.46)	317.8 (12.51)	152.7 (6.01)	156 (6.14)	3.6 (0.14)	226.3 (8.91)
193-EE_G	100-D210, -D250, -D300, -D420	155 (6.10)	385.8 (15.19)	487.4 (19.19)	360.8 (14.2)	176.5 (6.95)	180 (7.09)	3.6 (0.14)	265.2 (10.44)
193-EE_H	100-D630, -D860	255 (10.04)	552 (21.73)	915 (36.02)	508 (20)	269.3 (10.6)	270.7 (10.66)	3.6 (0.14)	384.1 (15.12)

Overload Cat. No.	Contactor Cat. No.	F	G	H	J	K	øM
193-EE_F	100-D95, -D110	45 (1-25/32)	100 (3.94)	145 (5.71)	135 (5.31)	22.3 (0.88)	8 - 5.6 (8 - 0.22)
193-EE_F	100-D140, -D180	45 (1-25/32)	100 (3.94)	145 (5.71)	135 (5.31)	22.3 (0.88)	8 - 5.6 (8 - 0.22)
193-EE_G	100-D210, -D250, -D300, -D420	54 (2-1/8)	130 (5.12)	180 (7.09)	140 (5.51)	23.5 (0.93)	8 - 6.5 (8 - 0.26)
193-EE_H	100-D630, -D860	52.5 (2.07)	226 (8.90)	230 (9.06)	108 (4.25)	109 (4.29)	8 - 13 (8 - 0.51)



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

Panel Adapter Mounted



Panel Adapter Cat. No.	Overload Cat. No.	Width A	Height B	Depth C	D	E1	E2	F	H1	H2	H3	J
193-EPB	193-ED_B 193-EE_B 193R-EE_B 193S-EE_B	45 (1-25/32)	116.5 (4-19/16)	92.7 (3-21/32)	4.4 (11/64)	11.4 (0.45)	57.9 (2-9/32)	62.5 (2-15/32)	95 (3-3/4)	30 (1-3/16)	75 (2-31/32)	52.1 (2-3/64)
193-EPD	193-EE_D 193R-EE_D 193S-EE_D	45 (1-25/32)	112.4 (4-7/16)	108.7 (4-9/32)	4.4 (11/64)	11.4 (0.45)	57.9 (2-9/32)	62.5 (2-15/32)	95 (3-3/4)	30 (1-3/16)	75 (2-31/32)	52.1 (2-3/64)
193-EPE	193-EE_E 193R-EE_E 193S-EE_E	72 (2-53/64)	107.4 (4-15/64)	127 (5/32)	5.5 (5/32)	26.4 (1-1/32)	54.5 (2-9/64)	48.3 (1-29/32)	90 (3-23/64)	60 (2-23/64)	—	43.3 (1-45/64)

DIN Rail / Panel Adapter - Terminal Cross Sections

		Cat. No. 193-EPB *	Cat. No. 193-EPD *	Cat. No. 193-EPE
Flexible-Stranded with Ferrule	Single Conductor	1.0...4.0 mm ²	2.5...16 mm ²	4.0...35 mm ²
	Torque	1.8 N•m	2.3 N•m	4.0 N•m
	Two Conductor	1.0...4.0 mm ²	2.5...10 mm ²	4.0...25 mm ²
	Torque	1.8 N•m	2.3 N•m	4.0 N•m
Coarse-Stranded/Solid	Single Conductor	1.5...6.0 mm ²	2.5...25 mm ²	4.0...50 mm ²
	Torque	1.8 N•m	2.3 N•m	4.0 N•m
	Two Conductor	1.5...6.0 mm ²	2.5...16 mm ²	4.0...35 mm ²
	Torque	1.8 N•m	2.3 N•m	4.0 N•m
Stranded/Solid	Single Conductor	14...8 AWG	16...6 AWG	12...1 AWG
	Torque	16 lb•in	20 lb•in	35 lb•in
	Two Conductor	14...10 AWG	16...6 AWG	12...2 AWG
	Torque	16 lb•in	20 lb•in	35 lb•in

* For multiple conductor applications, the same size and style wire must be used.



Bul. 193/592-EC1 Overload Relays:

- 0.4...5000 A current range
- DeviceNet™ ready (ODVA Conformance Tested)
- LED indicators
- 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 five trips and warnings)
- Node address switches (series B)

Bul. 193/592-EC2/EC3 Overload Relays:

- Features of Bul. 193/592-EC1
- Integrated I/O (4 In/2 Out)
- EC2: Low-level (1...5 A) internal ground fault protection
- EC3: High-level (20 mA...5 A) external ground fault protection
- PTC thermistor monitoring
- DeviceLogix™ component technology (series B)
- Two-speed motor protection (series B)

Bul. 193-EC4 Current Monitor Relay:

- Current monitoring for three independent channels

Bul. 193/592-EC5 Overload Relays with Voltage Monitoring:

- Features of Bul. 193/592-EC3
- Integrated I/O (6 In/2 Out)
- High-level (20 mA...5 A) external ground fault protection
- DeviceLogix™ component technology
- Two-speed motor protection
- Voltage protection, including:
 - Undervoltage
 - Overvoltage
 - Phase failure
 - Voltage unbalance
 - Phase rotation mismatch
 - Frequency
- Power protection and energy metering, including:
 - Real power (kW)
 - Reactive power (kVAR)
 - Apparent power (kVA)
 - Power factor (PF)
 - Real energy (kWh)
 - Reactive energy (kVARh)
 - Apparent energy (kVAh)
 - kW demand

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Standards Compliance

EN 60947-4-1
 CSA C22.2 No. 14
 UL 508, UL1053 (class 1)

Certifications

ABS
 CE
 cULus Listed (File No. E14840, Guide NKCR, NKCR7; File No. E53935, Guide KDAX)
 C-tick
 CCC

NOTE: Your order must include 1) the Cat. No. of overload relay selected, and 2) if required, Cat. No. of any accessories.

Product Overview

The E3 Overload Relay is available in two configurations: the E3 and E3 Plus. The following table illustrates the functional differences between the two configurations.

Feature	E3	EC Plus			
	193/592-EC1	193/592-EC2	193/592-EC3	193-EC4	193/592-EC5
Inputs*	2	4	4	4	6
Outputs	1	2	2	2	2
PTC Thermistor Input		✓	✓		
Ground Fault Protection		Internal 1...5 A	External 20 mA... 5 A‡	External 20 mA... 5 A‡	External 20 mA... 5 A‡
DeviceLogix		✓	✓	✓	✓
Heat Trace				✓	
Voltage Monitoring					✓

* Inputs are rated 24V DC.

‡ Requires the use of an external ground fault sensor, Cat. No. 193-CBCT_.

Thermal Overload

Thermal Utilization

The E3 Overload Relay provides overload protection through true RMS current measurement of the individual phase currents of the connected motor. Based on this information, a thermal model that simulates the actual heating of the motor is calculated. Percent of thermal capacity utilization (%TCU) reports this calculated value and can be read via the DeviceNet network. An overload trip occurs when the value reaches 100%.

Adjustable Settings

Thermal overload protection setup is accomplished simply by programming the motor's full load current (FLC) rating and the desired trip class (5...30). Programming of the actual values through software programming ensures the accuracy of the protection.

Thermal Memory

The E3 Overload Relay includes a thermal memory circuit designed to approximate the thermal decay for a trip class 30 setting. This means that the thermal model of the connected motor is maintained at all times, even if the supply power is removed.

Time to Trip

During an overload condition, the E3 Overload Relay provides an estimated time to trip that is accessible via the DeviceNet network. This allows corrective action to be taken so that production may continue uninterrupted.

Time to Reset

Following an overload trip, the E3 Overload Relay will not reset until the calculated percentage of thermal capacity utilization falls below the reset level. As this value decays, the time to reset, which is accessible via the DeviceNet network, is reported.



Thermal Warning

The E3 Overload Relay provides the capability to alert in the event of an impending overload trip. A thermal warning bit is set in the Warning Status when the calculated percentage of thermal capacity utilization exceeds the programmed thermal warning level, which has a setting range of 0...100% TCU.

Two-Speed Protection

The E3 Plus Overload Relay offers a second FLA setting for 2-speed motor protection. What used to require two separate overload relays - one for each set of motor windings - can now be accomplished with one device. Improved protection is delivered as thermal utilization is maintained in one device during operation in both speeds.

Phase Loss

The E3 Overload Relay offers configurable phase loss protection in allowing the installer to enable or disable the function plus set a time delay setting, adjustable from 0.1...25.0 seconds. The trip level is factory-set at a current imbalance measurement of 100%.

Ground (Earth) Fault

The E3 Plus Overload Relay incorporates zero sequence (core balance) sensing into its design through the 90 A rating for low level (arcing) ground fault detection. Trip and warning settings are adjustable from 20 mA...5.0 A. For devices rated greater than 90 A and for ground fault detection less than 1.0 A, the external core balance current transformer accessory is required. Class I protection is provided as defined by UL1053. Series B or later devices provide a trip-inhibit setting, offering flexibility to prevent tripping when the ground fault current magnitude exceeds 10 A. This can be useful to guard against the opening of the controller when the fault current could potentially exceed the controller's interrupting capacity rating.

Note: The E3 Plus Overload Relay is **not** a Ground Fault Circuit Interrupter for personnel protection as defined in article 100 of the U.S. National Electric Code.

Stall

Stall is defined as a condition where the motor is not able to reach full-speed operation in the appropriate amount of time required by the application. This can result in motor overheating as current draw is in excess of the motor's full load current rating.

The E3 Overload Relay provides user-adjustable stall protection. The trip setting has a range of 100...600% FLA, and the enable time is adjustable up to 250 seconds.

Jam (Overcurrent)

The E3 Overload Relay can respond quickly to take a motor off-line in the event of a mechanical jam, thereby reducing the potential for damage to the motor and the power transmission components. Trip adjustments include a trip setting adjustable from 50...600% FLA and a trip delay time with a range of 0.1...25.0 seconds. A separate warning setting is adjustable from 50...600% FLA.

Underload (Undercurrent)

A sudden drop in motor current can signal conditions such as

- Pump cavitation
- Tool breakage
- Belt breakage

For these instances, rapid fault detection can help minimize damage and aid in reducing production downtime.

Additionally, monitoring for an underload event can provide enhanced protection for motors that are coded by the medium handled (e.g., submersible pumps that pump water). Such motors can become overheated despite being underloaded. This can result from an absence or an insufficient amount of the medium (due to clogged filters, closed valves, etc.).

The E3 Overload Relay offers underload trip and warning settings adjustable from 10...100% FLA. The trip function also includes a trip delay time with a range of 0.1...25.0 seconds.

Over-temperature Protection

The E3 Plus Overload Relay provides motor over-temperature protection with the added provisions for terminating and monitoring of stator winding-embedded positive temperature coefficient (PTC) thermistors. PTC thermistors are semiconductors that exhibit a large increase in resistance when the rated response temperature is exceeded. When the monitored PTC thermistor resistance exceeds the response level of the E3 Plus Overload Relay (3400 Ω), it can be set to trip immediately or programmed to set the PTC bit of the Warning Status word.

Current Imbalance (Asymmetry)

The E3 Plus Overload Relay offers current imbalance trip and warning settings adjustable from 10...100%. The trip function also includes a trip delay time with a range of 0.1...25.0 seconds.

Remote Trip

The remote trip function allows an external device such as a vibration sensor to induce the E3 Overload Relay to trip. External device relay contacts are wired to the E3 Overload Relay discrete inputs. The discrete inputs are configurable with an option for assigning the remote trip function.

Current Monitoring Functions

The E3 Overload Relay allows the user to monitor the following operational data over the DeviceNet network:

- Individual phase currents (in amperes)
- Individual phase currents (as a percentage of motor full load current)
- Average current (in amperes)
- Average current (as a percentage of motor full load current)
- Percentage of thermal capacity utilized
- Current imbalance percentage
- Ground fault current (E3 Plus)

Diagnostic Functions

The E3 Overload Relay allows the user to monitor the following diagnostic information over the DeviceNet network:

- Device status
- Trip status
- Warning status
- Time to an overload trip
- Time to reset after an overload trip
- History of past five trips
- History of positive warnings
- Hours of operation
- Number of starts
- Trip snapshot

Status Indicators

The E3 Overload Relay provides the following LED indicators:

- **Network Status** — This green/red LED indicates the status of the network connection.
- **TRIP/WARN** — This LED flashes an amber code under a warning condition and a red code when tripped.
- **OUT A & B** — These amber LEDs illuminate when the output contacts are commanded closed.
- **IN 1 - 4** — These amber LEDs illuminate when the user-connected device contact is closed.:
Note: IN3 and 4 and OUT B are available only on the E3 Plus Overload Relay.

Inputs/Outputs

Inputs allow the connection of such devices as contactor and disconnect auxiliary contacts, pilot devices, limit switches, and float switches. Input status can be monitored via the network and mapped to a controller's input image table. Inputs are rated 24V DC and are current sinking. Power for the inputs is sourced from the DeviceNet network connection with convenient customer terminations at control terminals 5 and 6. Relay contact outputs can be controlled via the network or DeviceLogix function blocks for performing such tasks as contactor operation.

E3 and E3 Plus Electronic Overload Relays

Product Overview

Test/Reset Button

The Test/Reset button, located on the front of the E3 Overload Relay, allows the user to perform the following:

- **Test** — The trip relay contact will open if the E3 Overload Relay is in an untripped condition and the Test/Reset button is pressed for 2 seconds or longer.
- **Reset** — The trip relay contact will close if the E3 Overload Relay is in a tripped condition, supply voltage is present, and the Test/Reset button is pressed.

Single/Three-Phase Operation

The E3 Overload Relay can be applied to three-phase as well as single-phase applications. A programming parameter is provided for selection between single- and three-phase operation. Straight-through wiring is afforded in both cases.

DeviceNet Communications

The E3 Overload Relay is a Group 2 “slave only” device and supports the following:

- Unconnected Message Manager (UCMM) messages
- Polled I/O messaging
- Change-of-state/cyclic messaging
- Explicit messaging
- Group 4 — Off-line node recovery messaging
- Full parameter object support
- Auto-baud network rate identification
- Configuration consistency value

For more information on operation and maintenance of this product, please reference the user manual, publication 193-UM002*.

DeviceLogix

The E3 Plus offers increased control flexibility with DeviceLogix capabilities. Using RSNetWorx for DeviceNet (version 3.0 or later), function block programs can be configured and saved to an E3 Plus Overload Relay to operate single logic routines. The function blocks are programmed using standard Boolean operators (e.g., AND, OR, XOR, and NOT) and plus timers, counters, and latches. In addition to allowing the use of the integral discrete inputs, protection functions can also be used as inputs to trigger outputs. For example, the Ground Fault Protection function could be used to control Output A of the E3 Plus Overload Relay for operation of a circuit breaker short-trip mechanism.

AC Input Interface Module Accessory

The AC Input Interface Module conveniently allows the E3 Overload Relay to be retrofitted or applied in new applications that require 110/120V AC control circuitry. This new accessory simply plugs into the E3 Overload Relay's existing input terminals, optimizing panel space utilization. The module accepts termination of up to four external devices, making it compatible with the E3 and E3 Plus versions of the E3 overload relay. Optical isolation is provided between the AC input wiring and the internal 24V circuitry of the E3.

Voltage Protection (model EC5 only)

The E3 Plus model EC5 will provide the user with enhanced current-based motor protection just like the E3 Plus model, EC3, with the addition of voltage protection. With this product, users can protect against voltage issues e.g., undervoltage, voltage unbalance, phase loss, frequency, and phase rotation) before the contactor coil is energized.

Power Protection (model EC5 only)

While the motor is powering a load, the E3 Plus model, EC5, will also protect the motor based on power. This product will monitor and protect for excessive real power (kW), reactive power (kVAR), apparent power (kVA), and power factor for a specific application (e.g., pump applications).

Motor Energy Consumption (model EC5 only)

The E3 Plus model, EC5, can be included in a company's energy management system. This product will provide voltage, current, power (kW, kVAR, and kVA), energy (kWh, kVARh, kVAh, kW Demand, kVAR Demand, and kVA Demand), and power quality (power factor, frequency, and phase rotation) information down at the motor level.

DeviceNet™ Configuration Terminal (for use with E1 Plus overload relays, E3 and E3 Plus overload relays, ArmorStart® distributed motor controllers, and Bulletin 825-P modular protection systems)

The DeviceNet Configuration Terminal (**Cat. No. 193-DNCT**) is a handheld device that can be used to commission, configure, program, and monitor devices on your DeviceNet network. The 193-DNCT allows you to increase productivity and ease troubleshooting with easy access to information and diagnostics of your system. The 193-DNCT can be used with any DeviceNet devices and has DeviceLogix, metering, graphing, and auto-display capabilities. These capabilities can help ease troubleshooting by commissioning devices online through your network.

Network Who

- Terminal searches for all devices on the network and provides device address, device name, and status of a device.

CopyCat™

- Used to upload, store, and download device configurations and DeviceLogix™ programs for DeviceNet devices via your network
- User can easily replace and reconfigure scan lists of DeviceNet scanners (minus the Automatic Device Replacement configuration)
- Parameters can be accessed as either groups or as a numbered list of all parameters, and can be monitored and edited

Diagnostics

- Simplifies troubleshooting
- Can present DeviceNet diagnostics, network utilization, and make network statistics available to include baud rate, bus voltage, percentage of bus loading, and CAN errors

DeviceLogix

- Terminal allows the user to enable, monitor, edit, or delete DeviceLogix programs.

Parameter Monitoring and Editing

- If the selected device supports the full parameter object, parameters can be accessed as either groups or as a numbered list of all parameters
- Parameter screen displays all information for a single parameter
- Values can be monitored, edited, or copied from the parameter screen

EtherNet/IP Communication Auxiliary (for use with E3 and E3 Plus overload relays and Bulletin 825-P modular protection systems)

The EtherNet/IP Communications Auxiliary (**Cat. Nos. 193-DNENCAT and -DNCATR**) allows users of DeviceNet-based intelligent electronic overload relays to seamlessly communicate on an EtherNet/IP network without the need for using RSNetWorx for DeviceNet for network configuration. The communication auxiliary acts as a linking device to pass through EtherNet-based CIP explicit and I/O messages to the DeviceNet-based devices. Upon a configuration request, the communication auxiliary polls the DeviceNet network for the first 6 devices. For devices that support the full parameter object, parameters will be made available through an internal Web page for the user to view real-time information and configure each device when the user has the appropriate security privileges.

- Users will be able to view and configure parameters using a text file via the internal web page
- Allows users to read information into the programmable logic or automation controller
- Allows users to use RSLinx Classic or RSLinx Enterprise to serve device Parameters via Microsoft OPC (OLE, Object Linked Element, for Process Control) to SCADA systems and/or historical data collection systems such as FactoryTalk View, FactoryTalk Historian, and RSEnergyMetrix
- Option to allow users to connect to a DLR (Device Level Ring) network topology
 - allows the network to choose another physical communication path in the event that the physical link between two EtherNet devices is broken.
- ADR (Automatic Device Replacement) capabilities
 - the ADR recognizes when one of the six DeviceNet-based devices has been replaced with a new device, and it will automatically download the previous configuration parameters and node address to the new replacement device

E3 and E3 Plus Electronic Overload Relays

Catalog Number Explanation/Product Selection

Catalog Number Explanation

193 – EC1 B B
a *b* *c*

2

Type	
Code	Description
EC1	E3
EC2	E3 Plus with internal ground fault sensor
EC3	E3 Plus with external ground fault sensor
EC4	E3 Plus current monitor relay with external ground fault sensor
EC5➤	E3 Plus with voltage monitoring

Adjustment Rating [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
G	42...210
H	60...302
J	84...420
K	125...630
L	172...860
Z	9...5000

Bulletin 100 Contactor Size	
Code	Description
B	C09...C23
D	C30...C43
E	C60...C85
F	D95...D180
G	D210...D420
H	D630...D860
Z	Panel mount*

* Only available for Cat. Nos. 193-EC1ZZ, 193-EC3ZZ, and 193-EC4ZZ. For all other cat. nos., order Cat. No. 193-ECPM_ separately.
➤ Voltage input module and ribbon cable are included with Cat. No. 193-EC5.

Product Selection

Direct Contactor Mount

Bulletin 193-EC1 Electronic Motor Protection Relays

- 2 inputs
- 1 output

Mounts to Contactor	Adjustment Range [A]	Cat. No.
100-C09...100-C23	0.4...2	193-EC1PB
	1...5	193-EC1AB
	3...15	193-EC1BB
	5...25	193-EC1CB
100-C30...100-C43	1...5	193-EC1AD
	3...15	193-EC1BD
	5...25	193-EC1CD
	9...45	193-EC1DD
100-C60...100-C97	9...45	193-EC1DE
	18...90	193-EC1EE
100-D105...100-D180	28...140	* 193-EC1FF
	42...210	* 193-EC1GF
100-D210...100-D420	42...210	* 193-EC1GG
	60...302	* 193-EC1HG
	84...420	* 193-EC1JG
100-D630...100-D860	125...630	* 193-EC1KH
	172...860	* 193-EC1LH

* Does not include terminal lugs. See Accessories, page 2-228.

Bulletin 193-EC2 Electronic Motor Protection Relay

- 4 Inputs
- 2 Outputs
- PTC thermistor input
- DeviceLogix (series B and higher)
- Internal ground fault sensor

Mounts to Contactor	Adjustment Range [A]	Cat. No.
100-C09...100-C23	0.4...2	193-EC2PB
	1...5	193-EC2AB
	3...15	193-EC2BB
	5...25	193-EC2CB
100-C30...100-C43	1...5	193-EC2AD
	3...15	193-EC2BD
	5...25	193-EC2CD
	9...45	193-EC2DD
100-C60...100-C85	9...45	193-EC2DE
	18...90	193-EC2EE

Bulletin 193-EC3 Electronic Motor Protection Relay

- 4 inputs
- 2 outputs
- PTC thermistor input
- DeviceLogix (series B)
- External ground fault sensor input

Mounts to Contactor	Adjustment Range [A]	Cat. No.
100-C09...100-C23	0.4...2.0	193-EC3PB
	1...5	193-EC3AB
	3...15	193-EC3BB
100-C30...100-C43	5...25	193-EC3CB
	1...5	193-EC3AD
	3...15	193-EC3BD
100-C60...100-C97	5...25	193-EC3CD
	9...45	193-EC3DD
	9...45	193-EC3DE
100-D105...100-D180	18...90	193-EC3EE
	28...140	* 193-EC3FF
100-D210...100-D420	42...210	* 193-EC3GF
	42...210	* 193-EC3GG
100-D630...100-D860	60...302	* 193-EC3HG
	84...420	* 193-EC3JG
100-D630...100-D860	125...630	* 193-EC3KH
	172...860	* 193-EC3LH

* Does not include terminal lugs. See Accessories, page 2-228.

Bulletin 193-EC5 Voltage Monitor Relay*



- 6 inputs
- Voltage monitoring capabilities
- External ground fault sensor input
- 2 outputs
- DeviceLogix

Mounts to Contactor	Adjustment Range [A]	Cat. No.
100-C09...100-C23	0.4...2.0	193-EC5PB
	1...5	193-EC5AB
	3...15	193-EC5BB
	5...25	193-EC5CB
100-C30...100-C43	5...25	193-EC5CD
	9...45	193-EC5DD
100-C60...100-C85	9...45	193-EC5DE
	18...90	193-EC5EE
	28...140	193-EC5FF
100-D95...100-D180	42...210	193-EC5GF
	42...210	193-EC5GG
100-D210...100-D420	60...302	193-EC5HG
	84...420	193-EC5JG
100-D630...100-D860	125...630	193-EC5KH
	172...860	193-EC5LH

* Does not include terminal lugs. See Accessories, page 2-228.

Panel Mount Devices

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 • Ground Fault Sensor Input • PTC Thermistor Input • DeviceLogix 	9...5000	193-EC3ZZ
<ul style="list-style-type: none"> • 4 Inputs • 2 Outputs • Ground Fault Sensor Input • DeviceLogix 		193-EC4ZZ
<ul style="list-style-type: none"> • 6 Inputs • 2 Outputs • Ground Fault Sensor Input • Voltage Monitor Input • DeviceLogix 	9...5000	193-EC5ZZ

§ Current transformers supplied by customer. Refer to Bulletin 1411 Current Transformers and the CT Ratio to FLA chart below for proper current transformer selection.

Bulletin 193-EC4 Current Monitor Relay*

- 4 inputs
- External ground fault sensor input
- 2 outputs
- DeviceLogix

Mounts to Contactor	Adjustment Range [A]	Cat. No.
100-C09...100-C23	0.4...2.0	193-EC4PB
	1...5	193-EC4AB
	3...15	193-EC4BB
	5...25	193-EC4CB
100-C30...100-C43	9...45	193-EC4DD
100-C60...100-C97	18...90	193-EC4EE

* Does not include terminal lugs. See Accessories, page 2-228.

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	—	—

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

Add-on Accessories

	Description	For Use With	Pkg. Qty.	Cat. No.
	DIN Rail/Panel Adapter ✦	193-EC__B	1	193-ECPM1
		193-EC_D, 193-EC_ZZ		193-ECPM2
		193-EC__E		193-ECPM3
	AC Input Interface Module rated 110/120V AC, 50/60 Hz	193-EC — all 592-EC — all	1	193-EIMD
	Core Balanced Ground Fault Sensor <ul style="list-style-type: none"> Required when using either an E1 Plus Ground Fault Protection or Ground Fault/Jam Module Required for ground fault protection with the Cat. No. 193-EC3 overload relay 	100-C09...100-C37 NEMA size 00...2	1	193-CBCT1
		100-C09...100-C97 NEMA size 00...3		193-CBCT2
		100-C09...100-C97, 100-D105...100-D180 NEMA size 00...4		193-CBCT3
		100-C09...100-C97, 100-D105...100-D420 NEMA size 00...5		193-CBCT4
	DeviceNet Configuration Terminal Used to interface with objects on a DeviceNet network. Includes 1 m communications cable (193-CB1).	193-EDN, 193-EC (all), 592-EC (all); 280/281/283/284 ArmorStart, 825-P	1	193-DNCT
	1 meter communication cable, color-coded bare leads	193-DNCT	1	193-CB1
	1 meter communication cable, microconnector (male)	193-DNCT	1	193-CM1
	Panel Mount Adapter/Door Mount Bezel Kit	193-DNCT	1	193-DNCT-BZ1
	EtherNet/IP Communications Auxiliary DeviceNet to EtherNet/IP linking device	Single port	1	193-DNENCAT
		Dual port	193-EC_C (all), 592-EC_C (all)	1
	E3 Replacement Relay	193-EC1_F, 193-EC1_G, 193-EC1_H, 592-EC1_E, 592-EC1_F, 592-EC1_G	1	193-NREC1ZZ
	E3 Plus Model EC3 Replacement Relay	193-EC3_F, 193-EC3_G, 193-EC3_H, 592-EC3_E, 592-EC3_F, 592-EC3_G	1	193-NREC3ZZ
	E3 Plus Model EC5 Replacement Relay	193-EC5_F, 193-EC5_G, 193-EC5_H, 592-EC5_E, 592-EC5_F, 592-EC5_G	1	193-NREC5ZZ
	E3 Plus Replacement Voltage Input Module	193-EC5_, 592-EC5_	1	193-NVEC5VIM
	E3 Plus Replacement Cable and Connectors	193-EC_ all, 592-EC_ all	1	193-NCEC5CNT

✦ The electronic motor protection relay can be mounted separately to top-hat rail EN 50 022-35.



E3 and E3 Plus Electronic Overload Relays

Accessories

	Description	For Use With	Pkg. Qty.	Cat. No.
	Terminal Lugs • Set of two • Protection class IP2X per IEC 60529 and DIN 40 050	100-D140, 100-D180, 100-D115E...D180E, 193-EC_F, 193-EE_F	2	100-DTB180
		100-D210...100-D420, 193-EC_G, 193-EF2C, 193-EE_G		100-DTB420
	Terminal Lugs (UL/CSA), Copper Frame Set of three	100-D115, 100-D110	3	100-DL110
		100-D140, 100-D180, 193-EC_F, 193-EE_F		100-DL180
		100-D210...100-D420, 193-EC_G, 193-EE_G		100-DL420
		100-D630, 100-D860, 193-EC_H, 193-EE_H		100-DL630
		100-D630, 100-D860, 193-EC_H, 193-EE_H		100-DL860
	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	100-D115...100-D180, 193-EC_F, 193-EE_F	1	100-DTC180
		100-D210...100-D420, 193-EC_G, 193-EE_G		100-DTC420
		100-D630...100-D860, 193-EC_H, 193-EE_H		100-DTC860
	Phase Barriers Set of 4	100-D630...D860, 193-EC_H, 193-EE_H	4	100-DPB860

2

Marking Systems

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

	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 1492 W	100	100-FMA2

* Must be ordered in multiples of package quantities.

Main Circuits

	Cat. No. 193-EC_B, 193-EC_D, 193-EC_Z, 592-EC_T, 592-EC_C	Cat. No. 193-EC_E, 592-EC_D	Cat. No. 193-EC_F	Cat. No. 193-EC_G	Cat. No. 193-EC_H
Rated Insulation Voltage (U _i)	690V AC		1000V AC		
Rated Impulse Strength (U _{imp})	6 kV AC		6 kV AC		
Rated Operating Voltage (U _o) IEC/UL	690V AC/600V AC		1000V AC/600V AC		
Rated Frequency	20...250 Hz		50/60 Hz		
Terminal Cross-Sections					
Terminal Type	M5	M8			
Terminal Screws					
Flexible-Stranded with Ferrule Single Conductor Torque	2.5...16 mm ² 2.5 N•m	4...35 mm ² 4 N•m			
Flexible-Stranded with Ferrule Multiple Conductor Torque	6...10 mm ² 3.4 N•m	4...25 mm ² 4 N•m			
Coarse-Stranded/Solid Single Conductor Torque	2.5...25 mm ² 2.5 N•m	4...50 mm ² 4 N•m	—	—	—
Coarse-Stranded/Solid Multiple Conductor Torque	6...16 mm ² 3.4 N•m	4...35 mm ² 4 N•m			
Stranded/Solid— Single Conductor Torque	#14...6 AWG 22 lb•in	#12...1 AWG 35 lb•in			
Stranded/Solid Multiple Conductor Torque	#10...6 AWG 30 lb•in	#6...2 AWG 35 lb•in			
Pozidriv Screwdriver Size	2	—			
Slotted Screwdriver (mm)	1 x 6	—			
Hexagon Socket Size SW (mm)	—	4			

3-Pole Terminal Blocks

Cat. No. 100-DTB180	Cat. No. 100-DTB420
(A) 6...1/0 AWG, 16...50 mm ² B) 6 AWG...250 MCM, 16...120 mm ² 90...110 lb•in, 10...12 N•m	(2) 4 AWG...600 MCM, 25...240 mm ² 180...220 lb•in, 20...25 N•m

Terminal Lug Kits

Cat. No. 100-DL110	Cat. No. 100-DL180	Cat. No. 100-DL420	Cat. No. 100-DL630	Cat. No. 100-DL860
Lug: 6...2/0 AWG, 16...70 mm ² 90...110 lb•in, 10...12 N•m Terminal: 13/32 in, 10 mm 150 lb•in, 17 N•m	Lug: 6 AWG...250 MCM, 16...120 mm ² 90...110 lb•in, 10...12 N•m Terminal: 1/2 in, 13 mm 275 lb•in, 16 N•m	Lug: 2 AWG...350 MCM, 375 lb•in, 42 N•m Terminal: 11/16 in, 17 mm 140 lb•in, 16 N•m	Lug: 2/0 AWG...500 MCM, 70...240 mm ² 400 lb•in, 45 N•m Terminal: 3/4 in, 19 mm 600 lb•in, 68 N•m	Lug: 2/0 AWG...500 MCM, 70...240 mm ² 400 lb•in, 45 N•m Terminal: 3/4 in, 19 mm 600 lb•in, 68 N•m

Maximum Heat Dissipation (Watts)

	Cat. No. 193-EC_B, 193-EC_D	Cat. No. 193-EC_E	Cat. No. 193-EC_F	Cat. No. 193-EC_G	Cat. No. 193-EC_H
E3	3.83	4.43	10.67	22.52	35.36
E3 Plus	4.53	5.13	11.37	23.22	36.06

UL Short-Circuit Ratings

Cat. No.	Maximum Available Fault Current [A]	Maximum Voltage [V]
193-EC_B, 592-EC_T	5 000	600
193-EC_D, 592-EC_C	5 000	600
193-EC_E, 592-EC_D	10 000	600
193-EC_F	10 000	600
193-EC_G	18 000	600
193-EC_H	42 000	600
193-EC_Z	5 000	600

IEC Short-Circuit Ratings

Cat. No.	Maximum Available High Fault Current [A]	Maximum Voltage [V]
193-EC_B, 592-EC_T	100,000	690
193-EC_D, 592-EC_C	100,000	690
193-EC_E, 592-EC_D	100,000	690
193-EC_F	100,000	1000
193-EC_G	100,000	1000
193-EC_H	100,000	1000
193-EC_Z	100,000	690

E3 and E3 Plus Electronic Overload Relays

Specifications

Control Circuits

Power Supply Ratings	
Rated Supply Voltage (U_s)	24V DC (supply via DeviceNet connection)
Operating Range	11...25V DC
Power Consumption	
E3	3.2 W
E3 Plus	3.9 W
Output Relay Ratings	
Type of Contacts	Form A SPDT-NO
Rated Insulation Voltage (U_i)	300V AC
Rated Operating Voltage (U_o)	250V AC
Rated Operating Current (I_o)	5 A
Minimum Operating Current	10 mA @ 5V DC
Switching Capacity	B300 AC-15
Resistive Load Rating (p.f. = 1.0)	5 A, 250V AC/5 A, 30V DC
Inductive Load Rating (p.f. = 0.4) (L/R = 7 ms)	2 A, 250V AC/2 A, 30V DC
Input Ratings	
Supply Voltage	24V DC \pm 10% (provided by E3)
Input Type	Current Sinking
Thermistor/PTC Input Ratings	
Type of Control Unit	Mark A
Max. No. of Sensors in Series	6
Max. Cold Resistance of PTC Sensor Chain	1500 Ω
Trip Resistance	3400 $\Omega \pm 150 \Omega$
Reset Resistance	1600 $\Omega \pm 100 \Omega$
Short-Circuit Trip Resistance	25 $\Omega \pm 10 \Omega$
Thermistor/PTC Input Ratings, Continued	
Max. Voltage @ PTC Terminals ($R_{PTC} = 4 \text{ k}\Omega$)	7.5V DC
Max. Voltage @ PTC Terminals ($R_{PTC} = \text{open}$)	30V DC
Response Time	500 ms
Sensor Characteristic	<p style="text-align: center;">Per IEC 34-11-2</p>

Control and DeviceNet Terminal Cross-Sections

Terminal Screws	M3
Flexible-Stranded with Ferrule – Single Conductor Torque	0.25...2.5 mm ² 0.55 N•m
Flexible-Stranded with Ferrule – Multiple Conductor Torque	0.5...0.75 mm ² 0.55 N•m
Coarse-Stranded/Solid-Single Conductor Torque	0.2...4.0 mm ² 0.55 N•m
Coarse-Stranded/Solid-Multiple Conductor Torque	0.2...1.5 mm ² 0.55 N•m
Stranded/Solid-Single Conductor Torque	24...12 AWG 5 lb•in
Stranded/Solid-Multiple Conductor Torque	24...16 AWG 5 lb•in
Slotted Screwdriver (mm)	0.6 x 3.5

Electromagnetic Compatibility Ratings

Electrostatic Discharge Immunity Test Level	8kV Air Discharge, 6kV Contact Discharge
Performance Criteria	A *
RF Immunity Test Level	10V/m
Performance Criteria	A *
Electrical Fast Transient/Burst Immunity Test Level	4kV (Power), 2kV (Control & Comm)
Performance Criteria	A *
Surge Immunity Test Level	2kV (L-E), 1kV (L-L)
Performance Criteria	A *
Radiated Emissions	Class A
Conducted Emissions	Class A

* Performance Criteria A requires the device under test (DUT) to experience no degradation or loss of performance.

E3 and E3 Plus Electronic Overload Relays

Specifications

Environmental Ratings

Ambient Temperature Storage Operating	-40...+85 °C (-40...+185 °F) -20...+55 °C (-4...+131 °F)
Humidity Operating Damp Heat – Steady- State (per IEC 68-2-3) Damp Heat – Cyclic (per IEC 68-2-30)	5...95% Non-condensing 92% r.h., 40 °C(104 °F), 56 days 93% r.h., 25 °C/40 °C(77 °F/104 °F), 21 cycles
Vibration (per IEC 68-2-6)	3 G
Shock (per IEC 68-2-27)	30 G
Pollution Environment	Degree 2
Degree of Protection 193-ECxxx 592-ECxxx	1P1X 1P0

Current Reporting Accuracy

Phase Currents: 100% min. FLA Setting Value ... 720% max. FLA Setting Value 50%...100% min FLA Setting Value	+/- 5% +/- 10%
Ground Current (0.5...9.0 A)	+/- 10%

General

	Cat. No. 193-EC_B, 193-EC_D, 193-EC_Z	Cat. No. 193-EC_E	Cat. No. 193-EC_F	Cat. No. 193-EC_G	Cat. No. 193-EC_H
Approximate Weights	0.80 kg (1.77 lb)	1.23 kg (2.71 lb)	2.95 kg (6.5 lb)	4.43 kg (9.75 lb)	8.63 kg (19.0 lb)
Standards	CSA C22.2 No.14, DIN VDE 0660, EN 60 947, UL 508, UL 1053				
Certifications	CE, C-tick, cUL, CCC (pending)				

Protection and Warning Summary

Protective Function	Trip Enable	Warning Enable	Trip Level Settings		Trip Delay Settings		Warning Level Settings		Inhibit Time Settings*	
	Factory Default	Factory Default	Range	Default	Range [s]	Default [s]	Range	Default	Range [s]	Default [s]
Thermal Overload	Enabled	Disabled	0.4...5000 A	—	Trip Class 5...30	Trip Class 10	0...100 %TCU	85%	—	—
Phase Loss	Enabled	—	‡	‡	0.1...25.0	1.0	—	—	0...250	0
Ground (Earth) Fault	Disabled	Disabled	1.0...5.0 A	2.5 A	0.1...25.0	0.5	1.0...5.0 A	2.0 A	0...250	10
Stall (High Overload During Start)	Disabled	—	100...600 % FLA §	600 % FLA §	0...250 §	10§	—	—	—	—
Jam (High Overload During Run)	Disabled	Disabled	50...600 % FLA	250 % FLA	0.1...25.0	5.0	50...600 % FLA	150 % FLA	0...250	10
Underload	Disabled	Disabled	10...100 % FLA	50 % FLA	0.1...25.0	5.0	10...100 % FLA	70 % FLA	0...250	10
PTC	Disabled	Disabled	—	—	—	—	—	—	—	—
Current Imbalance (Asymmetry)	Disabled	Disabled	10...100%	35%	0.1...25.0	5.0	10...100%	20%	0...250	10
Comm Fault	Enabled	Disabled	—	—	—	—	—	—	—	—
Comm Idle	Disabled	Disabled	—	—	—	—	—	—	—	—

§ Inhibit time settings are used for both trip and warning functions.

‡ Phase loss trip level is set at a current imbalance greater than or equal to 100% and is not user adjustable.

* Stall protection is only applicable to the motor starting sequence.

External Current Transformers (for use with Cat. Nos. 193-EC1ZZ1, 193-EC3ZZ, 193-EC4ZZ, and 193-EC5ZZ)

The user shall provide one current transformer (CT) for each motor phase, and shall connect the CT's secondary leads to the appropriate E3 overload relay power terminals, as shown in current transformer's wiring diagrams. The CT shall have the appropriate ratio (refer to the product nameplate or product description). Additionally, the CT shall be selected to be capable of providing the required VA to the secondary load, which includes the E3 overload relay burden of 0.1 VA at the rated secondary current and the wiring burden. Finally, the CT shall be rated for protective relaying to accommodate the high inrush currents associated with motor startup, and shall have an accuracy of $\leq \pm 2\%$ over its normal operating range. Typical CT ratings include (Instrument Transformers, Inc. — Model #23 or equivalent):

ANSI (USA)	Class C5B0.1
CSA (Canada)	Class 10L5
IEC (Europe)	5 VA Class 5P10

Programming and Control Terminal

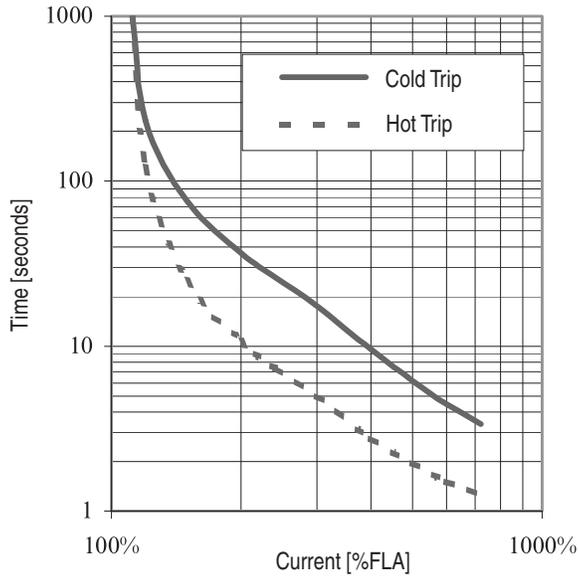
Display	
Display type	128x64 LCD with yellow-green backlighting
Viewing area	57 x 30 mm (2.24 x 1.18 in.)
Keypad	
Keypad type	Tactile embossed, domed keys, sealed membrane
Operation force	453 g (16 oz.)
Operational life	1 million operations
Communications	
Communication protocol	DeviceNet™ (125, 250, 500 Kbaud selectable)
Electrical	
Input voltage range	11...25V DC
Input power, typical	1.7 W
Input current	70 mA @ 24V DC
Environmental	
Operating temperature	0...50 °C (32...122 °F)
Storage temperature	-40...+85 °C (-40...+185 °F)
Humidity	5...95%, non-condensing
Operating shock	30 g
Non-operating shock	50 g
Operating vibration	2.5 g @ 5 Hz...2 kHz
Non-operating vibration	5 g @ 5 Hz...2 kHz
Dimensions	
Height	116 mm (4.57in.)
Width	70 mm (2.76 in.)
Depth	15.5 mm (0.67 in.)
Weight	85 g (3 oz.)
Certifications	
cULus	UL 508, C22.2, No. 14
CE	EN61000-6-2:2005 EN61000-6-4:2001
RoHS	This product meets the material restrictions of the European Union RoHS Directive

AC Input Interface Module

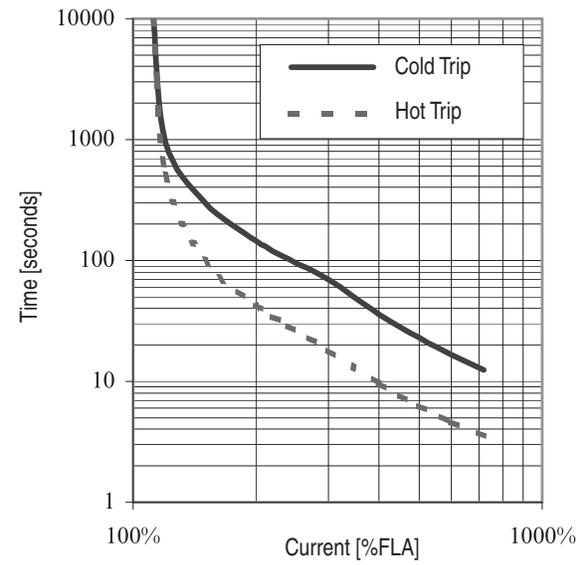
Electrical	
Number of inputs	4
Voltage category	110/120V AC
Operating voltage range	79...132V AC
Frequency range	47...63 Hz
Off-state voltage (max.)	20V AC
On-state voltage (min.)	79V AC
On-state current	2.0 mA @ 79V AC (min.), 10.0 mA @ 132V A (max.)
Inrush current (max.)	150 mA
Off-state current (max.)	1.0 mA
Heat dissipation (max.)	0.10 W/input
IEC input compatibility	Type 1
Environmental	
Operating temperature	-20...+55 °C (-4...+131 °F)
Storage temperature	-40...+85 °C (-40...+185 °F)
Humidity	5...95%, non-condensing
Vibration (IEC 68-2-6)	3 G
Shock (IEC 68-2-27)	30 G
Environmental	
Maximum altitude	2,000 m
Pollution environment	Pollution degree 2
Terminal marking	EN50012
Degree of protection	IP2LX
Electromagnetic Compatibility	
ESD Immunity (IEC 10000-4-2)	6 kV contact, 8 kV air
Radiated Immunity (IEC 10000-4-3)	10V/m
Fast transient burst (IEC 10000-4-4)	4 kV (Power), 2 kV (Control)
Surge immunity (IEC 10000-4-5)	2 kV common mode, 1 kV differential mode
Radiated and conducted emissions	Class A
Physical	
Weight	60 g (2.1 oz.)
Certifications	UR, cUR, CE

Trip Curves — E3 & E5 Plus Overload Relay

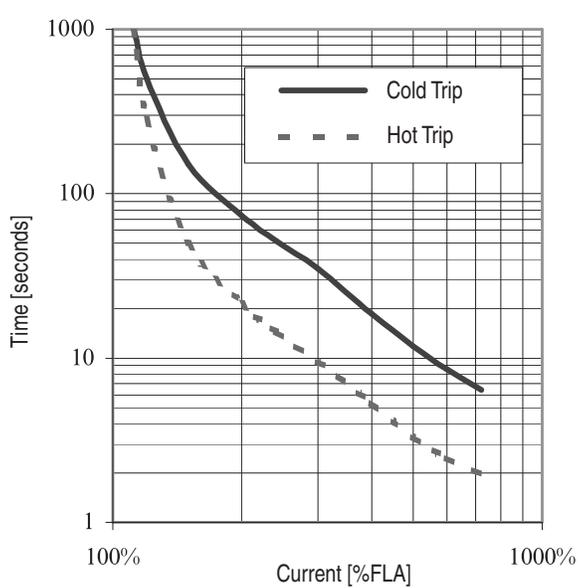
Trip Class 5



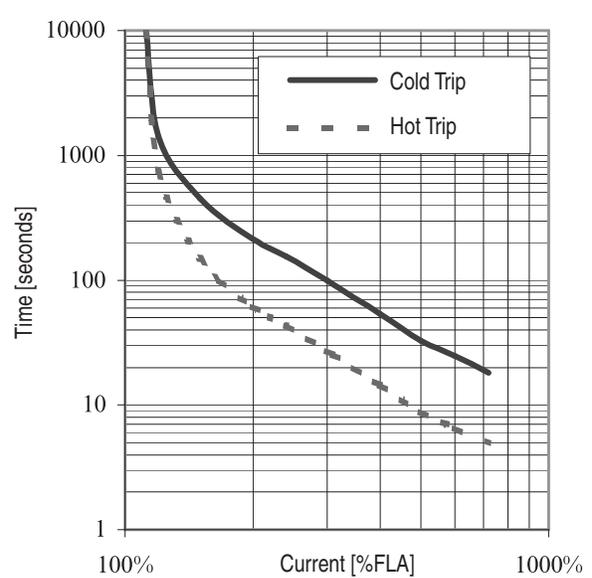
Trip Class 20



Trip Class 10

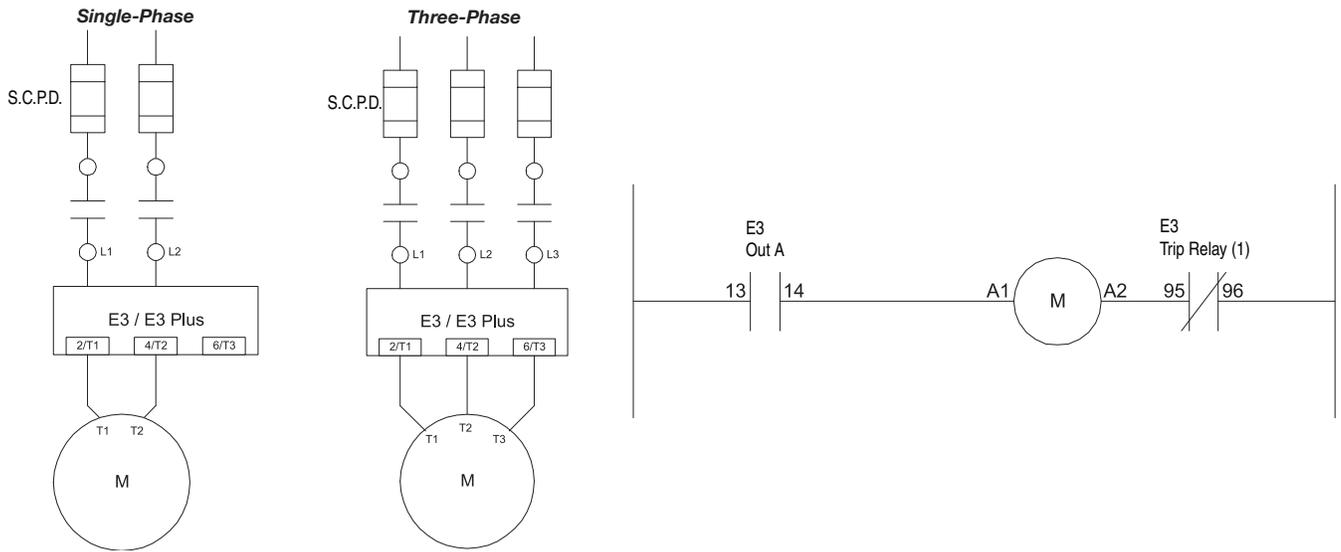


Trip Class 30



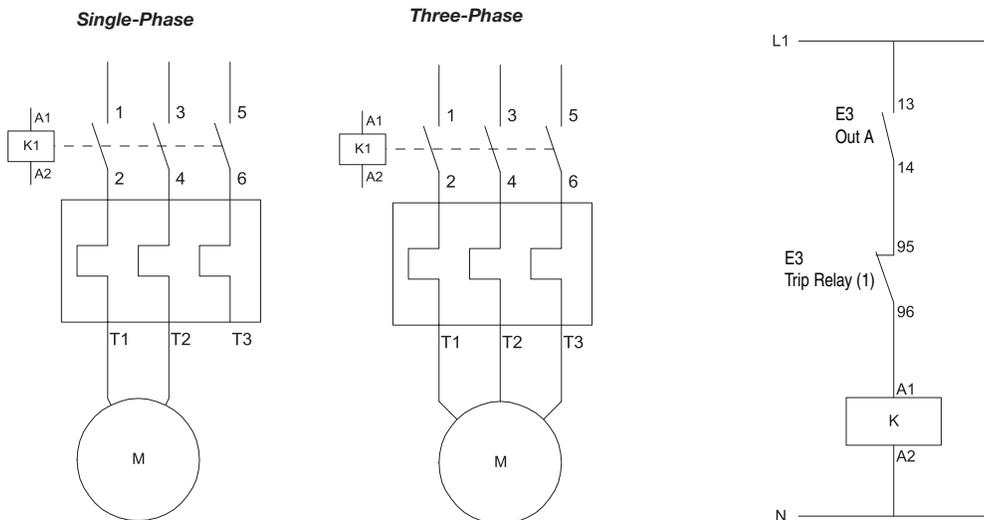
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Typical Wiring Schematics – NEMA



2

Typical Wiring Schematics – IEC

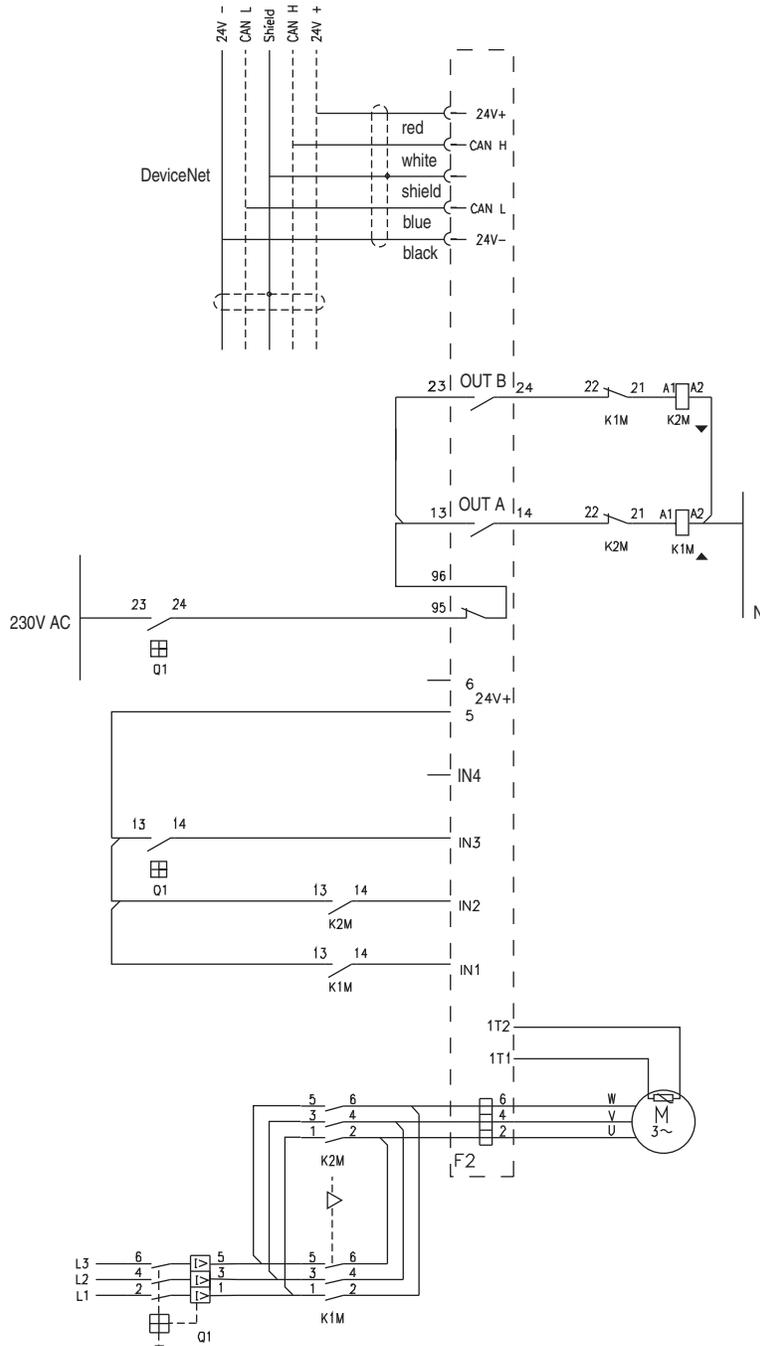


Bulletin 193-EC
E3 and E3 Plus Electronic Overload Relays
 Specifications

Typical Wiring Schematics – IEC

Reversing Starter Application

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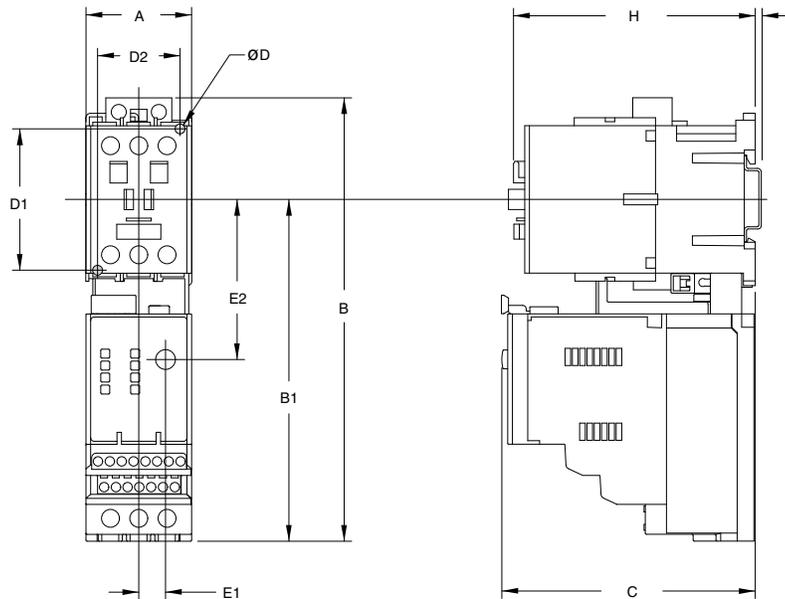


E3 and E3 Plus Electronic Overload Relays

Approximate Dimensions

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

Bulletin 109 Starter Approximate Dimensions



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

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

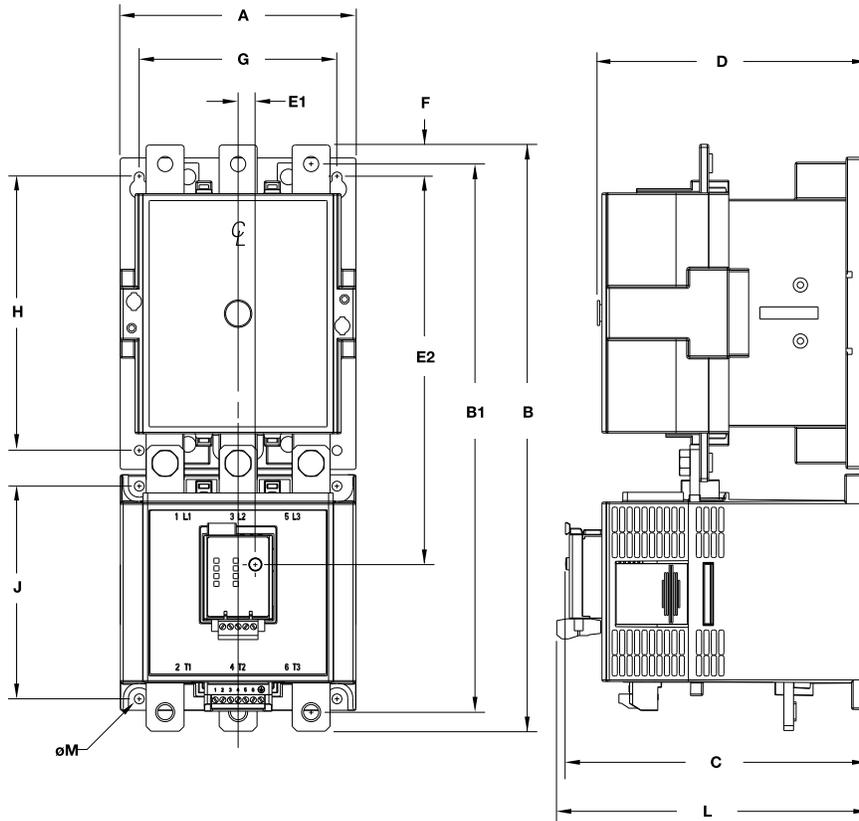
E3 and E3 Plus Electronic Overload Relays

Approximate Dimensions

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

Bulletin 109 Starter Approximate Dimensions, Continued

2



Overload Cat. No.	Contactor Cat. No.	A	Height B		B1	Depth C	D	E1	E2
			without Terminal Covers	with Terminal Covers					
193-EC_F	100-D95	120	336.3	418	311.8	175.1	156	11.4	216.1
	100-D110	(4.72)	(13.24)	(16.45)	(12.27)	(6.89)	(5.14)	(0.45)	(8.51)
193-EC_G	100-D140	120	339.8	418	317.8	175.1	156	11.4	216.1
	100-D182	(4.72)	(13.38)	(16.45)	(12.50)	(6.89)	(5.14)	(0.45)	(8.51)
193-EC_H	100-D210	155	385.8	487.4	360.8	198.9	180	11.4	255
	100-D250	(6.10)	(15.19)	(19.19)	(14.2)	(7.83)	(7.09)	(0.45)	(10.04)
	100-D300	255	552	915	508	291.7	270.7	11.4	373.9
	100-D420	(10.04)	(21.73)	(36.02)	(20)	(11.49)	(10.66)	(0.45)	(14.72)

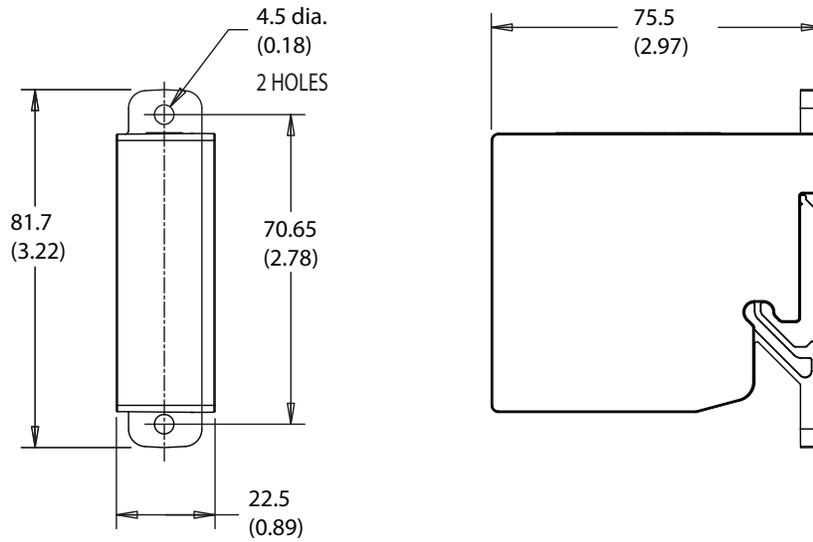
Overload Cat. No.	Contactor Cat. No.	F	G	H	J	K	L	M
193-EC_F	100-D95	12.5	100	145	135	22.3	180.9	8 - 5.6
	100-D110	(0.49)	(3.94)	(5.71)	(5.31)	(0.88)	(7.12)	(8 - 0.22)
193-EC_G	100-D140	16	100	145	135	22.3	180.9	8 - 5.6
	100-D182	(0.63)	(3.94)	(5.71)	(5.31)	(0.88)	(7.12)	(8 - 0.22)
193-EC_H	100-D210	21	130	180	140	23.5	204.7	8 - 6.5
	100-D250	(0.83)	(5.12)	(7.09)	(5.51)	(0.93)	(8.06)	(8 - 0.26)
	100-D300	52.5	226	230	108	109	297.5	8 - 13
	100-D420	(2.07)	(8.90)	(9.06)	(4.25)	(4.29)	(11.71)	(8 - 0.51)

E3 and E3 Plus Electronic Overload Relays

Approximate Dimensions

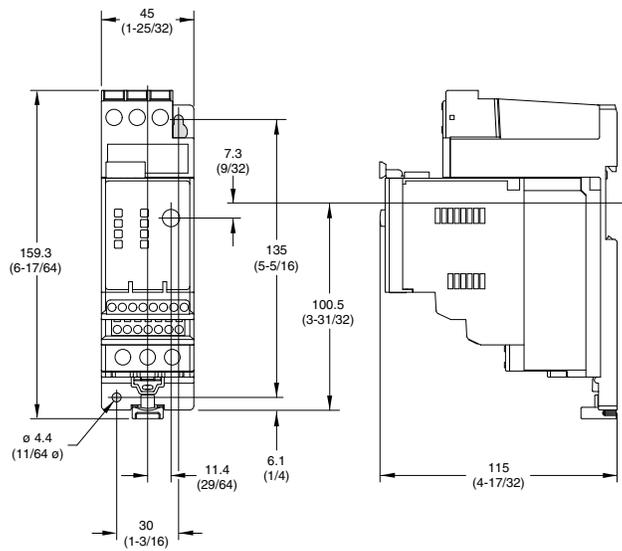
Approximate dimensions are shown in millimeters (inches). Dimensions are not to be used for manufacturing purposes.

Bulletin 193-EC5 Voltage Module



2

Panel Mount Adapters (For Use With Cat. No. 193-EC_ _B)

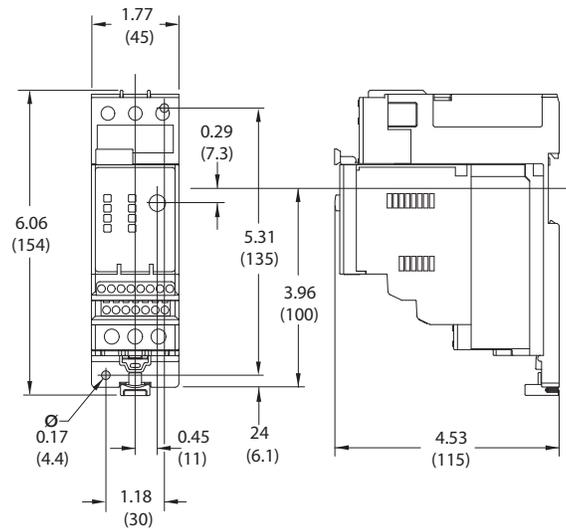


E3 and E3 Plus Electronic Overload Relays

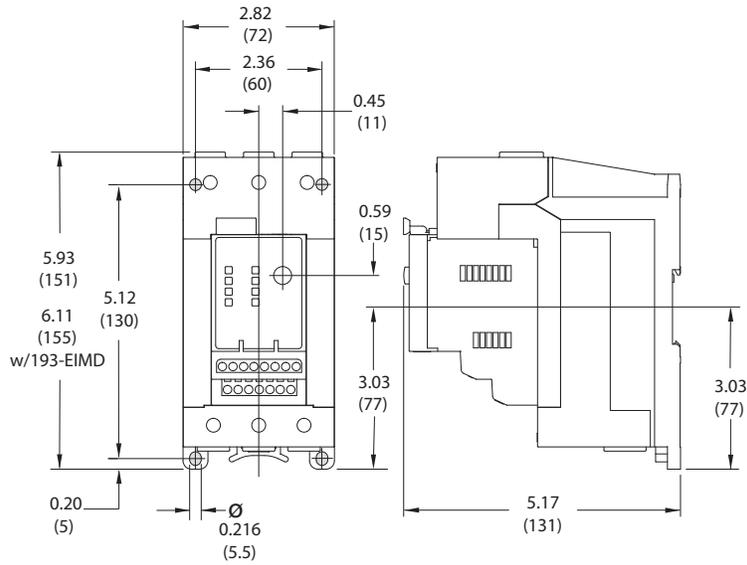
Approximate Dimensions

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

(For Use With Cat. No. 193-EC_ _D, 193-EC_ ZZ)



(For Use With Cat. No. 193-EC_ _E)





Bulletin 193-EF

193-EF1

- 0.5...400 A current range
- Phase loss/current imbalance protection
- LED indicators
- Digital (DIP switch) adjustments
- Adjustable Trip Class (2...30)

193-EF2 also includes:

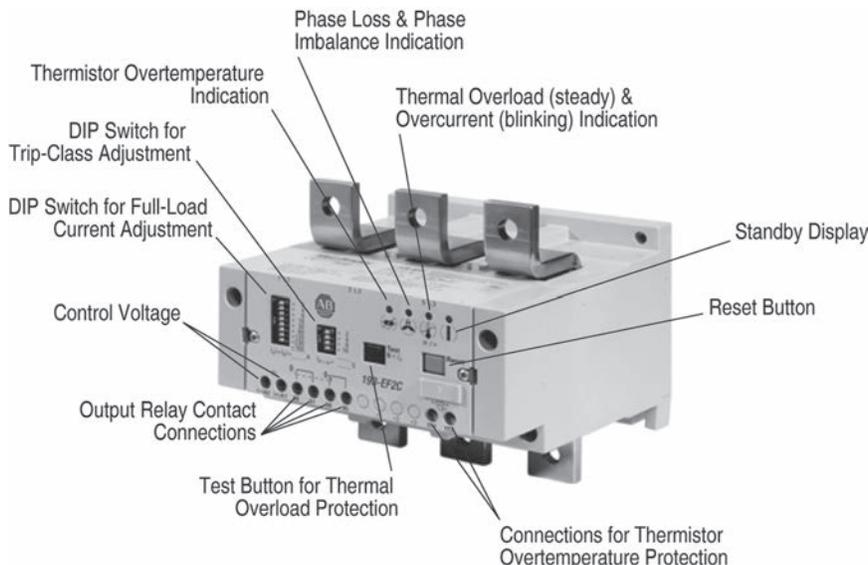
- 0.5...630 A current range
- Overcurrent indication
- PTC thermistor monitoring

Bulletin 193-EF overload relays offer precise and reliable ambient compensated overload protection for the protection of three-phase squirrel cage motors. DIP switch settings allow the Bulletin 193-EF overload relays to be closely matched to the motor characteristics to safely obtain full utilization of the motor. The wide adjustment range of the trip class setting allows the Bulletin 193-EF overload relays to be applied in a wide variety of applications. The 193-EF2 version offers enhanced motor protection with additional circuitry for monitoring motor winding embedded thermistors.

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 IEC 60947-4
 CSA C22.2 No. 14
 UL 508
Certifications
 CE
 CSA Certified (File No. LR13908)
 UL Listed (File No. E33916, Guide NKCR)

Features



Catalog Number Explanation

193 - **EF** **1** **A** **KP** - **RFL**
a *b* *c* *d* *e*

a

Model	
Code	Description
EF	Bulletin 193-EF solid-state overload relay

b

Version	
Code	Description
Basic	1
Advanced	2

c

Adjustment Range [A]	
Code	Description
A*	20...180
B‡	160...400
C‡	160...630

* Pass-thru mounting style
 ‡ Direct (to contactor) mount style

d

Voltage	
Code	Description
KJ	24V AC
KV	36V AC
KY	48V AC
KD	110V AC
KP	120V AC
KF	230V AC
KA	240V AC
KN	400V AC
KG	415V AC
KB	440V AC
ZJ	24V DC
ZY	48V DC

e

Factory Modifications	
Code	Description
R	Automatic reset
F	Remote reset
L	External indication

Solid-State Overload Relays

Product Selection/Accessories

Electronic Motor Protection Relays

Mounts to Contactor	Adjustment Range [A]	Cat. No.	Cat. No.§
100-D95...100-D180*	20...180*	193-EF1A⊗	193-EF2A⊗
100-D210...100-D420	160...400	193-EF1B⊗	193-EF2B⊗
100-D210...100-D420	160...630	—	193-EF2C⊗

* Contactor mounting requires the use of a bus bar mounting kit (Cat. Nos. 825-MVS or 825-MVS2).

* 0.5...20 A can be achieved by looping the motor supply cables. (Refer to the Specifications on page 2-244.) Use cable support Cat. No. 193-HD.

§ Device ships with the External Indication Module accessory (Cat. No. 193-LB1) included.

⊗ Coil Voltage Code

The catalog number as listed is incomplete. Select a coil voltage code from the table below for completion.

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

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

Factory Modification Options

Description	Suffix Code*
Automatic Reset of overload and thermistor overtemperature protection	-R
Remote Reset‡	-F
External Indication§	-L

* Refer to the Catalog Number explanation on page 2-241 for the proper suffix code sequence.

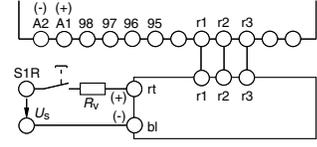
‡ Device ships with the Remote Reset Module accessory (Cat. No. 193-RB1) included.

§ Device ships with the External Indication Module accessory (Cat. No. 193-LB1) included.

Accessories

Add-On Modules

	Description	Pkg. Qty.	Cat. No.
	External Indication Module For front mounting on a control panel or MCC 3 m connection cable with plug Function status indication Trips and alarms can be reset IP54 protection	1	193-LB1
	Remote Reset Module Trip reset from any location Operating voltage: 24...48V AC/DC with external burden resistor: - 8.2 kΩ, 4 W — 110...230V AC/DC - 22 kΩ, 10 W — 240...440V AC/DC	1	193-RB1



Mounting Materials

	Description	For Use With	Pkg. Qty.	Cat. No.
	Transparent Front Cover	193-EF1, 139-EF2	1	193-PA
	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	100-D115 100-D140, 100-D180, 100-D115-E...100-D180-E	2	100-DTS110 100-DTS180
	Cable Support Set of 6 Includes terminal and fixing screws Provides support of cable end when looping through current evaluation ports	100-D210...100-D420	6	100-DTS420
	Terminal Lugs • Set of two • Protection class IP2X per IEC 60529 and DIN 40 050	193-EF1A, 193-EF2A	2	193-HD
		100-D115		100-DTB110
		100-D140, 100-D180, 100-D115E...D180E, 193-EC_F, 193-EE_F		100-DTB180
		100-D210...100-D420, 193-EC_G, 193-EF2C, 193-EE_G		100-DTB420



Connecting Components

	Description	For Use With	Pkg. Quantity	Cat. No.
	Terminal Lugs (UL/CSA), Copper Frame Set of three	100-D115, 100-D110	3	100-DL110
		100-D140, 100-D180, 193-EC_F, 193-EE_F		100-DL180
		100-D210...100-D420, 193-EC_G, 193-EE_G		100-DL420

Mounting Materials — Bus Bars

Set of 3 busbars, includes terminal and fixing screws. Suitable for use with Cat. No. 193-EF1A and 193-EF2A overload relays.

	Description	Pkg. Qty.	Cat. No.
	M8 connections Set of three 4 x 16 x 102 mm (1/8 x 5/8 x 4-1/64 in.) (125 A max.) Universally applicable Weight: 230 g	3	825-MVM
	M8 connections Set of three 4 x 20 x 117 mm (1/8 x 25/32 x 4-39/64 in.) (180 A max.) Universally applicable	3	825-MVM2
	M6 lower connections Set of three For mounting on Bul. 100-D95 and 100-D110 contactors with conventional coil	3	825-MVS
	M8 lower connections Set of three For mounting on Bul. 100-D140, 100-D180 conventional and Bul. 100-D95E...100-D180E contactors with electronic coil	3	825-MVS2

2

Labeling Materials

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

	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 1492 W	100	100-FMA2

* Must be ordered in multiples of package quantities.

Solid-State Overload Relays

Specifications

2

Supply Voltage Failure

In the event of a supply voltage failure, the output relay resets and the stand-by indicator goes out. The actual status is stored for 30 minutes. When the supply voltage is restored, the output relay reverts to its original state.

Reset — Manual

The reset button resets all protection functions. Resetting from any location is possible with the 193-RB1 remote reset module.

Reset — Automatic

Automatic resetting of thermal overload and thermistor overtemperature functions is an optional feature. All other protection functions must be reset manually.

Test Button for Thermal Overload Protection

Pressing the test button will verify thermal tripping operation time at $6x I_e$ without the motor being connected. The test button must be held for longer than the set trip time $t_{6x/e}$.

Device Installation and Commissioning

The operating instructions enclosed with the device provide all of the information necessary to set and commission it.

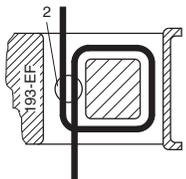
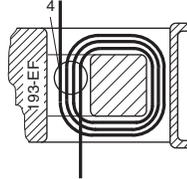
Surface Mounting

193-EF_A Snap-on fixing to standard DIN Rail or screw fixing
 193-EF_B Screw fixing
 193-EF_C Screw fixing
 Mounting position: optional

Setting the Rated Current (0.5...20 A) (193-EF1A and 193-EF2A Requires 193-HD)

The motor supply cables are looped through the current transformer twice, thereby doubling the rated motor current. The setting on the Bulletin 193-EF overload relay is the product of:

$$I_e [A] \times \dots \text{number of loops}$$

	Recommended for I_e [A]	Motor Supply Cables	Cable Cross Section (Flexible Strand)	
			IEC [mm ²]	CSA, UL (AWG No.)
	20...180	fed straight through	4...95	10...10 000
	10...20	looped twice	2.5...25	14...10
	5...10	looped 4 times	1...6	14
	2.5...5	looped 8 times	0.75...2.5	14
	0.5...2.5	looped 40 times	0.5...0.75	*

Rated Voltage Motor Circuit (primary circuit of current measuring device)				
IEC 947, EN 60947	[V]	1000		
CSA, UL	[V]	600		
Control Circuit				
IEC 947, EN 60947	[V]	440		
CSA, UL	[V]	240		
Rated Control Voltage U_s				
AC 50/60 Hz	[V]	24, 36, 48, 110, 120, 230, 240, 400, 415, 440, (0.8...1.1 U_s)		
DC	[V]	24, 48 (0.9...1.2 U_s)		
Terminal Cross-section				
Control circuit	[mm ²]	2 x 2.5		
Device Protection Fuse		10 A Type gG or 16 A Type gG		
Output Relay Contact Information				
Contact assembly		1 N.O. and 1 N.C., galvanically separated		
Rated operating voltage per UL/CSA: pilot duty 240V	[V]	24	110...125	220...250 380...440
Continuous Thermal current	[A]	4		
Rated AC operating current AC-15	[A]	3	3	1.2
Max. permissible switching current (cos = 0.3) AC-15	[A]	30	30	12
Rated DC operating current (L/R = 300 ms), no protective circuit needed DC-13	[A]	2	0.3	0.2 —
Max. rated back-up fuse current		10 A, 500V AC Type gG		
Ambient temperature				
Operation		-5...+60 °C		
Storage		-50...+60 °C		
Transport		-50...+85 °C		

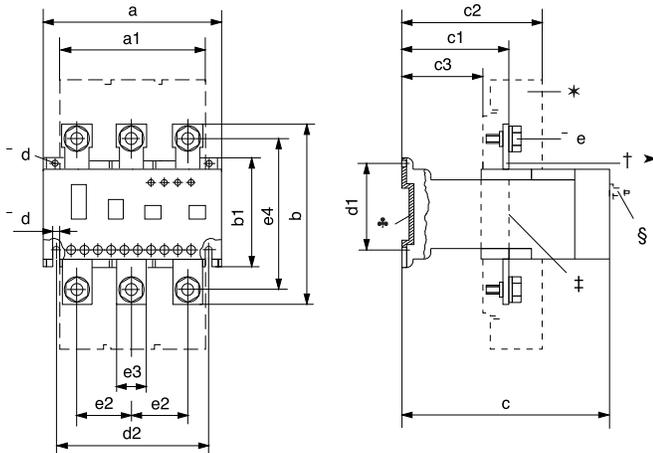
Sensor Measurement Circuit			
Measurement circuit Cross section	[mm ²]	0.5	1.5
Max. lead length*	[m]	200	600
Max. cold resistance of PTC sensor chain	kΩ	1.5	
Max. number of PTC sensors per IEC 34-11-2		6	
Weights			
Overload Relay			
193-EF1A	[g]	1 070	
193-EF2A	[g]	1 090	
193-EF1B	[g]	2 510	
193-EF2B	[g]	2 530	
193-EF2C	[g]	5 550	
193-LB1 indication module	[g]	160	
193-RB1 Remote reset module	[g]	160	
196-MTM Adapter	[g]	5	
193-PA Front cover	[g]	3	
193-HD Terminal lug	[g]	40	
Bus bars			
825-MVM	[g]	230	
825-MVM2	[g]	290	
825-MVS	[g]	280	
825-MVS2	[g]	350	
Approvals			
CE, UL Listed, CSA, Bureau Veritas, Lloyd's Register of Shipping, Maritime Register of Shipping, RINA			

* Type of wiring: insulated control leads, screened > 200 m (shield connected with 1T1)

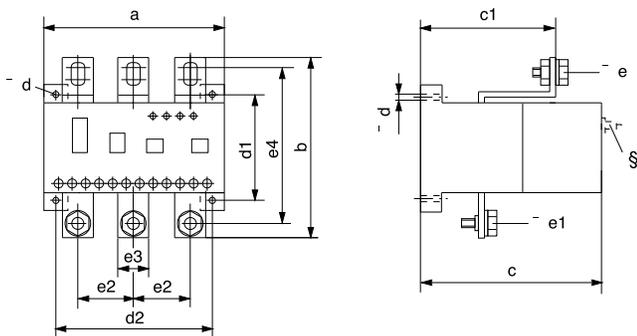


Dimensions in millimeters. Dimensions are not intended to be used for manufacturing purposes.

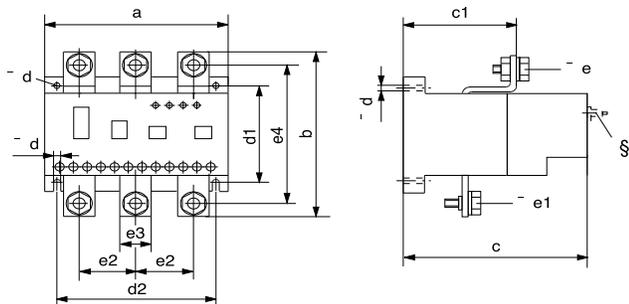
Cat. Nos. 193-EF1A, 193-EF2A
 (shown with cat. no. 825-MVM bus bar kit)



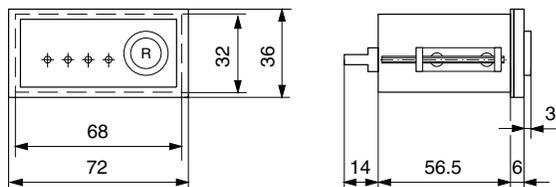
Cat. Nos. 193-EF1B, 193-EF2B



Cat. No. 193-EF2C



Cat. No. 193-LB1



Dimensions	193-EF1A 193-EF2A	193-EF1B 193-EF2B	193-EF2C
A	120	140	155
a1	105	—	—
b	100	142	143
b*	100	—	—
b+	117	—	—
b1	73	—	—
φd	5.4	5.8	6.5
d1	55...60	75	90...93
d2	100	125	135
φe	M8 x 12	M10 x 25	M10 x 25
φe1	—	M10 x 35	M10 x 25
e2	38.5	48	48
e3*	16	25	25
e3+	20	25	25
e4	82	117	118
e4*	82	—	—
e4+	97	—	—
c	143	148	178
c1	72	117	118
c2	93.5	—	—
c3	53.5	—	—

- * Terminal cover
- * Universally applicable busbars (Cat. No. 825-MVM)
- ‡ Feed-through openings 19 x 19 mm
- § With 193-LB1 indication module: c = c + 29 mm
- ♣ Can be mounted to DIN Rail EN 50 022-35
- ♣ Universally applicable busbars (Cat. No. 825-MVM2)

Bimetallic Overload Relays

Product Overview/Product Selection



Bulletin 193-K — Miniature Bimetallic Overload Relays

- Standard motor protection for AC and DC motors
- Overload protection Trip Class 10A
- Auxiliary switch (1 N.O. and 1 N.C.)
- Phase loss sensitivity
- Manual/Auto reset button
- Test release
- Stop button
- Trip indicator

Bulletin 193-K bimetallic overload relays are designed for use with Bulletin 100-K contactors and Bulletin 104-K reversing contactors. These class 10A ambient temperature-compensated thermal overload relays include a differential mechanism for sensitivity to phase-loss conditions.

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 UL 508
 CSA 22.2. No. 14
Certifications
 CE Marked
 cULus Listed (File No. E33916, Guide NKCR, NKCR7)

Miniature Bimetallic Overload Relays

Mounts to Contactor	Setting Range [A] **	Max. Current Rating of Backup Fuse [A]				Cat. No.
		IEC Coordination		UL 508		
		Type 1	Type 2	UL Class K5/RK5, 600V, 5 kA	UL Class CC, J, 600V, 50 kA	
100-K05...100-K12	0.10...0.16	35	1	1	1	193-KA16
	0.16...0.25	35	1	1	1	193-KA25
	0.25...0.40	35	2	1	1	193-KA40
	0.35...0.50	35	2	2	2	193-KA50
	0.45...0.63	35	2	2	2	193-KA63
	0.55...0.80	35	4	3	3	193-KA80
	0.75...1.0	35	4	3	3	193-KB10
	0.9...1.3	35	6	4	4	193-KB13
	1.1...1.6	35	6	5	5	193-KB16
	1.4...2.0	35	10	8	8	193-KB20
	1.8...2.5	35	20	10	10	193-KB25
	2.3...3.2	35	20	12	12	193-KB32
	2.9...4.0	35	20	15	15	193-KB40
3.5...4.8	35	20	15	15	193-KB48	
4.5...6.3	35	20	20	20	193-KB63	
100-K09...100-K12	5.5...7.5	35	20	25	25	193-KB75
	7.2...10.0	35	20	35	30	193-KC10
100-K12	9.0...12.5	35	20	50	30	193-KC12

* To select the setting range for use in Y-Δ Starters, multiply the rated operating current of the motor by a factor of 0.58.
 ** For motors with Service Factor of 1.15 or greater, use motor nameplate full load current. For motors with service factor of 1.0, use 90% of the motor nameplate full load current.

Accessories

	Description	Cat. No.
	Remote Reset Solenoid For remote reset of 193-K and 193-T1 overload relays	193-T1R⊗
	Reset Adapter Expands the reset target area when using an external reset	193-RA3
	External Reset Button For enclosed, through-the-door reset applications. Metal construction IP66, non-illuminated with rod (length: 142 mm, adjustable range 141...159 mm). Refer to the 800F catalog pages for additional types.	Reset Button
		Rod

⊗ Coil Voltage Codes for Remote Reset Solenoid

[V]	24	48	110	120	125	220...240
50 Hz	—	—	D	—	—	—
60 Hz	—	—	—	D	—	—
50/60 Hz	KJ	KY	—	—	—	KF
DC	ZJ	ZY	ZD	—	ZS	—

Main Circuits

		193-K
Rated Isolation Voltage U_i		690V
Rated Impulse Strength U_{imp}		6 kV
Rated Operating Voltage U_e	IEC/UL	690V AC / 600V AC
Wiring cross section Terminal type		
Terminal screws		M3.5
	Fine stranded with ferrule [mm ²]	2 x (1.5...4)
	Solid or coarse stranded [mm ²] [AWG]	2 x (1.5...4) 2 x (16...12)
Recommended torque	[N•m] [lb•in]	1.2 10.6
Pozidriv screwdriver	Size	2
Slotted screwdriver	[mm]	1 x 6

General Data

		193-K
Standards		IEC/EN 60947-1, -4-1, -5-1, UL 508, CSA 22.2. No. 14
Certifications		CE, cULus
Approximate Weights (unpackaged)		0.115 kg (0.25 lb)

Control Circuits

		193-K
Rated Isolation Voltage U_i		690V AC
Rated Impulse Strength U_{imp}		4 kV AC
Rated Operating Voltage U_e	IEC/UL	690V AC/600V AC
Rating Designation		A600/Q300
Rated Operating Current I_e		N.O./N.C.
AC-15	24V [A]	4
	240V [A]	2
	400V [A]	1.6
	690V [A]	0.15
DC-13	24V [A]	2
	110V [A]	0.4
	220V [A]	0.25
	440V [A]	0.08
Thermal Current I_{the}	[A]	5
Short-circuit withstand, fuse gG	[A]	6
Contact Reliability		15V, 2 mA
Wiring cross section Terminal type		
Terminal screw		M 3.5
	Fine stranded with ferrule [mm ²]	2 x (1...4)
	Solid or coarse stranded [mm ²] [AWG]	2 x (1...4) 2 x (18...12)
Recommended torque	[N•m] [lb•in]	1.2 10.6
Pozidriv screwdriver	Size	2
Slotted screwdriver	[mm]	1 x 6

Environmental Ratings

		193-K
Ambient Temperature	Storage Operating	-55...+80 °C (-67...+176 °F) -20...+60 °C (-4...+140 °F)
Humidity	Operating Damp Heat	5...95% Non-condensing per IEC/EN 60068-2-3 and IEC/EN 60068-2-30
Vibration (per IEC/EN 60068-2-6)		3 G
Shock (per IEC/EN 60068-2-27)		30 G
Max. Altitude		2000 m
Pollution Environment		Pollution Degree 3
Degree of Protection		IP2X
Protection		
Type of Relay	Ambient compensated, time delay, phase loss sensitive	
Nature of Relay	Bimetallic overload relay	
Trip Rating	120% FLA	
Trip Class	IEC: 10A, UL 10	
Reset Mode	Automatic or manual	
Power dissipation	up to 0.4 A	7 W
	0.5...12.5 A	6 W

General Data

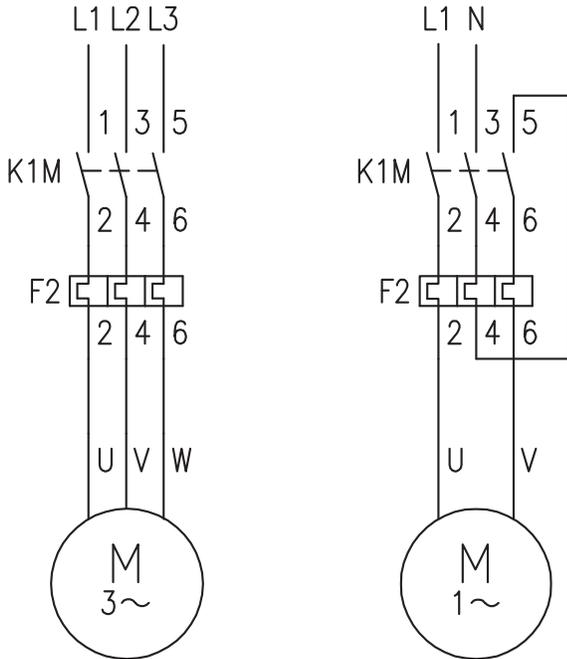
		193-K
Standards		IEC/EN 60947-1, -4-1, -5-1, UL 508, CSA 22.2. No. 14
Certifications		CE, cULus
Approximate Weights (unpackaged)		0.115 kg (0.25 lb)

Bimetallic Overload Relays

Specifications/Approximate Dimensions

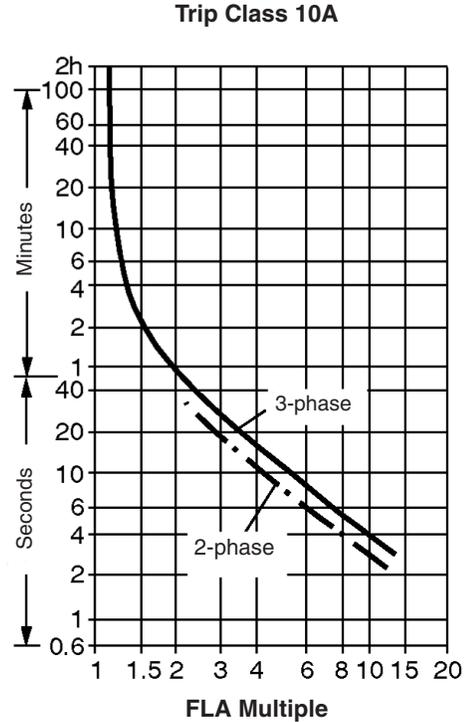
Thermal Overload Relays

Circuit Diagrams



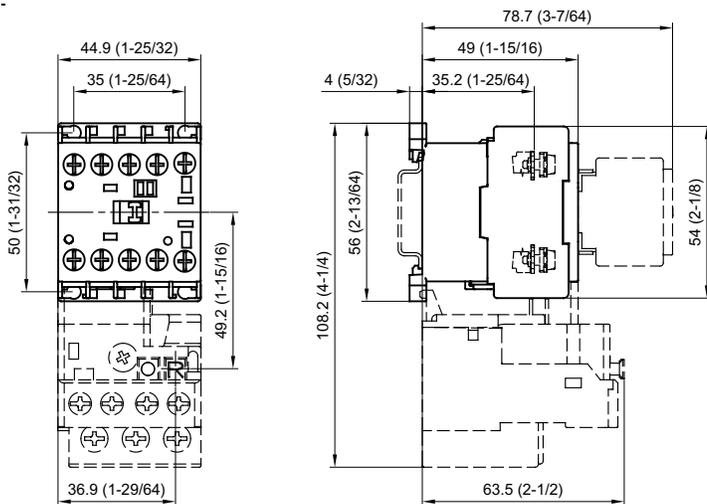
Trip Characteristics

These trip characteristics refer to IEC 60947 and are average values from cold start at an ambient temperature of 20 °C. Trip time is pictured as a function of operating current. With the device at normal operating temperature, the trip time decreases to approximately 25% of the shown value.



Bulletin 100-K, 193-K Approximate Dimensions

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



	<p>Bulletin 193-T1 — Bimetallic Overload Relays</p> <ul style="list-style-type: none"> • Overload protection trip class 10 / 10A • Phase loss protection • Ambient temperature compensation • Auxiliary contacts (1 N.O. and 1 N.C.) • Manual/automatic reset mode selectable • Test function for auxiliary contacts • Stop button • Trip indicator • Optional remote reset solenoid and external reset accessories <p>The 193-T1 bimetallic overload relays are ambient temperature compensated, ensuring that the tripping characteristic of the relay remains constant over an ambient temperature range of -20...+60 °C. These class 10 / 10A overload relays include a differential mechanism for high sensitivity to phase loss conditions and provide reliable motor protection in normal duty applications. In addition, they can be used to protect against overloads in DC-motor and variable frequency drive applications.</p>	<p>Table of Contents</p> <p>Product Selection 1 Accessories..... 2 Specifications..... 3 Approximate Dimensions..... 7</p> <p>Standards Compliance</p> <p>IEC/EN 60497-1, -4-1, -5-1 UL508 CSA C22.2 No.14</p> <p>Certifications</p> <p>cULus (File No. E33916, Guide NKCR, NKCR7), CE marked</p>
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Add-On Modules

	Description	For Use With	Pkg. Quantity *	Cat. No.
	<p>DIN Rail/Panel Mounting Adapter For separate mounting of overload relays Snaps on to 35 mm top hat rail</p>	<p>193-T1AA, 193-T1AB, 193-T1AC, 193-T1BC</p>	<p>1</p>	<p>193-T1APM</p>
	<p>Screw Adapter For screw fixing of the 193-T1APM panel adapter (1 required per adapter)</p>	<p>193-T1APM</p>	<p>10</p>	<p>140M-C-N45</p>
	<p>Remote Reset Solenoid For remote reset of 193-K and 193-T1 overload relays</p>	<p>193-K, 193-T1 (not for 193-T1DC_P)</p>	<p>1</p>	<p>193-T1R⊗</p>
	<p>External Reset Button For enclosed, through-the-door reset applications. Metal construction, IP66, non-illuminated. Refer to the 800F selection information for additional types.</p>	<p>All</p>	<p>1</p>	<p>800FM-R611</p>
	<p>Reset Rod Length 142 mm, adjustable range 141...159 mm</p>	<p>All</p>	<p>1</p>	<p>800F-ATR08</p>
	<p>Reset Adapter Expands the reset target area when using an external reset</p>	<p>193-K, 193-T1 (not for 193-T1DC_P)</p>	<p>1</p>	<p>193-RA3</p>

* Must be ordered in multiples of package quantity.

⊗ **Coil Voltage Codes for Remote Reset Solenoid**

[M]	24	48	110	120	125	220...240
50 Hz	—	—	D	—	—	—
60 Hz	—	—	—	D	—	—
50/60 Hz	KJ	KY	—	—	—	KF
DC	ZJ	ZY	ZD	—	ZS	—

Bulletin 193-T1
Bimetallic Overload Relays
 Product Selection

Thermal Overload Relays

For Use With*	Setting Range [A]‡	Max. Back-up fuse [A]			Cat. No.
		gL/gG		UL Class K5	
		50 kA, 690V AC		5 kA, 600V AC	
		IEC/EN 60947-4-1 Coordination			
		Type 1	Type 2	UL 508	
100-C09...100-C23	0.1...0.16	50	—	1	193-T1AA16
	0.16...0.25	50	—	1	193-T1AA25
	0.25...0.40	50	2	1	193-T1AA40
	0.35...0.50	50	2	2	193-T1AA50
	0.45...0.63	50	2	2	193-T1AA63
	0.55...0.80	50	4	3	193-T1AA80
	0.75...1.0	50	4	3	193-T1AB10
	0.90...1.3	50	6	4	193-T1AB13
	1.1...1.6	50	6	5	193-T1AB16
	1.4...2.0	50	10	8	193-T1AB20
	1.8...2.5	50	16	10	193-T1AB25
	2.3...3.2	50	16	12	193-T1AB32
	2.9...4.0	50	16	15	193-T1AB40
	3.5...4.8	50	16	15	193-T1AB48
	4.5...6.3	50	20	20	193-T1AB63
5.5...7.5	50	25	25	193-T1AB75	
7.2...10	50	25	35	193-T1AC10	
9.0...12.5	50	35	50	193-T1AC12	
100-C12...100-C23	11.3...16	50	35	60	193-T1AC16
100-C16...100-C23	15...20	80	40	80	193-T1AC20
	17.5...21.5	80	50	80	193-T1AC21
100-C23	21...25	80	50	100	193-T1AC25
100-C30...100-C37	15...20	80	40	80	193-T1BC20
	17.5...21.5	80	50	80	193-T1BC21
	21...25	80	50	100	193-T1BC25
	24.5...30	100	63	100	193-T1BC30
	29...36	125	63	125	193-T1BC36
100-C37	33...38	125	63	150	193-T1BC38
100-C43	17...25	100	50	100	193-T1CC25
	24.5...36	125	80	125	193-T1CC36
	35...47	160	100	175	193-T1CC47
100-C60...100-C97	35...47	160	100	175	193-T1DC47
	45...60	200	125	250§	193-T1DC60
100-C72...100-C97	58...75	200	125	300§	193-T1DC75
100-C85...100-C97	72...90	250	160	350§	193-T1DC90
Separate mounting required (Panel-mounted device)	35...47	160	100	175	193-T1DC47P
	45...60	200	125	250§	193-T1DC60P
	58...75	200	125	300§	193-T1DC75P
	72...90	250	160	350§	193-T1DC90P

* Bulletin 193-T1 overload relays shall not be used with 100-C09...100-C43 conventional DC coil-controlled contactors. Use electronic controlled DC coil versions.

‡ To select the setting range for use in Y-Δ Starters, multiply the rated operating current of the motor by a factor of 0.58.

‡ For motors with service factor of 1.15 or greater, use motor nameplate full load current. For motors with service factor of 1.0, use 90% of the motor nameplate full load current.

§ Max. Back-up fuse [A], UL Class K5, 10 kA, 600V AC



Marking System

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

	Description	Pkg. Quantity*	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

* Must be ordered in multiples of package quantities.

Thermal Overload Relays

Main Circuits

Cat. No.		193-T1...	
Rated isolation voltage U_i		690V AC	
Rated impulse withstand voltage U_{imp} (between main poles and between main poles and auxiliary circuits)		6kV AC	
Rated impulse withstand voltage U_{imp} (between auxiliary circuits)		4kV AC	
Rated operating voltage U_e	IEC	690V AC	440V DC
	UL, CSA	600V AC	
Rated frequencies		[Hz]	50/60
Operational frequencies		DC...400 Hz	
Power dissipation	193-T1A, 193-T1B	up to 0.4 A	7 W
		0.5...36 A	6 W
		38 A	12 W
	193-T1C	25...47 A	12 W
	193-T1D	47...90 A	18 W

Control Circuits

Cat. No.		193-T1...	
Rated operating current I_e			
AC-15	24V	[A]	4
	240V	[A]	2
	400V	[A]	1.6
	690V	[A]	0.15
DC-13	24V	[A]	2
	110V	[A]	0.4
	220V	[A]	0.25
	440V	[A]	0.08
Thermal Current I_{th}			5
Short-circuit withstand, Fuse	IEC, gL/gG	[A]	6
Short-circuit withstand, circuit breaker \leq 1 kA prospective short-circuit-current			4
Min. contact load for reliable operation			15V, 2 mA
UL Rating			A600/Q300

Terminations

Cat. Nos.	Main Circuits						Control Circuits	Remote Reset
	193-T1A...	193-T1BC20... T1BC25	193-T1BC30... T1BC38	193-T1C...	193-T1D...	193-T1APM	193-T1... all	193-T1R...
Wiring cross section Terminal type								
Terminal screws	M4	M4	M4	M5	M6	M4	M3.5	M3.5
 Fine stranded with ferrule	1 conductor [mm ²] 2 conductors [mm ²]	1.5...4 1.5...4	1.5...4 1.5...4	2.5...10 -	2.5...16 -	10...35 -	1.5...10 -	1...2.5 -
 Solid or coarse stranded	1 conductor [mm ²] 2 conductors [mm ²]	1.5...6 1.5...6	1.5...6 1.5...6	2.5...16 -	2.5...25 -	10...35 -	1.5...16 -	1...2.5 -
 Fine stranded with ferrule	1 conductor [AWG] 2 conductors [AWG]	No. 16...10 No. 16...10	No. 14...10 No. 14...10	No. 10...6 -	No. 10...6 -	No. 8...1 -	No. 16...6 -	No. 18...12 No. 18...12
Recommended torque	[N•m]	1.5 ... 2.2	1.5 ... 2.2	2.5 ... 3.5	2.5 ... 3.5	4.5 ... 6	1.8...2.8	1.2
	[lb•in]	13 ... 20	13 ... 20	22 ... 31	22 ... 31	40 ... 53	16...25	10.6
Pozidrive screwdriver No.	Size	2	2	2	2	-	2	2
Slotted screwdriver	[mm]	0.8 x 5.5	0.8 x 5.5	0.8 x 5.5	0.8 x 5.5	-	0.8 x 5.5	0.8 x 5.5
Hexagon socket screw	Size	-	-	-	-	4	-	-



Bulletin 193-T1
Bimetallic Overload Relays
 Specifications

193-T1R Remote Reset

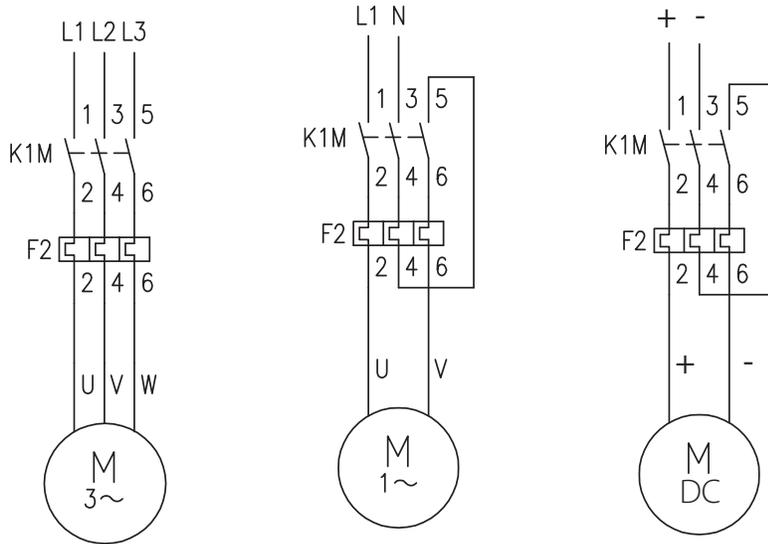
Operating Limits		
Maximum Command Impulse		5s
AC 50/60 Hz	Pick-up [$x U_s$]	0.8...1.1
	Drop-out [$x U_s$]	
DC	Pick-up [$x U_s$]	0.7...1.25
	Drop-out [$x U_s$]	
Coil Consumption		
AC 50/60 Hz	Pick-up [VA/W]	
	Hold-in [VA/W]	
DC	Pick-up [W]	17 (24, 110, 125V) 25 (48V)
	Hold-in [W]	17 (24, 110, 125V) 25 (48V)

General

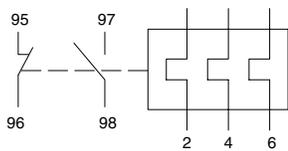
Cat. No.		193-T1...	
Type of Overload Relay	Bimetallic, Ambient Compensated, Phase Loss Sensitive		
Trip Rating (ultimate tripping current)	120% FLA		
Phase loss sensitivity: Trip rating at phase loss	115% FLA		
Trip Class		193-T1A/-T1B	193-T1C/-T1D
	IEC/EN 60947-4-1	10A	10
	UL	10	
Reset Mode	Automatic or Manual		
Test release	Manual release of auxiliary contacts		
Trip indication	By means of a flag visible through an opening in the relay front		
Compensation temperature range	-20...+60 °C (-4...+140 °F)		
Climatic Conditions	Release Tolerance at -20 °C	1.05...1.4 $x I_n$	
	Storage Temperature Range	-55...+80 °C (-67...+176 °F)	
	Operating Temperature Range	-20...+60 °C (-4...+140 °F)	
	Air moisture (Storage/Operating) (per IEC/EN 60068-2-6), service	5...95% rel.humidity, non-condensing	
Vibration	IEC/EN 61373 (vibration railways)	category 1, class B	
	IEC/EN 60092-504 (vibration ships), service (per IEC/EN 68000-2-27), transport	0.7 g, all axes, 2...200 Hz	
Shock	IEC/EN 60068-2-27 (Shock half-sinus), service	30 g	
	IEC/EN 61373 (shock railways)	11 ms > 5 g all axes	
Max. Altitude	2000 m		
Pollution Degree	3		
Degree of Protection, with wires connected	IP2X		
Approximate Weight (unpacked)	193-T1A, 193-T1B	0.16...25 A	0.115 kg
	193-T1B	30...38 A	0.155 kg
	193-T1C	25...47 A	0.330 kg
	193-T1D	47...90 A	0.360 kg
	193-T1...P	47...90 A	0.415 kg
Standards	IEC/EN 60497-1, -4-1, -5-1, UL508, CSA C22.2 No.14		
Certifications	CE, cULus		

2

Circuit Diagrams



Wiring Schematic



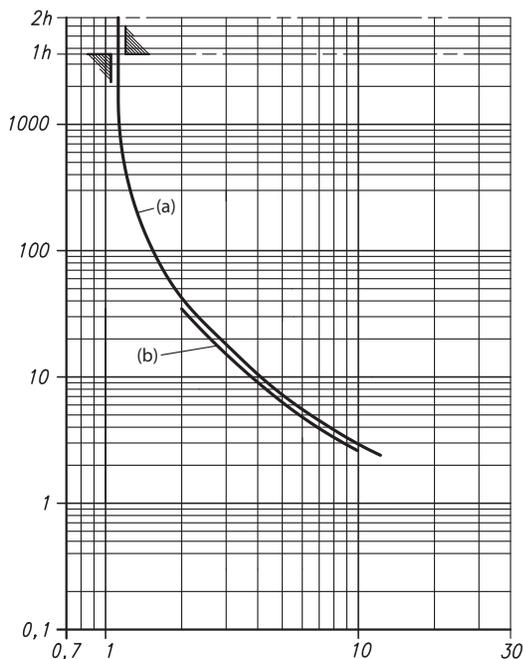
Typical IEC Wiring Schematic

Trip Characteristics

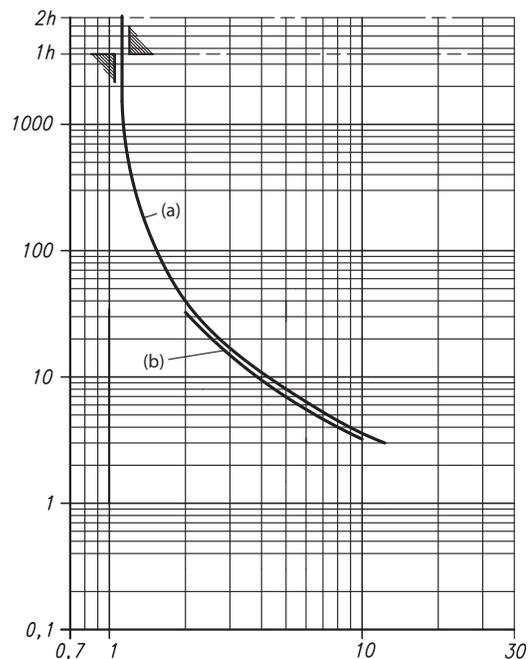
These trip characteristics refer to IEC/EN 60947-4-1 and are average values from cold start at an ambient temperature of 20 °C. Trip time is pictured as a function of operating current. With the device at max. operating temperature, the trip time decreases to approximately 25% of the shown value.

- (a) Tripping characteristics 3-poles from the cold state
- (b) Tripping characteristics 2-poles from the cold state

Cat. Nos. 193-T1AA16...AA40 Overload Relays



Cat. Nos. 193-T1AA50...AB40 Overload Relays

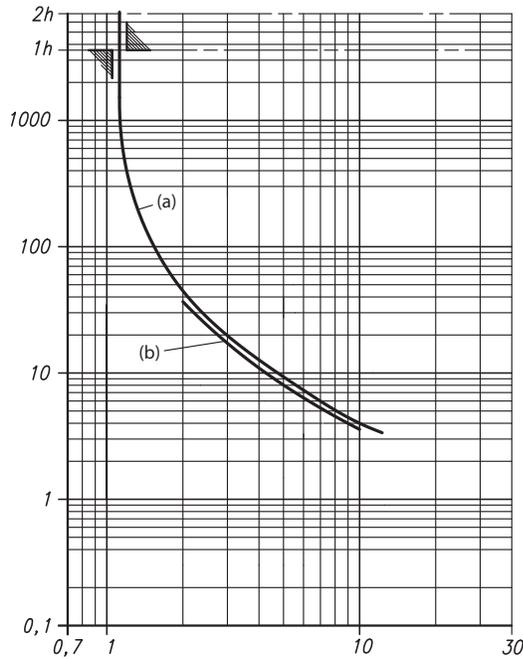


Bimetallic Overload Relays

Specifications

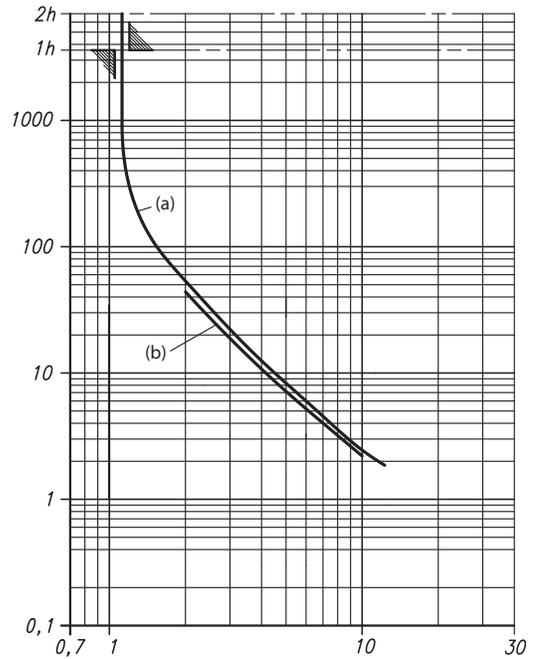
2

Cat. Nos. 193-T1AB48...AC25 Overload Relays

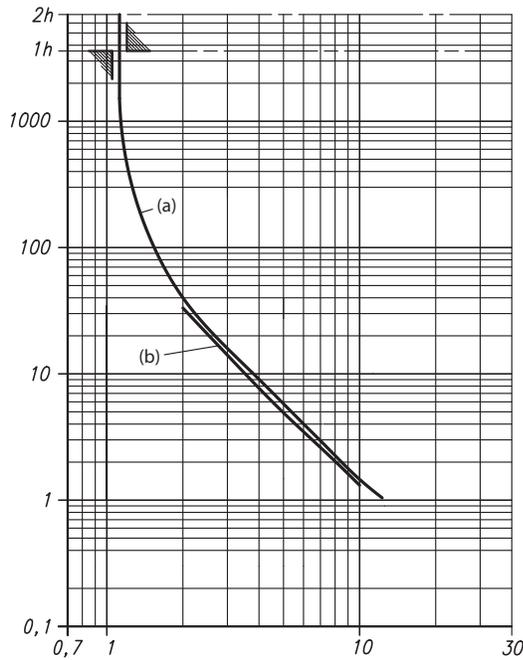


Tripping Time [s]
Multiple of the set current [I_e]

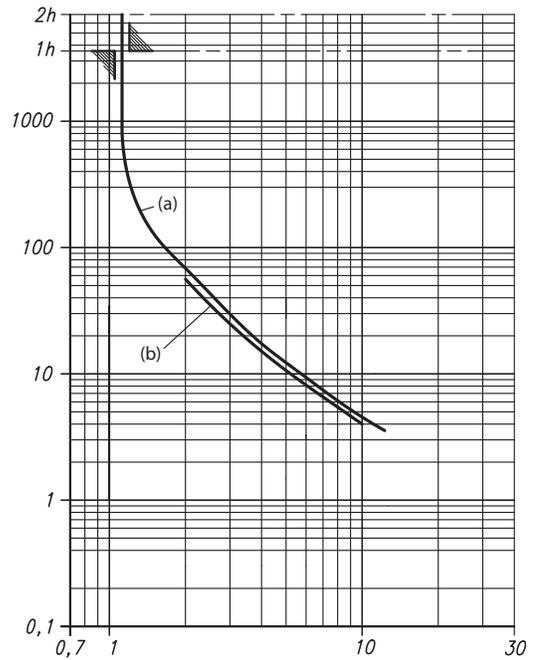
Cat. Nos. 193-T1BC20...BC25 Overload Relays



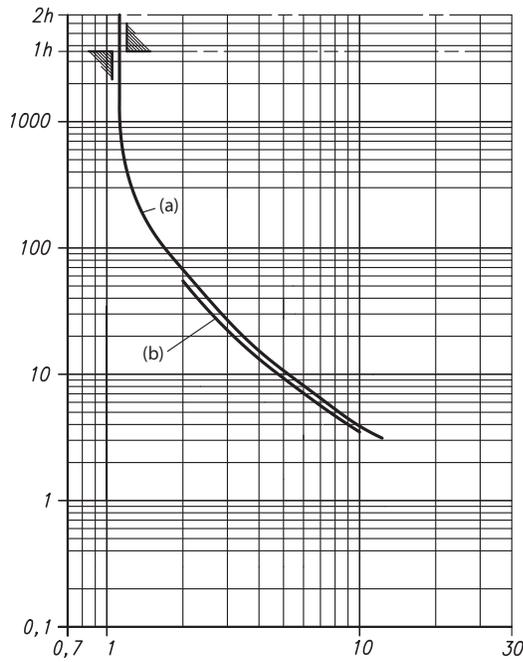
Cat. Nos. 193-T1BC30...BC38 Overload Relays



Cat. Nos. 193-T1CC25...CC47 Overload Relays



Cat. Nos. 193-T1DC47...DC90 Overload Relays

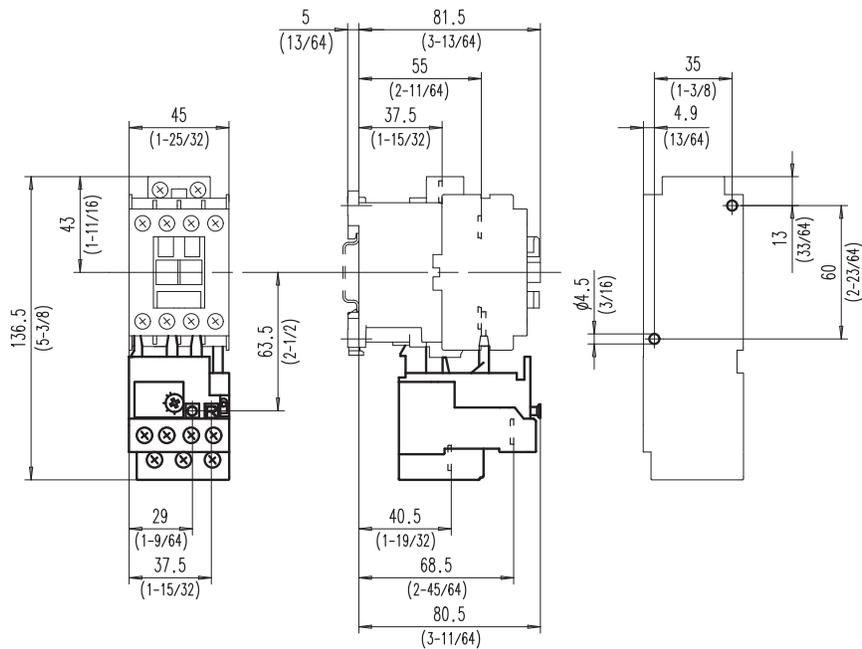


2

Approximate Dimensions

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

Cat. Nos. 193-T1AA16...AC25 Overload Relays

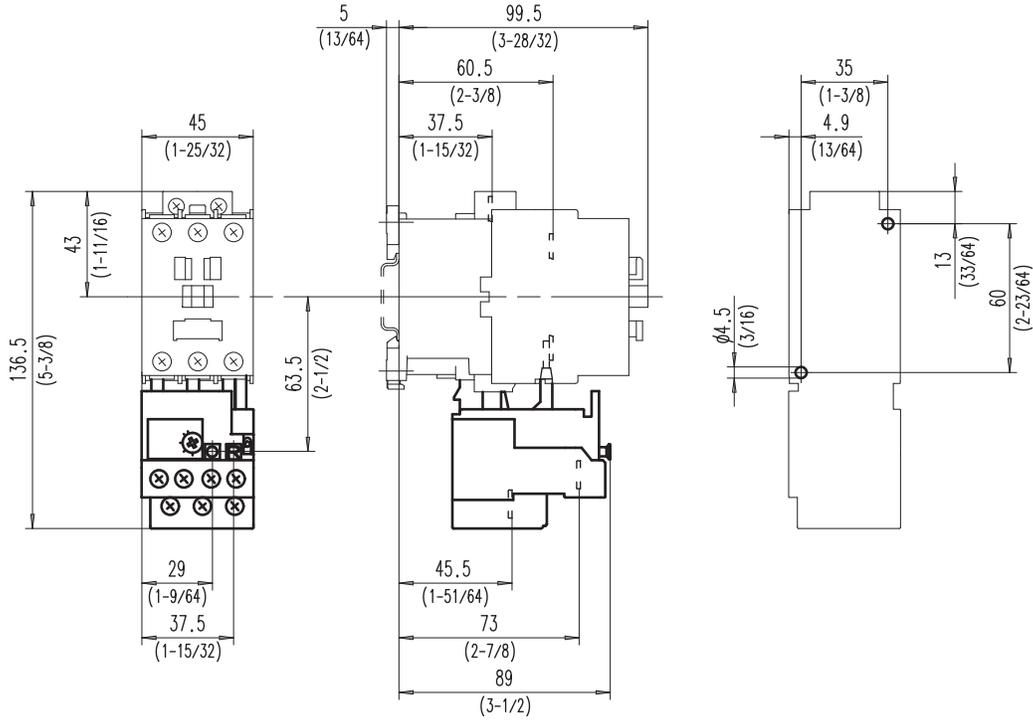


Bimetallic Overload Relays

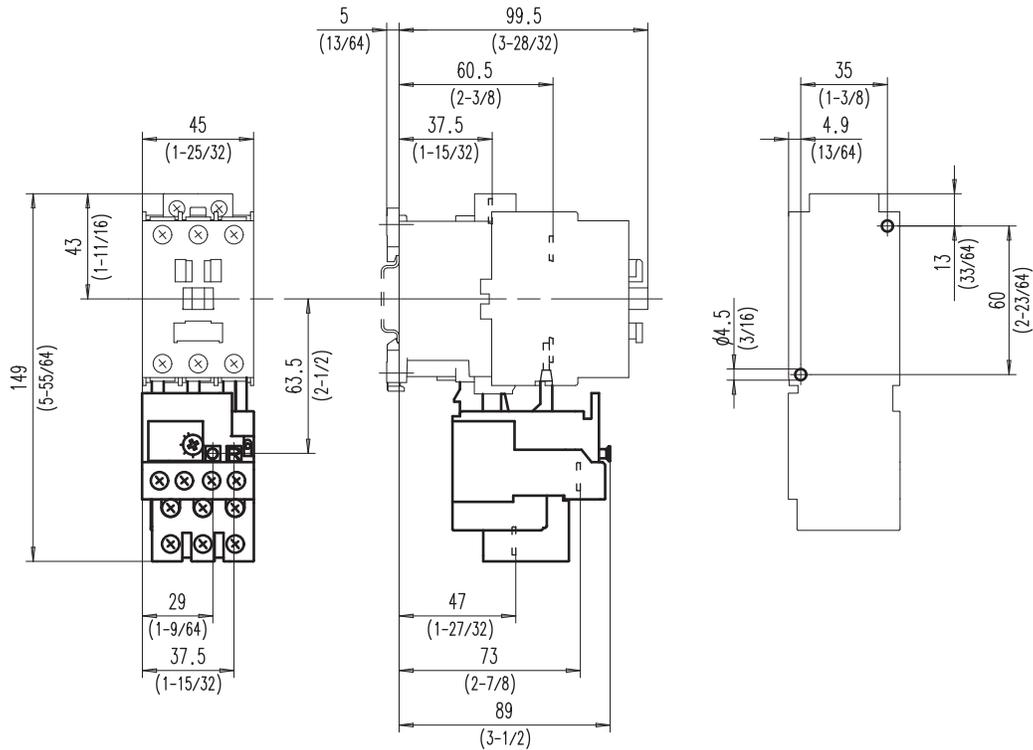
Approximate Dimensions

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

Cat. Nos. 193-T1BC20...25 Overload Relays

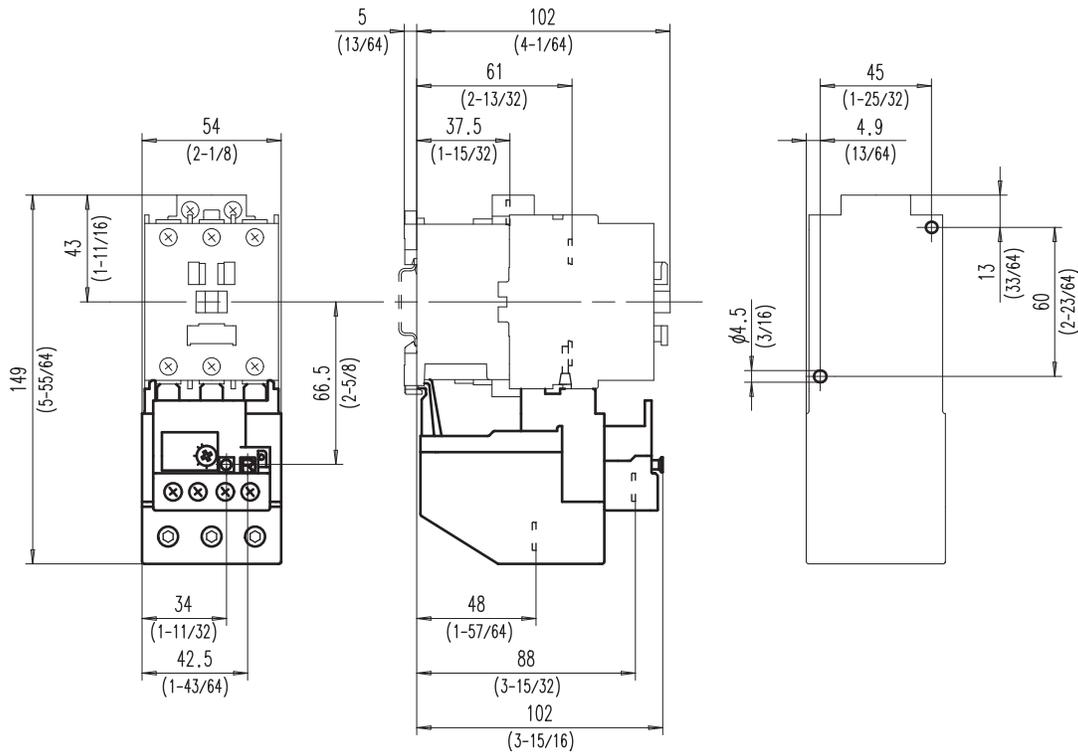


Cat. Nos. 193-T1BC30...38 Overload Relays

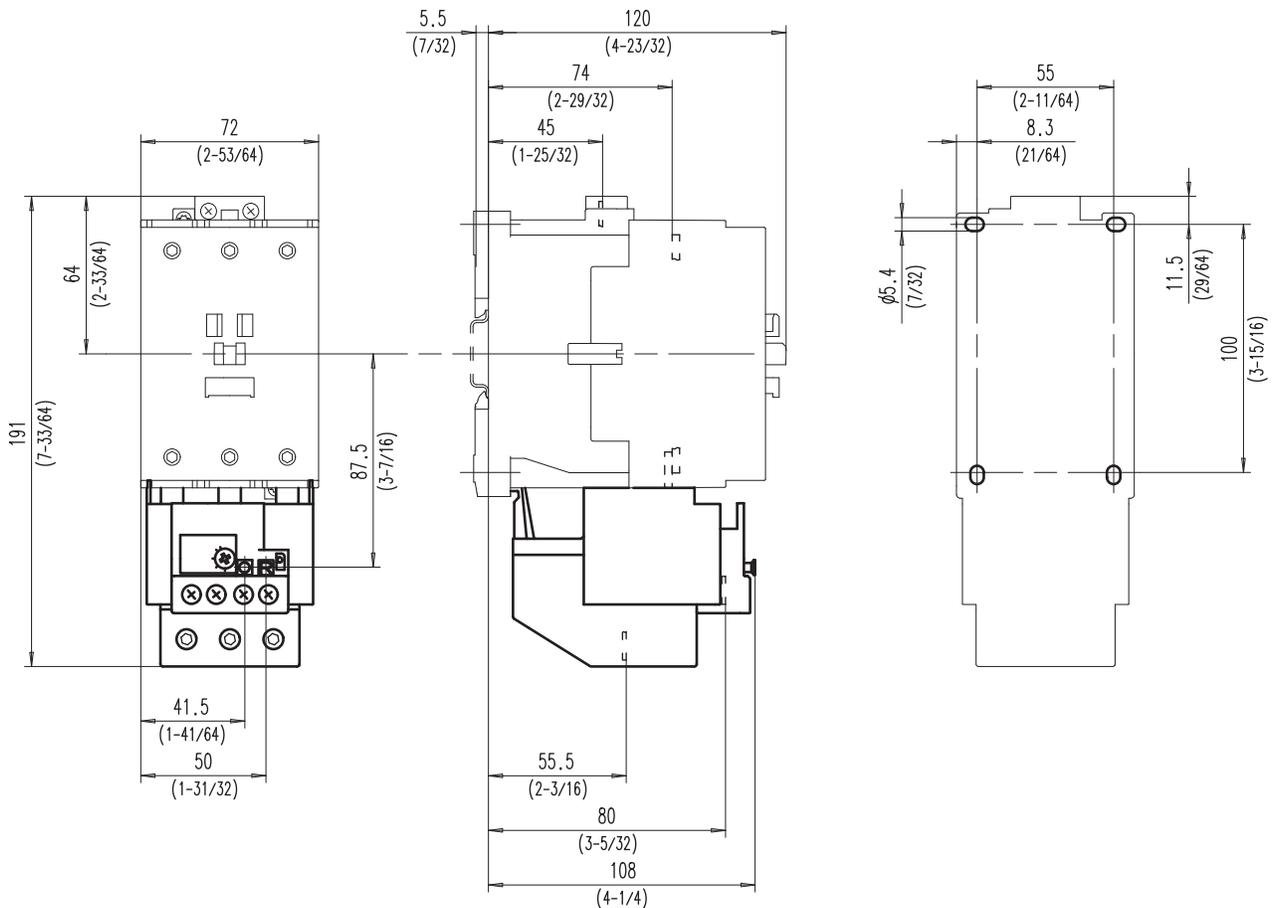


Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Cat. Nos. 193-T1CC25...47 Overload Relays



Cat. Nos. 193-T1DC47...90 Overload Relays

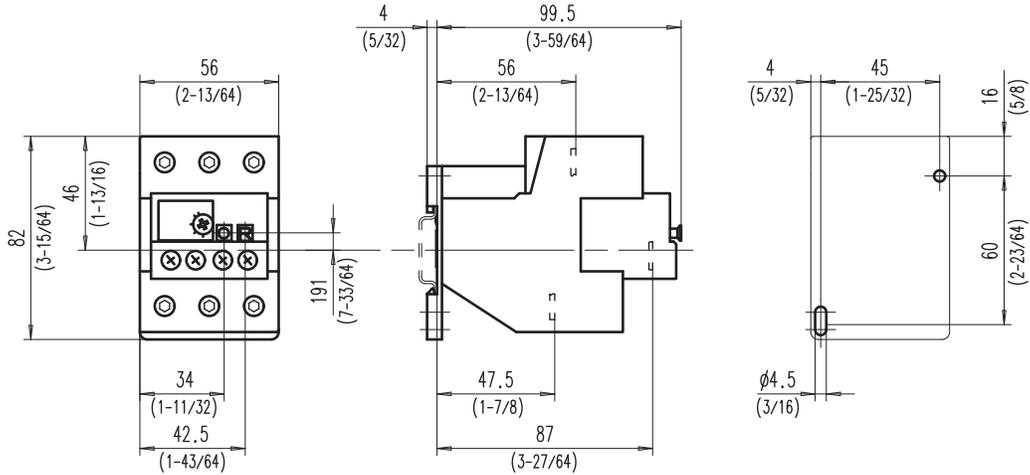


Bimetallic Overload Relays

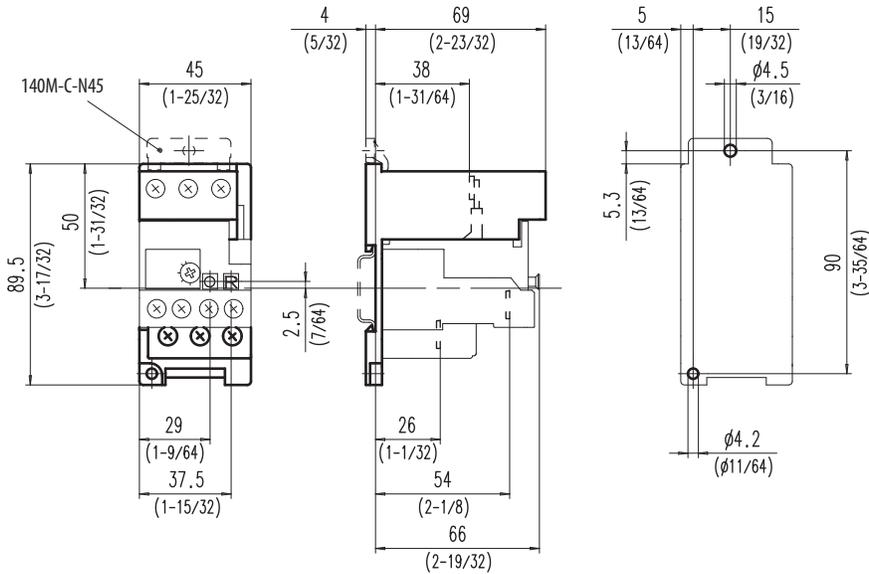
Approximate Dimensions

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

Cat. Nos. 193-T1DC47P...90P Overload Relays

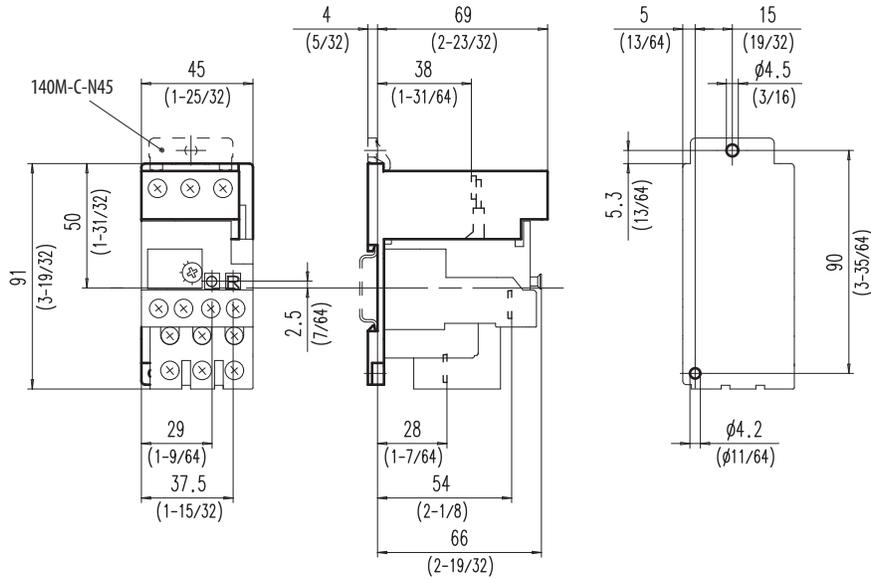


Cat. No. 193-T1APM DIN Rail/Panel Mounting Adapter (for use with Cat. Nos. 193-T1AA16...AC25 and 193-T1BC20...25 Overload Relays)

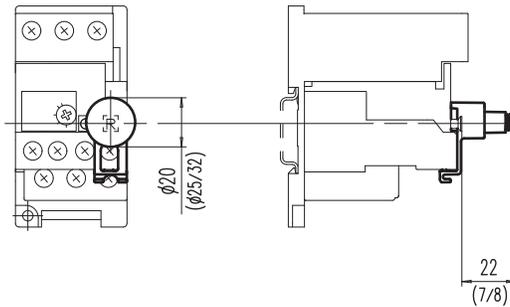


Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

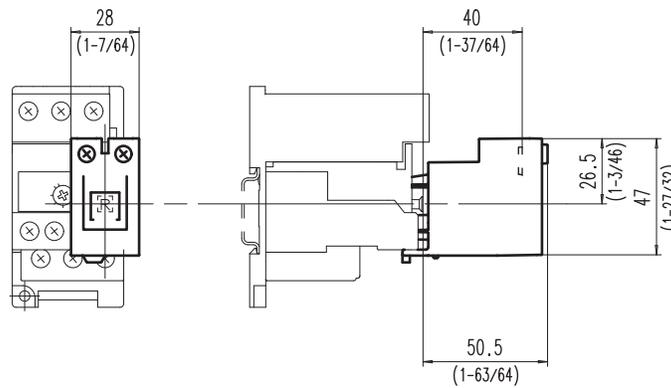
Cat. No. 193-T1APM DIN Rail/Panel Mounting Adapter
 (for use with Cat. No. 193-T1BC30...38 Overload Relays)



Cat. No. 193-RA3 Reset Adapter



Cat. No. 193-T1R Remote Reset Solenoid





Bulletin 825-P

- 0.5...5000 A current range
- 120/240V AC and 24/48V DC Control Power
- Suitable for low- and medium-voltage applications
- Modular design with pluggable options
 - Voltage input card
 - Expansion I/O cards
 - Communications cards, including DeviceNet
 - RTD scanner module
- Conformal Coating options
- Energy Metering
 - MWh
 - MVARh
- Comprehensive protection functions
- Built-in keypad and backlit 2-line LCD
- Test/Reset button
- Status LEDs
- Front accessible RS232 port
- Three output relays
- Two configurable inputs
- NEMA 12 (IP65) compatible

Table of Contents

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Standards Compliance

IEC 60947-1
 IEC 60947-4 Type 2
 Coordination
 CSA C22.2, No. 14
 UL 508

Certifications

UL Listed (File No. E 14840,
 Guide NKCR)
 CSA Certified (File No. LR1234)
 CE
 C-tick

Description

The Bulletin 825-P Modular Protection System for motors offers a compact, modular design that uniquely allows an installer to configure a device's functional capabilities to match the application requirements. Flexibility is also afforded by accommodating future expansion of the system as the application requirements grow. Finally, ease of installation is provided through pluggable options and accessories.

Comprehensive Protection

The Bulletin 825-P Modular Protection System offers in-depth motor protection coverage by monitoring the critical elements of motor current, line voltage and temperature. High resolution settings allow the installer to configure a precise envelope of protection to achieve maximum motor utilization while avoiding damage and downtime.

ANSII No.	Function	ANSII No.	Function
Current Elements		Temperature Elements	
51	Thermal Overload	49	PTC Thermistor
46	Current Imbalance/Phase Loss	49	Stator RTD
50G/51G	Ground Fault	38	Bearing RTD
37	Undercurrent (Load Loss)	—	Ambient and Other RTD
48	Overcurrent (Load Jam)	Power Elements	
50	Short Circuit	37	Underpower
47	Phase Reversal	55/78	Power Factor
81	Frequency	—	Reactive Power
86	Overload Lockout	—	—
Voltage Elements		Motor Starting Elements	
27	Undervoltage	66	Starts/Hour
59	Overvoltage	—	Stall - Acceleration Time Monitoring
47	Phase Reversal	14	Speed Switch Monitoring
81	Frequency	19	Reduced Voltage Starting
—	—	48	Incomplete Start

NOTE: Voltage, power, and energy elements are only available with the installation of the voltage input option card.

Full Function Metering

Current Elements	Voltage Elements	Power Elements	Energy Elements	Thermal Elements
Phase Currents	Line-Line Voltages	Real Power (kW)	Real Energy (MWh)	% Thermal Capacity Utilization
Average Current	Avg. Line-Line Voltage	Reactive Power (kVAR)	Reactive Energy Forward (MVARh)	RTD Values
% Motor Load	Line-Neutral Voltages	Apparent Power (kVA)	Reactive Energy Reverse (MVARh)	—
Current Imbalance	Avg. Line-Neutral Voltage	Power Factor	Apparent Energy (MVAh)	—
Ground Fault Current	Voltage Imbalance	—	—	—
System Frequency	System Frequency	—	—	—

NOTE: Voltage and power elements are only available with the installation of the voltage input option card.

Statistical Values

The 825-P Modular Protection System provides the following valuable statistical values of motor operation:

- Elapsed time of operation
- Stopped time
- Percent of time running
- Number of starts
- Number of emergency starts
- Date and time of last trip reset

Historical Data

The 825-P Modular Protection System saves records for the five most recent trip events. Each trip event is summarized with record of the following prior to trip data capture:

- Event day and time
- Trip identification
- Phase and ground current values
- Voltage values

Function Overview

Description	Trip Level Setting Range	Trip Delay Setting Time	Warning Level Setting Range
Motor FLA I_e	0.5...5000 A	—	—
Locked Rotor Current	2.5...12 x I_e	—	50...100% TCU
Locked Rotor Time	1...600 s	—	—
Short Circuit	4...12 x I_e	0...5.00 s	4...12 x I_e
Ground Fault (Residual)	0.1...1.0 x I_e	0...5.00 s	0.1...1.0 x I_e
Ground Fault (Core balance)	0.01...25 A	0...5.00 s	0.01...25 A
Jam	1.0...6.0 x I_e	0...5.00 s	1.0...6.0 x I_e
Undercurrent	0.1...1.0 x I_e	0...120 s	0.1...1.0 x I_e
Current Imbalance	5...80%	0...240 s	5...80%
Start Monitoring	—	0...240 s	—
RTD Temp	0...250 °C	—	0...250 °C
Phase Reversal	Disable, Enable	—	—
Undervoltage	0.60...1.00 x V_{nom}	0...120 s	0.60...1.00 x V_{nom}
Overvoltage	1.00...1.20 x V_{nom}	0...120 s	1.00...1.20 x V_{nom}
Underpower	1...25000 kW	0...240 s	1...25000 kW
Power Factor	0.05...0.99	0...240 s	0.05...0.99
VAR	1...25000 kVAR	0...240 s	1...25000 kVAR
Frequency	45...55/55...65 Hz	0...240 s	45...55/55...65 Hz
Start Inhibit (Starts/hour)	1...15	—	—
Speed Switch	—	0...240 s	—

Bulletin 825-P
Modular Protection System
 Product Selection

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	Description	Cat. No.	
	Basic Unit Note: The minimum requirements for a complete basic system are one basic unit and one converter module.	120...240V AC/DC 825-PD*	
		24...48V DC 825-PZ*	
	Converter Module	0.5...2.5 A 825-MCM2	
		1.0...5.0 825-MCM5	
		2.5...20 A 825-MCM20	
		20...180 A 825-MCM180	
		160...420 825-MCM420	
		160...630 A 825-MCM630N	
	Core Balance Ground Fault Sensor 100:1	825-CBCT	
	RTD Scanner Module 12 RTD input channels with individual programming for 10 Ω copper, 100 Ω nickel, 120 Ω nickel, or 100 Ω platinum. Fiber optic connection to Basic Unit. Class I, Division 2, Group T48.	120 / 240V AC 825-PR12D	
	Voltage Input Card Monitoring of V_A , V_B , V_C , and V_N	300V AC Line to Neutral Max. 825-PVS*	
	Expansion I/O Card (3) Inputs (4) Output relays (1) 4...20 mA analog output	120V AC Rated Inputs 825-PIOD*	
		24V DC Rated Inputs 825-PIOR*	
	DeviceNet Communication Card DeviceLogix technology, Node address selection switches, ODVA conformance tested.	—	825-PDN*
	Modbus RTU Communication Card	—	825-PMB*
	MPS Explorer Software ‡	Windows-based Configuration Tool	
	Operation Instructions *	Quick Start Guide	825-QS001*
		Basic Unit User Manual	825-UM004*
DeviceNet Card		825-UM005*	

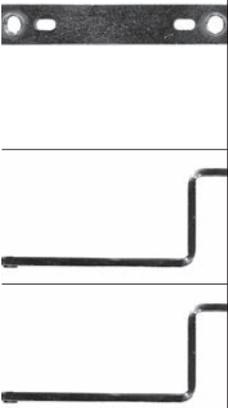
* Factory modification available. For conformal coating add **CC** to the cat. no. **Example: Cat. No. 825-PZ** becomes **Cat. No. 825-PZ-CC**.

‡ Please contact your local Rockwell Automation sales office or Allen-Bradley distributor.

* Detailed operation instructions ship separately from the product. Please contact your local Rockwell Automation sales office or Allen-Bradley distributor to obtain printed copies.

NOTE: A no-charge download can be found at www.rockwellautomation.com/support/firmware.html.



	Description		Cat. No.
	<p align="center">Bus Bars for 825-MCM180 Three-piece set includes terminals and screws</p>	<p>M8 connections Set of three 4 x 16 x 102 mm (1/8 x 5/8 x 4-1/64 in.) (125 A max.) Universally applicable Weight: 230 g</p>	825-MVM
		<p>M8 connections Set of three 4 x 20 x 117 mm (1/8 x 25/32 x 4-39/64 in.) (180 A max.) Universally applicable</p>	825-MVM2
		<p>M6 lower connections Set of three For mounting on Bul. 100-D105 and 100-D110 contactors with conventional coil</p>	825-MVS
		<p>M8 lower connections Set of three For mounting on Bul. 100-D140, 100-D180 conventional and Bul. 100-D105E...100-D180E contactors with electronic coil</p>	825-MVS2
	<p align="center">Terminal Shields</p> <ul style="list-style-type: none"> • 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 	100-D115	100-DTS110
		100-D140, 100-D180, 100-D115-E...100-D180-E	100-DTS180
		100-D210...100-D420	100-DTS420
	<p align="center">Terminal Lugs</p> <ul style="list-style-type: none"> • Set of two • Protection class IP2X per IEC 60529 and DIN 40 050 	100-D115	100-DTB110
		100-D140, 100-D180, 100-D115E...D180E, 193-EC_F, 193-EE_F	100-DTB180
		100-D210...100-D420, 193-EC_G, 193-EF2C, 193-EE_G	100-DTB420
	<p>Thermal Utilization Meter</p>	For display of percent thermal capacity utilized Requires the use of an Expansion I/O Card	825-MTUM
	<p align="center">DeviceNet Configuration Terminal</p> Used to interface with objects on a DeviceNet network. Includes 1 m communications cable (193-CB1).	193-EDN, 193-EC (all), 592-EC (all); 280/281/283/284 ArmorStart, 825-P	193-DNCT
	<p>1 meter communication cable, color-coded bare leads</p>	193-DNCT	193-CB1
	<p>1 meter communication cable, microconnector (male)</p>	193-DNCT	193-CM1
	<p align="center">Panel Mount Adapter/Door Mount Bezel Kit</p>	193-DNCT	193-DNCT-BZ1
<p>EtherNet/IP Communications Auxiliary DeviceNet to EtherNet/IP linking device</p>	Single port	193-EC_C (all), 592-EC_C (all)	193-DNENCAT
	Dual port	193-EC_C (all), 592-EC_C (all)	193-DNENCATR
—	<p>Connection Cable (Replacement) Bul. 825-P to Bul. 825-MCM connection</p>		825-MCA

Bulletin 825-P
Modular Protection System
Specifications

Electrical Ratings

Main Circuits						
Rated Operating Voltage U_e IEC CSA/UL	825-MCM2 825-MCM5		825-MCM20	825-MCM180 825-MCM420 825-MCM630N		
	400V AC 240V AC		690V AC 600V AC	1000V AC 600V AC		
Rated Impulse Strength U_{imp}	2.5 kV		6 kV	8 kV		
Operating Current Range (A)	825-MCM2	825-MCM5	825-MCM20	825-MCM180	825-MCM420	825-MCM630N
	0.5...2.5	1...5	2.5...20	20...180	160...420	160...630
Rated Continuous Thermal Current (A)	3	6	24	216	504	756
Rated Saturation Current (A)	30	60	240	1350	3400	4600
Rated Frequency	50/60 Hz \pm 3 Hz					

Voltage Input Option Card

Rated Operating Voltage U_e	250V AC Max
Operating Range	0.8...1.1 U_e
Rated Continuous Voltage	300V AC
Rated Insulation Voltage U_i	300V AC
Rated Impulse Strength U_{imp}	4kV
Rated Frequency	50/60 Hz \pm 5 Hz

Control Circuits

Supply

Rated Supply Voltage U_s	110...240V AC, 110...250V DC	24...48V DC
Operating Range	0.8...1.1 U_e	0.8...1.1 U_e
Rated Frequency (V AC)	50/60 Hz \pm 5 Hz	—
Max. Power Consumption	40VA (AC) / 15W (DC)	15 W

Output Relays

Type of Contacts	Trip	Form C SPDT
	Aux1...Aux6	Form A SPST — N.O.
Rated Insulation Voltage U_i	300V AC	
Rated Operating Voltage U_e	240V AC	
Rated Impulse Strength U_{imp}	4kV	
Rated Thermal Current I_{the}	5 A	
Rated Operating Current I^p	120V AC	3 A
	240V AC	1.5 A
Contact Rating Designation	B300	
Utilization Category	AC15	
Contact Reliability	5 mA @ 17V	

Inputs

Rated Operating Voltage U_e	IN1 and IN2	IN3, IN4, and IN5
	24V AC/DC	120V AC/DC (825-PIOD), 24V AC/DC (825-PIOR)
Operating Range	0.8...1.1 U_e	
Rated Insulation Voltage U_i	300V AC	
Rated Impulse Strength U_{imp}	4kV	
Rated Frequency (V AC)	50/60 Hz \pm 5 Hz	
On-State Voltage	15V	79V
On-State Current (turn-on)	2 mA	2 mA
Steady-State Current	15 mA	15 mA
Off-State Voltage	5V	20V
Off-State Current	0.5 mA	1 mA
Transition Voltage	5...15V	20...79V

PTC Thermistor Input

Type of Control Unit	Mark A
Max. No. of Sensors in Series	6
Max. Cold Resistance of PTC Sensor Chain	1500 Ω
Trip Resistance	3400 $\Omega \pm$ 150 Ω
Reset Resistance	1500...1650 Ω
Short-Circuit Trip Resistance	25 $\Omega \pm$ 10 Ω

2



Mechanical Ratings

Environmental		
Ambient Temperature	Storage	-40...+85 °C (-40...+185 °F)
	Operation (open)	-20...+60 °C (-4...+140 °F)
Humidity (Operating)		5...95%, non-condensing
Max. Altitude		2000 m
Vibration (Per IEC 68-2-6)		3 G
Shock (per IEC 68-2-27)		30 G
Control Terminals		
Terminal Screw		M3
Cross Section (1 wire, stranded/solid)		0.14...2.5 mm ² (#20...12 AWG)
Terminal Screw Torque		0.79 N•m (7 lb-in)

Electromagnetic Compatibility

Electrostatic Discharge Immunity	Test Level	8 kV Air Discharge, 6 kV Contact Discharge
	Performance Criteria	1 ‡*
RF Immunity	Test Level	10V/m
	Performance Criteria	1 ‡*
Electrical Fast Transient/Burst immunity	Test Level	4 kV (Power), 2 kV (Control and Comms)
	Performance Criteria	1 ‡*
Surge Immunity	Test Level	2 kV L-E, 1 kV L-L
	Performance Criteria	1 ‡*
Radiated Emissions		Class A
Conducted Emissions		Class A

‡ Performance Criteria 1 requires the DUT to experience no degradation or loss of performance.

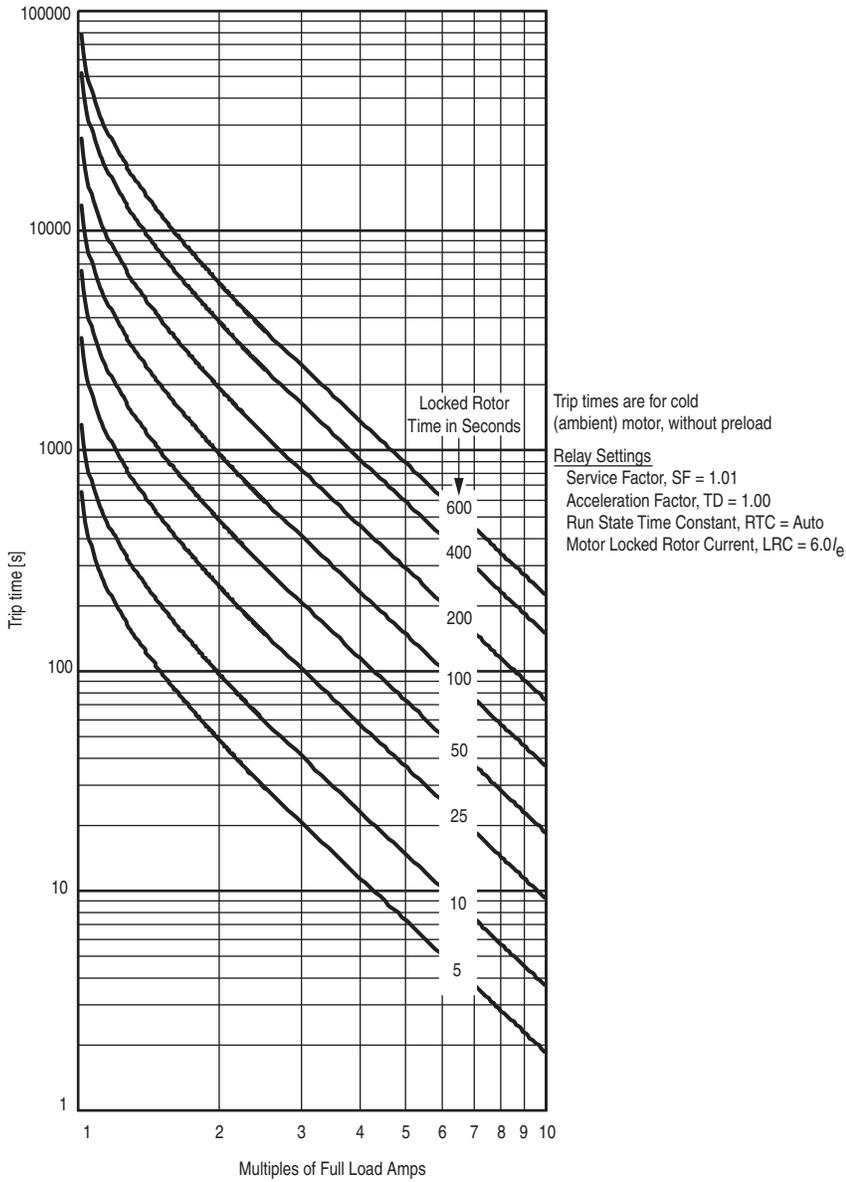
* Environment 2.

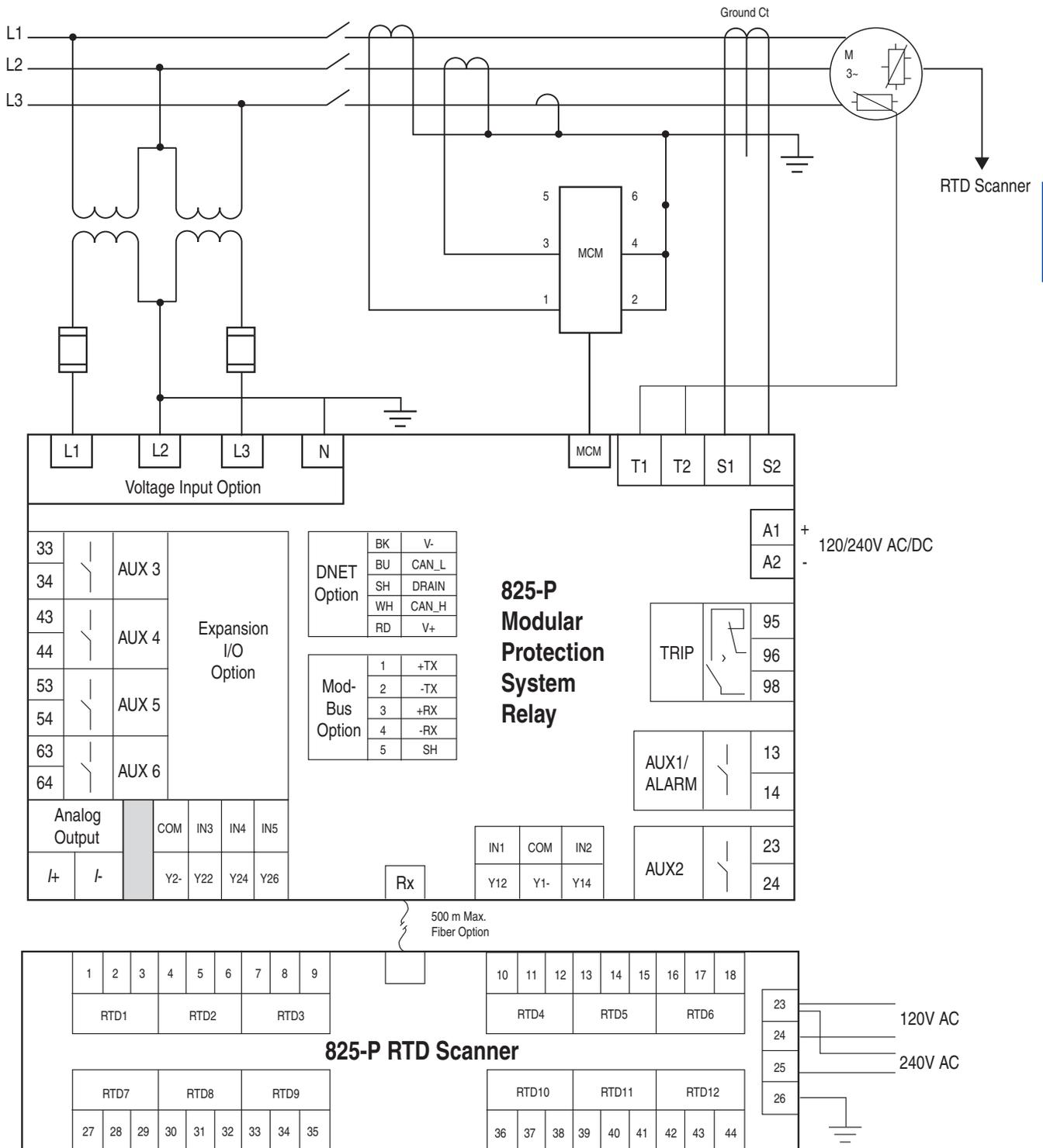
RTD Scanner Module

Supply		
Rated Supply Voltage U_s		110/240V AC
Operating Range		0.80...1.2 U_s
Rated Frequency		50/60 Hz \pm 5 Hz
Max. Power Consumption		5VA
Rated Insulation Voltage U_i		300V AC
Rated Impulse Strength U_{imp}		4 kV
Pollution Degree		2
Environmental		
Ambient Temperature	Storage	-40...+85 °C (-40...+185 °F)
	Operation (open)	-20...+60 °C (-4...+140 °F)
Humidity (Operating)		5...95%, Non-condensing
Max. Altitude		2000 m
Vibration (per IEC 68-2-6)		3 G
Shock (per IEC 68-2-27)		30 G
Inputs		
No. of Input Channels		12
Type		3-wire
Compatibility		CU10, NI100, NI120, PT100 (per IEC 60751: 1983)
Range		-50...+250 °C
Accuracy		\pm 2 °C
Open Circuit Detection		>250 °C
Short-Circuit Detection		< -50 °C
Control Terminals		
Terminal Screw		M3
Cross Section (1 wire, stranded/solid)		0.25...2.5 mm ² (#24...12 AWG)
Torque		0.4...0.6 N•m (3.5...5.3 lb•in.)
Degree of Protection		IP20

Trip Curves

2



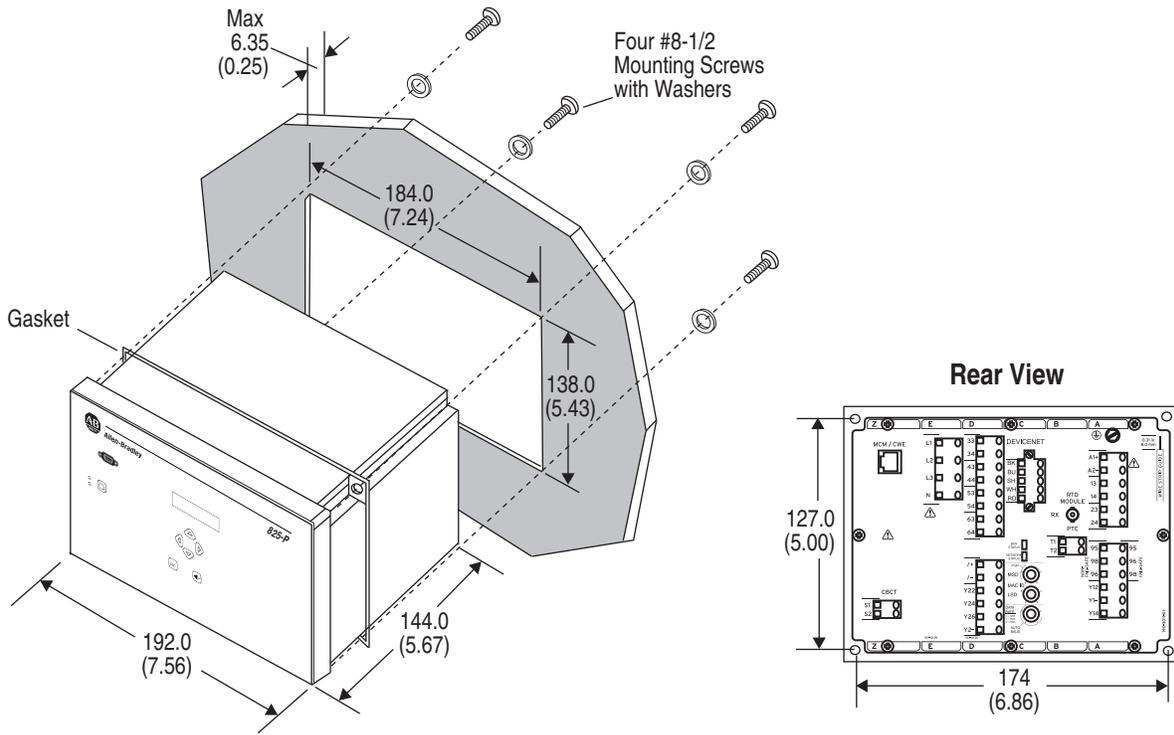


*Open Delta Voltage Connection

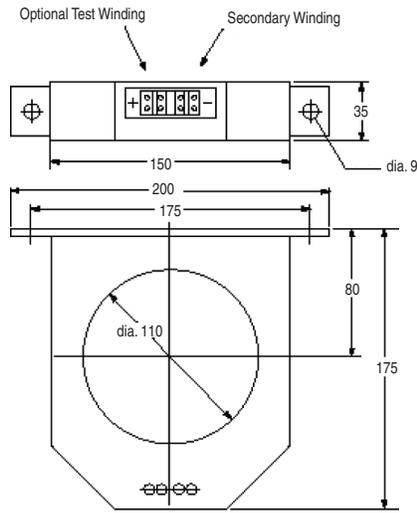
Bulletin 825-P
Modular Protection System
 Approximate Dimensions

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

2



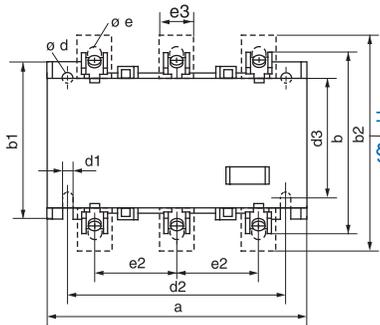
Core Balance Current Transformer



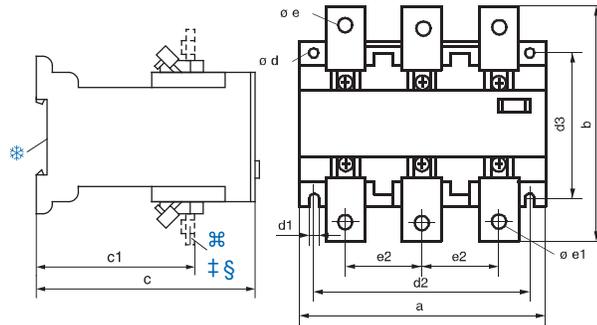
Cat. No. 825-CBCT

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

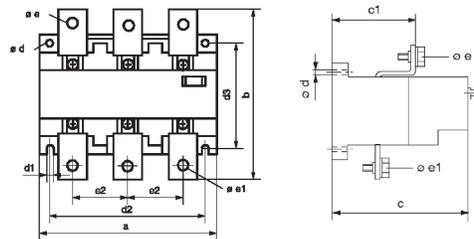
Bulletin 825-MCM Converter Module



Cat. No. 825-MCM2...825-MCM180



Cat. No. 825-MCM420



Cat. No. 825-MCM630N



Dimensions

Cat. No.	a	b	c	c1	ø d	d1	d2	d3	ø e	ø e1	e2	b1	b2
825-MCM2, -MCM5, -MCM20	120	85	102	66	5.3	5.3	100	55	2 x 2.5 mm ²	—	38.5		
825-MCM180	120		102	72	5.3	5.3	100	55	♣	♣	38.5	75	‡/§ 100/118
825-MCM420	155	145	156	118	6.3	6.3	135	88	11	M10	48		
825-MCM630N	155	145	177	118	6.3	6.3	135	88	11	M10	48		

⌘ For snapping on to DIN Rail (EN 50 022-35 x 15 or 35 x 7.5).

♣ Cat. No. 825-MCM180; with bus bar or max. ø 19 mm aperture for looping the conductors.

‡ With Cat. No. 825-MVM.

§ Cat. No. 825-MVM2

♣ See below for bus bars for Cat. No. 825-MCM180.

Bus Bars

Terminal Dimensions

Cat. No.	Terminal Dimensions	
	Bottom	Top
825-MVM	M8	M8

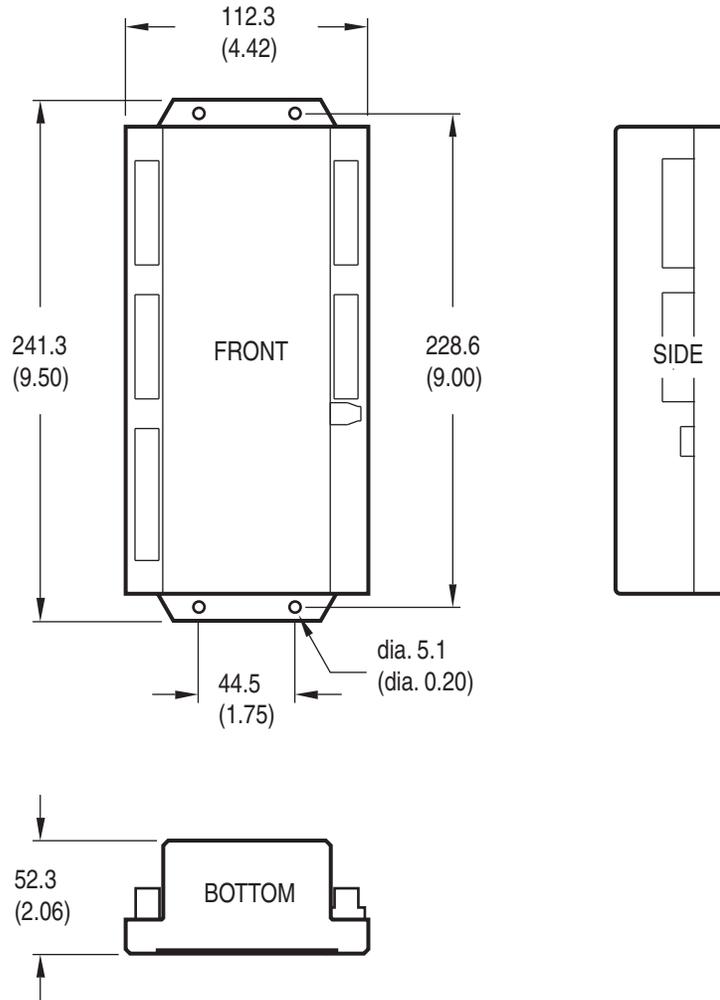
Modular Protection System

Approximate Dimensions

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

RTD Scanner

2





Bulletin 141A MCS Mounting System

- Modularity makes planning easy
- Factory-assembled starters
- Easy starter exchange
- Flexible field assembly of starters
 - DOL starters
 - Reversing starters
 - Star-Delta starters
 - Soft starters
 - Inverter
 - Complete range of accessories
- 3 mounting methods
 - On busbars
 - On 35 mm and 75 mm top hat rails
 - Screw fixing

Table of Contents

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 Modules 2-273
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Standards Compliance

UL 508
 CSA 22.2 No. 14
 EN 60947

Certifications

CE
 cULus

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; not all combinations will produce a valid catalog number.

141A – G S 45 R R 25
 a *b* *c* *d* *e* *f* *g*

a

Type	
Code	Description
C	Compact standard busbar module with wires
G	Standard busbar module with wires

c

Width	
Code	Description
45	45 mm
54	54 mm
63	63 mm
72	72 mm
81	81 mm
90	90 mm
180	180 mm
270	270 mm

d

Top Hat Rail	
Code	Description
R	RA-specific plastic rail
S	Standard plastic rail
M	Metal rail

f

Current Rating	
Code	Description
Blank	0 A (no wires)
16	16 A
25	32 A
45	63 A
125	125 A

b

Length	
Code	Description
C	Compact (160 mm)
S	Short (200 mm)
M	Medium (260 mm)

e

Bottom Hat Rail	
Code	Description
R	RA-specific rail
S	Standard rail
H	Rail carrier
Blank	No bottom rail

g

Frame Size	
Code	Description
H	For 140U-H or 140M-H

141A – F S 45 R S 25
 a *b* *c* *d* *e* *f* *g*

a

Type	
Code	Description
F	Standard busbar module with terminals

c

Width	
Code	Description
45	45 mm
54	54 mm
63	63 mm
72	72 mm
81	81 mm
108	108 mm
110	110 mm

d

Top Hat Rail	
Code	Description
R	RA-specific plastic rail
S	Standard plastic rail
V	Screw mounting variable positions

e

Bottom Hat Rail	
Code	Description
S	Standard rail
Blank	No bottom rail

b

Length	
Code	Description
S	Short (200 mm)
M	Medium (260 mm)
L	Long (320 mm)

f

Current Rating	
Code	Description
25	32 A
63	63 A
200	200 A
250	250 A

g

Terminal Location	
Code	Description
Blank	Terminals on top
T	Terminals on top
B	Terminals on bottom

Bulletin 141A
MCS Mounting System
 Catalog Number Explanation

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; not all combinations will produce a valid catalog number.

141A – S S 45 R R 25
 a *b* *c* *d* *e* *f*

2

a

Type	
Code	Description
S	ISO (isolation) busbar module with wires

c

Width	
Code	Description
45	45 mm
54	54 mm
63	63 mm

d

Top Hat Rail	
Code	Description
R	RA-specific plastic rail
S	Standard plastic rail

f

Current Rating	
Code	Description
Blank	0 A (no wires)
25	32 A
45	63 A

b

Length	
Code	Description
S	Short (200 mm)
M	Medium (260 mm)

e

Bottom Hat Rail	
Code	Description
R	RA-specific rail
S	Standard plastic rail

141A – W S 45 R R P
 a *b* *c* *d* *e* *f*

a

Type	
Code	Description
W	Panel mounting modules

c

Width	
Code	Description
45	45 mm
54	54 mm

d

Top (Middle) Hat Rail	
Code	Description
R	RA-specific plastic rail

f

Terminal Location	
Code	Description
P	With PE terminal

b

Length	
Code	Description
S	Short (200 mm)
M	Medium (260 mm)
L	Long (333 mm)

e

Bottom Hat Rail	
Code	Description
R	RA-specific plastic rail

141A – C U H 125 B
 a *b* *c* *d* *e*

a

Type	
Code	Description
C	Busbar module for specific devices

c

Width	
Code	Description
H	Frame size H
J	Frame size J
L	Frame sizes K and L

d

Current Rating	
Code	Description
125	125 A
250	250 A
600	600 A

e

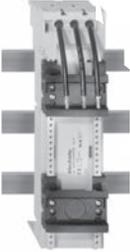
Terminal Location	
Code	Description
Blank	Rear connecting studs (suitable for top or bottom)
T	Wires on top
B	Wires on bottom

b

Length	
Code	Description
U	Universal — 140U or 140M

ISO Busbar Modules

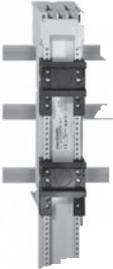
- 2-part construction
 - Device Adapter Plate (or DAP) (carrying the starter) snaps onto the base of the module
 - Base module remains on busbar when exchanging starters, providing isolation from live parts
- Test position with load circuit isolated
- Designed for use with control plug (order separately)
- Modules with current ratings supply the load current by means of wire connections matched to Bulletin 140-M motor protection circuit breakers
- Modules can form bigger platforms using the connection clips (see accessories)
- For plugging on 5 mm or 10 mm thick busbars
- Meets feeder circuit spacings per UL 508A

	Description	Rated Thermal Current I_{th} [A]	Width [mm]	Rails	Pkg. Qty.	Cat. No.
	ISO Busbar Modules with Wires — Short Length Wires on DAP for electrical connection 200 mm tall Top Hat Rails: R = MCS-Specific top hat rail	32	45	2R	1	141A-SS45RR25
			54			141A-SS54RR25
		63	54			141A-SS54RR45
			63	141A-SS63RR45		
		Without electrical connections	45	1R	1	141A-SS45R
			54			141A-SS54R
	ISO Busbar Modules with Wires — Medium Length Wires on DAP for electrical connection 260 mm tall Top Hat Rails: R = MCS-Specific top hat rail; S = Standard top hat rail	32	45	1R+1S	1	141A-SM45RS25
			54			141A-SM54RS25
		63	54			141A-SM54RS45
			63			141A-SM63RS45
		Without electrical connections	45	1S	1	141A-SM45S
			54			141A-SM54S
			63			141A-SM63S

Standard Busbar Modules

- Modules plug directly onto the busbar
- Suitable for use with control plug
- Modules with current ratings supply the load current by means of wire or terminal connections
- Modules can form bigger platforms using the connection clips (see accessories)
- For plugging on 5 mm or 10 mm thick busbars
- Meets feeder circuit spacings per UL 508A

2

	Description	Rated Thermal Current I_{th} [A]	Width [mm]	Rails	Pkg. Qty.	Cat. No.
	Standard Busbar Modules with Wires — Compact Length With wires for electrical connection, 160 mm tall For use with Cat. No. 141A-CTU3 Compact Busbar Supports Top Hat Rails: R = MCS-Specific top hat rail	32	45	1R	1	141A-CC45R32
		63	54			141A-CC54R63
	Standard Busbar Modules with Wires — Short Length With wires for electrical connection, 200 mm tall Top Hat Rails: R = MCS-Specific top hat rail S = Standard top hat rail	16	45	2R	1	141A-GS45RR16
			54			141A-GS54RR16
		32	45			141A-GS45RR25
			54			141A-GS44RR25
		63	54	141A-GS44RR45		
			63	141A-GS63RR45		
		125 (For 140-CMN)	90	141A-GS90M125		
			180	141A-GS180M125		
		125 (For 140M-H, 140U-H, and 140UE-H)§	270	141A-GS270M125		
			180	141A-GS180M125H		
Without electrical connections (e.g., for reversing starters)	45	141A-GS45R				
	54	141A-GS54R				
	72	141A-GS72S				
81	1R	141A-GS81S				
	1S					
	Standard Busbar Modules with Wires — Medium Length With wires for electrical connection 260 mm tall Top Hat Rails: R = MCS-Specific top hat rail S = Standard top hat rail	32	45	1R+1S	1	141A-GM45RS25
			54			141A-GM54RS25
		63	54			141A-GM54RS45
			63	141A-GM63RS45		
		Without electrical connections (e.g., for reversing starters)	45	141A-GM45S		
			54	141A-GM54S		
63	141A-GM63S					
	Standard Busbar Modules with Terminals — Short Length 200 mm tall With terminals for electrical connection S = Standard top hat rail	32	45	1S	1	141A-FS45S25
			54			141A-FS54S63
		63*	63			141A-FS63S63
			72			141A-FS72S63
			81			141A-FS81S63
	Standard Busbar Modules with Terminals — Medium Length 260 mm tall With terminals for electrical connection S = Standard top hat rail	32	45	2S		141A-FM45SS25
			54			141A-FM54SS63
		63*	63			141A-FM63SS63
			72			141A-FM72SS63
			81			141A-FM81SS63
	Standard Busbar Module with Terminals on Top 222 mm tall With box terminals on top for electrical connection Wire size 70 mm ² (2/0 AWG) Universal mounting capability with sliding pocket nuts (M4)	200	108	—	1	141A-FS108V200T
	Standard Busbar Module with Terminals on Top 320 mm tall With box terminals on top for electrical connection Wire size 120 mm ² (250 MCM) Universal mounting capability with sliding pocket nuts (M4)	250	110	—	1	141A-FL110V250T
	Standard Busbar Module with Terminals on Bottom 222 mm tall With box terminals on bottom for electrical connection Wire size 70 mm ² (2/0 AWG) Universal mounting capability with sliding pocket nuts (M4)	200	108	—	1	141A-FS108V200B

§ Also requires a Cat. No. 140U-H-DRA DIN Rail adaptor.

* Also requires a Cat. No. 141A-FTS63 spacing adapter for UL508A applications.



Circuit Breaker Mounting Modules for Bulletin 140U and 140M Circuit Breakers

- Modules plug or clamp directly onto the busbar
- For plugging on 5 mm or 10 mm thick busbars

	Description	For Use With	Rated Thermal Current I_{th} [A]	Width [mm]	Pkg. Qty.	Cat. No.
	Standard Busbar Module with Flexible Connecting Wires for electrical connection For use with Bulletin 140U circuit breaker (H-Frame) For use with Bulletin 140M circuit breaker (H-Frame) Meets feeder circuit spacings per UL 508A	140U H-Frame 140M H-Frame (Top feed)	125	90		141A-CUH125T
		140U H-Frame 140M H-Frame (Bottom feed)	125	90		141A-CUH125B
	Standard Busbar Module with Rear Connecting Studs for electrical connection For use with Bulletin 140U circuit breakers (J-, K- or L-Frame) For use with Bulletin 140M circuit breakers (J-, K- or L-Frame) Meets feeder circuit spacings per UL 508A	140U J-Frame 140M J-Frame (Top or bottom feed)	250	105	1	141A-CUJ250
		140U K-Frame 140U L-Frame 140M L-Frame (Top or bottom feed)	630	140	141A-CUL600	

2

Panel Mounting Modules

- Mounts on (2) 35 mm Top Hat Rails, (1) 75 mm Top Hat Rail, or screw mounts
- Suitable for use with control plug

	Description	Width [mm]	Rails	Pkg. Qty.	Cat. No.
	Mounting Module — Short Length 228 mm tall Top hat rails: R = MCS-specific top hat rail For 2-component starters	45	2R	1	141A-WS45RR
		54			141A-WS54RR
	Mounting Module — Medium Length 283 mm tall Top hat rails: R = MCS-specific top hat rail For 3-component starters using 193-ED or -EE overload relays	45	2R	1	141A-WM45RR
		54			141A-WM54RR
	Mounting Module — Long Length 333 mm tall Top hat rails: R = MCS-specific top hat rail For 3-component starters using 193-EC, -ED or -EE overload relays	45	2R	1	141A-WL45RR
		54			141A-WL54RR

Bulletin 141A
MCS Mounting System
 Product Selection

Busbar Components

	Description	Ampere Rating *	Height x Width (mm)	Pkg. Qty.	Cat. No.
	Busbar 800 mm length Tinned copper busbar*	200	12 x 5	3	141A-B125A
		250‡	15 x 5		141A-B155A
		320	20 x 5		141A-B205A
		400‡	25 x 5		141A-B255A
		450	30 x 5		141A-B305A
		360	12 x 10		141A-B1210A
		520	20 x 10		141A-B2010A
		630	30 x 10		141A-B3010A
	Busbar 1200 mm length Tinned copper busbar*	200	12 x 5	3	141A-B125C
		250‡	15 x 5		141A-B155C
		320	20 x 5		141A-B205C
		400‡	25 x 5		141A-B255C
		450	30 x 5		141A-B305C
		360	12 x 10		141A-B1210C
		520	20 x 10		141A-B2010C
		630	30 x 10		141A-B3010C
	Busbar 2400 mm length Tinned copper busbar*	200	12 x 5	12	141A-B125N
		250‡	15 x 5		141A-B155N
		320	20 x 5		141A-B205N
		400‡	25 x 5		141A-B255N
		450	30 x 5	6	141A-B305N
		360	12 x 10		141A-B1210N
		520	20 x 10		141A-B2010N
		630	30 x 10		141A-B3010N
	Double-T Busbar 2400 mm length Tin-plated copper busbar	960	TT	1	141A-BT11NZ
		1250	TT	1	141A-BT12NZ

* Ratings shown are based upon tested conditions at an ambient temperature of 40 °C and a busbar temperature of 70 °C.

* Only available in North America.

‡ IEC applications only

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Busbar Components, Continued

	Description	Busbar [mm]	Pkg. Qty.	Cat. No.
	Busbar Support — Compact 60 mm pole center spacing 3-pole with inside mounting holes (meets feeder circuit spacings per UL508A) includes end cover	12 x 5 or 12 x 10	10	141A-CTU3
	Busbar Support 60 mm pole center spacing 3-pole with inside mounting holes (meets feeder circuit spacings per UL508A)	12, 20, 30 x 5 or 12, 20, 30 x 10	10	141A-TU3
	Busbar Support 60 mm pole center spacing 3-pole with inside mounting holes (approved for branch circuit applications per UL508)	12...30 x 5 or 12...30 x 10	10	141A-TR3
	Busbar Support 60 mm pole center spacing 4-pole with inside mounting holes			141A-TR4
	Busbar Support 1-pole (meets feeder circuit spacings per UL508A) includes PE and N labels	12, 20, 30 x 5 or 12, 20, 30 x 10		141A-TR1
	Busbar Support with terminals 60 mm pole center spacing Terminals for electrical connections 1.5...16 mm ² (#16...6 AWG) 3-pole	12...30 x 5 or 12...30 x 10	10	141A-TR3F16
	Description	No. of Poles	Pkg. Qty.	Cat. No.
	Double-T Busbar Support For double-T busbars 60 mm spacing (meets feeder circuit spacings per UL 508A)	3-pole	3	141A-T13
		1-pole	10	141A-T11
	Busbar End Cover Prevents contact with the busbar ends and prevents busbars from sliding. The end cover can easily be clipped on the busbar support.	3-pole (for use with Cat. Nos. 141A-TU3 or 141A-TR3)	10	141A-TR3E
		4-pole (for use with Cat. No. 141A-TR4)		141A-TR4E
		3-Pole (for use with Cat. No. 141A-T13 double T busbar supports)	4	141A-T13E

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Bulletin 141A
MCS Mounting System
 Product Selection

Busbar Components, Continued

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	Description	Busbar [mm]	Pkg. Qty.	Cat. No.	
	Supply Module 3-pole For use with Compact Busbar Supports, Cat. No. 141A-CTU3 6...50 mm ² (10...1/0 AWG) round conductors and flat conductors up to 6 x 9 x 0.8 54 mm wide (meets feeder circuit spacings per UL 508A)	12 x 5 or 12 x 10	1	141A-CVN350	
	Supply Module 3-pole For use with Compact Busbar Supports, Cat. No. 141A-CTU3 35...150 mm ² (2 AWG...300 MCM) round conductors and flat conductors up to 10 x 20 x 1 90 mm wide (meets feeder circuit spacings per UL 508A)	12 x 5 or 12 x 10	1	141A-CVN3150	
	Supply Module 3-pole 6...50 mm ² (10...1/0 AWG) 54 mm wide (meets feeder circuit spacings per UL 508A)	12...30 x 5 or 12...30 x 10 or TT	1	141A-VN370	
	Supply Module 3-pole 35...120 mm ² (2 AWG...250 MCM) 81 mm wide (meets feeder circuit spacings per UL 508A)		1	141A-VN3120	
	Supply Module 3-pole 95...185 mm ² (3/0 AWG...350 MCM) 135 mm wide	20...30 x 5 or 20...30 x 10 or TT	1	141A-VN3185	
	Supply Module 3-pole for round conductors 120...300 mm ² (250...600 MCM) 135 mm wide		1	141A-VN3300R	
	Supply Module 3-pole for flat conductors up to 32 x 20 mm equivalent to 300 mm ² (300...600 MCM) round conductor ampacity 135 mm wide		1	141A-VN3300F	
	Supply Module 3-Pole (set of 3 terminals) for round conductors 120...300 mm ² (250...600 MCM) 153 mm wide (3 single poles of 51 mm each) (meets feeder circuit spacings per UL 508A) Requires Cat. No. 141A-BK180, 141A-BK228 or 141A-BK250 terminal cover	20...30 x 5 or 20...30 x 10 or TT	1	141A-VU3300R	
	Supply Module 3-Pole (set of 3 terminals) for flat conductors up to 32x20 mm equivalent to 300 mm ² (600 MCM) 153 mm wide (3 single poles of 51 mm each) (meets feeder circuit spacings per UL 508A) Requires Cat. No. 141A-BK180, 141A-BK228 or 141A-BK250 terminal cover		1	141A-VU3300F	
	Single Terminals Single terminals for supplying busbars 2.5...16 mm ² (#14...6 AWG)	12...30 x 5	25	141A-VS116	
		12...30 x 10		141A-VS216	
	Single Terminals Single terminals for supplying busbars 4...35 mm ² (#12...2 AWG)	12...30 x 5		141A-VS135	
		12...30 x 10		141A-VS235	
	Single Terminals Single terminals for supplying busbars 16...70 mm ² (#6...2/0 AWG)	12...30 x 5		141A-VS170	
		12...30 x 10		141A-VS270	
	Single Terminals Single terminals for supplying busbars 16...120 mm ² (#6...250 MCM)	12...30 x 10		141A-VS2120	
	Description	Max. Terminal Space (W x H) [mm]	Busbar [mm]	Pkg. Qty.	Cat. No.
	Brace Terminals 3-pole For the connection of flat or flexible copper busbars (meets feeder circuit spacings per UL508A)	55 x 28	30 x 10 or TT	1	141A-VB75528F
		68 x 28			141A-VB76828F
		105 x 28			141A-VB710528F

Busbar Components, Continued

	Description	Busbar [mm]	Pkg. Qty.	Cat. No.	
	Terminal Cover Finger protection when busbars supplied with single terminals. Attaches directly to busbars. Height: 180 mm, Width: 54 mm	12...30 x 5 or 12...30 x 10	1	141A-BK1	
	Terminal Cover Finger protection when bus bars are supplied by Cat. No. 141A-VU3300_ supply module Attaches directly to bus bars Height: 200 mm Depth: 90 mm	Width: 180 mm	1	141A-BK180	
		Width: 228 mm	1	141A-BK228	
		Width: 250 mm	1	141A-BK250	
	Terminal Cover Kit Customized terminal cover width using end supports, front shroud and top/bottom shroud Shrouds can be cut to desired width Attaches directly to bus bars	Left and right support	1	141A-BKH	
		Front shroud, 1100 mm	1	141A-BKC	
	Busbar Connector System distance: 5...10 mm	12...20 x 5 or 12...20 x 10	12	141A-VC3A	
	Busbar Connector System distance: 13...20 mm	20...30 x 5 or 20...30 x 10	6	141A-VC3B	
	Busbar Connector System distance: 50...60 mm		3	141A-VC3C	
	Busbar Connector System distance: 100...110 mm		3	141A-VC3D	
	Double-T Busbar Connectors For connection of double-T busbar racks with same dimensions, Width: 50 mm	Double-T	6	141A-VC5E	
	Double-T Busbar Connectors For connection of double-T busbar racks with same dimensions, Width: 95 mm		3	141A-VC5F	
	Double-T Busbar Connectors For connection of double-T busbar racks with same dimensions, Width: 150 mm		3	141A-VC5G	
	Phase Separator For UL installation of end-to-end busbar connections 3-pole, including two mounts For use with Busbar Connectors	For use with Cat. No. 141A-VC3A, -VC3B, -VC5E, -VC3C, -VC5F, -VC3D, -VC5G	Width: 105 mm	1	141A-PS105
			Width: 145 mm		141A-PS145
			Width: 200 mm		141A-PS200
	Busbar Shroud Cover — Compact 160 x 700 mm Covers all three busbars For use with Compact Busbar Supports, Cat. No. 141A-CTU3	12 x 5 or 12 x 10	2	141A-CBCF1	
	Busbar Shroud Holder — Compact Two required per section of Busbar Shroud Cover For use with Busbar Shroud Cover — Compact, Cat. No. 141A-CBCF1		10	141A-CBCF1H	
	Busbar Shroud Cover 200 x 1100 mm Covers all three busbars	12...30 x 5 or 12...30 x 10	2	141A-BCF1	
	Busbar Shroud Holder Two required per section of Busbar Shroud Cover		10	141A-BCF1H	
	Single Pole Busbar Covers Snap-on profile for single busbars for protection against electric shock. Length: 1 m, can be cut to length.	12...30 x 5	10	141A-BS5	
		12...30 x 10		141A-BS10	
	Busbar Cover For double-T busbars Length: 1 m; can be cut to length	—	5	141A-BCT1	
	Compartment Section Fits to 141A-T13 double-T busbar supports Adjusts the installation depth	Double-T	48 mm	1	141A-BST48
			76 mm	1	141A-BST76
	Panel Busbar Shroud Provides isolation between busbar and panel (required for feeder-circuit applications per UL 508A) 230 x 810 mm	All	2	141A-BCR	



Bulletin 141A
MCS Mounting System
 Product Selection

Busbar Components, Continued

	Description	Busbar [mm]	Pkg. Qty.	Cat. No.
	Busbar Support Spacer — Compact Fits under Compact Busbar Supports, Cat. No. 141A-CTU3 Adds 18 mm to the depth of the Busbar Support Fulfills phase-to-ground spacing requirements for UL508A applications Panel Busbar Shroud, Cat. No. 141A-BCR, not required	12 x 5 or 12 x 10	10	141A-CTS3
	Busbar Support Spacer — Compact Fits under Compact Busbar Supports, Cat. No. 141A-TU3 Adds 20 mm to the depth of the Busbar Support Fulfills phase-to-ground spacing requirements for UL508A applications Panel Busbar Shroud, Cat. No. 141A-BCR, not required	12, 20, 30 x 5 or 12, 20, 30 x 10	10	141A-TS3

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	Description			Pkg. Qty.	Cat. No.	
	Busbar Fuse Switch 3-pole switch disconnecter with fuses	For fuse links D02, for D01 fuses use reducer	400V AC	63 A*	1	141A-NF0102
		For 10 x 38 NFC cylindrical fuses	690V AC	32 A	1	141A-NF1038
	Fuse base, 3-pole, Class CC For UL Class CC fuses 27 mm wide Withstand rating 200 kA (600V) With spring terminals (meets feeder circuit spacings per UL508A)		600V	30 A	1	141A-NFHCC30
	Fuse base, 3-pole, Class CC with LED For UL Class CC fuses 27 mm wide Withstand rating 200 kA (600V) With spring terminals (meets feeder circuit spacings per UL508A)		600V	30 A	1	141A-NFHCC30L
	Spacer Module Connectable on both sides 9 mm wide			5		141A-NFAD
	Reducer D02 reducer for D01 fuses For 141A-NF0102			20		141A-NFAR
	Class J Busbar Fuse Base For mounting on 10 mm wide and double-T busbars Top or bottom connection For UL Class J fuses		61...100 A	1		141A-NFJ100
			101...200 A	1		141A-NFJ200
			201...400 A	1		141A-NFJ400

* The use of spacer module 141A-NFAD is recommended for a continuous load above 35 A.

Busbar Components, Continued

	Description			Pkg. Qty.	Cat. No.	
	NH Fuse Switch Disconnecter Connection bottom or top Size 00 for plugging on 5, 10 mm thick and double-T busbars. Sizes 1 and 2 conversion kit 141A-NFAFR5 is required for plugging on 5 mm thick busbars. Size 3 only for plugging on 10 mm and double-T busbars.	Size 00 200 x 106 mm	Box terminals 70 mm ²	160 A	1	141A-NFD160
		Size 1 243 x 184 mm	M10 120 mm ²	250 A	1	141A-NFD250
		Size 2 288 x 210 mm	M10 240 mm ²	400 A	1	141A-NFD400
		Size 3 300 x 256 mm	M12 240 mm ²	630 A	1	141A-NFD630
	NH Fuse Switch Disconnecter 3-pole, bottom connections Multi-function handle Lockable in OFF position with 3 padlocks FLAG indicator shows the switch status Fuse can be changed without tools Applicable as main isolator according to IEC/EN 60204-1 (main switch)	Size 00 200 x 106 mm	Box terminals 70 mm ²	125 A	1	141A-NFD125SB
		Size 1 286 x 184 mm	M10 120 mm ²	250 A	1	141A-NFD250SB
	Non-Fused Switch Disconnecter w/ External Operator 3-pole, bottom connections Multi-function handle Lockable in OFF position with 3 padlocks FLAG indicator shows the switch status Fuse can be changed without tools Applicable as main isolator according to IEC/EN 60204-1 (main switch) (additional extension shaft and door handle required)	Size 00 200 x 106 mm	Box terminals 70 mm ²	160 A	1	141A-N160SB
		Size 1 286 x 184 mm	M10 120 mm ²	320 A	1	141A-N320SB
	Pilot Switch For NH-fuse switch disconnectors Signaling ON/OFF position of lid 250V AC/5 A; 30V DC/4 A	Size 00 (Series B)		1	141A-NFASNC0	
		Size 1 (Series B)		1	141A-NFASNC1	
		Size 2...3		1	141A-NFASNFD	
	Wedge Clamp Terminal For NH-fuse switch disconnectors Connection accessories	Size 1 18 x 10 mm	70...150 mm ²	1	141A-NFVF1150	
		Size 2 21 x 15 mm	120...240 mm ²	1	141A-NFVF2240	
		Size 3 25 x 20 mm	150...300 mm ²	1	141A-NFVF3300	
	Conversion Kit For NH-fuse switch disconnecter to reduce size 1 and 2 on to 5 mm busbars	Size 1 and 2		1	141A-NFAFR5	
	Cover for Cable Lugs For NH fuse switch disconnecter Can be clipped on bottom or top	Size 00		1	141A-NFAC00A	
		Size 1		2	141A-NFAC1A	
		Size 2		2	141A-NFAC2A	
		Size 3		2	141A-NFAC3A	
	Rotary Operating Handle For use with Cat. No. 141A-N160SB or 141A-N320SB non-fused switch disconnecter	Black		IP66	1	141A-NDN66
		Red/Yellow		IP66	1	141A-NDRY66
	Operating Shaft For use with Cat. No. 141A-NDN66 or 141A-NDRY66 rotary operating handle	290 mm		1	141A-ND1	
		490 mm		1	141A-ND2	

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	Description	Width [mm]	Pkg. Qty.	Cat. No.
	Hat (DIN) Rails — MCS Top Hat Rail (Plastic) Slides onto mounting modules and is then fixed with screws. Has notches for MCS components (prevents movement of components when used with vertical busbar).	45	10	141A-AHR45
		54		141A-AHR54
		63		141A-AHR63
	Hat (DIN) Rails — Standard Top Hat Rail (Plastic) Slides onto mounting modules and is then fixed with screws.	72	10	141A-AHS72
		81		141A-AHS81
	Control Plug Pull-apart terminal block allows fast and simple disconnection of control wiring. Snaps on the support of the mobile device rail. Composed of plug holder, male and female parts.	8 Pole	1	141A-APC8
		10 Pole	1	141A-APC10
		12 Pole	1	141A-APC12
	Control Plug Holder Suitable for use with 8-, 10-, or 12-pole control plugs.			141A-APH
	Spacer module — for compact busbar modules For 9 mm spacing of mounting modules. Connection clips (Cat. No. 141A-AK) are included for attaching the spacer module to the mounting modules. 160 mm long	9	10	141A-CAS9B
	Spacer module — for Standard or ISO busbar modules For 9 mm spacing of mounting modules. Connection clips (Cat. No. 141A-AK) are included for attaching the spacer module to the mounting modules. 200 mm long	9		141A-AS9B
	Spacer Module — for Panel Mounting modules For spacing of load feeders by 9 mm e.g. for improved cooling. Connection clips (Cat. No. 141A-AK) are included for attaching the spacer module to the mounting modules 228 mm long	9		141A-AS9W
	Connection Clip For joining base of mounting modules.		50	141A-AK
	Micro Switch N.C. Contact Only for ISO Modules. Automatically drops out the contactor when the DAP (Device Adapter Plate) (carrying the starter) is unplugged from the base of the ISO busbar module.		10	141A-AS
	Spacing Adapter For use with 63A standard busbar mounting modules with terminals Cat. No. 141A-FS...63 or 141A-FM...63 Required for UL508A applications		4	141A-FTS63

Module Data

		Iso Modules		Standard Modules with Wire Connections				Standard Modules with Box Terminals			
		141A-S		141A-G, 141A-CC				141A-F			
		32	63	16	32	63	125	32	63	200	250
 stranded	[mm ²] [AWG]	6 10	10 8	4 12	6 10	10 8	—	4 12	16 6	6...70 10...2/0	35...120 2...250 MCM
 solid	[mm ²] [AWG]	—	—	—	—	—	—	4 12	16 6	6...70 10...2/0	35...120 2...250 MCM
 Laminated copper	[mm ²] [AWG]	—	—	—	—	—	43 1/0	—	—	—	—
Insulation rating of conductors	[°C]	105		105				—	—	—	—

* The admissible load of a complete system depends on the system topography and the application parameters. Factors of influence are ambient temperature, air circulation, busbar load, distribution of busbar load, mix of modules and switchgear components.



Supply Modules

		Supply Modules								
		141A-TR3F16	141A-VN370, 141A-CVN350	141A-CVN3150	141A-VN3120	141A-VN3185	141A-VN3300R	141A-VN3300F	141A-VU3300R	141A-VU3300F
 stranded	[mm ²] [AWG]	1.5...16 16...6	6...50 10...1/0	35...150 2...300 MCM	35...120 2...250 MCM	95...185 No. 3/0...350 MCM	150...300 300...600 MCM	—	120...300 250...600 MCM	—
 solid	[mm ²] [AWG]	1.5...16 16...6	6...50 10...1/0	35...150 2...300 MCM	35...120 2...250 MCM	95...185 No. 3/0...350 MCM	150...300 300...600 MCM	—	120...300 250...600 MCM	—
 Laminated copper	[mm]	—	—	—	—	—	—	3 x 20 x 1... 10 x 32 x 1	—	3 x 20 x 1... 10 x 32 x 1
Tightening Torque	[N•m/lb•in]	—	8...10/ 71...89	12...15/ 106...133	12...15/ 106...133	30/266	30/266	30/266	30/266	30/266

Class J Bus Bar Fuse Bases

		Class J Bus Bar Fuse Bases		
		141A-NFJ100	141A-NFJ200	141A-NFJ400
 stranded	[mm ²] [AWG]	6...70 10...2/0	10...150 8...300 MCM	16...300 4...600 MCM
 solid	[mm ²] [AWG]	6...70 10...2/0	10...150 8...300 MCM	16...300 4...600 MCM
Tightening Torque	[N•m/lb•in]	14...16/125...142	16...18/142...160	38...40/336...355

Single Terminals

		Single Terminals		
		141A-VS116, 141A-VS216	141A-VS135, 141A-VS235	141A-VS170, 141A-VS270
 stranded	[mm ²] [AWG]	2.5...16 14...6	4...35 12...2	16...70 6...2/0
 solid	[mm ²] [AWG]	2.5...16 14...6	4...35 12...2	16...70 6...2/0
 Laminated copper				
1. Conductor	[mm]	—	5 x 9 x 0.8	5 x 9 x 0.8
2. Conductor	[mm]	—	—	5 x 9 x 0.8
Clamping area Width x Height	[mm]	7.5 x 7.5	10.5 x 11	14 x 14
Tightening Torque	[N•m/lb•in]	4/35	6/53	10/120

Bulletin 141A
MCS Mounting System
 Specifications

Short-Circuit Current Ratings (support spacing at 800 mm)

Cat. No.	Description	Max. Circuit Bkr. Cat. No.	C. B. Rating	SCCR		Max. Class CC, J or T Fuse	SCCR 480V	Max. Class CC, J or T Fuse	SCCR 600V
				480V	600V				
141A-B125*	12x5 Copper Bus Bar	140U-J6D3-D25	250 A	65 kA	25 kA	400 A	100 kA	400 A	100 kA
141A-B1210*	12x10 Copper Bus Bar	140U-J6D3-D25	250 A	65 kA	25 kA	400 A	100 kA	400 A	100 kA
141A-B205*	20x5 Copper Bus Bar	140U-K6D3-D40	400 A	65 kA	35 kA	500 A	100 kA	400 A	100 kA
141A-B2010*	20x10 Copper Bus Bar	140U-K6D3-D40	400 A	65 kA	35 kA	500 A	100 kA	400 A	100 kA
141A-B305*	30x5 Copper Bus Bar	140U-K6D3-D40	400 A	65 kA	35 kA	500 A	100 kA	500 A	100 kA
		140U-L6D3-D60	600 A	—	35 kA	500 A	100 kA	500 A	100 kA
141A-B3010*	30x10 Copper Bus Bar	140U-K6D3-D40	400 A	65 kA	35 kA	600 A	100 kA	600 A	100 kA
		140U-L6D3-D60	600 A	65 kA	35 kA	600 A	100 kA	600 A	100 kA
141A-BT1*NZ	TT Copper Bus Bar	140U-M6D3-D80	800 A	65 kA	30 kA	800 A Class T	100 kA	600 A	100 kA
141A-TU3	Bus Bar Support	140U-K6D3-D40	400 A	65 kA	35 kA	600 A	100 kA	600 A	100 kA
		140U-L6D3-D60	600 A	65 kA	35 kA	600 A	100 kA	600 A	100 kA
141A-T13	Bus Bar Support	140U-M6D3-D80	800 A	65 kA	30 kA	800 A Class T	100 kA	600 A	100 kA
141A-TR3E	BB Support End Cover	140U-K6D3-D40	400 A	65 kA	35 kA	600 A	100 kA	600 A	100 kA
		140U-L6D3-D60	600 A	65 kA	35kA	600 A	100 kA	600 A	100 kA
141A-T13E	BB Support End Cover	140U-M6D3-D80	800 A	65 kA	30 kA	800 A Class T	100 kA	600 A	100 kA
141A-VN370	Supply Module	140U-J6D3-D25	250 A	65 kA	25 kA	400 A	100 kA	400 A	100 kA
141A-VN3120	Supply Module	140U-K6D3-D40	400 A	65 kA	35 kA	600 A	100 kA	600 A	100 kA
		140U-L6D3-D60	600 A	65 kA	35 kA	600 A	100 kA	600 A	100 kA
141A-VN3185	Supply Module	140U-K6D3-D40	400 A	65 kA	35 kA	500 A	100 kA	300 A	100 kA
141A-VN3300R	Supply Module	140U-K6D3-D40	400 A	65 kA	35 kA	500 A	100 kA	300 A	100 kA
141A-VU3300R	Supply Module	140U-K6D3-D40	400 A	65 kA	35 kA	500 A	100 kA	300 A	100 kA
141A-VS54136F	Profile Terminals	140U-M6D3-D80	800 A	65 kA	30 kA	800 A Class T	100 kA	600 A	100 kA
141A-CUH125B	Circuit Breaker Module	140U-H6C3-D12	125 A	65 kA	25 kA	N/A	N/A	N/A	N/A
141A-CUH125T	Circuit Breaker Module	140U-H6C3-D12	125 A	65 kA	25 kA	N/A	N/A	N/A	N/A
141A-CUJ250	Circuit Breaker Module	140U-J6D3-D25	250 A	65 kA	25 kA	N/A	N/A	N/A	N/A
141A-CUL600	Circuit Breaker Module	140U-K6D3-D40	400 A	65 kA	35 kA	N/A	N/A	N/A	N/A
		140U-L6D3-D60	600 A	65 kA	35 kA	N/A	N/A	N/A	N/A
141A-SS*25 141A-SM*25 141A-GS*25 141A-GM*25 141A-FS*25 141A-FM*25	Bus Bar Module	140M-C2E-B16	1.6 A	65 kA	47 kA	30 A	100 kA	30 A	100 kA
		140M-C2E-C10	10 A	65 kA	30 kA	30 A	100 kA	30 A	100 kA
		140M-C2E-C25	25 A	30 kA	30 kA	30 A	100 kA	30 A	100 kA
		140M-D8E-C25	25 A	65 kA	30 kA	30 A	100 kA	30 A	100 kA
		140M-F8E-C32	32A	65 kA	30 kA	—	—	—	—
141A-SS*45 141A-SM*45 141A-GS*45 141A-GM*45	Bus Bar Module	140M-F8E-C45	45 A	65 kA	18 kA	—	—	—	—

Busbars (required quality)

Material		E-CU blank or tinned
Busbar widths 5 or 10 mm thick	[mm]	12, 15, 20, 25, 30
Tolerance of thickness	[mm]	+0.1/-0.3
Corner radius	[mm]	0.5
Tolerance of center spacing	[mm]	60 +0.5/-0.5
Standard		DIN 46433

General Data

Main Circuits

Rated insulation voltage U_i		
Acc. to IEC, EN	[V]	690
Acc. to UL, NEMA, CSA, EEMAC	[V]	600
Rated impulse withstand voltage U_{imp}	[kV]	8
Rated frequency	[Hz]	50...60
Pollution degree		3
Ambient temperature		
Operation	[°C]	-25...+60
Transport and storage	[°C]	-50...+80

Protection class	
- Modules and busbars	IP00
- Modules and busbars mounted on plate, connected conductors and usage of busbar covers	IP20
- Iso-Modules with device adapter plate removed, from front	IP20 B (finger proof)
Standards and Norms	IEC/EN 60439-1
Certifications	CE, cULus Recognized



Control Circuits

Control plugs		
Rated insulation voltage U_i		
Acc. to IEC, EN	[V]	250
Acc. to UL, NEMA, CSA, EEMAC	[V]	300
Rated impulse withstand voltage U_{imp}	[kV]	4
Rated current at 40 °C ambient temperature I_{th}	[A]	12

Micro switch		
Rated insulation voltage U_i		
Acc. to IEC, EN	[V]	250
Acc. to UL, NEMA, CSA, EEMAC	[V]	300
Rated current		Suitable for switching contactors 100-C AC-coil-voltage \leq 250 V DC-coil-voltage \leq 120 V

Weight [g]

MCS Iso Busbar Module	[g]
141A-SM45RS25	402
141A-SM45S	300
141A-SM54RS25	418
141A-SM54RS45	494
141A-SM54S	327
141A-SM63RS45	502
141A-SM63S	405
141A-SS45R	279
141A-SS45RR25	381
141A-SS54R	305
141A-SS54RR25	396
141A-SS54RR45	472
141A-SS63RR45	480

MCS Standard Busbar Module	[g]
141A-CC45R32	198
141A-CC54R63	218
141A-FM45SS25	293
141A-FM54SS63	349
141A-FM63SS63	370
141A-FM72SS63	408
141A-FM81SS63	429
141A-FS45S25	272
141A-FS54S63	328
141A-FS63S63	349
141A-FS72S63	387
141A-FS81S63	408
141A-GM45RS25	313
141A-GM54RS25	368
141A-GM54RS45	379
141A-GM63RS45	400
141A-GM45S	211
141A-GM54S	277
141A-GM63S	298
141A-GS45R	200
141A-GS45RR25	302
141A-GS54R	226
141A-GS54RR25	347
141A-GS54RR45	358
141A-GS63RR45	379
141A-GS72S	268
141A-GS81S	289
141A-GS90M125	781
141A-GS180M125	1021
141A-GS270M125	1271

MCS Standard Busbar Module >100 A	[g]
141A-FL110V250T	1200
141A-FS108V200B	1000
141A-FS108V200T	1000
MCS Mounting Module	[g]
141A-WL45RR	211
141A-WL45RRP	240
141A-WL54RR	222
141A-WL54RRP	251
141A-WM45RR	189
141A-WM45RRP	212
141A-WM54RR	211
141A-WM54RRP	234
141A-WS45RR	163
141A-WS45RRP	180
141A-WS54RR	204
141A-WS54RRP	221

Busbar Components	[g]	Busbar Components	[g]
141A-BCF1	750	141A-NFHCC30	185
141A-BCF1H	40	141A-NFHCC30L	187
141A-BCR	800	141A-NFJ100	3280
141A-BCT1	380	141A-NFJ200	4500
141A-BK1	144	141A-NFJ400	6900
141A-BK180	395	141A-NFVF1150	116
141A-BK228	425	141A-NFVF2240	199
141A-BK250	440	141A-NFVF3300	247
141A-BKC	420	141A-PS105	172
141A-BKH	90	141A-PS145	196
141A-BKS	150	141A-PS200	218
141A-BS10	101	141A-T11	158
141A-BS5	87	141A-T13	591
141A-BST48	700	141A-T13E	20
141A-BST76	1050	141A-TR1	59
141A-CBCF1	420	141A-TR3	203
141A-CBCF1H	18	141A-TR3E	21
141A-CTS3	52	141A-TR3F16	285
141A-CTU3	68	141A-TR4	256
141A-CVN3150	575	141A-TR4E	28
141A-CVN350	206	141A-TS3	131
141A-N160SB	2160	141A-TU3	127
141A-N320SB	5650	141A-VB710528F	840
141A-ND1	130	141A-VB75528F	500
141A-ND2	220	141A-VB76828F	630
141A-NDN66	570	141A-VC3A	185
141A-NDRY66	570	141A-VC3B	251
141A-NF0102	759	141A-VC3C	565
141A-NF1038	760	141A-VC3D	870
141A-NFAC00A	124	141A-VC5E	494
141A-NFAC1A	107	141A-VC5F	943
141A-NFAC2A	109	141A-VC5G	1461
141A-NFAC3A	156	141A-VN3120	485
141A-NFAD	61	141A-VN3185	1140
141A-NFAFR5	65	141A-VN3300F	1619
141A-NFAR	1	141A-VN3300R	1540
141A-NFASNC0	11	141A-VN370	360
141A-NFASNC1	11	141A-VS116	21
141A-NFASNF	7	141A-VS135	46
141A-NFASNFD	11	141A-VS170	71
141A-NFD125SB	2190	141A-VS2120	109
141A-NFD160	1300	141A-VS216	23
141A-NFD250	3760	141A-VS235	47
141A-NFD250SB	2460	141A-VS270	74
141A-NFD400	5500	141A-VU3300F	1325
141A-NFD630	7840	141A-VU3300R	1550

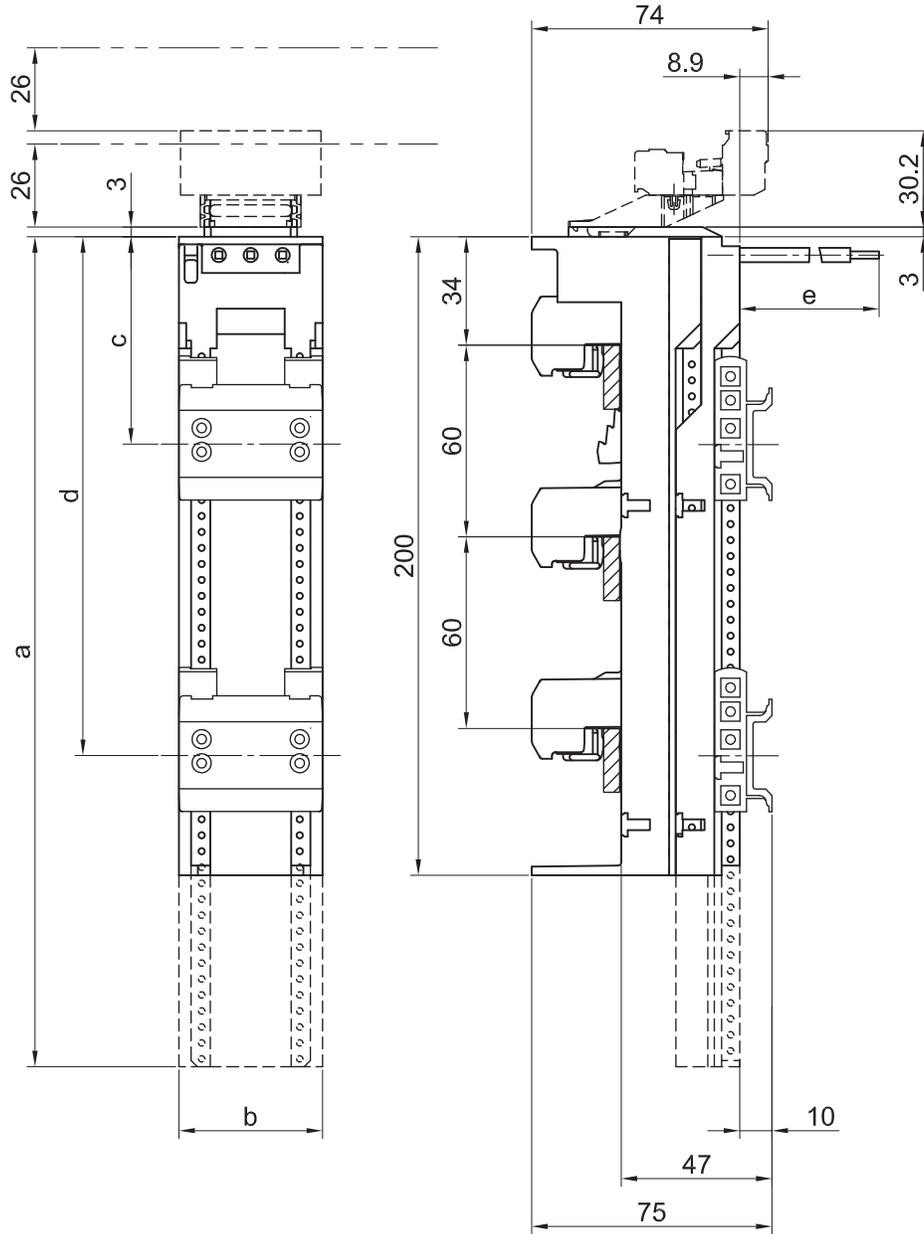
Accessories	[g]
141A-AHR45	15
141A-AHR54	16
141A-AHR63	16
141A-AHS72	17
141A-AHS81	18
141A-AK	1
141A-APC10	35
141A-APC12	40
141A-APC8	29
141A-APH	5
141A-AS	75
141A-AS9B	20
141A-AS9S	38
141A-AS9W	20
141A-CAS9B	20
141A-FTS63	8

Bulletin 141A
MCS Mounting System
 Approximate Dimensions

Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

Cat. No. 141A-S...ISO Busbar Modules

2

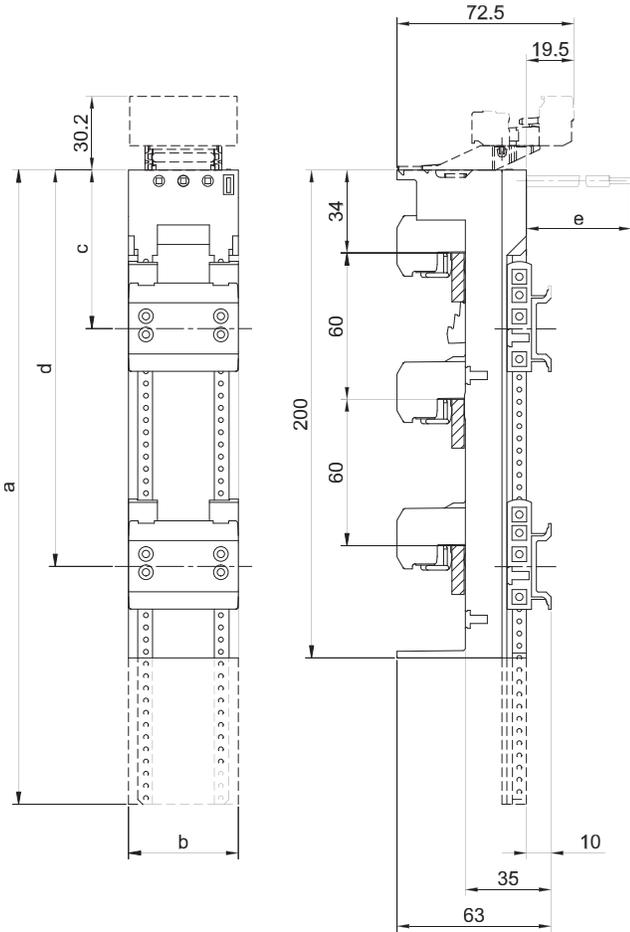


Cat. No.	A	B	C	D	E
141A-SS45RR25	200	45	65	162.5	73
141A-SS54RR25	200	54	65	162.5	73
141A-SS54RR45	200	54	65	170	95
141A-SS63RR45	200	63	65	170	95
141A-SS45R	200	45	—	162.5	—
141A-SS54R	200	54	—	170	—
141A-SM45RS25	260	45	65	170	73
141A-SM54RS25	260	54	65	170	73
141A-SM54RS45	260	54	65	170	95
141A-SM63RS45	260	63	65	170	95
141A-SM45S	260	45	—	170	—
141A-SM54S	260	54	—	170	—
141A-SM63S	260	63	—	170	—

NOTE:
 FREE SPACE REQUIRED TO GET THE
 DEVICE ADAPTER PLATE IN PARKING
 POSITION.

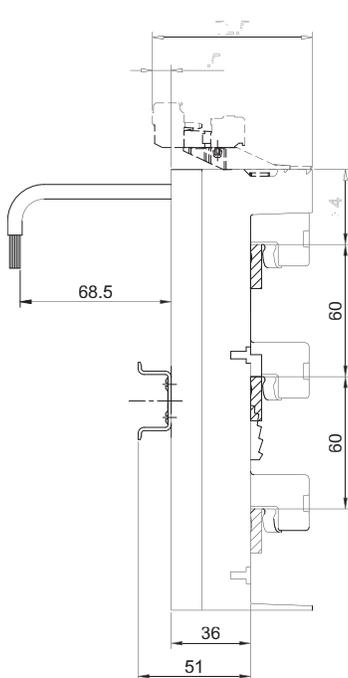
Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

Cat. No. 141A-GS, Standard Busbar Modules with Wires

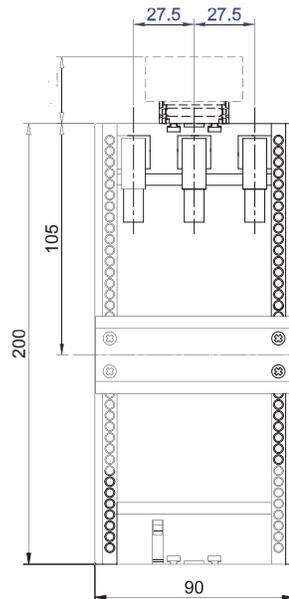


Cat. No.	A	B	C	D	E
141A-CC45R32	160	45	62	—	90
141A-CC54R63	160	54	62	—	90
141A-GM45RS25	260	45	65	170	73
141A-GM54RS25	260	54	65	170	73
141A-GM54RS45	260	54	65	170	95
141A-GM63RS45	260	63	65	170	95
141A-GM45S	260	45	—	170	—
141A-GM54S	260	54	—	170	—
141A-GM63S	260	63	—	170	—
141A-GS45RR16	200	45	65	162.5	73
141A-GS54RR16	200	54	65	162.5	73
141A-GS45RR25	200	45	65	162.5	73
141A-GS54RR25	200	54	65	162.5	73
141A-GS54RR45	200	54	65	170	95
141A-GS63RR45	200	63	65	170	95
141A-GS45R	200	45	—	162.5	—
141A-GS54R	200	54	—	170	—
141A-GS72S	200	72	105	—	—
141A-GS81S	200	81	105	—	—

NOTE:
 FREE SPACE REQUIRED TO PLUG/UNPLUG MODULE INTO THE
 BUSBARS.

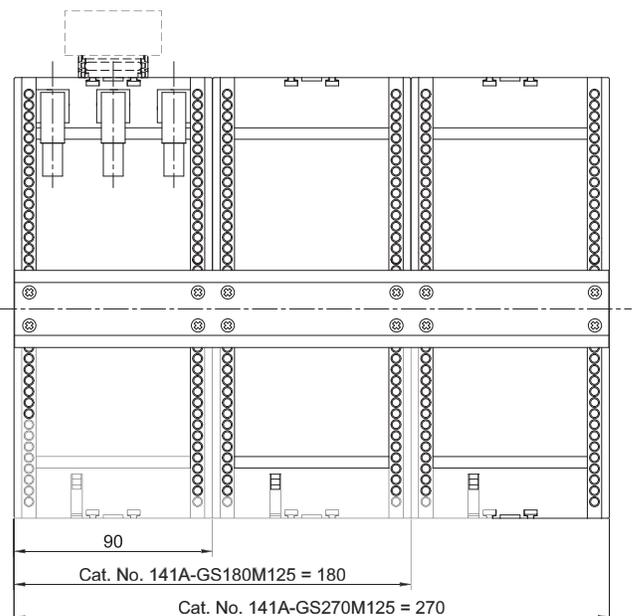


Cat. No. 141A-GS90M125



Cat. No. 141A-GS180M125

Cat. No. 141A-GS270M125



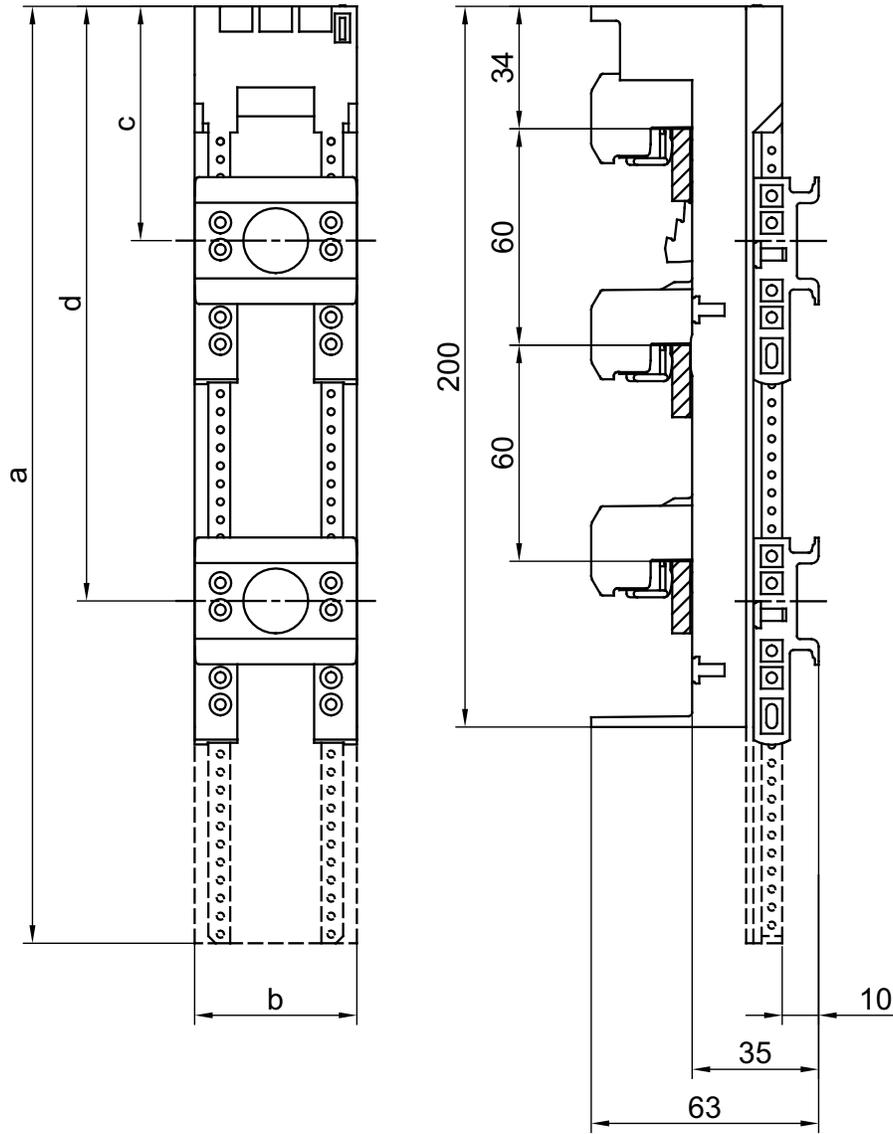
MCS Mounting System

Approximate Dimensions

Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

Cat. No. 141A-F... Standard Busbar Modules with Terminals

2



Cat. No.	a	b	c	d	WIRE SIZES	
					mm ²	AWG
141A-FS45S25	200	45	65	—	6	#10
141A-FS54S63	200	54	65	—	16	#6
141A-FS63S63	200	63	65	—	16	#6
141A-FS72S63	200	72	65	—	16	#6
141A-FS81S63	200	81	65	—	16	#6
141A-FM45SS25	260	45	65	170	6	#10
141A-FM54SS63	260	54	65	170	16	#6
141A-FM63SS63	260	63	65	170	16	#6
141A-FM72SS63	260	72	65	170	16	#6
141A-FM81SS63	260	81	65	170	16	#6

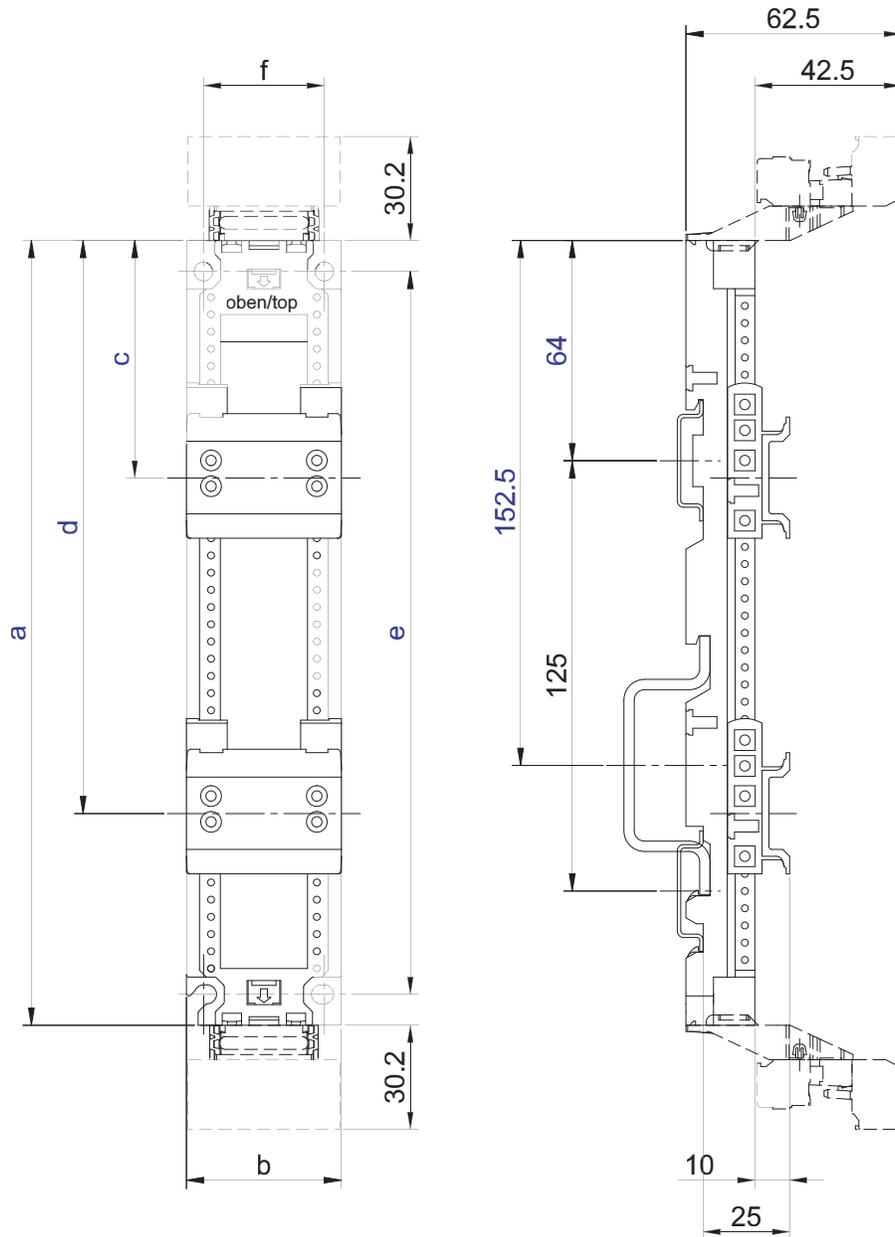
NOTE:

1. FREE SPACE REQUIRED TO PLUG/UNPLUG MODULE INTO THE BUSBARS.



Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

Cat. No. 141A-W... Panel Mount Modules



Cat. No.	a	b	c	d	e	f
141A-WS45RR(P)	228	45	69	166.5	210	35
141A-WS54RR(P)	228	54	69	174	210	40
141A-WM45RR(P)	283	45	69	166.5	265	35
141A-WM54RR(P)	283	54	69	174	265	40
141A-WL45RR(P)	333	45	69	166.5	315	35
141A-WL54RR(P)	333	54	69	174	315	40

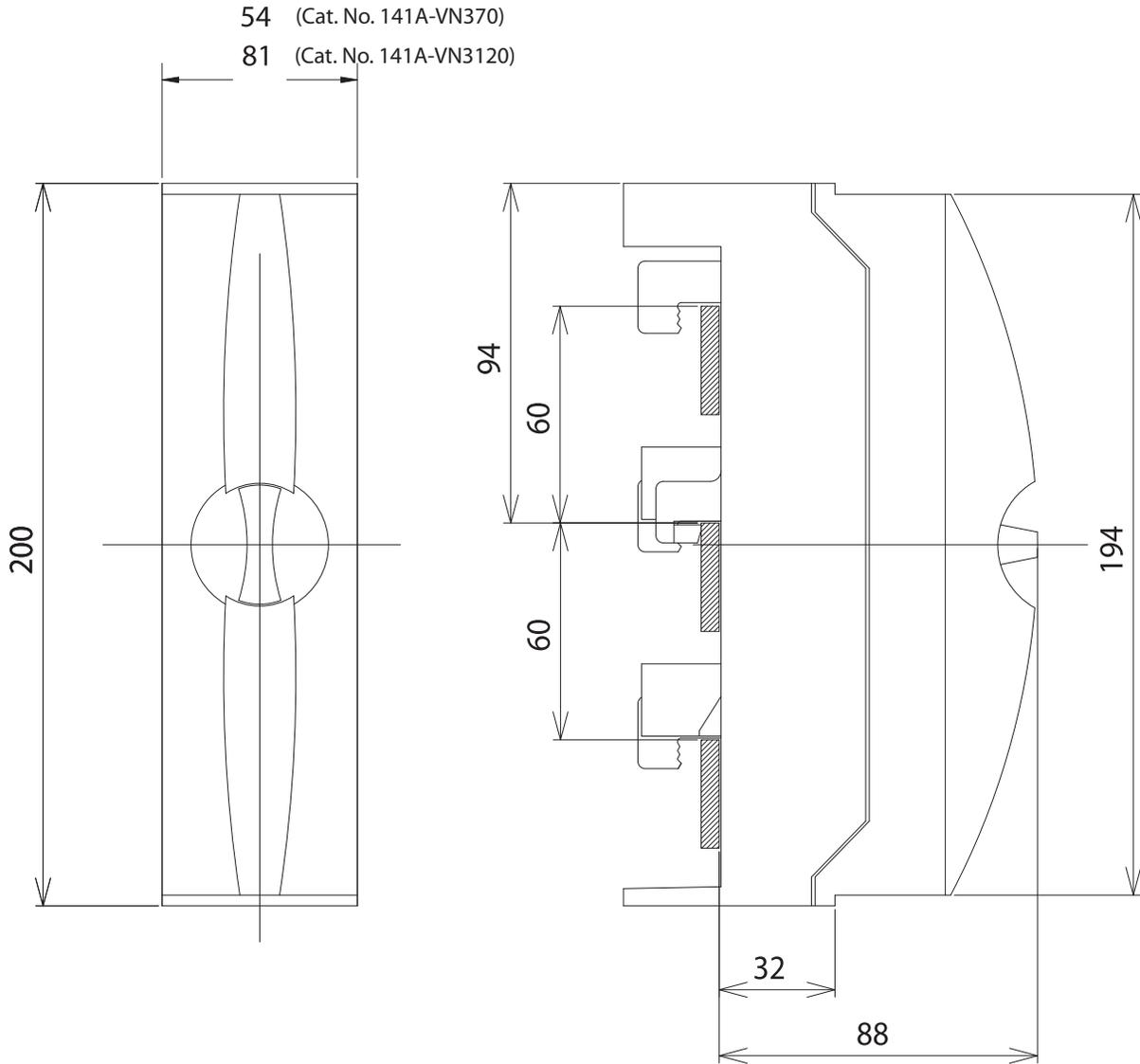
Bulletin 141A
MCS Mounting System
Approximate Dimensions

Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

Supply Modules

Cat. Nos. 141A-VN370 and 141A-VN3120

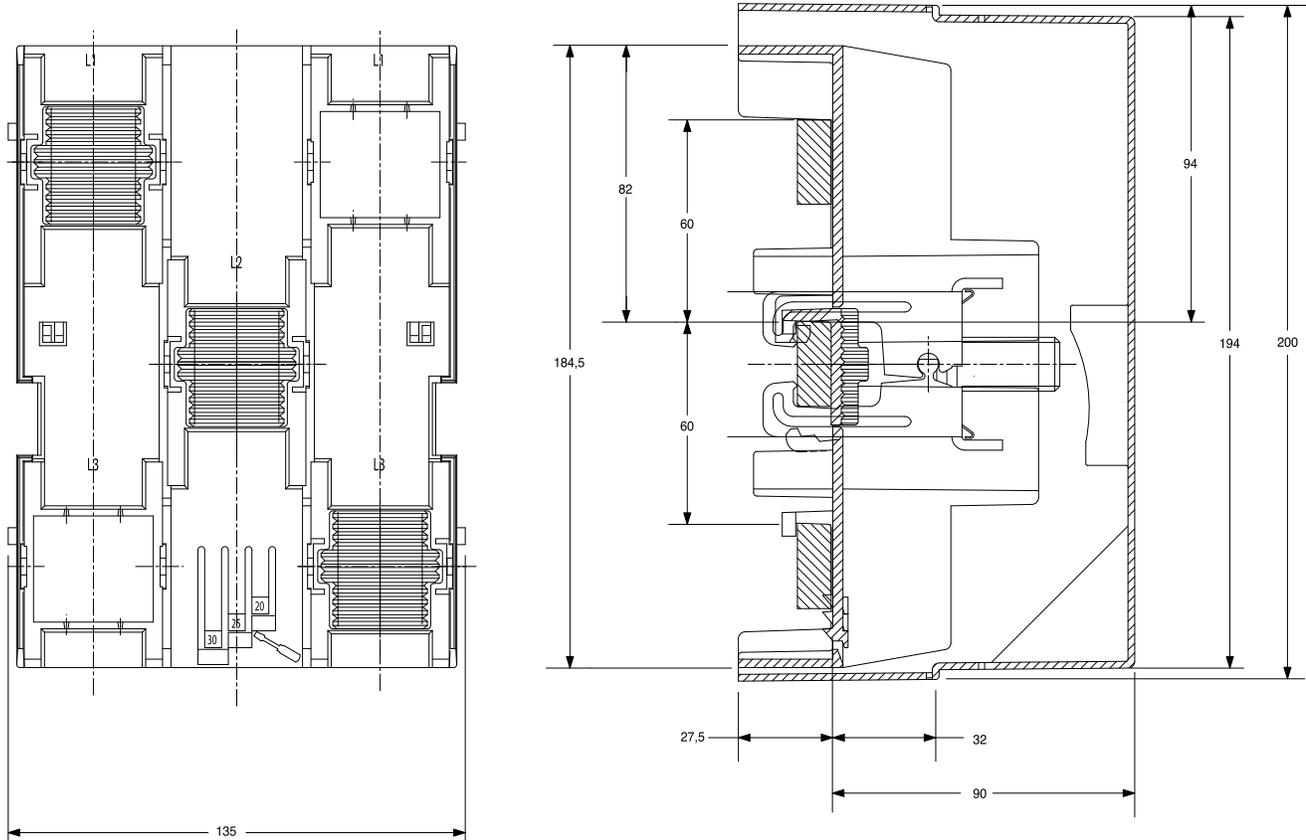
2



Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

Supply Modules, Continued

Cat. Nos. 141A-VN3185, -VN3300R, and -VN3300F



MCS Mounting System

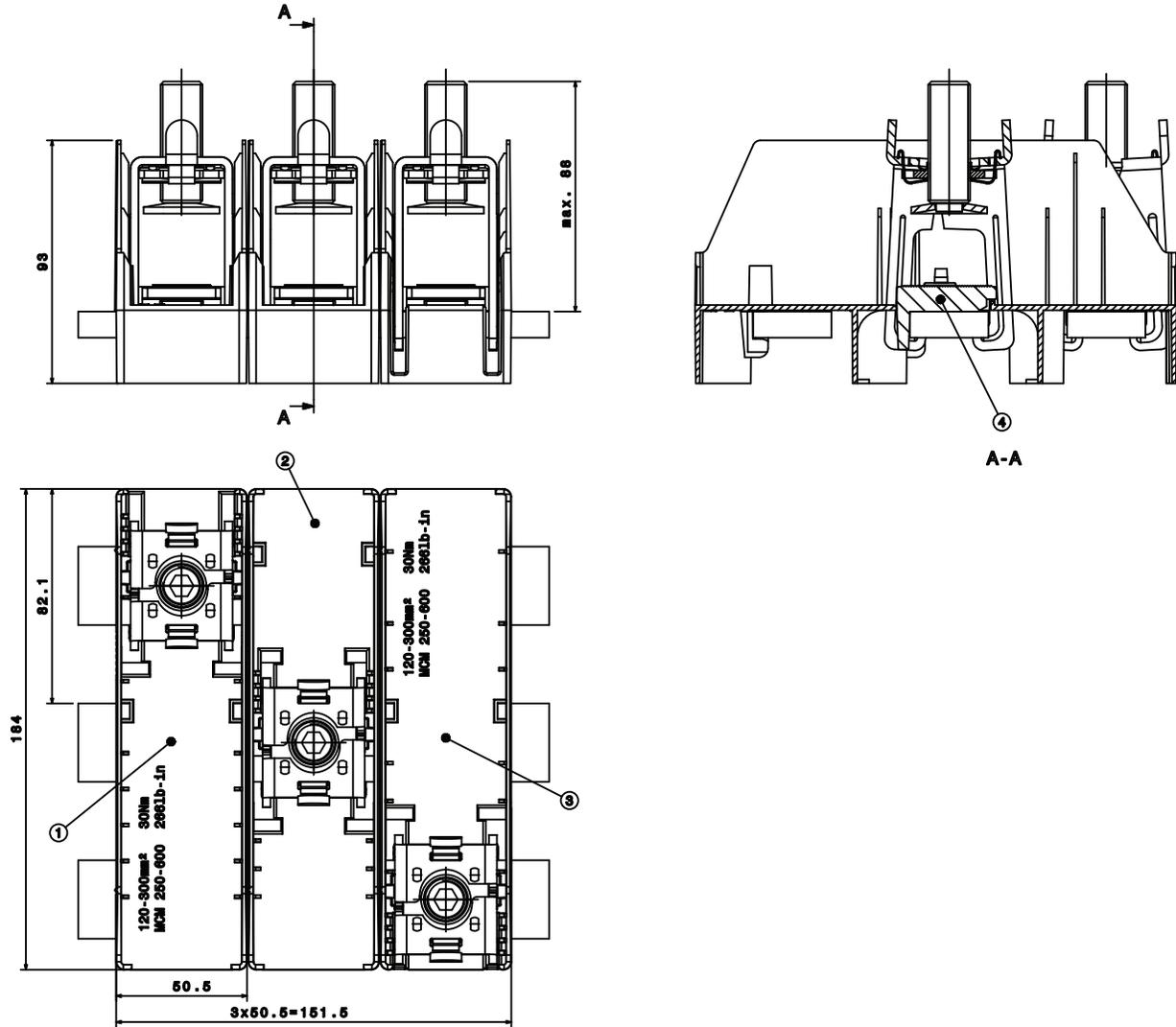
Approximate Dimensions

Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

Supply Modules, Continued

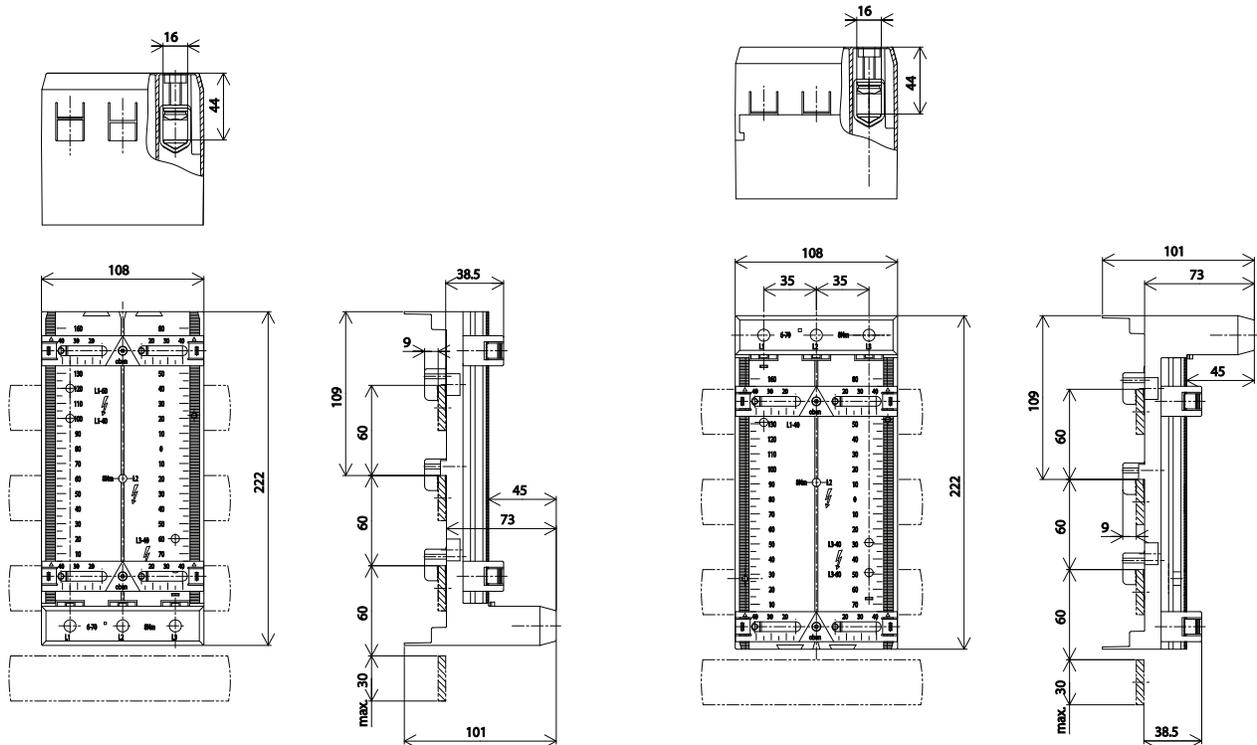
Cat. Nos. 141A-VU3300R and -VU3300F

2



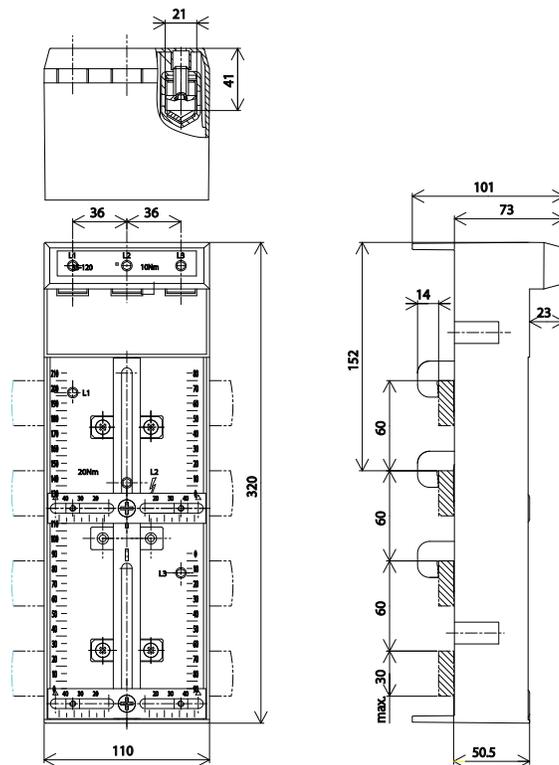
Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

Standard Busbar Modules — Universal Adapters



Cat. No. 141A-FS108V200B

Cat. No. 141A-FS108V200T

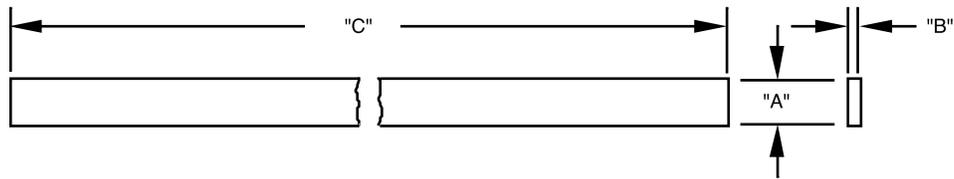


Cat. No. 141A-FL110V250T

Bulletin 141A
MCS Mounting System
 Approximate Dimensions

Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

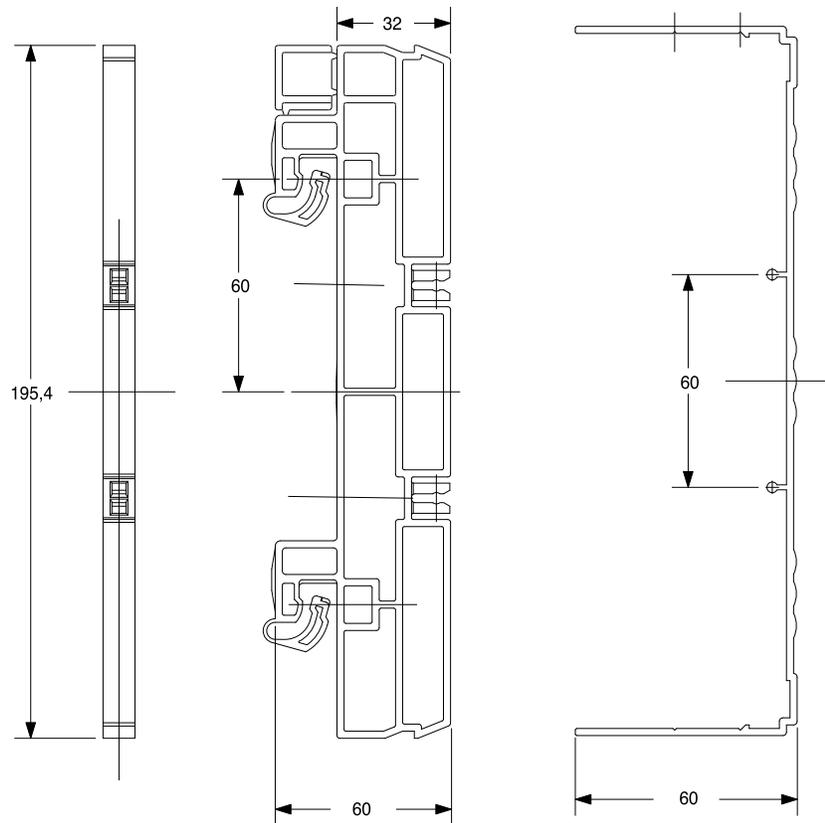
Busbars



2

Cat. No.	A	B	C	Cat. No.	A	B	C
141A-B3010A	30	10	800	141A-B255B	25	5	1600
141A-B2010A	20	10	800	141A-B205B	20	5	1600
141A-B1210A	12	10	800	141A-B155B	15	5	1600
141A-B305A	30	5	800	141A-B125B	12	5	1600
141A-B255A	25	5	800	141A-B3010N	30	10	2400
141A-B205A	20	5	800	141A-B2010N	20	10	2400
141A-B155A	15	5	800	141A-B1210N	12	10	2400
141A-B125A	12	5	800	141A-B305N	30	5	2400
141A-B3010B	30	10	1600	141A-B255N	25	5	2400
141A-B2010B	20	10	1600	141A-B205N	20	5	2400
141A-B1210B	12	10	1600	141A-B155N	15	5	2400
141A-B305B	30	5	1600	141A-B125N	12	5	2400
				141A-BT11NZ	30	40	2400
				141A-BT12NZ	30	40	2400

Cat. Nos. 141A-BCF1, 141A-BCF1H Busbar Cover and Cover Holder

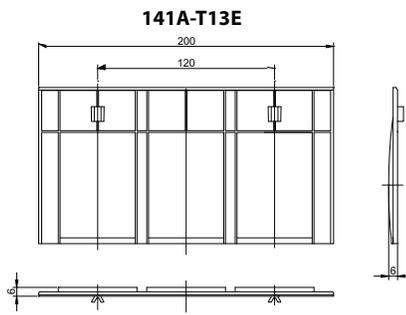
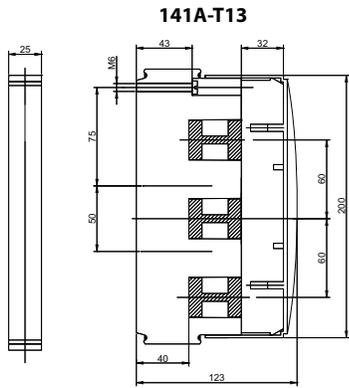
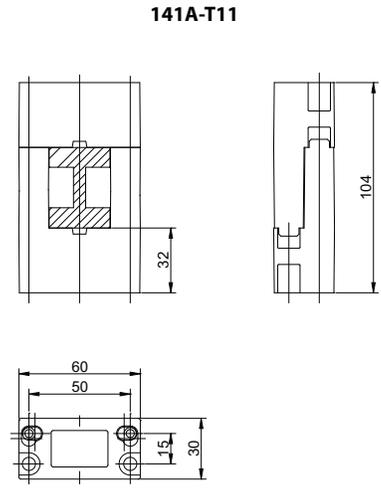
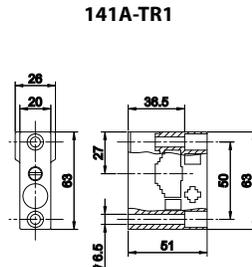
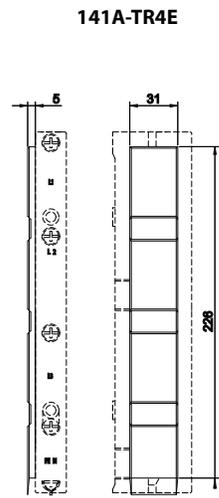
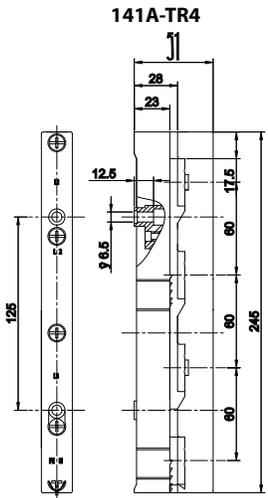
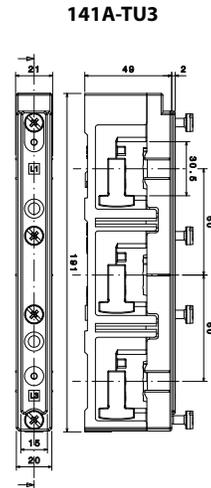
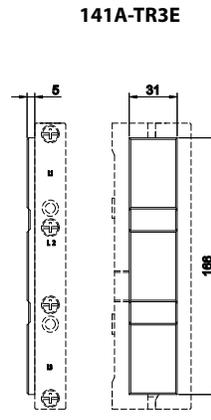
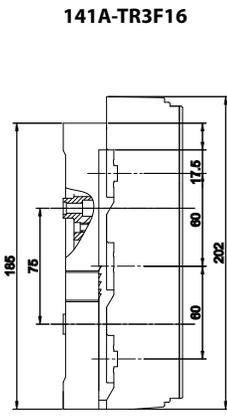
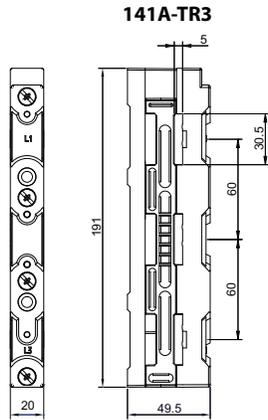


Cat. No. 141A-BCF1

Cat. No. 141A-BCF1H

Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

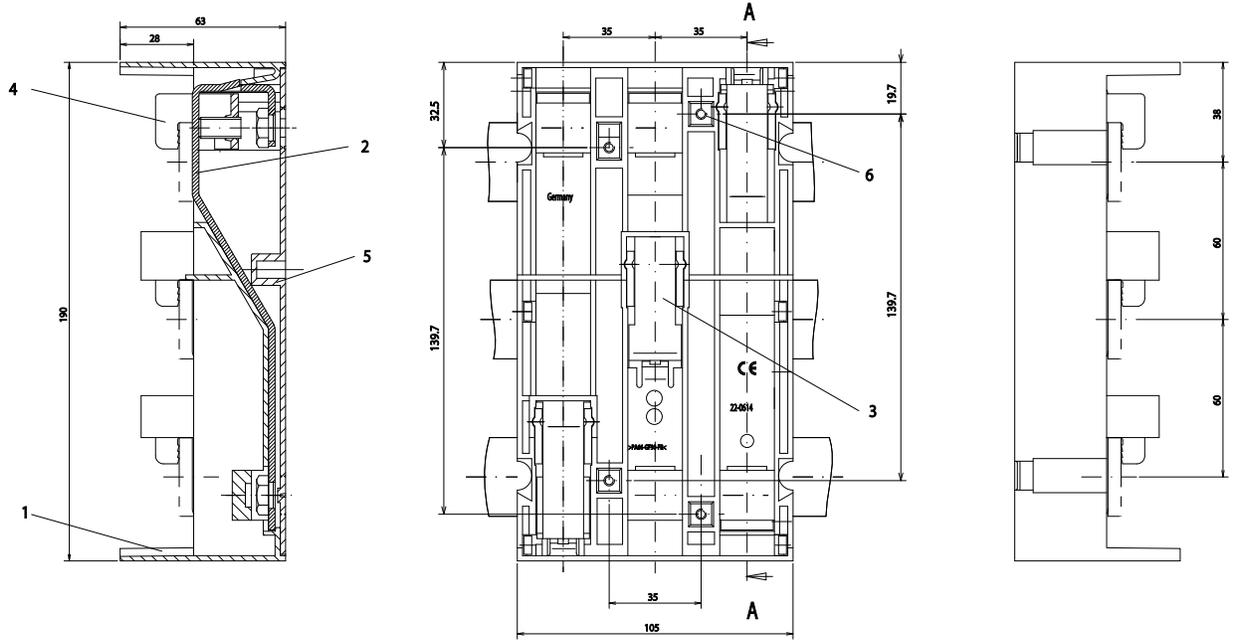
Cat. No. 141A-TR...Busbar Supports and End Covers



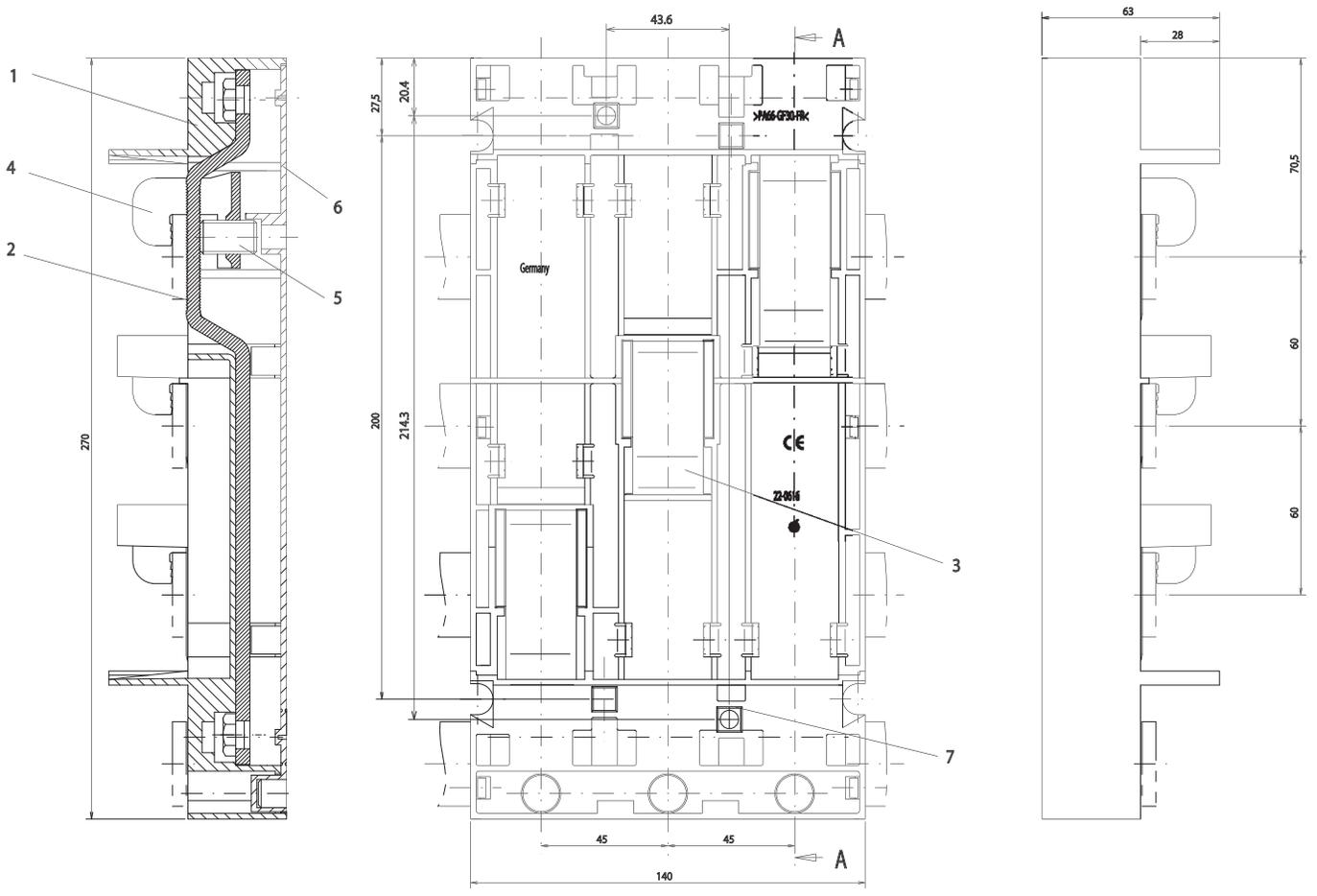
Bulletin 141A
MCS Mounting System
 Approximate Dimensions

Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

2



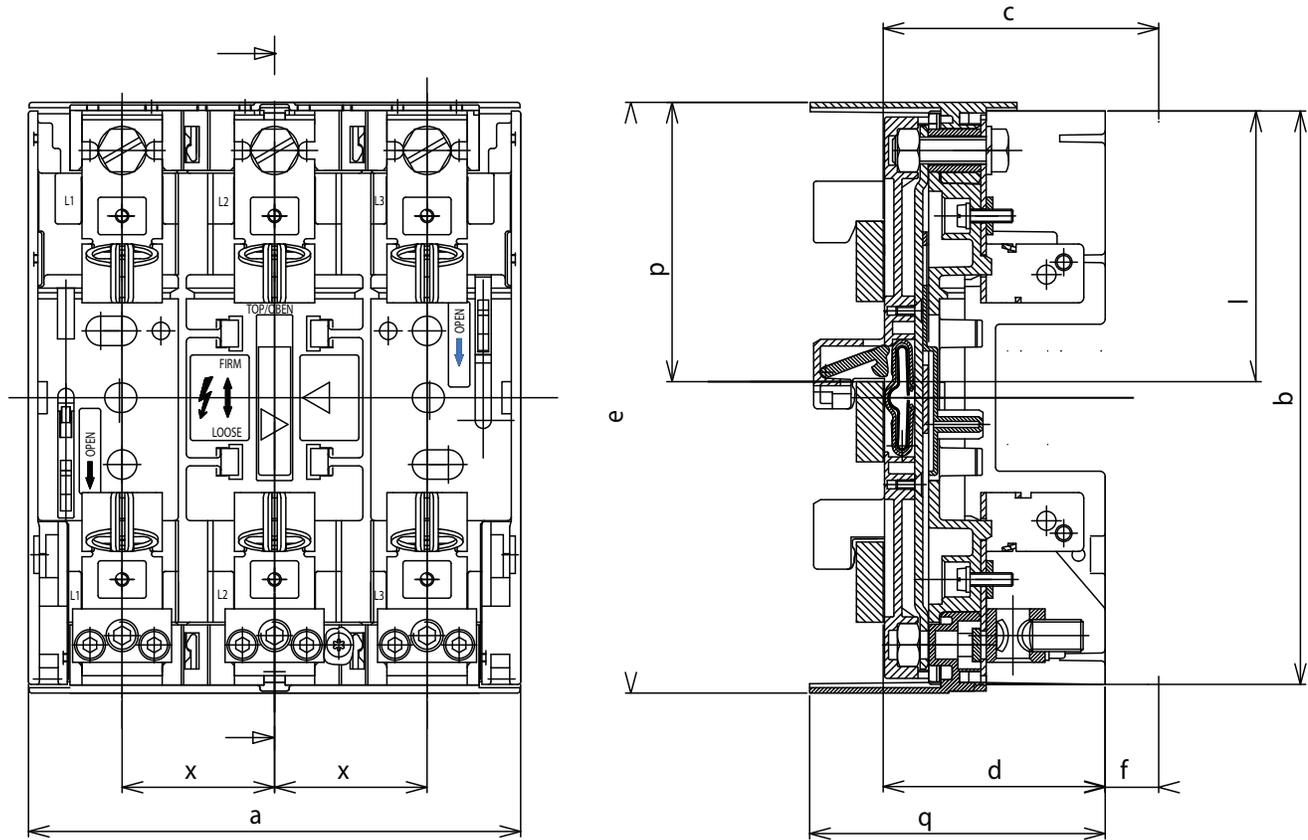
Cat. No. 141A-CUJ250



Cat. No. 141A-CUL600

Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

Cat. No. 141A-NFJ...



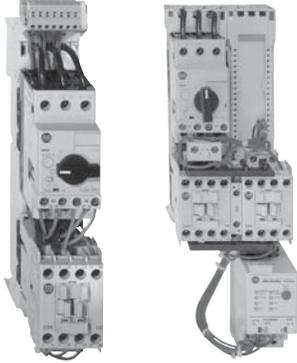
2

Cat. No.	a	b	c	d	e	f	l	p	q	x
141A-NFJ100	184	214.5	103	83	221	20	101	104.5	110.5	57
141A-NFJ200	210	255	117	97	268	20	118	128	124.5	65
141A-NFJ400	256	267	132.5	112.5	285	20	121.5	136.5	139	81

Open Type Starters

Product Overview

2



Bulletin 103S/107S and 103T/107T Combination Starters

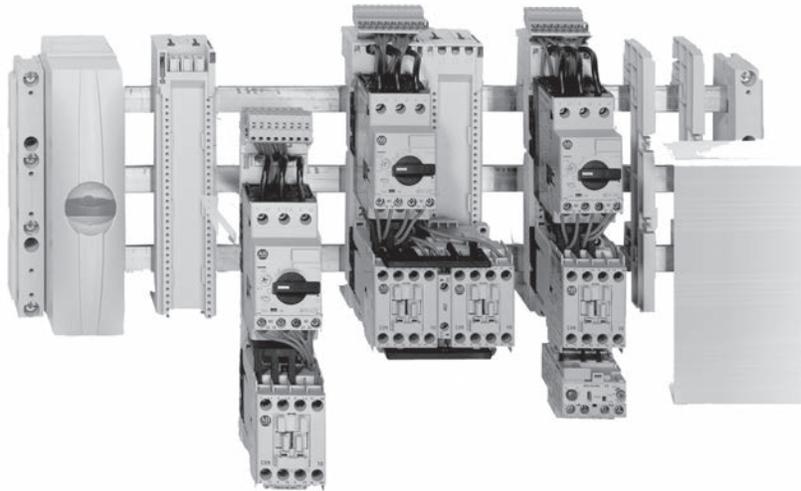
- Bulletin 103S/107S Combination Starters are 2-Component Starters
 - Bulletin 140M Motor Protection Circuit Breakers (MPCBs)
 - Bulletin 100-C/104-C Contactors
- Bulletin 103T/107T Combination Starters are 3-Component Starters
 - Bulletin 140M Motor Circuit Protectors (MCPs)
 - Bulletin 100-C/104-C Contactors
 - Bulletin 193-E Electronic Overload Relays
- Current range 0.1...90 A
- cULus Listed for control and protection of motor loads
- Factory-installed options include:
 - Lockable handles
 - Control plugs (pull-apart terminal blocks)
 - Auxiliary and trip indication contacts
 - Surge suppressors

Standards Compliance

UL 508
 CSA 22.2, No. 14
 IEC 60947 -2, -4

Certifications

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



	Standard Busbar Mount		ISO Busbar Mount		Panel Mount	
	103S/107S	103T/107T	103S/107S	103T/107T	103S/107S	103T/107T
AC Coils	✓	✓	✓	✓	✓	✓
DC Coils	✓	✓	✓	✓	✓	✓
cULus	✓	✓	✓	✓	✓	✓
IEC/CE	✓	✓	✓	✓	✓	✓
Components						
140M (MPCB)	✓	—	✓	—	✓	—
140M (MCP)	—	✓	—	✓	—	✓
100-C Contactor	✓	✓	✓	✓	✓	✓
193 Overload Relay	—	✓	—	✓	—	✓
Max Current	90 A	45 A	45 A	45 A	45 A	45 A
Control Plug	Optional	Optional	Standard	Standard	Optional	Optional
Overload Protection						
140M (MPCB)	✓	—	✓	—	✓	—
193-E1 Plus/E3	—	✓	—	✓	—	✓
Busbar mount						
5/10 mm busbars	✓	✓	✓	✓	—	—
Panel Mount						
(2) Hat (DIN) Rail mount	—	—	—	—	✓	✓
(4) Screw mount	—	—	—	—	✓	✓



Coordination Ratings for Bulletin 103S and 103T Starters

Bulletin 103S starters consist of a Bulletin 140M Motor Protection Circuit Breaker (MPCB) and a Bulletin 100C Contactor. These starters are referred to as 2-Component Starters.

Bulletin 103T starters consist of a Bulletin 140M Motor Circuit Protector (MCP), a Bulletin 100C Contactor and a Bulletin 193 Overload Relay. These starters are referred to as 3-Component Starters.

All of these combination starters may provide the branch-circuit, short-circuit protection, overload protection and magnetic control for each individual motor circuit. Additional short-circuit protection is not required for the protection of the individual motor circuits. Additionally, these starters are available with Type 1 or Type 2 coordination, as Type F Combination Motor Controllers (CMCs), or as Type E Self-Protected Combination Motor Controllers. These different coordination levels between the Bulletin 140M circuit breakers and the Bulletin 100C contactors are illustrated below, along with the IEC and UL/CSA approvals for each type of starter.

IEC Type 1 coordination

- * The contactor or starter may be inoperative and require replacement in the event of a short-circuit.

IEC Type 2 coordination

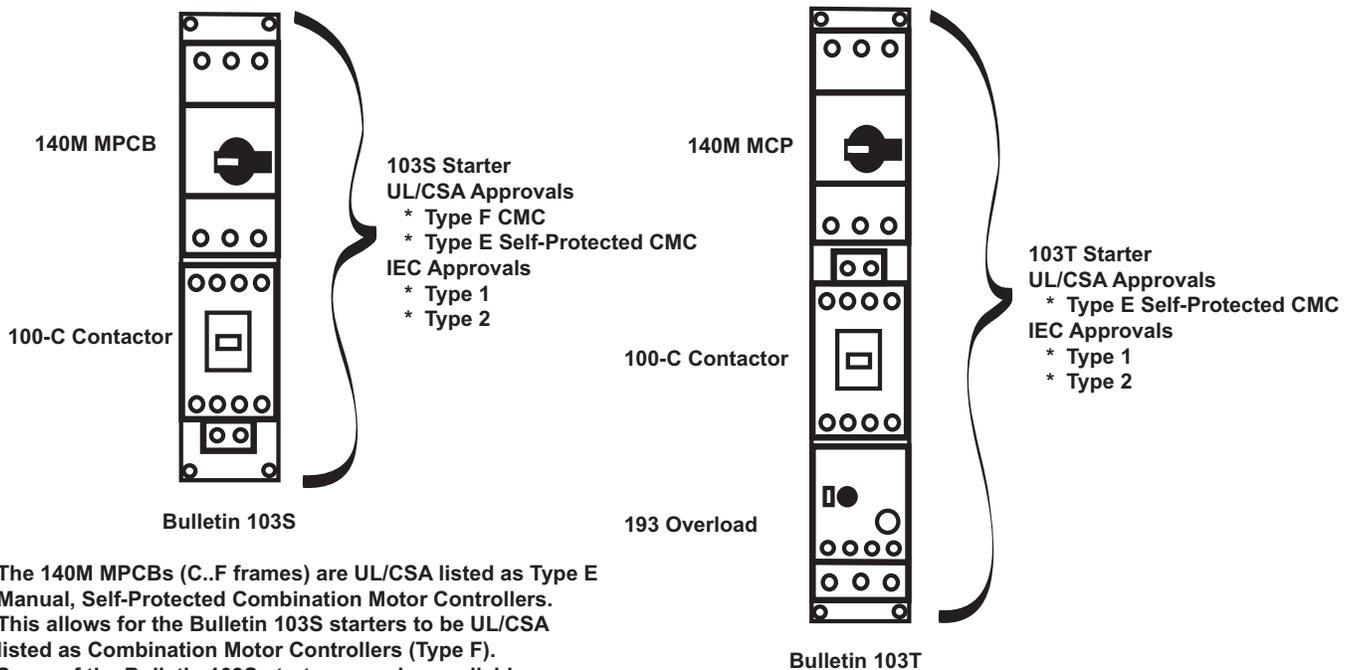
- * No damage to the overload relay or other parts may occur in the event of a short-circuit, except welding of the contactor is permitted, as long as the contacts can be easily separated without significant deformation (such as with a screwdriver).

UL Type F Combination Motor Controller

- * No damage to the motor protection circuit breaker is allowed in the event of a short-circuit. The contactor may be inoperative and require replacement.

UL Type E Self-Protected Combination Motor Controller

- * No damage to the contactor, overload relay, or other parts may occur in the event of a short-circuit.

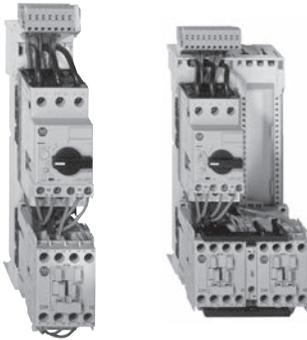


The 140M MPCBs (C..F frames) are UL/CSA listed as Type E Manual, Self-Protected Combination Motor Controllers. This allows for the Bulletin 103S starters to be UL/CSA listed as Combination Motor Controllers (Type F). Some of the Bulletin 103S starters are also available with Type 2 coordination between the 140M and the 100C.

Additionally, some of the Bulletin 103S starters have also been UL/CSA listed as Type E Self-Protected Combination Motor Controllers, providing an additional level of coordination between the 140M and the 100-C.

The 140M MCPs (C..F frames) are UL/CSA listed as Manual Motor Controllers. This allows for the Bulletin 103T starters to be UL/CSA listed only as Type E Self-Protected Combination Motor Controllers.

This listing then allows for the Bulletin 103T starters to provide the short-circuit protection, overload protection and magnetic control for individual motor circuits and insures a high level of coordination between the 140M and the 100C.



Bulletin 103S/107S IEC Starters

- Non-reversing (Bul. 103S) and reversing (Bul. 107S) starters
- Current range 0.1...90 A
- cULus Listed Type F Combination Motor Controllers
 - Type 1 Coordination
 - Type 2 Coordination
- cULus Listed Type E Self-Protected Combination Motor Controllers
- Assemblies consist of Bulletin 140M MPCBs and Bulletin 100-C contactors mounted on Bulletin 141A busbar or panel mounting modules
- Installation and wiring of Control Plug for auxiliary contacts is standard on ISO Busbar Mount starters.
- Factory installed options include:
 - Installation of Lockable Twist Knob.
 - Installation of Spacing Adapter for Type E or Type F Starters.
 - Electronic Interface and Surge Suppressors for coil on 100-C.
 - Additional auxiliary contacts for 100-C.
 - Additional auxiliary or trip contacts on 140M.

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Standards Compliance

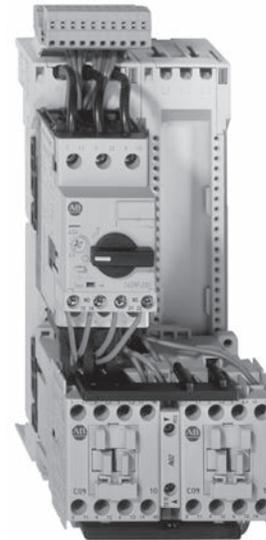
UL 508
 CSA 22.2, No. 14
 IEC 60947 -2, -4

Certifications

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



Bulletin 103S Panel Mount starter with front-mount auxiliary contacts and red/yellow lockable knob, as factory-installed options.



Bulletin 107S Standard Busbar Mount starter with front-mount auxiliary contacts and control plug, as factory-installed options.

Group Motor, Type E, and Type F Combination Motor Controllers (UL/CSA)

The Bulletin 103S/107S motor controllers can be used in a variety of applications. These starters can be used in group motor applications or as a stand-alone product without any additional short-circuit protection in the motor branch circuits.

Most of the Bul. 140M-C/D motor protection circuit breakers, used in the Bul. 103S/107S starters, are cULus Listed as a **Type E** manual self-protected combination motor controller. Although there are many tests involved, one of the critical tests provide a self-protected combination motor controller that must pass to perform 6000 electrical operations and an additional 4000 mechanical operations after a short circuit.

By definition, a **Type F** combination motor controller consists of a Type E manual self-protected combination motor controller and a magnetic or solid-state motor controller (such as a Bul. 100-C contactor or an SMC). As with a manual Type E self-protected combination motor controller, additional short-circuit protection for the individual motor circuits is not required.

A combination of a Bul. 140M manual self-protected combination motor controller and a 100-C contactor can be listed as a Type E self-protected combination motor controller. In this case, the 140M and 100-C must pass the additional 6000 electrical and 4000 mechanical operations test. In some cases, this may require oversizing either component to achieve weld-free performance and meet the additional life requirements.

Multiple Motor Installation with Bul. 103S Combination Starters

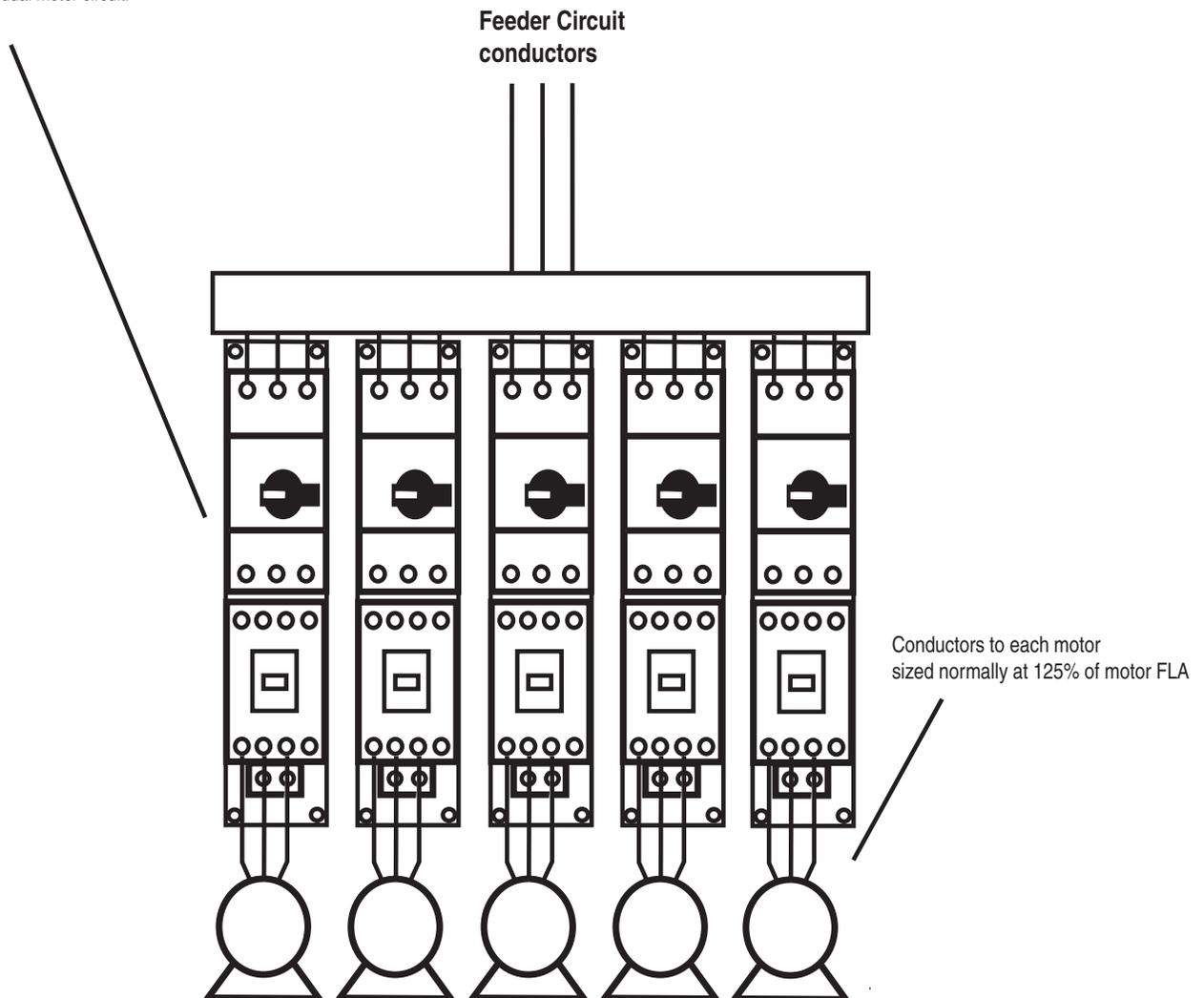
Bulletin 103S Combination Starters provide Individual Branch Circuit Protection for each motor.

They consist of a Bulletin 140M Motor Protection Circuit Breaker and a 100-C Contactor.

These combination starters may provide the branch circuit, short-circuit protection, overload protection, and magnetic control for each individual motor circuit. Additional short-circuit protection is not required for the protection of the individual motor circuits, leaving only the requirement for protection of the feeder circuit conductors by an upstream protective device.

Below is an example that illustrates installations involving multiple motors using Bulletin 103S Combination Starters.

Bulletin 103S Combination Starters are UL/CSA listed as Type F Combination Motor Controllers or as Type E Self-Protected Combination Motor Controllers. These starters may provide the branch-circuit protection for each individual motor circuit.



Open Type Starters

Catalog Number Explanation

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; not all combinations will produce a valid catalog number.

103S - A T D 2 - C A16 C - KN

a b c d e f g h i

2

a

Bulletin Number	
Code	Description
103S	DOL Starter with MPCB
107S	Rev. Starter with MPCB

b

Contactor Size	
Code	Description
A	100-C09
B	100-C12
C	100-C16
D	100-C23
E	100-C30
F	100-C37
G	100-C43
H	100-C60
J	100-C72
K	100-C85

c

Style	
Code	Description
S	On 141A ISO Busbar Module(s)
T	On 141A Standard Busbar Module(s)
W	On 141A Panel Mounting Module(s)

d

AC Coil Voltage	
Code	Description
Q	12V AC, 60 Hz
R	12V AC, 50 Hz
J	24V AC, 60 Hz
K	24V AC, 50 Hz
KJ	24V AC, 50/60 Hz
V	32V AC, 50 Hz / 36V AC, 60 Hz
W	36V AC, 50 Hz
X	42V AC, 50 Hz / 48V AC, 60 Hz
Y	48V AC, 50 Hz
KY	48V AC, 50/60 Hz
KP	100V AC, 50 Hz / 100...110V AC, 60 Hz
D	110V AC, 50 Hz / 120V AC, 60 Hz
KD	100V AC, 50/60 Hz
P	120V AC, 50 Hz
KL	200...230V AC, 50/60 Hz
H	208V AC, 60 Hz
L	208...240V AC, 60 Hz
A	220V AC, 50 Hz / 240V AC, 60 Hz
F	220...230V AC, 50 Hz
KF	230V AC, 50/60 Hz
VA	230...240V AC, 50 Hz
T	240V AC, 50 Hz / 277V AC, 60 Hz
E	380V AC, 60 Hz
N	380...400V AC, 50 Hz / 440V AC, 60 Hz
KN	400V AC, 50/60 Hz
G	400...415V AC, 50 Hz
B	440V AC, 50 Hz / 480V AC, 60 Hz
M	500V AC, 50 Hz
C	550V AC, 50 Hz / 600V AC, 60 Hz

d, Continued

DC Coil Voltage		
Contactor Size A-G	Contactor Size H-J	Description
ZR	DR	6...12V DC
ZQ	DQ	12V DC
ZJ	DJ	24V DC
DJ	DJ	24V DC with Diode
EJ	—	24V DC Electronic
ZW	DW	36V DC
ZY	DY	48V DC
ZZ	DZ	60V DC
ZB	DB	64V DC
ZG	DG	72V DC
ZE	DE	80V DC
ZD	DD	110V DC
ZP	DP	115V DC
ZS	DS	125V DC
ZA	DA	220V DC
ZF	DF	230V DC
ZT	DT	250V DC

e

Contactor Aux. Contacts	
Code	Description
2	1 N.O.
3	1 N.O. + 1 N.C.

f

Circuit Breaker Frame Size	
Code	Description
C	C Frame
D	D Frame
F	F Frame
G	CMN Frame

g

Circuit Breaker Current Range	
Code	Description
A16	0.1...0.16 A
A25	0.16...0.25 A
A40	0.25...0.4 A
A63	0.4...0.63 A
B10	0.63...1.0 A
B16	1.0...1.6 A
B25	1.6...2.5 A
B40	2.5...4.0 A
B63	4.0...6.3 A
C10	6.3...10 A
C16	10...16 A
C20	16...20 A
C25	20...25 A
C32	25...32 A
C45	32...45 A
C63	45...63 A
C90	63...90 A

h

Circuit Breaker Aux. and Trip Contacts for 140M	
Select only one from each group	
Bottom Front	
Code	Description
X	Without Aux. Trip Contacts
A	1 N.C. Aux. Contact
B	1 N.O. Aux. Contact
C	1 N.O. + 1 N.C. Aux. Contact
D	2 N.O. Aux. Contacts
E	2 N.C. Aux. Contacts
R	1 N.O. (SC+OL) + 1 N.C. Aux. Contact
S	1 N.O. (SC+OL) + 1 N.O. Aux. Contact
Right Side	
Code	Description
K	1 N.C. (SC+OL) + 1 N.C. (SC)
L	1 N.O. (SC+OL) + 1 N.O. (SC)
M	1 N.C. (SC+OL) + 1 N.O. (SC)
N	1 N.O. (SC+OL) + 1 N.C. (SC)
Q	1 N.O. (SC) + 1 N.C. (SC)

Circuit Breaker Aux. and Trip Contacts for 140-CMN	
Select only one from each group	
Bottom Front	
Code	Description
X	Without Aux. and Trip Contacts
C	1 N.O. + 1 N.C. Aux. Contact
D	2 N.O. Aux. Contact
E	2 N.C. Aux. Contact
Top Front	
Code	Description
K	1 N.C. (OL) + 1 N.C. (SC)
L	1 N.O. (OL) + 1 N.O. (SC)
M	1 N.C. (OL) + 1 N.O. (SC)
N	1 N.O. (OL) + 1 N.C. (SC)

i

Modifications, Accessories	
Circuit Breaker Accessories	
Code	Description
TE	Type E Adder Module
KN	Lockable Twist Knob, Black
KY	Lockable Twist Knob, Red/Yellow
Coil Accessories	
Code	Description
JE	Electronic Interface(s)
D	Surge Suppressor Diode
R	Surge Suppressor RC
V	Surge Suppressor Varistor
Additional Contactor Auxiliaries (Side Mount)	
Code	Description
S01	1 N.C.
S10	1 N.O.
S11	1 N.O. + 1 N.C.
S20	2 N.O.
Additional Contactor Auxiliaries (Front Mount)	
Code	Description
F11	1 N.O. + 1 N.C.
F20	2 N.O.
F22	2 N.O. + 2 N.C.
Mounting System Accessories	
Code	Description
MS	Micro Switch (ISO Modules only)
SP	Top Mount Control Plug (pull-apart terminal block with spring clamp terminals) for control circuit * (Standard Busbar and Panel Mounting Modules only)

* Standard for starters on ISO Modules; no code required.



Bulletin 103S/107S Combination Starters
UL/CSA in Group Motor Installation

Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)									DOL Starters	Reversing Starters
	Hp Ratings as a UL 508 Motor Controller in Group Motor Installations*				Max. Fuse or Circuit Breaker per NEC [A]	Max. Short-Circuit Current [kA]					
	200V AC	230V AC	460V AC	575V AC		Type 1 Coordination	Type 2 Coordination		Cat. No.	Cat. No.	
C-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules											
0.10...0.16	—	—	—	—	450	65	47	65	47	103S-AT02-CA16C	107S-AT03-CA16C
0.16...0.25	—	—	—	—	450	65	47	65	47	103S-AT02-CA25C	107S-AT03-CA25C
0.25...0.40	—	—	—	—	450	65	47	65	47	103S-AT02-CA40C	107S-AT03-CA40C
0.40...0.63	—	—	—	—	450	65	47	65	47	103S-AT02-CA63C	107S-AT03-CA63C
0.63...1.00	—	—	1/2	3/4	450	65	47	65	47	103S-AT02-CB10C	107S-AT03-CB10C
1.00...1.60	—	—	1/2...1	3/4...1	450	65	47	65	47	103S-AT02-CB16C	107S-AT03-CB16C
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	65	10	103S-AT02-CB25C	107S-AT03-CB25C
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	50	—	103S-AT02-CB40C	107S-AT03-CB40C
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	50	—	103S-AT02-CB63C	107S-AT03-CB63C
6.30...9.00	1-1/2...2	2	5	7-1/2	450	65	30	50	—	103S-AT02-CC10C	107S-AT03-CC10C
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	50	—	103S-BT02-CC10C	107S-BT03-CC10C
10.0...12.0	3	3	7-1/2	10	450	30	30	—	—	103S-BT02-CC16C	107S-BT03-CC16C
10.0...16.0	3...5	5	7-1/2...10	10	450	30	30	—	—	103S-CT02-CC16C	107S-CT03-CC16C
10.0...16.0	3...5	5	7-1/2...10	10...15	450	30	30	—	—	103S-DT02-CC16C	107S-DT03-CC16C
14.5...20.0	5	5...7-1/2	15	15	450	30	30	—	—	103S-DT02-CC20C	107S-DT03-CC20C
18.0...23.0	5	7-1/2	15	15	450	30	30	—	—	103S-DT02-CC25C	107S-DT03-CC25C
D-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules											
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	65	10	103S-AT02-DB25C	107S-AT03-DB25C
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	65	30	103S-DT02-DB25C	107S-DT03-DB25C
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	65	—	103S-AT02-DB40C	107S-AT03-DB40C
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	65	30	103S-DT02-DB40C	107S-DT03-DB40C
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	65	—	103S-AT02-DB63C	107S-AT03-DB63C
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	65	30	103S-ET03-DB63C	107S-ET03-DB63C
6.30...9.00	1-1/2...2	2	5	7-1/2	450	65	30	65	—	103S-AT02-DC10C	107S-AT03-DC10C
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	65	—	103S-BT02-DC10C	107S-BT03-DC10C
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	65	—	103S-CT02-DC10C	107S-CT03-DC10C
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	65	30	103S-ET03-DC10C	107S-ET03-DC10C
10.0...12.0	3	3	7-1/2	10	450	65	30	65	—	103S-BT02-DC16C	107S-BT03-DC16C
10.0...16.0	3...5	5	7-1/2...10	10	450	65	30	65	—	103S-CT02-DC16C	107S-CT03-DC16C
10.0...16.0	3...5	5	7-1/2...10	10...15	450	65	30	65	—	103S-DT02-DC16C	107S-DT03-DC16C
10.0...16.0	3...5	5	7-1/2...10	10...15	450	65	30	65	30	103S-ET03-DC16C	107S-ET03-DC16C
14.5...20.0	5	5...7-1/2	15	15	450	65	30	65	—	103S-DT02-DC20C	107S-DT03-DC20C
14.5...20.0	5	5...7-1/2	15	20	450	65	30	65	—	103S-ET03-DC20C	107S-ET03-DC20C
18.0...23.0	5	7-1/2	15	15	450	65	30	65	—	103S-DT02-DC25C	107S-DT03-DC25C
18.0...25.0	7-1/2	7-1/2...10	15...20	20	450	65	30	65	—	103S-ET03-DC25C	107S-ET03-DC25C
F-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules											
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	600	65	30	65	30	103S-ET03-FC10C	107S-ET03-FC10C
10.0...16.0	3...5	5	7-1/2...10	10...15	600	65	30	65	30	103S-ET03-FC16C	107S-ET03-FC16C
14.5...20.0	5	5...7-1/2	15	15...20	600	65	30	65	30	103S-ET03-FC20C	107S-ET03-FC20C
18.0...25.0	7-1/2	7-1/2...10	15...20	20	600	65	30	65	30	103S-ET03-FC25C	107S-ET03-FC25C
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	600	65	30	65	30	103S-GT03-FC25C	107S-GT03-FC25C
23.0...30.0	7-1/2	10	20	25	600	65	30	65	30	103S-ET03-FC32C	107S-ET03-FC32C
23.0...32.0	7-1/2...10	10	20...25	30	600	65	30	65	30	103S-FT03-FC32C	107S-FT03-FC32C
23.0...32.0	7-1/2...10	10	20...25	30	600	65	30	65	30	103S-GT03-FC32C	107S-GT03-FC32C
23.0...32.0	7-1/2...10	10	20...25	30	600	65	30	65	30	103S-HT03-FC32C	107S-HT03-FC32C
32.0...37.0	10	10	25	30	600	65	18	65	10	103S-FT03-FC45C	107S-FT03-FC45C
32.0...43.0	10	15	30	30	600	65	18	65	10	103S-GT03-FC45C	107S-GT03-FC45C
32.0...45.0	10	15	30	30...40	600	65	18	65	10	103S-HT03-FC45C	107S-HT03-FC45C
32.0...45.0	10	15	30	30...40	600	65	18	65	10	103S-JT03-FC45C	107S-JT03-FC45C
CMN-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules											
40.0...60.0	15	15...20	30...40	40...50	1000	42	18	42	18	103S-HT03-GC63C	107S-HT03-GC63C
40.0...63.0	15...20	15...20	30...40	40...60	1000	42	18	42	18	103S-JT03-GC63C	107S-JT03-GC63C
40.0...63.0	15...20	15...20	30...40	40...60	1000	42	18	42	18	103S-KT03-GC63C	107S-KT03-GC63C
63.0...72.0	20	25	50	60	1000	35	10	35	10	103S-JT03-GC90C	107S-JT03-GC90C
63.0...85.0	25	30	50...60	60	1000	35	10	35	10	103S-KT03-GC90C	107S-KT03-GC90C

* Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

⊗ Coil voltage code—see page 2-315



Open Type Starters

Product Selection & Coordination Ratings

UL/CSA in Group Motor Installation, Continued

2

Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)									DOL Starters	Reversing Starters
	Hp Ratings as a UL 508 Motor Controller in Group Motor Installations*				Max. Fuse or Circuit Breaker per NEC [A]	Max. Short-Circuit Current [kA]					
	200V AC	230V AC	460V AC	575V AC		Type 1 Coordination		Type 2 Coordination			
						480V AC	600V AC	480V AC	600V AC	Cat. No.	Cat. No.
C-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules											
0.10...0.16	—	—	—	—	450	65	47	65	47	103S-AS02-CA16C	107S-AS03-CA16C
0.16...0.25	—	—	—	—	450	65	47	65	47	103S-AS02-CA25C	107S-AS03-CA25C
0.25...0.40	—	—	—	—	450	65	47	65	47	103S-AS02-CA40C	107S-AS03-CA40C
0.40...0.63	—	—	—	—	450	65	47	65	47	103S-AS02-CA63C	107S-AS03-CA63C
0.63...1.00	—	—	1/2	3/4	450	65	47	65	47	103S-AS02-CB10C	107S-AS03-CB10C
1.00...1.60	—	—	1/2...1	3/4...1	450	65	47	65	47	103S-AS02-CB16C	107S-AS03-CB16C
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	65	10	103S-AS02-CB25C	107S-AS03-CB25C
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	50	—	103S-AS02-CB40C	107S-AS03-CB40C
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	50	—	103S-AS02-CB63C	107S-AS03-CB63C
6.30...9.00	1-1/2...2	2	5	7-1/2	450	65	30	50	—	103S-AS02-CC10C	107S-AS03-CC10C
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	50	—	103S-BS02-CC10C	107S-BS03-CC10C
10.0...12.0	3	3	7-1/2	10	450	30	30	—	—	103S-BS02-CC16C	107S-BS03-CC16C
10.0...16.0	3...5	5	7-1/2...10	10	450	30	30	—	—	103S-CS02-CC16C	107S-CS03-CC16C
10.0...16.0	3...5	5	7-1/2...10	10...15	450	30	30	—	—	103S-DS02-CC16C	107S-DS03-CC16C
14.5...20.0	5	5...7-1/2	15	15	450	30	30	—	—	103S-DS02-CC20C	107S-DS03-CC20C
18.0...23.0	5	7-1/2	15	15	450	30	30	—	—	103S-DS02-CC25C	107S-DS03-CC25C
D-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules											
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	65	10	103S-AS02-DB25C	107S-AS03-DB25C
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	65	30	103S-DS02-DB25C	107S-DS03-DB25C
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	65	—	103S-AS02-DB40C	107S-AS03-DB40C
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	65	30	103S-DS02-DB40C	107S-DS03-DB40C
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	65	—	103S-AS02-DB63C	107S-AS03-DB63C
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	65	30	103S-ES03-DB63C	107S-ES03-DB63C
6.30...9.00	1-1/2...2	2	5	7-1/2	450	65	30	65	—	103S-AS02-DC10C	107S-AS03-DC10C
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	65	—	103S-BS02-DC10C	107S-BS03-DC10C
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	65	—	103S-CS02-DC10C	107S-CS03-DC10C
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	65	30	103S-ES03-DC10C	107S-ES03-DC10C
10.0...12.0	3	3	7-1/2	10	450	65	30	65	—	103S-BS02-DC16C	107S-BS03-DC16C
10.0...16.0	3...5	5	7-1/2...10	10	450	65	30	65	—	103S-CS02-DC16C	107S-CS03-DC16C
10.0...16.0	3...5	5	7-1/2...10	10...15	450	65	30	65	—	103S-DS02-DC16C	107S-DS03-DC16C
10.0...16.0	3...5	5	7-1/2...10	10...15	450	65	30	65	30	103S-ES03-DC16C	107S-ES03-DC16C
14.5...20.0	5	5...7-1/2	15	15	450	65	30	65	—	103S-DS02-DC20C	107S-DS03-DC20C
14.5...20.0	5	5...7-1/2	15	20	450	65	30	65	—	103S-ES03-DC20C	107S-ES03-DC20C
18.0...23.0	5	7-1/2	15	15	450	65	30	65	—	103S-DS02-DC25C	107S-DS03-DC25C
18.0...25.0	7-1/2	7-1/2...10	15...20	20	450	65	30	65	—	103S-ES03-DC25C	107S-ES03-DC25C
F-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules											
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	600	65	30	65	30	103S-ES03-FC10C	107S-ES03-FC10C
10.0...16.0	3...5	5	7-1/2...10	10...15	600	65	30	65	30	103S-ES03-FC16C	107S-ES03-FC16C
14.5...20.0	5	5...7-1/2	15	15...20	600	65	30	65	30	103S-ES03-FC20C	107S-ES03-FC20C
18.0...25.0	7-1/2	7-1/2...10	15...20	20	600	65	30	65	30	103S-ES03-FC25C	107S-ES03-FC25C
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	600	65	30	65	30	103S-GS03-FC25C	107S-GS03-FC25C
23.0...30.0	7-1/2	10	20	25	600	65	30	65	30	103S-ES03-FC32C	107S-ES03-FC32C
23.0...32.0	7-1/2...10	10	20...25	30	600	65	30	65	30	103S-FS03-FC32C	107S-FS03-FC32C
23.0...32.0	7-1/2...10	10	20...25	30	600	65	30	65	30	103S-GS03-FC32C	107S-GS03-FC32C
32.0...37.0	10	10	25	30	600	65	18	65	10	103S-FS03-FC45C	107S-FS03-FC45C
32.0...43.0	10	15	30	30	600	65	18	65	10	103S-GS03-FC45C	107S-GS03-FC45C

* Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

⊗ Coil voltage code—see page 2-315



UL/CSA in Group Motor Installation, Continued

Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)									DOL Starters	Reversing Starters
	Hp Ratings as a UL 508 Motor Controller in Group Motor Installations*				Max. Fuse or Circuit Breaker per NEC	Max. Short-Circuit Current [kA]					
	Type 1 Coordination		Type 2 Coordination			Type 1 Coordination		Type 2 Coordination			
	200V AC	230V AC	460V AC	575V AC		480V AC	600V AC	480V AC	600V AC	Cat. No.	Cat. No.
C-Frame with 100-C/104-C Contactors on Panel Mounting Modules											
0.10...0.16	—	—	—	—	450	65	47	65	47	103S-AW02-CA16C	107S-AW03-CA16C
0.16...0.25	—	—	—	—	450	65	47	65	47	103S-AW02-CA25C	107S-AW03-CA25C
0.25...0.40	—	—	—	—	450	65	47	65	47	103S-AW02-CA40C	107S-AW03-CA40C
0.40...0.63	—	—	—	—	450	65	47	65	47	103S-AW02-CA63C	107S-AW03-CA63C
0.63...1.00	—	—	1/2	3/4	450	65	47	65	47	103S-AW02-CB10C	107S-AW03-CB10C
1.00...1.60	—	—	1/2...1	3/4...1	450	65	47	65	47	103S-AW02-CB16C	107S-AW03-CB16C
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	65	10	103S-AW02-CB25C	107S-AW03-CB25C
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	50	—	103S-AW02-CB40C	107S-AW03-CB40C
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	50	—	103S-AW02-CB63C	107S-AW03-CB63C
6.30...9.00	1-1/2...2	2	5	7-1/2	450	65	30	50	—	103S-AW02-CC10C	107S-AW03-CC10C
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	50	—	103S-BW02-CC10C	107S-BW03-CC10C
10.0...12.0	3	3	7-1/2	10	450	30	30	—	—	103S-CW02-CC16C	107S-CW03-CC16C
10.0...16.0	3...5	5	7-1/2...10	10	450	30	30	—	—	103S-CW02-CC16C	107S-CW03-CC16C
10.0...16.0	3...5	5	7-1/2...10	10...15	450	30	30	—	—	103S-DW02-CC16C	107S-DW03-CC16C
14.5...20.0	5	5...7-1/2	15	15	450	30	30	—	—	103S-DW02-CC20C	107S-DW03-CC20C
18.0...23.0	5	7-1/2	15	15	450	30	30	—	—	103S-DW02-CC25C	107S-DW03-CC25C
D-Frame with 100-C/104-C Contactors on Panel Mounting Modules											
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	65	10	103S-AW02-DB25C	107S-AW03-DB25C
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	65	30	103S-DW02-DB25C	107S-DW03-DB25C
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	65	—	103S-AW02-DB40C	107S-AW03-DB40C
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	65	30	103S-DW02-DB40C	107S-DW03-DB40C
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	65	—	103S-AW02-DB63C	107S-AW03-DB63C
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	65	30	103S-EW03-DB63C	107S-EW03-DB63C
6.30...9.00	1-1/2...2	2	5	7-1/2	450	65	30	65	—	103S-AW02-DC10C	107S-AW03-DC10C
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	65	—	103S-BW02-DC10C	107S-BW03-DC10C
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	65	—	103S-CW02-DC10C	107S-CW03-DC10C
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	65	30	103S-EW03-DC10C	107S-EW03-DC10C
10.0...12.0	3	3	7-1/2	10	450	65	30	65	—	103S-BW02-DC16C	107S-BW03-DC16C
10.0...16.0	3...5	5	7-1/2...10	10	450	65	30	65	—	103S-CW02-DC16C	107S-CW03-DC16C
10.0...16.0	3...5	5	7-1/2...10	10...15	450	65	30	65	—	103S-DW02-DC16C	107S-DW03-DC16C
10.0...16.0	3...5	5	7-1/2...10	10...15	450	65	30	65	30	103S-EW03-DC16C	107S-EW03-DC16C
14.5...20.0	5	5...7-1/2	15	15	450	65	30	65	—	103S-DW02-DC20C	107S-DW03-DC20C
14.5...20.0	5	5...7-1/2	15	20	450	65	30	65	—	103S-EW03-DC20C	107S-EW03-DC20C
18.0...23.0	5	7-1/2	15	15	450	65	30	65	—	103S-DW02-DC25C	107S-DW03-DC25C
18.0...25.0	7-1/2	7-1/2...10	15...20	20	450	65	30	65	—	103S-EW03-DC25C	107S-EW03-DC25C
F-Frame with 100-C/104-C Contactors on Panel Mounting Modules											
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	600	65	30	65	30	103S-EW03-FC10C	107S-EW03-FC10C
10.0...16.0	3...5	5	7-1/2...10	10...15	600	65	30	65	30	103S-EW03-FC16C	107S-EW03-FC16C
14.5...20.0	5	5...7-1/2	15	15...20	600	65	30	65	30	103S-EW03-FC20C	107S-EW03-FC20C
18.0...25.0	7-1/2	7-1/2...10	15...20	20	600	65	30	65	30	103S-EW03-FC25C	107S-EW03-FC25C
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	600	65	30	65	30	103S-GW03-FC25C	107S-GW03-FC25C
23.0...30.0	7-1/2	10	20	25	600	65	30	65	30	103S-EW03-FC32C	107S-EW03-FC32C
23.0...32.0	7-1/2...10	10	20...25	30	600	65	30	65	30	103S-FW03-FC32C	107S-FW03-FC32C
23.0...32.0	7-1/2...10	10	20...25	30	600	65	30	65	30	103S-GW03-FC32C	107S-GW03-FC32C
32.0...37.0	10	10	25	30	600	65	18	65	10	103S-FW03-FC45C	107S-FW03-FC45C
32.0...43.0	10	15	30	30	600	65	18	65	10	103S-GW03-FC45C	107S-GW03-FC45C

* Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

⊗ Coil voltage code—see page 2-315



Open Type Starters

Product Selection & Coordination Ratings

UL/CSA as a UL508 Type F Combination Motor Controller

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Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)								DOL Starters	Reversing Starters
	Hp Ratings as a UL 508 Type F Combination Motor Controller*				Max. Short-Circuit Current [kA]					
	200V AC	230V AC	460V AC	575V AC	480Y/277V AC	600Y/347V AC	480Y/277V AC	600Y/347V AC	Cat. No.	Cat. No.
C-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules										
0.10...0.16	—	—	—	—	65	47	65	47	103S-AT02-CA16C-TE	107S-AT03-CA16C-TE
0.16...0.25	—	—	—	—	65	47	65	47	103S-AT02-CA25C-TE	107S-AT03-CA25C-TE
0.25...0.40	—	—	—	—	65	47	65	47	103S-AT02-CA40C-TE	107S-AT03-CA40C-TE
0.40...0.63	—	—	—	—	65	47	65	47	103S-AT02-CA63C-TE	107S-AT03-CA63C-TE
0.63...1.00	—	—	1/2	3/4	65	47	65	47	103S-AT02-CB10C-TE	107S-AT03-CB10C-TE
1.00...1.60	—	—	1/2...1	3/4...1	65	47	65	47	103S-AT02-CB16C-TE	107S-AT03-CB16C-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	10	103S-AT02-CB25C-TE	107S-AT03-CB25C-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	—	—	103S-AT02-CB40C-TE	107S-AT03-CB40C-TE
4.00...6.30	1...1-1/2	1...2	3...5	—	65	⚡	—	⚡	103S-AT02-CB63C-TE	107S-AT03-CB63C-TE
6.30...9.00	1-1/2...2	2	5	—	65	⚡	—	⚡	103S-AT02-CC10C-TE	107S-AT03-CC10C-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	—	65	⚡	50	⚡	103S-BT02-CC10C-TE	107S-BT03-CC10C-TE
10.0...12.0	3	3	7-1/2	—	30	⚡	—	⚡	103S-DT02-CC16C-TE	107S-DT03-CC16C-TE
10.0...16.0	3...5	5	7-1/2...10	—	30	⚡	—	⚡	103S-CT02-CC16C-TE	107S-CT03-CC16C-TE
10.0...16.0	3...5	5	7-1/2...10	—	30	⚡	—	⚡	103S-DT02-CC16C-TE	107S-DT03-CC16C-TE
14.5...20.0	5	5...7-1/2	15	—	10	⚡	—	⚡	103S-DT02-CC20C-TE	107S-DT03-CC20C-TE
18.0...23.0	—	—	—	—	⚡	⚡	⚡	⚡	103S-DT02-CC25C-TE	107S-DT03-CC25C-TE
D-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules										
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	10	103S-AT02-DB25C-TE	107S-AT03-DB25C-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	30	103S-DT02-DB25C-TE	107S-DT03-DB25C-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	65	—	103S-AT02-DB40C-TE	107S-AT03-DB40C-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	65	30	103S-DT02-DB40C-TE	107S-DT03-DB40C-TE
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	65	—	103S-AT02-DB63C-TE	107S-AT03-DB63C-TE
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	65	30	103S-ET03-DB63C-TE	107S-ET03-DB63C-TE
6.30...9.00	1-1/2...2	2	5	7-1/2	65	30	65	—	103S-AT02-DC10C-TE	107S-AT03-DC10C-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	—	103S-BT02-DC10C-TE	107S-BT03-DC10C-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	—	103S-CT02-DC10C-TE	107S-CT03-DC10C-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	30	103S-ET03-DC10C-TE	107S-ET03-DC10C-TE
10.0...12.0	3	3	7-1/2	10	65	30	65	—	103S-BT02-DC16C-TE	107S-BT03-DC16C-TE
10.0...16.0	3...5	5	7-1/2...10	10	65	30	65	—	103S-CT02-DC16C-TE	107S-CT03-DC16C-TE
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	—	103S-DT02-DC16C-TE	107S-DT03-DC16C-TE
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	30	103S-ET03-DC16C-TE	107S-ET03-DC16C-TE
14.5...20.0	5	5...7-1/2	15	—	65	⚡	65	⚡	103S-DT02-DC20C-TE	107S-DT03-DC20C-TE
14.5...20.0	5	5...7-1/2	15	—	65	⚡	65	⚡	103S-ET03-DC20C-TE	107S-ET03-DC20C-TE
18.0...23.0	5	7-1/2	15	—	65	⚡	65	⚡	103S-DT02-DC25C-TE	107S-DT03-DC25C-TE
18.0...25.0	7-1/2	7-1/2...10	15...20	—	65	⚡	65	⚡	103S-ET03-DC25C-TE	107S-ET03-DC25C-TE
F-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules										
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	30	103S-ET03-FC10C-TE	107S-ET03-FC10C-TE
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	30	103S-ET03-FC16C-TE	107S-ET03-FC16C-TE
14.5...20.0	5	5...7-1/2	15	15...20	65	30	65	30	103S-ET03-FC20C-TE	107S-ET03-FC20C-TE
18.0...25.0	7-1/2	7-1/2...10	15...20	20	65	30	65	30	103S-ET03-FC25C-TE	107S-ET03-FC25C-TE
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	65	30	65	30	103S-GT03-FC25C-TE	107S-GT03-FC25C-TE
23.0...30.0	7-1/2	10	20	25	65	30	65	30	103S-ET03-FC32C-TE	107S-ET03-FC32C-TE
23.0...32.0	7-1/2...10	10	20...25	30	65	30	65	30	103S-FT03-FC32C-TE	107S-FT03-FC32C-TE
23.0...32.0	7-1/2...10	10	20...25	30	65	30	65	30	103S-GT03-FC32C-TE	107S-GT03-FC32C-TE
23.0...32.0	7-1/2...10	10	20...25	30	65	30	65	30	103S-HT03-FC32C-TE	107S-HT03-FC32C-TE
32.0...37.0	10	10	25	—	65	⚡	65	⚡	103S-FT03-FC45C-TE	107S-FT03-FC45C-TE
32.0...43.0	10	15	30	—	65	⚡	65	⚡	103S-GT03-FC45C-TE	107S-GT03-FC45C-TE
32.0...45.0	10	15	30	—	65	⚡	65	⚡	103S-HT03-FC45C-TE	107S-HT03-FC45C-TE
32.0...45.0	10	15	30	—	65	⚡	65	⚡	103S-JT03-FC45C-TE	107S-JT03-FC45C-TE

* Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

⚡ This starter is not valid for application at this horsepower and voltage.

⊗ Coil voltage code—see page 2-315



UL/CSA as a UL508 Type F Combination Motor Controller, Continued

Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)								DOL Starters	Reversing Starters
	Hp Ratings as a UL 508 Type F Combination Motor Controller*				Max. Short-Circuit Current [kA]					
					Type 1 Coordination		Type 2 Coordination		Cat. No.	Cat. No.
	200V AC	230V AC	460V AC	575V AC	480Y/277V AC	600Y/347V AC	480Y/277V AC	600Y/347V AC		
C-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules										
0.10...0.16	—	—	—	—	65	47	65	47	103S-AS02-CA16C-TE	107S-AS03-CA16C-TE
0.16...0.25	—	—	—	—	65	47	65	47	103S-AS02-CA25C-TE	107S-AS03-CA25C-TE
0.25...0.40	—	—	—	—	65	47	65	47	103S-AS02-CA40C-TE	107S-AS03-CA40C-TE
0.40...0.63	—	—	—	—	65	47	65	47	103S-AS02-CA63C-TE	107S-AS03-CA63C-TE
0.63...1.00	—	—	1/2	3/4	65	47	65	47	103S-AS02-CB10C-TE	107S-AS03-CB10C-TE
1.00...1.60	—	—	1/2...1	3/4...1	65	47	65	47	103S-AS02-CB16C-TE	107S-AS03-CB16C-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	10	103S-AS02-CB25C-TE	107S-AS03-CB25C-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	—	—	103S-AS02-CB40C-TE	107S-AS03-CB40C-TE
4.00...6.30	1...1-1/2	1...2	3...5	—	65	❖	—	❖	103S-AS02-CB63C-TE	107S-AS03-CB63C-TE
6.30...9.00	1-1/2...2	2	5	—	65	❖	—	❖	103S-AS02-CC10C-TE	107S-AS03-CC10C-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	—	65	❖	50	❖	103S-BS02-CC10C-TE	107S-BS03-CC10C-TE
10.0...12.0	3	3	7-1/2	—	30	❖	—	❖	103S-BS02-CC16C-TE	107S-BS03-CC16C-TE
10.0...16.0	3...5	5	7-1/2...10	—	30	❖	—	❖	103S-CS02-CC16C-TE	107S-CS03-CC16C-TE
10.0...16.0	3...5	5	7-1/2...10	—	30	❖	—	❖	103S-DS02-CC16C-TE	107S-DS03-CC16C-TE
14.5...20.0	5	5...7-1/2	15	—	10	❖	—	❖	103S-DS02-CC20C-TE	107S-DS03-CC20C-TE
18.0...23.0	—	—	—	—	❖	❖	❖	❖	103S-DS02-CC25C-TE	107S-DS03-CC25C-TE
D-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules										
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	10	103S-AS02-DB25C-TE	107S-AS03-DB25C-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	30	103S-DS02-DB25C-TE	107S-DS03-DB25C-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	65	—	103S-AS02-DB40C-TE	107S-AS03-DB40C-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	65	30	103S-DS02-DB40C-TE	107S-DS03-DB40C-TE
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	65	—	103S-AS02-DB63C-TE	107S-AS03-DB63C-TE
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	65	30	103S-ES03-DB63C-TE	107S-ES03-DB63C-TE
6.30...9.00	1-1/2...2	2	5	7-1/2	65	30	65	—	103S-AS02-DC10C-TE	107S-AS03-DC10C-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	—	103S-BS02-DC10C-TE	107S-BS03-DC10C-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	—	103S-CS02-DC10C-TE	107S-CS03-DC10C-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	30	103S-ES03-DC10C-TE	107S-ES03-DC10C-TE
10.0...12.0	3	3	7-1/2	10	65	30	65	—	103S-BS02-DC16C-TE	107S-BS03-DC16C-TE
10.0...16.0	3...5	5	7-1/2...10	10	65	30	65	—	103S-CS02-DC16C-TE	107S-CS03-DC16C-TE
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	—	103S-DS02-DC16C-TE	107S-DS03-DC16C-TE
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	30	103S-ES03-DC16C-TE	107S-ES03-DC16C-TE
14.5...20.0	5	5...7-1/2	15	—	65	❖	65	❖	103S-DS02-DC20C-TE	107S-DS03-DC20C-TE
14.5...20.0	5	5...7-1/2	15	—	65	❖	65	❖	103S-ES03-DC20C-TE	107S-ES03-DC20C-TE
18.0...23.0	5	7-1/2	15	—	65	❖	65	❖	103S-DS02-DC25C-TE	107S-DS03-DC25C-TE
18.0...25.0	7-1/2	7-1/2...10	15...20	—	65	❖	65	❖	103S-ES03-DC25C-TE	107S-ES03-DC25C-TE
F-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules										
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	30	103S-ES03-FC10C-TE	107S-ES03-FC10C-TE
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	30	103S-ES03-FC16C-TE	107S-ES03-FC16C-TE
14.5...20.0	5	5...7-1/2	15	15...20	65	30	65	30	103S-ES03-FC20C-TE	107S-ES03-FC20C-TE
18.0...25.0	7-1/2	7-1/2...10	15...20	20	65	30	65	30	103S-ES03-FC25C-TE	107S-ES03-FC25C-TE
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	65	30	65	30	103S-GS03-FC25C-TE	107S-GS03-FC25C-TE
23.0...30.0	7-1/2	10	20	25	65	30	65	30	103S-ES03-FC32C-TE	107S-ES03-FC32C-TE
23.0...32.0	7-1/2...10	10	20...25	30	65	30	65	30	103S-FS03-FC32C-TE	107S-FS03-FC32C-TE
23.0...32.0	7-1/2...10	10	20...25	30	65	30	65	30	103S-GS03-FC32C-TE	107S-GS03-FC32C-TE
32.0...37.0	10	10	25	—	65	❖	65	❖	103S-FS03-FC45C-TE	107S-FS03-FC45C-TE
32.0...43.0	10	15	30	—	65	❖	65	❖	103S-GS03-FC45C-TE	107S-GS03-FC45C-TE

* Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.
 ❖ This starter is not valid for application at this horsepower and voltage.

⊗ Coil voltage code—see page 2-315



Open Type Starters

Product Selection & Coordination Ratings

UL/CSA as a UL508 Type F Combination Motor Controller, Continued

Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)								DOL Starters	Reversing Starters
	Hp Ratings as a UL 508 Type F Combination Motor Controller*				Max. Short-Circuit Current [kA]					
	200V AC	230V AC	460V AC	575V AC	Type 1 Coordination 480Y/277V AC	Type 2 Coordination 600Y/347V AC	Type 1 Coordination 480Y/277V AC	Type 2 Coordination 600Y/347V AC	Cat. No.	Cat. No.
C-Frame with 100-C/104-C Contactors on Panel Mounting Modules										
0.10...0.16	—	—	—	—	65	47	65	47	103S-AW02-CA16C-TE	107S-AW03-CA16C-TE
0.16...0.25	—	—	—	—	65	47	65	47	103S-AW02-CA25C-TE	107S-AW03-CA25C-TE
0.25...0.40	—	—	—	—	65	47	65	47	103S-AW02-CA40C-TE	107S-AW03-CA40C-TE
0.40...0.63	—	—	—	—	65	47	65	47	103S-AW02-CA63C-TE	107S-AW03-CA63C-TE
0.63...1.00	—	—	1/2	3/4	65	47	65	47	103S-AW02-CB10C-TE	107S-AW03-CB10C-TE
1.00...1.60	—	—	1/2...1	3/4...1	65	47	65	47	103S-AW02-CB16C-TE	107S-AW03-CB16C-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	10	103S-AW02-CB25C-TE	107S-AW03-CB25C-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	—	—	103S-AW02-CB40C-TE	107S-AW03-CB40C-TE
4.00...6.30	1...1-1/2	1...2	3...5	—	65	⚡	—	⚡	103S-AW02-CB63C-TE	107S-AW03-CB63C-TE
6.30...9.00	1-1/2...2	2	5	—	65	⚡	—	⚡	103S-AW02-CC10C-TE	107S-AW03-CC10C-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	—	65	⚡	50	⚡	103S-BW02-CC10C-TE	107S-BW03-CC10C-TE
10.0...12.0	3	3	7-1/2	—	30	⚡	—	⚡	103S-BW02-CC16C-TE	107S-BW03-CC16C-TE
10.0...16.0	3...5	5	7-1/2...10	—	30	⚡	—	⚡	103S-CW02-CC16C-TE	107S-CW03-CC16C-TE
10.0...16.0	3...5	5	7-1/2...10	—	30	⚡	—	⚡	103S-DW02-CC16C-TE	107S-DW03-CC16C-TE
14.5...20.0	5	5...7-1/2	15	—	10	⚡	—	⚡	103S-DW02-CC20C-TE	107S-DW03-CC20C-TE
18.0...23.0	—	—	—	—	—	⚡	—	⚡	103S-DW02-CC25C-TE	107S-DW03-CC25C-TE
D-Frame with 100-C/104-C Contactors on Panel Mounting Modules										
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	10	103S-AW02-DB25C-TE	107S-AW03-DB25C-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	30	103S-DW02-DB25C-TE	107S-DW03-DB25C-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	65	—	103S-AW02-DB40C-TE	107S-AW03-DB40C-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	65	30	103S-DW02-DB40C-TE	107S-DW03-DB40C-TE
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	65	—	103S-AW02-DB63C-TE	107S-AW03-DB63C-TE
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	65	30	103S-EW03-DB63C-TE	107S-EW03-DB63C-TE
6.30...9.00	1-1/2...2	2	5	7-1/2	65	30	65	—	103S-AW02-DC10C-TE	107S-AW03-DC10C-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	—	103S-BW02-DC10C-TE	107S-BW03-DC10C-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	—	103S-CW02-DC10C-TE	107S-CW03-DC10C-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	30	103S-EW03-DC10C-TE	107S-EW03-DC10C-TE
10.0...12.0	3	3	7-1/2	10	65	30	65	—	103S-BW02-DC16C-TE	107S-BW03-DC16C-TE
10.0...16.0	3...5	5	7-1/2...10	10	65	30	65	—	103S-CW02-DC16C-TE	107S-CW03-DC16C-TE
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	—	103S-DW02-DC16C-TE	107S-DW03-DC16C-TE
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	30	103S-EW03-DC16C-TE	107S-EW03-DC16C-TE
14.5...20.0	5	5...7-1/2	15	—	65	⚡	65	⚡	103S-DW02-DC20C-TE	107S-DW03-DC20C-TE
14.5...20.0	5	5...7-1/2	15	—	65	⚡	65	⚡	103S-EW03-DC20C-TE	107S-EW03-DC20C-TE
18.0...23.0	5	7-1/2	15	—	65	⚡	65	⚡	103S-DW02-DC25C-TE	107S-DW03-DC25C-TE
18.0...25.0	7-1/2	7-1/2...10	15...20	—	65	⚡	65	⚡	103S-EW03-DC25C-TE	107S-EW03-DC25C-TE
F-Frame with 100-C/104-C Contactors on Panel Mounting Modules										
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	30	103S-EW03-FC10C-TE	107S-EW03-FC10C-TE
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	30	103S-EW03-FC16C-TE	107S-EW03-FC16C-TE
14.5...20.0	5	5...7-1/2	15	15...20	65	30	65	30	103S-EW03-FC20C-TE	107S-EW03-FC20C-TE
18.0...25.0	7-1/2	7-1/2...10	15...20	20	65	30	65	30	103S-EW03-FC25C-TE	107S-EW03-FC25C-TE
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	65	30	65	30	103S-GW03-FC25C-TE	107S-GW03-FC25C-TE
23.0...30.0	7-1/2	10	20	25	65	30	65	30	103S-EW03-FC32C-TE	107S-EW03-FC32C-TE
23.0...32.0	7-1/2...10	10	20...25	30	65	30	65	30	103S-FW03-FC32C-TE	107S-FW03-FC32C-TE
23.0...32.0	7-1/2...10	10	20...25	30	65	30	65	30	103S-GW03-FC32C-TE	107S-GW03-FC32C-TE
32.0...37.0	10	10	25	—	65	⚡	65	⚡	103S-FW03-FC45C-TE	107S-FW03-FC45C-TE
32.0...43.0	10	15	30	—	65	⚡	65	⚡	103S-GW03-FC45C-TE	107S-GW03-FC45C-TE

* Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.
 ⚡ This starter is not valid for application at this horsepower and voltage.

⊗ Coil voltage code—see page 2-315



UL/CSA as a UL508 Self Protected Type E Combination Motor Controller

Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)						DOL Starters Cat. No.	Reversing Starters Cat. No.
	Hp Ratings as a UL 508 Self Protected Type E Combination Motor Controller*				Max. Short-Circuit Current [kA]			
	200V AC	230V AC	460V AC	575V AC	480Y/277V AC	600Y/347V AC		
C-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules								
0.10...0.16	—	—	—	—	65	47	103S-AT02-CA16C-TE	107S-AT03-CA16C-TE
0.16...0.25	—	—	—	—	65	47	103S-AT02-CA25C-TE	107S-AT03-CA25C-TE
0.25...0.40	—	—	—	—	65	47	103S-AT02-CA40C-TE	107S-AT03-CA40C-TE
0.40...0.63	—	—	—	—	65	47	103S-AT02-CA63C-TE	107S-AT03-CA63C-TE
0.63...1.00	—	—	1/2	3/4	65	47	103S-AT02-CB10C-TE	107S-AT03-CB10C-TE
1.00...1.60	—	—	1/2...1	3/4...1	65	47	103S-AT02-CB16C-TE	107S-AT03-CB16C-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	—	65	❖	103S-AT02-CB25C-TE	107S-AT03-CB25C-TE
2.50...4.00	—	—	—	—	❖	❖	103S-AT02-CB40C-TE	107S-AT03-CB40C-TE
4.00...6.30	—	—	—	—	❖	❖	103S-AT02-CB63C-TE	107S-AT03-CB63C-TE
6.30...9.00	—	—	—	—	❖	❖	103S-AT02-CC10C-TE	107S-AT03-CC10C-TE
6.30...10.0	—	—	—	—	❖	❖	103S-BT02-CC10C-TE	107S-BT03-CC10C-TE
10.0...12.0	—	—	—	—	❖	❖	103S-BT02-CC16C-TE	107S-BT03-CC16C-TE
10.0...16.0	—	—	—	—	❖	❖	103S-CT02-CC16C-TE	107S-CT03-CC16C-TE
10.0...16.0	—	—	—	—	❖	❖	103S-DT02-CC16C-TE	107S-DT03-CC16C-TE
14.5...20.0	—	—	—	—	❖	❖	103S-DT02-CC20C-TE	107S-DT03-CC20C-TE
18.0...23.0	—	—	—	—	❖	❖	103S-DT02-CC25C-TE	107S-DT03-CC25C-TE
D-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules								
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	—	65	❖	103S-AT02-DB25C-TE	107S-AT03-DB25C-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	103S-DT02-DB25C-TE	107S-DT03-DB25C-TE
2.50...4.00	—	—	—	—	❖	❖	103S-AT02-DB40C-TE	107S-AT03-DB40C-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	103S-DT02-DB40C-TE	107S-DT03-DB40C-TE
4.00...6.30	—	—	—	—	❖	❖	103S-AT02-DB63C-TE	107S-AT03-DB63C-TE
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	103S-ET03-DB63C-TE	107S-ET03-DB63C-TE
6.30...9.00	—	—	—	—	❖	❖	103S-AT02-DC10C-TE	107S-AT03-DC10C-TE
6.30...10.0	—	—	—	—	❖	❖	103S-BT02-DC10C-TE	107S-BT03-DC10C-TE
6.30...10.0	—	—	—	—	❖	❖	103S-CT02-DC10C-TE	107S-CT03-DC10C-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	103S-ET03-DC10C-TE	107S-ET03-DC10C-TE
10.0...12.0	—	—	—	—	❖	❖	103S-BT02-DC16C-TE	107S-BT03-DC16C-TE
10.0...16.0	—	—	—	—	❖	❖	103S-CT02-DC16C-TE	107S-CT03-DC16C-TE
10.0...16.0	—	—	—	—	❖	❖	103S-DT02-DC16C-TE	107S-DT03-DC16C-TE
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	103S-ET03-DC16C-TE	107S-ET03-DC16C-TE
14.5...20.0	—	—	—	—	❖	❖	103S-DT02-DC20C-TE	107S-DT03-DC20C-TE
14.5...20.0	5	5...7-1/2	15	—	65	❖	103S-ET03-DC20C-TE	107S-ET03-DC20C-TE
18.0...23.0	—	—	—	—	❖	❖	103S-DT02-DC25C-TE	107S-DT03-DC25C-TE
18.0...25.0	7-1/2	7-1/2...10	15...20	—	65	❖	103S-ET03-DC25C-TE	107S-ET03-DC25C-TE
F-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules								
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	103S-ET03-FC10C-TE	107S-ET03-FC10C-TE
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	103S-ET03-FC16C-TE	107S-ET03-FC16C-TE
14.5...20.0	5	5...7-1/2	15	15...20	65	30	103S-ET03-FC20C-TE	107S-ET03-FC20C-TE
18.0...25.0	7-1/2	7-1/2...10	15...20	20	65	30	103S-ET03-FC25C-TE	107S-ET03-FC25C-TE
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	65	30	103S-GT03-FC25C-TE	107S-GT03-FC25C-TE
23.0...30.0	7-1/2	10	20	25	65	30	103S-ET03-FC32C-TE	107S-ET03-FC32C-TE
23.0...32.0	7-1/2...10	10	20...25	30	65	30	103S-FT03-FC32C-TE	107S-FT03-FC32C-TE
23.0...32.0	7-1/2...10	10	20...25	30	65	30	103S-GT03-FC32C-TE	107S-GT03-FC32C-TE
23.0...32.0	7-1/2...10	10	20...25	30	65	30	103S-HT03-FC32C-TE	107S-HT03-FC32C-TE
32.0...37.0	10	10	25	—	65	❖	103S-FT03-FC45C-TE	107S-FT03-FC45C-TE
32.0...43.0	10	15	30	—	65	❖	103S-GT03-FC45C-TE	107S-GT03-FC45C-TE
32.0...45.0	10	15	30	—	65	❖	103S-HT03-FC45C-TE	107S-HT03-FC45C-TE
32.0...45.0	10	15	30	—	65	❖	103S-JT03-FC45C-TE	107S-JT03-FC45C-TE

* Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

❖ This starter is not valid for application at this horsepower and voltage.

⊗ Coil voltage code—see page 2-315



Open Type Starters

Product Selection & Coordination Ratings

UL/CSA as a UL508 Self Protected Type E Combination Motor Controller, Continued

Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)						DOL Starters Cat. No.	Reversing Starters Cat. No.
	Hp Ratings as a UL 508 Self Protected Type E Combination Motor Controller*				Max. Short-Circuit Current [kA]			
	200V AC	230V AC	460V AC	575V AC	480Y/277V AC	600Y/347V AC		
C-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules								
0.10...0.16	—	—	—	—	65	47	103S-ASØ2-CA16C-TE	107S-ASØ3-CA16C-TE
0.16...0.25	—	—	—	—	65	47	103S-ASØ2-CA25C-TE	107S-ASØ3-CA25C-TE
0.25...0.40	—	—	—	—	65	47	103S-ASØ2-CA40C-TE	107S-ASØ3-CA40C-TE
0.40...0.63	—	—	—	—	65	47	103S-ASØ2-CA63C-TE	107S-ASØ3-CA63C-TE
0.63...1.00	—	—	1/2	3/4	65	47	103S-ASØ2-CB10C-TE	107S-ASØ3-CB10C-TE
1.00...1.60	—	—	1/2...1	3/4...1	65	47	103S-ASØ2-CB16C-TE	107S-ASØ3-CB16C-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	—	65	—	103S-ASØ2-CB25C-TE	107S-ASØ3-CB25C-TE
2.50...4.00	—	—	—	—	—	—	103S-ASØ2-CB40C-TE	107S-ASØ3-CB40C-TE
4.00...6.30	—	—	—	—	—	—	103S-ASØ2-CB63C-TE	107S-ASØ3-CB63C-TE
6.30...9.00	—	—	—	—	—	—	103S-ASØ2-CC10C-TE	107S-ASØ3-CC10C-TE
6.30...10.0	—	—	—	—	—	—	103S-BSØ2-CC10C-TE	107S-BSØ3-CC10C-TE
10.0...12.0	—	—	—	—	—	—	103S-BSØ2-CC16C-TE	107S-BSØ3-CC16C-TE
10.0...16.0	—	—	—	—	—	—	103S-CSØ2-CC16C-TE	107S-CSØ3-CC16C-TE
10.0...16.0	—	—	—	—	—	—	103S-DSØ2-CC16C-TE	107S-DSØ3-CC16C-TE
14.5...20.0	—	—	—	—	—	—	103S-DSØ2-CC20C-TE	107S-DSØ3-CC20C-TE
18.0...23.0	—	—	—	—	—	—	103S-DSØ2-CC25C-TE	107S-DSØ3-CC25C-TE
D-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules								
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	—	65	—	103S-ASØ2-DB25C-TE	107S-ASØ3-DB25C-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	103S-DSØ2-DB25C-TE	107S-DSØ3-DB25C-TE
2.50...4.00	—	—	—	—	—	—	103S-ASØ2-DB40C-TE	107S-ASØ3-DB40C-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	103S-DSØ2-DB40C-TE	107S-DSØ3-DB40C-TE
4.00...6.30	—	—	—	—	—	—	103S-ASØ2-DB63C-TE	107S-ASØ3-DB63C-TE
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	103S-ESØ3-DB63C-TE	107S-ESØ3-DB63C-TE
6.30...9.00	—	—	—	—	—	—	103S-ASØ2-DC10C-TE	107S-ASØ3-DC10C-TE
6.30...10.0	—	—	—	—	—	—	103S-BSØ2-DC10C-TE	107S-BSØ3-DC10C-TE
6.30...10.0	—	—	—	—	—	—	103S-CSØ2-DC10C-TE	107S-CSØ3-DC10C-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	103S-ESØ3-DC10C-TE	107S-ESØ3-DC10C-TE
10.0...12.0	—	—	—	—	—	—	103S-BSØ2-DC16C-TE	107S-BSØ3-DC16C-TE
10.0...16.0	—	—	—	—	—	—	103S-CSØ2-DC16C-TE	107S-CSØ3-DC16C-TE
10.0...16.0	—	—	—	—	—	—	103S-DSØ2-DC16C-TE	107S-DSØ3-DC16C-TE
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	103S-ESØ3-DC16C-TE	107S-ESØ3-DC16C-TE
14.5...20.0	—	—	—	—	—	—	103S-DSØ2-DC20C-TE	107S-DSØ3-DC20C-TE
14.5...20.0	5	5...7-1/2	15	—	65	—	103S-ESØ3-DC20C-TE	107S-ESØ3-DC20C-TE
18.0...23.0	—	—	—	—	—	—	103S-DSØ2-DC25C-TE	107S-DSØ3-DC25C-TE
18.0...25.0	7-1/2	7-1/2...10	15...20	—	65	—	103S-ESØ3-DC25C-TE	107S-ESØ3-DC25C-TE
F-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules								
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	103S-ESØ3-FC10C-TE	107S-ESØ3-FC10C-TE
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	103S-ESØ3-FC16C-TE	107S-ESØ3-FC16C-TE
14.5...20.0	5	5...7-1/2	15	15...20	65	30	103S-ESØ3-FC20C-TE	107S-ESØ3-FC20C-TE
18.0...25.0	7-1/2	7-1/2...10	15...20	20	65	30	103S-ESØ3-FC25C-TE	107S-ESØ3-FC25C-TE
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	65	30	103S-GSØ3-FC25C-TE	107S-GSØ3-FC25C-TE
23.0...30.0	7-1/2	10	20	25	65	30	103S-ESØ3-FC32C-TE	107S-ESØ3-FC32C-TE
23.0...32.0	7-1/2...10	10	20...25	30	65	30	103S-FSØ3-FC32C-TE	107S-FSØ3-FC32C-TE
23.0...32.0	7-1/2...10	10	20...25	30	65	30	103S-GSØ3-FC32C-TE	107S-GSØ3-FC32C-TE
32.0...37.0	10	10	25	—	65	—	103S-FSØ3-FC45C-TE	107S-FSØ3-FC45C-TE
32.0...43.0	10	15	30	—	65	—	103S-GSØ3-FC45C-TE	107S-GSØ3-FC45C-TE

* Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

❖ This starter is not valid for application at this horsepower and voltage.

⊗Coil voltage code—see page 2-315



UL/CSA as a UL508 Self Protected Type E Combination Motor Controller, Continued

Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)						DOL Starters Cat. No.	Reversing Starters Cat. No.
	Hp Ratings as a UL 508 Self Protected Type E Combination Motor Controller*					Max. Short-Circuit Current [kA]		
	200V AC	230V AC	460V AC	575V AC	480Y/277V AC			
C-Frame with 100-C/104-C Contactors on Panel Mounting Modules								
0.10...0.16	—	—	—	—	65	47	103S-AW02-CA16C-TE	107S-AW03-CA16C-TE
0.16...0.25	—	—	—	—	65	47	103S-AW02-CA25C-TE	107S-AW03-CA25C-TE
0.25...0.40	—	—	—	—	65	47	103S-AW02-CA40C-TE	107S-AW03-CA40C-TE
0.40...0.63	—	—	—	—	65	47	103S-AW02-CA63C-TE	107S-AW03-CA63C-TE
0.63...1.00	—	—	1/2	3/4	65	47	103S-AW02-CB10C-TE	107S-AW03-CB10C-TE
1.00...1.60	—	—	1/2...1	3/4...1	65	47	103S-AW02-CB16C-TE	107S-AW03-CB16C-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	—	65	❖	103S-AW02-CB25C-TE	107S-AW03-CB25C-TE
2.50...4.00	—	—	—	—	❖	❖	103S-AW02-CB40C-TE	107S-AW03-CB40C-TE
4.00...6.30	—	—	—	—	❖	❖	103S-AW02-CB63C-TE	107S-AW03-CB63C-TE
6.30...9.00	—	—	—	—	❖	❖	103S-AW02-CC10C-TE	107S-AW03-CC10C-TE
6.30...10.0	—	—	—	—	❖	❖	103S-BW02-CC10C-TE	107S-BW03-CC10C-TE
10.0...12.0	—	—	—	—	❖	❖	103S-BW02-CC16C-TE	107S-BW03-CC16C-TE
10.0...16.0	—	—	—	—	❖	❖	103S-CW02-CC16C-TE	107S-CW03-CC16C-TE
10.0...16.0	—	—	—	—	❖	❖	103S-DW02-CC16C-TE	107S-DW03-CC16C-TE
14.5...20.0	—	—	—	—	❖	❖	103S-DW02-CC20C-TE	107S-DW03-CC20C-TE
18.0...23.0	—	—	—	—	❖	❖	103S-DW02-CC25C-TE	107S-DW03-CC25C-TE
D-Frame with 100-C/104-C Contactors on Panel Mounting Modules								
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	—	65	❖	103S-AW02-DB25C-TE	107S-AW03-DB25C-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	103S-DW02-DB25C-TE	107S-DW03-DB25C-TE
2.50...4.00	—	—	—	—	❖	❖	103S-AW02-DB40C-TE	107S-AW03-DB40C-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	103S-DW02-DB40C-TE	107S-DW03-DB40C-TE
4.00...6.30	—	—	—	—	❖	❖	103S-AW02-DB63C-TE	107S-AW03-DB63C-TE
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	103S-EW03-DB63C-TE	107S-EW03-DB63C-TE
6.30...9.00	—	—	—	—	❖	❖	103S-AW02-DC10C-TE	107S-AW03-DC10C-TE
6.30...10.0	—	—	—	—	❖	❖	103S-BW02-DC10C-TE	107S-BW03-DC10C-TE
6.30...10.0	—	—	—	—	❖	❖	103S-CW02-DC10C-TE	107S-CW03-DC10C-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	103S-EW03-DC10C-TE	107S-EW03-DC10C-TE
10.0...12.0	—	—	—	—	❖	❖	103S-BW02-DC16C-TE	107S-BW03-DC16C-TE
10.0...16.0	—	—	—	—	❖	❖	103S-CW02-DC16C-TE	107S-CW03-DC16C-TE
10.0...16.0	—	—	—	—	❖	❖	103S-DW02-DC16C-TE	107S-DW03-DC16C-TE
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	103S-EW03-DC16C-TE	107S-EW03-DC16C-TE
14.5...20.0	—	—	—	—	❖	❖	103S-DW02-DC20C-TE	107S-DW03-DC20C-TE
14.5...20.0	5	5...7-1/2	15	—	65	❖	103S-EW03-DC20C-TE	107S-EW03-DC20C-TE
18.0...23.0	—	—	—	—	❖	❖	103S-DW02-DC25C-TE	107S-DW03-DC25C-TE
18.0...25.0	7-1/2	7-1/2...10	15...20	—	65	❖	103S-EW03-DC25C-TE	107S-EW03-DC25C-TE
F-Frame with 100-C/104-C Contactors on Panel Mounting Modules								
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	103S-EW03-FC10C-TE	107S-EW03-FC10C-TE
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	103S-EW03-FC16C-TE	107S-EW03-FC16C-TE
14.5...20.0	5	5...7-1/2	15	15...20	65	30	103S-EW03-FC20C-TE	107S-EW03-FC20C-TE
18.0...25.0	7-1/2	7-1/2...10	15...20	20	65	30	103S-EW03-FC25C-TE	107S-EW03-FC25C-TE
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	65	30	103S-GW03-FC25C-TE	107S-GW03-FC25C-TE
23.0...30.0	7-1/2	10	20	25	65	30	103S-EW03-FC32C-TE	107S-EW03-FC32C-TE
23.0...32.0	7-1/2...10	10	20...25	30	65	30	103S-FW03-FC32C-TE	107S-FW03-FC32C-TE
23.0...32.0	7-1/2...10	10	20...25	30	65	30	103S-GW03-FC32C-TE	107S-GW03-FC32C-TE
32.0...37.0	10	10	25	—	65	❖	103S-FW03-FC45C-TE	107S-FW03-FC45C-TE
32.0...43.0	10	15	30	—	65	❖	103S-GW03-FC45C-TE	107S-GW03-FC45C-TE

* Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

❖ This starter is not valid for application at this horsepower and voltage.

⊗ Coil voltage code—see page 2-315



Open Type Starters

Product Selection & Coordination Ratings

IEC Type 1 and Type 2 Short-Circuit Coordination

2

Motor Current Adjustment Range [A]	IEC kW and Coordination Ratings (50 Hz)												DOL Starters Cat. No.	Reversing Starters Cat. No.
	kW Ratings*				Max. Short-Circuit Current [kA]									
					Type 1 Coordination				Type 2 Coordination					
	230V AC	400V AC	500V AC	690V AC	230V AC	400V AC	500V AC	690V AC	230V AC	400V AC	500V AC	690V AC		
C-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules														
0.10...0.16	—	—	0.06	0.06	65	65	65	50	65	65	65	50	103S-AT02-CA16C	107S-AT03-CA16C
0.16...0.25	0.02	0.06	0.06	0.12	65	65	65	50	65	65	65	50	103S-AT02-CA25C	107S-AT03-CA25C
0.25...0.40	0.06	0.09	0.12	0.18	65	65	65	50	65	65	65	50	103S-AT02-CA40C	107S-AT03-CA40C
0.40...0.63	0.09	0.18	0.18	0.37	65	65	65	50	65	65	65	50	103S-AT02-CA63C	107S-AT03-CA63C
0.63...1.00	0.12	0.25	0.37	0.55	65	65	65	50	65	65	65	50	103S-AT02-CB10C	107S-AT03-CB10C
1.00...1.60	0.25	0.55	0.75	1.1	65	65	65	50	65	65	65	50	103S-AT02-CB16C	107S-AT03-CB16C
1.60...2.50	0.55	0.75	1.1	1.8	65	65	50	8	65	50	50	8	103S-AT02-CB25C	107S-AT03-CB25C
2.50...4.00	0.75	1.5	2.2	3	65	50	50	8	50	50	—	—	103S-AT02-CB40C	107S-AT03-CB40C
4.00...6.30	1.5	2.2	3	4	65	50	50	4	50	50	—	—	103S-AT02-CB63C	107S-AT03-CB63C
6.30...9.00	2.2	4	4	—	65	65	50	—	50	50	—	—	103S-AT02-CC10C	107S-AT03-CC10C
6.30...10.0	2.2	4	5.5	5.5	65	65	50	4	50	50	50	—	103S-BT02-CC10C	107S-BT03-CC10C
6.30...10.0	2.2	4	5.5	7.5	65	65	50	4	50	50	50	—	103S-CT02-CC10C	107S-CT03-CC10C
10.0...12.0	4	5.5	—	—	65	65	—	—	50	50	—	—	103S-BT02-CC16C	107S-BT03-CC16C
10.0...16.0	4	7.5	7.5	—	65	50	10	—	50	—	—	—	103S-CT02-CC16C	107S-CT03-CC16C
10.0...16.0	4	7.5	10	10	65	50	10	3	50	50	—	—	103S-DT02-CC16C	107S-DT03-CC16C
14.5...20.0	4	10	11	—	50	15	6	—	15	—	—	—	103S-DT02-CC20C	107S-DT03-CC20C
18.0...23.0	6.3	11	13	—	50	15	6	—	15	—	—	—	103S-DT02-CC25C	107S-DT03-CC25C
D-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules														
1.60...2.50	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103S-AT02-DB25C	107S-AT03-DB25C
1.60...2.50	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103S-DT02-DB25C	107S-DT03-DB25C
2.50...4.00	0.75	1.5	2.2	3	65	65	50	10	65	65	50	—	103S-AT02-DB40C	107S-AT03-DB40C
2.50...4.00	0.75	1.5	2.2	3	65	65	50	50	65	65	50	50	103S-DT02-DB40C	107S-DT03-DB40C
4.00...6.30	1.5	2.2	3	4	65	65	50	50	65	65	50	—	103S-AT02-DB63C	107S-AT03-DB63C
4.00...6.30	1.5	2.2	3	4	65	65	50	50	65	65	50	50	103S-ET03-DB63C	107S-ET03-DB63C
6.30...9.00	2.2	4	4	—	65	65	50	—	65	65	—	—	103S-AT02-DC10C	107S-AT03-DC10C
6.30...10.0	2.2	4	5.5	5.5	65	65	50	50	65	65	65	—	103S-BT02-DC10C	107S-BT03-DC10C
6.30...10.0	2.2	4	5.5	7.5	65	65	50	50	65	65	65	50	103S-CT02-DC10C	107S-CT03-DC10C
6.30...10.0	2.2	4	5.5	7.5	65	65	50	50	65	65	65	50	103S-ET03-DC10C	107S-ET03-DC10C
10.0...12.0	4	5.5	—	—	65	65	—	—	65	65	—	—	103S-BT02-DC16C	107S-BT03-DC16C
10.0...16.0	4	7.5	7.5	—	65	65	50	—	65	65	50	—	103S-CT02-DC16C	107S-CT03-DC16C
10.0...16.0	4	7.5	10	10	65	65	50	6	65	65	50	—	103S-DT02-DC16C	107S-DT03-DC16C
10.0...16.0	4	7.5	10	13	65	65	50	6	65	65	50	—	103S-ET03-DC16C	107S-ET03-DC16C
14.5...20.0	4	10	11	—	65	65	25	—	65	65	25	—	103S-DT02-DC20C	107S-DT03-DC20C
14.5...20.0	4	10	11	15	65	65	25	6	65	65	25	—	103S-ET03-DC20C	107S-ET03-DC20C
18.0...23.0	6.3	11	13	—	65	50	25	—	65	50	25	—	103S-DT02-DC25C	107S-DT03-DC25C
18.0...25.0	6.3	11	15	—	65	50	25	—	65	50	25	—	103S-ET03-DC25C	107S-ET03-DC25C
F-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules														
6.30...10.0	2.2	4	5.5	7.5	65	65	50	50	65	65	50	50	103S-ET03-FC10C	107S-ET03-FC10C
10.0...16.0	4	7.5	10	13	65	65	50	50	65	65	50	50	103S-ET03-FC16C	107S-ET03-FC16C
14.5...20.0	4	10	11	15	65	65	50	50	65	65	50	50	103S-ET03-FC20C	107S-ET03-FC20C
18.0...25.0	6.3	11	15	—	65	65	50	—	65	65	50	—	103S-ET03-FC25C	107S-ET03-FC25C
18.0...25.0	6.3	11	15	22	65	65	50	50	65	65	50	50	103S-GT03-FC25C	107S-GT03-FC25C
23.0...30.0	7.5	15	15	—	65	65	50	—	65	65	50	—	103S-ET03-FC32C	107S-ET03-FC32C
23.0...32.0	7.5	15	20	—	65	65	50	—	65	65	50	—	103S-FT03-FC32C	107S-FT03-FC32C
23.0...32.0	7.5	15	20	22	65	65	50	50	65	65	50	50	103S-GT03-FC32C	107S-GT03-FC32C
23.0...32.0	7.5	15	20	25	65	65	50	50	65	65	50	50	103S-HT03-FC32C	107S-HT03-FC32C
32.0...37.0	11	18.5	—	—	65	65	—	—	65	65	—	—	103S-FT03-FC45C	107S-FT03-FC45C
32.0...43.0	13	22	25	—	65	65	50	—	65	65	50	—	103S-GT03-FC45C	107S-GT03-FC45C
32.0...45.0	13	22	30	—	65	65	50	—	65	65	50	—	103S-HT03-FC45C	107S-HT03-FC45C
32.0...45.0	13	22	30	—	65	65	50	—	65	65	50	—	103S-JT03-FC45C	107S-JT03-FC45C
CMN-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules														
40.0...60.0	18.5	32	37	—	65	65	50	—	65	65	30	—	103S-HT03-GC63C	107S-HT03-GC63C
40.0...63.0	18.5	32	40	—	65	65	50	—	65	65	30	—	103S-JT03-GC63C	107S-JT03-GC63C
40.0...63.0	18.5	32	40	45	65	65	50	8	65	65	30	—	103S-KT03-GC63C	107S-KT03-GC63C
63.0...72.0	22	40	45	—	65	65	50	—	65	65	15	—	103S-JT03-GC90C	107S-JT03-GC90C
63.0...85.0	25	45	50	—	65	65	50	—	65	65	15	—	103S-KT03-GC90C	107S-KT03-GC90C

* kW ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

⊗ Coil voltage code—see page 2-315



IEC Type 1 and Type 2 Short-Circuit Coordination, Continued

Motor Current Adjustment Range [A]	IEC kW and Coordination Ratings (50 Hz)												DOL Starters	Reversing Starters
	kW Ratings*				Max. Short-Circuit Current [kA]									
					Type 1 Coordination				Type 2 Coordination				Cat. No.	Cat. No.
	230V AC	400V AC	500V AC	690V AC	230V AC	400V AC	500V AC	690V AC	230V AC	400V AC	500V AC	690V AC		
C-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules														
0.10...0.16	—	—	0.06	0.06	65	65	65	50	65	65	65	50	103S-AS02-CA16C	107S-AS03-CA16C
0.16...0.25	0.02	0.06	0.06	0.12	65	65	65	50	65	65	65	50	103S-AS02-CA25C	107S-AS03-CA25C
0.25...0.40	0.06	0.09	0.12	0.18	65	65	65	50	65	65	65	50	103S-AS02-CA40C	107S-AS03-CA40C
0.40...0.63	0.09	0.18	0.18	0.37	65	65	65	50	65	65	65	50	103S-AS02-CA63C	107S-AS03-CA63C
0.63...1.00	0.12	0.25	0.37	0.55	65	65	65	50	65	65	65	50	103S-AS02-CB10C	107S-AS03-CB10C
1.00...1.60	0.25	0.55	0.75	1.1	65	65	65	50	65	65	65	50	103S-AS02-CB16C	107S-AS03-CB16C
1.60...2.50	0.55	0.75	1.1	1.8	65	65	50	8	65	50	50	8	103S-AS02-CB25C	107S-AS03-CB25C
2.50...4.00	0.75	1.5	2.2	3	65	50	50	8	50	50	—	—	103S-AS02-CB40C	107S-AS03-CB40C
4.00...6.30	1.5	2.2	3	4	65	50	50	4	50	50	—	—	103S-AS02-CB63C	107S-AS03-CB63C
6.30...9.00	2.2	4	4	—	65	65	50	—	50	50	—	—	103S-AS02-CC10C	107S-AS03-CC10C
6.30...10.0	2.2	4	5.5	5.5	65	65	50	4	50	50	50	—	103S-BS02-CC10C	107S-BS03-CC10C
6.30...10.0	2.2	4	5.5	7.5	65	65	50	4	50	50	50	—	103S-CS02-CC10C	107S-CS03-CC10C
10.0...12.0	4	5.5	—	—	65	65	—	—	50	50	—	—	103S-BS02-CC16C	107S-BS03-CC16C
10.0...16.0	4	7.5	7.5	—	65	50	10	—	50	—	—	—	103S-CS02-CC16C	107S-CS03-CC16C
10.0...16.0	4	7.5	10	10	65	50	10	3	50	50	—	—	103S-DS02-CC16C	107S-DS03-CC16C
14.5...20.0	4	10	11	—	50	15	6	—	15	—	—	—	103S-DS02-CC20C	107S-DS03-CC20C
18.0...23.0	6.3	11	13	—	50	15	6	—	15	—	—	—	103S-DS02-CC25C	107S-DS03-CC25C
D-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules														
1.60...2.50	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103S-AS02-DB25C	107S-AS03-DB25C
1.60...2.50	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103S-DS02-DB25C	107S-DS03-DB25C
2.50...4.00	0.75	1.5	2.2	3	65	65	50	10	65	65	50	—	103S-AS02-DB40C	107S-AS03-DB40C
2.50...4.00	0.75	1.5	2.2	3	65	65	50	50	65	65	50	50	103S-DS02-DB40C	107S-DS03-DB40C
4.00...6.30	1.5	2.2	3	4	65	65	50	50	65	65	50	—	103S-AS02-DB63C	107S-AS03-DB63C
4.00...6.30	1.5	2.2	3	4	65	65	50	50	65	65	50	50	103S-ES03-DB63C	107S-ES03-DB63C
6.30...9.00	2.2	4	4	—	65	65	50	—	65	65	—	—	103S-AS02-DC10C	107S-AS03-DC10C
6.30...10.0	2.2	4	5.5	5.5	65	65	50	50	65	65	65	—	103S-BS02-DC10C	107S-BS03-DC10C
6.30...10.0	2.2	4	5.5	7.5	65	65	65	50	65	65	65	50	103S-CS02-DC10C	107S-CS03-DC10C
6.30...10.0	2.2	4	5.5	7.5	65	65	65	50	65	65	65	50	103S-ES03-DC10C	107S-ES03-DC10C
10.0...12.0	4	5.5	—	—	65	65	—	—	65	65	—	—	103S-BS02-DC16C	107S-BS03-DC16C
10.0...16.0	4	7.5	7.5	—	65	65	50	—	65	65	50	—	103S-CS02-DC16C	107S-CS03-DC16C
10.0...16.0	4	7.5	10	10	65	65	50	6	65	65	50	—	103S-DS02-DC16C	107S-DS03-DC16C
10.0...16.0	4	7.5	10	13	65	65	50	6	65	65	50	—	103S-ES03-DC16C	107S-ES03-DC16C
14.5...20.0	4	10	11	—	65	65	25	—	65	65	25	—	103S-DS02-DC20C	107S-DS03-DC20C
14.5...20.0	4	10	11	15	65	65	25	6	65	65	25	—	103S-ES03-DC20C	107S-ES03-DC20C
18.0...23.0	6.3	11	13	—	65	50	25	—	65	50	25	—	103S-DS02-DC25C	107S-DS03-DC25C
18.0...25.0	6.3	11	15	—	65	50	25	—	65	50	25	—	103S-ES03-DC25C	107S-ES03-DC25C
F-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules														
6.30...10.0	2.2	4	5.5	7.5	65	65	50	50	65	65	50	50	103S-ES03-FC10C	107S-ES03-FC10C
10.0...16.0	4	7.5	10	13	65	65	50	50	65	65	50	50	103S-ES03-FC16C	107S-ES03-FC16C
14.5...20.0	4	10	11	15	65	65	50	50	65	65	50	50	103S-ES03-FC20C	107S-ES03-FC20C
18.0...25.0	6.3	11	15	—	65	65	50	—	65	65	50	—	103S-ES03-FC25C	107S-ES03-FC25C
18.0...25.0	6.3	11	15	22	65	65	50	50	65	65	50	50	103S-GS03-FC25C	107S-GS03-FC25C
23.0...30.0	7.5	15	15	—	65	65	50	—	65	65	50	—	103S-ES03-FC32C	107S-ES03-FC32C
23.0...32.0	7.5	15	20	—	65	65	50	—	65	65	50	—	103S-FS03-FC32C	107S-FS03-FC32C
23.0...32.0	7.5	15	20	22	65	65	50	50	65	65	50	50	103S-GS03-FC32C	107S-GS03-FC32C
32.0...37.0	11	18.5	—	—	65	65	—	—	65	65	—	—	103S-FS03-FC45C	107S-FS03-FC45C
32.0...43.0	13	22	25	—	65	65	50	—	65	65	50	—	103S-GS03-FC45C	107S-GS03-FC45C

* kW ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

⊗ Coil voltage code—see page 2-315



Open Type Starters

Product Selection & Coordination Ratings

IEC Type 1 and Type 2 Short-Circuit Coordination, Continued

2

Motor Current Adjustment Range [A]	IEC kW and Coordination Ratings (50 Hz)												DOL Starters Cat. No.	Reversing Starters Cat. No.
	kW Ratings*				Max. Short-Circuit Current [kA]									
					Type 1 Coordination				Type 2 Coordination					
	230V AC	400V AC	500V AC	690V AC	230V AC	400V AC	500V AC	690V AC	230V AC	400V AC	500V AC	690V AC		
C-Frame with 100-C/104-C Contactors on Panel Mounting Modules														
0.10...0.16	—	—	0.06	0.06	100	100	65	50	65	65	65	50	103S-AW02-CA16C	107S-AW03-CA16C
0.16...0.25	0.02	0.06	0.06	0.12	100	100	65	50	65	65	65	50	103S-AW02-CA25C	107S-AW03-CA25C
0.25...0.40	0.06	0.09	0.12	0.18	100	100	65	50	65	65	65	50	103S-AW02-CA40C	107S-AW03-CA40C
0.40...0.63	0.09	0.18	0.18	0.37	100	100	65	50	65	65	65	50	103S-AW02-CA63C	107S-AW03-CA63C
0.63...1.00	0.12	0.25	0.37	0.55	100	100	65	50	65	65	65	50	103S-AW02-CB10C	107S-AW03-CB10C
1.00...1.60	0.25	0.55	0.75	1.1	100	100	65	50	65	65	65	50	103S-AW02-CB16C	107S-AW03-CB16C
1.60...2.50	0.55	0.75	1.1	1.8	100	65	50	8	65	50	50	8	103S-AW02-CB25C	107S-AW03-CB25C
2.50...4.00	0.75	1.5	2.2	3	100	50	50	8	50	50	—	—	103S-AW02-CB40C	107S-AW03-CB40C
4.00...6.30	1.5	2.2	3	4	100	50	50	4	50	50	—	—	103S-AW02-CB63C	107S-AW03-CB63C
6.30...9.00	2.2	4	4	—	100	65	50	—	50	50	—	—	103S-AW02-CC10C	107S-AW03-CC10C
6.30...10.0	2.2	4	5.5	5.5	100	65	50	4	50	50	50	—	103S-BW02-CC10C	107S-BW03-CC10C
6.30...10.0	2.2	4	5.5	7.5	100	65	50	4	50	50	50	—	103S-CW02-CC10C	107S-CW03-CC10C
10.0...12.0	4	5.5	—	—	100	65	—	—	50	50	—	—	103S-BW02-CC16C	107S-BW03-CC16C
10.0...16.0	4	7.5	7.5	—	100	50	10	—	50	—	—	—	103S-CW02-CC16C	107S-CW03-CC16C
10.0...16.0	4	7.5	10	10	100	50	10	3	50	50	—	—	103S-DW02-CC16C	107S-DW03-CC16C
14.5...20.0	4	10	11	—	50	15	6	—	15	—	—	—	103S-DW02-CC20C	107S-DW03-CC20C
18.0...23.0	6.3	11	13	—	50	15	6	—	15	—	—	—	103S-DW02-CC25C	107S-DW03-CC25C
D-Frame with 100-C/104-C Contactors on Panel Mounting Modules														
1.60...2.50	0.55	0.75	1.1	1.8	100	100	50	10	100	100	50	10	103S-AW02-DB25C	107S-AW03-DB25C
1.60...2.50	0.55	0.75	1.1	1.8	100	100	50	10	100	100	50	10	103S-DW02-DB25C	107S-DW03-DB25C
2.50...4.00	0.75	1.5	2.2	3	100	100	50	10	100	100	50	—	103S-AW02-DB40C	107S-AW03-DB40C
2.50...4.00	0.75	1.5	2.2	3	100	100	50	50	100	100	50	50	103S-DW02-DB40C	107S-DW03-DB40C
4.00...6.30	1.5	2.2	3	4	100	100	50	50	100	100	50	—	103S-AW02-DB63C	107S-AW03-DB63C
4.00...6.30	1.5	2.2	3	4	100	100	50	50	100	100	50	50	103S-EW03-DB63C	107S-EW03-DB63C
6.30...9.00	2.2	4	4	—	100	65	50	—	65	65	—	—	103S-AW02-DC10C	107S-AW03-DC10C
6.30...10.0	2.2	4	5.5	5.5	100	100	65	50	100	100	65	—	103S-BW02-DC10C	107S-BW03-DC10C
6.30...10.0	2.2	4	5.5	7.5	100	100	65	50	100	100	65	50	103S-CW02-DC10C	107S-CW03-DC10C
6.30...10.0	2.2	4	5.5	7.5	100	100	65	50	100	100	65	50	103S-EW03-DC10C	107S-EW03-DC10C
10.0...12.0	4	5.5	—	—	100	65	—	—	65	65	—	—	103S-BW02-DC16C	107S-BW03-DC16C
10.0...16.0	4	7.5	7.5	—	100	65	50	—	65	65	50	—	103S-CW02-DC16C	107S-CW03-DC16C
10.0...16.0	4	7.5	10	10	100	65	50	6	65	65	50	—	103S-DW02-DC16C	107S-DW03-DC16C
10.0...16.0	4	7.5	10	13	100	65	50	6	65	65	50	—	103S-EW03-DC16C	107S-EW03-DC16C
14.5...20.0	4	10	11	—	65	65	25	—	65	65	25	—	103S-DW02-DC20C	107S-DW03-DC20C
14.5...20.0	4	10	11	15	65	65	25	6	65	65	25	—	103S-EW03-DC20C	107S-EW03-DC20C
18.0...23.0	6.3	11	13	—	65	50	25	—	65	50	25	—	103S-DW02-DC25C	107S-DW03-DC25C
18.0...25.0	6.3	11	15	—	65	50	25	—	65	50	25	—	103S-EW03-DC25C	107S-EW03-DC25C
F-Frame with 100-C/104-C Contactors on Panel Mounting Modules														
6.30...10.0	2.2	4	5.5	7.5	100	100	50	50	100	100	50	50	103S-EW03-FC10C	107S-EW03-FC10C
10.0...16.0	4	7.5	10	13	100	100	50	50	100	100	50	50	103S-EW03-FC16C	107S-EW03-FC16C
14.5...20.0	4	10	11	15	100	100	50	50	100	100	50	50	103S-EW03-FC20C	107S-EW03-FC20C
18.0...25.0	6.3	11	15	—	100	100	50	—	100	100	50	—	103S-EW03-FC25C	107S-EW03-FC25C
18.0...25.0	6.3	11	15	22	100	100	50	50	100	100	50	50	103S-GW03-FC25C	107S-GW03-FC25C
23.0...30.0	7.5	15	15	—	100	100	50	—	100	100	50	—	103S-EW03-FC32C	107S-EW03-FC32C
23.0...32.0	7.5	15	20	—	100	100	50	—	100	100	50	—	103S-FW03-FC32C	107S-FW03-FC32C
23.0...32.0	7.5	15	20	22	100	100	50	50	100	100	50	50	107S-GW03-FC32C	107S-GW03-FC32C
32.0...37.0	11	18.5	—	—	100	100	—	—	100	100	—	—	103S-FW03-FC45C	107S-FW03-FC45C
32.0...43.0	13	22	25	—	100	100	50	—	100	100	50	—	103S-GW03-FC45C	107S-GW03-FC45C

* kW ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

⊗ Coil voltage code—see page 2-315



⊗ **Coil Voltage Codes for AC Control**

Voltage [V]	12	24	32	36	42	48	100	100-110	110	120	127	200	200-220	200-230	208	208-240
50 Hz	R	K	V	W	X	Y	KP	—	D	P	S	KG	—	—	—	—
60 Hz	Q	J	—	V	—	X	—	KP	—	D	—	—	KG	—	H	L
50/60 Hz	—	KJ	—	—	—	KY	KP	—	KD	—	—	KG	—	KL	—	—
Voltage [V]	220-230	230	230-240	240	277	347	380	380-400	400	400-415	440	480	500	550	600	
50 Hz	F	—	VA	T	—	—	—	N	—	G	B	—	M	C	—	—
60 Hz	—	—	—	A	T	I	E	—	—	—	N	B	—	—	C	—
50/60 Hz	—	KF	—	KA	—	—	—	—	KN	—	KB	—	—	—	—	—

⊗ **Coil Voltage Codes for DC Control**

DC Voltages [V]		9	12	24	36	48	60	64	72	80	110	115	125	220	230	250
Contactor size A...G	Standard	ZR	ZQ	ZJ	ZW	ZY	ZZ	ZB	ZG	ZE	ZD	ZP	ZS	ZA	ZF	ZT
	with Integrated Diode	—	—	DJ	—	—	—	—	—	—	—	—	—	—	—	—
	with Electronic Coil	—	—	EJ	—	—	—	—	—	—	—	—	—	—	—	—
Contactor size H...J	with Integrated Diode	DR	DQ	DJ	DW	DY	DZ	DB	DG	DE	DD	DP	DS	DA	DF	DT

103S Factory-Installed Options

Change option code ① to desired auxiliary contact: 103S-AWD①-CA16C

Contactor Auxiliaries without “-SP” Control Plug									
Option ①	Description	ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
		9...23 A	30...43 A	60...85 A	9...23 A	30...43 A	60...85 A	9...23 A	30...43 A
2	1 N.O.	NA	NA	NA	Standard	Standard	Standard	Standard	Standard
3	1 N.O. + 1 N.C.	NA	NA	NA	Available	Available	Available	Available	Available
4	2 N.O.	NA	NA	NA	Available	Available	Available	Available	Available
6	2 N.O. + 1 N.C.	NA	NA	NA	Available	NA	NA	Available	NA
7	2 N.O. + 2 N.C.	NA	NA	NA	NA	Available	Available	NA	Available
8	3 N.O. + 2 N.C.	NA	NA	NA	Available	NA	NA	Available	NA

Change option code ① to desired auxiliary contact: 103S-AWD①-CA16C

Contactor Auxiliaries with “-SP” Control Plug									
Option ①	Description	ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
		9...23 A	30...43 A	60...85 A	9...23 A	30...43 A	60...85 A	9...23 A	30...43 A
2	1 N.O.	Standard	Standard	NA	Available	Available	Available	Available	Available
3	1 N.O. + 1 N.C.	Available	Available	NA	Available	Available	Available	Available	Available
4	2 N.O.	Available	Available	NA	Available	Available	Available	Available	Available
6	2 N.O. + 1 N.C.	NA	NA	NA	NA	NA	NA	NA	NA
7	2 N.O. + 2 N.C.	NA	NA	NA	NA	NA	NA	NA	NA
8	3 N.O. + 2 N.C.	NA	NA	NA	NA	NA	NA	NA	NA

Change option code ② to desired auxiliary contact: 103S-AWD2-CA16②

Circuit Breaker Aux/Trip Contacts									
Option ②	Description	ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
		9...23 A	30...43 A	60...85 A	9...23 A	30...43 A	60...85 A	9...23 A	30...43 A
X*	Without Aux/Trip Contacts	NA	NA	NA	Available	Available	Available	Available	Available
A*	1 N.C. Aux.	NA	NA	NA	Available	Available	NA	Available	Available
B	1 N.O. Aux.	Available	Available	NA	Available	Available	NA	Available	Available
C	1 N.O. + 1 N.C. Aux.	Standard	Standard	NA	Standard	Standard	Standard	Standard	Standard
D	2 N.O. Aux.	Available	Available	NA	Available	Available	Available	Available	Available
E*	2 N.C. Aux.	NA	NA	NA	Available	Available	Available	Available	Available
R*	1 N.O. Trip + 1 N.C. Aux	NA	NA	NA	Available	Available	NA	Available	Available
S	1 N.O. Trip + 1 N.O. Aux	Available	Available	NA	Available	Available	NA	Available	Available

* Not available when an “-SP” Control Plug is selected.

Add option code ③ to desired auxiliary contact: 103S-AWD2-CA16C③

Additional Circuit Breaker Aux/Trip Contacts									
Option ③	Description	ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
		9...23 A	30...43 A	60...85 A	9...23 A	30...43 A	60...85 A	9...23 A	30...43 A
Blank	Without Aux/Trip Contacts	Available	Available	Available	Available	Available	Available	Available	Available
C*	1 N.O. + 1 N.C. Aux.	Available	Available	NA	Available	Available	NA	Available	Available
D*	2 N.O. Aux.	Available	Available	NA	Available	Available	NA	Available	Available
E*‡	2 N.C. Aux.	Available	Available	NA	Standard	Standard	NA	Standard	Standard
K	1 N.C. (OL) Trip + 1 N.C. (SC) Trip	Available	Available	NA	Available	Available	Available	Available	Available
L	1 N.O. (OL) Trip + 1 N.O. (SC) Trip	Available	Available	NA	Available	Available	Available	Available	Available
M‡	1 N.C. (OL) Trip + 1 N.O. (SC) Trip	Available	Available	NA	Available	Available	Available	Available	Available
N‡	1 N.O. (OL) Trip + 1 N.C. (SC) Trip	Available	Available	NA	Available	Available	Available	Available	Available
Q‡	1 N.O. (SC) Trip + 1 N.C. (SC) Trip	Available	Available	NA	Available	Available	NA	Available	Available

* Not available on 60...85 A starters.

‡ Not available when an “-SP” Control Plug is selected on 60...85 A starters.

Add option code ④ to desired auxiliary contact: 103S-AWD2-CA16C-④

Modifications/Accessories	
Option ④	Description
JE	Electronic Interface
R	Surge Suppressor, RC
V	Surge Suppressor, Varistor
D	Surge Suppressor, Diode
KN	Lockable Knob, Black
KY	Lockable Knob, Red/Yellow
TE	Spacing Adapter for UL508 Type E
SP	Control Plug, Top Mount

107S Factory-Installed Options

Change option code ① to desired auxiliary contact: 107S-AWD①-CA16C

Contactor Auxiliaries without “-SP” Control Plug									
Option ①	Description	ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
		9...23 A	30...43 A	60...85 A	9...23 A	30...43 A	60...85 A	9...23 A	30...43 A
3	1 N.O. + 1 N.C.	NA	NA	NA	Standard	Standard	Standard	Standard	Standard
7	2 N.O. + 2 N.C.	NA	NA	NA	Available	Available	Available	Available	Available

Change option code ① to desired auxiliary contact: 107S-AWD①-CA16C

Contactor Auxiliaries with “-SP” Control Plug									
Option ①	Description	ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
		9...23 A	30...43 A	60...85 A	9...23 A	30...43 A	60...85 A	9...23 A	30...43 A
3	1 N.O. + 1 N.C.	Standard	Standard	NA	Available	Available	Available	Available	Available
7	2 N.O. + 2 N.C.	Available	Available	NA	Available	Available	Available	Available	Available

Change option code ② to desired auxiliary contact: 107S-AWD2-CA16②

Circuit Breaker Aux/Trip Contacts									
Option ②	Description	ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
		9...23 A	30...43 A	60...85 A	9...23 A	30...43 A	60...85 A	9...23 A	30...43 A
X*	Without Aux/Trip Contacts	NA	NA	NA	Available	Available	Available	Available	Available
A*	1 N.C. Aux.	NA	NA	NA	Available	Available	NA	Available	Available
B	1 N.O. Aux.	Available	Available	NA	Available	Available	NA	Available	Available
C	1 N.O. + 1 N.C. Aux.	Standard	Standard	NA	Standard	Standard	Standard	Standard	Standard
D	2 N.O. Aux.	Available	Available	NA	Available	Available	Available	Available	Available
E*	2 N.C. Aux.	NA	NA	NA	Available	Available	Available	Available	Available
R*	1 N.O. Trip + 1 N.C. Aux	NA	NA	NA	Available	Available	NA	Available	Available
S	1 N.O. Trip + 1 N.O. Aux	Available	Available	NA	Available	Available	NA	Available	Available

* Not available when an “-SP” Control Plug is selected.

Add option code ③ to desired auxiliary contact: 107S-AWD2-CA16C③

Additional Circuit Breaker Aux/Trip Contacts									
Option ③	Description	ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
		9...23 A	30...43 A	60...85 A	9...23 A	30...43 A	60...85 A	9...23 A	30...43 A
Blank	Without Aux/Trip Contacts	Available	Available	Available	Available	Available	Available	Available	Available
C*	1 N.O. + 1 N.C. Aux.	Available	Available	NA	Available	Available	NA	Available	Available
D*	2 N.O. Aux.	Available	Available	NA	Available	Available	NA	Available	Available
E*‡	2 N.C. Aux.	Available	Available	NA	Available	Available	NA	Available	Available
K	1 N.C. (OL) Trip + 1 N.C. (SC) Trip	Available	Available	NA	Available	Available	Available	Available	Available
L	1 N.O. (OL) Trip + 1 N.O. (SC) Trip	Available	Available	NA	Available	Available	Available	Available	Available
M‡	1 N.C. (OL) Trip + 1 N.O. (SC) Trip	Available	Available	NA	Available	Available	Available	Available	Available
N‡	1 N.O. (OL) Trip + 1 N.C. (SC) Trip	Available	Available	NA	Available	Available	Available	Available	Available
Q*	1 N.O. (SC) Trip + 1 N.C. (SC) Trip	Available	Available	NA	Available	Available	NA	Available	Available

* Not available on 60...85 A starters.

‡ Not available when a “-SP” Control Plug is selected on 60...85 A starters.

Add option code ④ to desired auxiliary contact: 107S-AWD2-CA16C-④

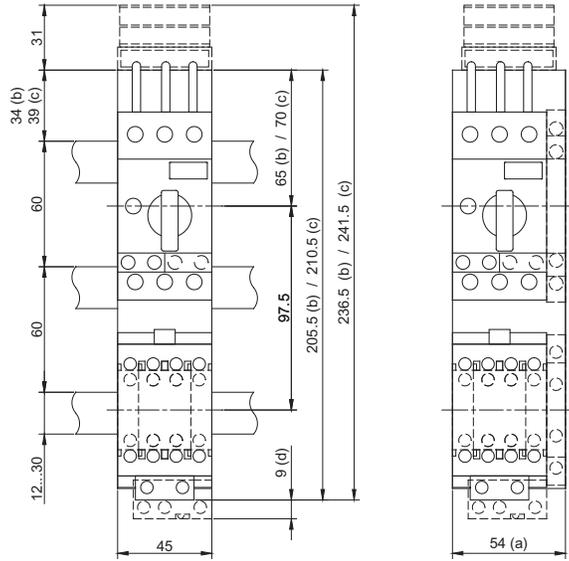
Modifications/Accessories	
Option ④	Description
JE	Electronic Interface
R	Surge Suppressor, RC
V	Surge Suppressor, Varistor
D	Surge Suppressor, Diode
KN	Lockable Knob, Black
KY	Lockable Knob, Red/Yellow
TE	Spacing Adapter for UL508 Type E
SP	Control Plug, Top Mount

Bulletin 103S/107S
Open Type Starters
 Approximate Dimensions

Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.

Standard and ISO Busbar Mount — Bulletin 103S Non-Reversing Starters

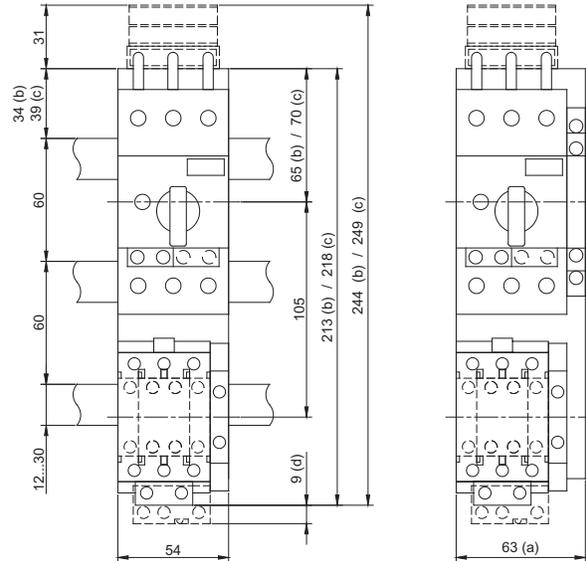
2



Circuit Breaker: 140M-C / -D
 Contactor: 100-C09...23
 Reference Print: D00GMD

- (a) With additional side-mount aux. or trip contact(s)
- (b) Standard busbar mount with control plug
- (c) Iso busbar mount
- (d) Electronic interface

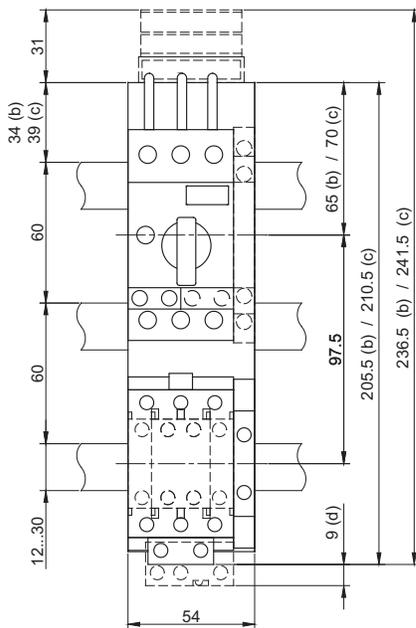
Bulletin 103S Busbar Mount



Circuit Breaker: 140M-F
 Contactor: 100-C30...37
 Reference Print: D10GMF

- (a) With additional side-mount aux. or trip contact
- (b) Standard busbar mount with control plug
- (c) Iso busbar mount
- (d) Electronic interface

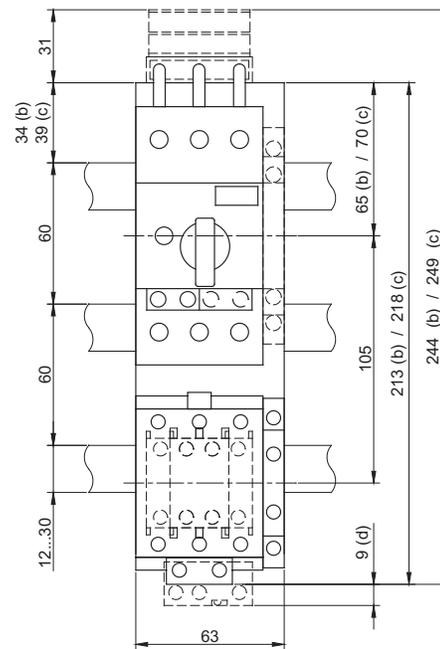
Bulletin 103S Busbar Mount



Circuit Breaker: 140M-D
 Contactor: 100-C30...37
 Reference Print: D10GMD

- (b) Standard busbar mount with control plug
- (c) Iso busbar mount
- (d) Electronic interface

Bulletin 103S Busbar Mount



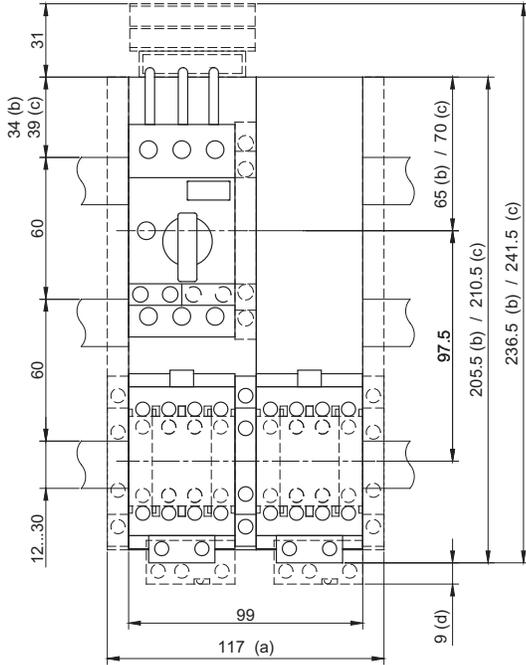
Circuit Breaker: 140M-F
 Contactor: 100-C43
 Reference Print: D20GMF

- (b) Standard busbar mount with control plug
- (c) Iso busbar mount
- (d) Electronic interface

Bulletin 103S Busbar Mount

Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.

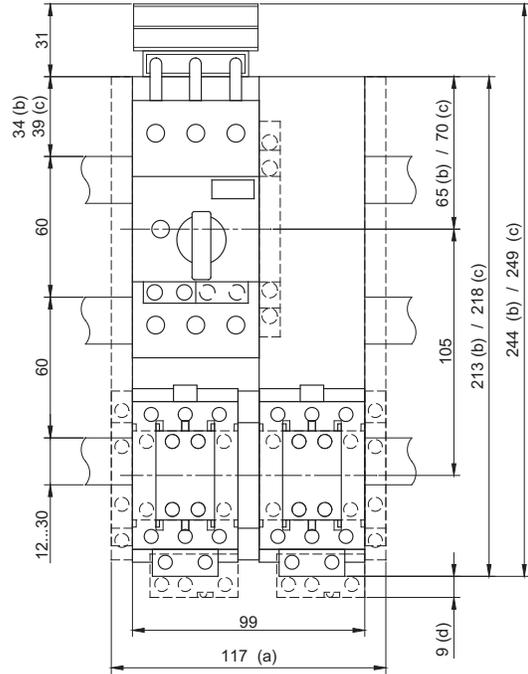
Standard and ISO Busbar Mount — Bulletin 107S Reversing Starters



Circuit Breaker: 140M-D
 Contactors: 100-C09...23
 Reference Print: R00GMD

- (a) With additional side-mount aux. contacts
- (b) Standard busbar mount with control plug
- (c) Iso busbar mount
- (d) Electronic interfaces

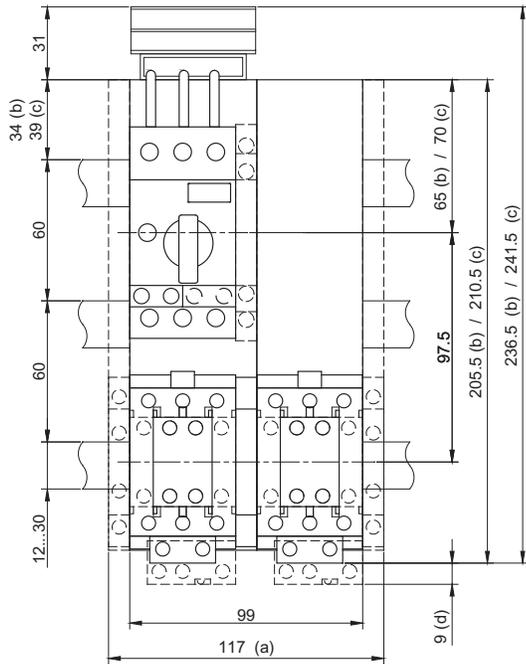
Bulletin 107S Busbar Mount



Circuit Breaker: 140M-F
 Contactors: 100-C30...37
 Reference Print: R10GMF

- (a) With additional side-mount aux. contacts
- (b) Standard busbar mount with control plug
- (c) Iso busbar mount
- (d) Electronic interface

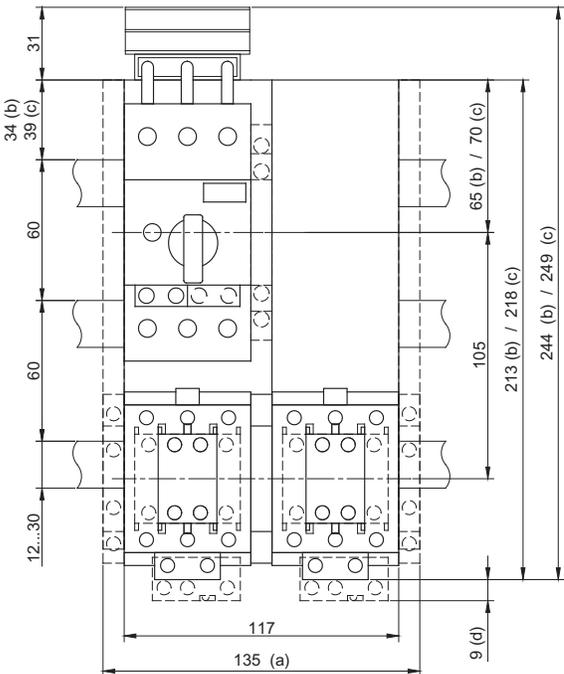
Bulletin 107S Busbar Mount



Circuit Breaker: 140M-D
 Contactors: 100-C30...37
 Reference Print: R10GMD

- (a) With additional side-mount aux. contacts
- (b) Standard busbar mount with control plug
- (c) Iso busbar mount
- (d) Electronic interface

Bulletin 107S Busbar Mount



Circuit Breaker: 140M-F
 Contactors: 100-C43
 Reference Print: R20GMF

- (a) With additional side-mount aux. contacts
- (b) Standard busbar mount with control plug
- (c) Iso busbar mount
- (d) Electronic interface

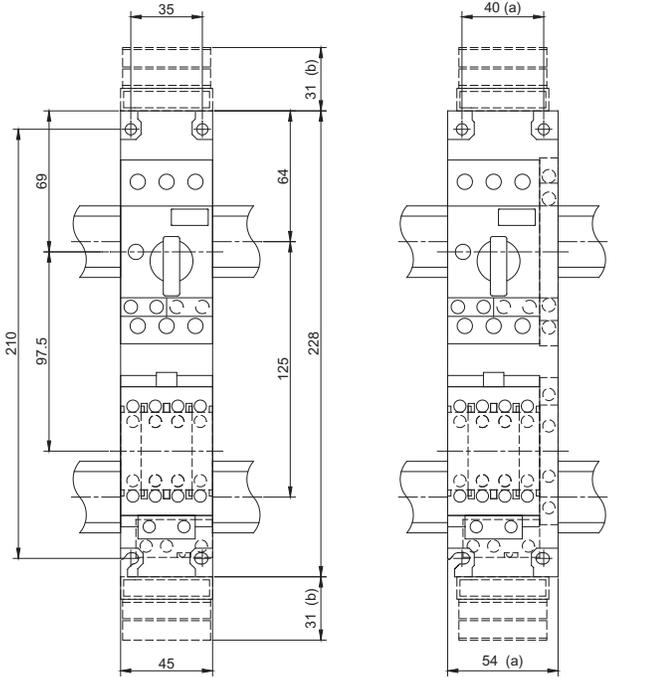
Bulletin 107S Busbar Mount

Bulletin 103S/107S
Open Type Starters
 Approximate Dimensions

Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.

Panel Mount — Bulletin 103S Non-Reversing Starters

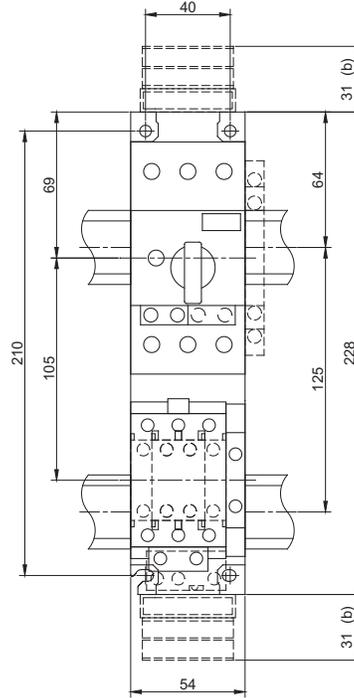
2



Circuit Breaker: 140M-C/D
 Contactor: 100-C09...23
 Reference Print: D00WMD

(a) With additional side-mount aux. or trip contact(s)
 (b) Control plug on top OR bottom side optional

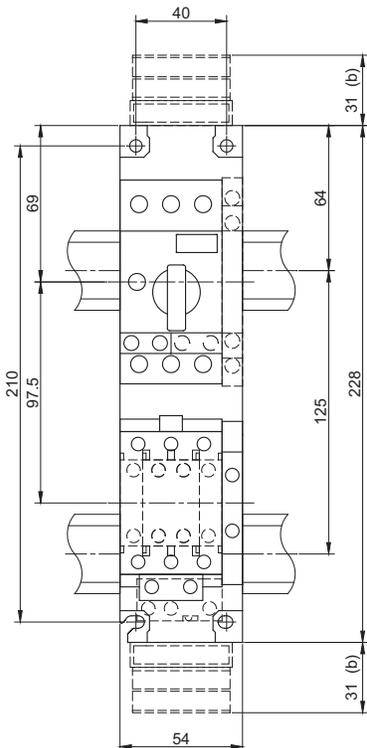
Bulletin 103S Panel Mount



Circuit Breaker: 140M-F
 Contactor: 100-C30...37
 Reference Print: D10WMF

(a) With additional side-mount aux. or trip contact
 (b) Control plug on top OR bottom side optional

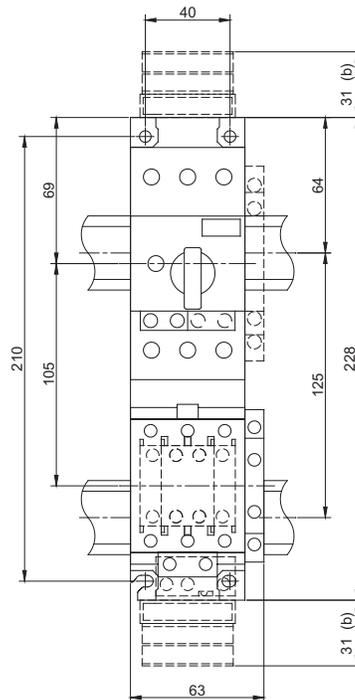
Bulletin 103S Panel Mount



Circuit Breaker: 140M-D
 Contactor: 100-C30...37
 Reference Print: D10WMD

(b) Control plug on top OR bottom side optional

Bulletin 103S Panel Mount



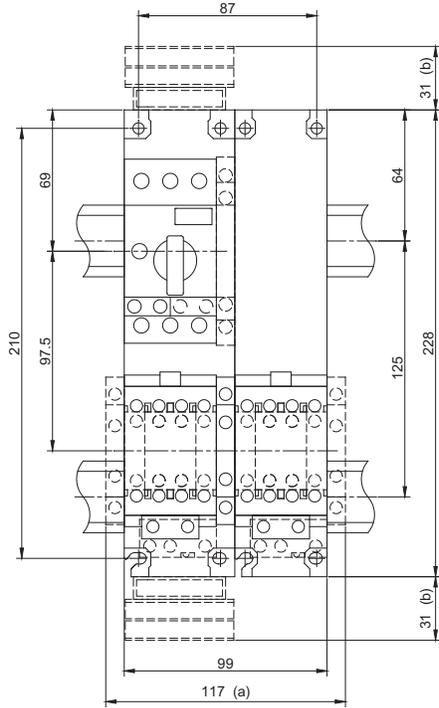
Circuit Breaker: 140M-F
 Contactor: 100-C43
 Reference Print: D20WMF

(a) With additional side-mount aux. or trip contact
 (b) Control plug on top OR bottom side optional

Bulletin 103S Panel Mount

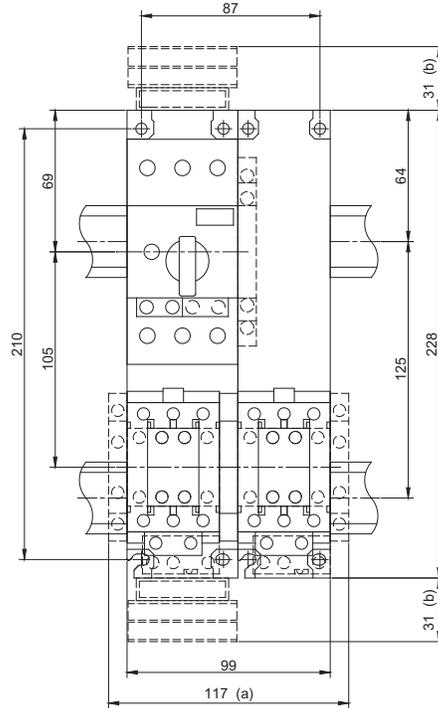
Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.

Panel Mount — Bulletin 107S Reversing Starters



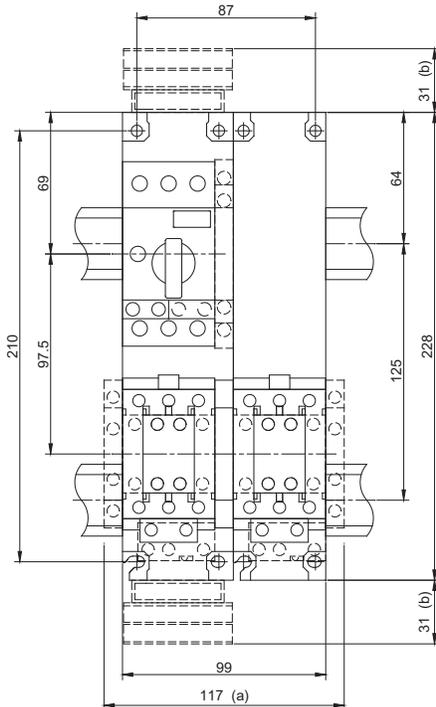
Circuit Breaker: 140M-C/D
 Contactors: 100-C09...23
 Reference Print: R00WMD
 (a) With additional side-mount aux. contacts
 (b) Control plug on top OR bottom side optional

Bulletin 107S Panel Mount



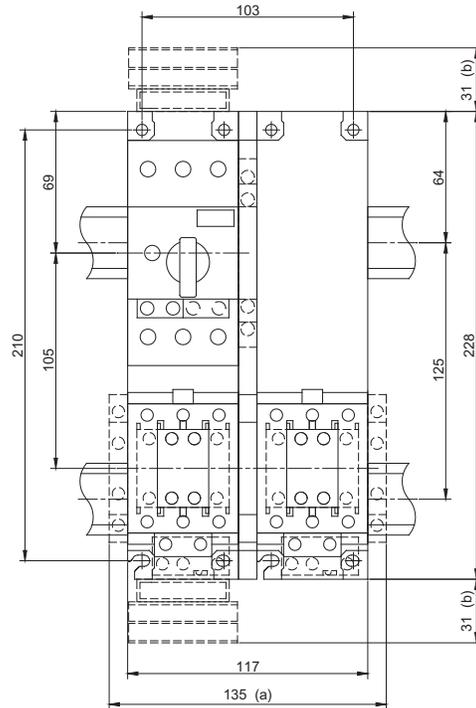
Circuit Breaker: 140M-F
 Contactors: 100-C30...37
 Reference Print: R10WMF
 (a) With additional side-mount aux. contacts
 (b) Control plug on top OR bottom side optional

Bulletin 107S Panel Mount



Circuit Breaker: 140M-D
 Contactors: 100-C30...37
 Reference Print: R10WMD
 (a) With additional side-mount aux. contacts
 (b) Control plug on top OR bottom side optional

Bulletin 107S Panel Mount



Circuit Breaker: 140M-F
 Contactors: 100-C43
 Reference Print: R20WMF
 (a) With additional side-mount aux. contacts
 (b) Control plug on top OR bottom side optional

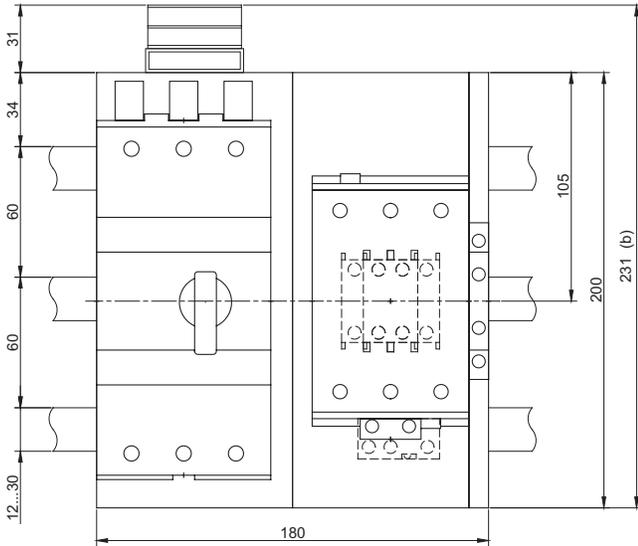
Bulletin 107S Panel Mount

Bulletin 103S/107S
Open Type Starters
 Approximate Dimensions

Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.

Standard Busbar Mount — Bulletin 103S Non-Reversing and Bulletin 107S Reversing Starters

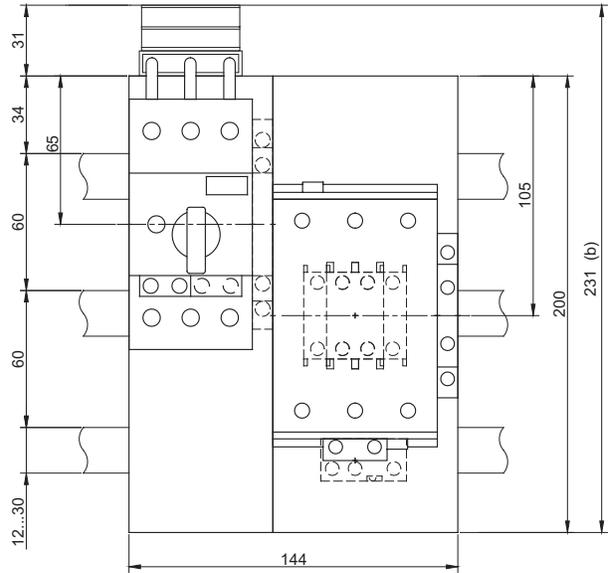
2



Circuit Breaker: 140-CMN
 Contactor: 100-C60...85
 Reference Print: D30GCM

(b) Standard busbar mount with control plug

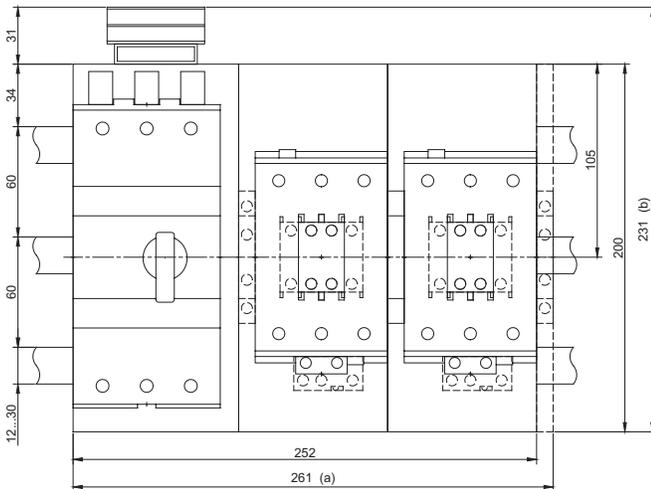
Bulletin 103S Busbar Mount



Circuit Breaker: 140M-F
 Contactor: 100-C60...85
 Reference Print: D30GMF

(b) Standard busbar mount with control plug

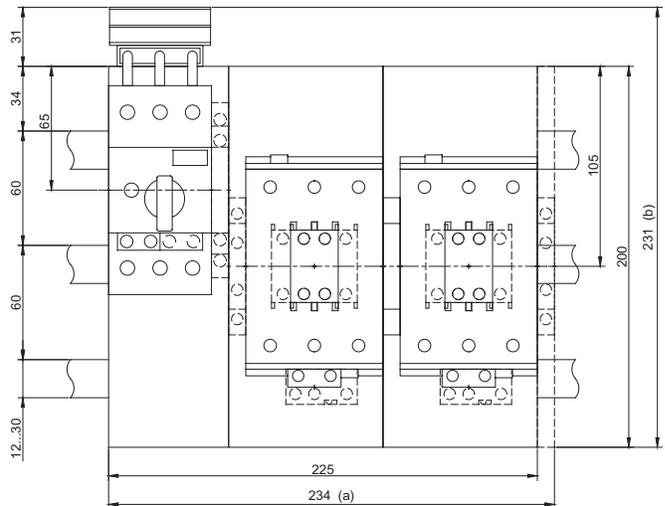
Bulletin 103S Busbar Mount



Circuit Breaker: 140-CMN
 Contactors: 100-C60...85
 Reference Print: R30GCM

(a) With additional side-mount aux. contacts
 (b) Standard busbar mount with control plug

Bulletin 107S Busbar Mount



Circuit Breaker: 140M-F
 Contactors: 100-C60...85
 Reference Print: R30GMF

(a) With additional side-mount aux. contacts
 (b) Standard busbar adapter with control plug

Bulletin 107S Busbar Mount



Bulletin 103T/107T IEC Starters

- Non-reversing (Bul. 103T) and reversing (Bul. 107T) starters
- Current Range 0.1...45 A
- cULus Listed Motor Controllers
 - Type 1 Coordination
 - Type 2 Coordination
- cULus Listed Type E Self-Protected Combination Motor Controllers
- Assemblies consist of Bulletin 140M MCPs or 140F fuse holders and Bulletin 100-C contactors and Bulletin 193-E overload relays mounted on Bulletin 141A busbar or panel mounting modules
- Factory installed options include:
 - Installation and wiring of Control Plug for auxiliary contacts.
 - Installation of Lockable Twist Knob.
 - Installation of Spacing Adapter for Type E Self-Protected Starters.
 - Electronic Interface and Surge Suppressors for coil on 100-C.
 - Additional auxiliary contacts for 100-C.
 - Additional auxiliary or trip contacts on 140M.

Table of Contents

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Standards Compliance

UL 508
 CSA 22.2, No. 14
 IEC 60947 -2, -4

Certifications

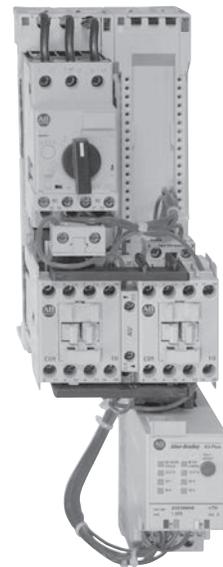
cULus Listed (File No.
 E125316, Guide NKJH, NKJH7)
 CE Marked



Bulletin 103T starter with Bulletin 193-ED overload relay and red/yellow lockable knob, as factory-installed option



Bulletin 103T starter with Bulletin 193-EC overload relay and red/yellow lockable knob, as factory-installed option



Bulletin 107T starter with Bulletin 193-EC overload relay with control plug option (factory-wired inputs and outputs)

Cat. No. Explanation

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; not all combinations will produce a valid catalog number.

103T - A S D 2 - Q A16 C - C1P - TE

a *b* *c* *d* *e* *f* *g* *h* *i* *j*
a *d (cont'd)* *g (cont'd)* *i (cont'd)*

Bulletin Number	
Code	Description
103T	DOL Starter with MCP
107T	Rev. Starter with MCP

Contactor Size	
Code	Description
A	100-C09
B	100-C12
C	100-C16
D	100-C23
E	100-C30
F	100-C37
G	100-C43

Style	
Code	Description
S	On 141A ISO Busbar Module(s)
T	On 141A Standard Busbar Module(s)
W	On 141A Panel Mounting Module(s)

AC Coil Voltage	
Code	Description
Q	12V AC, 60 Hz
R	12V AC, 50 Hz
J	24V AC, 60 Hz
K	24V AC, 50 Hz
KJ	24V AC, 50/60 Hz
V	32V AC, 50 Hz /36V AC, 60 Hz
W	36V AC, 50 Hz
X	42V AC, 50 Hz /48V AC, 60 Hz
Y	48V AC, 50 Hz
KY	48V AC, 50/60 Hz
KP	100V AC, 50 Hz /100...110V AC, 60 Hz
D	110V AC, 50 Hz /120V AC, 60 Hz
KD	100V AC, 50/60 Hz
P	120V AC, 50 Hz
KL	200...230V AC, 50/60 Hz
H	208V AC, 60 Hz
L	208...240V AC, 60 Hz
A	220V AC, 50 Hz /240V AC, 60 Hz
F	220...230V AC, 50 Hz
KF	230V AC, 50/60 Hz
VA	230...240V AC, 50 Hz
T	240V AC, 50 Hz /277V AC, 60 Hz
E	380V AC, 60 Hz
N	380...400V AC, 50 Hz /440V AC, 60 Hz
KN	400V AC, 50/60 Hz
G	400...415V AC, 50 Hz

DC Coil Voltage	
Code	Description
B	440V AC, 50 Hz /480V AC, 60 Hz
M	500V AC, 50 Hz
C	550V AC, 50 Hz /600V AC, 60 Hz
Contactor Size A...G	
Code	Description
ZR	6...12V DC
ZQ	12V DC
ZJ	24V DC
DJ	24V DC with Diode
EJ	24V DC Electronic
ZW	36 VDC
ZY	48V DC
ZZ	60V DC
ZB	64V DC
ZG	72V DC
ZE	80V DC
ZD	110V DC
ZP	115V DC
ZS	125V DC
ZA	220V DC
ZF	230V DC
ZT	250V DC

Contactor Aux. Contacts	
Code	Description
2	1 N.O.
3	1 N.O. + 1 N.C.

Circuit Breaker Frame Size	
Code	Description
Q	C Frame
R	D Frame
T	F Frame
F3	Bul. 140F fuse holder

Circuit Breaker Current Range	
Code	Description
A16	0.16 A
A25	0.25 A
A40	0.4 A
A63	0.63 A
B10	1.0 A
B25	2.5 A
B40	4.0 A
B63	6.3 A
C10	10 A
C16	16 A
C25	25 A
C32	32 A
C45	45 A

Bul. 140F Fuse Holder Type	
Code	Description
C	For 30 A Class CC fuses
F	For 32 A gL-gG fuses
M	For 30 A midget fuses
CL	For 30 A Class CC fuses w/ B.F.I.
FL	For 32 A gL-gG fuses w/ B.F.I.
ML	For 30 A midget fuses w/ B.F.I.

Circuit Breaker Aux. and Trip Contacts for 140M	
Select only one from each group	
Bottom Front	
Code	Description
X	Without Aux. Trip Contacts
A	1 N.C. Aux. Contact
B	1 N.O. Aux. Contact
C	1 N.O. + 1 N.C. Aux. Contact
D	2 N.O. Aux. Contact
E	2 N.C. Aux. Contact
R	1 N.O. (SC+OL) + 1 N.C. Aux. Contact
S	1 N.O. (SC+OL) + 1 N.O. Aux. Contact
Right Side	
Code	Description
K	1 N.C. (SC+OL) + 1 N.C. (SC)
L	1 N.O. (SC+OL) + 1 N.O. (SC)
M	1 N.C. (SC+OL) + 1 N.O. (SC)
N	1 N.O. (SC+OL) + 1 N.C. (SC)
Q	1 N.O. (SC) + 1 N.C. (SC)
Fuse Holder Aux. Contacts for 140F	
Bottom Front	
Code	Description
C	1 N.O. + 1 N.C. early break aux. contact

193-ED/EE O/L Relay	
Code	Description
D1	193-ED Cl.10, Man. Reset
E1	193-EE Cl.10...30, M./A. Reset
Adjustment Range	
Code	Description
..A	0.1...0.5 A
..B	0.2...1.0 A
..C	1.0...5.0 A
..D	3.2...16 A
..E	5.4...27 A
..F	9...45 A

193-EC Electronic O/L Relay	
Code	Description
C1	193-EC1 (2 Input / 1 Output)
C2	193-EC2 (4 Input / 2 Output)
Adjustment Range	
Code	Description
..P	0.4...2.0 A
..A	1.0...5.0 A
..B	3.0...15 A
..C	5.0...25 A
..D	9.0...45 A
..E	18...90 A

Modifications, Accessories	
Circuit Breaker Accessories	
Code	Description
TE	Spacer Module
KN	Lockable Twist Knob, Black
KY	Lockable Twist Knob, Red/Yellow
Coil Accessories	
Code	Description
JE	Electronic Interface(s)
D	Surge Suppressor Diode
R	Surge Suppressor RC
V	Surge Suppressor Varistor
Additional Contactor Auxiliaries (Side Mount)	
Code	Description
S01	1 N.C.
S10	1 N.O.
S11	1 N.O. + 1 N.C.
S20	2 N.O.
Additional Contactor Auxiliaries (Front Mount)	
Code	Description
F11	1 N.O. + 1 N.C.
F20	2 N.O.
F22	2 N.O. + 2 N.C.
Mounting System Accessories	
Code	Description
MS	Micro Switch (ISO Modules only)
SP	Top Mount Control Plug (pull-apart terminal block with spring clamp terminals) for control circuit* (standard Bus bar and panel mounting modules only)

* Standard for Starters on ISO Adapters, no code required

Multiple Motor Installation with 103T Combination Starters

Each Motor has an Individual Branch Circuit Protective Device (BCPD)

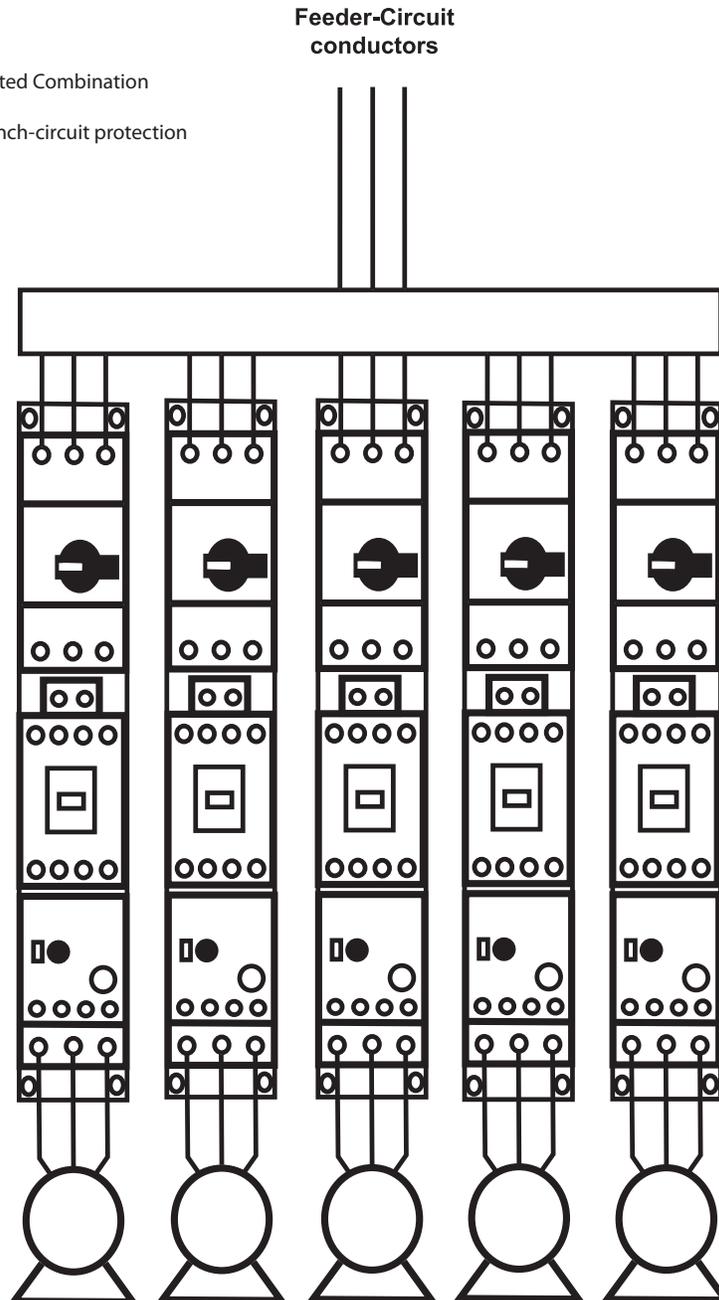
Bulletin 103T starters provide Individual Branch Circuit Protection for each motor.

They consist of a 140M Motor Circuit Protector, a 100C Contactor and a 193 Overload Relay.

These combination starters may provide the branch-circuit, short-circuit protection, overload protection and magnetic control for each individual motor circuit. Additional short-circuit protection is not required for the protection of the individual motor circuits, leaving only the requirement for protection of the Feeder-Circuit conductors by an upstream protective device.

Below is an example that illustrates installations involving multiple motors using Bulletin 103T Combination Starters.

Bulletin 103T Combination Starters
 UL/CSA Listed as Type E Self-Protected Combination
 Motor Controllers.
 These starters may provide the branch-circuit protection
 for each individual motor circuit.



Conductors to each
 motor sized normally
 at 125% of motor FLA

Open Type Starters

Product Selection & Coordination Ratings

Group Motor and Type E Combination Motor Controllers (UL/CSA)

The Bulletin 103T/107T motor controllers can be used in a variety of applications. These starters can be used in a group motor application or as a stand-alone product without any additional short-circuit protection in the motor branch circuits.

Most of the 140M-C/D motor protection circuit breakers used in the 103T/107T starters are UL listed as a manual motor controller with instantaneous trip, short-circuit protection and is rated for group motor applications. Since there is no overload protection provided by these MCPs, a separate overload relay must be added to the motor branch circuit.

A combination of a 140M motor circuit protector, 100-C contactor, and 193-E overload relay can be listed as a Type E self-protected combination motor controller. In this case, the 140M, 100-C, and 193-E must pass an additional 6000 electrical and 4000 mechanical operational test after a short-circuit. In some cases, this may require oversizing the 140M motor circuit protector or the 100-C contactor to achieve weld-free performance and meet the additional life requirements.

Bulletin 103T/107T starters utilizing the 140F fuse holders must be used with a separate disconnecting means, as these fuse holders are not rated as a disconnect switch.

With Bulletin 193-EC, -ED, or EE Overload Relays—UL/CSA in Group Motor Installations

Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)									DOL Starters Cat. No.	Reversing Starters Cat. No.
	Hp Ratings as a UL 508 Motor Controller in Group Motor Installations*				Max. Fuse or C.B. per NEC [A]	Max. Short-Circuit Current [kA]					
	200V AC	230V AC	460V AC	575V AC		Type 1 Coordination		Type 2 Coordination			
						480V AC	600V AC	480V AC	600V AC		
C-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules											
0.10...0.40	—	—	—	—	450	65	47	65	47	103T-AT02-QA40C-D1A	107T-AT03-QA40C-D1A
0.10...0.40	—	—	—	—	450	65	47	65	47	103T-AT02-QA40C-E1A	107T-AT03-QA40C-E1A
0.20...1.00	—	—	—	1/2	450	65	47	65	47	103T-AT02-QB10C-D1B	107T-AT03-QB10C-D1B
0.20...1.00	—	—	—	1/2	450	65	47	65	47	103T-AT02-QB10C-E1B	107T-AT03-QB10C-E1B
0.40...1.00	—	—	—	1/2	450	65	47	65	47	103T-AT02-QB10C-C1P	—
0.40...1.00	—	—	—	1/2	450	65	47	65	47	103T-AT02-QB10C-C2P	107T-AT03-QB10C-C2P
0.4 ... 2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	103T-AT02-QB25C-C1P	—
0.4 ... 2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	103T-AT02-QB25C-C2P	107T-AT03-QB25C-C2P
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AT02-QB25C-D1C	107T-AT03-QB25C-D1C
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AT02-QB25C-E1C	107T-AT03-QB25C-E1C
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AT02-QB25C-C1A	—
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AT02-QB25C-C2A	107T-AT03-QB25C-C2A
D-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules											
0.4 ... 2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	103T-AT02-RB25C-C1P	—
0.4 ... 2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	103T-AT02-RB25C-C2P	107T-AT03-RB25C-C2P
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AT02-RB25C-D1C	107T-AT03-RB25C-D1C
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AT02-RB25C-E1C	107T-AT03-RB25C-E1C
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AT02-RB25C-C1A	—
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AT02-RB25C-C2A	107T-AT03-RB25C-C2A
0.4 ... 2.0	—	—	1/2...1	1/2...1	450	65	30	65	30	103T-DT02-RB25C-C1P	—
0.4 ... 2.0	—	—	1/2...1	1/2...1	450	65	30	65	30	103T-DT02-RB25C-C2P	107T-DT03-RB25C-C2P
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	30	103T-DT02-RB25C-D1C	107T-DT03-RB25C-D1C
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	30	103T-DT02-RB25C-E1C	107T-DT03-RB25C-E1C
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	30	103T-DT02-RB25C-C1A	—
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	30	103T-DT02-RB25C-C2A	107T-DT03-RB25C-C2A
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	103T-AT02-RB40C-D1C	107T-AT03-RB40C-D1C
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	103T-AT02-RB40C-E1C	107T-AT03-RB40C-E1C
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	103T-AT02-RB40C-C1A	—
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	103T-AT02-RB40C-C2A	107T-AT03-RB40C-C2A
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	103T-DT02-RB40C-D1C	107T-DT03-RB40C-D1C
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	103T-DT02-RB40C-E1C	107T-DT03-RB40C-E1C
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	103T-DT02-RB40C-C1A	—
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	103T-DT02-RB40C-C2A	107T-DT03-RB40C-C2A
3.2 ... 6.3	3/4...1-1/2	3/4...2	2...5	3...5	450	65	30	65	—	103T-AT02-RB63C-D1D	107T-AT03-RB63C-D1D
3.2 ... 6.3	3/4...1-1/2	3/4...2	2...5	3...5	450	65	30	65	—	103T-AT02-RB63C-E1D	107T-AT03-RB63C-E1D
3.0 ... 6.3	3/4...1-1/2	3/4...2	1-1/2...5	3...5	450	65	30	65	—	103T-AT02-RB63C-C1B	—
3.0 ... 6.3	3/4...1-1/2	3/4...2	1-1/2...5	3...5	450	65	30	65	—	103T-AT02-RB63C-C2B	107T-AT03-RB63C-C2B
3.2 ... 10	3/4...3	3/4...3	2...7-1/2	3...10	450	65	30	65	—	103T-BT02-RC10C-D1D	107T-BT03-RC10C-D1D
3.2 ... 10	3/4...3	3/4...3	2...7-1/2	3...10	450	65	30	65	—	103T-BT02-RC10C-E1D	107T-BT03-RC10C-E1D
3.0 ... 10	3/4...3	3/4...3	1-1/2...7-1/2	3...10	450	65	30	65	—	103T-BT02-RC10C-C1B	—
3.0 ... 10	3/4...3	3/4...3	1-1/2...7-1/2	3...10	450	65	30	65	—	103T-BT02-RC10C-C2B	107T-BT03-RC10C-C2B
3.2 ... 10	3/4...3	3/4...3	2...7-1/2	3...10	450	65	30	65	30	103T-ET03-RC10C-E1D	107T-ET03-RC10C-E1D
3.0 ... 10	3/4...3	3/4...3	1-1/2...7-1/2	3...10	450	65	30	65	30	103T-ET03-RC10C-C1B	—
3.0 ... 10	3/4...3	3/4...3	1-1/2...7-1/2	3...10	450	65	30	65	30	103T-ET03-RC10C-C2B	107T-ET03-RC10C-C2B
3.2 ... 16	3/4...5	3/4...5	2...10	3...10	450	65	30	65	—	103T-CT02-RC16C-D1D	107T-CT03-RC16C-D1D
3.2 ... 16	3/4...5	3/4...5	2...10	3...10	450	65	30	65	—	103T-CT02-RC16C-E1D	107T-CT03-RC16C-E1D
3.0 ... 15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	—	103T-CT02-RC16C-C1B	—
3.0 ... 15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	—	103T-CT02-RC16C-C2B	107T-CT03-RC16C-C2B



Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)									DOL Starters	Reversing Starters
	Hp Ratings as a UL 508 Motor Controller in Group Motor Installations*					Max. Fuse or C.B. per NEC [A]	Max. Short-Circuit Current [kA]				
	200V AC	230V AC	460V AC	575V AC	Type 1 Coordination		Type 2 Coordination	Type 2 Coordination	Type 2 Coordination	Cat. No.	Cat. No.
D-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules											
3.2 ... 16	3/4...5	3/4...5	2...10	3...10	450	65	30	65	30	103T-ET03-RC16C-E1D	107T-ET03-RC16C-E1D
3.0 ... 15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	30	103T-ET03-RC16C-C1B	—
3.0 ... 15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	30	103T-ET03-RC16C-C2B	107T-ET03-RC16C-C2B
5.4 ... 23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	30	50	—	103T-DT02-RC25C-D1E	107T-DT03-RC25C-D1E
5.4 ... 23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	30	50	—	103T-DT02-RC25C-E1E	107T-DT03-RC25C-E1E
5.0 ... 23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	30	50	—	103T-DT02-RC25C-C1C	—
5.0 ... 23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	30	50	—	103T-DT02-RC25C-C2C	107T-DT03-RC25C-C2C
5.4 ... 25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	450	65	30	65	—	103T-ET03-RC25C-E1E	107T-ET03-RC25C-E1E
5.0 ... 25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	450	65	30	65	—	103T-ET03-RC25C-C1C	—
5.0 ... 25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	450	65	30	65	—	103T-ET03-RC25C-C2C	107T-ET03-RC25C-C2C
F-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules											
5.4 ... 25	1-1/2...7-1/2	1-1/2...10	5...20	5...20	600	65	30	65	30	103T-ET03-TC25C-E1E	107T-ET03-TC25C-E1E
5.0 ... 25	1-1/2...7-1/2	1-1/2...10	5...20	5...20	600	65	30	65	30	103T-ET03-TC25C-C1C	—
5.0 ... 25	1-1/2...7-1/2	1-1/2...10	5...20	5...20	600	65	30	65	30	103T-ET03-TC25C-C2C	107T-ET03-TC25C-C2C
9.0 ... 30	3...7-1/2	3...10	7-1/2...20	7-1/2...25	600	65	30	65	30	103T-ET03-TC32C-E1F	107T-ET03-TC32C-E1F
9.0 ... 30	3...7-1/2	3...10	7-1/2...20	7-1/2...25	600	65	30	65	30	103T-ET03-TC32C-C1D	—
9.0 ... 30	3...7-1/2	3...10	7-1/2...20	7-1/2...25	600	65	30	65	30	103T-ET03-TC32C-C2D	107T-ET03-TC32C-C2D
9.0 ... 32	3...10	3...10	7-1/2...25	7-1/2...30	600	65	30	65	30	103T-FT03-TC32C-E1F	107T-FT03-TC32C-E1F
9.0 ... 32	3...10	3...10	7-1/2...25	7-1/2...30	600	65	30	65	30	103T-FT03-TC32C-C1D	—
9.0 ... 32	3...10	3...10	7-1/2...25	7-1/2...30	600	65	30	65	30	103T-FT03-TC32C-C2D	107T-FT03-TC32C-C2D
9.0 ... 37	3...10	3...10	7-1/2...25	7-1/2...30	600	65	18	65	—	103T-FT03-TC45C-E1F	107T-FT03-TC45C-E1F
9.0 ... 37	3...10	3...10	7-1/2...25	7-1/2...30	600	65	18	65	—	103T-FT03-TC45C-C1D	—
9.0 ... 37	3...10	3...10	7-1/2...25	7-1/2...30	600	65	18	65	—	103T-FT03-TC45C-C2D	107T-FT03-TC45C-C2D
9.0 ... 43	3...10	3...15	7-1/2...30	7-1/2...30	600	65	18	65	—	103T-GT03-TC45C-E1F	107T-GT03-TC45C-E1F
9.0 ... 43	3...10	3...15	7-1/2...30	7-1/2...30	600	65	18	65	—	103T-GT03-TC45C-C1D	—
9.0 ... 43	3...10	3...15	7-1/2...30	7-1/2...30	600	65	18	65	—	103T-GT03-TC45C-C2D	107T-GT03-TC45C-C2D
18 ... 45	7-1/2...10	7-1/2...15	15...30	20...40	600	65	18	65	—	103T-HT03-TC45C-E1G	107T-HT03-TC45C-E1G
9.0 ... 45	3...10	3...15	7-1/2...30	7-1/2...40	600	65	18	65	—	103T-HT03-TC45C-C1D	—
9.0 ... 45	3...10	3...15	7-1/2...30	7-1/2...40	600	65	18	65	—	103T-HT03-TC45C-C2D	107T-HT03-TC45C-C2D

* Hp ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.
 ⊗ Coil voltage code—see page 2-343



Open Type Starters

Product Selection & Coordination Ratings

With Bulletin 193-EC, -ED, or EE Overload Relays—UL/CSA in Group Motor Installations

Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)									DOL Starters Cat. No.	Reversing Starters Cat. No.
	Hp Ratings as a UL 508 Motor Controller in Group Motor Installations*				Max. Fuse or C.B. per NEC [A]	Max. Short-Circuit Current [kA]					
	200V AC	230V AC	460V AC	575V AC		Type 1 Coordination		Type 2 Coordination			
						480V AC	600V AC	480V AC	600V AC		
C-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules											
0.10...0.40	—	—	—	—	450	65	47	65	47	103T-AS02-QA40C-D1A	107T-AS03-QA40C-D1A
0.10...0.40	—	—	—	—	450	65	47	65	47	103T-AS02-QA40C-E1A	107T-AS03-QA40C-E1A
0.20...1.00	—	—	—	1/2	450	65	47	65	47	103T-AS02-QB10C-D1B	107T-AS03-QB10C-D1B
0.20...1.00	—	—	—	1/2	450	65	47	65	47	103T-AS02-QB10C-E1B	107T-AS03-QB10C-E1B
0.40...1.00	—	—	—	1/2	450	65	47	65	47	103T-AS02-QB10C-C1P	—
0.40...1.00	—	—	—	1/2	450	65	47	65	47	103T-AS02-QB10C-C2P	107T-AS03-QB10C-C2P
0.4 ... 2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	103T-AS02-QB25C-C1P	—
0.4 ... 2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	103T-AS02-QB25C-C2P	107T-AS03-QB25C-C2P
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AS02-QB25C-D1C	107T-AS03-QB25C-D1C
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AS02-QB25C-E1C	107T-AS03-QB25C-E1C
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AS02-QB25C-C1A	—
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AS02-QB25C-C2A	107T-AS03-QB25C-C2A
D-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules											
0.4 ... 2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	103T-AS02-RB25C-C1P	—
0.4 ... 2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	103T-AS02-RB25C-C2P	107T-AS03-RB25C-C2P
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AS02-RB25C-D1C	107T-AS03-RB25C-D1C
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AS02-RB25C-E1C	107T-AS03-RB25C-E1C
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AS02-RB25C-C1A	—
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AS02-RB25C-C2A	107T-AS03-RB25C-C2A
0.4 ... 2.0	—	—	1/2...1	1/2...1	450	65	30	65	30	103T-DS02-RB25C-C1P	—
0.4 ... 2.0	—	—	1/2...1	1/2...1	450	65	30	65	30	103T-DS02-RB25C-C2P	107T-DS03-RB25C-C2P
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	30	103T-DS02-RB25C-D1C	107T-DS03-RB25C-D1C
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	30	103T-DS02-RB25C-E1C	107T-DS03-RB25C-E1C
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	30	103T-DS02-RB25C-C1A	—
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	30	103T-DS02-RB25C-C2A	107T-DS03-RB25C-C2A
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	103T-AS02-RB40C-D1C	107T-AS03-RB40C-D1C
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	103T-AS02-RB40C-E1C	107T-AS03-RB40C-E1C
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	103T-AS02-RB40C-C1A	—
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	103T-AS02-RB40C-C2A	107T-AS03-RB40C-C2A
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	103T-DS02-RB40C-D1C	107T-DS03-RB40C-D1C
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	103T-DS02-RB40C-E1C	107T-DS03-RB40C-E1C
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	103T-DS02-RB40C-C1A	—
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	103T-DS02-RB40C-C2A	107T-DS03-RB40C-C2A
3.2 ... 6.3	3/4...1-1/2	3/4...2	2...5	3...5	450	65	30	65	—	103T-AS02-RB63C-D1D	107T-AS03-RB63C-D1D
3.2 ... 6.3	3/4...1-1/2	3/4...2	2...5	3...5	450	65	30	65	—	103T-AS02-RB63C-E1D	107T-AS03-RB63C-E1D
3.0 ... 6.3	3/4...1-1/2	3/4...2	1-1/2...5	3...5	450	65	30	65	—	103T-AS02-RB63C-C1B	—
3.0 ... 6.3	3/4...1-1/2	3/4...2	1-1/2...5	3...5	450	65	30	65	—	103T-AS02-RB63C-C2B	107T-AS03-RB63C-C2B
3.2 ... 10	3/4...3	3/4...3	2...7-1/2	3...10	450	65	30	65	—	103T-BS02-RC10C-D1D	107T-BS03-RC10C-D1D
3.2 ... 10	3/4...3	3/4...3	2...7-1/2	3...10	450	65	30	65	—	103T-BS02-RC10C-E1D	107T-BS03-RC10C-E1D
3.0 ... 10	3/4...3	3/4...3	1-1/2...7-1/2	3...10	450	65	30	65	—	103T-BS02-RC10C-C1B	—
3.0 ... 10	3/4...3	3/4...3	1-1/2...7-1/2	3...10	450	65	30	65	—	103T-BS02-RC10C-C2B	107T-BS03-RC10C-C2B
3.2 ... 10	3/4...3	3/4...3	2...7-1/2	3...10	450	65	30	65	30	103T-ES03-RC10C-E1D	107T-ES03-RC10C-E1D
3.0 ... 10	3/4...3	3/4...3	1-1/2...7-1/2	3...10	450	65	30	65	30	103T-ES03-RC10C-C1B	—
3.0 ... 10	3/4...3	3/4...3	1-1/2...7-1/2	3...10	450	65	30	65	30	103T-ES03-RC10C-C2B	107T-ES03-RC10C-C2B
3.2 ... 16	3/4...5	3/4...5	2...10	3...10	450	65	30	65	—	103T-CS02-RC16C-D1D	107T-CS03-RC16C-D1D
3.2 ... 16	3/4...5	3/4...5	2...10	3...10	450	65	30	65	—	103T-CS02-RC16C-E1D	107T-CS03-RC16C-E1D
3.0 ... 15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	—	103T-CS02-RC16C-C1B	—
3.0 ... 15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	—	103T-CS02-RC16C-C2B	107T-CS03-RC16C-C2B

2



Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)										DOL Starters	Reversing Starters
	Hp Ratings as a UL 508 Motor Controller in Group Motor Installations*					Max. Fuse or C.B. per NEC	Max. Short-Circuit Current [kA]					
	200V AC	230V AC	460V AC	575V AC	Type 1 Coordination		Type 2 Coordination	Type 2 Coordination				
					480V AC		600V AC	480V AC	600V AC			
D-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules												
3.2 ... 16	3/4...5	3/4...5	2...10	3...10	450	65	30	65	30	103T-ES03-RC16C-E1D	107T-ES03-RC16C-E1D	
3.0 ... 15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	30	103T-ES03-RC16C-C1B	—	
3.0 ... 15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	30	103T-ES03-RC16C-C2B	107T-ES03-RC16C-C2B	
5.4 ... 23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	—	50	—	103T-DS02-RC25C-D1E	107T-DS03-RC25C-D1E	
5.4 ... 23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	—	50	—	103T-DS02-RC25C-E1E	107T-DS03-RC25C-E1E	
5.0 ... 23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	—	50	—	103T-DS02-RC25C-C1C	—	
5.0 ... 23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	—	50	—	103T-DS02-RC25C-C2C	107T-DS03-RC25C-C2C	
5.4 ... 25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	450	65	30	65	—	103T-ES03-RC25C-E1E	107T-ES03-RC25C-E1E	
5.0 ... 25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	450	65	30	65	—	103T-ES03-RC25C-C1C	—	
5.0 ... 25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	450	65	30	65	—	103T-ES03-RC25C-C2C	107T-ES03-RC25C-C2C	
F-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules												
5.4 ... 25	1-1/2...7-1/2	1-1/2...10	5...20	5...20	600	65	30	65	30	103T-ES03-TC25C-E1E	107T-ES03-TC25C-E1E	
5.0 ... 25	1-1/2...7-1/2	1-1/2...10	5...20	5...20	600	65	30	65	30	103T-ES03-TC25C-C1C	—	
5.0 ... 25	1-1/2...7-1/2	1-1/2...10	5...20	5...20	600	65	30	65	30	103T-ES03-TC25C-C2C	107T-ES03-TC25C-C2C	
9.0 ... 30	3...7-1/2	3...10	7-1/2...20	7-1/2...25	600	65	30	65	30	103T-ES03-TC32C-E1F	107T-ES03-TC32C-E1F	
9.0 ... 30	3...7-1/2	3...10	7-1/2...20	7-1/2...25	600	65	30	65	30	103T-ES03-TC32C-C1D	—	
9.0 ... 30	3...7-1/2	3...10	7-1/2...20	7-1/2...25	600	65	30	65	30	103T-ES03-TC32C-C2D	107T-ES03-TC32C-C2D	
9.0 ... 32	3...10	3...10	7-1/2...25	7-1/2...30	600	65	30	65	30	103T-FS03-TC32C-E1F	107T-FS03-TC32C-E1F	
9.0 ... 32	3...10	3...10	7-1/2...25	7-1/2...30	600	65	30	65	30	103T-FS03-TC32C-C1D	—	
9.0 ... 32	3...10	3...10	7-1/2...25	7-1/2...30	600	65	30	65	30	103T-FS03-TC32C-C2D	107T-FS03-TC32C-C2D	
9.0 ... 37	3...10	3...10	7-1/2...25	7-1/2...30	600	65	18	65	—	103T-FS03-TC45C-E1F	107T-FS03-TC45C-E1F	
9.0 ... 37	3...10	3...10	7-1/2...25	7-1/2...30	600	65	18	65	—	103T-FS03-TC45C-C1D	—	
9.0 ... 37	3...10	3...10	7-1/2...25	7-1/2...30	600	65	18	65	—	103T-FS03-TC45C-C2D	107T-FS03-TC45C-C2D	
9.0 ... 43	3...10	3...15	7-1/2...30	7-1/2...30	600	65	18	65	—	103T-GS03-TC45C-E1F	107T-GS03-TC45C-E1F	
9.0 ... 43	3...10	3...15	7-1/2...30	7-1/2...30	600	65	18	65	—	103T-GS03-TC45C-C1D	—	
9.0 ... 43	3...10	3...15	7-1/2...30	7-1/2...30	600	65	18	65	—	103T-GS03-TC45C-C2D	107T-GS03-TC45C-C2D	

* Hp ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.
 ⊗ Coil voltage code—see page 2-343



Open Type Starters

Product Selection & Coordination Ratings

With Bulletin 193-EC, -ED, or EE Overload Relays—UL/CSA in Group Motor Installations

2

Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)										DOL Starters Cat. No.	Reversing Starters Cat. No.
	Hp Ratings as a UL 508 Motor Controller in Group Motor Installations*				Max. Fuse or C.B. per NEC [A]	Max. Short-Circuit Current [kA]						
	200V AC	230V AC	460V AC	575V AC		Type 1 Coordination 480V AC 600V AC		Type 2 Coordination 480V AC	Type 2 Coordination 600V AC			
C-Frame with 100-C/104-C Contactors on Panel Mounting Modules												
0.10...0.40	—	—	—	—	450	65	47	65	47	103T-AW02-QA40C-D1A	107T-AW03-QA40C-D1A	
0.10...0.40	—	—	—	—	450	65	47	65	47	103T-AW02-QA40C-E1A	107T-AW03-QA40C-E1A	
0.20...1.00	—	—	—	1/2	450	65	47	65	47	103T-AW02-QB10C-D1B	107T-AW03-QB10C-D1B	
0.20...1.00	—	—	—	1/2	450	65	47	65	47	103T-AW02-QB10C-E1B	107T-AW03-QB10C-E1B	
0.40...1.00	—	—	—	1/2	450	65	47	65	47	103T-AW02-QB10C-C1P	—	
0.40...1.00	—	—	—	1/2	450	65	47	65	47	103T-AW02-QB10C-C2P	107T-AW03-QB10C-C2P	
0.4 ... 2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	103T-AW02-QB25C-C1P	—	
0.4 ... 2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	103T-AW02-QB25C-C2P	107T-AW03-QB25C-C2P	
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AW02-QB25C-D1C	107T-AW03-QB25C-D1C	
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AW02-QB25C-E1C	107T-AW03-QB25C-E1C	
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AW02-QB25C-C1A	—	
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AW02-QB25C-C2A	107T-AW03-QB25C-C2A	
D-Frame with 100-C/104-C Contactors on Panel Mounting Modules												
0.4 ... 2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	103T-AW02-RB25C-C1P	—	
0.4 ... 2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	103T-AW02-RB25C-C2P	107T-AW03-RB25C-C2P	
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AW02-RB25C-D1C	107T-AW03-RB25C-D1C	
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AW02-RB25C-E1C	107T-AW03-RB25C-E1C	
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AW02-RB25C-C1A	—	
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	—	103T-AW02-RB25C-C2A	107T-AW03-RB25C-C2A	
0.4 ... 2.0	—	—	1/2...1	1/2...1	450	65	30	65	30	103T-DW02-RB25C-C1P	—	
0.4 ... 2.0	—	—	1/2...1	1/2...1	450	65	30	65	30	103T-DW02-RB25C-C2P	107T-DW03-RB25C-C2P	
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	30	103T-DW02-RB25C-D1C	107T-DW03-RB25C-D1C	
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	30	103T-DW02-RB25C-E1C	107T-DW03-RB25C-E1C	
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	30	103T-DW02-RB25C-C1A	—	
1.0 ... 2.5	1/2	1/2...3/4	1/2...1-1/2	3/4...2	450	65	30	65	30	103T-DW02-RB25C-C2A	107T-DW03-RB25C-C2A	
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	103T-AW02-RB40C-D1C	107T-AW03-RB40C-D1C	
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	103T-AW02-RB40C-E1C	107T-AW03-RB40C-E1C	
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	103T-AW02-RB40C-C1A	—	
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	103T-AW02-RB40C-C2A	107T-AW03-RB40C-C2A	
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	103T-DW02-RB40C-D1C	107T-DW03-RB40C-D1C	
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	103T-DW02-RB40C-E1C	107T-DW03-RB40C-E1C	
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	103T-DW02-RB40C-C1A	—	
1.0 ... 4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	103T-DW02-RB40C-C2A	107T-DW03-RB40C-C2A	
3.2 ... 6.3	3/4...1-1/2	3/4...2	2...5	3...5	450	65	30	65	—	103T-AW02-RB63C-D1D	107T-AW03-RB63C-D1D	
3.2 ... 6.3	3/4...1-1/2	3/4...2	2...5	3...5	450	65	30	65	—	103T-AW02-RB63C-E1D	107T-AW03-RB63C-E1D	
3.0 ... 6.3	3/4...1-1/2	3/4...2	1-1/2...5	3...5	450	65	30	65	—	103T-AW02-RB63C-C1B	—	
3.0 ... 6.3	3/4...1-1/2	3/4...2	1-1/2...5	3...5	450	65	30	65	—	103T-AW02-RB63C-C2B	107T-AW03-RB63C-C2B	
3.2 ... 10	3/4...3	3/4...3	2...7-1/2	3...10	450	65	30	65	—	103T-BW02-RC10C-D1D	107T-BW03-RC10C-D1D	
3.2 ... 10	3/4...3	3/4...3	2...7-1/2	3...10	450	65	30	65	—	103T-BW02-RC10C-E1D	107T-BW03-RC10C-E1D	
3.0 ... 10	3/4...3	3/4...3	1-1/2...7-1/2	3...10	450	65	30	65	—	103T-BW02-RC10C-C1B	—	
3.0 ... 10	3/4...3	3/4...3	1-1/2...7-1/2	3...10	450	65	30	65	—	103T-BW02-RC10C-C2B	107T-BW03-RC10C-C2B	
3.2 ... 10	3/4...3	3/4...3	2...7-1/2	3...10	450	65	30	65	30	103T-EW03-RC10C-E1D	107T-EW03-RC10C-E1D	
3.0 ... 10	3/4...3	3/4...3	1-1/2...7-1/2	3...10	450	65	30	65	30	103T-EW03-RC10C-C1B	—	
3.0 ... 10	3/4...3	3/4...3	1-1/2...7-1/2	3...10	450	65	30	65	30	103T-EW03-RC10C-C2B	107T-EW03-RC10C-C2B	
3.2 ... 16	3/4...5	3/4...5	2...10	3...10	450	65	30	65	—	103T-CW02-RC16C-D1D	107T-CW03-RC16C-D1D	
3.2 ... 16	3/4...5	3/4...5	2...10	3...10	450	65	30	65	—	103T-CW02-RC16C-E1D	107T-CW03-RC16C-E1D	
3.0 ... 15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	—	103T-CW02-RC16C-C1B	—	
3.0 ... 15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	—	103T-CW02-RC16C-C2B	107T-CW03-RC16C-C2B	
3.2 ... 16	3/4...5	3/4...5	2...10	3...10	450	65	30	65	30	103T-EW03-RC16C-E1D	107T-EW03-RC16C-E1D	
3.0 ... 15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	30	103T-EW03-RC16C-C1B	—	
3.0 ... 15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	30	103T-EW03-RC16C-C2B	107T-EW03-RC16C-C2B	
5.4 ... 23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	—	50	—	103T-DW02-RC25C-D1E	107T-DW03-RC25C-D1E	
5.4 ... 23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	—	50	—	103T-DW02-RC25C-E1E	107T-DW03-RC25C-E1E	
5.0 ... 23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	—	50	—	103T-DW02-RC25C-C1C	—	
5.0 ... 23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	—	50	—	103T-DW02-RC25C-C2C	107T-DW03-RC25C-C2C	
5.4 ... 25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	450	65	30	65	—	103T-EW03-RC25C-E1E	107T-EW03-RC25C-E1E	
5.0 ... 25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	450	65	30	65	—	103T-EW03-RC25C-C1C	—	
5.0 ... 25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	450	65	30	65	—	103T-EW03-RC25C-C2C	107T-EW03-RC25C-C2C	



Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)									DOL Starters	Reversing Starters
	Hp Ratings as a UL 508 Motor Controller in Group Motor Installations*					Max. Fuse or C.B. per NEC [A]	Max. Short-Circuit Current [kA]				
	200V AC	230V AC	460V AC	575V AC	Type 1 Coordination		Type 2 Coordination	Type 2 Coordination			
								480V AC	600V AC	480V AC	600V AC
F-Frame with 100-C/104-C Contactors on Panel Mounting Modules											
Cat. No.					Cat. No.					Cat. No.	
5.4 ... 25	1-1/2...7-1/2	1-1/2...10	5...20	5...20	600	65	30	65	30	103T-EW03-TC25C-E1E	107T-EW03-TC25C-E1E
5.0 ... 25	1-1/2...7-1/2	1-1/2...10	5...20	5...20	600	65	30	65	30	103T-EW03-TC25C-C1C	—
5.0 ... 25	1-1/2...7-1/2	1-1/2...10	5...20	5...20	600	65	30	65	30	103T-EW03-TC25C-C2C	107T-EW03-TC25C-C2C
9.0 ... 30	3...7-1/2	3...10	7-1/2...20	7-1/2...25	600	65	30	65	30	103T-EW03-TC32C-E1F	107T-EW03-TC32C-E1F
9.0 ... 30	3...7-1/2	3...10	7-1/2...20	7-1/2...25	600	65	30	65	30	103T-EW03-TC32C-C1D	—
9.0 ... 30	3...7-1/2	3...10	7-1/2...20	7-1/2...25	600	65	30	65	30	103T-EW03-TC32C-C2D	107T-EW03-TC32C-C2D
9.0 ... 32	3...10	3...10	7-1/2...25	7-1/2...30	600	65	30	65	30	103T-FW03-TC32C-E1F	107T-FW03-TC32C-E1F
9.0 ... 32	3...10	3...10	7-1/2...25	7-1/2...30	600	65	30	65	30	103T-FW03-TC32C-C1D	—
9.0 ... 32	3...10	3...10	7-1/2...25	7-1/2...30	600	65	30	65	30	103T-FW03-TC32C-C2D	107T-FW03-TC32C-C2D
9.0 ... 37	3...10	3...10	7-1/2...25	7-1/2...30	600	65	18	65	—	103T-FW03-TC45C-E1F	107T-FW03-TC45C-E1F
9.0 ... 37	3...10	3...10	7-1/2...25	7-1/2...30	600	65	18	65	—	103T-FW03-TC45C-C1D	—
9.0 ... 37	3...10	3...10	7-1/2...25	7-1/2...30	600	65	18	65	—	103T-FW03-TC45C-C2D	107T-FW03-TC45C-C2D
9.0 ... 43	3...10	3...15	7-1/2...30	7-1/2...30	600	65	18	65	—	103T-GW03-TC45C-E1F	107T-GW03-TC45C-E1F
9.0 ... 43	3...10	3...15	7-1/2...30	7-1/2...30	600	65	18	65	—	103T-GW03-TC45C-C1D	—
9.0 ... 43	3...10	3...15	7-1/2...30	7-1/2...30	600	65	18	65	—	103T-GW03-TC45C-C2D	107T-GW03-TC45C-C2D

* Hp ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

⊗ Coil voltage code—see page 2-343



Open Type Starters

Product Selection & Coordination Ratings

2

Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)						DOL Starters Cat. No.	Reversing Starters Cat. No.
	Hp Ratings as a UL 508 Self Protected Type E Combination Motor Controller*				Max. Short-Circuit Current [kA]			
	200V AC	230V AC	460V AC	575V AC	480Y/277V AC	600Y/347V AC		
C-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules								
0.10...0.40	—	—	—	—	65	47	103T-AT02-QA40C-D1A-TE	107T-AT03-QA40C-D1A-TE
0.10...0.40	—	—	—	—	65	47	103T-AT02-QA40C-E1A-TE	107T-AT03-QA40C-E1A-TE
0.20...1.00	—	—	—	1/2	65	47	103T-AT02-QB10C-D1B-TE	107T-AT03-QB10C-D1B-TE
0.20...1.00	—	—	—	1/2	65	47	103T-AT02-QB10C-E1B-TE	107T-AT03-QB10C-E1B-TE
0.40...1.00	—	—	—	1/2	65	47	103T-AT02-QB10C-C1P-TE	—
0.40...1.00	—	—	—	1/2	65	47	103T-AT02-QB10C-C2P-TE	107T-AT03-QB10C-C2P-TE
0.4...2.0	—	—	1/2...3/4	—	65	❖	103T-AT02-QB25C-C1P-TE	—
0.4...2.0	—	—	1/2...3/4	—	65	❖	103T-AT02-QB25C-C2P-TE	107T-AT03-QB25C-C2P-TE
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	103T-AT02-QB25C-D1C-TE	107T-AT03-QB25C-D1C-TE
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	103T-AT02-QB25C-E1C-TE	107T-AT03-QB25C-E1C-TE
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	103T-AT02-QB25C-C1A-TE	—
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	103T-AT02-QB25C-C2A-TE	107T-AT03-QB25C-C2A-TE
D-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules								
0.4...2.0	—	—	1/2...3/4	—	65	❖	103T-AT02-RB25C-C1P-TE	—
0.4...2.0	—	—	1/2...3/4	—	65	❖	103T-AT02-RB25C-C2P-TE	107T-AT03-RB25C-C2P-TE
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	103T-AT02-RB25C-D1C-TE	107T-AT03-RB25C-D1C-TE
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	103T-AT02-RB25C-E1C-TE	107T-AT03-RB25C-E1C-TE
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	103T-AT02-RB25C-C1A-TE	—
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	103T-AT02-RB25C-C2A-TE	107T-AT03-RB25C-C2A-TE
0.4...2.0	—	—	1/2...3/4	1/2...1	65	30	103T-DT02-RB25C-C1P-TE	—
0.4...2.0	—	—	1/2...3/4	1/2...1	65	30	103T-DT02-RB25C-C2P-TE	107T-DT03-RB25C-C2P-TE
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	103T-DT02-RB25C-D1C-TE	107T-DT03-RB25C-D1C-TE
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	103T-DT02-RB25C-E1C-TE	107T-DT03-RB25C-E1C-TE
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	103T-DT02-RB25C-C1A-TE	—
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	103T-DT02-RB25C-C2A-TE	107T-DT03-RB25C-C2A-TE
1.0...4.0	1/2...3/4	1/2...3/4	1/2...2	3/4...3	65	30	103T-DT02-RB40C-D1C-TE	107T-DT03-RB40C-D1C-TE
1.0...4.0	1/2...3/4	1/2...3/4	1/2...2	3/4...3	65	30	103T-DT02-RB40C-E1C-TE	107T-DT03-RB40C-E1C-TE
1.0...4.0	1/2...3/4	1/2...3/4	1/2...2	3/4...3	65	30	103T-DT02-RB40C-C1A-TE	—
1.0...4.0	1/2...3/4	1/2...3/4	1/2...2	3/4...3	65	30	103T-DT02-RB40C-C2A-TE	107T-DT03-RB40C-C2A-TE
3.2...10	3/4...2	3/4...3	2...5	3...7-1/2	65	30	103T-ET03-RC10C-E1D-TE	107T-ET03-RC10C-E1D-TE
3.0...10	3/4...2	3/4...3	1-1/2...5	3...7-1/2	65	30	103T-ET03-RC10C-C1B-TE	—
3.0...10	3/4...2	3/4...3	1-1/2...5	3...7-1/2	65	30	103T-ET03-RC10C-C2B-TE	107T-ET03-RC10C-C2B-TE
3.2...16	3/4...3	3/4...5	2...10	3...10	65	30	103T-ET03-RC16C-E1D-TE	107T-ET03-RC16C-E1D-TE
3.0...15	3/4...3	3/4...5	2...10	3...10	65	30	103T-ET03-RC16C-C1B-TE	—
3.0...15	3/4...3	3/4...5	2...10	3...10	65	30	103T-ET03-RC16C-C2B-TE	107T-ET03-RC16C-C2B-TE
5.4...25	1-1/2...5	1-1/2...7-1/2	5...15	—	65	❖	103T-ET03-RC25C-E1E-TE	107T-ET03-RC25C-E1E-TE
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	—	65	❖	103T-ET03-RC25C-C1C-TE	—
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	—	65	❖	103T-ET03-RC25C-C2C-TE	107T-ET03-RC25C-C2C-TE
F-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules								
5.4...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	65	30	103T-ET03-TC25C-E1E-TE	107T-ET03-TC25C-E1E-TE
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	65	30	103T-ET03-TC25C-C1C-TE	—
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	65	30	103T-ET03-TC25C-C2C-TE	107T-ET03-TC25C-C2C-TE
9.0...30	3...7-1/2	3...10	7-1/2...20	7-1/2...20	65	30	103T-ET03-TC32C-E1F-TE	107T-ET03-TC32C-E1F-TE
9.0...30	3...7-1/2	3...10	7-1/2...20	7-1/2...20	65	30	103T-ET03-TC32C-C1D-TE	—
9.0...30	3...7-1/2	3...10	7-1/2...20	7-1/2...20	65	30	103T-ET03-TC32C-C2D-TE	107T-ET03-TC32C-C2D-TE
9.0...32	3...7-1/2	3...10	7-1/2...20	7-1/2...25	65	30	103T-FT03-TC32C-E1F-TE	107T-ET03-TC32C-E1F-TE
9.0...32	3...7-1/2	3...10	7-1/2...20	7-1/2...25	65	30	103T-FT03-TC32C-C1D-TE	—
9.0...32	3...7-1/2	3...10	7-1/2...20	7-1/2...25	65	30	103T-FT03-TC32C-C2D-TE	107T-ET03-TC32C-C2D-TE
9.0...37	3...10	3...10	7-1/2...25	—	65	❖	103T-FT03-TC45C-E1F-TE	107T-FT03-TC45C-E1F-TE
9.0...37	3...10	3...10	7-1/2...25	—	65	❖	103T-FT03-TC45C-C1D-TE	—
9.0...37	3...10	3...10	7-1/2...25	—	65	❖	103T-FT03-TC45C-C2D-TE	107T-FT03-TC45C-C2D-TE
9.0...43	3...10	3...15	7-1/2...30	—	65	❖	103T-GT03-TC45C-E1F-TE	107T-GT03-TC45C-E1F-TE
9.0...43	3...10	3...15	7-1/2...30	—	65	❖	103T-GT03-TC45C-C1D-TE	—
9.0...43	3...10	3...15	7-1/2...30	—	65	❖	103T-GT03-TC45C-C2D-TE	107T-GT03-TC45C-C2D-TE
18...45	7-1/2...10	7-1/2...15	15...30	—	65	❖	103T-HT03-TC45C-E1G-TE	107T-HT03-TC45C-E1G-TE
9.0...45	3...10	3...15	7-1/2...30	—	65	❖	103T-HT03-TC45C-C1D-TE	—
9.0...45	3...10	3...15	7-1/2...30	—	65	❖	103T-HT03-TC45C-C2D-TE	107T-HT03-TC45C-C2D-TE

* Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

❖ This starter is not valid for application at this horsepower and voltage.

⊗ Coil voltage code—see page 2-343



Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)						DOL Starters Cat. No.	Reversing Starters Cat. No.
	Hp Ratings as a UL 508 Self Protected Type E Combination Motor Contoller*				Max. Short-Circuit Current [kA]			
	200V AC	230V AC	460V AC	575V AC	480Y/277V AC	600Y/347V AC		
C-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules								
0.10...0.40	—	—	—	—	65	47	103T-AS02-QA40C-D1A-TE	107T-AS03-QA40C-D1A-TE
0.10...0.40	—	—	—	—	65	47	103T-AS02-QA40C-E1A-TE	107T-AS03-QA40C-E1A-TE
0.20...1.00	—	—	—	1/2	65	47	103T-AS02-QB10C-D1B-TE	107T-AS03-QB10C-D1B-TE
0.20...1.00	—	—	—	1/2	65	47	103T-AS02-QB10C-E1B-TE	107T-AS03-QB10C-E1B-TE
0.40...1.00	—	—	—	1/2	65	47	103T-AS02-QB10C-C1P-TE	—
0.40...1.00	—	—	—	1/2	65	47	103T-AS02-QB10C-C2P-TE	107T-AS03-QB10C-C2P-TE
0.4...2.0	—	—	1/2...3/4	—	65	❖	103T-AS02-QB25C-C1P-TE	—
0.4...2.0	—	—	1/2...3/4	—	65	❖	103T-AS02-QB25C-C2P-TE	107T-AS03-QB25C-C2P-TE
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	103T-AS02-QB25C-D1C-TE	107T-AS03-QB25C-D1C-TE
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	103T-AS02-QB25C-E1C-TE	107T-AS03-QB25C-E1C-TE
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	103T-AS02-QB25C-C1A-TE	—
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	103T-AS02-QB25C-C2A-TE	107T-AS03-QB25C-C2A-TE
D-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules								
0.4...2.0	—	—	1/2...3/4	—	65	❖	103T-AS02-RB25C-C1P-TE	—
0.4...2.0	—	—	1/2...3/4	—	65	❖	103T-AS02-RB25C-C2P-TE	107T-AS03-RB25C-C2P-TE
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	103T-AS02-RB25C-D1C-TE	107T-AS03-RB25C-D1C-TE
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	103T-AS02-RB25C-E1C-TE	107T-AS03-RB25C-E1C-TE
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	103T-AS02-RB25C-C1A-TE	—
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	103T-AS02-RB25C-C2A-TE	107T-AS03-RB25C-C2A-TE
0.4...2.0	—	—	1/2...3/4	1/2...1	65	30	103T-DS02-RB25C-C1P-TE	—
0.4...2.0	—	—	1/2...3/4	1/2...1	65	30	103T-DS02-RB25C-C2P-TE	107T-DS03-RB25C-C2P-TE
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	103T-DS02-RB25C-D1C-TE	107T-DS03-RB25C-D1C-TE
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	103T-DS02-RB25C-E1C-TE	107T-DS03-RB25C-E1C-TE
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	103T-DS02-RB25C-C1A-TE	—
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	103T-DS02-RB25C-C2A-TE	107T-DS03-RB25C-C2A-TE
1.0...4.0	1/2...3/4	1/2...3/4	1/2...2	3/4...3	65	30	103T-DS02-RB40C-D1C-TE	107T-DS03-RB40C-D1C-TE
1.0...4.0	1/2...3/4	1/2...3/4	1/2...2	3/4...3	65	30	103T-DS02-RB40C-E1C-TE	107T-DS03-RB40C-E1C-TE
1.0...4.0	1/2...3/4	1/2...3/4	1/2...2	3/4...3	65	30	103T-DS02-RB40C-C1A-TE	—
1.0...4.0	1/2...3/4	1/2...3/4	1/2...2	3/4...3	65	30	103T-DS02-RB40C-C2A-TE	107T-DS03-RB40C-C2A-TE
3.2...10	3/4...2	3/4...3	2...5	3...7-1/2	65	30	103T-ES03-RC10C-E1D-TE	107T-ES03-RC10C-E1D-TE
3.0...10	3/4...2	3/4...3	1-1/2...5	3...7-1/2	65	30	103T-ES03-RC10C-C1B-TE	—
3.0...10	3/4...2	3/4...3	1-1/2...5	3...7-1/2	65	30	103T-ES03-RC10C-C2B-TE	107T-ES03-RC10C-C2B-TE
3.2...16	3/4...3	3/4...5	2...10	3...10	65	30	103T-ES03-RC16C-E1D-TE	107T-ES03-RC16C-E1D-TE
3.0...15	3/4...3	3/4...5	2...10	3...10	65	30	103T-ES03-RC16C-C1B-TE	—
3.0...15	3/4...3	3/4...5	2...10	3...10	65	30	103T-ES03-RC16C-C2B-TE	107T-ES03-RC16C-C2B-TE
5.4...25	1-1/2...5	1-1/2...7-1/2	5...15	—	65	❖	103T-ES03-RC25C-E1E-TE	107T-ES03-RC25C-E1E-TE
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	—	65	❖	103T-ES03-RC25C-C1C-TE	—
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	—	65	❖	103T-ES03-RC25C-C2C-TE	107T-ES03-RC25C-C2C-TE
F-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules								
5.4...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	65	30	103T-ES03-TC25C-E1E-TE	107T-ES03-TC25C-E1E-TE
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	65	30	103T-ES03-TC25C-C1C-TE	—
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	65	30	103T-ES03-TC25C-C2C-TE	107T-ES03-TC25C-C2C-TE
9.0...30	3...7-1/2	3...10	7-1/2...20	7-1/2...20	65	30	103T-ES03-TC32C-E1F-TE	107T-ES03-TC32C-E1F-TE
9.0...30	3...7-1/2	3...10	7-1/2...20	7-1/2...20	65	30	103T-ES03-TC32C-C1D-TE	—
9.0...30	3...7-1/2	3...10	7-1/2...20	7-1/2...20	65	30	103T-ES03-TC32C-C2D-TE	107T-ES03-TC32C-C2D-TE
9.0...32	3...7-1/2	3...10	7-1/2...20	7-1/2...25	65	30	103T-FS03-TC32C-E1F-TE	107T-ES03-TC32C-E1F-TE
9.0...32	3...7-1/2	3...10	7-1/2...20	7-1/2...25	65	30	103T-FS03-TC32C-C1D-TE	—
9.0...32	3...7-1/2	3...10	7-1/2...20	7-1/2...25	65	30	103T-FS03-TC32C-C2D-TE	107T-ES03-TC32C-C2D-TE
9.0...37	3...10	3...10	7-1/2...25	—	65	❖	103T-FS03-TC45C-E1F-TE	107T-FS03-TC45C-E1F-TE
9.0...37	3...10	3...10	7-1/2...25	—	65	❖	103T-FS03-TC45C-C1D-TE	—
9.0...37	3...10	3...10	7-1/2...25	—	65	❖	103T-FS03-TC45C-C2D-TE	107T-FS03-TC45C-C2D-TE
9.0...43	3...10	3...15	7-1/2...30	—	65	❖	103T-GS03-TC45C-E1F-TE	107T-GS03-TC45C-E1F-TE
9.0...43	3...10	3...15	7-1/2...30	—	65	❖	103T-GS03-TC45C-C1D-TE	—
9.0...43	3...10	3...15	7-1/2...30	—	65	❖	103T-GS03-TC45C-C2D-TE	107T-GS03-TC45C-C2D-TE

* Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.
 ❖ This starter is not valid for application at this horsepower and voltage.

⊗ Coil voltage code—see page 2-343

Open Type Starters

Product Selection & Coordination Ratings

2

Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)						DOL Starters Cat. No.	Reversing Starters Cat. No.
	Hp Ratings as a UL 508 Self Protected Type E Combination Motor Controller*				Max. Short-Circuit Current [kA]			
	200V AC	230V AC	460V AC	575V AC	480Y/277V AC	600Y/347V AC		
C-Frame with 100-C/104-C Contactors on Panel Mounting Modules								
0.10...0.40	—	—	—	—	65	47	103T-AW@2-QA40C-D1A-TE	107T-AW@3-QA40C-D1A-TE
0.10...0.40	—	—	—	—	65	47	103T-AW@2-QA40C-E1A-TE	107T-AW@3-QA40C-E1A-TE
0.20...1.00	—	—	—	1/2	65	47	103T-AW@2-QB10C-D1B-TE	107T-AW@3-QB10C-D1B-TE
0.20...1.00	—	—	—	1/2	65	47	103T-AW@2-QB10C-E1B-TE	107T-AW@3-QB10C-E1B-TE
0.40...1.00	—	—	—	1/2	65	47	103T-AW@2-QB10C-C1P-TE	—
0.40...1.00	—	—	—	1/2	65	47	103T-AW@2-QB10C-C2P-TE	107T-AW@3-QB10C-C2P-TE
0.4...2.0	—	—	1/2...3/4	—	65	⚡	103T-AW@2-QB25C-C1P-TE	—
0.4...2.0	—	—	1/2...3/4	—	65	⚡	103T-AW@2-QB25C-C2P-TE	107T-AW@3-QB25C-C2P-TE
1.0...2.5	1/2	1/2	1/2...1	—	65	⚡	103T-AW@2-QB25C-D1C-TE	107T-AW@3-QB25C-D1C-TE
1.0...2.5	1/2	1/2	1/2...1	—	65	⚡	103T-AW@2-QB25C-E1C-TE	107T-AW@3-QB25C-E1C-TE
1.0...2.5	1/2	1/2	1/2...1	—	65	⚡	103T-AW@2-QB25C-C1A-TE	—
1.0...2.5	1/2	1/2	1/2...1	—	65	⚡	103T-AW@2-QB25C-C2A-TE	107T-AW@3-QB25C-C2A-TE
D-Frame with 100-C/104-C Contactors on Panel Mounting Modules								
0.4...2.0	—	—	1/2...3/4	—	65	⚡	103T-AW@2-RB25C-C1P-TE	—
0.4...2.0	—	—	1/2...3/4	—	65	⚡	103T-AW@2-RB25C-C2P-TE	107T-AW@3-RB25C-C2P-TE
1.0...2.5	1/2	1/2	1/2...1	—	65	⚡	103T-AW@2-RB25C-D1C-TE	107T-AW@3-RB25C-D1C-TE
1.0...2.5	1/2	1/2	1/2...1	—	65	⚡	103T-AW@2-RB25C-E1C-TE	107T-AW@3-RB25C-E1C-TE
1.0...2.5	1/2	1/2	1/2...1	—	65	⚡	103T-AW@2-RB25C-C1A-TE	—
1.0...2.5	1/2	1/2	1/2...1	—	65	⚡	103T-AW@2-RB25C-C2A-TE	107T-AW@3-RB25C-C2A-TE
0.4...2.0	—	—	1/2...3/4	1/2...1	65	30	103T-DW@2-RB25C-C1P-TE	—
0.4...2.0	—	—	1/2...3/4	1/2...1	65	30	103T-DW@2-RB25C-C2P-TE	107T-DW@3-RB25C-C2P-TE
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	103T-DW@2-RB25C-D1C-TE	107T-DW@3-RB25C-D1C-TE
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	103T-DW@2-RB25C-E1C-TE	107T-DW@3-RB25C-E1C-TE
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	103T-DW@2-RB25C-C1A-TE	—
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	103T-DW@2-RB25C-C2A-TE	107T-DW@3-RB25C-C2A-TE
1.0...4.0	1/2...3/4	1/2...3/4	1/2...2	3/4...3	65	30	103T-DW@2-RB40C-D1C-TE	107T-DW@3-RB40C-D1C-TE
1.0...4.0	1/2...3/4	1/2...3/4	1/2...2	3/4...3	65	30	103T-DW@2-RB40C-E1C-TE	107T-DW@3-RB40C-E1C-TE
1.0...4.0	1/2...3/4	1/2...3/4	1/2...2	3/4...3	65	30	103T-DW@2-RB40C-C1A-TE	—
1.0...4.0	1/2...3/4	1/2...3/4	1/2...2	3/4...3	65	30	103T-DW@2-RB40C-C2A-TE	107T-DW@3-RB40C-C2A-TE
3.2...10	3/4...2	3/4...3	2...5	3...7-1/2	65	30	103T-EW@3-RC10C-E1D-TE	107T-EW@3-RC10C-E1D-TE
3.0...10	3/4...2	3/4...3	1-1/2...5	3...7-1/2	65	30	103T-EW@3-RC10C-C1B-TE	—
3.0...10	3/4...2	3/4...3	1-1/2...5	3...7-1/2	65	30	103T-EW@3-RC10C-C2B-TE	107T-EW@3-RC10C-C2B-TE
3.2...16	3/4...3	3/4...5	2...10	3...10	65	30	103T-EW@3-RC16C-E1D-TE	107T-EW@3-RC16C-E1D-TE
3.0...15	3/4...3	3/4...5	2...10	3...10	65	30	103T-EW@3-RC16C-C1B-TE	—
3.0...15	3/4...3	3/4...5	2...10	3...10	65	30	103T-EW@3-RC16C-C2B-TE	107T-EW@3-RC16C-C2B-TE
5.4...25	1-1/2...5	1-1/2...7-1/2	5...15	—	65	⚡	103T-EW@3-RC25C-E1E-TE	107T-EW@3-RC25C-E1E-TE
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	—	65	⚡	103T-EW@3-RC25C-C1C-TE	—
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	—	65	⚡	103T-EW@3-RC25C-C2C-TE	107T-EW@3-RC25C-C2C-TE
F-Frame with 100-C/104-C Contactors on Panel Mounting Modules								
5.4...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	65	30	103T-EW@3-TC25C-E1E-TE	107T-EW@3-TC25C-E1E-TE
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	65	30	103T-EW@3-TC25C-C1C-TE	—
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	65	30	103T-EW@3-TC25C-C2C-TE	107T-EW@3-TC25C-C2C-TE
9.0...30	3...7-1/2	3...10	7-1/2...20	7-1/2...20	65	30	103T-EW@3-TC32C-E1F-TE	107T-EW@3-TC32C-E1F-TE
9.0...30	3...7-1/2	3...10	7-1/2...20	7-1/2...20	65	30	103T-EW@3-TC32C-C1D-TE	—
9.0...30	3...7-1/2	3...10	7-1/2...20	7-1/2...20	65	30	103T-EW@3-TC32C-C2D-TE	107T-EW@3-TC32C-C2D-TE
9.0...32	3...7-1/2	3...10	7-1/2...20	7-1/2...25	65	30	103T-FW@3-TC32C-E1F-TE	107T-EW@3-TC32C-E1F-TE
9.0...32	3...7-1/2	3...10	7-1/2...20	7-1/2...25	65	30	103T-FW@3-TC32C-C1D-TE	—
9.0...32	3...7-1/2	3...10	7-1/2...20	7-1/2...25	65	30	103T-FW@3-TC32C-C2D-TE	107T-EW@3-TC32C-C2D-TE
9.0...37	3...10	3...10	7-1/2...25	—	65	⚡	103T-FW@3-TC45C-E1F-TE	107T-FW@3-TC45C-E1F-TE
9.0...37	3...10	3...10	7-1/2...25	—	65	⚡	103T-FW@3-TC45C-C1D-TE	—
9.0...37	3...10	3...10	7-1/2...25	—	65	⚡	103T-FW@3-TC45C-C2D-TE	107T-FW@3-TC45C-C2D-TE
9.0...43	3...10	3...15	7-1/2...30	—	65	⚡	103T-GW@3-TC45C-E1F-TE	107T-GW@3-TC45C-E1F-TE
9.0...43	3...10	3...15	7-1/2...30	—	65	⚡	103T-GW@3-TC45C-C1D-TE	—
9.0...43	3...10	3...15	7-1/2...30	—	65	⚡	103T-GW@3-TC45C-C2D-TE	107T-GW@3-TC45C-C2D-TE
18...45	7-1/2...10	7-1/2...15	15...30	—	65	⚡	103T-HW@3-TC45C-E1G-TE	107T-HW@3-TC45C-E1G-TE
9.0...45	3...10	3...15	7-1/2...30	—	65	⚡	103T-HW@3-TC45C-C1D-TE	—
9.0...45	3...10	3...15	7-1/2...30	—	65	⚡	103T-HW@3-TC45C-C2D-TE	107T-HW@3-TC45C-C2D-TE

* Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

⚡ This starter is not valid for application at this horsepower and voltage.

⊗ Coil voltage code—see page 2-343



With Bulletin 193-EC, -ED, or EE Overload Relays—UL/CSA as a Fused Motor Controller

Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)								DOL Starters	Reversing Starters
	Hp Ratings as a Fused Motor Controller*				Type 1 Coordination		Type 2 Coordination			
	200V AC	230V AC	460V AC	575V AC	Max. Class CC Fuse	Max Short-Circuit Current [kA], 600V AC	Max. Class CC Fuse	Max Short-Circuit Current [kA], 600V AC	Cat. No.	Cat. No.
Bulletin 140F Fuse Holder with 100-C/104-C Contactors on Standard Bus Bar Modules										
0.10...0.50	—	—	—	—	3	100	3	100	103T-AT02-F3CC-D1A	107T-AT03-F3CC-D1A
0.10...0.50	—	—	—	—	3	100	3	100	103T-AT02-F3CC-E1A	107T-AT03-F3CC-E1A
0.20...1.00	—	—	—	1/2	6	100	6	100	103T-AT02-F3CC-D1B	107T-AT03-F3CC-D1B
0.20...1.00	—	—	—	1/2	6	100	6	100	103T-AT02-F3CC-E1B	107T-AT03-F3CC-E1B
0.40...1.00	—	—	—	1/2	6	100	6	100	103T-AT02-F3CC-C1P	—
0.40...1.00	—	—	—	1/2	6	100	6	100	103T-AT02-F3CC-C2P	107T-AT03-F3CC-C2P
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	103T-AT02-F3CC-D1C	107T-AT03-F3CC-D1C
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	103T-AT02-F3CC-E1C	107T-AT03-F3CC-E1C
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	103T-AT02-F3CC-C1A	—
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	103T-AT02-F3CC-C2A	107T-AT03-F3CC-C2A
3.2...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	103T-AT02-F3CC-D1D	107T-AT03-F3CC-D1D
3.2...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	103T-AT02-F3CC-E1D	107T-AT03-F3CC-E1D
3.0...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	103T-AT02-F3CC-C1B	—
3.0...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	103T-AT02-F3CC-C2B	107T-AT03-F3CC-C2B
3.2...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	103T-BT02-F3CC-D1D	107T-BT03-F3CC-D1D
3.2...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	103T-BT02-F3CC-E1D	107T-BT03-F3CC-E1D
3.0...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	103T-BT02-F3CC-C1B	—
3.0...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	103T-BT02-F3CC-C2B	107T-BT03-F3CC-C2B
3.2...16.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	103T-CT02-F3CC-D1D	107T-CT03-F3CC-D1D
3.2...16.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	103T-CT02-F3CC-E1D	107T-CT03-F3CC-E1D
3.0...15.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	103T-CT02-F3CC-C1B	—
3.0...15.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	103T-CT02-F3CC-C2B	107T-CT03-F3CC-C2B
5.4...23.0	1-1/2...5	1-1/2...7-1/2	5...15	5...15	30	100	30	100	103T-DT02-F3CC-D1E	107T-DT03-F3CC-D1E
5.4...23.0	1-1/2...5	1-1/2...7-1/2	5...15	5...15	30	100	30	100	103T-DT02-F3CC-E1E	107T-DT03-F3CC-E1E
5.0...23.0	1-1/2...5	1-1/2...7-1/2	5...15	5...15	30	100	30	100	103T-DT02-F3CC-C1C	—
5.0...23.0	1-1/2...5	1-1/2...7-1/2	5...15	5...15	30	100	30	100	103T-DT02-F3CC-C2C	107T-DT03-F3CC-C2C

* Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

⊗ Coil voltage code—see page 2-343



Open Type Starters

Product Selection & Coordination Ratings

2

Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)								DOL Starters Cat. No.	Reversing Starters Cat. No.
	Hp Ratings as a Fused Motor Controller*				Type 1 Coordination		Type 2 Coordination			
	200V AC	230V AC	460V AC	575V AC	Max. Class CC Fuse [A]	Max Short-Circuit Current [kA], 600V AC	Max. Class CC Fuse [A]	Max Short-Circuit Current [kA], 600V AC		
Bulletin 140F Fuse Holder with 100-C/104-C Contactors on Standard Bus Bar Modules										
0.10...0.50	—	—	—	—	3	100	3	100	103T-AT02-F3CC-D1A	107T-AT03-F3CC-D1A
0.10...0.50	—	—	—	—	3	100	3	100	103T-AT02-F3CC-E1A	107T-AT03-F3CC-E1A
0.20...1.00	—	—	—	1/2	6	100	6	100	103T-AT02-F3CC-D1B	107T-AT03-F3CC-D1B
0.20...1.00	—	—	—	1/2	6	100	6	100	103T-AT02-F3CC-E1B	107T-AT03-F3CC-E1B
0.40...1.00	—	—	—	1/2	6	100	6	100	103T-AT02-F3CC-C1P	—
0.40...1.00	—	—	—	1/2	6	100	6	100	103T-AT02-F3CC-C2P	107T-AT03-F3CC-C2P
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	103T-AT02-F3CC-D1C	107T-AT03-F3CC-D1C
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	103T-AT02-F3CC-E1C	107T-AT03-F3CC-E1C
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	103T-AT02-F3CC-C1A	—
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	103T-AT02-F3CC-C2A	107T-AT03-F3CC-C2A
3.2...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	103T-AT02-F3CC-D1D	107T-AT03-F3CC-D1D
3.2...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	103T-AT02-F3CC-E1D	107T-AT03-F3CC-E1D
3.0...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	103T-AT02-F3CC-C1B	—
3.0...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	103T-AT02-F3CC-C2B	107T-AT03-F3CC-C2B
3.2...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	103T-BT02-F3CC-D1D	107T-BT03-F3CC-D1D
3.2...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	103T-BT02-F3CC-E1D	107T-BT03-F3CC-E1D
3.0...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	103T-BT02-F3CC-C1B	—
3.0...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	103T-BT02-F3CC-C2B	107T-BT03-F3CC-C2B
3.2...16.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	103T-CT02-F3CC-D1D	107T-CT03-F3CC-D1D
3.2...16.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	103T-CT02-F3CC-E1D	107T-CT03-F3CC-E1D
3.0...15.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	103T-CT02-F3CC-C1B	—
3.0...15.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	103T-CT02-F3CC-C2B	107T-CT03-F3CC-C2B
5.4...23.0	1-1/2...5	1-1/2...7-1/2	5...15	5...15	30	100	30	100	103T-DT02-F3CC-D1E	107T-DT03-F3CC-D1E
5.4...23.0	1-1/2...5	1-1/2...7-1/2	5...15	5...15	30	100	30	100	103T-DT02-F3CC-E1E	107T-DT03-F3CC-E1E
5.0...23.0	1-1/2...5	1-1/2...7-1/2	5...15	5...15	30	100	30	100	103T-DT02-F3CC-C1C	—
5.0...23.0	1-1/2...5	1-1/2...7-1/2	5...15	5...15	30	100	30	100	103T-DT02-F3CC-C2C	107T-DT03-F3CC-C2C

* Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

⊗ Coil voltage code—see page 2-343



Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)								DOL Starters	Reversing Starters
	Hp Ratings as a Fused Motor Controller*				Type 1 Coordination		Type 2 Coordination			
	200V AC	230V AC	460V AC	575V AC	Max. Class CC Fuse [A]	Max Short-Circuit Current [kA], 600V AC	Max. Class CC Fuse [A]	Max Short-Circuit Current [kA], 600V AC	Cat. No.	Cat. No.
Bulletin 140F Fuse Holder with 100-C/104-C Contactors on Panel Mounting Modules										
0.10...0.50	—	—	—	—	3	100	3	100	103T-AW@2-F3CC-D1A	107T-AW@3-F3CC-D1A
0.10...0.50	—	—	—	—	3	100	3	100	103T-AW@2-F3CC-E1A	107T-AW@3-F3CC-E1A
0.20...1.00	—	—	—	1/2	6	100	6	100	103T-AW@2-F3CC-D1B	107T-AW@3-F3CC-D1B
0.20...1.00	—	—	—	1/2	6	100	6	100	103T-AW@2-F3CC-E1B	107T-AW@3-F3CC-E1B
0.40...1.00	—	—	—	1/2	6	100	6	100	103T-AW@2-F3CC-C1P	—
0.40...1.00	—	—	—	1/2	6	100	6	100	103T-AW@2-F3CC-C2P	107T-AW@3-F3CC-C2P
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	103T-AW@2-F3CC-D1C	107T-AW@3-F3CC-D1C
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	103T-AW@2-F3CC-E1C	107T-AW@3-F3CC-E1C
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	103T-AW@2-F3CC-C1A	—
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	103T-AW@2-F3CC-C2A	107T-AW@3-F3CC-C2A
3.2...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	103T-AW@2-F3CC-D1D	107T-AW@3-F3CC-D1D
3.2...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	103T-AW@2-F3CC-E1D	107T-AW@3-F3CC-E1D
3.0...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	103T-AW@2-F3CC-C1B	—
3.0...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	103T-AW@2-F3CC-C2B	107T-AW@3-F3CC-C2B
3.2...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	103T-BW@2-F3CC-D1D	107T-BW@3-F3CC-D1D
3.2...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	103T-BW@2-F3CC-E1D	107T-BW@3-F3CC-E1D
3.0...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	103T-BW@2-F3CC-C1B	—
3.0...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	103T-BW@2-F3CC-C2B	107T-BW@3-F3CC-C2B
3.2...16.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	103T-CW@2-F3CC-D1D	107T-CW@3-F3CC-D1D
3.2...16.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	103T-CW@2-F3CC-E1D	107T-CW@3-F3CC-E1D
3.0...15.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	103T-CW@2-F3CC-C1B	—
3.0...15.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	103T-CW@2-F3CC-C2B	107T-CW@3-F3CC-C2B
5.4...23.0	1-1/2...5	1-1/2...7-1/2	5...15	5...15	30	100	30	100	103T-DW@2-F3CC-D1E	107T-DW@3-F3CC-D1E
5.4...23.0	1-1/2...5	1-1/2...7-1/2	5...15	5...15	30	100	30	100	103T-DW@2-F3CC-E1E	107T-DW@3-F3CC-E1E
5.0...23.0	1-1/2...5	1-1/2...7-1/2	5...15	5...15	30	100	30	100	103T-DW@2-F3CC-C1C	—
5.0...23.0	1-1/2...5	1-1/2...7-1/2	5...15	5...15	30	100	30	100	103T-DW@2-F3CC-C2C	107T-DW@3-F3CC-C2C

* Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

⊗ Coil voltage code—see page 2-343



Open Type Starters

Product Selection & Coordination Ratings

IEC Type 1 and Type 2 Short-Circuit Coordination

Motor Current Adjustment Range [A]	IEC kW and Coordination Ratings (50 Hz)												DOL Starters Cat. No.	Reversing Starters Cat. No.
	kW Ratings*				Max. Short-Circuit Current [kA]									
					Type 1 Coordination				Type 2 Coordination					
	230V AC	400V AC	500V AC	690V AC	230V AC	400V AC	500V AC	690V AC	230V AC	400V AC	500V AC	690V AC		
C-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules														
0.10...0.40	0.06	0.09	0.12	0.18	65	65	65	50	65	65	50	50	103T-AT@2-QA40C-D1A	107T-AT@3-QA40C-D1A
0.10...0.40	0.06	0.09	0.12	0.18	65	65	65	50	65	65	50	50	103T-AT@2-QA40C-E1A	107T-AT@3-QA40C-E1A
0.20...1.00	0.12	0.25	0.37	0.55	65	65	65	50	65	65	50	50	103T-AT@2-QB10C-D1B	107T-AT@3-QB10C-D1B
0.20...1.00	0.12	0.25	0.37	0.55	65	65	65	50	65	65	50	50	103T-AT@2-QB10C-E1B	107T-AT@3-QB10C-E1B
0.40...1.00	0.12	0.25	0.37	0.55	65	65	65	50	65	65	50	50	103T-AT@2-QB10C-C1P	—
0.40...1.00	0.12	0.25	0.37	0.55	65	65	65	50	65	65	50	50	103T-AT@2-QB10C-C2P	107T-AT@3-QB10C-C2P
0.4 ... 2.0	0.37	0.75	0.75	1.1	65	65	50	8	65	50	50	8	103T-AT@2-QB25C-C1P	—
0.4 ... 2.0	0.37	0.75	0.75	1.1	65	65	50	8	65	50	50	8	103T-AT@2-QB25C-C2P	107T-AT@3-QB25C-C2P
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	8	65	50	50	8	103T-AT@2-QB25C-D1C	107T-AT@3-QB25C-D1C
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	8	65	50	50	8	103T-AT@2-QB25C-E1C	107T-AT@3-QB25C-E1C
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	8	65	50	50	8	103T-AT@2-QB25C-C1A	—
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	8	65	50	50	8	103T-AT@2-QB25C-C2A	107T-AT@3-QB25C-C2A
D-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules														
0.4 ... 2.0	0.37	0.75	0.75	1.1	65	65	50	10	65	65	50	10	103T-AT@2-RB25C-C1P	—
0.4 ... 2.0	0.37	0.75	0.75	1.1	65	65	50	10	65	65	50	10	103T-AT@2-RB25C-C2P	107T-AT@3-RB25C-C2P
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103T-AT@2-RB25C-D1C	107T-AT@3-RB25C-D1C
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103T-AT@2-RB25C-E1C	107T-AT@3-RB25C-E1C
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103T-AT@2-RB25C-C1A	—
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103T-AT@2-RB25C-C2A	107T-AT@3-RB25C-C2A
0.4 ... 2.0	0.37	0.75	0.75	1.1	65	65	50	10	65	65	50	10	103T-DT@2-RB25C-C1P	—
0.4 ... 2.0	0.37	0.75	0.75	1.1	65	65	50	10	65	65	50	10	103T-DT@2-RB25C-C2P	107T-DT@3-RB25C-C2P
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103T-DT@2-RB25C-D1C	107T-DT@3-RB25C-D1C
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103T-DT@2-RB25C-E1C	107T-DT@3-RB25C-E1C
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103T-DT@2-RB25C-C1A	—
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103T-DT@2-RB25C-C2A	107T-DT@3-RB25C-C2A
1.0 ... 4.0	0.75	1.5	2.2	3	65	50	50	10	65	65	50	—	103T-AT@2-RB40C-D1C	107T-AT@3-RB40C-D1C
1.0 ... 4.0	0.75	1.5	2.2	3	65	50	50	10	65	65	50	—	103T-AT@2-RB40C-E1C	107T-AT@3-RB40C-E1C
1.0 ... 4.0	0.75	1.5	2.2	3	65	50	50	10	65	65	50	—	103T-AT@2-RB40C-C1A	—
1.0 ... 4.0	0.75	1.5	2.2	3	65	50	50	10	65	65	50	—	103T-AT@2-RB40C-C2A	107T-AT@3-RB40C-C2A
1.0 ... 4.0	0.75	1.5	2.2	3	65	50	50	50	65	65	50	50	103T-DT@2-RB40C-D1C	107T-DT@3-RB40C-D1C
1.0 ... 4.0	0.75	1.5	2.2	3	65	50	50	50	65	65	50	50	103T-DT@2-RB40C-E1C	107T-DT@3-RB40C-E1C
1.0 ... 4.0	0.75	1.5	2.2	3	65	50	50	50	65	65	50	50	103T-DT@2-RB40C-C1A	—
1.0 ... 4.0	0.75	1.5	2.2	3	65	50	50	50	65	65	50	50	103T-DT@2-RB40C-C2A	107T-DT@3-RB40C-C2A
3.2 ... 6.3	1.5	2.2	3	4	65	65	50	50	65	65	50	—	103T-AT@2-RB63C-D1D	107T-AT@3-RB63C-D1D
3.2 ... 6.3	1.5	2.2	3	4	65	65	50	50	65	65	50	—	103T-AT@2-RB63C-E1D	107T-AT@3-RB63C-E1D
3.0 ... 6.3	1.5	2.2	3	4	65	65	50	50	65	65	50	—	103T-AT@2-RB63C-C1B	—
3.0 ... 6.3	1.5	2.2	3	4	65	65	50	50	65	65	50	—	103T-AT@2-RB63C-C2B	107T-AT@3-RB63C-C2B
3.2 ... 10	2.2	4	5.5	5.5	65	65	65	50	65	65	65	—	103T-BT@2-RC10C-D1D	107T-BT@3-RC10C-D1D
3.2 ... 10	2.2	4	5.5	5.5	65	65	65	50	65	65	65	—	103T-BT@2-RC10C-E1D	107T-BT@3-RC10C-E1D
3.0 ... 10	2.2	4	5.5	5.5	65	65	65	50	65	65	65	—	103T-BT@2-RC10C-C1B	—
3.0 ... 10	2.2	4	5.5	5.5	65	65	65	50	65	65	65	—	103T-BT@2-RC10C-C2B	107T-BT@3-RC10C-C2B
3.2 ... 10	2.2	4	5.5	7.5	65	65	65	50	65	65	65	50	103T-ET@3-RC10C-E1D	107T-ET@3-RC10C-E1D
3.0 ... 10	2.2	4	5.5	7.5	65	65	65	50	65	65	65	50	103T-ET@3-RC10C-C1B	—
3.0 ... 10	2.2	4	5.5	7.5	65	65	65	50	65	65	65	50	103T-ET@3-RC10C-C2B	107T-ET@3-RC10C-C2B
3.2 ... 16	4	7.5	7.5	—	65	65	50	—	65	65	50	—	103T-CT@2-RC16C-D1D	107T-CT@3-RC16C-D1D
3.2 ... 16	4	7.5	7.5	—	65	65	50	—	65	65	50	—	103T-CT@2-RC16C-E1D	107T-CT@3-RC16C-E1D
3.0 ... 15	4	7.5	7.5	—	65	65	50	—	65	65	50	—	103T-CT@2-RC16C-C1B	—
3.0 ... 15	4	7.5	7.5	—	65	65	50	—	65	65	50	—	103T-CT@2-RC16C-C2B	107T-CT@3-RC16C-C2B
3.2 ... 16	4	7.5	10	13	65	65	50	6	65	65	50	—	103T-ET@3-RC16C-E1D	107T-ET@3-RC16C-E1D
3.0 ... 15	4	7.5	10	13	65	65	50	6	65	65	50	—	103T-ET@3-RC16C-C1B	—
3.0 ... 15	4	7.5	10	13	65	65	50	6	65	65	50	—	103T-ET@3-RC16C-C2B	107T-ET@3-RC16C-C2B
5.4 ... 23	6.3	11	13	—	65	50	25	—	65	50	25	—	103T-DT@2-RC25C-D1E	107T-DT@3-RC25C-D1E
5.4 ... 23	6.3	11	13	—	65	50	25	—	65	50	25	—	103T-DT@2-RC25C-E1E	107T-DT@3-RC25C-E1E
5.0 ... 23	6.3	11	13	—	65	50	25	—	65	50	25	—	103T-DT@2-RC25C-C1C	—
5.0 ... 23	6.3	11	13	—	65	50	25	—	65	50	25	—	103T-DT@2-RC25C-C2C	107T-DT@3-RC25C-C2C
5.4 ... 25	6.3	11	15	—	65	50	25	—	65	50	25	—	103T-ET@3-RC25C-E1E	107T-ET@3-RC25C-E1E
5.0 ... 25	6.3	11	15	—	65	50	25	—	65	50	25	—	103T-ET@3-RC25C-C1C	—
5.0 ... 25	6.3	11	15	—	65	50	25	—	65	50	25	—	103T-ET@3-RC25C-C2C	107T-ET@3-RC25C-C2C

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Motor Current Adjustment Range [A]	IEC kW and Coordination Ratings (50 Hz)												DOL Starters	Reversing Starters
	kW Ratings*				Max. Short-Circuit Current [kA]									
					Type 1 Coordination				Type 2 Coordination					
	230V AC	400V AC	500V AC	690V AC	230V AC	400V AC	500V AC	690V AC	230V AC	400V AC	500V AC	690V AC	Cat. No.	Cat. No.
F-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules														
5.4 ... 25	6.3	11	15	—	65	65	50	—	65	65	50	—	103T-ET [⊗] 3-TC25C-E1E	107T-ET [⊗] 3-TC25C-E1E
5.0 ... 25	6.3	11	15	—	65	65	50	—	65	65	50	—	103T-ET [⊗] 3-TC25C-C1C	—
5.0 ... 25	6.3	11	15	—	65	65	50	—	65	65	50	—	103T-ET [⊗] 3-TC25C-C2C	107T-ET [⊗] 3-TC25C-C2C
5.4 ... 25	6.3	11	15	18.5	65	65	50	50	65	65	50	50	103T-FT [⊗] 3-TC25C-E1E	107T-FT [⊗] 3-TC25C-E1E
5.0 ... 25	6.3	11	15	18.5	65	65	50	50	65	65	50	50	103T-FT [⊗] 3-TC25C-C1C	—
5.0 ... 25	6.3	11	15	18.5	65	65	50	50	65	65	50	50	103T-FT [⊗] 3-TC25C-C2C	107T-FT [⊗] 3-TC25C-C2C
9.0 ... 30	7.5	15	15	—	65	65	50	—	65	65	50	—	103T-ET [⊗] 3-TC32C-E1F	107T-ET [⊗] 3-TC32C-E1F
9.0 ... 30	7.5	15	15	—	65	65	50	—	65	65	50	—	103T-ET [⊗] 3-TC32C-C1D	—
9.0 ... 30	7.5	15	15	—	65	65	50	—	65	65	50	—	103T-ET [⊗] 3-TC32C-C2D	107T-ET [⊗] 3-TC32C-C2D
9.0 ... 32	7.5	15	20	—	65	65	50	—	65	65	50	—	103T-FT [⊗] 3-TC32C-E1F	107T-FT [⊗] 3-TC32C-E1F
9.0 ... 32	7.5	15	20	—	65	65	50	—	65	65	50	—	103T-FT [⊗] 3-TC32C-C1D	—
9.0 ... 32	7.5	15	20	—	65	65	50	—	65	65	50	—	103T-FT [⊗] 3-TC32C-C2D	107T-FT [⊗] 3-TC32C-C2D
9.0 ... 32	7.5	15	20	22	65	65	50	50	65	65	50	50	103T-GT [⊗] 3-TC32C-E1F	107T-GT [⊗] 3-TC32C-E1F
9.0 ... 32	7.5	15	20	22	65	65	50	50	65	65	50	50	103T-GT [⊗] 3-TC32C-C1D	107T-GT [⊗] 3-TC32C-C1D
9.0 ... 32	7.5	15	20	22	65	65	50	50	65	65	50	50	103T-GT [⊗] 3-TC32C-C2D	107T-GT [⊗] 3-TC32C-C2D
9.0 ... 37	11	18.5	—	—	65	65	—	—	65	65	—	—	103T-FT [⊗] 3-TC45C-E1F	107T-FT [⊗] 3-TC45C-E1F
9.0 ... 37	11	18.5	—	—	65	65	—	—	65	65	—	—	103T-FT [⊗] 3-TC45C-C1D	—
9.0 ... 37	11	18.5	—	—	65	65	—	—	65	65	—	—	103T-FT [⊗] 3-TC45C-C2D	107T-FT [⊗] 3-TC45C-C2D
9.0 ... 43	13	22	25	—	65	65	50	—	65	65	50	—	103T-GT [⊗] 3-TC45C-E1F	107T-GT [⊗] 3-TC45C-E1F
9.0 ... 43	13	22	25	—	65	65	50	—	65	65	50	—	103T-GT [⊗] 3-TC45C-C1D	=2
9.0 ... 43	13	22	25	—	65	65	50	—	65	65	50	—	103T-GT [⊗] 3-TC45C-C2D	107T-GT [⊗] 3-TC45C-C2D
18 ... 45	13	22	30	—	65	65	50	—	65	65	50	—	103T-HT [⊗] 3-TC45C-E1G	107T-HT [⊗] 3-TC45C-E1G
9.0 ... 45	13	22	30	—	65	65	50	—	65	65	50	—	103T-HT [⊗] 3-TC45C-C1D	=2
9.0 ... 45	13	22	30	—	65	65	50	—	65	65	50	—	103T-HT [⊗] 3-TC45C-C2D	107T-HT [⊗] 3-TC45C-C2D

* kW ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

⊗ Coil voltage code—see page 2-343



Open Type Starters

Product Selection & Coordination Ratings

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Motor Current Adjustment Range [A]	IEC kW and Coordination Ratings (50 Hz)												DOL Starters Cat. No.	Reversing Starters Cat. No.
	kW Ratings*				Max. Short-Circuit Current [kA]									
					Type 1 Coordination				Type 2 Coordination					
	230V AC	400V AC	500V AC	690V AC	230V AC	400V AC	500V AC	690V AC	230V AC	400V AC	500V AC	690V AC		
C-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules														
0.10...0.40	0.06	0.09	0.12	0.18	65	65	65	50	65	65	50	50	103T-AS02-QA40C-D1A	107T-AS03-QA40C-D1A
0.10...0.40	0.06	0.09	0.12	0.18	65	65	65	50	65	65	50	50	103T-AS02-QA40C-E1A	107T-AS03-QA40C-E1A
0.20...1.00	0.12	0.25	0.37	0.55	65	65	65	50	65	65	50	50	103T-AS02-QB10C-D1B	107T-AS03-QB10C-D1B
0.20...1.00	0.12	0.25	0.37	0.55	65	65	65	50	65	65	50	50	103T-AS02-QB10C-E1B	107T-AS03-QB10C-E1B
0.40...1.00	0.12	0.25	0.37	0.55	65	65	65	50	65	65	50	50	103T-AS02-QB10C-C1P	—
0.40...1.00	0.12	0.25	0.37	0.55	65	65	65	50	65	65	50	50	103T-AS02-QB10C-C2P	107T-AS03-QB10C-C2P
0.4...2.0	0.37	0.75	0.75	1.1	65	65	50	8	65	50	50	8	103T-AS02-QB25C-C1P	—
0.4...2.0	0.37	0.75	0.75	1.1	65	65	50	8	65	50	50	8	103T-AS02-QB25C-C2P	107T-AS03-QB25C-C2P
1.0...2.5	0.55	0.75	1.1	1.8	65	65	50	8	65	50	50	8	103T-AS02-QB25C-D1C	107T-AS03-QB25C-D1C
1.0...2.5	0.55	0.75	1.1	1.8	65	65	50	8	65	50	50	8	103T-AS02-QB25C-E1C	107T-AS03-QB25C-E1C
1.0...2.5	0.55	0.75	1.1	1.8	65	65	50	8	65	50	50	8	103T-AS02-QB25C-C1A	—
1.0...2.5	0.55	0.75	1.1	1.8	65	65	50	8	65	50	50	8	103T-AS02-QB25C-C2A	107T-AS03-QB25C-C2A
D-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules														
0.4...2.0	0.37	0.75	0.75	1.1	65	65	50	10	65	65	50	10	103T-AS02-RB25C-C1P	—
0.4...2.0	0.37	0.75	0.75	1.1	65	65	50	10	65	65	50	10	103T-AS02-RB25C-C2P	107T-AS03-RB25C-C2P
1.0...2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103T-AS02-RB25C-D1C	107T-AS03-RB25C-D1C
1.0...2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103T-AS02-RB25C-E1C	107T-AS03-RB25C-E1C
1.0...2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103T-AS02-RB25C-C1A	—
1.0...2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103T-AS02-RB25C-C2A	107T-AS03-RB25C-C2A
0.4...2.0	0.37	0.75	0.75	1.1	65	65	50	10	65	65	50	10	103T-DS02-RB25C-C1P	—
0.4...2.0	0.37	0.75	0.75	1.1	65	65	50	10	65	65	50	10	103T-DS02-RB25C-C2P	107T-DS03-RB25C-C2P
1.0...2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103T-DS02-RB25C-D1C	107T-DS03-RB25C-D1C
1.0...2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103T-DS02-RB25C-E1C	107T-DS03-RB25C-E1C
1.0...2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103T-DS02-RB25C-C1A	—
1.0...2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103T-DS02-RB25C-C2A	107T-DS03-RB25C-C2A
1.0...4.0	0.75	1.5	2.2	3	65	50	50	10	65	65	50	—	103T-AS02-RB40C-D1C	107T-AS03-RB40C-D1C
1.0...4.0	0.75	1.5	2.2	3	65	50	50	10	65	65	50	—	103T-AS02-RB40C-E1C	107T-AS03-RB40C-E1C
1.0...4.0	0.75	1.5	2.2	3	65	50	50	10	65	65	50	—	103T-AS02-RB40C-C1A	—
1.0...4.0	0.75	1.5	2.2	3	65	50	50	10	65	65	50	—	103T-AS02-RB40C-C2A	107T-AS03-RB40C-C2A
1.0...4.0	0.75	1.5	2.2	3	65	50	50	10	65	65	50	50	103T-DS02-RB40C-D1C	107T-DS03-RB40C-D1C
1.0...4.0	0.75	1.5	2.2	3	65	50	50	10	65	65	50	50	103T-DS02-RB40C-E1C	107T-DS03-RB40C-E1C
1.0...4.0	0.75	1.5	2.2	3	65	50	50	10	65	65	50	50	103T-DS02-RB40C-C1A	—
1.0...4.0	0.75	1.5	2.2	3	65	50	50	10	65	65	50	50	103T-DS02-RB40C-C2A	107T-DS03-RB40C-C2A
3.2...6.3	1.5	2.2	3	4	65	65	50	50	65	65	50	—	103T-AS02-RB63C-D1D	107T-AS03-RB63C-D1D
3.2...6.3	1.5	2.2	3	4	65	65	50	50	65	65	50	—	103T-AS02-RB63C-E1D	107T-AS03-RB63C-E1D
3.0...6.3	1.5	2.2	3	4	65	65	50	50	65	65	50	—	103T-AS02-RB63C-C1B	—
3.0...6.3	1.5	2.2	3	4	65	65	50	50	65	65	50	—	103T-AS02-RB63C-C2B	107T-AS03-RB63C-C2B
3.2...10	2.2	4	5.5	5.5	65	65	65	50	65	65	65	—	103T-BS02-RC10C-D1D	107T-BS03-RC10C-D1D
3.2...10	2.2	4	5.5	5.5	65	65	65	50	65	65	65	—	103T-BS02-RC10C-E1D	107T-BS03-RC10C-E1D
3.0...10	2.2	4	5.5	5.5	65	65	65	50	65	65	65	—	103T-BS02-RC10C-C1B	—
3.0...10	2.2	4	5.5	5.5	65	65	65	50	65	65	65	—	103T-BS02-RC10C-C2B	107T-BS03-RC10C-C2B
3.2...10	2.2	4	5.5	7.5	65	65	65	50	65	65	65	50	103T-ES03-RC10C-E1D	107T-ES03-RC10C-E1D
3.0...10	2.2	4	5.5	7.5	65	65	65	50	65	65	65	50	103T-ES03-RC10C-C1B	—
3.0...10	2.2	4	5.5	7.5	65	65	65	50	65	65	65	50	103T-ES03-RC10C-C2B	107T-ES03-RC10C-C2B
3.2...16	4	7.5	7.5	—	65	65	50	—	65	65	50	—	103T-CS02-RC16C-D1D	107T-CS03-RC16C-D1D
3.2...16	4	7.5	7.5	—	65	65	50	—	65	65	50	—	103T-CS02-RC16C-E1D	107T-CS03-RC16C-E1D
3.0...15	4	7.5	7.5	—	65	65	50	—	65	65	50	—	103T-CS02-RC16C-C1B	—
3.0...15	4	7.5	7.5	—	65	65	50	—	65	65	50	—	103T-CS02-RC16C-C2B	107T-CS03-RC16C-C2B
3.2...16	4	7.5	10	13	65	65	50	6	65	65	50	—	103T-ES03-RC16C-E1D	107T-ES03-RC16C-E1D
3.0...15	4	7.5	10	13	65	65	50	6	65	65	50	—	103T-ES03-RC16C-C1B	—
3.0...15	4	7.5	10	13	65	65	50	6	65	65	50	—	103T-ES03-RC16C-C2B	107T-ES03-RC16C-C2B
5.4...23	6.3	11	13	—	65	50	25	—	65	50	25	—	103T-DS02-RC25C-D1E	107T-DS03-RC25C-D1E
5.4...23	6.3	11	13	—	65	50	25	—	65	50	25	—	103T-DS02-RC25C-E1E	107T-DS03-RC25C-E1E
5.0...23	6.3	11	13	—	65	50	25	—	65	50	25	—	103T-DS02-RC25C-C1C	—
5.0...23	6.3	11	13	—	65	50	25	—	65	50	25	—	103T-DS02-RC25C-C2C	107T-DS03-RC25C-C2C
5.4...25	6.3	11	15	—	65	50	25	—	65	50	25	—	103T-ES03-RC25C-E1E	107T-ES03-RC25C-E1E
5.0...25	6.3	11	15	—	65	50	25	—	65	50	25	—	103T-ES03-RC25C-C1C	—
5.0...25	6.3	11	15	—	65	50	25	—	65	50	25	—	103T-ES03-RC25C-C2C	107T-ES03-RC25C-C2C



Motor Current Adjustment Range [A]	IEC kW and Coordination Ratings (50 Hz)												DOL Starters	Reversing Starters
	kW Ratings*				Max. Short-Circuit Current [kA]									
					Type 1 Coordination				Type 2 Coordination				Cat. No.	Cat. No.
	230V AC	400V AC	500V AC	690V AC	230V AC	400V AC	500V AC	690V AC	230V AC	400V AC	500V AC	690V AC		
F-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules														
5.4 ... 25	6.3	11	15	—	65	65	50	—	65	65	50	—	103T-ES03-TC25C-E1E	107T-ES03-TC25C-E1E
5.0 ... 25	6.3	11	15	—	65	65	50	—	65	65	50	—	103T-ES03-TC25C-C1C	—
5.0 ... 25	6.3	11	15	—	65	65	50	—	65	65	50	—	103T-ES03-TC25C-C2C	107T-ES03-TC25C-C2C
5.4 ... 25	6.3	11	15	18.5	65	65	50	50	65	65	50	50	103T-FS03-TC25C-E1E	107T-FS03-TC25C-E1E
5.0 ... 25	6.3	11	15	18.5	65	65	50	50	65	65	50	50	103T-FS03-TC25C-C1C	—
5.0 ... 25	6.3	11	15	18.5	65	65	50	50	65	65	50	50	103T-FS03-TC25C-C2C	107T-FS03-TC25C-C2C
9.0 ... 30	7.5	15	15	—	65	65	50	—	65	65	50	—	103T-ES03-TC32C-E1F	107T-ES03-TC32C-E1F
9.0 ... 30	7.5	15	15	—	65	65	50	—	65	65	50	—	103T-ES03-TC32C-C1D	—
9.0 ... 30	7.5	15	15	—	65	65	50	—	65	65	50	—	103T-ES03-TC32C-C2D	107T-ES03-TC32C-C2D
9.0 ... 32	7.5	15	20	—	65	65	50	—	65	65	50	—	103T-FS03-TC32C-E1F	107T-FS03-TC32C-E1F
9.0 ... 32	7.5	15	20	—	65	65	50	—	65	65	50	—	103T-FS03-TC32C-C1D	—
9.0 ... 32	7.5	15	20	—	65	65	50	—	65	65	50	—	103T-FS03-TC32C-C2D	107T-FS03-TC32C-C2D
9.0 ... 32	7.5	15	20	22	65	65	50	50	65	65	50	50	103T-GS03-TC32C-E1F	107T-GS03-TC32C-E1F
9.0 ... 32	7.5	15	20	22	65	65	50	50	65	65	50	50	103T-GS03-TC32C-C1D	—
9.0 ... 32	7.5	15	20	22	65	65	50	50	65	65	50	50	103T-GS03-TC32C-C2D	107T-GS03-TC32C-C2D
9.0 ... 37	11	18.5	—	—	65	65	—	—	65	65	—	—	103T-FS03-TC45C-E1F	107T-FS03-TC45C-E1F
9.0 ... 37	11	18.5	—	—	65	65	—	—	65	65	—	—	103T-FS03-TC45C-C1D	—
9.0 ... 37	11	18.5	—	—	65	65	—	—	65	65	—	—	103T-FS03-TC45C-C2D	107T-FS03-TC45C-C2D
9.0 ... 43	13	22	25	—	65	65	50	—	65	65	50	—	103T-GS03-TC45C-E1F	107T-GS03-TC45C-E1F
9.0 ... 43	13	22	25	—	65	65	50	—	65	65	50	—	103T-GS03-TC45C-C1D	—
9.0 ... 43	13	22	25	—	65	65	50	—	65	65	50	—	103T-GS03-TC45C-C2D	107T-GS03-TC45C-C2D

* kW ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

⊗ Coil voltage code—see page 2-343



Open Type Starters

Product Selection & Coordination Ratings

2

Motor Current Adjustment Range [A]	IEC kW and Coordination Ratings (50 Hz)												DOL Starters Cat. No.	Reversing Starters Cat. No.
	kW Ratings*				Max. Short-Circuit Current [kA]									
					Type 1 Coordination				Type 2 Coordination					
	230V AC	400V AC	500V AC	690V AC	230V AC	400V AC	500V AC	690V AC	230V AC	400V AC	500V AC	690V AC		
C-Frame with 100-C/104-C Contactors on Panel Mounting Modules														
0.10...0.40	0.06	0.09	0.12	0.18	100	100	65	50	65	65	50	50	103T-AW@2-QA40C-D1A	107T-AW@3-QA40C-D1A
0.10...0.40	0.06	0.09	0.12	0.18	100	100	65	50	65	65	50	50	103T-AW@2-QA40C-E1A	107T-AW@3-QA40C-E1A
0.20...1.00	0.12	0.25	0.37	0.55	100	100	65	50	65	65	50	50	103T-AW@2-QB10C-D1B	107T-AW@3-QB10C-D1B
0.20...1.00	0.12	0.25	0.37	0.55	100	100	65	50	65	65	50	50	103T-AW@2-QB10C-E1B	107T-AW@3-QB10C-E1B
0.40...1.00	0.12	0.25	0.37	0.55	100	100	65	50	65	65	50	50	103T-AW@2-QB10C-C1P	—
0.40...1.00	0.12	0.25	0.37	0.55	100	100	65	50	65	65	50	50	103T-AW@2-QB10C-C2P	107T-AW@3-QB10C-C2P
0.4 ... 2.0	0.37	0.75	0.75	1.1	100	65	50	8	65	50	50	8	103T-AW@2-QB25C-C1P	—
0.4 ... 2.0	0.37	0.75	0.75	1.1	100	65	50	8	65	50	50	8	103T-AW@2-QB25C-C2P	107T-AW@3-QB25C-C2P
1.0 ... 2.5	0.55	0.75	1.1	1.8	100	65	50	8	65	50	50	8	103T-AW@2-QB25C-D1C	107T-AW@3-QB25C-D1C
1.0 ... 2.5	0.55	0.75	1.1	1.8	100	65	50	8	65	50	50	8	103T-AW@2-QB25C-E1C	107T-AW@3-QB25C-E1C
1.0 ... 2.5	0.55	0.75	1.1	1.8	100	65	50	8	65	50	50	8	103T-AW@2-QB25C-C1A	—
1.0 ... 2.5	0.55	0.75	1.1	1.8	100	65	50	8	65	50	50	8	103T-AW@2-QB25C-C2A	107T-AW@3-QB25C-C2A
D-Frame with 100-C/104-C Contactors on Panel Mounting Modules														
0.4 ... 2.0	0.37	0.75	0.75	1.1	100	100	50	10	100	100	50	10	103T-AW@2-RB25C-C1P	—
0.4 ... 2.0	0.37	0.75	0.75	1.1	100	100	50	10	100	100	50	10	103T-AW@2-RB25C-C2P	107T-AW@3-RB25C-C2P
1.0 ... 2.5	0.55	0.75	1.1	1.8	100	100	50	10	100	100	50	10	103T-AW@2-RB25C-D1C	107T-AW@3-RB25C-D1C
1.0 ... 2.5	0.55	0.75	1.1	1.8	100	100	50	10	100	100	50	10	103T-AW@2-RB25C-E1C	107T-AW@3-RB25C-E1C
1.0 ... 2.5	0.55	0.75	1.1	1.8	100	100	50	10	100	100	50	10	103T-AW@2-RB25C-C1A	—
1.0 ... 2.5	0.55	0.75	1.1	1.8	100	100	50	10	100	100	50	10	103T-AW@2-RB25C-C2A	107T-AW@3-RB25C-C2A
0.4 ... 2.0	0.37	0.75	0.75	1.1	100	100	50	10	100	100	50	10	103T-DW@2-RB25C-C1P	—
0.4 ... 2.0	0.37	0.75	0.75	1.1	100	100	50	10	100	100	50	10	103T-DW@2-RB25C-C2P	107T-DW@3-RB25C-C2P
1.0 ... 2.5	0.55	0.75	1.1	1.8	100	100	50	10	100	100	50	10	103T-DW@2-RB25C-D1C	107T-DW@3-RB25C-D1C
1.0 ... 2.5	0.55	0.75	1.1	1.8	100	100	50	10	100	100	50	10	103T-DW@2-RB25C-E1C	107T-DW@3-RB25C-E1C
1.0 ... 2.5	0.55	0.75	1.1	1.8	100	100	50	10	100	100	50	10	103T-DW@2-RB25C-C1A	—
1.0 ... 2.5	0.55	0.75	1.1	1.8	100	100	50	10	100	100	50	10	103T-DW@2-RB25C-C2A	107T-DW@3-RB25C-C2A
1.0 ... 4.0	0.75	1.5	2.2	3	100	100	50	10	100	100	50	—	103T-AW@2-RB40C-D1C	107T-AW@3-RB40C-D1C
1.0 ... 4.0	0.75	1.5	2.2	3	100	100	50	10	100	100	50	—	103T-AW@2-RB40C-E1C	107T-AW@3-RB40C-E1C
1.0 ... 4.0	0.75	1.5	2.2	3	100	100	50	10	100	100	50	—	103T-AW@2-RB40C-C1A	—
1.0 ... 4.0	0.75	1.5	2.2	3	100	100	50	10	100	100	50	—	103T-AW@2-RB40C-C2A	107T-AW@3-RB40C-C2A
1.0 ... 4.0	0.75	1.5	2.2	3	100	100	50	10	100	100	50	50	103T-DW@2-RB40C-D1C	107T-DW@3-RB40C-D1C
1.0 ... 4.0	0.75	1.5	2.2	3	100	100	50	10	100	100	50	50	103T-DW@2-RB40C-E1C	107T-DW@3-RB40C-E1C
1.0 ... 4.0	0.75	1.5	2.2	3	100	100	50	10	100	100	50	50	103T-DW@2-RB40C-C1A	—
1.0 ... 4.0	0.75	1.5	2.2	3	100	100	50	10	100	100	50	50	103T-DW@2-RB40C-C2A	107T-DW@3-RB40C-C2A
3.2 ... 6.3	1.5	2.2	3	4	100	100	50	50	100	100	50	—	103T-AW@2-RB63C-D1D	107T-AW@3-RB63C-D1D
3.2 ... 6.3	1.5	2.2	3	4	100	100	50	50	100	100	50	—	103T-AW@2-RB63C-E1D	107T-AW@3-RB63C-E1D
3.0 ... 6.3	1.5	2.2	3	4	100	100	50	50	100	100	50	—	103T-AW@2-RB63C-C1B	—
3.0 ... 6.3	1.5	2.2	3	4	100	100	50	50	100	100	50	—	103T-AW@2-RB63C-C2B	107T-AW@3-RB63C-C2B
3.2 ... 10	2.2	4	5.5	5.5	100	100	65	50	100	100	65	—	103T-BW@2-RC10C-D1D	107T-BW@3-RC10C-D1D
3.2 ... 10	2.2	4	5.5	5.5	100	100	65	50	100	100	65	—	103T-BW@2-RC10C-E1D	107T-BW@3-RC10C-E1D
3.0 ... 10	2.2	4	5.5	5.5	100	100	65	50	100	100	65	—	103T-BW@2-RC10C-C1B	—
3.0 ... 10	2.2	4	5.5	5.5	100	100	65	50	100	100	65	—	103T-BW@2-RC10C-C2B	107T-BW@3-RC10C-C2B
3.2 ... 10	2.2	4	5.5	7.5	100	100	65	50	100	100	65	50	103T-EW@3-RC10C-E1D	107T-EW@3-RC10C-E1D
3.0 ... 10	2.2	4	5.5	7.5	100	100	65	50	100	100	65	50	103T-EW@3-RC10C-C1B	—
3.0 ... 10	2.2	4	5.5	7.5	100	100	65	50	100	100	65	50	103T-EW@3-RC10C-C2B	107T-EW@3-RC10C-C2B
3.2 ... 16	4	7.5	7.5	—	100	65	50	—	65	65	50	—	103T-CW@2-RC16C-D1D	107T-CW@3-RC16C-D1D
3.2 ... 16	4	7.5	7.5	—	100	65	50	—	65	65	50	—	103T-CW@2-RC16C-E1D	107T-CW@3-RC16C-E1D
3.0 ... 15	4	7.5	7.5	—	100	65	50	—	65	65	50	—	103T-CW@2-RC16C-C1B	—
3.0 ... 15	4	7.5	7.5	—	100	65	50	—	65	65	50	—	103T-CW@2-RC16C-C2B	107T-CW@3-RC16C-C2B
3.2 ... 16	4	7.5	10	13	100	65	50	6	65	65	50	—	103T-EW@3-RC16C-E1D	107T-EW@3-RC16C-E1D
3.0 ... 15	4	7.5	10	13	100	65	50	6	65	65	50	—	103T-EW@3-RC16C-C1B	—
3.0 ... 15	4	7.5	10	13	100	65	50	6	65	65	50	—	103T-EW@3-RC16C-C2B	107T-EW@3-RC16C-C2B
5.4 ... 23	6.3	11	13	—	65	50	25	—	65	50	25	—	103T-DW@2-RC25C-D1E	107T-DW@3-RC25C-D1E
5.4 ... 23	6.3	11	13	—	65	50	25	—	65	50	25	—	103T-DW@2-RC25C-E1E	107T-DW@3-RC25C-E1E
5.0 ... 23	6.3	11	13	—	65	50	25	—	65	50	25	—	103T-DW@2-RC25C-C1C	—
5.0 ... 23	6.3	11	13	—	65	50	25	—	65	50	25	—	103T-DW@2-RC25C-C2C	107T-DW@3-RC25C-C2C
5.4 ... 25	6.3	11	15	—	65	50	25	—	65	50	25	—	103T-EW@3-RC25C-E1E	107T-EW@3-RC25C-E1E
5.0 ... 25	6.3	11	15	—	65	50	25	—	65	50	25	—	103T-EW@3-RC25C-C1C	—
5.0 ... 25	6.3	11	15	—	65	50	25	—	65	50	25	—	103T-EW@3-RC25C-C2C	107T-EW@3-RC25C-C2C



Motor Current Adjustment Range [A]	IEC kW and Coordination Ratings (50 Hz)												DOL Starters Cat. No.	Reversing Starters Cat. No.
	kW Ratings*				Max. Short-Circuit Current [kA]									
	230V AC	400V AC	500V AC	690V AC	Type 1 Coordination				Type 2 Coordination					
230V AC	400V AC	500V AC	690V AC	230V AC	400V AC	500V AC	690V AC	230V AC	400V AC	500V AC	690V AC			
F-Frame with 100-C/104-C Contactors on Panel Mounting Modules														
5.4 ... 25	6.3	11	15	—	100	100	50	—	100	100	50	—	103T-EW@3-TC25C-E1E	107T-EW@3-TC25C-E1E
5.0 ... 25	6.3	11	15	—	100	100	50	—	100	100	50	—	103T-EW@3-TC25C-C1C	—
5.0 ... 25	6.3	11	15	—	100	100	50	—	100	100	50	—	103T-EW@3-TC25C-C2C	107T-EW@3-TC25C-C2C
5.4 ... 25	6.3	11	15	18.5	100	100	50	50	100	100	50	50	103T-FW@3-TC25C-E1E	107T-FW@3-TC25C-E1E
5.0 ... 25	6.3	11	15	18.5	100	100	50	50	100	100	50	50	103T-FW@3-TC25C-C1C	—
5.0 ... 25	6.3	11	15	18.5	100	100	50	50	100	100	50	50	103T-FW@3-TC25C-C2C	107T-FW@3-TC25C-C2C
9.0 ... 30	7.5	15	15	—	100	100	50	—	100	100	50	—	103T-EW@3-TC32C-E1F	107T-EW@3-TC32C-E1F
9.0 ... 30	7.5	15	15	—	100	100	50	—	100	100	50	—	103T-EW@3-TC32C-C1D	—
9.0 ... 30	7.5	15	15	—	100	100	50	—	100	100	50	—	103T-EW@3-TC32C-C2D	107T-EW@3-TC32C-C2D
9.0 ... 32	7.5	15	20	—	100	100	50	—	100	100	50	—	103T-FW@3-TC32C-E1F	107T-FW@3-TC32C-E1F
9.0 ... 32	7.5	15	20	—	100	100	50	—	100	100	50	—	103T-FW@3-TC32C-C1D	—
9.0 ... 32	7.5	15	20	—	100	100	50	—	100	100	50	—	103T-FW@3-TC32C-C2D	107T-FW@3-TC32C-C2D
9.0 ... 32	7.5	15	20	22	100	100	50	50	100	100	50	50	103T-GW@3-TC32C-E1F	107T-GW@3-TC32C-E1F
9.0 ... 32	7.5	15	20	22	100	100	50	50	100	100	50	50	103T-GW@3-TC32C-C1D	—
9.0 ... 32	7.5	15	20	22	100	100	50	50	100	100	50	50	103T-GW@3-TC32C-C2D	107T-GW@3-TC32C-C2D
9.0 ... 37	11	18.5	—	—	100	100	—	—	100	100	—	—	103T-FW@3-TC45C-E1F	107T-FW@3-TC45C-E1F
9.0 ... 37	11	18.5	—	—	100	100	—	—	100	100	—	—	103T-FW@3-TC45C-C1D	—
9.0 ... 37	11	18.5	—	—	100	100	—	—	100	100	—	—	103T-FW@3-TC45C-C2D	107T-FW@3-TC45C-C2D
9.0 ... 43	13	22	25	—	100	100	50	—	100	100	50	—	103T-GW@3-TC45C-E1F	107T-GW@3-TC45C-E1F
9.0 ... 43	13	22	25	—	100	100	50	—	100	100	50	—	103T-GW@3-TC45C-C1D	—
9.0 ... 43	13	22	25	—	100	100	50	—	100	100	50	—	103T-GW@3-TC45C-C2D	107T-GW@3-TC45C-C2D

* kW ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

⊗Coil voltage code—see this page

⊗ **Coil Voltage Codes for AC Control**

Voltage [V]	12	24	32	36	42	48	100	100-110V	110V	120	127	200	200-220	200-230	208	208-240
50 Hz	R	K	V	W	X	Y	KP	—	D	P	S	KG	—	—	—	—
60 Hz	Q	J	—	V	—	X	—	KP	—	D	—	—	KG	—	H	L
50/60 Hz	—	KJ	—	—	—	KY	KP	—	KD	—	—	KG	—	KL	—	—
Voltage [V]	220-230	230	230-240	240	277	347	380	380-400	400	400-415	440	480	500	550	600	
50 Hz	F	—	VA	T	—	—	—	N	—	G	B	—	M	C	—	—
60 Hz	—	—	—	A	T	I	E	—	—	—	N	B	—	—	C	—
50/60 Hz	—	KF	—	KA	—	—	—	—	KN	—	KB	—	—	—	—	—

⊗ **Coil Voltage Codes for DC Control**

DC Voltages [V]	9	12	24	36	48	60	64	72	80	110	115	125	220	230	250
Standard	ZR	ZQ	ZJ	ZW	ZY	ZZ	ZB	ZG	ZE	ZD	ZP	ZS	ZA	ZF	ZT
with Integrated Diode	—	—	DJ	—	—	—	—	—	—	—	—	—	—	—	—
with Electronic Coil	—	—	EJ	—	—	—	—	—	—	—	—	—	—	—	—



103T Factory-Installed Options

Change option code ① to desired auxiliary contact: 103T-AWD①-CA16C

Contactor Auxiliaries without “-SP” Control Plug									
Option ①	Description	ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
		9...23 A	30...43 A	60...85 A	9...23 A	30...43 A	60...85 A	9...23 A	30...43 A
2	1 N.O.	NA	NA	NA	Standard	Standard	Standard	Standard	Standard
3	1 N.O. + 1 N.C.	NA	NA	NA	Available	Available	Available	Available	Available
4	2 N.O.	NA	NA	NA	Available	Available	Available	Available	Available
6	2 N.O. + 1 N.C.	NA	NA	NA	Available	NA	NA	Available	NA
7	2 N.O. + 2 N.C.	NA	NA	NA	NA	Available	Available	NA	Available
8	3 N.O. + 2 N.C.	NA	NA	NA	Available	NA	NA	Available	NA

Change option code ① to desired auxiliary contact: 103T-AWD①-CA16C

Contactor Auxiliaries with “-SP” Control Plug									
Option ①	Description	ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
		9...23 A	30...43 A	60...85 A	9...23 A	30...43 A	60...85 A	9...23 A	30...43 A
2	1 N.O.	Standard	Standard	NA	Available	Available	Available	Available	Available
3	1 N.O. + 1 N.C.	Available	Available	NA	Available	Available	Available	Available	Available
4	2 N.O.	Available	Available	NA	Available	Available	Available	Available	Available
6	2 N.O. + 1 N.C.	NA	NA	NA	NA	NA	NA	NA	NA
7	2 N.O. + 2 N.C.	NA	NA	NA	NA	NA	NA	NA	NA
8	3 N.O. + 2 N.C.	NA	NA	NA	NA	NA	NA	NA	NA

Change option code ② to desired auxiliary contact: 103T-AWD2-CA16②

Circuit Breaker Aux/Trip Contacts									
Option ②	Description	ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
		9...23 A	30...43 A	60...85 A	9...23 A	30...43 A	60...85 A	9...23 A	30...43 A
X*	Without Aux/Trip Contacts	NA	NA	NA	Available	Available	Available	Available	Available
A*	1 N.C. Aux.	NA	NA	NA	Available	Available	NA	Available	Available
B	1 N.O. Aux.	Available	Available	NA	Available	Available	NA	Available	Available
C	1 N.O. + 1 N.C. Aux.	Standard	Standard	NA	Standard	Standard	Standard	Standard	Standard
D	2 N.O. Aux.	Available	Available	NA	Available	Available	Available	Available	Available
E*	2 N.C. Aux.	NA	NA	NA	Available	Available	Available	Available	Available
R*	1 N.O. Trip + 1 N.C. Aux	NA	NA	NA	Available	Available	NA	Available	Available
S	1 N.O. Trip + 1 N.O. Aux	Available	Available	NA	Available	Available	NA	Available	Available

* Not available when an “-SP” Control Plug is selected.

Add option code ③ to desired auxiliary contact: 103T-AWD2-CA16C③

Additional Circuit Breaker Aux/Trip Contacts									
Option ③	Description	ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
		9...23 A	30...43 A	60...85 A	9...23 A	30...43 A	60...85 A	9...23 A	30...43 A
Blank	Without Aux/Trip Contacts	Available	Available	Available	Available	Available	Available	Available	Available
C*	1 N.O. + 1 N.C. Aux.	Available	Available	NA	Available	Available	NA	Available	Available
D*	2 N.O. Aux.	Available	Available	NA	Available	Available	NA	Available	Available
E*‡	2 N.C. Aux.	Available	Available	NA	Standard	Standard	NA	Standard	Standard
K	1 N.C. (OL) Trip + 1 N.C. (SC) Trip	Available	Available	NA	Available	Available	Available	Available	Available
L	1 N.O. (OL) Trip + 1 N.O. (SC) Trip	Available	Available	NA	Available	Available	Available	Available	Available
M‡	1 N.C. (OL) Trip + 1 N.O. (SC) Trip	Available	Available	NA	Available	Available	Available	Available	Available
N‡	1 N.O. (OL) Trip + 1 N.C. (SC) Trip	Available	Available	NA	Available	Available	Available	Available	Available
Q‡	1 N.O. (SC) Trip + 1 N.C. (SC) Trip	Available	Available	NA	Available	Available	NA	Available	Available

* Not available on 60...85 A starters.

‡ Not available when an “-SP” Control Plug is selected on 60...85 A starters.

Add option code ④ to desired auxiliary contact: 103T-AWD2-CA16C-④

Modifications/Accessories	
Option ④	Description
R	Surge Suppressor, RC
V	Surge Suppressor, Varistor
D	Surge Suppressor, Diode
KN	Lockable Knob, Black
KY	Lockable Knob, Red/Yellow
TE	Spacing Adapter for UL508 Type E
SP	Control Plug, Top Mount

107T Factory-Installed Options

Change option code ① to desired auxiliary contact: 107T-AWD①-CA16C

Contactor Auxiliaries without “-SP” Control Plug									
Option ①	Description	ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
		9...23 A	30...43 A	60...85 A	9...23 A	30...43 A	60...85 A	9...23 A	30...43 A
3	1 N.O. + 1 N.C.	NA	NA	NA	Standard	Standard	Standard	Standard	Standard
7	2 N.O. + 2 N.C.	NA	NA	NA	Available	Available	Available	Available	Available

Change option code ① to desired auxiliary contact: 107T-AWD①-CA16C

Contactor Auxiliaries with “-SP” Control Plug									
Option ①	Description	ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
		9...23 A	30...43 A	60...85 A	9...23 A	30...43 A	60...85 A	9...23 A	30...43 A
3	1 N.O. + 1 N.C.	Standard	Standard	NA	Available	Available	Available	Available	Available
7	2 N.O. + 2 N.C.	Available	Available	NA	Available	Available	Available	Available	Available

Change option code ② to desired auxiliary contact: 107T-AWD2-CA16②

Circuit Breaker Aux/Trip Contacts									
Option ②	Description	ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
		9...23 A	30...43 A	60...85 A	9...23 A	30...43 A	60...85 A	9...23 A	30...43 A
X*	Without Aux/Trip Contacts	NA	NA	NA	Available	Available	Available	Available	Available
A*	1 N.C. Aux.	NA	NA	NA	Available	Available	NA	Available	Available
B	1 N.O. Aux.	Available	Available	NA	Available	Available	NA	Available	Available
C	1 N.O. + 1 N.C. Aux.	Standard	Standard	NA	Standard	Standard	Standard	Standard	Standard
D	2 N.O. Aux.	Available	Available	NA	Available	Available	Available	Available	Available
E*	2 N.C. Aux.	NA	NA	NA	Available	Available	Available	Available	Available
R*	1 N.O. Trip + 1 N.C. Aux	NA	NA	NA	Available	Available	NA	Available	Available
S	1 N.O. Trip + 1 N.O. Aux	Available	Available	NA	Available	Available	NA	Available	Available

Add option code ③ to desired auxiliary contact: 107T-AWD2-CA16C③

Additional Circuit Breaker Aux/Trip Contacts									
Option ③	Description	ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
		9...23 A	30...43 A	60...85 A	9...23 A	30...43 A	60...85 A	9...23 A	30...43 A
Blank	Without Aux/Trip Contacts	Available	Available	Available	Available	Available	Available	Available	Available
C*	1 N.O. + 1 N.C. Aux.	Available	Available	NA	Available	Available	NA	Available	Available
D*	2 N.O. Aux.	Available	Available	NA	Available	Available	NA	Available	Available
E*‡	2 N.C. Aux.	Available	Available	NA	Available	Available	NA	Available	Available
K	1 N.C. (OL) Trip + 1 N.C. (SC) Trip	Available	Available	NA	Available	Available	Available	Available	Available
L	1 N.O. (OL) Trip + 1 N.O. (SC) Trip	Available	Available	NA	Available	Available	Available	Available	Available
M‡	1 N.C. (OL) Trip + 1 N.O. (SC) Trip	Available	Available	NA	Available	Available	Available	Available	Available
N‡	1 N.O. (OL) Trip + 1 N.C. (SC) Trip	Available	Available	NA	Available	Available	Available	Available	Available
Q*	1 N.O. (SC) Trip + 1 N.C. (SC) Trip	Available	Available	NA	Available	Available	NA	Available	Available

* Not available on 60...85 A starters.

‡ Not available when a “-SP” Control Plug is selected on 60...85 A starters.

Add option code ④ to desired auxiliary contact: 107T-AWD2-CA16C-④

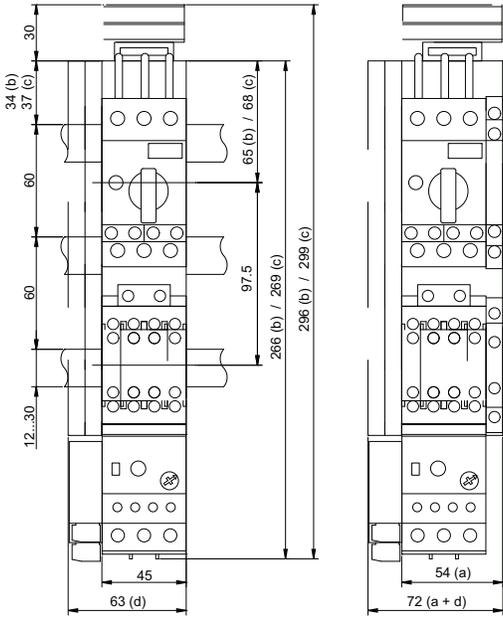
Modifications/Accessories	
Option ④	Description
R	Surge Suppressor, RC
V	Surge Suppressor, Varistor
D	Surge Suppressor, Diode
KN	Lockable Knob, Black
KY	Lockable Knob, Red/Yellow
TE	Spacing Adapter for UL508 Type E
SP	Control Plug, Top Mount



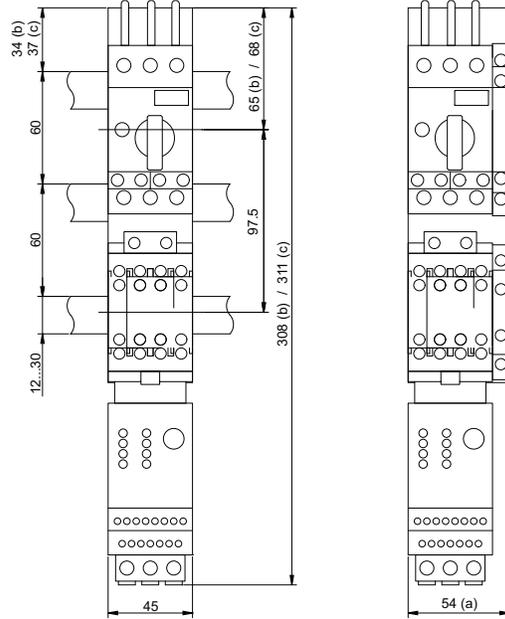
Bulletin 103T/107T
Open Type Starters
 Approximate Dimensions

Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.

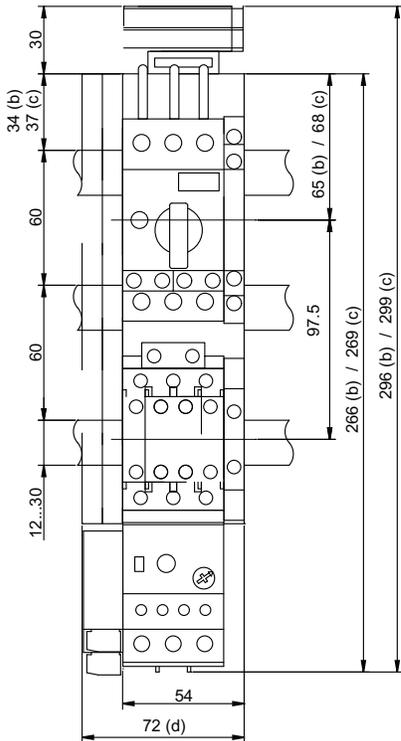
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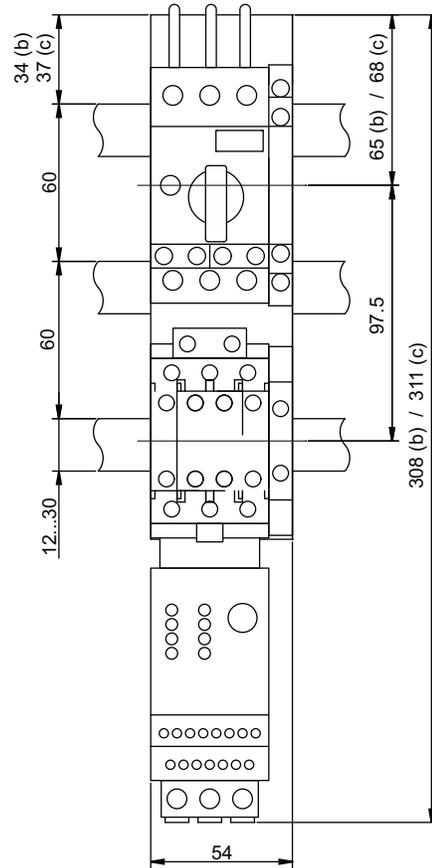
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 Contactor: 100-C09...23
 Motor Protection Relay: 193-ED / -EE
 (a) With additional side-mount aux. or trip contact(s)
 (b) Standard busbar adapter with control plug
 (c) Iso busbar adapter with control plug
 (d) With 193-E* side-mount module



Circuit Breaker: 140M-C / -D
 Contactor: 100-C09...23
 Motor Protection Relay: 193-EC...
 (a) With additional side-mount aux. or trip contact(s)
 (b) Standard busbar adapter
 (c) Iso busbar adapter



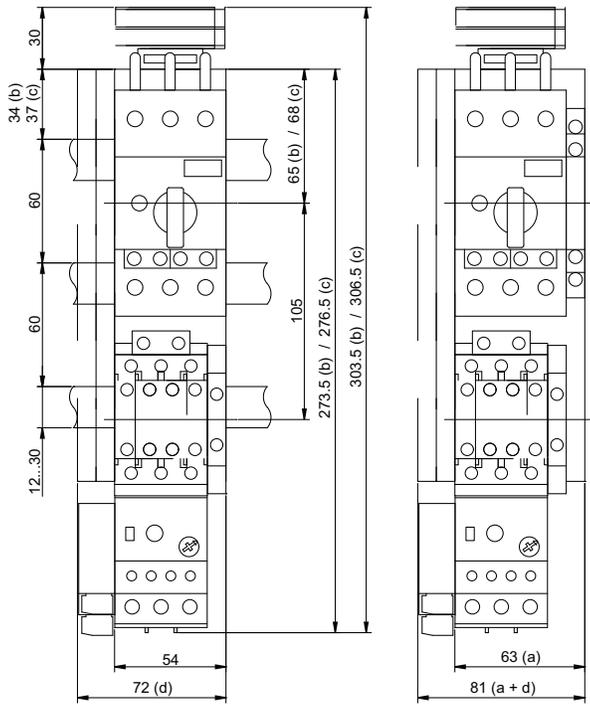
Circuit Breaker: 140M-D
 Contactor: 100-C30...37
 Motor Protection Relay: 193-EE
 (b) Standard busbar adapter with control plug
 (c) Iso busbar adapter with control plug
 (d) With 193-E* side-mount module



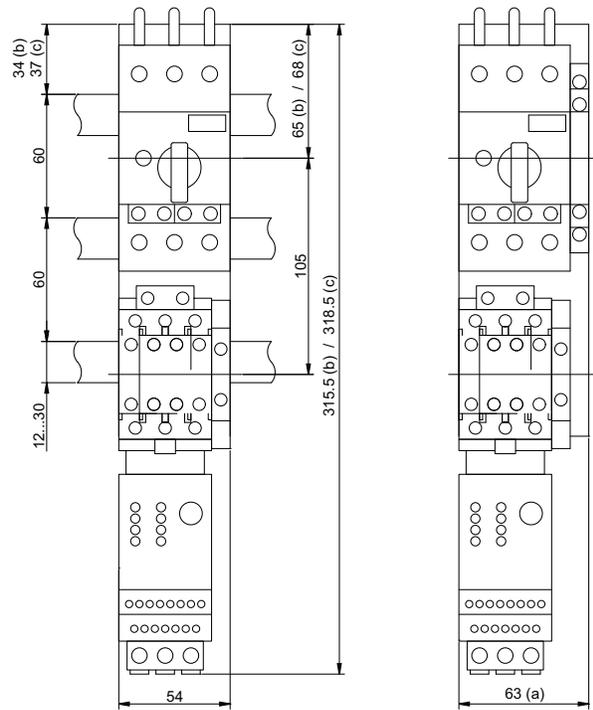
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 Contactor: 100-C30...37
 Motor Protection Relay: 193-EC...
 (b) Standard busbar adapter
 (c) Iso busbar adapter



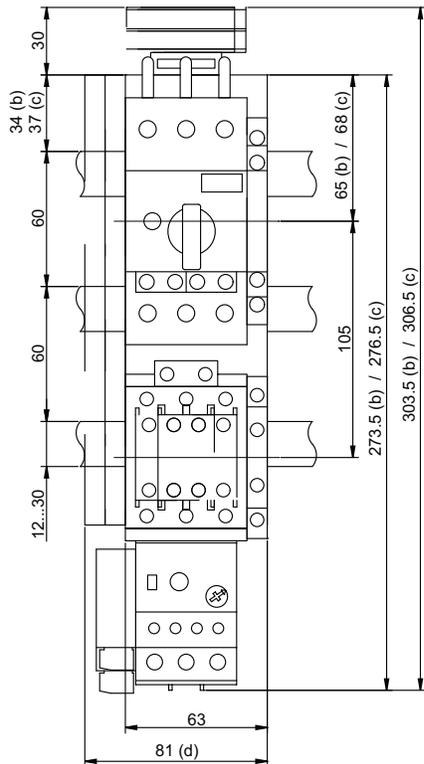
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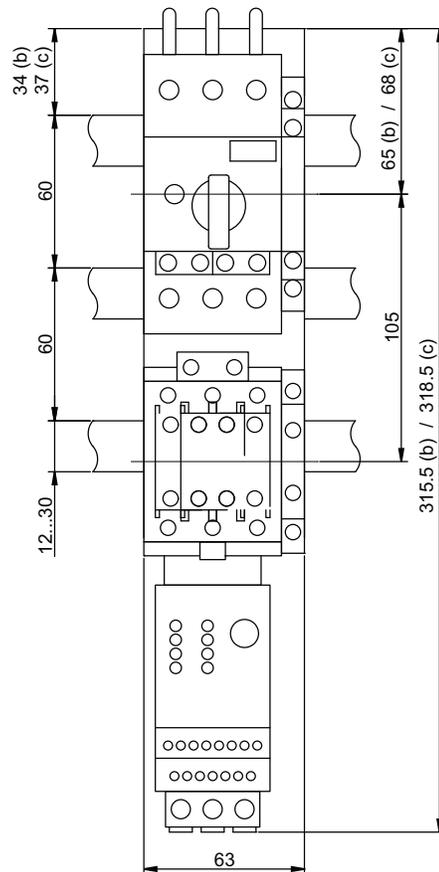
Circuit Breaker: 140M-F
 Contactor: 100-C30...37
 Motor Protection Relay: 193-EE
 (a) With additional side-mount aux. or trip contact
 (b) Standard busbar adapter with control plug
 (c) Iso busbar adapter with control plug
 (d) With 193-E* side-mount module



Circuit Breaker: 140M-F
 Contactor: 100-C30...37
 Motor Protection Relay: 193-EC...
 (a) With additional side-mount aux. or trip contact
 (b) Standard busbar adapter
 (c) Iso busbar adapter



Circuit Breaker: 140M-F
 Contactor: 100-C43
 Motor Protection Relay: 193-EE
 (b) Standard busbar adapter with control plug
 (c) Iso busbar adapter with control plug
 (d) With 193-E* side-mount module

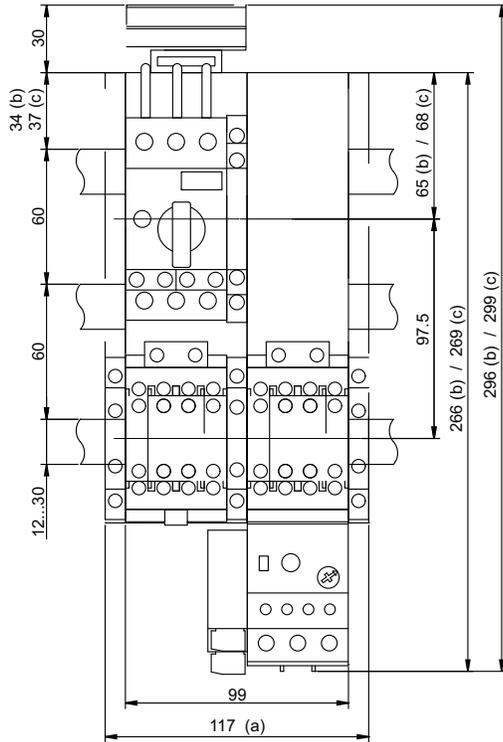


Circuit Breaker: 140M-F
 Contactor: 100-C43
 Motor Protection Relay: 193-EC...
 (b) Standard busbar adapter
 (c) Iso busbar adapter

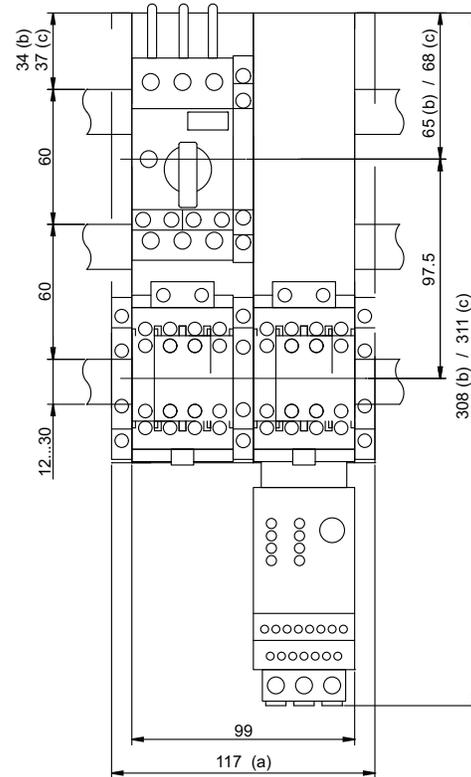
Bulletin 103T/107T
Open Type Starters
 Approximate Dimensions

Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.

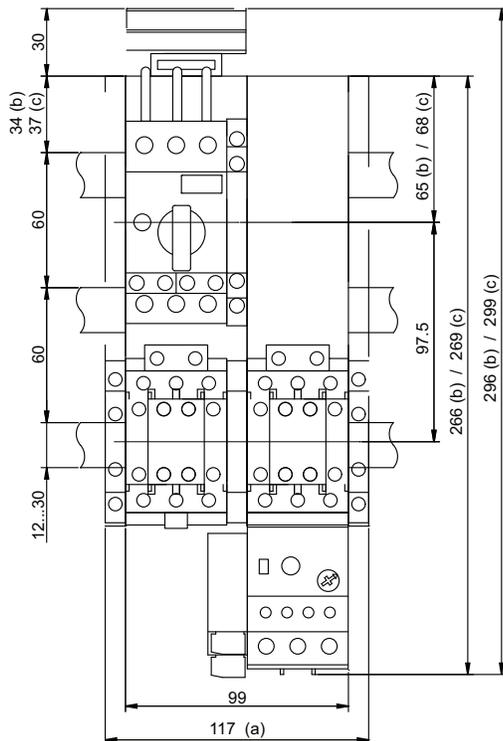
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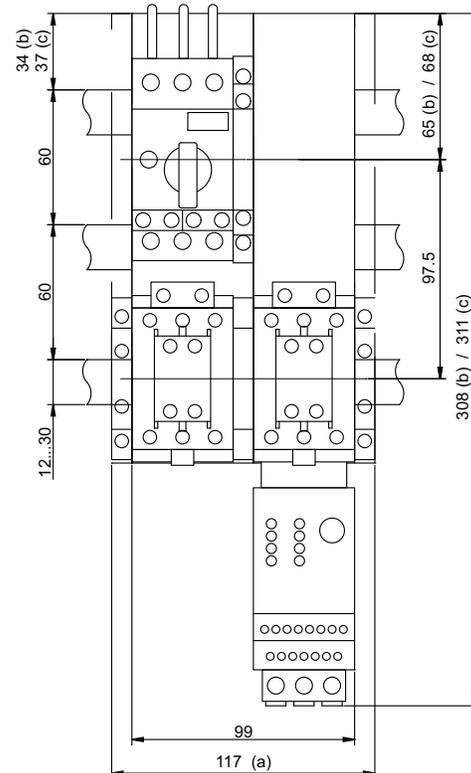
Circuit Breaker: 140M-C / -D (a) With additional side-mount aux. contacts
 Contactors: 100-C09...23 (b) Standard busbar adapter with control plug
 Motor Protection Relay: 193-ED / -EE (c) Iso busbar adapter with control plug



Circuit Breaker: 140M-C / -D (a) With additional side-mount aux. contacts
 Contactors: 100-C09...23 (b) Standard busbar adapter
 Motor Protection Relay: 193-EC... (c) Iso busbar adapter

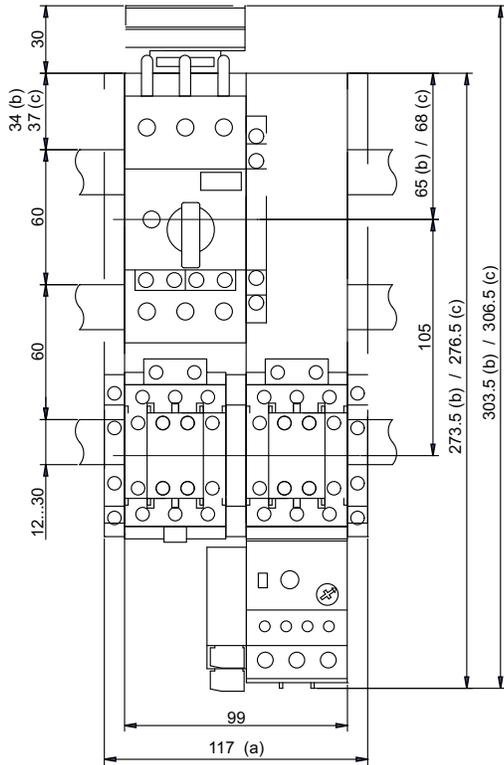


Circuit Breaker: 140M-D (a) With additional side-mount aux. contacts
 Contactors: 100-C30...37 (b) Standard busbar adapter with control plug
 Motor Protection Relay: 193-EE (c) Iso busbar adapter with control plug

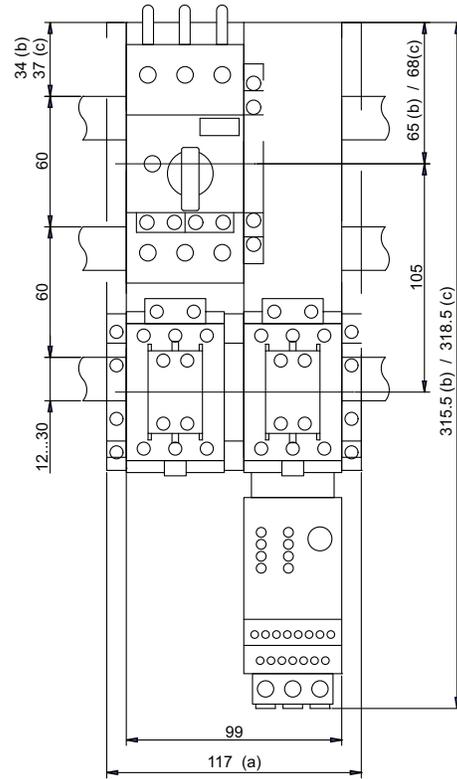


Circuit Breaker: 140M-D (a) With additional side-mount aux. contacts
 Contactors: 100-C30...37 (b) Standard busbar adapter
 Motor Protection Relay: 193-EC... (c) Iso busbar adapter

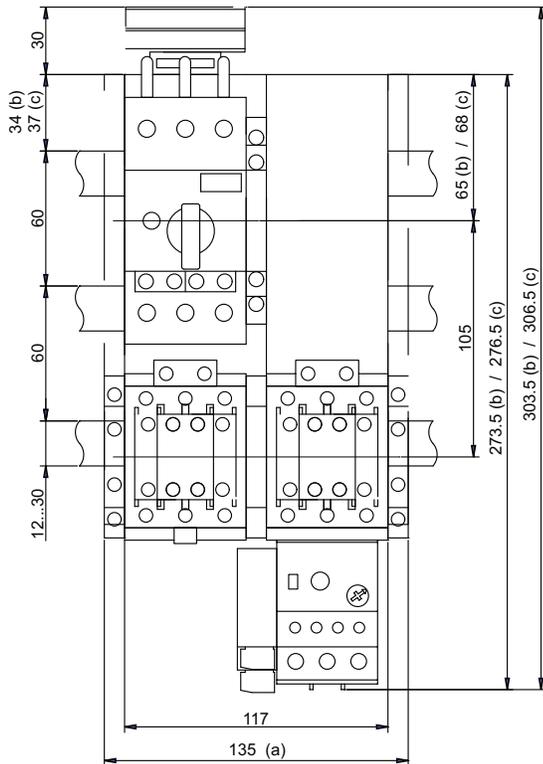
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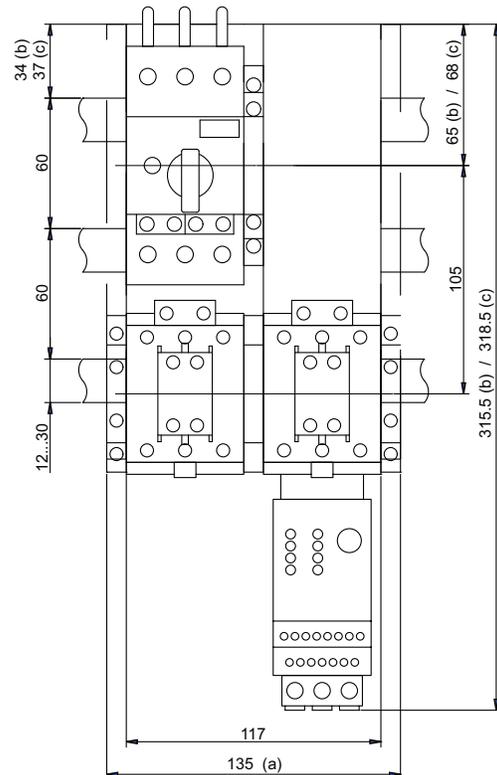
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 Contactors: 100-C30...37 (b) Standard busbar adapter with control plug
 Motor Protection Relay: 193-EE (c) Iso busbar adapter with control plug



Circuit Breaker: 140M-F (a) With additional side-mount aux. contacts
 Contactors: 100-C30...37 (b) Standard busbar adapter
 Motor Protection Relay: 193-EC... (c) Iso busbar adapter



Circuit Breaker: 140M-F (a) With additional side-mount aux. contacts
 Contactors: 100-C43 (b) Standard busbar adapter with control plug
 Motor Protection Relay: 193-EE (c) Iso busbar adapter with control plug



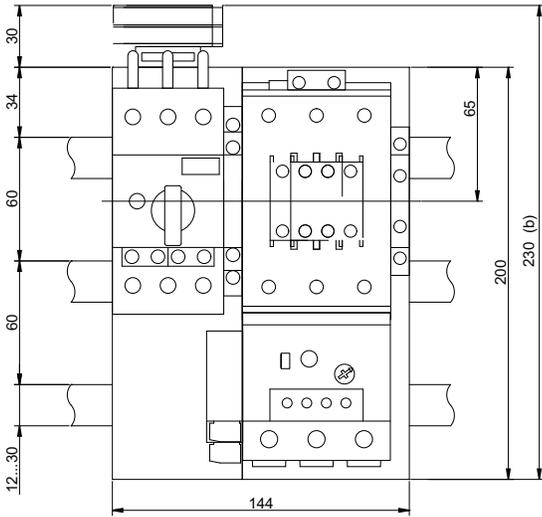
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 Motor Protection Relay: 193-EC... (c) Iso busbar adapter



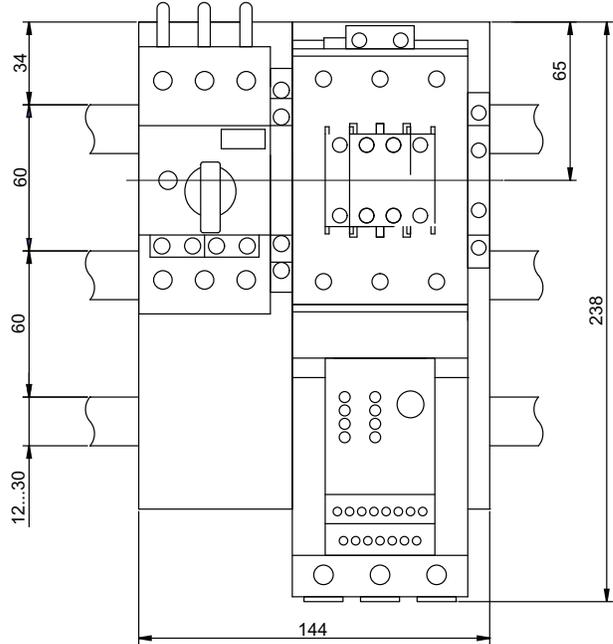
Bulletin 103T/107T
Open Type Starters
 Approximate Dimensions

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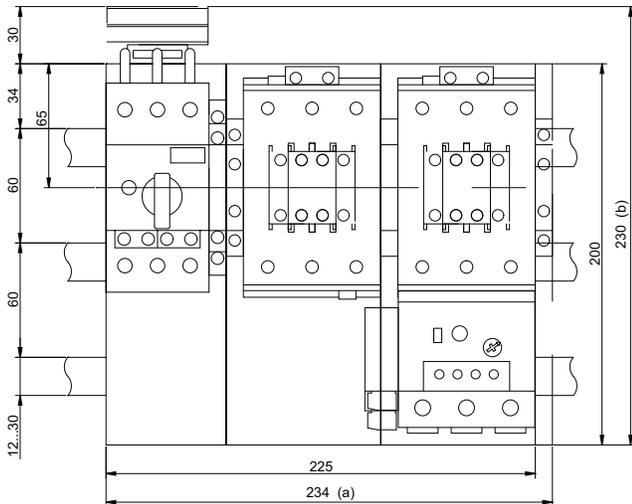
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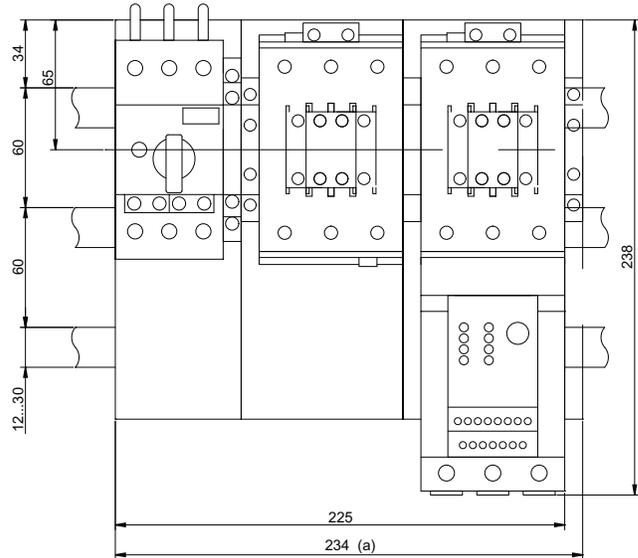
Circuit Breaker: 140M-F
 Contactor: 100-C60...85
 Motor Protection Relay: 193-EE
 (b) Standard busbar adapter with control plug



Circuit Breaker: 140M-F
 Contactor: 100-C60...85
 Motor Protection Relay: 193-EC...

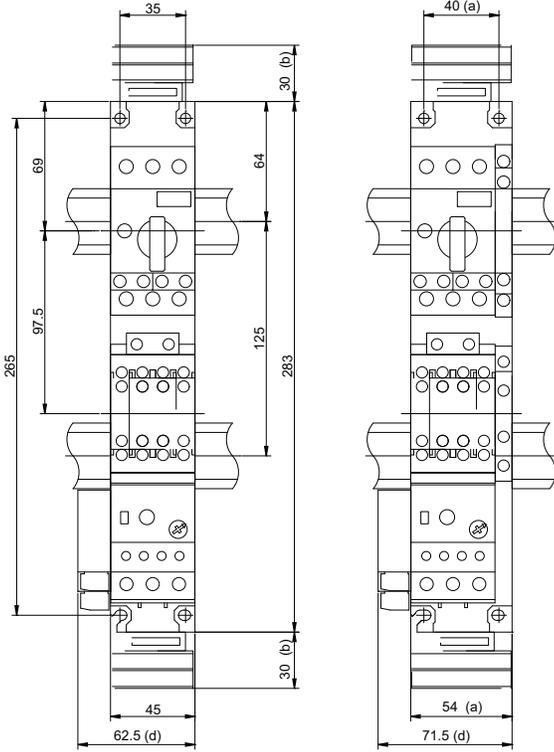


Circuit Breaker: 140M-F
 Contactors: 100-C60...85
 Motor Protection Relay: 193-EE
 (a) With additional side-mount aux. contacts
 (b) Standard busbar adapter with control plug

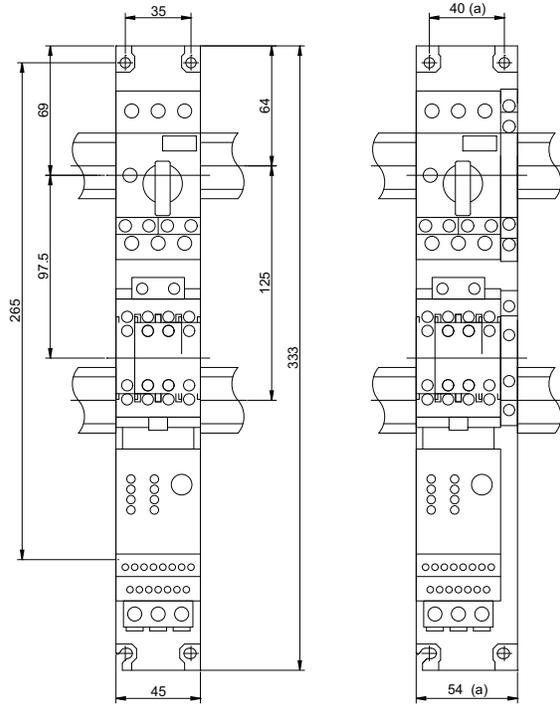


Circuit Breaker: 140M-F
 Contactors: 100-C60...85
 Motor Protection Relay: 193-EC...
 (a) With additional side-mount aux. contacts

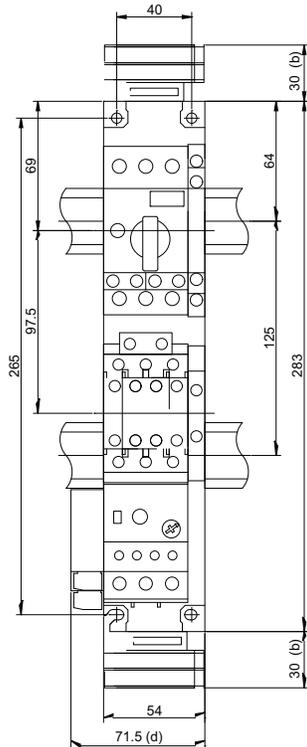
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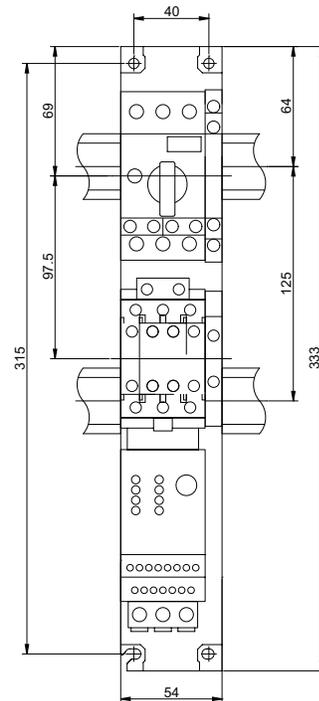
Circuit Breaker: 140M-C / -D (a) With additional side-mount aux. or trip contact(s)
 Contactors: 100-C09...23 (b) Control plug on top OR bottom side optional
 Motor Protection Relay: 193-ED / -EE (d) With 193-E* side-mount module



Circuit Breaker: 140M-C / -D (a) With additional side-mount aux. or trip contact(s)
 Contactors: 100-C09...23
 Motor Protection Relay: 193-EC...



Circuit Breaker: 140M-D (b) Control plug on top OR bottom side optional
 Contactor: 100-C30...37 (d) With 193-E* side-mount module
 Motor Protection Relay: 193-EE

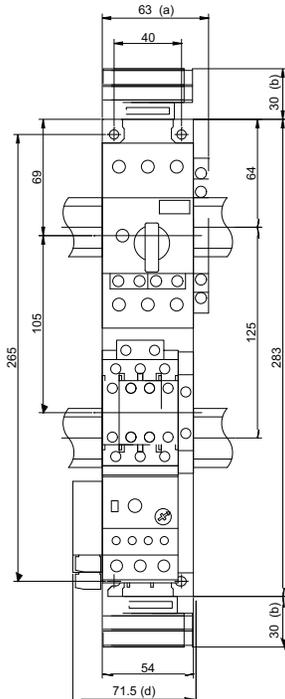


Circuit Breaker: 140M-D
 Contactor: 100-C30...37
 Motor Protection Relay: 193-EC...

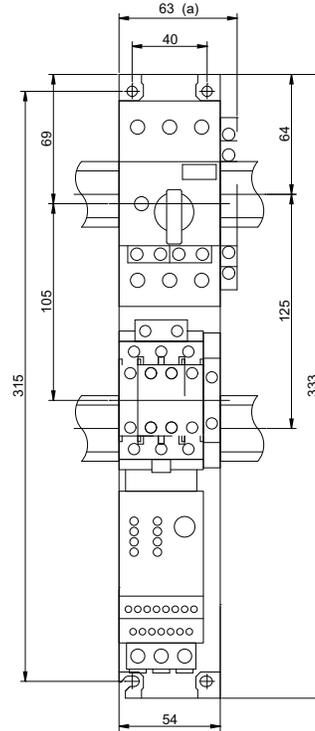
Bulletin 103T/107T
Open Type Starters
 Approximate Dimensions

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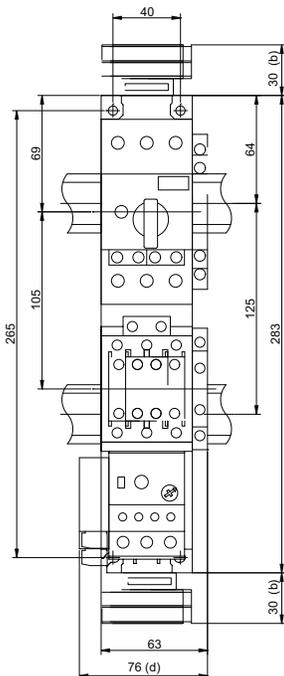
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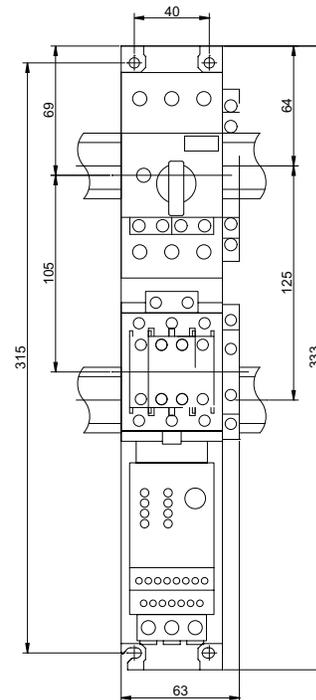
Circuit Breaker: 140M-F (a) With additional side-mount aux. or trip contact
 Contactor: 100-C30...37 (b) Control plug on top OR bottom side optional
 Motor Protection Relay: 193-EE (d) With 193-E* side-mount module



Circuit Breaker: 140M-F (a) With additional side-mount aux. or trip contact
 Contactor: 100-C30...37
 Motor Protection Relay: 193-EE...

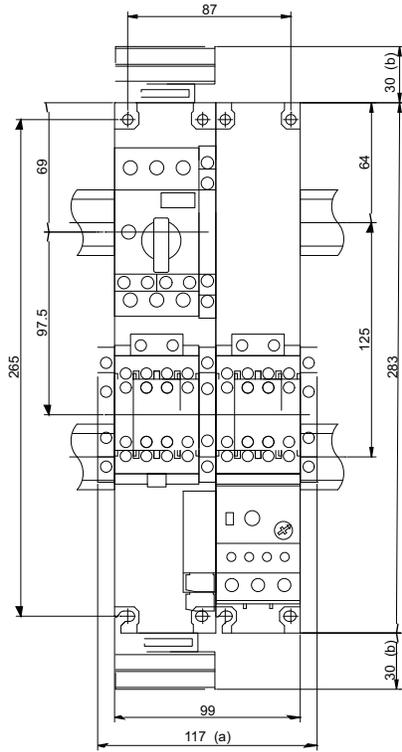


Circuit Breaker: 140M-F (b) Control plug on top OR bottom side optional
 Contactor: 100-C43 (d) With 193-E* side-mount module
 Motor Protection Relay: 193-EE

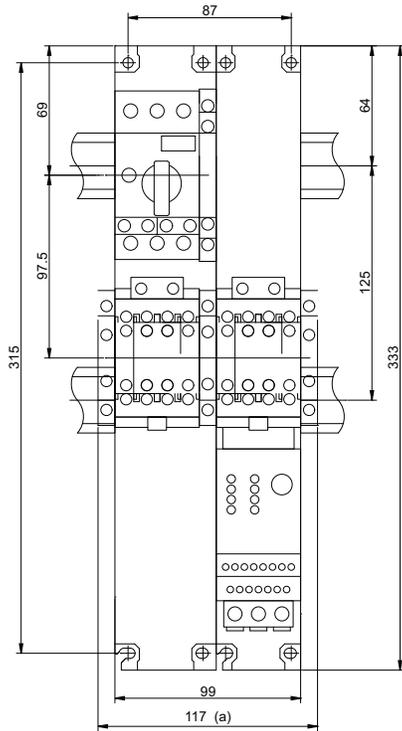


Circuit Breaker: 140M-F
 Contactor: 100-C43
 Motor Protection Relay: 193-EE...

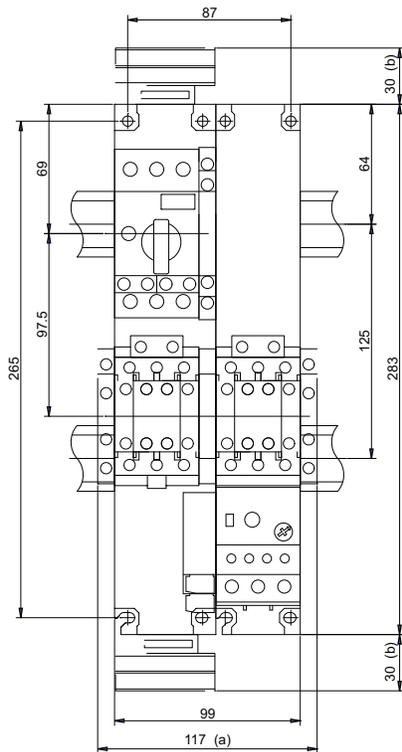
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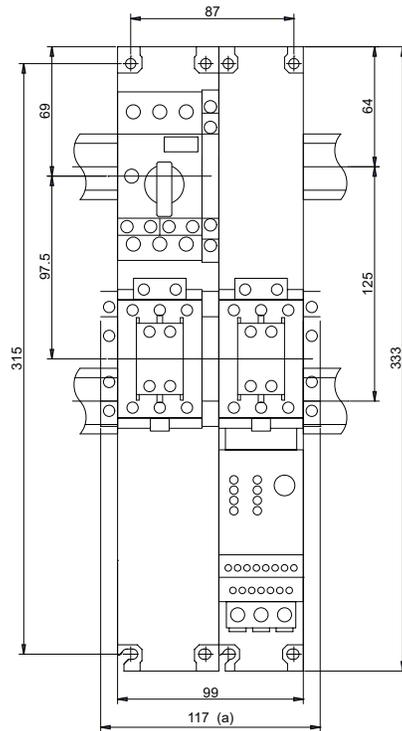
Circuit Breaker: 140M-C / -D (a) With additional side-mount aux. contacts
 Contactors: 100-C09...23 (b) Control plug on top OR bottom side optional
 Motor Protection Relay: 193-ED / -EE



Circuit Breaker: 140M-C / -D (a) With additional side-mount aux. contacts
 Contactors: 100-C09...23
 Motor Protection Relay: 193-EC...



Circuit Breaker: 140M-D (a) With additional side-mount aux. contacts
 Contactors: 100-C30...37 (b) Control plug on top OR bottom side optional
 Motor Protection Relay: 193-EE

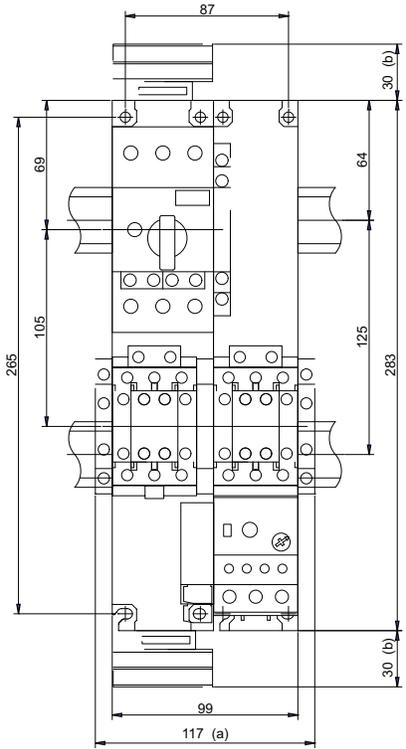


Circuit Breaker: 140M-D (a) With additional side-mount aux. contacts
 Contactors: 100-C30...37
 Motor Protection Relay: 193-EC...

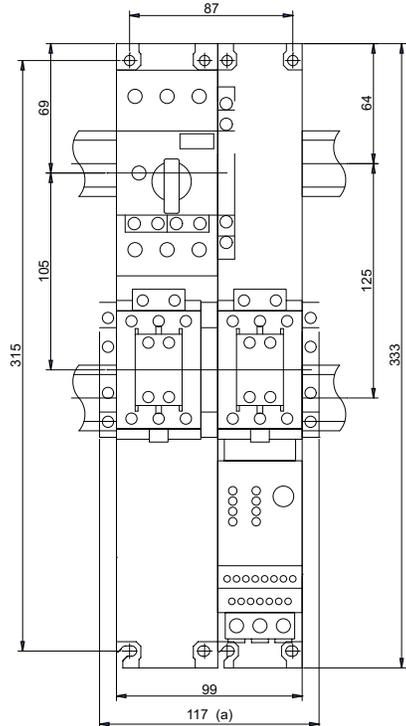
Bulletin 103T/107T
Open Type Starters
 Approximate Dimensions

Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.

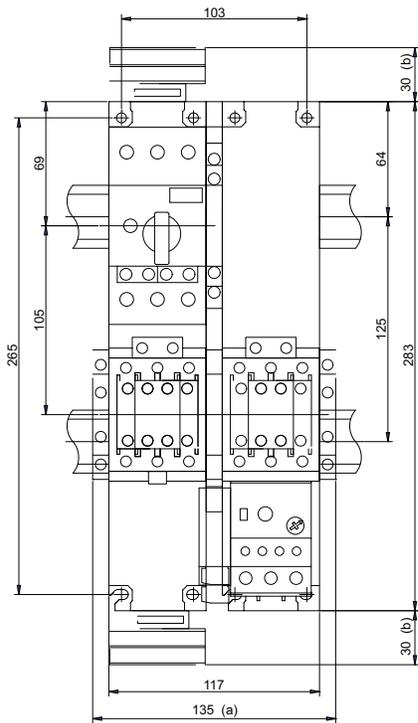
2



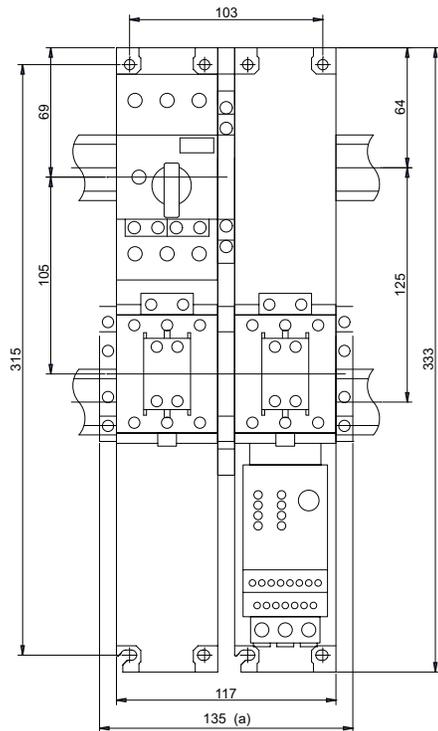
Circuit Breaker: 140M-F (a) With additional side-mount aux. contacts
 Contactors: 100-C30...37 (b) Control plug on top OR bottom side optional
 Motor Protection Relay: 193-EE



Circuit Breaker: 140M-F (a) With additional side-mount aux. contacts
 Contactors: 100-C30...37 (b) Control plug on top OR bottom side optional
 Motor Protection Relay: 193-EC...



Circuit Breaker: 140M-F (a) With additional side-mount aux. contacts
 Contactors: 100-C43 (b) Control plug on top OR bottom side optional
 Motor Protection Relay: 193-EE



Circuit Breaker: 140M-F (a) With additional side-mount aux. contacts
 Contactors: 100-C43 (b) Control plug on top OR bottom side optional
 Motor Protection Relay: 193-EC...

Eco and Compact Combination Starters

Product Overview



Bulletin 190 Eco and Compact Combination Starters

- Current range: 0.1...43 A
- Bulletin 190E/191E modular Eco starters
- Bulletin 190S/191S Pre-wired compact starters
- Uses Bulletin 140M motor protection circuit breakers (MPCBs) and Bulletin 100-C or 100-K contactors
- cULus Listed for control and protection of motor loads
- Type 1 or Type 2 Coordination
- Mounts to top hat rail(s) or screw mounts

Your order must include: cat. no. of the starter selected and, if required, cat. no. of any accessories.

Table of Contents

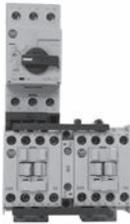
Product Selection 2-358
 Factory-Installed
 Modifications 2-370

Standards Compliance

IEC/EN 60947-1, -2, -4-1, -5
 IEC/EN 60204-1
 CSA 22.2, No. 14
 UL 508

Certifications

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

							
	Eco Starter with 100-K Miniature Contactor	Eco Starter with 100-C IEC Contactor	Reversing Eco Starter with 100-K Miniature Contactor	Reversing Eco Starter with 100-C IEC Contactor	Compact Combination Starter (25 A)	Compact Combination Starter (45 A)	Reversing Compact Combination Starter (25 A)
AC Coils	✓	✓	✓	✓	✓	✓	✓
DC Coils	✓	24V DC only	✓	24V DC only	✓	✓	24V DC only
Standards Compliance	See this page						
cULus Listed	See this page						
CE	✓	✓	✓	✓	✓	✓	✓
IEC 60947	✓	✓	✓	✓	✓	✓	✓
Type 2 Coordination	See pages 2-362 and page 2-368						
Components	140M-C	140M-C,-D	140M-C	140M-C,-D	140M-C,-D	140M-F	140M-C,-D
MPCB							
Contactor	100-K	100-C	104-K	104-C	100-C	100-C	104-C

Eco and Compact Combination Starters

Catalog Number Explanation

Cat. No. Explanation

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; not all combinations will produce a valid catalog number.

190S - A N D 2 - C A16 C - TE
a b c d e f g h i

2

Bulletin Number	
Starter Type	
Code	Description
190S	DOL Starter with MPCB
191S	Rev Starter with MPCB

Contactor Size	
Code	Description
A	100-C09
B	100-C12
C	100-C16
D	100-C23
E	100-C30
F	100-C37
G	100-C43

Style	
Code	Description
N	Open Style — Screw mount (4), 35 mm top hat rail mount (2) or 75 mm top hat rail mount (1)

AC Coil Voltage	
Code	Description
Q	12V AC, 60 Hz
R	12V AC, 50 Hz
J	24V AC, 60 Hz
K	24V AC, 50 Hz
KJ	24V AC, 50/60 Hz
V	32V AC, 50 Hz /36V AC, 60 Hz
W	36V AC, 50 Hz
X	42V AC, 50 Hz /48V AC, 60 Hz
Y	48V AC, 50 Hz
KY	48V AC, 50/60 Hz
KP	100V AC, 50 Hz /100...110V AC, 60 Hz
D	110V AC, 50 Hz /120V AC, 60 Hz
KD	100V AC, 50/60 Hz
P	120V AC, 50 Hz
KL	200...230V AC, 50/60 Hz
H	208V AC, 60 Hz
L	208...240V AC, 60 Hz
A	220V AC, 50 Hz /240V AC, 60 Hz
F	220...230V AC, 50 Hz
KF	230V AC, 50/60 Hz
VA	230...240V AC, 50 Hz
T	240V AC, 50 Hz /277V AC, 60 Hz
E	380V AC, 60 Hz
N	380...400V AC, 50 Hz /440V AC, 60 Hz
KN	400V AC, 50/60 Hz
G	400...415V AC, 50 Hz
B	440V AC, 50 Hz /480V AC, 60 Hz
M	500V AC, 50 Hz
C	550V AC, 50 Hz /600V AC, 60 Hz

DC Coil Voltage — Bul. 190S only	
Code	Description
ZR	6...12V DC
ZQ	12V DC
ZJ	24V DC
DJ	24V DC with Diode
EJ	24V DC electronic*
ZW	36V DC
ZY	48V DC
ZZ	60V DC
ZB	64V DC
ZG	72V DC
ZE	80V DC
ZD	110V DC
ZP	115V DC
ZS	125V DC
ZA	220V DC
ZF	230V DC
ZT	250V DC

* Also available for Bulletin 191S

Contactor Aux. Contacts	
Code	Description
2	1 N.O. (190S only)
3	1 N.O. + 1 N.C. (Bul. 191S and 190S, contactor sizes E...G only)

Circuit Breaker Frame Size	
Code	Description
C	C Frame
D	D Frame
F	F Frame

Circuit Breaker Current Range	
Code	Description
A16	0.1...0.16 A
A25	0.16...0.25 A
A40	0.25...0.4 A
A63	0.4...0.63 A
B10	0.63...1.0 A
B16	1.0...1.6 A
B25	1.6...2.5 A
B40	2.5...4.0 A
B63	4.0...6.3 A
C10	6.3...10 A
C16	10...16 A
C20	16...20 A
C25	20...25 A
C32	25...32 A
C45	32...45 A

Circuit Breaker Aux. and Trip Contacts for 140M	
Bottom Front	
Code	Description
C	1 N.O. + 1 NC Aux. Contact
D	2 N.O. Aux. Contact
R	1 N.O. (SC+OL) + 1 NC Aux. Contact
S	1 N.O. (SC+OL) + 1 N.O. Aux. Contact

Modifications, Accessories	
Circuit Breaker Accessories	
Code	Description
TE	Spacer Module
KN	Lockable Twist Knob, Black
KY	Lockable Twist Knob, Red/Yellow

Additional CB Auxiliaries (Side Mount)	
Code	Description
A02	2 N.C.
A20	2 N.O.
A11	1 N.O. + 1 N.C.

Additional CB Trip Contacts (Side Mount)	
Code	Description
R00	1 N.O. Thermal-Mag + 1 N.O. Mag Only
R01	1 N.O. Thermal-Mag + 1 N.C. Mag Only
R10	1 N.C. Thermal-Mag + 1 N.O. Mag Only
R11	1 N.C. Thermal-Mag + 1 N.C. Mag Only
M11	1 N.O. Mag Only + 1 N.C. Mag Only

Coil Accessories	
Code	Description
JE	Electronic Interface(s)
D	Surge Suppressor Diode
R	Surge Suppressor RC
V	Surge Suppressor Varistor

Additional Contactor Auxiliaries (Side Mount)	
Code	Description
S01	1 N.C.
S10	1 N.O.
S11	1 N.O. + 1 N.C.
S20	2 N.O.

Additional Contactor Auxiliaries (Front Mount)	
Code	Description
F11	1 N.O. + 1 N.C.
F20	2 N.O.
F22	2 N.O. + 2 N.C.

Cat. No. Explanation

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; not all combinations will produce a valid catalog number.

190E - A N D 2 - C A16 X - TE
a b c d e f g h i

a

Bulletin Number	
Starter Type	
Code	Description
190E	DOL Starter with MPCB
191E	Rev Starter with MPCB

b

Contactor Size	
Code	Description
A	100-C09
B	100-C12
C	100-C16
D	100-C23
KM	100-K05
KN	100-K09
KP	100-K12

c

Style	
Code	Description
N	Open Style — 35 mm top hat rail mount (1)

d

AC Coil Voltages for Contactor Size A-D	
Code	Description
Q	12V AC, 60 Hz
R	12V AC, 50 Hz
J	24V AC, 60 Hz
K	24V AC, 50 Hz
KJ	24V AC, 50/60 Hz
V	32V AC, 50 Hz/36V AC, 60 Hz
W	36V AC, 50 Hz
X	42V AC, 50 Hz/48V AC, 60 Hz
Y	48V AC, 50 Hz
KY	48V AC, 50/60 Hz
KP	100V AC, 50 Hz/100...110V AC, 60 Hz
D	110V AC, 50 Hz/120V AC, 60 Hz
KD	100V AC, 50/60 Hz
P	120V AC, 50 Hz
KL	200...230V AC, 50/60 Hz
H	208V AC, 60 Hz
L	208...240V AC, 60 Hz
A	220V AC, 50 Hz /240V AC, 60 Hz
F	220...230V AC, 50 Hz
KF	230V AC, 50/60 Hz
VA	230...240V AC, 50 Hz
T	240V AC, 50 Hz/277V AC, 60 Hz
E	380V AC, 60 Hz
N	380...400V AC, 50 Hz/440V AC, 60 Hz
KN	400V AC, 50/60 Hz
G	400...415V AC, 50 Hz
B	440V AC, 50 Hz/480V AC, 60 Hz
M	500V AC, 50 Hz
C	550V AC, 50 Hz/600V AC, 60 Hz

d, continued

DC Coil Voltages for Contactor Size A...D	
Code	Description
EJ	24V DC electronic
AC Coil Voltages for Contactor Size KM...KP	
Code	Description
KJ	24V AC, 50/60 Hz
D	110V AC, 50 Hz/120V AC, 60 Hz
KF	230V AC, 50/60 Hz
KA	240V AC, 50/60 Hz
KN	400V AC, 50/60 Hz
B	440V AC, 50 Hz/480V AC, 60 Hz
VC	525V AC, 50 Hz/600V AC, 60 Hz
DC Coil Voltage for Contactor Sizes KM...KP	
Code	Description
ZQ	12V DC
ZJ	24V DC
DJ	24V DC with integrated diode
ZD	110V DC
ZS	125V DC
ZA	220V DC
ZT	250V DC

e

Contactor Aux. Contacts	
Code	Description
1	1 N.C. (190E, or 191E-KM...KP)
2	1 N.O. (190E, or 191E-KM...KP)
3	1 N.O. + 1 N.C. (191E-A...D)

f

Circuit Breaker Frame Size	
Code	Description
C	C Frame
D	D Frame

g

Circuit Breaker Current Range	
Code	Description
A16	0.1...0.16 A
A25	0.16...0.25 A
A40	0.25...0.4 A
A63	0.4...0.63 A
B10	0.63...1.0 A
B16	1.0...1.6 A
B25	1.6...2.5 A
B40	2.5...4.0 A
B63	4.0...6.3 A
C10	6.3...10 A
C16	10...16 A
C20	16...20 A
C25	20...25 A

h

Circuit Breaker Aux. and Trip Contacts for 140M	
Bottom Front	
Code	Description
X	Without Aux. Trip Contacts
A	1 N.C. Aux. Contact
B	1 N.O. Aux. Contact
C	1 N.O. + 1 N.C. Aux. Contact
D	2 N.O. Aux. Contact
R	1 N.O. (SC+OL) + 1 N.C. Aux. Contact
S	1 N.O. (SC+OL) + 1 N.O. Aux. Contact

i

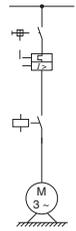
Modifications, Accessories	
Circuit Breaker Accessories	
Code	Description
TE	Spacing Adapter
KN	Lockable Twist Knob, Black
KY	Lockable Twist Knob, Red/Yellow
Additional CB Auxiliaries (Side Mount)	
Code	Description
A02	2 N.C.
A20	2 N.O.
A11	1 N.O. + 1 N.C.
Additional CB Trip Contacts (Side Mount)	
Code	Description
R00	1 N.O. Thermal-Mag + 1 N.O. Mag Only
R01	1 N.O. Thermal-Mag + 1 N.C. Mag Only
R10	1 N.C. Thermal-Mag + 1 N.O. Mag Only
R11	1 N.C. Thermal-Mag + 1 N.C. Mag Only
M11	1 N.O. Mag Only + 1 N.C. Mag Only
Coil Accessories	
Code	Description
JE	Electronic Interface(s)
D	Surge Suppressor Diode
R	Surge Suppressor RC
V	Surge Suppressor Varistor
Additional Contactor Auxiliaries (Side Mount)	
Code	Description
S01	1 N.C.
S10	1 N.O.
S11	1 N.O. + 1 N.C.
S20	2 N.O.
Additional Contactor Auxiliaries (Front Mount)	
Code	Description
F11	1 N.O. + 1 N.C.
F20	2 N.O.
F22	2 N.O. + 2 N.C.



Bulletin 190E Direct On-Line Eco Starters

Note: Verify that the motor protection circuit breaker can be set to the rated motor current!

- 190E/191E Modular Eco Starter using Bulletin 140M Motor Protection Circuit Breaker and Bulletin 100-K/104-K Mini Contactors and Bulletin 100-C/104-C MCS Contactors
- Mounting Options:
Snap Fixing on (1) 35 mm top hat rail



2

Group Motor, Type E and Type F Combination Motor Controllers (UL/CSA)

The 190E/191E motor controllers can be used in a variety of applications. These starters can be used in a group motor application or as a stand-alone product without any additional short-circuit protection in the motor branch circuits.

Most of the 140M-C/D motor protection circuit breakers used in the 190E/191E starters are UL Listed as a manual Type E self-protected combination motor controller. Although there are many tests involved, one of the critical tests a self-protected combination motor controller must pass is to perform 6000 electrical ops. and an additional 4000 mechanical ops. after a short circuit.

By definition, a Type F combination motor controller consists of a Type E manual self protected combination motor controller and a magnetic or solid-state motor controller (such as a 100-C contactor or an SMC). As with a manual Type E self-protected combination motor controller, additional short-circuit protection is not required for the individual motor circuits.

A combination of a 140M manual self protected combination motor controller and 100-C contactor can be listed as a Type E self-protected combination motor controller. In this case, the 140M and 100-C must pass the additional 6000 electrical and 4000 mechanical operational test. In some cases, this may require over sizing of the 140M motor protection circuit breaker or the 100-C contactor to achieve weld-free performance and meet the additional life requirements.

UL/CSA in Group Motor Installations

Motor Current Adjustment Range [A]	UL/CSA Hp Ratings (60 Hz)				Max. Fuse or Circuit Breaker per NEC [A]	Max. Short-Circuit Current [kA]				DOL Starter	Reversing Starter
	Hp Ratings as a UL508 Motor Controller in Group Motor Installations*					Type 1 Coordination		Type 2 Coordination			
	200V	230V	460V	575V		480V	600V	480V	600V	Cat. No.	Cat. No.
C-Frame with 100-K/104-K Mini Contactors											
0.10...0.16	—	—	—	—	450	65	47	65	—	190E-KMN2-CA16X	191E-KMN1-CA16X
0.16...0.25	—	—	—	—	450	65	47	65	—	190E-KMN2-CA25X	191E-KMN1-CA25X
0.25...0.40	—	—	—	—	450	65	47	65	—	190E-KMN2-CA40X	191E-KMN1-CA40X
0.40...0.63	—	—	—	—	450	65	47	65	—	190E-KMN2-CA63X	191E-KMN1-CA63X
0.63...1.00	—	—	1/2	3/4	450	65	47	65	—	190E-KMN2-CB10X	191E-KMN1-CB10X
1.00...1.60	—	—	1/2...1	3/4...1	450	65	47	65	—	190E-KMN2-CB16X	191E-KMN1-CB16X
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	—	—	190E-KMN2-CB25X	191E-KMN1-CB25X
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	—	—	190E-KMN2-CB63X	191E-KMN1-CB63X
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	—	—	190E-KNN2-CB63X	191E-KNN1-CB63X
6.30...9.00	1-1/2...2	2	5	5	450	65	30	—	—	190E-KNN2-CC10X	191E-KNN1-CC10X
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2	450	65	30	—	—	190E-KPN2-CC10X	191E-KPN1-CC10X
10.0...11.0	3	3	7-1/2	7-1/2	450	30	30	—	—	190E-KPN2-CC16X	191E-KPN1-CC16X
C-Frame with 100-C/104-C Contactors											
0.10...0.16	—	—	—	—	450	65	47	65	47	190E-AN2-CA16X	191E-AN3-CA16X
0.16...0.25	—	—	—	—	450	65	47	65	47	190E-AN2-CA25X	191E-AN3-CA25X
0.25...0.40	—	—	—	—	450	65	47	65	47	190E-AN2-CA40X	191E-AN3-CA40X
0.40...0.63	—	—	—	—	450	65	47	65	47	190E-AN2-CA63X	191E-AN3-CA63X
0.63...1.00	—	—	1/2	3/4	450	65	47	65	47	190E-AN2-CB10X	191E-AN3-CB10X
1.00...1.60	—	—	1/2...1	3/4...1	450	65	47	65	47	190E-AN2-CB16X	191E-AN3-CB16X
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	65	10	190E-AN2-CB25X	191E-AN3-CB25X
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	50	—	190E-AN2-CB40X	191E-AN3-CB40X
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	50	—	190E-AN2-CB63X	191E-AN3-CB63X
6.30...9.00	1-1/2...2	2	5	7-1/2	450	65	30	50	—	190E-AN2-CC10X	191E-AN3-CC10X
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	50	—	190E-BN2-CC10X	191E-BN3-CC10X
10.0...12.0	3	3	7-1/2	10	450	30	30	—	—	190E-BN2-CC16X	191E-BN3-CC16X
10.0...16.0	3...5	5	7-1/2...10	10...15	450	30	30	—	—	190E-DN2-CC16X	191E-DN3-CC16X
14.5...20.0	5	5...7-1/2	15	15	450	30	30	—	—	190E-DN2-CC20X	191E-DN3-CC20X
18.0...23.0	5	7-1/2	15	15	450	30	30	—	—	190E-DN2-CC25X	191E-DN3-CC25X
D-Frame with 100-C/104-C Contactors											
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	65	10	190E-AN2-DB25X	191E-AN3-DB25X
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	65	30	190E-DN2-DB25X	191E-DN3-DB25X
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	65	—	190E-AN2-DB40X	191E-AN3-DB40X
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	65	30	190E-DN2-DB40X	191E-DN3-DB40X
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	65	—	190E-AN2-DB63X	191E-AN3-DB63X
6.30...9.00	1-1/2...2	2	5	7-1/2	450	65	30	65	—	190E-AN2-DC10X	191E-AN3-DC10X
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	65	—	190E-BN2-DC10X	191E-BN3-DC10X
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	65	—	190E-CN2-DC10X	191E-CN3-DC10X
10.0...12.0	3	3	7-1/2	10	450	65	30	65	—	190E-BN2-DC16X	191E-BN3-DC16X
10.0...16.0	3...5	5	7-1/2...10	10	450	65	30	65	—	190E-CN2-DC16X	191E-CN3-DC16X
10.0...16.0	3...5	5	7-1/2...10	10...15	450	65	30	65	—	190E-DN2-DC16X	191E-DN3-DC16X
14.5...20.0	5	5...7-1/2	15	15	450	65	30	65	—	190E-DN2-DC20X	191E-DN3-DC20X
18.0...23.0	5	7-1/2	15	15	450	65	30	65	—	190E-DN2-DC25X	191E-DN3-DC25X

* Hp ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

⊗Coil voltage code—see page 2-363

UL/CSA as a UL508 Type F Combination Motor Controller

2

Motor Current Adjustment Range [A]	UL/CSA Hp Ratings (60 Hz)				Max. Short-Circuit Current [kA]				DOL Starter Cat. No.	Reversing Starter Cat. No.
	Hp Ratings as a UL508 Type F Combination Motor Controller*				Type 1 Coordination		Type 2 Coordination			
	200V	230V	460V	575V	480Y/277V	600Y/347V	480Y/277V	600Y/347V		
C-Frame with Bulletin 100-K/104-K Mini Contactors										
0.10...0.16	—	—	—	—	65	47	65	—	190E-KMN®2-CA16X-TE	191E-KMN®1-CA16X-TE
0.16...0.25	—	—	—	—	65	47	65	—	190E-KMN®2-CA25X-TE	191E-KMN®1-CA25X-TE
0.25...0.40	—	—	—	—	65	47	65	—	190E-KMN®2-CA40X-TE	191E-KMN®1-CA40X-TE
0.40...0.63	—	—	—	—	65	47	65	—	190E-KMN®2-CA63X-TE	191E-KMN®1-CA63X-TE
0.63...1.00	—	—	1/2	3/4	65	47	65	—	190E-KMN®2-CB10X-TE	191E-KMN®1-CB10X-TE
1.00...1.60	—	—	1/2...1	3/4...1	65	47	65	—	190E-KMN®2-CB16X-TE	191E-KMN®1-CB16X-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	3/4...2	65	30	—	—	190E-KMN®2-CB25X-TE	191E-KMN®1-CB25X-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	—	—	190E-KMN®2-CB40X-TE	191E-KMN®1-CB40X-TE
4.00...6.30	1...1-1/2	1...2	3...5	—	65	⊕	—	⊕	190E-KNN®2-CB63X-TE	191E-KNN®1-CB63X-TE
6.30...9.00	1-1/2...2	2	5	—	65	⊕	—	⊕	190E-KNN®2-CC10X-TE	191E-KNN®1-CC10X-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	—	65	⊕	—	⊕	190E-KPN®2-CC10X-TE	191E-KPN®1-CC10X-TE
10.0...11.0	3	3	7-1/2	—	30	⊕	—	⊕	190E-KPN®2-CC16X-TE	191E-KPN®1-CC16X-TE
C-Frame with Bulletin 100-C/104-C Contactors										
0.10...0.16	—	—	—	—	65	47	65	47	190E-AN®2-CA16X-TE	191E-AN®3-CA16X-TE
0.16...0.25	—	—	—	—	65	47	65	47	190E-AN®2-CA25X-TE	191E-AN®3-CA25X-TE
0.25...0.40	—	—	—	—	65	47	65	47	190E-AN®2-CA40X-TE	191E-AN®3-CA40X-TE
0.40...0.63	—	—	—	—	65	47	65	47	190E-AN®2-CA63X-TE	191E-AN®3-CA63X-TE
0.63...1.00	—	—	1/2	3/4	65	47	65	47	190E-AN®2-CB10X-TE	191E-AN®3-CB10X-TE
1.00...1.60	—	—	1/2...1	3/4...1	65	47	65	47	190E-AN®2-CB16X-TE	191E-AN®3-CB16X-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	10	190E-AN®2-CB25X-TE	191E-AN®3-CB25X-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	—	—	190E-AN®2-CB40X-TE	191E-AN®3-CB40X-TE
4.00...6.30	1...1-1/2	1...2	3...5	—	65	⊕	—	⊕	190E-AN®2-CB63X-TE	191E-AN®3-CB63X-TE
6.30...9.00	1-1/2...2	2	5	—	65	⊕	—	⊕	190E-AN®2-CC10X-TE	191E-AN®3-CC10X-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	—	65	⊕	—	⊕	190E-BN®2-CC10X-TE	191E-BN®3-CC10X-TE
10.0...12.0	3	3	7-1/2	—	30	⊕	—	⊕	190E-BN®2-CC16X-TE	191E-BN®3-CC16X-TE
10.0...16.0	3...5	5	7-1/2...10	—	30	⊕	—	⊕	190E-CN®2-CC16X-TE	191E-CN®3-CC16X-TE
10.0...16.0	3...5	5	7-1/2...10	—	30	⊕	—	⊕	190E-DN®2-CC16X-TE	191E-DN®3-CC16X-TE
14.5...20.0	5	5...7-1/2	15	—	10	⊕	—	⊕	190E-DN®2-CC20X-TE	191E-DN®3-CC20X-TE
18.0...23.0	—	—	—	—	⊕	⊕	⊕	⊕	190E-DN®2-CC25X-TE	191E-DN®3-CC25X-TE
D-Frame with Bulletin 100-C/104-C Contactors										
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	10	190E-AN®2-DB25X-TE	191E-AN®3-DB25X-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	30	190E-DN®2-DB25X-TE	191E-DN®3-DB25X-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	65	—	190E-AN®2-DB40X-TE	191E-AN®3-DB40X-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	65	30	190E-DN®2-DB40X-TE	191E-DN®3-DB40X-TE
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	65	—	190E-AN®2-DB63X-TE	191E-AN®3-DB63X-TE
6.30...9.00	1-1/2...2	2	5	7-1/2	65	30	65	—	190E-AN®2-DC10X-TE	191E-AN®3-DC10X-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	—	190E-BN®2-DC10X-TE	191E-BN®3-DC10X-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	—	190E-CN®2-DC10X-TE	191E-CN®3-DC10X-TE
10.0...12.0	3	3	7-1/2	10	65	30	65	—	190E-BN®2-DC16X-TE	191E-BN®3-DC16X-TE
10.0...16.0	3...5	5	7-1/2...10	10	65	30	65	—	190E-CN®2-DC16X-TE	191E-CN®3-DC16X-TE
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	—	190E-DN®2-DC16X-TE	191E-DN®3-DC16X-TE
14.5...20.0	5	5...7-1/2	15	—	65	⊕	65	⊕	190E-DN®2-DC20X-TE	191E-DN®3-DC20X-TE
18.0...23.0	5	7-1/2	15	—	65	⊕	65	⊕	190E-DN®2-DC25X-TE	191E-DN®3-DC25X-TE

* Hp ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.
 ⊕ This starter is not valid for application at this horsepower and voltage.

⊗Coil voltage code—see page 2-363

UL/CSA as a UL508 Self-Protected Type E Combination Motor Controller

Motor Current Adjustment Range [A]	UL/CSA Hp Ratings (60 Hz)				Max. Short-Circuit Current [kA]		DOL Starter	Reversing Starter
	Hp Ratings as a UL508 Self-Protected Type E Combination Motor Controller*				480Y/277V	600Y/347V	Cat. No.	Cat. No.
	200V	230V	460V	575V				
C-Frame with Bulletin 100-K/104-K Mini Contactors								
0.10...0.16	—	—	—	—	✦	✦	190E-KMN②-CA16X-TE	191E-KMN①-CA16X-TE
0.16...0.25	—	—	—	—	✦	✦	190E-KMN②-CA25X-TE	191E-KMN①-CA25X-TE
0.25...0.40	—	—	—	—	✦	✦	190E-KMN②-CA40X-TE	191E-KMN①-CA40X-TE
0.40...0.63	—	—	—	—	✦	✦	190E-KMN②-CA63X-TE	191E-KMN①-CA63X-TE
0.63...1.00	—	—	—	—	✦	✦	190E-KMN②-CB10X-TE	191E-KMN①-CB10X-TE
1.00...1.60	—	—	—	—	✦	✦	190E-KMN②-CB16X-TE	191E-KMN①-CB16X-TE
1.60...2.50	—	—	—	—	✦	✦	190E-KMN②-CB25X-TE	191E-KMN①-CB25X-TE
2.50...4.00	—	—	—	—	✦	✦	190E-KMN②-CB40X-TE	191E-KMN①-CB40X-TE
4.00...6.30	—	—	—	—	✦	✦	190E-KNN②-CB63X-TE	191E-KNN①-CB63X-TE
6.30...9.00	—	—	—	—	✦	✦	190E-KNN②-CC10X-TE	191E-KNN①-CC10X-TE
6.30...10.0	—	—	—	—	✦	✦	190E-KPN②-CC10X-TE	191E-KPN①-CC10X-TE
10.0...11.0	—	—	—	—	✦	✦	190E-KPN②-CC16X-TE	191E-KPN①-CC16X-TE
C-Frame with Bulletin 100-C/104-C Contactors								
0.10...0.16	—	—	—	—	65	47	190E-AN②-CA16X-TE	191E-AN③-CA16X-TE
0.16...0.25	—	—	—	—	65	47	190E-AN②-CA25X-TE	191E-AN③-CA25X-TE
0.25...0.40	—	—	—	—	65	47	190E-AN②-CA40X-TE	191E-AN③-CA40X-TE
0.40...0.63	—	—	—	—	65	47	190E-AN②-CA63X-TE	191E-AN③-CA63X-TE
0.63...1.00	—	—	1/2	3/4	65	47	190E-AN②-CB10X-TE	191E-AN③-CB10X-TE
1.00...1.60	—	—	1/2...1	3/4...1	65	47	190E-AN②-CB16X-TE	191E-AN③-CB16X-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	—	65	✦	190E-AN②-CB25X-TE	191E-AN③-CB25X-TE
2.50...4.00	—	—	—	—	✦	✦	190E-AN②-CB40X-TE	191E-AN③-CB40X-TE
4.00...6.30	—	—	—	—	✦	✦	190E-AN②-CB63X-TE	191E-AN③-CB63X-TE
6.30...9.00	—	—	—	—	✦	✦	190E-AN②-CC10X-TE	191E-AN③-CC10X-TE
6.30...10.0	—	—	—	—	✦	✦	190E-BN②-CC10X-TE	191E-BN③-CC10X-TE
10.0...12.0	—	—	—	—	✦	✦	190E-BN②-CC16X-TE	191E-BN③-CC16X-TE
10.0...16.0	—	—	—	—	✦	✦	190E-CN②-CC16X-TE	191E-CN③-CC16X-TE
10.0...16.0	—	—	—	—	✦	✦	190E-DN②-CC16X-TE	191E-DN③-CC16X-TE
14.5...20.0	—	—	—	—	✦	✦	190E-DN②-CC20X-TE	191E-DN③-CC20X-TE
18.0...23.0	—	—	—	—	✦	✦	190E-DN②-CC25X-TE	191E-DN③-CC25X-TE
D-Frame with Bulletin 100-C/104-C Contactors								
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	—	65	✦	190E-AN②-DB25X-TE	191E-AN③-DB25X-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	190E-DN②-DB25X-TE	191E-DN③-DB25X-TE
2.50...4.00	—	—	—	—	✦	✦	190E-AN②-DB40X-TE	191E-AN③-DB40X-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	190E-DN②-DB40X-TE	191E-DN③-DB40X-TE
4.00...6.30	—	—	—	—	✦	✦	190E-AN②-DB63X-TE	191E-AN③-DB63X-TE
6.30...9.00	—	—	—	—	✦	✦	190E-AN②-DC10X-TE	191E-AN③-DC10X-TE
6.30...10.0	—	—	—	—	✦	✦	190E-BN②-DC10X-TE	191E-BN③-DC10X-TE
6.30...10.0	—	—	—	—	✦	✦	190E-CN②-DC10X-TE	191E-CN③-DC10X-TE
10.0...12.0	—	—	—	—	✦	✦	190E-BN②-DC16X-TE	191E-BN③-DC16X-TE
10.0...16.0	—	—	—	—	✦	✦	190E-CN②-DC16X-TE	191E-CN③-DC16X-TE
10.0...16.0	—	—	—	—	✦	✦	190E-DN②-DC16X-TE	191E-DN③-DC16X-TE
14.5...20.0	—	—	—	—	✦	✦	190E-DN②-DC20X-TE	191E-DN③-DC20X-TE
18.0...23.0	—	—	—	—	✦	✦	190E-DN②-DC25X-TE	191E-DN③-DC25X-TE

* Hp ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

✦ This starter is not valid for application at this horsepower and voltage.

⊗Coil voltage code—see page 2-363



IEC Type 1 and Type 2 Short-Circuit Coordination

Motor Current Adjustment Range [A]	IEC kW Ratings for Standard Motors, 1500 rpm				Max. Short-Circuit Current [kA]				Max. Short-Circuit Current [kA]				DOL Starter	Reversing Starter
	Max. kW, 50 Hz*				Type 1 Coordination				Type 2 Coordination				Cat. No.	Cat. No.
	230V	400V	500V	690V	230V	400V	500V	690V	230V	400V	500V	690V		
C-Frame with Bulletin 100-K/104-K Mini Contactors														
0.10...0.16	—	0.02	—	—	100	65	65	65	65	65	—	—	190E-KMN®2-CA16X	191E-KMN®1-CA16X
0.16...0.25	0.02	0.06	0.06	—	100	65	65	65	65	65	—	—	190E-KMN®2-CA25X	191E-KMN®1-CA25X
0.25...0.40	0.06	0.09	0.12	—	100	65	65	65	65	65	—	—	190E-KMN®2-CA40X	191E-KMN®1-CA40X
0.40...0.63	0.09	0.18	0.18	—	100	65	65	65	65	65	—	—	190E-KMN®2-CA63X	191E-KMN®1-CA63X
0.63...1.00	0.12	0.25	0.37	—	100	65	65	65	65	65	—	—	190E-KMN®2-CB10X	191E-KMN®1-CB10X
1.00...1.60	0.25	0.55	0.75	—	100	65	65	10	65	65	—	—	190E-KMN®2-CB16X	191E-KMN®1-CB16X
1.60...2.50	0.55	0.75	1.1	—	100	65	65	8	50	50	—	—	190E-KMN®2-CB25X	191E-KMN®1-CB25X
2.50...4.00	0.75	1.5	2.2	—	100	65	65	8	—	—	—	—	190E-KMN®2-CB40X	191E-KMN®1-CB40X
4.00...6.30	1.5	2.2	2.2	—	100	65	65	4	—	—	—	—	190E-KNN®2-CB63X	191E-KNN®1-CB63X
6.30...9.00	2.2	4	4	—	100	65	65	4	—	—	—	—	190E-KNN®2-CC10X	191E-KNN®1-CC10X
6.30...10.0	2.2	4	4	—	100	65	65	4	—	—	—	—	190E-KPN®2-CC10X	191E-KPN®1-CC10X
10.0...11.0	4	5.5	—	—	100	50	50	3	—	—	—	—	190E-KPN®2-CC16X	191E-KPN®1-CC16X
C-Frame with Bulletin 100-C/104-C Contactors														
0.10...0.16	—	—	0.06	0.06	100	100	65	50	100	100	65	50	190E-AN®2-CA16X	191E-AN®3-CA16X
0.16...0.25	0.02	0.06	0.06	0.12	100	100	65	50	100	100	65	50	190E-AN®2-CA25X	191E-AN®3-CA25X
0.25...0.40	0.06	0.09	0.12	0.18	100	100	65	50	100	100	65	50	190E-AN®2-CA40X	191E-AN®3-CA40X
0.40...0.63	0.09	0.18	0.18	0.37	100	100	65	50	100	100	65	50	190E-AN®2-CA63X	191E-AN®3-CA63X
0.63...1.00	0.12	0.25	0.37	0.55	100	100	65	50	100	100	65	50	190E-AN®2-CB10X	191E-AN®3-CB10X
1.00...1.60	0.25	0.55	0.75	1.1	100	100	65	50	100	100	65	50	190E-AN®2-CB16X	191E-AN®3-CB16X
1.60...2.50	0.55	0.75	1.1	1.8	100	65	50	8	65	50	50	8	190E-AN®2-CB25X	191E-AN®3-CB25X
2.50...4.00	0.75	1.5	2.2	3	100	50	50	8	50	50	—	—	190E-AN®2-CB40X	191E-AN®3-CB40X
4.00...6.30	1.5	2.2	3	4	100	50	50	4	50	50	—	—	190E-AN®2-CB63X	191E-AN®3-CB63X
6.30...9.00	2.2	4	4	—	100	65	50	—	50	50	—	—	190E-AN®2-CC10X	191E-AN®3-CC10X
6.30...10.0	2.2	4	5.5	5.5	100	65	50	4	50	50	50	—	190E-BN®2-CC10X	191E-BN®3-CC10X
6.30...10.0	2.2	4	5.5	7.5	100	65	50	4	50	50	50	—	190E-CN®2-CC10X	191E-CN®3-CC10X
10.0...12.0	4	5.5	—	—	100	65	—	—	50	50	—	—	190E-BN®2-CC16X	191E-BN®3-CC16X
10.0...16.0	4	7.5	7.5	—	100	50	10	—	50	—	—	—	190E-CN®2-CC16X	191E-CN®3-CC16X
10.0...16.0	4	7.5	10	10	100	50	10	3	50	50	—	—	190E-DN®2-CC16X	191E-DN®3-CC16X
14.5...20.0	4	10	11	—	50	15	6	—	15	—	—	—	190E-DN®2-CC20X	191E-DN®3-CC20X
18.0...23.0	6.3	11	13	—	50	15	6	—	15	—	—	—	190E-DN®2-CC25X	191E-DN®3-CC25X
D-Frame with Bulletin 100-C/104-C Contactors														
1.60...2.50	0.55	0.75	1.1	1.8	100	100	50	10	100	100	50	10	190E-AN®2-DB25X	191E-AN®3-DB25X
1.60...2.50	0.55	0.75	1.1	1.8	100	100	50	10	100	100	50	10	190E-DN®2-DB25X	191E-DN®3-DB25X
2.50...4.00	0.75	1.5	2.2	3	100	100	50	10	100	100	50	—	190E-AN®2-DB40X	191E-AN®3-DB40X
2.50...4.00	0.75	1.5	2.2	3	100	100	50	50	100	100	50	50	190E-DN®2-DB40X	191E-DN®3-DB40X
4.00...6.30	1.5	2.2	3	4	100	100	50	50	100	100	50	—	190E-AN®2-DB63X	191E-AN®3-DB63X
6.30...9.00	2.2	4	4	—	100	65	50	—	100	65	—	—	190E-AN®2-DC10X	191E-AN®3-DC10X
6.30...10.0	2.2	4	5.5	5.5	100	100	65	50	100	100	65	—	190E-BN®2-DC10X	191E-BN®3-DC10X
6.30...10.0	2.2	4	5.5	7.5	100	100	65	50	100	100	65	50	190E-CN®2-DC10X	191E-CN®3-DC10X
10.0...12.0	4	5.5	—	—	100	65	—	—	65	65	—	—	190E-BN®2-DC16X	191E-BN®3-DC16X
10.0...16.0	4	7.5	7.5	—	100	65	50	—	65	65	50	—	190E-CN®2-DC16X	191E-CN®3-DC16X
10.0...16.0	4	7.5	10	10	100	65	50	6	65	65	50	—	190E-DN®2-DC16X	191E-DN®3-DC16X
14.5...20.0	4	10	11	—	65	65	25	—	65	65	25	—	190E-DN®2-DC20X	191E-DN®3-DC20X
18.0...23.0	6.3	11	13	—	65	50	25	—	65	50	25	—	190E-DN®2-DC25X	191E-DN®3-DC25X

* kW ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

⊗Coil voltage code—see page 2-363

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Bulletin 190E/191E Eco Starters with Bulletin 100-K/104-K Mini Contactors

⊗ Coil Voltage Codes for AC or DC Control

Voltage [V]	24	110	120	230	240	400	480	600
50 Hz	—	D	—	—	—	—	—	—
60 Hz	—	—	D	—	—	—	B	VC
50/60 Hz	KJ	—	—	KF	KA	KN	—	—
Voltage [V]	12	24	110	125	220	250		
DC	ZQ	ZJ	ZD	ZS	ZA	ZT		
DC w/ Diode	—	DJ	—	—	—	—		

Bulletin 190E/191E Eco Starters with Bulletin 100-C/104-C MCS Contactors

⊗ Coil Voltage Codes for AC or DC Control

Voltage [V]	12	24	32	36	42	48	100	100... 110	110	120	127	200	200... 220	200... 230	208	208... 240
50 Hz	R	K	V	W	X	Y	KP	—	D	P	S	KG	L	—	—	—
60 Hz	Q	J	—	V	—	X	—	KP	—	D	—	—	KG	—	H	L
50/60 Hz	—	KJ	—	—	—	KY	KP	—	KD	—	—	KG	—	KL	—	—
Voltage [V]	220... 230	230	230... 240	240	277	347	380	380... 400	400	400... 415	440	480	500	550	600	
50 Hz	F	—	VA	T	—	—	—	N	—	G	B	—	M	C	—	
60 Hz	—	—	—	A	T	I	E	—	—	—	N	B	—	—	C	
50/60 Hz	—	KF	—	KA	—	—	—	—	KN	—	KB	—	—	—	—	
Voltage [V]	24															
DC	EJ															

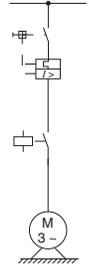
Bulletin 190S/191S

Compact Combination Starters

Product Selection

Bulletin 190S Direct On-Line Compact Starters

- 190S Compact Starter using Bulletin 140M Motor Protection Circuit Breaker and Bulletin 100-C Contactor
- Short-Circuit Coordination Type "1" and "2" according to IEC 60947-4-1
- Complete unit, ready for connection with internal wiring
- Accessories: Bulletin 140M Circuit Breakers and 100-C Contactors
- Removable cover
- IEC and cULus Certified
- Auxiliary Contacts Wired to Terminal Block at Bottom of Starter Assembly
- Mounting Versions:
 - Screw Fixing
 - Snap Fixing on (1) or (2) 35 mm top hat rails
 - Snap Fixing on (1) 75 mm top hat rail



2

Group Motor, Type E and Type F Combination Motor Controllers (UL/CSA)

The 190S/191S motor controllers can be used in a variety of applications. These starters can be used in a group motor application or as a stand alone product without any additional short-circuit protection in the motor branch circuits.

Most of the 140M-C/D motor protection circuit breakers used in the 190S/191S starters are UL Listed as a manual Type E self-protected combination motor controller. Although there are many tests involved, one of the critical tests that the self-protected combination motor controller must pass is to perform 6000 electrical ops. and an additional 4000 mechanical ops. after a short circuit.

By definition, a Type F combination motor controller consists of a Type E manual self-protected combination motor controller and a magnetic or solid-state motor controller (e.g., a 100-C contactor or an SMC). As with a manual Type E self-protected combination motor controller, additional short-circuit protection is not required for the individual motor circuits.

The combination of a 140M manual self-protected combination motor controller and 100-C contactor can be listed as a Type E self-protected combination motor controller. In this case, the 140M and 100-C must pass the additional 6000 electrical and 4000 mechanical operational test. In some cases, this may require oversizing the 140M motor protection circuit breaker or the 100-C contactor to achieve weld-free performance and meet the additional life requirements.

NOTE: Verify that the motor protection circuit breaker can be set to the rated motor current.

UL/CSA in Group Motor Installations

Motor Current Adjustment Range [A]	UL/CSA Hp Ratings (60 Hz)				Max. Fuse or Circuit Breaker per NEC [A]	Max. Short-Circuit Current [kA]				DOL Starter Cat. No.	Reversing Starter (AC coils only) Cat. No.
	Hp Ratings as a UL508 Motor Controller in Group Motor Installations*					Type 1 Coordination		Type 2 Coordination			
	200V	230V	460V	575V		480V	600V	480V	600V		
C-Frame with Bulletin 100-C/104-C Contactors											
0.10...0.16	—	—	—	—	450	65	47	65	47	190S-AN®2-CA16C	191S-AN®3-CA16C
0.16...0.25	—	—	—	—	450	65	47	65	47	190S-AN®2-CA25C	191S-AN®3-CA25C
0.25...0.40	—	—	—	—	450	65	47	65	47	190S-AN®2-CA40C	191S-AN®3-CA40C
0.40...0.63	—	—	—	—	450	65	47	65	47	190S-AN®2-CA63C	191S-AN®3-CA63C
0.63...1.00	—	—	1/2	3/4	450	65	47	65	47	190S-AN®2-CB10C	191S-AN®3-CB10C
1.00...1.60	—	—	1/2...1	3/4...1	450	65	47	65	47	190S-AN®2-CB16C	191S-AN®3-CB16C
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	65	10	190S-AN®2-CB25C	191S-AN®3-CB25C
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	50	—	190S-AN®2-CB40C	191S-AN®3-CB40C
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	50	—	190S-AN®2-CB63C	191S-AN®3-CB63C
6.30...9.00	1-1/2...2	2	5	7-1/2	450	65	30	50	—	190S-AN®2-CC10C	191S-AN®3-CC10C
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	50	—	190S-BN®2-CC10C	191S-BN®3-CC10C
10.0...12.0	3	3	7-1/2	10	450	30	30	—	—	190S-BN®2-CC16C	191S-BN®3-CC16C
10.0...16.0	3...5	5	7-1/2...10	10	450	30	30	—	—	190S-CN®2-CC16C	191S-CN®3-CC16C
10.0...16.0	3...5	5	7-1/2...10	10...15	450	30	30	—	—	190S-DN®2-CC16C	191S-DN®3-CC16C
14.5...20.0	5	5...7-1/2	15	15	450	30	30	—	—	190S-DN®2-CC20C	191S-DN®3-CC20C
18.0...23.0	5	7-1/2	15	15	450	30	30	—	—	190S-DN®2-CC25C	191S-DN®3-CC25C
D-Frame with Bulletin 100-C/104-C Contactors											
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	65	10	190S-AN®2-DB25C	191S-AN®3-DB25C
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	65	30	190S-DN®2-DB25C	191S-DN®3-DB25C
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	65	—	190S-AN®2-DB40C	191S-AN®3-DB40C
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	65	30	190S-DN®2-DB40C	191S-DN®3-DB40C
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	65	—	190S-AN®2-DB63C	191S-AN®3-DB63C
6.30...9.00	1-1/2...2	2	5	7-1/2	450	65	30	65	—	190S-AN®2-DC10C	191S-AN®3-DC10C
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	65	—	190S-BN®2-DC10C	191S-BN®3-DC10C
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	65	—	190S-CN®2-DC10C	191S-CN®3-DC10C
10.0...12.0	3	3	7-1/2	10	450	65	30	65	—	190S-BN®2-DC16C	191S-BN®3-DC16C
10.0...16.0	3...5	5	7-1/2...10	10	450	65	30	65	—	190S-CN®2-DC16C	191S-CN®3-DC16C
10.0...16.0	3...5	5	7-1/2...10	10...15	450	65	30	65	—	190S-DN®2-DC16C	191S-DN®3-DC16C
14.5...20.0	5	5...7-1/2	15	15	450	65	30	65	—	190S-DN®2-DC20C	191S-DN®3-DC20C
18.0...23.0	5	7-1/2	15	15	450	65	30	65	—	190S-DN®2-DC25C	191S-DN®3-DC25C
F-Frame with Bulletin 100-C/104-C Contactors											
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	600	65	30	65	30	190S-EN®3-FC10C	—
10.0...16.0	3...5	5	7-1/2...10	10...15	600	65	30	65	30	190S-EN®3-FC16C	—
14.5...20.0	5	5...7-1/2	15	15...20	600	65	30	65	30	190S-EN®3-FC20C	—
18.0...25.0	7-1/2	7-1/2...10	15...20	20	600	65	30	65	30	190S-EN®3-FC25C	—
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	600	65	30	65	30	190S-GN®3-FC25C	—
23.0...30.0	7-1/2	10	20	25	600	65	30	65	30	190S-EN®3-FC32C	—
23.0...32.0	7-1/2...10	10	20...25	30	600	65	30	65	30	190S-FN®3-FC32C	—
23.0...32.0	7-1/2...10	10	20...25	30	600	65	30	65	30	190S-GN®3-FC32C	—
32.0...37.0	10	10	25	30	600	65	18	65	10	190S-FN®3-FC45C	—
32.0...43.0	10	15	30	30	600	65	18	65	10	190S-GN®3-FC45C	—

* Hp ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

⊗Coil voltage code—see page 2-369



Compact Combination Starters

Product Selection & Coordination Ratings

UL/CSA as a UL508 Type F Combination Motor Controller

Motor Current Adjustment Range [A]	UL/CSA Hp Ratings (60 Hz)				Max. Short-Circuit Current [kA]				DOL Starter Cat. No.	Reversing Starter Cat. No.
	Hp Ratings as a UL508 Type F Combination Motor Controller*				Type 1 Coordination		Type 2 Coordination			
	200V	230V	460V	575V	480Y/277V	600Y/347V	480Y/277V	600Y/347V		
C-Frame with Bulletin 100-C/104-C Contactors and Spacing Adapter										
0.10...0.16	—	—	—	—	65	47	65	47	190S-AN®2-CA16C-TE	191S-AN®3-CA16C-TE
0.16...0.25	—	—	—	—	65	47	65	47	190S-AN®2-CA25C-TE	191S-AN®3-CA25C-TE
0.25...0.40	—	—	—	—	65	47	65	47	190S-AN®2-CA40C-TE	191S-AN®3-CA40C-TE
0.40...0.63	—	—	—	—	65	47	65	47	190S-AN®2-CA63C-TE	191S-AN®3-CA63C-TE
0.63...1.00	—	—	1/2	3/4	65	47	65	47	190S-AN®2-CB10C-TE	191S-AN®3-CB10C-TE
1.00...1.60	—	—	1/2...1	3/4...1	65	47	65	47	190S-AN®2-CB16C-TE	191S-AN®3-CB16C-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	10	190S-AN®2-CB25C-TE	191S-AN®3-CB25C-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	—	—	190S-AN®2-CB40C-TE	191S-AN®3-CB40C-TE
4.00...6.30	1...1-1/2	1...2	3...5	—	65	❖	—	❖	190S-AN®2-CB63C-TE	191S-AN®3-CB63C-TE
6.30...9.00	1-1/2...2	2	5	—	65	❖	—	❖	190S-AN®2-CC10C-TE	191S-AN®3-CC10C-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	—	65	❖	—	❖	190S-BN®2-CC10C-TE	191S-BN®3-CC10C-TE
10.0...12.0	3	3	7-1/2	—	30	❖	—	❖	190S-BN®2-CC16C-TE	191S-BN®3-CC16C-TE
10.0...16.0	3...5	5	7-1/2...10	—	30	❖	—	❖	190S-CN®2-CC16C-TE	191S-CN®3-CC16C-TE
10.0...16.0	3...5	5	7-1/2...10	—	30	❖	—	❖	190S-DN®2-CC16C-TE	191S-DN®3-CC16C-TE
14.5...20.0	5	5...7-1/2	15	—	10	❖	—	❖	190S-DN®2-CC20C-TE	191S-DN®3-CC20C-TE
18.0...23.0	—	—	—	—	❖	❖	❖	❖	190S-DN®2-CC25C-TE	191S-DN®3-CC25C-TE
D-Frame with Bulletin 100-C/104-C Contactors and Spacing Adapter										
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	10	190S-AN®2-DB25C-TE	191S-AN®3-DB25C-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	30	190S-DN®2-DB25C-TE	191S-DN®3-DB25C-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	65	—	190S-AN®2-DB40C-TE	191S-AN®3-DB40C-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	65	30	190S-DN®2-DB40C-TE	191S-DN®3-DB40C-TE
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	65	—	190S-AN®2-DB63C-TE	191S-AN®3-DB63C-TE
6.30...9.00	1-1/2...2	2	5	7-1/2	65	30	65	—	190S-AN®2-DC10C-TE	191S-AN®3-DC10C-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	—	190S-BN®2-DC10C-TE	191S-BN®3-DC10C-TE
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	—	190S-CN®2-DC10C-TE	191S-CN®3-DC10C-TE
10.0...12.0	3	3	7-1/2	10	65	30	65	—	190S-BN®2-DC16C-TE	191S-BN®3-DC16C-TE
10.0...16.0	3...5	5	7-1/2...10	10	65	30	65	—	190S-CN®2-DC16C-TE	191S-CN®3-DC16C-TE
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	—	190S-DN®2-DC16C-TE	191S-DN®3-DC16C-TE
14.5...20.0	5	5...7-1/2	15	—	65	❖	65	❖	190S-DN®2-DC20C-TE	191S-DN®3-DC20C-TE
18.0...23.0	5	7-1/2	15	—	65	❖	65	❖	190S-DN®2-DC25C-TE	191S-DN®3-DC25C-TE
F-Frame with Bulletin 100-C/104-C Contactors and Spacing Adapter										
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	30	190S-EN®3-FC10C-TE	—
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	30	190S-EN®3-FC16C-TE	—
14.5...20.0	5	5...7-1/2	15	15...20	65	30	65	30	190S-EN®3-FC20C-TE	—
18.0...25.0	7-1/2	7-1/2...10	15...20	20	65	30	65	30	190S-EN®3-FC25C-TE	—
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	65	30	65	30	190S-GN®3-FC25C-TE	—
23.0...30.0	7-1/2	10	20	25	65	30	65	30	190S-EN®3-FC32C-TE	—
23.0...32.0	7-1/2...10	10	20...25	30	65	30	65	30	190S-FN®3-FC32C-TE	—
23.0...32.0	7-1/2...10	10	20...25	30	65	30	65	30	190S-GN®3-FC32C-TE	—
32.0...37.0	10	10	25	—	65	❖	65	❖	190S-FN®3-FC45C-TE	—
32.0...43.0	10	15	30	—	65	❖	65	❖	190S-GN®3-FC45C-TE	—

* Hp ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

❖ This starter is not valid for application at this horsepower and voltage.

⊗Coil voltage code—see page 2-369

2



UL/CSA as a UL508 Self-Protected Type E Combination Motor Controller

Motor Current Adjustment Range [A]	UL/CSA Hp Ratings (60 Hz)				Max. Short-Circuit Current [kA]		DOL Starter	Reversing Starter
	Hp Ratings as a UL508 Self-Protected Type E Combination Motor Controller*				480Y/277V	600Y/347V	Cat. No.	Cat. No.
	200V	230V	460V	575V				
C-Frame with Bulletin 100-C/104-C Contactors and Spacing Adapter								
0.10...0.16	—	—	—	—	65	47	190S-AN®2-CA16C-TE	191S-AN®3-CA16C-TE
0.16...0.25	—	—	—	—	65	47	190S-AN®2-CA25C-TE	191S-AN®3-CA25C-TE
0.25...0.40	—	—	—	—	65	47	190S-AN®2-CA40C-TE	191S-AN®3-CA40C-TE
0.40...0.63	—	—	—	—	65	47	190S-AN®2-CA63C-TE	191S-AN®3-CA63C-TE
0.63...1.00	—	—	1/2	3/4	65	47	190S-AN®2-CB10C-TE	191S-AN®3-CB10C-TE
1.00...1.60	—	—	1/2...1	3/4...1	65	47	190S-AN®2-CB16C-TE	191S-AN®3-CB16C-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	—	65	❖	190S-AN®2-CB25C-TE	191S-AN®3-CB25C-TE
2.50...4.00	—	—	—	—	❖	❖	190S-AN®2-CB40C-TE	191S-AN®3-CB40C-TE
4.00...6.30	—	—	—	—	❖	❖	190S-AN®2-CB63C-TE	191S-AN®3-CB63C-TE
6.30...9.00	—	—	—	—	❖	❖	190S-AN®2-CC10C-TE	191S-AN®3-CC10C-TE
6.30...10.0	—	—	—	—	❖	❖	190S-BN®2-CC10C-TE	191S-BN®3-CC10C-TE
10.0...12.0	—	—	—	—	❖	❖	190S-BN®2-CC16C-TE	191S-BN®3-CC16C-TE
10.0...16.0	—	—	—	—	❖	❖	190S-CN®2-CC16C-TE	191S-CN®3-CC16C-TE
10.0...16.0	—	—	—	—	❖	❖	190S-DN®2-CC16C-TE	191S-DN®3-CC16C-TE
14.5...20.0	—	—	—	—	❖	❖	190S-DN®2-CC20C-TE	191S-DN®3-CC20C-TE
18.0...23.0	—	—	—	—	❖	❖	190S-DN®2-CC25C-TE	191S-DN®3-CC25C-TE
D-Frame with Bulletin 100-C/104-C Contactors and Spacing Adapter								
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	—	65	❖	190S-AN®2-DB25C-TE	191S-AN®3-DB25C-TE
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	190S-DN®2-DB25C-TE	191S-DN®3-DB25C-TE
2.50...4.00	—	—	—	—	❖	❖	190S-AN®2-DB40C-TE	191S-AN®3-DB40C-TE
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	190S-DN®2-DB40C-TE	191S-DN®3-DB40C-TE
4.00...6.30	—	—	—	—	❖	❖	190S-AN®2-DB63C-TE	191S-AN®3-DB63C-TE
6.30...9.00	—	—	—	—	❖	❖	190S-AN®2-DC10C-TE	191S-AN®3-DC10C-TE
6.30...10.0	—	—	—	—	❖	❖	190S-BN®2-DC10C-TE	191S-BN®3-DC10C-TE
6.30...10.0	—	—	—	—	❖	❖	190S-CN®2-DC10C-TE	191S-CN®3-DC10C-TE
10.0...12.0	—	—	—	—	❖	❖	190S-BN®2-DC16C-TE	191S-BN®3-DC16C-TE
10.0...16.0	—	—	—	—	❖	❖	190S-CN®2-DC16C-TE	191S-CN®3-DC16C-TE
10.0...16.0	—	—	—	—	❖	❖	190S-DN®2-DC16C-TE	191S-DN®3-DC16C-TE
14.5...20.0	—	—	—	—	❖	❖	190S-DN®2-DC20C-TE	191S-DN®3-DC20C-TE
18.0...23.0	—	—	—	—	❖	❖	190S-DN®2-DC25C-TE	191S-DN®3-DC25C-TE
F-Frame with Bulletin 100-C/104-C Contactors and Spacing Adapter								
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	190S-EN®3-FC10C-TE	—
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	190S-EN®3-FC16C-TE	—
14.5...20.0	5	5...7-1/2	15	15...20	65	30	190S-EN®3-FC20C-TE	—
18.0...25.0	7-1/2	7-1/2...10	15...20	20	65	30	190S-EN®3-FC25C-TE	—
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	65	30	190S-GN®3-FC25C-TE	—
23.0...30.0	7-1/2	10	20	25	65	30	190S-EN®3-FC32C-TE	—
23.0...32.0	7-1/2...10	10	20...25	30	65	30	190S-FN®3-FC32C-TE	—
23.0...32.0	7-1/2...10	10	20...25	30	65	30	190S-GN®3-FC32C-TE	—
32.0...37.0	10	10	25	—	65	❖	190S-FN®3-FC45C-TE	—
32.0...43.0	10	15	30	—	65	❖	190S-GN®3-FC45C-TE	—

* Hp ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

❖ This starter is not valid for application at this horsepower and voltage.

⊗Coil voltage code—see page 2-369



Bulletin 190S/191S
Compact Combination Starters
 Product Selection & Coordination Ratings

IEC Type 1 and Type 2 Short-Circuit Coordination

Motor Current Adjustment Range [A]	IEC kW Ratings for Standard Motors, 1500 rpm				Max. Short-Circuit Current [kA]								DOL Starter Cat. No.	Reversing Starter Cat. No.
	Max. kW, 50 Hz*				Type 1 Coordination				Type 2 Coordination					
	230V	400V	500V	690V	230V	400V	500V	690V	230V	400V	500V	690V		
C-Frame with Bulletin 100-C/104-C Contactors														
0.10...0.16	—	—	0.06	0.06	100	100	65	50	100	100	65	50	190S-AN®2-CA16C	191S-AN®3-CA16C
0.16...0.25	0.02	0.06	0.06	0.12	100	100	65	50	100	100	65	50	190S-AN®2-CA25C	191S-AN®3-CA25C
0.25...0.40	0.06	0.09	0.12	0.18	100	100	65	50	100	100	65	50	190S-AN®2-CA40C	191S-AN®3-CA40C
0.40...0.63	0.09	0.18	0.18	0.37	100	100	65	50	100	100	65	50	190S-AN®2-CA63C	191S-AN®3-CA63C
0.63...1.00	0.12	0.25	0.37	0.55	100	100	65	50	100	100	65	50	190S-AN®2-CB10C	191S-AN®3-CB10C
1.00...1.60	0.25	0.55	0.75	1.1	100	100	65	50	100	100	65	50	190S-AN®2-CB16C	191S-AN®3-CB16C
1.60...2.50	0.55	0.75	1.1	1.8	100	65	50	8	65	50	50	8	190S-AN®2-CB25C	191S-AN®3-CB25C
2.50...4.00	0.75	1.5	2.2	3	100	50	50	8	50	50	—	—	190S-AN®2-CB40C	191S-AN®3-CB40C
4.00...6.30	1.5	2.2	3	4	100	50	50	4	50	50	—	—	190S-AN®2-CB63C	191S-AN®3-CB63C
6.30...9.00	2.2	4	4	—	100	65	50	—	50	50	—	—	190S-AN®2-CC10C	191S-AN®3-CC10C
6.30...10.0	2.2	4	5.5	5.5	100	65	50	4	50	50	50	—	190S-BN®2-CC10C	191S-BN®3-CC10C
6.30...10.0	2.2	4	5.5	7.5	100	65	50	4	50	50	50	—	190S-CN®2-CC10C	191S-BN®3-CC10C
10.0...12.0	4	5.5	—	—	100	65	—	—	50	50	—	—	190S-BN®2-CC16C	191S-BN®3-CC16C
10.0...16.0	4	7.5	7.5	—	100	50	10	—	50	—	—	—	190S-CN®2-CC16C	191S-CN®3-CC16C
10.0...16.0	4	7.5	10	10	100	50	10	3	50	50	—	—	190S-DN®2-CC16C	191S-DN®3-CC16C
14.5...20.0	4	10	11	—	50	15	6	—	15	—	—	—	190S-DN®2-CC20C	191S-DN®3-CC20C
18.0...23.0	6.3	11	13	—	50	15	6	—	15	—	—	—	190S-DN®2-CC25C	191S-DN®3-CC25C
D-Frame with Bulletin 100-C/104-C Contactors														
1.60...2.50	0.55	0.75	1.1	1.8	100	100	50	10	100	100	50	10	190S-AN®2-DB25C	191S-AN®3-DB25C
1.60...2.50	0.55	0.75	1.1	1.8	100	100	50	10	100	100	50	10	190S-DN®2-DB25C	191S-DN®3-DB25C
2.50...4.00	0.75	1.5	2.2	3	100	100	50	10	100	100	50	—	190S-AN®2-DB40C	191S-AN®3-DB40C
2.50...4.00	0.75	1.5	2.2	3	100	100	50	50	100	100	50	50	190S-DN®2-DB40C	191S-DN®3-DB40C
4.00...6.30	1.5	2.2	3	4	100	100	50	50	100	100	50	—	190S-AN®2-DB63C	191S-AN®3-DB63C
6.30...9.00	2.2	4	4	—	100	65	50	—	100	65	—	—	190S-AN®2-DC10C	191S-AN®3-DC10C
6.30...10.0	2.2	4	5.5	5.5	100	100	65	50	100	100	65	—	190S-BN®2-DC10C	191S-BN®3-DC10C
6.30...10.0	2.2	4	5.5	7.5	100	100	65	50	100	100	65	50	190S-CN®2-DC10C	191S-CN®3-DC10C
10.0...12.0	4	5.5	—	—	100	65	—	—	65	65	—	—	190S-BN®2-DC16C	191S-BN®3-DC16C
10.0...16.0	4	7.5	7.5	—	100	65	50	—	65	65	50	—	190S-CN®2-DC16C	191S-CN®3-DC16C
10.0...16.0	4	7.5	10	10	100	65	50	6	65	65	50	—	190S-DN®2-DC16C	191S-DN®3-DC16C
14.5...20.0	4	10	11	—	65	65	25	—	65	65	25	—	190S-DN®2-DC20C	191S-DN®3-DC20C
18.0...23.0	6.3	11	13	—	65	50	25	—	65	50	25	—	190S-DN®2-DC25C	191S-DN®3-DC25C
F-Frame with Bulletin 100-C/104-C Contactors														
6.30...10.0	2.2	4	5.5	7.5	100	100	50	50	100	100	50	50	190S-EN®3-FC10C	—
10.0...16.0	4	7.5	10	13	100	100	50	50	100	100	50	50	190S-EN®3-FC16C	—
14.5...20.0	4	10	11	15	100	100	50	50	100	100	50	50	190S-EN®3-FC20C	—
18.0...25.0	6.3	11	15	—	100	100	50	—	100	100	50	—	190S-EN®3-FC25C	—
18.0...25.0	6.3	11	15	22	100	100	50	50	100	100	50	50	190S-GN®3-FC25C	—
23.0...30.0	7.5	15	15	—	100	100	50	—	100	100	50	—	190S-EN®3-FC32C	—
23.0...32.0	7.5	15	20	—	100	100	50	—	100	100	50	—	190S-FN®3-FC32C	—
23.0...32.0	7.5	15	20	22	100	100	50	50	100	100	50	50	190S-GN®3-FC32C	—
32.0...37.0	11	18.5	—	—	100	100	—	—	100	100	—	—	190S-FN®3-FC45C	—
32.0...43.0	13	22	25	—	100	100	50	—	100	100	50	—	190S-GN®3-FC45C	—

* kW ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

⊗Coil voltage code—see page 2-369

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Bulletin 190S/191S Compact Combination Starters

⊗ **Coil Voltage Codes for AC Control**

[V]	12	24	32	36	42	48	100	100-110	110	120	127	200	200-220	200-230	208	208-240
AC, 50 Hz	R	K	V	W	X	Y	KP	—	D	P	S	KG	L	—	—	—
AC, 60 Hz	Q	J	—	V	—	X	—	KP	—	D	—	—	KG	—	H	L
AC, 50/60 Hz	—	KJ	—	—	—	KY	KP	—	KD	—	—	KG	—	KL	—	—
[V]	220-230	230	230-240	240	277	347	380	380-400	400	400-415	440	480	500	550	600	
AC, 50 Hz	F	—	VA	T	—	—	—	N	—	G	B	—	M	C	—	
AC, 60 Hz	—	—	—	A	T	I	E	—	—	—	N	B	—	—	C	
AC, 50/60 Hz	—	KF	—	KA	—	—	—	—	KN	—	KB	—	—	—	—	



⊗ **Coil Voltage Codes for DC Control (Bulletin 190S only)**

[V]	9	12	24	36	48	60	64	72	80	110	115	125	220	230	250
Standard	ZR	ZQ	ZJ	ZW	ZY	ZZ	ZB	ZG	ZE	ZD	ZP	ZS	ZA	ZF	ZT
with Integrated Diode	—	—	DJ	—	—	—	—	—	—	—	—	—	—	—	—
Electronic*	—	—	EJ	—	—	—	—	—	—	—	—	—	—	—	—

* Also available for Bulletin 191S starters.

Bulletin 190/191
Eco & Compact Combination Starters
 Factory-Installed Options

Bulletin 190E/191E/190S/191S Factory-Installed Modifications

Note: For modifications change (option code †) and — add (option code §) for desired features to cat. no.

* Change option code X to desired auxiliary contact: 190E-KMND2-CA16X

Bulletin 140M Auxiliary and Trip Contacts		190E	191E	190S	191S
X	Without Auxiliary and Trip Contacts	Standard	Standard	NA	NA
A	Auxiliary Contact 1 N.C.	Available	Available	NA	NA
B	Auxiliary Contact 1 N.O.	Available	Available	NA	NA
C	Auxiliary Contact 1 N.O. + 1 N.C.	Available	Available	Standard	Standard
D	Auxiliary Contact 2 N.O.	Available	Available	Available	Available
E	Auxiliary Contact 2 N.C.	Available	Available	Available	Available
R	1 N.O. Trip + 1 N.C. Auxiliary Contact	Available	Available	Available	Available
S	1 N.O. Trip + 1 N.O. Auxiliary Contact	Available	Available	Available	Available

‡ Add desired option codes AFTER auxiliary contact option code: 190S-AND2-CA16X-KY

Modifications, Accessories		190E	191E	190S	191S
JE †	Electronic Interfaces (100-C)	Available	Available	Available	Available
R †	Surge Suppressor RC (100-C)	Available	Available	Available	Available
V †	Surge Suppressor Varistor (100-C)	Available	Available	Available	Available
D †	Surge Suppressor Diode (100-C)	Available	Available	Available	Available
KN	Lockable Twist Knob (140M) - Black	Available	Available	Available	Available
KY	Lockable Twist Knob (140M) - Red/Yellow	Available	Available	Available	Available
TE	Spacing Adapter for UL508 Type E and Type F	Available	Available	Available	Available

Additional Contactor Auxiliaries (Side Mount) §

S01 †	1 N.C.	Available	Available	Available	Available
S10 †	1 N.O.	Available	Available	Available	Available
S11 †	1 N.O. + 1 N.C.	Available	Available	Available	Available
S20 †	2 N.O.	Available	Available	Available	Available

Additional Contactor Auxiliaries (Front Mount)

F11 †	1 N.O. + 1 N.C.	Available	Available	NA	NA
F20 †	2 N.O.	Available	Available	NA	NA
F22 †	2 N.O. + 2 N.C.	Available	Available	NA	NA

Additional Bulletin 140M Auxiliaries (Side Mount)

A02	2 N.C.	Available	Available	Available	Available
A20	2 N.O.	Available	Available	Available	Available
A11	1 N.O. + 1 N.C.	Available	Available	Available	Available

Additional Bulletin 140M Trip Contacts (Side Mount)

R00	1 N.O. Thermal-Mag + 1 N.O. Mag Only	Available	Available	Available	Available
R01	1 N.O. Thermal-Mag + 1 N.C. Mag Only	Available	Available	Available	Available
R10	1 N.C. Thermal-Mag + 1 N.O. Mag Only	Available	Available	Available	Available
R11	1 N.C. Thermal-Mag + 1 N.C. Mag Only	Available	Available	Available	Available
M11	1 N.O. Mag Only + 1 N.C. Mag Only	Available	Available	Available	Available

† 191E and 191S Reversing Eco Starters will have two of these accessories installed (one on each contactor).

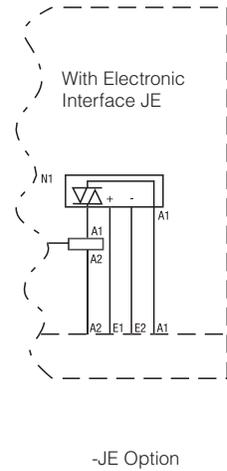
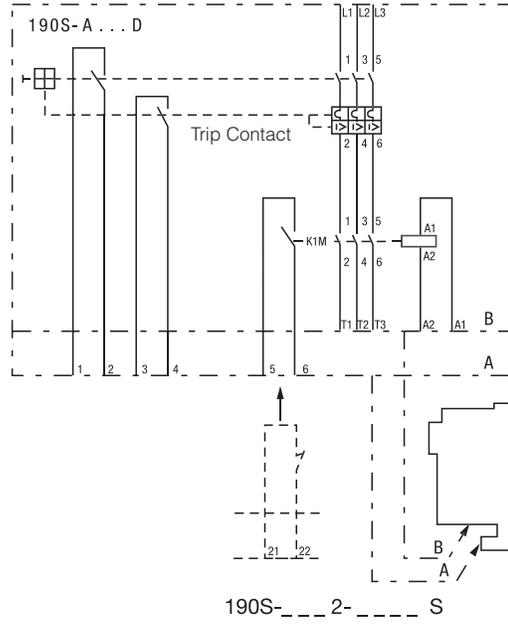
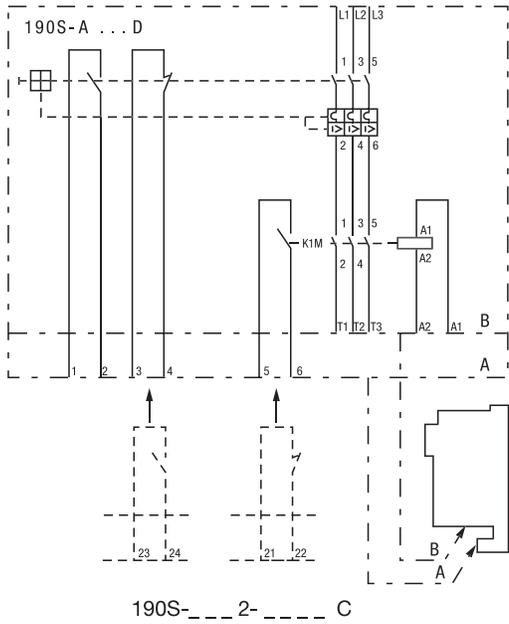
§ Not available on 190E/191E Eco starters with 100-K/104-K mini contactors.

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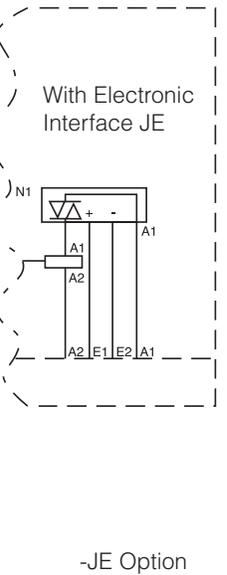
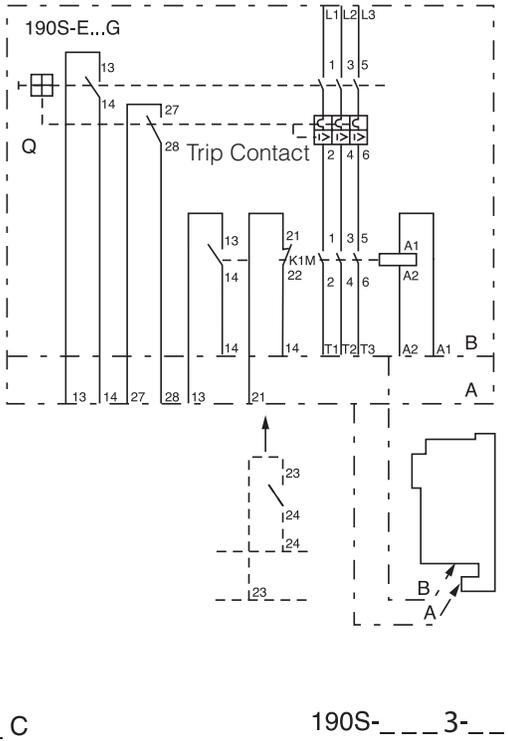
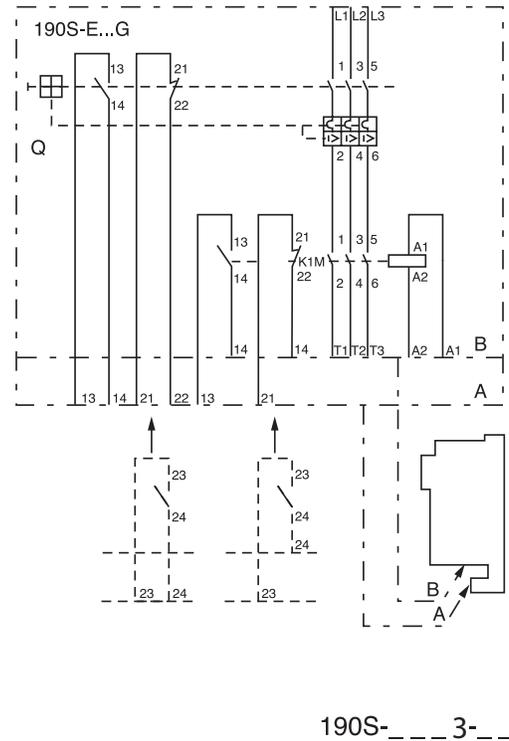
Wiring Diagrams

IEC Wiring Diagram Cat. No. 190S-A...D



2

IEC Wiring Diagram Cat. No. 190S-E...G

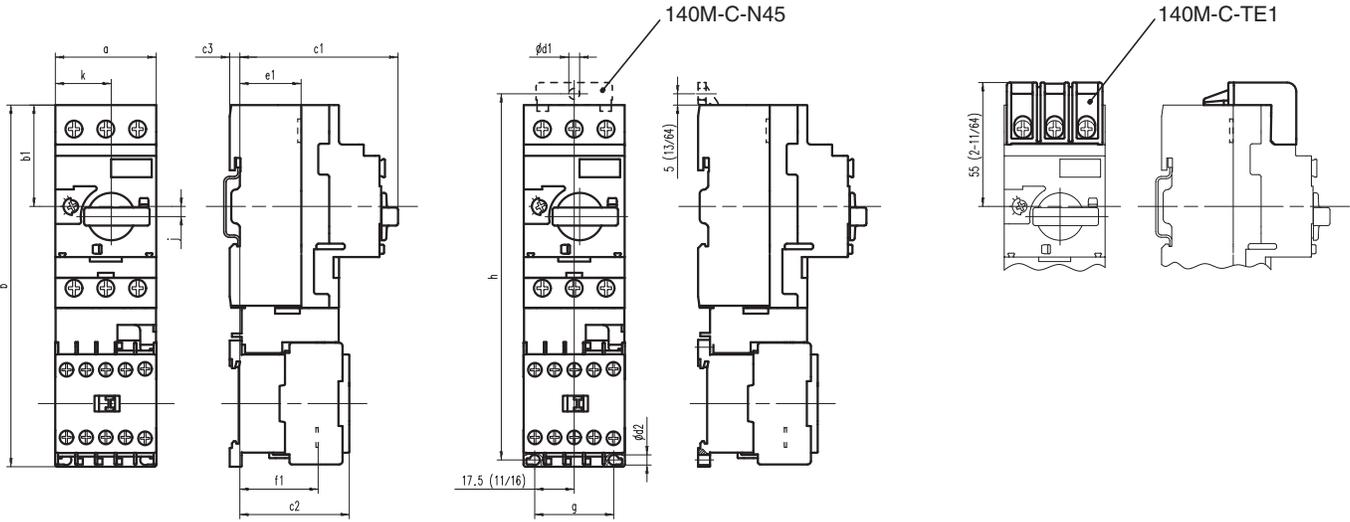


Eco and Compact Combination Starters

Approximate Dimensions

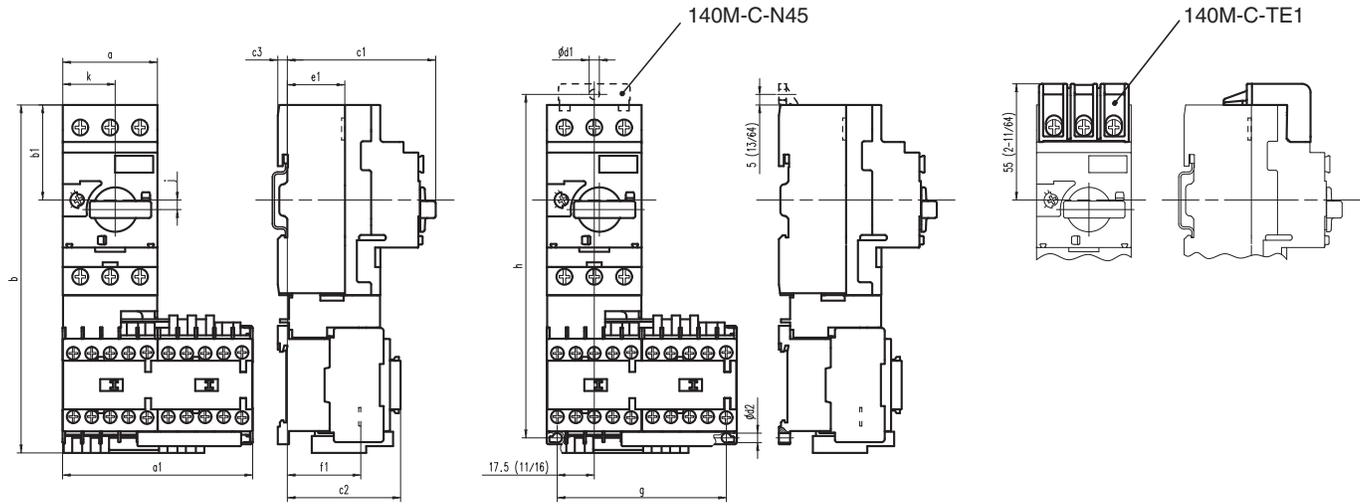
Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

190E-KM/190E-KN/190E-KP



		a	b	b1	c1	c2	c3	φd1	φd2	e1	f1	g	h	j	k
190E-KM	140M-C2E + 140M-C-PEK12 + 100-K05	45 (1-25/32)	160 (6-19/64)	45 (1-25/32)	70 (2-49/64)	49 (1-59/64)	4.5 (3/16)	4.5 (3/16)	4.5 (3/16)	27 (1-1/16)	34.5 (1-23/64)	35 (1-25/64)	162 (6-3/8)	4.5 (3/16)	24.5 (31/32)
190E-KN	140M-C2E + 140M-C-PEK12 + 100-K09	45 (1-25/32)	160 (6-19/64)	45 (1-25/32)	70 (2-49/64)	49 (1-59/64)	4.5 (3/16)	4.5 (3/16)	4.5 (3/16)	27 (1-1/16)	34.5 (1-23/64)	35 (1-25/64)	162 (6-3/8)	4.5 (3/16)	24.5 (31/32)
190E-KP	140M-C2E + 140M-C-PEK12 + 100-K12	45 (1-25/32)	160 (6-19/64)	45 (1-25/32)	70 (2-49/64)	49 (1-59/64)	4.5 (3/16)	4.5 (3/16)	4.5 (3/16)	27 (1-1/16)	34.5 (1-23/64)	35 (1-25/64)	162 (6-3/8)	4.5 (3/16)	24.5 (31/32)

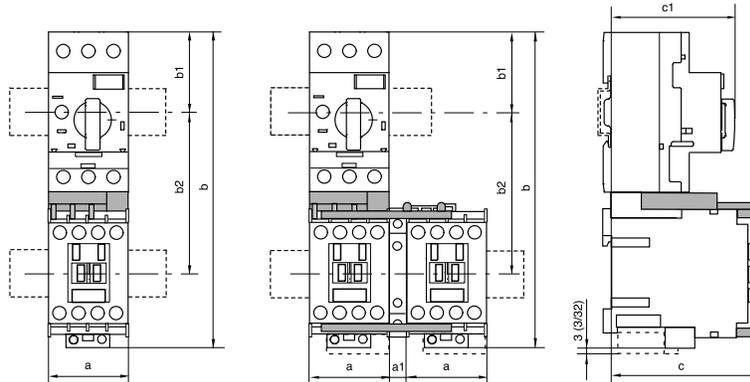
191E-KM/191E-KN/191E-KP



		a	a1	b	b1	c1	c2	c3	φd1	φd2	e1	f1	g	h	j	k
191E-KM	140M-C2E + 140M-C-PEK12 + 104-K05	45 (1-25/32)	90 (3-45/64)	164.5 (6-15/32)	45 (1-25/32)	70 (2-49/64)	54 (2-1/8)	4.5 (3/16)	4.5 (3/16)	4.5 (3/16)	27 (1-1/16)	34.5 (1-23/64)	80 (3-5/32)	162 (6-3/8)	4.5 (3/16)	24.5 (31/32)
191E-KN	140M-C2E + 140M-C-PEK12 + 104-K09	45 (1-25/32)	90 (3-45/64)	164.5 (6-15/32)	45 (1-25/32)	70 (2-49/64)	54 (2-1/8)	4.5 (3/16)	4.5 (3/16)	4.5 (3/16)	27 (1-1/16)	34.5 (1-23/64)	80 (3-5/32)	162 (6-3/8)	4.5 (3/16)	24.5 (31/32)
191E-KP	140M-C2E + 140M-C-PEK12 + 104-K12	45 (1-25/32)	90 (3-45/64)	164.5 (6-15/32)	45 (1-25/32)	70 (2-49/64)	54 (2-1/8)	4.5 (3/16)	4.5 (3/16)	4.5 (3/16)	27 (1-1/16)	34.5 (1-23/64)	80 (3-5/32)	162 (6-3/8)	4.5 (3/16)	24.5 (31/32)

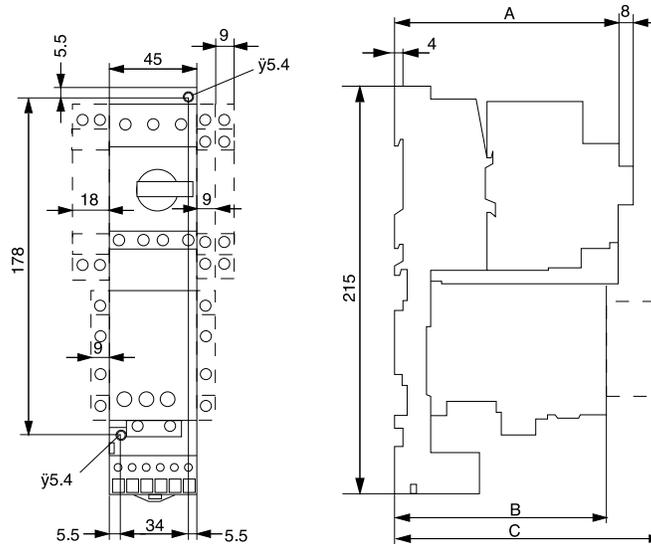
Dimensions are shown in millimeters. Dimensions are not intended to be used for manufacturing purposes.

190E/191E-A...D



Cat. No.	a	a1	b	b1	b2	c	c1
190E Eco Starters							
190E-AN...190E-DN	45 (1-25/32)	0	178 (7)	45 (1-25/32)	—	83.5 (3-19/64)	70 (2-49/64)
191E Reversing Eco Starters							
191E-AN...191E-DN	45 (1-25/32)	9 (23/64)	178 (7)	45 (1-25/32)	—	83.5 (3-19/64)	70 (2-49/64)

190S-A...D



Front View	Side View	A [mm]	B [mm]
 190S-AN, -ANEJ, 190S-BN, -BNEJ, 190S-CN, -CNEJ, 190S-DN, -DNEJ	140M-C	112	107
	140M-D	122	
190S-ANZ, -ANDJ, 190S-BNZ, -BNDJ, 190S-CNZ, -CNDJ	140M-C	134.5	132.5
	140M-D	144.5	
190S-DNZ, -DNDJ	140M-C	157	150
	140M-D	167	

Front View	C [mm]
 100-FA, 100-FC 100-FPT 100-FL	138
	157
	160
100-FA, 100-FC	163.5
100-FA, 100-FC	181

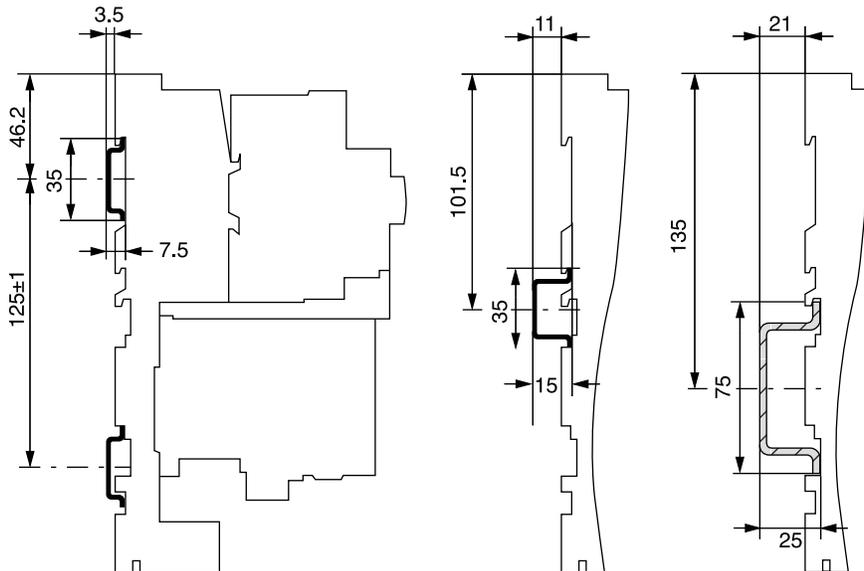
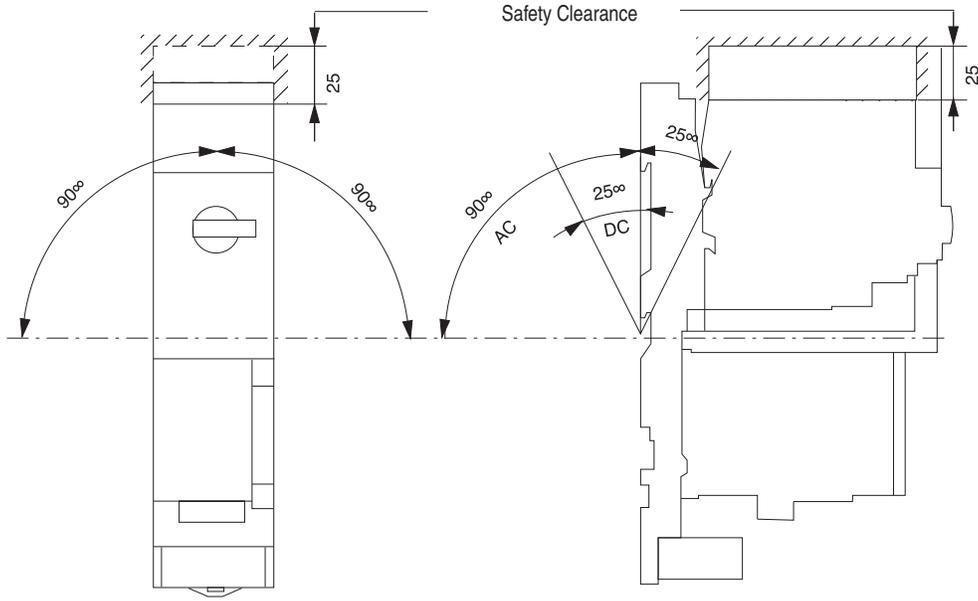
Eco & Compact Combination Starters

Approximate Dimensions

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

190S-A...D

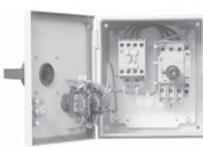
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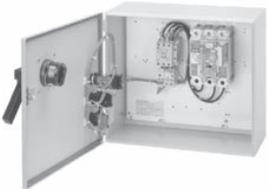


IEC Enclosed Starters

Product Overview

2

					
	103H/107H	140M	103C/107C	105-C	109-C
Starter Type	Non-reversing (103H)/reversing (107H) Combination	Motor protection circuit breaker only	Non-reversing (103C)/reversing (107C) Combination	Reversing Non-combination	Non-reversing Non-combination
AC Coils	✓	—	✓	✓	✓
DC Coils	—	—	—	—	—
UL/CSA	✓	✓	✓	✓	✓
IEC	✓	✓	✓	✓	✓
CE	—	—	✓§	✓§	✓§
Components					
140M (MPCB)	✓	✓	✓	—	—
100-C Contactor	✓	—	✓	✓	✓
193 Overload Relay	—	—	—	✓	✓
194R Disconnect	—	—	—	—	—
Max. Current*	43 A	45 A	16 A	23 A (plastic enclosure), 85 A (metal enclosure)	43 A (plastic enclosure), 85 A (metal enclosure)
Enclosure Material	Metal	Metal	Molded plastic	Molded plastic or metal	Molded plastic or metal
Enclosure Type	IP66 (Type 3/4/12)	IP66 (Type 3/4/12)	IP66 (Type 3/3R/12K)	IP42 (Type 1) and IP66 (Type 3/4/12) - metal enclosures IP66 (Type 4/4X/12) - plastic enclosures	IP42 (Type 1) and IP66 (Type 3/4/12) - metal enclosures IP66 (Type 4/4X/12) - plastic enclosures
Product Selection	Page 2-378	Page 2-380	Page 2-388	Page 2-384	Page 2-386

			
	106-C	112-C	113-C
Starter Type	Reversing combination	Non-reversing combination	Non-reversing combination
AC Coils	✓	✓	✓
DC Coils	—	—	—
UL/CSA	✓	✓	✓
IEC	✓	✓	✓
CE	—	—	—
Components			
Motor Protection Circuit Breaker	—	—	—
Motor Circuit Protector	—	—	✓
100-C Contactor	✓	✓	✓
193 Overload Relay	✓	✓	✓
194R Disconnect	✓	✓	—
Max. Current*	85 A	72 A	72 A
Enclosure Material	Standard	Metal	Metal
Enclosure Type	IP42 (Type 1) and IP66 (Type 3/4/12)	IP42 (Type 1) and IP66 (Type 3/4/12)	IP42 (Type 1) and IP66 (Type 3/4/12)
Product Selection	Page 2-388	Page 2-389	Page 2-390

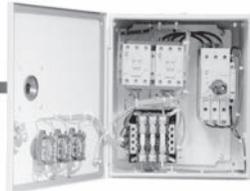
* For IEC enclosed starter solutions from 95...860 A, contact your local Rockwell Automation sales office or Allen-Bradley distributor.

§ CE approved with plastic enclosures only.





Bulletin 103H starter in enclosure size A



Bulletin 107H starter in enclosure size C

Bulletin 103H/107H/140M Enclosed Combination Starters and Motor Protectors

Bulletin 103H/107H enclosed combination starters consist of a Bulletin 140M motor protection circuit breaker and a Bulletin 100C/104C contactor in a metallic Type 3/4/12 enclosure.

Bulletin 140M enclosed motor protection circuit breakers consist of a Bulletin 140M motor protection circuit breaker in a metallic Type 3/4/12 enclosure.

Features

- Current range 0.1...45 A
- cULus Listed for control and protection of motor loads
 - Motor disconnect
 - Short-circuit and overload protection
 - Motor switching (magnetic)
- Factory-installed options include
 - Pushbuttons, selector switches, and pilot lights
 - Control transformer
 - Auxiliary and trip indication contacts

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 Dimensions..... 2-382

Standards Compliance

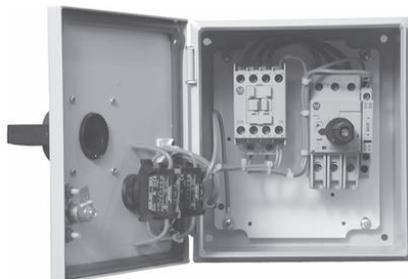
UL 508
 CSA 22.2 No. 14

Certifications

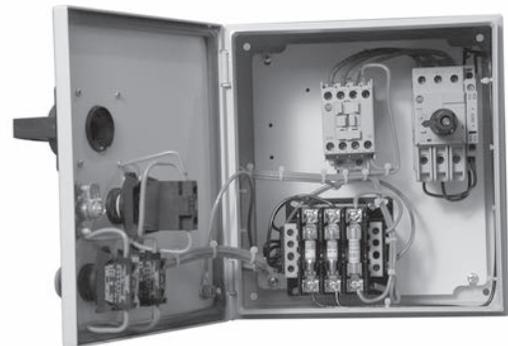
cULus Listed (File No. E 125316, Guide NKJH, NKJH7)

Product Selection

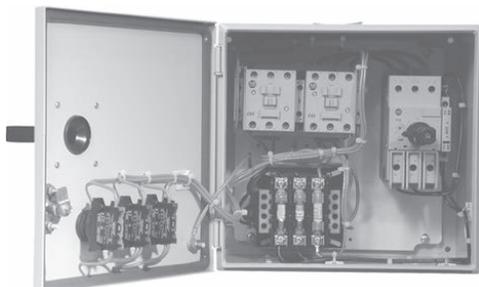
Reversing and Non-reversing Starters



The "A" size box accommodates:
 -103H Non-Reversing Starters
 -Motors up to 15 Hp/480V (23 A)
 -2 pilot devices



The "B" size box accommodates:
 -103H Non-Reversing Starters AND 107H Reversing Starters
 -Motors up to 15 Hp/480V (23 A)
 -Control Transformer and 3 pilot devices



The "C" size box accommodates:
 103H Non-Reversing Starters AND 107H Reversing Starters
 -Motors up to 30 Hp/480V (43 A)
 -Control Transformer and 3 pilot devices

Type E and Type F Combination Motor Controllers (UL/CSA)

Most of the 140M-C/D motor protection circuit breakers used in the 103H/107H starters are UL Listed as a manual **Type E** self-protected combination motor controller. Although there are many tests involved, one of the critical tests a self-protected combination motor controller must pass is to perform 6000 electrical ops. and an additional 4000 mechanical ops. after a short circuit.

By definition, a **Type F** combination motor controller consists of a Type E manual self protected combination motor controller and a magnetic or solid-state motor controller (such as a 100-C contactor or an SMC). As with a manual Type E self-protected combination motor controller, additional short-circuit protection is not required for the individual motor circuits.

A combination of a Bulletin 140M manual self-protected combination motor controller and 100-C contactor can be listed as a **Type E** self-protected combination motor controller. In this case, the 140M and 100-C must pass the additional 6000 electrical and 4000 mechanical operational test. In some cases, this may require oversizing of the 140M motor protection circuit breaker or the 100-C contactor to achieve weld-free performance and meet the additional life requirements.

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Product Selection and Coordination Ratings (UL/CSA as a UL508 Type F Combination Motor Controller)

Motor Current Adjustment Range [A]	Hp Ratings as a UL508 Type F Combination Motor Controller*				Max. Short-Circuit Current [kA]				Non-Reversing Starter Cat. No.	Enclosure Size	Reversing Starter Cat. No.	Enclosure Size
					Type 1 Coordination		Type 2 Coordination					
	200V	230V	460V	575V	480Y/277V	600Y/347V	480Y/277V	600Y/347V				
25 A Frame Size												
0.10...0.16	—	—	—	—	65	47	65	47	103H-AF002-CA16X	A	107H-AF003-CA16X	B
0.16...0.25	—	—	—	—	65	47	65	47	103H-AF002-CA25X	A	107H-AF003-CA25X	B
0.25...0.40	—	—	—	—	65	47	65	47	103H-AF002-CA40X	A	107H-AF003-CA40X	B
0.40...0.63	—	—	—	—	65	47	65	47	103H-AF002-CA63X	A	107H-AF003-CA63X	B
0.63...1.00	—	—	1/2	3/4	65	47	65	47	103H-AF002-CB10X	A	107H-AF003-CB10X	B
1.00...1.60	—	—	1/2...1	3/4...1	65	47	65	47	103H-AF002-CB16X	A	107H-AF003-CB16X	B
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	10	103H-AF002-DB25X	A	107H-AF003-DB25X	B
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	65	—	103H-AF002-DB40X	A	107H-AF003-DB40X	B
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	65	30	103H-DF002-DB40X	A	107H-DF003-DB40X	B
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	65	—	103H-AF002-DB63X	A	107H-AF003-DB63X	B
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	65	30	103H-EF002-DB63X	C	107H-EF003-DB63X	C
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	—	103H-BF002-DC10X	A	107H-BF003-DC10X	B
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	30	103H-EF002-DC10X	C	107H-EF003-DC10X	C
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	—	103H-CF002-DC16X	A	107H-CF003-DC16X	B
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	30	103H-EF002-DC16X	C	107H-EF003-DC16X	C
14.5...20.0	5	5	10	—	65	❖	65	❖	103H-DF002-DC20X	A	107H-DF003-DC20X	B
18.0...23.0	5	7-1/2	15	—	65	❖	65	❖	103H-DF002-DC25X	A	107H-DF003-DC25X	C
45 A Frame Size												
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	10	103H-EF002-FC10X	C	107H-EF003-FC10X	C
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	10	103H-EF002-FC16X	C	107H-EF003-FC16X	C
14.5...20.0	5	5...7-1/2	15	15...20	65	30	65	10	103H-EF002-FC20X	C	107H-EF003-FC20X	C
18.0...25.0	7-1/2	7-1/2...10	15...20	20	65	30	65	10	103H-EF002-FC25X	C	107H-EF003-FC25X	C
23.0...32.0	7-1/2...10	10	20...25	30	65	30	65	10	103H-FF002-FC32X	C	107H-FF003-FC32X	C
32.0...43.0	10	15	30	—	65	❖	65	❖	107H-GF003-FC45X	C	107H-GF003-FC45X	C

❖ Line Voltage Codes — see page 2-381

⊗ Coil Voltage Codes — see page 2-381

* Hp ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

❖ This starter is not valid for application at this horsepower and voltage.

Product Selection and Coordination Ratings (UL/CSA as a UL508 Self-Protected Type E Combination Motor Controller)

Motor Current Adjustment Range [A]	UL/CSA Hp and Coordination Ratings (60 Hz)						Non-Reversing Starter Cat. No.	Enclosure Size	Reversing Starter Cat. No.	Enclosure Size
	Hp Ratings as a UL508 Self-Protected Type E Combination Motor Controller*				Max. Short-Circuit Current [kA]					
	200V	230V	460V	575V	480Y/277V	600Y/347V				
25 A Frame Size										
0.10...0.16	—	—	—	—	65	47	103H-AF002-CA16X	A	107H-AF003-CA16X	B
0.16...0.25	—	—	—	—	65	47	103H-AF002-CA25X	A	107H-AF003-CA25X	B
0.25...0.40	—	—	—	—	65	47	103H-AF002-CA40X	A	107H-AF003-CA40X	B
0.40...0.63	—	—	—	—	65	47	103H-AF002-CA63X	A	107H-AF003-CA63X	B
0.63...1.00	—	—	1/2	3/4	65	47	103H-AF002-CB10X	A	107H-AF003-CB10X	B
1.00...1.60	—	—	1/2...1	3/4...1	65	47	103H-AF002-CB16X	A	107H-AF003-CB16X	B
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	—	65	❖	103H-AF002-DB25X	A	107H-AF003-DB25X	B
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	103H-DF002-DB25X	A	107H-DF003-DB25X	B
2.50...4.00	—	—	—	—	❖	❖	103H-AF002-DB40X	A	107H-AF003-DB40X	B
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	103H-DF002-DB40X	A	107H-DF003-DB40X	B
4.00...6.30	—	—	—	—	❖	❖	103H-AF002-DB63X	A	107H-AF003-DB63X	B
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	103H-EF002-DB63X	C	107H-EF003-DB63X	C
6.30...10.0	—	—	—	—	❖	❖	103H-BF002-DC10X	A	107H-BF003-DC10X	B
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	103H-EF002-DC10X	C	107H-EF003-DC10X	C
10.0...16.0	—	—	—	—	❖	❖	103H-CF002-DC16X	A	107H-CF003-DC16X	B
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	103H-EF002-DC16X	C	107H-EF003-DC16X	C
14.5...20.0	—	—	—	—	❖	❖	103H-DF002-DC20X	A	107H-DF003-DC20X	B
14.5...20.0	5	5	10	—	65	❖	103H-EF002-DC20X	C	107H-EF003-DC20X	C
18.0...23.0	—	—	—	—	❖	❖	103H-DF002-DC25X	A	107H-DF003-DC25X	C
18.0...23.0	5	7-1/2	15	—	65	❖	103H-EF002-DC25X	C	107H-EF003-DC25X	C
45 A Frame Size										
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	103H-EF002-FC10X	C	107H-EF003-FC10X	C
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	103H-EF002-FC16X	C	107H-EF003-FC16X	C
14.5...20.0	5	5...7-1/2	15	15...20	65	30	103H-EF002-FC20X	C	107H-EF003-FC20X	C
18.0...25.0	7-1/2	7-1/2...10	15...20	20	65	30	103H-EF002-FC25X	C	107H-EF003-FC25X	C
23.0...32.0	7-1/2...10	10	20...25	30	65	30	103H-FF002-FC32X	C	107H-FF003-FC32X	C
32.0...43.0	10	15	30	—	65	❖	103H-GF002-FC45X	C	107H-GF003-FC45X	C

❖ Line Voltage Codes — see page 2-381

⊗ Coil Voltage Codes — see page 2-381

* Hp ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current.

❖ This starter is not valid for application at this horsepower and voltage.

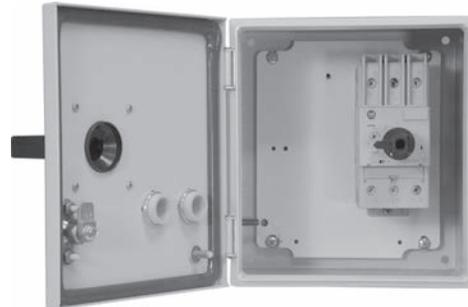


Bulletin 103H/107H/140M
IEC Enclosed Starters
 Product Selection

Enclosed Motor Protectors

- Self-protected UL Type E manual combination motor controller
- 65 kA at 480V
- 30 kA at 600V
- AC control

2



Rated Operational Current [A]	Motor Current Adjustment Range [A]	Magnetic Trip Current [A]	Maximum Hp, 3-phase				Cat. No.	Enclosure Size
			200V	230V	460V	575V		
25 A Frame Size								
0.16	0.10...0.16	2.1	—	—	—	—	140M-F-CA16X	A
0.25	0.16...0.25	3.3	—	—	—	—	140M-F-CA25X	A
0.4	0.25...0.40	5.2	—	—	—	—	140M-F-CA40X	A
0.63	0.40...0.63	8.2	—	—	—	—	140M-F-CA63X	A
1	0.63...1.0	13	—	—	0.5	0.75‡	140M-F-CB10X	A
1.6	1.0...1.6	21	—	—	1	1‡	140M-F-CB16X	A
2.5	1.6...2.5	33	0.5	0.75	1.5	2	140M-F-DB25X	A
4	2.5...4.0	52	1	1	3	3	140M-F-DB40X	A
6.3	4.0...6.3	82	1.5	2	5	5	140M-F-DB63X	A
10	6.3...10	130	3	3	7.5	10	140M-F-DC10X	A
16	10...16	208	3	5	10	15	140M-F-DC16X	A
20	14.5...20	260	5	7.5	15	—	140M-F-DC20X	A
25	18...25	325	7.5	7.5	15*	—	140M-F-DC25X	A
45 A Frame Size								
10	6.3...10	130	3	3	7.5	10	140M-F-FC10X	C
16	10...16	208	3	5	10	15	140M-F-FC16X	C
20	14.5...20	260	5	7.5	15	20	140M-F-FC20X	C
25	18...25	325	7.5	10	20	25	140M-F-FC25X	C
32	23...32	416	10	10	25	30	140M-F-FC32X	C
45	32...45	585	15	15	30	—	140M-F-FC45X	C

* 30 kA
 ‡ 47 kA

Bulletin 103H/107H Factory Installed Modifications

Note: For modifications add (option code §) for desired features to cat. no.

§ Add desired option codes. Example: 103H-AND2-CA16X-KY

Coil Options	
JE*	Electronic Interfaces (100-C)
R*	Surge Suppressor RC (100-C)
V*	Surge Suppressor Varistor (100-C)
D*	Surge Suppressor Diode (100-C)
Additional Contactor Auxiliaries (Side Mount)	
S01*	1 N.C.
S10*	1 N.O.
S11*	1 N.O. + 1 N.C.
S20*	2 N.O.
Additional 140M Auxiliaries (Side Mount)	
A02	2 N.C.
A20	2 N.O.
A11	1 N.O. + 1 N.C.
Additional 140M Trip Contacts (Side Mount)	
R00	1 N.O. Thermal-Mag + 1 N.O. Mag Only
R01	1 N.O. Thermal-Mag + 1 N.C. Mag Only
R10	1 N.C. Thermal-Mag + 1 N.O. Mag Only
R11	1 N.C. Thermal-Mag + 1 N.C. Mag Only
M11	1 N.O. Mag Only + 1 N.C. Mag Only
Control Options	
1	Push Button — 103H Start-Stop / 107H For-Rev-Stop
1M	Multifunction Push Button — 103H Start-Stop / 107H For-Rev-Stop
14RM	Multifunction Push Button — 103H Start-Stop-Pilot Light
3	Selector Switch — 103H Hand-Off-Auto / 107H For-Off-Rev
4R	Pilot Light (red, ON) (103H only)
4RW	Pilot Light (red—FOR, White — REV) (107H only)
6P*‡	Control Transformer‡ (not available with enclosure size A)
KY	Bulletin 140M External Handle — Red/Yellow

- * 107H - One per contactor, for a total of two per option code.
- ⊗ Starters in enclosure size "A" will change to enclosure size "B" when a control transformer is factory installed.
- ‡ Auxiliary contact option "A20" is required when selecting this control transformer.

Line and Coil Voltage Codes

⊗ **Line Voltage Codes**

The Cat. No. as listed is incomplete. Select a line voltage code from the table below to complete the Cat. No.
 Example: 208V 60 Hz: **Cat. No. 103H-AF⊗2-CA16X** becomes **Cat. No. 103H-AFH⊗2-CA16X**.

Line Voltages [V]	208	230	240	380	400	415	480	600
60 Hz	H	—	A	—	—	—	B	C
50 Hz	—	F	—	N	KN	G	—	—

⊗ **Coil Voltage Codes**

The Cat. No. as listed is incomplete. Select a coil voltage code from the table below to complete the Cat. No.
 Example: 120V 60 Hz: **Cat. No. 103H-AFH⊗-CA16X** becomes **Cat. No. 103H-AFHD2-CA16X**.

Standard Coil Voltages [V]	24	110	120	208	220...230	240...260	277	380...400	415	480	600
AC, 50 Hz	K	D	P	—	F	—	—	N	B	—	—
AC, 60 Hz	J	—	D	H	—	A	T	—	—	B	C
AC, 50/60 Hz	KJ	KD	—	—	—	—	—	—	—	—	—

Standard Coil Voltages [V]		24
DC	Standard	ZJ
	With integrated diode	KJ

140M Factory Installed Modifications (Enclosed)

Note: For modifications add (option code §) for desired features to cat. no.

§ Add desired option codes. Example: 140M-F-CA16X-UVB

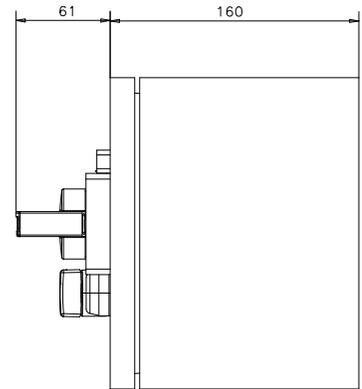
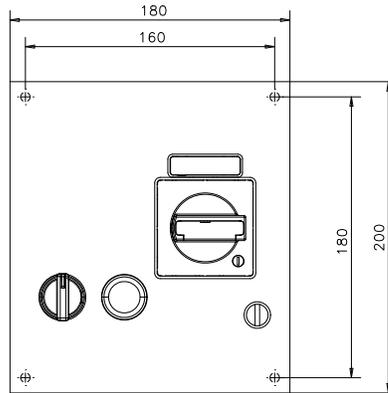
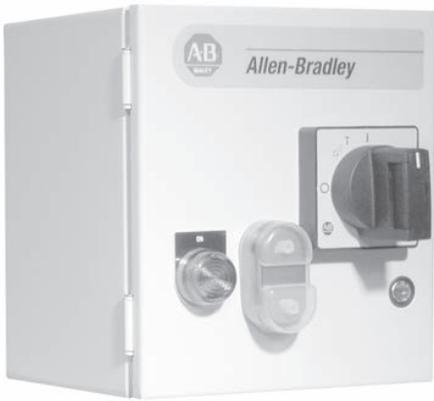
Modifications	
UV⊗	Undervoltage Trip
SN⊗	Shunt Trip
Additional 140M Auxiliaries (Side Mount)	
A02	2 N.C.
A20	2 N.O.
A11	1 N.O. + 1 N.C.
Additional 140M Trip Contacts (Side Mount)	
R00	1 N.O. Thermal-Mag + 1 N.O. Mag Only
R01	1 N.O. Thermal-Mag + 1 N.C. Mag Only
R10	1 N.C. Thermal-Mag + 1 N.O. Mag Only
R11	1 N.C. Thermal-Mag + 1 N.C. Mag Only
M11	1 N.O. Mag Only + 1 N.C. Mag Only



Bulletin 103H/107H/140M
IEC Enclosed Starters
 Enclosure Dimensions

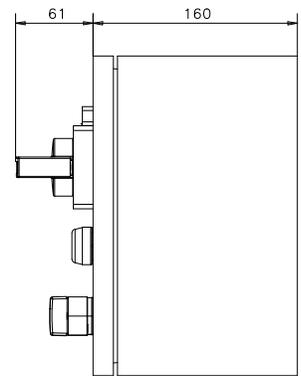
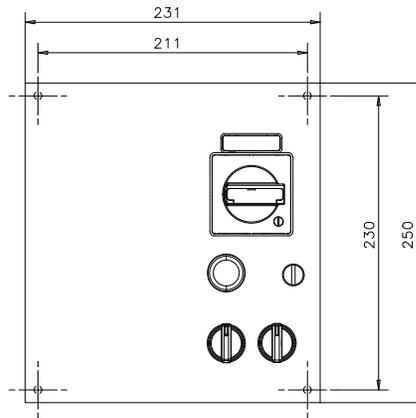
Dimensions in mm. Dimensions are not intended to be used for manufacturing purposes.

Enclosure Style A

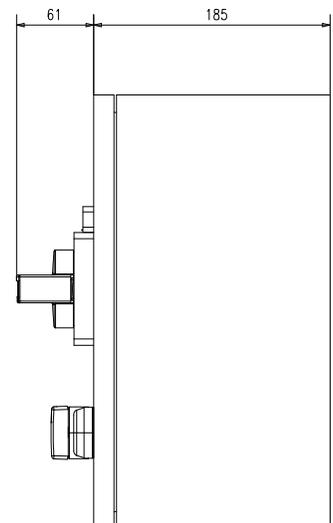
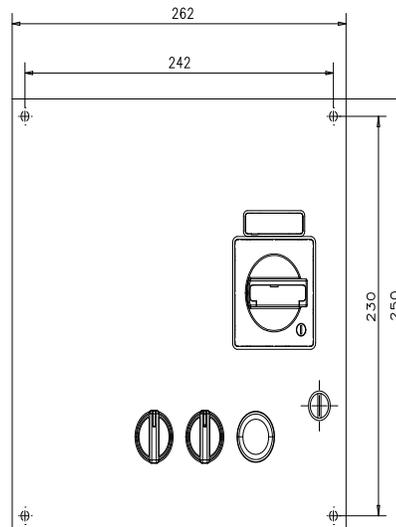


2

Enclosure Style B



Enclosure Style C



IEC Enclosed Combination Starters

Product Overview/Product Selection



Bulletin 103C/107C Enclosed Combination Starters

Bulletin 103C enclosed combination Direct-On-Line starters consist of a Bulletin 140M motor protection circuit breaker and a Bulletin 100-C contactor in an impact-resistant molded Type 3/3R/12K (IP 66) enclosure.

Bulletin 107C enclosed combination Direct-On-Line starters consist of a Bulletin 140M motor protection circuit breaker and a Bulletin 104-C contactor in an impact-resistant molded Type 3/3R/12K (IP 66) enclosure.

- Compact design
- 0.1...21 A current range
- cULus Listed for control and protection of motor loads
 - Motor disconnect
 - Short-circuit and overload protection
 - Motor switching (magnetic)

Your order must include: Cat. No. of the combination starter selected, coil voltage code, motor protection circuit breaker suffix code, and if required, factory-installed modifications suffix code and/or Cat. No. of any accessories.

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Standards Compliance

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

Certifications

cULus Listed (File E205542,
 Guide NKJH, NKJH7)

Product Selection

Setting Range [A]	Ratings According to IEC 60947-4-2								Ratings as a UL508 Type F Combination Motor Controller						IP66 (Type 3/3R/12K) Raintight, Dusttight, Corrosion-Resistant Molded Plastic Enclosure	
	Coordinated Breaking Capacity, I _q [kA]				Output Power, AC-3 [kW]				Coordinated Breaking Capacity, I _q , Type 1 [kA]		3-Phase Hp*				With START/STOP Multifunction Push Button (3 Functions)	
	400/415V AC		500V AC	690V AC					480V	600V						
	Type 1	Type 2	Type 1	Type 1	400/415V AC	500V AC	690V AC	480V	600V	200V	230V	460V	575V	Cat. No.*		
0.1...0.16	65	65	65	50	—	0.06	0.06	65	47	—	—	—	—	103C-09L-CA16X-1M	107C-09L-CA16X-1M	
0.16...0.25	65	65	65	50	0.06	0.06	0.12	65	47	—	—	—	—	103C-09L-CA25X-1M	107C-09L-CA25X-1M	
0.25...0.4	65	65	65	50	0.09	0.12	0.18	65	47	—	—	—	—	103C-09L-CA40X-1M	107C-09L-CA40X-1M	
0.4...0.63	65	65	65	50	0.18	0.18	0.37	65	47	—	—	—	—	103C-09L-CA63X-1M	107C-09L-CA63X-1M	
0.63...1.0	65	65	65	50	0.25	0.37	0.55	65	47	—	—	—	1/2	103C-09L-CB10X-1M	107C-09L-CB10X-1M	
1.0...1.6	65	65	65	50	0.55	0.75	1.1	65	47	—	—	3/4	3/4	103C-09L-CB16X-1M	107C-09L-CB16X-1M	
1.6...2.5	65	50	50	8	0.75	1.1	1.8	65	30	1/2	1/2	1	1-1/2	103C-09L-CB25X-1M	107C-09L-CB25X-1M	
2.5...4.0	50	50	50	8	1.5	2.2	3	65	30	3/4	3/4	2	3	103C-09L-CB40X-1M	107C-09L-CB40X-1M	
2.5...4.0	65	65	50	10	1.5	2.2	3	65	30	3/4	3/4	2	3	103C-09L-DB40X-1M	107C-09L-DB40X-1M	
4.0...6.3	50	50	50	4	2.2	3	4	65	—	1	1-1/2	3	—	103C-09L-CB63X-1M	107C-09L-CB63X-1M	
4.0...6.3	65	65	50	50	2.2	3	4	65	30	1	1-1/2	3	5	103C-09L-DB63X-1M	107C-09L-DB63X-1M	
6.3...10	65	50	50	—	4	4	—	65	—	2	3	5	—	103C-09L-CC10X-1M	107C-09L-CC10X-1M	
6.3...10	65	65	50	—	4	4	—	65	30	2	3	5	7-1/2	103C-09L-DC10X-1M	107C-09L-DC10X-1M	
6.3...10	65	50	50	4	4	5.5	5.5	65	—	2	3	5	—	103C-12L-CC10X-1M	107C-12L-CC10X-1M	
6.3...10	65	65	65	50	4	5.5	5.5	65	30	2	3	5	7-1/2	103C-12L-DC10X-1M	107C-12L-DC10X-1M	
6.3...10	65	50	50	4	4	5.5	7.5	65	—	2	3	5	—	103C-16L-CC10X-1M	107C-16L-CC10X-1M	
6.3...10	65	65	65	50	4	5.5	7.5	65	30	2	3	5	7-1/2	103C-16L-DC10X-1M	107C-16L-DC10X-1M	
10...16	50	50	10	3	7.5	10	—	30	—	3	5	10	—	103C-12L-CC16X-1M	107C-12L-CC16X-1M	
10...16	65	65	—	—	5.5	—	—	65	30	3	5	10	10	103C-12L-DC16X-1M	107C-12L-DC16X-1M	
10...16	50	50	10	3	7.5	10	—	30	—	3	5	10	—	103C-12L-CC16X-1M	107C-16L-CC16X-1M	
10...16	65	—	50	6	7.5	10	—	65	30	3	5	10	10	103C-16L-DC16X-1M	107C-16L-DC16X-1M	

* Hp ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current and service factor.
 * Bulletin 140M Motor Protection Circuit Breaker comes separately as a kit.

⊗ 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: 110V, 50 Hz/120V, 60 Hz: **Cat. No. 103C-12L-DC-1M** becomes **Cat. No. 103C-12LD-DC16-1M**.

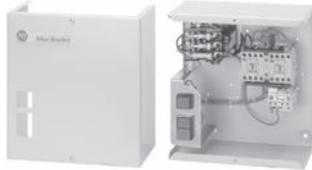
[V]	24	110	120	230	400	440	480
50 Hz	—	D	—	—	—	B	—
60 Hz	—	—	D	—	—	—	B
50/60 Hz	KJ	—	—	KF	KN	—	—

IEC Reversing Starters

Product Overview/Product Selection/Accessories



Cat. No. 105-CAK...



Cat. No. 105-C09ABA1F-1-6P
Type 1 Metal Enclosure with Lift-off Cover

Bulletin 105 IEC Reversing Starters

- Impact-resistant molded plastic enclosures IP66 (Type 4/4X/12)
- Selection of metal enclosures IP42 (Type 1) and IP66 (Type 3/4/12)
- Bimetallic Class 10 overload relays
- Solid-state overload relays
- Compact design
- Meets international standards

Bulletin 105 enclosed starters use Bulletin 104 reversing contactors and Bulletin 193 solid-state overload relays. These reversing starters (9...85 A) incorporate a “dual” interlock that provides both mechanical and electrical interlocking in a single unit. A normally open auxiliary contact is also included on each contactor.

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Standards Compliance

EN/IEC 60947-4-1
 VDE 0660
 CSA C22.2 No. 14
 UL 508

Certifications

cULus Listed (File E3125, Guide NLDX, NLDX7)

Your order must include: Cat. No. of the reversing starter selected, coil voltage code, overload relay suffix code, and, if required, factory-installed modifications suffix code and/or Cat. No. of any accessories.

Product Selection

Enclosed Type — Molded Plastic, AC Operated

Max I _e [A]	Ratings (AC3, AC4)							E1 Plus Overload Relay Full Load Current Range [A]	Cat. No.
	kW	Hp							
	3-Phase	1-Phase		3-Phase					
380V/ 415V	115V	230V	200V	230V	460V	575V			
IP66 (Type 4, 4X, 12) Watertight, Dusttight Corrosion-Resistant Molded Plastic Enclosure With START/STOP Multifunction Push Button (3 functions) and Reset									
9	4	1/2	1-1/2	2	2	5	7-1/2	1.0...5.0	105-C09L⊗E1C-1M-7
9	4	1/2	1-1/2	2	2	5	7-1/2	3.2...16	105-C09L⊗E1D-1M-7
12	5-1/2	1/2	2	3	3	7-1/2	10	3.2...16	105-C12L⊗E1D-1M-7
16	7-1/2	1	3	5	5	10	15	3.2...16	105-C16L⊗E1D-1M-7
23	11	2	3	5	7-1/2	15	15	5.4...27	105-C23L⊗E1E-1M-7

⊗ 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. 105-C12L⊗E1D-1M-7** becomes **105-C12LDE1D-1M-7**.

[V]	24	110	120	230	400	440	480
50 Hz	—	D	—	—	—	B	—
60 Hz	—	—	D	—	—	—	B
50/60 Hz	KJ	—	—	KF	KN	—	—

Accessories

Description	Cat. No.
E1 Plus DeviceNet and Protection Module Communicates motor diagnostic data via DeviceNet, includes additional I/O, and provides enhanced motor protection options.	193-EDN
E1 Plus EtherNet/IP and Protection Module Communicates motor diagnostic data via EtherNet/IP, includes additional I/O, and provides enhanced motor protection options.	193-ETN
E1 Plus Jam Protection Module Provides Jam protection with adjustable trip level and trip delay setting. The module also provides an input to allow remote reset of a trip.	193-EJM
E1 Plus Ground Fault Module Provides adjustable 20 mA...5 A ground fault protection. The module also provides an input to allow remote reset of a trip.	193-EGF
E1 Plus Ground Fault/Jam Module Provides adjustable 20 mA...5 A ground fault and fixed jam protection. The module also provides an input to allow remote reset of a trip.	193-EGJ
E1 Plus PTC Module Provides terminals for connection up to six PTC thermistor sensors. Sensors react to actual temperature and therefore provide enhanced motor protection. Module also provides an input to allow remote reset of a trip.	193-EPT
E1 Plus Remote Reset Module Provides an input to allow remote reset of a trip.	193-ERR

Modifications, including pilot lights and selector switches, are available through the Modified Standards Program. Send Modified Standard quote requests to RADBQuote@ra.rockwell.com.



Enclosed Type — Sheet Metal, AC-Operated

Max I _e [A]	Ratings (AC3, AC4)							IP42 (Type 1) General Purpose Sheet Metal Enclosure (Lift-off cover through 105-C72)	IP66 (Type 3/4/12) Watertight, Dusttight Sheet Metal Enclosure (Hinged Cover)
	kW	Hp							
		3-Phase	1-Phase *		3-Phase				
	380V/ 415V	115V	230V	200V	230V	460V	575V	Cat. No.	Cat. No.
9	4	1/2	1-1/2	2	2	5	7-1/2	105-C09A	105-C09F
12	5-1/2	1/2	2	3	3	7-1/2	10	105-C12A	105-C12F
16	7-1/2	1	3	5	5	10	15	105-C16A	105-C16F
23	11	2	3	5	7-1/2	15	15	105-C23A	105-C23F
30	15	2	5	7-1/2	10	20	25	105-C30A	105-C30F
37	18-1/2	3	5	10	10	25	30	105-C37A	105-C37F
43	22	3	7-1/2	10	15	30	30	105-C43A	105-C43F
60	30	5	10	15	20	40	50	105-C60A	105-C60F
72	37	5	15	20	25	50	60	105-C72A	105-C72F
85	45	7-1/2	15	25	30	60	60	105-C85A	105-C85F



⊗ 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. 105-C09A becomes **Cat. No. 105-C09AB**.

AC Voltage		24	48	110	120	208	208... 240	220	240	277	380... 400	400... 415	440	480	500	600
Common Control* Coil Voltage Code	50 Hz	—	—	—	—	—	—	A	T	—	N	G	B	—	M	—
	60Hz	—	—	—	—	H	L	—	A	—	—	—	N	B	—	C
Separate Control (without transformer) Coil Voltage Code	50 Hz	K	Y	D	—	—	—	—	—	—	—	—	—	—	—	—
	60Hz	J	X	—	D	—	—	—	—	T	—	—	—	—	—	—

⊕ Overload Relay Code

The Cat. No. as listed is incomplete. Select an overload relay code from page 2-205 to complete the Cat. No.

- * For single-phase (1Ø) applications, consult your local Rockwell Automation sales office or Allen-Bradley distributor.
- ⊗ When selecting a factory-installed control circuit transformer (see Modifications page 2-393), 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. 105-C09FB-6P** will have a transformer with a 480V primary/120V secondary 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. 105-C09FBJ-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.

IEC Non-Reversing Starters

Product Overview/Product Selection



Cat. No. 109-C09ABA1F-1-4R-6P
IP42 (Type 1)

Metal Enclosure with Lift-off Cover



Molded Plastic Enclosures

Bulletin 109 IEC Non-Reversing Starters

- Impact-resistant molded enclosures (9...43 A)
IP66 (Type 4/4X/12)
- Selection of metal enclosures (9...85 A)
IP42 (Type 1)
IP66 (Type 3/4/12)
- Bimetallic Class 10 overload relays
- Solid-state overload relays
- Compact design
- Meets international standards

Bulletin 109 enclosed starters are designed using Bulletin 100 contactors (9...85 A) and Bulletin 193 bimetallic (Class 10) or solid-state overload relays in a metal or molded plastic enclosure.

Your order must include: Cat. No. of the starter selected, coil voltage code, overload relay suffix code, and, if required, factory-installed modifications suffix code and/or cat. no. of any accessories.

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EN/IEC 60947-4-1
VDE 0660
CSA C22.2 No. 14
UL 508

Certifications

cULus Listed (File E3125,
Guide NLDX, NLDX7)

Product Selection — AC-Operated Starters Enclosed Type — Molded Plastic

Ratings (AC3, AC4)									With START (Green) and STOP (Raised Red) Push Buttons	With RESET (Blue) Push Button		
Max I _e [A]	kW	Hp									Cat. No.	Cat. No.
		1-Phase		3-Phase								
	3-Phase	115V	230V	200V	230V	460V	575V	575V				
IP66 (EN/IEC Only) ABS V-0 Molded Plastic Enclosure (Cat. No. 198E-A0S4)												
9	4	1/2	1-1/2	2	2	5	7-1/2	1.0...5.0	109-C09V⊗E1C-1	109-C09V⊗E1C-7		
9	4	1/2	1-1/2	2	2	5	7-1/2	3.2...16	109-C09V⊗E1D-1	109-C09V⊗E1D-7		
12	5-1/2	1/2	2	3	3	7-1/2	10	3.2...16	109-C12V⊗E1D-1	109-C12V⊗E1D-7		
16	7-1/2	1	3	5	5	10	15	3.2...16	109-C16V⊗E1D-1	109-C16V⊗E1D-7		
23	11	2	3	5	7-1/2	15	15	5.4...27	109-C23V⊗E1E-1	109-C23V⊗E1E-7		
IP66 (Type 4, 4X, 12K) Watertight, Dusttight Corrosion-Resistant Small Molded Plastic Enclosure (Cat. No. 198E-C0S4)												
9	4	1/2	1-1/2	2	2	5	7-1/2	1.0...5.0	109-C09K⊗E1C-1	109-C09K⊗E1C-7		
9	4	1/2	1-1/2	2	2	5	7-1/2	3.2...16	109-C09K⊗E1D-1	109-C09K⊗E1D-7		
12	5-1/2	1/2	2	3	3	7-1/2	10	3.2...16	109-C12K⊗E1D-1	109-C12K⊗E1D-7		
16	7-1/2	1	3	5	5	10	15	3.2...16	109-C16K⊗E1D-1	109-C16K⊗E1D-7		
23	11	2	3	5	7-1/2	15	15	5.4...27	109-C23K⊗E1E-1	109-C23K⊗E1E-7		
With START/STOP Multifunction Push Button (2 Functions) and Reset												
IP66 (Type 4, 4X, 12K) Watertight, Dusttight Corrosion-Resistant Large Molded Plastic Enclosure (Cat. No. 198E-C2S4)												
9	4	1/2	1-1/2	2	2	5	7-1/2	1.0...5.0	109-C09L⊗E1C-1M-7			
9	4	1/2	1-1/2	2	2	5	7-1/2	3.2...16	109-C09L⊗E1D-1M-7			
12	5-1/2	1/2	2	3	3	7-1/2	10	3.2...16	109-C12L⊗E1D-1M-7			
16	7-1/2	1	3	5	5	10	15	3.2...16	109-C16L⊗E1D-1M-7			
23	11	2	3	5	7-1/2	15	15	5.4...27	109-C23L⊗E1E-1M-7			
30	15	2	5	7-1/2	10	20	25	9.0...45	109-C30L⊗E1F-1M-7			
37	18-1/2	3	5	10	10	25	30	9.0...45	109-C37L⊗E1F-1M-7			
43	22	3	7-1/2	10	15	30	30	9.0...45	109-C43L⊗E1F-1M-7			

⊗ 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. 109-C12K⊗E1D-1M-7 becomes 105-C12KLDE1D-1M-7.

[V]	24	110	120	230	400	440	480
50 Hz	—	D	—	—	—	B	—
60 Hz	—	—	D	—	—	—	B
50/60 Hz	KJ	—	—	KF	KN	—	—



Accessories

Description	Cat. No.
E1 Plus DeviceNet and Protection Module Communicates motor diagnostic data via DeviceNet, includes additional I/O, and provides enhanced motor protection options.	193-EDN
E1 Plus EtherNet/IP and Protection Module Communicates motor diagnostic data via EtherNet/IP, includes additional I/O, and provides enhanced motor protection options.	193-ETN
E1 Plus Jam Protection Module Provides Jam protection with adjustable trip level and trip delay setting. The module also provides an input to allow remote reset of a trip.	193-EJM
E1 Plus Ground Fault Module Provides adjustable 20 mA...5 A ground fault protection. The module also provides an input to allow remote reset of a trip.	193-EGF
E1 Plus Ground Fault/Jam Module Provides adjustable 20 mA...5 A ground fault and fixed jam protection. The module also provides an input to allow remote reset of a trip.	193-EGJ
E1 Plus PTC Module Provides terminals for connection up to six PTC thermistor sensors. Sensors react to actual temperature and therefore provide enhanced motor protection. Module also provides an input to allow remote reset of a trip.	193-EPT
E1 Plus Remote Reset Module Provides an input to allow remote reset of a trip.	193-ERR

Modifications, including pilot lights and selector switches, are available through the Modified Standards Program. Send Modified Standard quote requests to RADBQuote@ra.rockwell.com.

Enclosed Type — Sheet Metal

Max I _e [A]	Ratings (AC3, AC4)							IP42 (Type 1) General Purpose Sheet Metal Enclosure (Liftoff Cover) Cat. No.	IP66 (Type 3, 4, 12) Watertight, Dusttight Sheet Metal Enclosure (Hinged Cover) Cat. No.
	kW	Hp							
		3-Phase 380V/415V	1-Phase		3-Phase				
		115V	230V	200V	230V	460V	575V		
9	4	1/2	1-1/2	2	2	5	7-1/2	109-C09A	109-C09F
12	5-1/2	1/2	2	3	3	7-1/2	10	109-C12A	109-C12F
16	7-1/2	1	3	5	5	10	15	109-C16A	109-C16F
23	11	2	3	5	7-1/2	15	15	109-C23A	109-C23F
30	15	2	5	7-1/2	10	20	25	109-C30A	109-C30F
37	18-1/2	3	5	10	10	25	30	109-C37A	109-C37F
43	22	3	7-1/2	10	15	30	30	109-C43A	109-C43F
60	30	5	10	15	20	40	50	109-C60A	109-C60F
72	37	5	15	20	25	50	60	109-C72A	109-C72F
85	45	7-1/2	15	25	30	60	60	109-C85A	109-C85F

⊗ **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. 109-C09A** becomes **Cat. No. 109-C09AB**.

AC Voltage [V]		24	48	110	120	208	208... 240	220	240	277	380... 400	400... 415	440	480	500	600
Common Control† Coil Voltage Code	50 Hz	—	—	—	—	—	—	A	T	—	N	G	B	—	M	—
	60 Hz	—	—	—	—	H	L	—	A	—	—	—	N	B	—	C
Separate Control (without transformer) Coil Voltage Code	50 Hz	K	Y	D	—	—	—	—	—	—	—	—	—	—	—	—
	60 Hz	J	X	—	D	—	—	—	—	T	—	—	—	—	—	—

⊕ **Overload Relay Code**

The Cat. No. as listed is incomplete. Select an overload relay code from page 2-205 to complete the Cat. No. Select an overload relay code from E1 Plus Overload Relay for 3Ø Applications: Phase Loss Protection, Class 10 or 20 to complete the Cat. No. Bimetal overload relays are not available in molded plastic enclosed starters.

† When selecting a factory-installed control circuit transformer (see page 2-393), 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. 109-C09FB-6P** will have a transformer with a 480V primary/120V secondary 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. 109-C09FBJC-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil. Control Circuit transformers are not available in molded plastic enclosures

IEC Reversing Combination Starters

Product Overview/Product Selection — Fusible Disconnect Type

2



Cat. No. 106-C30FBA1H-4RW-6P
IP66 (Type 3,4,12)
Metal Enclosure with Hinged Cover

Bulletin 106 IEC Reversing Combination Starters

- Selection of metal enclosures IP42 (Type 1) and IP66 (Type 3/4/12)
- Bimetallic Class 10 overload relay
- Solid-state overload relays
- Compact design
- Meets international standards
- Can be modified in the field
- Handle with defeater mechanism
- Padlockable handle (up to three padlocks)

Bulletin 106 Combination starters use a Bulletin 104 reversing contactor, a Bulletin 193 bimetallic (Class 10) or solid-state overload relay, and a Bulletin 194R rotary disconnect switch. Reversing starters (9 A...72 A) incorporate a “dual” interlock that provides both mechanical and electrical interlocking in a single unit. A normally open auxiliary contact is also included on each contactor.

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EN/IEC 60947-4-1
 VDE 0660
 CSA C22.2 No. 14
 UL 508

Certifications

cULus Listed (File E3125, Guide NLDX, NLDX7)

Your order must include: Cat. No. of the reversing combination starter selected, coil voltage code, overload relay suffix code, and, if required, factory-installed modifications suffix code and/or Cat. No. of any accessories.

Product Selection

Fusible Disconnect Type AC Operated

Max I _e [A]	Ratings (AC3, AC4)					Fuse Clip Rating Amperes/UL Class	IP42 (Type 1) General-Purpose Sheet Metal Enclosure (Hinged Cover)	IP66 (Type 3, 4, 12) Watertight, Dusttight Sheet Metal Enclosure (Hinged Cover)
	kW	Hp					Cat. No.	Cat. No.
	3-Phase 380...415V	200V	3-Phase					
9	4	2	2	5	7-1/2	30 A/Class J	106-C09A ⊕	106-C09F ⊕
12	5-1/2	3	3	7-1/2	10	30 A/Class J	106-C12A ⊕	106-C12F ⊕
23	11	5	7-1/2	15	15	30 A/Class J	106-C23A ⊕	106-C23F ⊕
30	15	7-1/2	10	20	25	60 A/Class J	106-C30A ⊕	106-C30F ⊕
43	22	10	15	30	30	60 A/Class J	106-C43A ⊕	106-C43F ⊕
60	30	15	20	40	50	100 A/Class J	106-C60A ⊕	106-C60F ⊕
72	37	20	25	50	60	100 A/Class J	106-C72A ⊕	106-C72F ⊕

⊗ 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. 106-C09A⊕ becomes **Cat. No. 106-C09AB**⊕.

Voltage		208V	230...240V	460...480V	575...600V
Common Control * Coil Voltage Code	60 Hz	H	A	B	C
120V — Separate Control (without transformer) Coil Voltage Code		AD	AD	CD	CD

⊕ Overload Relay Code

The Cat. No. as listed is incomplete. Select an overload relay code from page 2-205 to complete the Cat. No.

* When selecting a factory-installed control circuit transformer (see Modifications page 2-393), 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. 106-C09FB**⊕-6P will have a transformer with a 480V primary/120V secondary 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. 106-C09FBJ**⊕-6P will have a transformer with a 480V primary/24V secondary and a 24V starter coil.



Bulletin 112 IEC Combination Starters

- Compact design
- Can be modified in the field
- Selection of enclosures
IP42 (Type 1)
IP66 (Type 3/4/12)
- Bimetallic Class 10 overload relays
- Solid-state overload relays
- Fusible or non-fusible versions
- Handle with defeater mechanism
- Padlockable handle with up to three padlocks

Bulletin 112 is the first true IEC combination starter on the market, in that the enclosure and components have been designed to specific IEC standard requirements. The Bulletin 112 combination starter consists of a Bulletin 100 Contactor, Bulletin 193 bimetallic (Class 10) or solid-state overload relay and Bulletin 194R fused disconnect switch installed in a common enclosure. These full-voltage combination starters are designed to provide the disconnecting means, short-circuit protection (with suitable fuses), control and overload protection for three-phase squirrel-cage motors. All starters include a normally open auxiliary contact as standard.

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EN/IEC 60947-4-1
 VDE 0660
 CSA C22.2 No. 14
 UL 508

Certifications

cULus Listed (File E125316,
 Guide NKJH, NKJH7)



Your order must include: Cat. No. of the combination starter selected, coil voltage code, overload relay suffix code, and, if required, factory-installed modifications suffix code and/or Cat. No. of any accessories.

Product Selection — AC-Operated Starters

Fusible Disconnect Type

Max I_e [A]	Ratings (AC3, AC4)					Fuse Clip Rating Amperes/ UL Class	IP42 (Type 1) General Purpose Sheet Metal Enclosure (Hinged Cover)	IP66 (Type 3/4/12) Watertight, Dusttight Sheet Metal Enclosure (Hinged Cover)
	Hp						Cat. No.	Cat. No.
	3-Phase							
	200V	230V	460V	575V				
9	2	2	5	7-1/2	30 A/Class CC	112-C09A	112-C09F	
12	3	3	7-1/2	10	30 A/Class J	112-C12A	112-C12F	
23	5	7-1/2	15	15	30 A/Class J	112-C23A	112-C23F	
30	7-1/2	10	20	25	60 A/Class J	112-C30A	112-C30F	
43	10	15	30	30	60 A/Class J	112-C43A	112-C43F	
60	15	20	40	50	100 A/Class J	* 112-C60A	* 112-C60F	
72	20	25	50	60	100 A/Class J	* 112-C72A	* 112-C72F	

Non-Fusible Disconnect Type

Max I_e [A]	Ratings (AC3, AC4)					IP42 (Type 1) General Purpose Sheet Metal Enclosure (Hinged Cover)	IP66 (Type 3/4/12) Watertight, Dusttight Sheet Metal Enclosure (Hinged Cover)		
	Hp							Cat. No.	Cat. No.
	3-Phase								
	200V	230V	460V	575V					
9	2	2	5	7-1/2		112-C09A-DNF	112-C09F-DNF		
12	3	3	7-1/2	10		112-C12A-DNF	112-C12F-DNF		
23	5	7-1/2	15	15		112-C23A-DNF	112-C23F-DNF		
30	7-1/2	10	20	25		112-C30A-DNF	112-C30F-DNF		
43	10	15	30	30		112-C43A-DNF	112-C43F-DNF		
60	15	20	40	50	*	112-C60A-DNF	* 112-C60F-DNF		
72	20	25	50	60	*	112-C72A-DNF	* 112-C72F-DNF		

⊗ 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. 112-C09A** becomes **Cat. No. 112-C09AB**.

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

⊕ Overload Relay Code

The Cat. No. as listed is incomplete. Select an overload relay code from page 2-205 to complete the Cat. No.

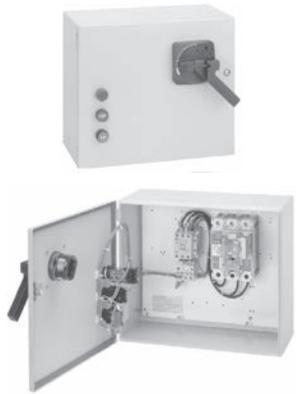
* When selecting a factory-installed control circuit transformer (see Modifications page 2-393), use the Common Control Coil Voltage Code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 112-C09FB-6P** will have a transformer with a 480V primary/120V secondary 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. 112-C09FBJ-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.

* The Bul. 193-TI bi-metallic overload relays are not available for this product selection.

IEC Circuit Breaker Combination Starters

Product Overview/Product Selection

2



Cat. No. 113-C30FBA1H-4R-43
IP66 (Type 3,4,12) Metal Enclosure
with Hinged Cover

Bulletin 113 IEC Combination Starters

- Compact design
- Can be modified in the field
- Selection of enclosures
 - IP42 (Type 1)
 - IP66 (Type 3/4/12)
- Bimetallic Class 10 overload relays
- Solid-state overload relays
- Handle defeater mechanism
- Padlockable handle with up to three padlocks
- Adjustable instantaneous trip circuit breaker

Bulletin 113 combination starter consists of a Bulletin 100 contactor, Bulletin 193 bimetallic (Class 10) or solid-state overload relay and a motor circuit protector installed in a common enclosure. These full-voltage combination starters are designed to provide the disconnecting means, short-circuit protection, control and overload protection for three-phase squirrel-cage motors. All starters include a normally open auxiliary contact as standard.

Table of Contents

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 Accessories..... 2-391
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Standards Compliance

EN/IEC 60947-4-1
 VDE 0660
 CSA C22.2 No. 14
 UL 508

Certifications

cULus Listed (File E125316,
 Guide NKJH, NKJH7)

Your order must include: Cat. No. of the combination starter selected, coil voltage code, overload relay suffix code, and, if required, factory-installed modifications suffix code and/or Cat. No. of any accessories.

Product Selection

Circuit Breaker Type - AC Operated

Max I_e [A]	Ratings (AC3, AC4)				IP42 (Type 1) General Purpose Sheet Metal Enclosure (Hinged Cover)	IP66 (Type 3/4/12) Watertight, Dusttight Sheet Metal Enclosure (Hinged Cover)
	Hp*					
	3-Phase					
	200V	230V	460V	575V	Cat. No.	Cat. No.
30	1/2	1/2	—	—	113-C30A-33	113-C30F-33
	3/4...1	3/4...1	1/2...1	—	113-C30A-35	113-C30F-35
	—	—	—	1/2...1-1/2	113-C30A-36	113-C30F-36
	1-1/2...3	1-1/2...3	1-1/2...3	2...3	113-C30A-38	113-C30F-38
	5	—	—	—	113-C30A-39	113-C30F-39
	7-1/2	5...7-1/2	5...7-1/2	—	113-C30A-40	113-C30F-40
	—	10	—	5...10	113-C30A-41	113-C30F-41
	—	—	10	—	113-C30A-42	113-C30F-42
43	—	—	20	15...20	113-C30A-43	113-C30F-43
	—	—	—	25	113-C30A-44	113-C30F-44
	7-1/2...10	10	—	—	113-C43A-41	113-C43F-41
	—	15	—	—	113-C43A-42	113-C43F-42
60	—	—	20...25	—	113-C43A-44	113-C43F-44
	—	—	30	25...30	113-C43A-45	113-C43F-45
	15	—	—	—	113-C60A-42	113-C60F-42
	—	15...20	—	—	113-C60A-43	113-C60F-43
72	—	—	40	40	113-C60A-46	113-C60F-46
	15...20	—	—	—	113-C72A-43	113-C72F-43
	—	20...25	—	—	113-C72A-44	113-C72F-44
	—	—	40...50	—	113-C72A-47	113-C72F-47
	—	—	40...60	—	113-C72A-48	113-C72F-48

⊗ 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. 113-C30A-33** becomes **Cat. No. 113-C30AB-33**.

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

⊕ Overload Relay Code

The Cat. No. as listed is incomplete. Select an overload relay code from page 2-205 to complete the Cat. No.

* For design "E" motor applications, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

* When selecting a factory-installed control circuit transformer (see Modifications page 2-393), 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. 113-C30FB3-6P** will have a transformer with a 480V primary/120V secondary 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. 113-C30FBJ-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.

‡ The Bul. 193-TI bi-metallic overload relays are not available for this product selection.

For Bulletins 105, 106, 109, 112, and 113

	Description	For Use With Bulletin No.	Enclosure Type	Cat. No.
	Red "ON" Pilot Light* Full Voltage Type	120V	Metal Lift-off, Metal Hinged, and Molded Plastic	* 198-PL21R
		208V		* 198-PL25R
		240V		* 198-PL22R
		24V	Metal Hinged	* 198-PL26R
		120V		* 198-PL27R
		240V		* 198-PL28R
	Green Pilot Light* Full Voltage Type	24V	Metal Lift-off, Metal Hinged, and Molded Plastic	* 198-PL26G
		120V		* 198-PL21G
		240V		* 198-PL22G
	Dual "ON" Pilot Light* Forward — Red Reverse — White Full Voltage Type	120V	Metal Hinged	198-PL21RW
		240V		198-PL22RW
	Pilot Device Mounting Bracket (required when mounting pilot devices in metal lift-off enclosures)	105, 109	Metal Lift-off	198-BR1
	Control Circuit Fuse Block For Class CC rejection type fuses (fuses not included)	All	Metal Lift-off and Metal Hinged	1491-R162
	Grounding Bushing Adapts to 1/2 in. N.P.T., PG 16.5 & BS20 mm threads	109	Molded Plastic	198-GR1
	Single Pole N.O. Auxiliary Contact for Disconnect Switch	106, 112	Metal Hinged	‡ 195-GA10
	Closing Button For 22.5mm Round Panel Hole	All	All	198-N1
	"OFF-ON" Selector Switch 2-Position Maintained	All	Metal Lift-off and Metal Hinged	* 198-MT3

* Does not include legend plate. See page 10-113 for Bulletin 800F Legend Plate. Legend Plates for use on metal-hinged enclosures only.

* Requires mounting bracket **Cat. No. 198-BR1** when using metal lift-off enclosures.

‡ An auxiliary contact adaptor, **Cat. No. 194R-AA**, is required when installing auxiliary contact, **Cat. No. 195-GA10**.

§ 3 required for disconnect switch.

Bulletin 100 Enclosed Starter Line
Accessories — Field Installed
 Accessories

For Bulletins 105, 106, 109, 112, and 113

2

	Description	For Use With Bulletin No.	Enclosure Type	Cat. No.
	"HAND-OFF-AUTO" Selector Switch 3-Position Maintained, Includes Legend Plate	105, 106, 109, 112, 113	Metal Lift-off and Metal Hinged	* 198-MT1
		103H	Metal Hinged	198-MT4
	"FORWARD-OFF-REVERSE" Selector Switch 3-Position Maintained	105, 106	Metal Lift-off and Metal Hinged	* 198-MT2
		105, 109	Metal Lift-off	* 198-MS3
	"START-STOP" Push Button Flush green "I/START" Extended red "O/STOP"	103H	Metal Hinged	198-MS23
		All	Metal Hinged	198-MS13
	"START" Push Button Flush green "START"	All	Metal Hinged	198-MS13
	"ON-OFF" Push Button	105, 109	Metal Lift-off	* 198-MS6
	"FORWARD, REVERSE-STOP" Push Button	105	Metal Lift-off	* 198-MS7
	"STOP" Push Button Flush red "STOP"	All	Metal Hinged	198-MS14
	"ON" Push Button Flush green "ON"	All	Metal Hinged	198-MS15
	"OFF" Push Button Flush red "OFF"	All	Metal Hinged	198-MS16
	"FORWARD, REVERSE-STOP" Push Buttons	105, 106	Metal Hinged	198-MS17
	"START" Push Button Flush green "START" and "STOP" Push Button Flush red "STOP"	103H	Metal Hinged	198-MS22
	"RESET" Push Button	All	Metal Lift-off and Metal Hinged	* 198-MR3
	Wiring Kit for Starters IEC ModCenter	103H	—	198-W103H
		109	—	198-W109
		112	—	198-W112
	Wiring Kit for Transformers IEC ModCenter	103H	—	198-WT2
		109, 112	—	198-WT1

* Requires mounting bracket Cat. No. 198-BR1 when using metal lift-off enclosures.

* Requires reset adapter Cat. No. 193-RA3 for 193-T1 bimetallic overload relay and reset adapter Cat. No. 193-ERA for Bulletin 193 E1 Plus electronic overload relay.

Full Voltage Non-Reversing Starters and Lighting Contactors (Bulletins 109 with metal enclosures, 100L)

Listed on this and the following pages are factory-installed modifications and special features which are available for the low voltage (600V maximum) 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. 109-C09ADA1E-1**

Description of Modification	Suffix Code	Enclosure Design	C09/C A	C12/C B	C16/C C	100L-C20	C23/C D	C30	C37	C43	C60	C72	C85
START-STOP Push Button	1	Metal Lift-off	A	A	A	NA	A	A	A	A	A	A	A
		Metal Hinged	A	A	A	NA	A	A	A	A	A	A	A
ON-OFF Push Button	1E	Metal Lift-off	A	A	A	A	A	A	A	A	A	A	A
		Metal Hinged	A	A	A	A	A	A	A	A	A	A	A
HAND-OFF-AUTO Selector Switch	3	Metal Lift-off	A	A	A	A	A	A	A	A	A	A	A
		Metal Hinged	A	A	A	A	A	A	A	A	A	A	A
OFF-ON Selector Switch	3E	Metal Lift-off	A	A	A	A	A	A	A	A	A	A	A
		Metal Hinged	A	A	A	A	A	A	A	A	A	A	A
RUN-Red Pilot Light*	4R	Plastic Lift-off	A	A	A	NA	A	A	A	A	A	A	A
RUN-Green Pilot Light*	4G		A	A	A	NA	A	A	A	A	A	A	A
RUN-Yellow Pilot Light*	4Y		A	A	A	NA	A	A	A	A	A	A	A
Red LED Pilot Light (120V)	4R1	Plastic Lift-off	A	A	A	NA	A	NA	NA	NA	NA	NA	NA
Red LED Pilot Light (240V)	4R2	Plastic Lift-off	A	A	A	NA	A	NA	NA	NA	NA	NA	NA
Control Circuit Transformer 2 Primary and 1 Secondary Fuse Provided (Standard Capacity)	6P*	Metal Lift-off	A	A	A	A	A	A	A	A	A	A	A
		Metal Hinged	A	A	A	A	A	A	A	A	A	A	A
External Reset	7	Plastic Lift-off	A	A	A	NA	A	NA	NA	NA	NA	NA	NA
		Metal Lift-off	A	A	A	NA	A	A	A	A	A	A	A
		Metal Hinged	A	A	A	NA	A	A	A	A	A	A	A
Control Circuit Fuse Block 2 Fuses Provided	22	Metal Lift-off	A	A	A	A	A	A	A	A	A	A	A
		Metal Hinged	A	A	A	A	A	A	A	A	A	A	A
Additional 1 N.O. - 1 N.C. (Side Mount) Auxiliary Contact on Contactor (100L only)	90	Metal Lift-off	NA	NA	NA	A	NA	NA	NA	NA	NA	NA	NA
		Metal Hinged	NA	NA	NA	A	NA	NA	NA	NA	NA	NA	NA
Additional 1 N.O. - 1 N.C. (Side Mount) Auxiliary Contact on Contactor	901	Metal Lift-off	A	A	A	A	A	A	A	A	A	A	A
		Metal Hinged	A	A	A	A	A	A	A	A	A	A	A
Additional 1 N.O. - 1 N.C. (Front Mount) Auxiliary Contact on Contactor	901T	Metal Lift-off	A	A	A	A	A	A	A	A	A	A	A
		Metal Hinged	A	A	A	A	A	A	A	A	A	A	A

* With Bulletin 800F Integrated LED Module. Pilot light is available for control voltages of 240V or less. If applicable, select a transformer. For starters with molded plastic lift-off enclosures, the voltage of the LED module must equal the starter's coil voltage.

Non-Reversing Circuit Breaker Combination Starters (Bulletin 113)

Description of Modification	Suffix Code	Enclosure Design	C09	C12	C16	C23	C30	C37	C43	C60	C72	C85
START-STOP Push Button	1	ALL	NA	NA	NA	NA	A	NA	A	A	A	NA
HAND-OFF-AUTO	3	ALL	NA	NA	NA	NA	A	NA	A	A	A	NA
Red Pilot Light†	4R	ALL	NA	NA	NA	NA	A	NA	A	A	A	NA
Control Circuit Transformer 2 Primary and 1 Secondary Fuse Provided (Standard Capacity)	6P*	ALL	NA	NA	NA	NA	A	NA	A	A	A	NA
External Reset	7	ALL	NA	NA	NA	NA	A	NA	A	A	A	NA
Control Circuit Fuse Block 2 Fuses Provided	22	ALL	NA	NA	NA	NA	A	NA	A	A	A	NA
Additional 1 N.O. - 1 N.C. (Side Mount) Auxiliary Contact on Contactor	901	ALL	NA	NA	NA	NA	A	NA	A	A	A	NA
Additional 1 N.O. - 1 N.C. (Front Mount) Auxiliary Contact on Contactor	901T	ALL	NA	NA	NA	NA	A	NA	A	A	A	NA

A=Available Option

NA=Not Available

† *□*■▲*□□□□*□□*□□*

* When ordering in Canada, use suffix 6. Primary fusing is not required by the Canadian Electrical Code.

Bulletin 100 Enclosed Starter Line
Accessories — Field Installed
Modifications

Full Voltage Reversing and Multi-Speed Starters (Bulletin 105 with metal enclosures)

Description of Modification	Suffix Code	Enclosure Design	C09	C12	C16	C23	C30	C37	C43	C60	C72	C85
FOR-REV-STOP Push Buttons (105 Only)	1	Metal Lift-off	A	A	A	A	A	A	A	A	A	NA
		Metal Hinged	A	A	A	A	A	A	A	A	A	A
FOR-OFF-REV Selector Switch (105 Only)	3	Metal Lift-off	A	A	A	A	A	A	A	A	A	NA
		Metal Hinged	A	A	A	A	A	A	A	A	A	A
Red FOR/ White REV Pilot Lights* (105 Only)	4RW	Metal Hinged	A	A	A	A	A	A	A	A	A	A
			A	A	A	A	A	A	A	A	A	A
Control Circuit Transformer 2 Primary and 1 Secondary Fuse Provided (Standard Capacity)	6P*	ALL	A	A	A	A	A	A	A	A	A	A
1 External Reset (105 Only)	7	ALL	A	A	A	A	A	A	A	A	A	A
Control Circuit Fuse Block 2 Fuses Provided	22	ALL	A	A	A	A	A	A	A	A	A	A
Additional 1 N.O. – 1 N.C. (Side Mount) Auxiliary Contact on Each Contactor	901	ALL	A	A	A	A	A	A	A	A	A	A
Additional 1 N.O. – 1 N.C. (Front Mount) Auxiliary Contact on Each Contactor	901T	ALL	A	A	A	A	A	A	A	A	A	A

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Reversing and Non-Reversing Fusible Combination Starters (Bulletins 106, 112)

Description of Modification	Suffix Code	Enclosure Design	C09	C12	C16	C23	C30	C37	C43	C60	C72	C85
START-STOP Push Button (112 Only)	1	ALL	A	A	NA	A	A	NA	A	A	A	NA
FOR-REV-STOP Push Buttons (106 Only)	1	ALL	A	A	NA	A	A	NA	A	A	A	NA
HAND-OFF-AUTO Selector Switch (112 Only)	3	ALL	A	A	NA	A	A	NA	A	A	A	NA
FOR-REV-STOP Selector Switch (106 Only)	3	ALL	A	A	NA	A	A	NA	A	A	A	NA
Red Pilot Light* (112 Only)	4R	ALL	A	A	NA	A	A	NA	A	A	A	NA
Red FOR/ White REV Pilot Lights* (106 Only)	4RW	ALL	A	A	NA	A	A	NA	A	A	A	NA
Control Circuit Transformer 2 Primary and 1 Secondary Fuse Provided (Standard Capacity)	6P*	ALL	A	A	NA	A	A	NA	A	A	A	NA
External Reset	7	ALL	A	A	NA	A	A	NA	A	A	A	NA
Fuse Cover For Disconnect Switch	8	ALL	A	A	NA	A	A	NA	A	A	A	NA
Control Circuit Fuse Block 2 Fuses Provided	22	ALL	A	A	NA	A	A	NA	A	A	A	NA
N.O. Auxiliary Contact On Disconnect Switch	98	ALL	A	A	NA	A	A	NA	A	A	A	NA
Additional 1 N.O. – 1 N.C. (Side Mount) Auxiliary Contact on Contactor (112 Only)	901	ALL	A	A	NA	A	A	NA	A	A	A	NA
Additional 1 N.O. – 1 N.C. (Side Mount) Auxiliary Contact on each Contactor (106 Only)	901	ALL	A	A	NA	A	A	NA	A	A	A	NA
Additional 1 N.O. – 1 N.C. (Front Mount) Auxiliary Contact on Contactor (112 Only)	901T	ALL	A	A	NA	A	A	NA	A	A	A	NA
Additional 1 N.O. – 1 N.C. (Front Mount) Auxiliary Contact on each Contactor (106 Only)	901T	ALL	A	A	NA	A	A	NA	A	A	A	NA

A=Available Option

NA=Not Available

* Transformer Type.

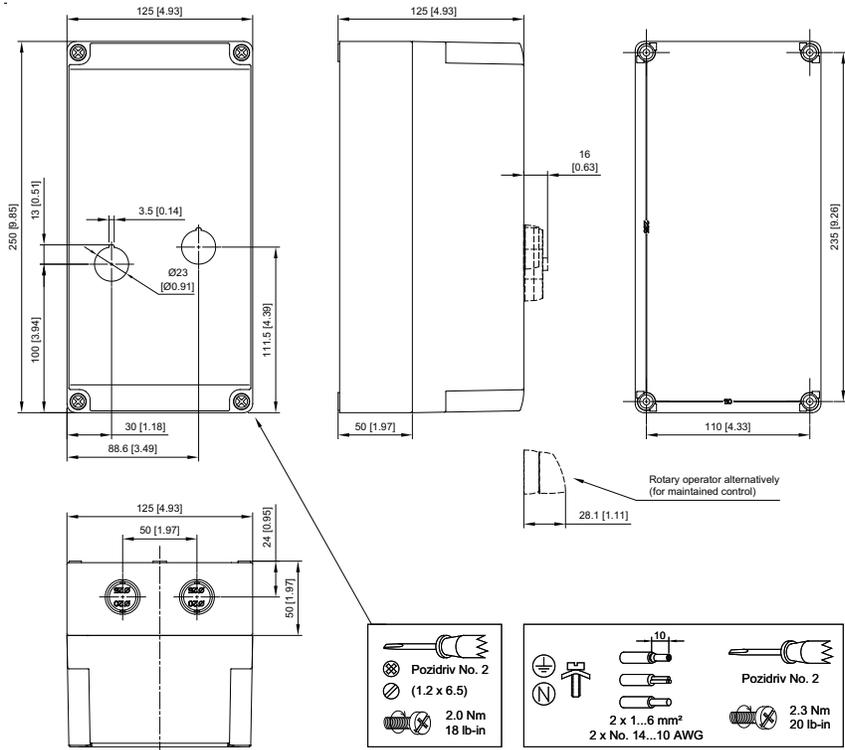
* When ordering in Canada, use suffix 6. Primary fusing is not required by the Canadian Electrical Code.



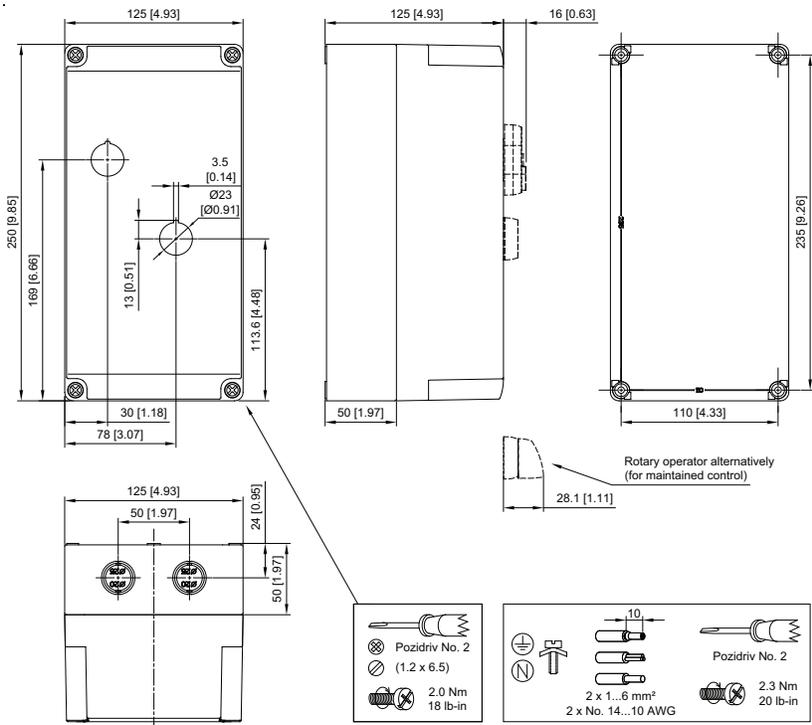
Bulletin 100 Enclosed Starter Line
Accessories — Field Installed
 Approximate Dimensions

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

2

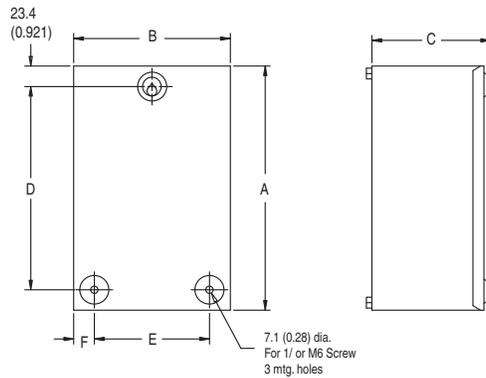


Cat. No. 198E-COS4R



Cat. No. 198E-C2S4

Bulletin 109 Metal Lift-Off Enclosures Type 1 (IP42)

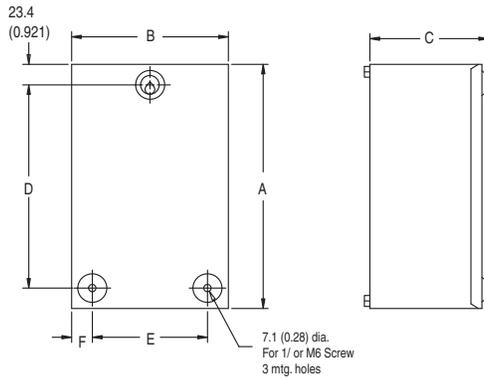


Contactor Size	A Height	B Width	C Depth	D	E	F
IP42 (Type 1) General Purpose Metal Lift-Off Enclosure for Bulletin 109 (Without Transformer)						
C09...C23	315	188	203	270	140	24
C30...C43	(12-27/64)	(7-23/64)	(8)	(10-5/8)	(5-33/64)	(15/16)
C60...C72	305	178	203	270	140	24
	(12)	(7)	(8)	(10-5/8)	(5-33/64)	(15/16)
C85	585	257	203	540	210	23.5
	(23-1/32)	(10-7/64)	(8)	(21-17/64)	(8-17/64)	(59/64)
IP42 (Type 1) General Purpose Metal Lift-Off Enclosure for Bulletin 109 (With Transformer)						
C09...C23	305	178	203	245	140	24
	(12)	(7)	(8)	(9-41/64)	(5-33/64)	(15/16)
C30...C43	290	270	152	245	225	22.5
	(11-27/64)	(10-5/8)	(5-31/32)	(9-41/64)	(8-55/64)	(57/64)
C60...C72	315	325	203	270	280	22.5
	(12-27/64)	(12-51/64)	(8)	(10-5/8)	(11-1/64)	(57/64)
C85	585	257	203	540	210	23.5
	(23-1/32)	(10-7/64)	(8)	(21-17/64)	(8-17/64)	(59/64)

Bulletin 100 Enclosed Starter Line
Accessories — Field Installed
 Approximate Dimensions

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

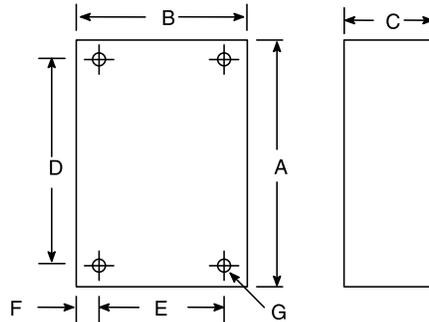
Bulletins 105 and 120E Metal Lift-Off Enclosures Type 1 (IP42)



Metal Lift-Off

Contactor Size	A Height	B Width	C Depth	D	E	F	G (dia.)
IP42 (Type 1) General Purpose Metal Lift-off Enclosure for Bulletin 105 and 120E (Without Transformer)							
C09...C23	220 (8-21/32)	235 (9-1/4)	152 (5-31/32)	175 (6-57/64)	190 (7-31/64)	22.5 (57/64)	—
C30...C43	290 (11-27/64)	270 (10-5/8)	152 (5-31/32)	245 (9-41/32)	225 (8-55/64)	22.5 (57/64)	—
C60...C72	315 (12-27/64)	325 (12-51/64)	203 (8)	270 (10-5/8)	280 (11-1/64)	22.5 (57/64)	—
C85	610 (24)	406 (16)	230 (9-1/16)	572 (22-1/2)	368 (14-1/2)	19 (3/4)	11 (7-16)
IP42 (Type 1) General Purpose Metal Lift-Off Enclosure for Bulletin 105 and 120E (With Transformer)							
C09...C23	290 (11-27/64)	270 (10-5/8)	152 (5-31/32)	245 (9-41/64)	225 (8-55/64)	22.5 (57/64)	—
C30...C43	315 (12-27/64)	325 (12-51/64)	203 (8)	270 (10-5/8)	280 (11-1/64)	22.5 (57/64)	—

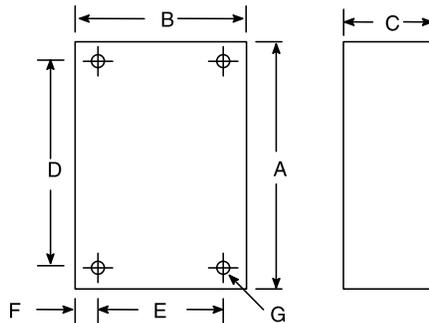
Bulletins 106, 112, and 113 Metal Hinged Enclosures Type 1 (IP42), Type 3/4/12 (IP66)



Contactor Size	A Height	B Width	C Depth	D	E	F	G (dia.)
IP42 (Type 1) and IP66 (Type 3/4/12) General Purpose Metal Hinged Enclosure for Bulletin 106 (With and Without Transformer)							
C30...C43	350 (13-25/32)	400 (15-3/4)	200 (7-7/8)	315 (12-13/32)	178 (7)	62 (2-7/16)	6.4 (1/4)
C60...C72	610 (24)	406 (16)	224 (8-13/16)	572 (22-1/2)	368 (14-1/2)	19 (3/4)	12.7 (1/2)
IP42 (Type 1) and IP66 (Type 3/4/12) General Purpose Metal Hinged Enclosure for Bulletin 112 (With and Without Transformer)							
C09...C23	350 (13-25/32)	200 (7-7/8)	200 (7-7/8)	315 (12-13/32)	76 (3)	62 (2-7/16)	6.4 (1/4)
C30...C43	350 (13-25/32)	400 (15-3/4)	200 (7-7/8)	315 (12-13/32)	178 (7)	111 (4-3/8)	6.4 (1/4)
C60...C72	610 (24)	406 (16)	224 (8-13/16)	572 (22-1/2)	368 (14-1/2)	19 (3/4)	12.7 (1/2)
IP42 (Type 1) and IP66 (Type 3/4/12) General Purpose Metal Hinged Enclosure for Bulletin 113 (With and Without Transformer)							
C30...C72	610 (24)	406 (16)	224 (8-13/16)	572 (22-1/2)	368 (14-1/2)	19 (3/4)	12.7 (1/2)

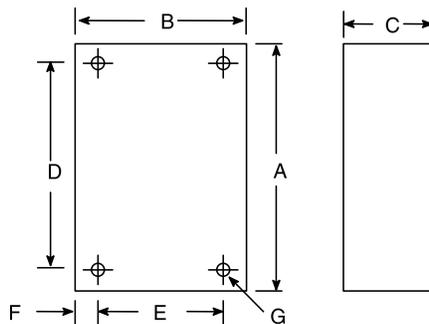
Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Bulletin 109 Metal Hinged Enclosures Type 3/4/12 (IP66)



Contactor Size	A Height	B Width	C Depth	D	E	F	G (dia.)
IP66 (Type 3/4/12) Metal Hinged Enclosure for Bulletin 109 (Without Transformer)							
C09...C43	300 (11-13/16)	200 (7-7/8)	160 (6-5/16)	265 (10-7/16)	76 (3)	62 (2-7/16)	5.5 (7/32)
C60...C72	350 (13-25/32)	200 (7-7/8)	210 (8-9/32)	315 (12-13/32)	76 (3)	62 (2-7/16)	5.5 (7/32)
C85	762 (30)	305 (12)	276 (10-7/8)	724 (28-1/2)	267 (10-1/2)	19 (3/4)	11 (7/16)
IP66 (Type 3/4/12) Metal Hinged Enclosure for Bulletin 109 (With Transformer)							
C09...C23	300 (11-13/16)	200 (7-7/8)	160 (6-5/16)	265 (10-7/16)	76 (3)	62 (2-7/16)	5.5 (7/32)
C30...C43	300 (11-13/16)	300 (11-13/16)	160 (6-5/16)	236 (9-5/16)	178 (7)	61 (2-13/32)	5.5 (7/32)
C60...C72	350 (13-25/32)	400 (15-3/4)	210 (8-9/32)	315 (12-13/32)	178 (7)	111 (4-3/8)	5.5 (7/32)
C85	610 (24)	406 (16)	230 (9-1/16)	572 (22-1/2)	368 (14-1/2)	19 (3/4)	11 (7/16)

Bulletins 105 and 120E Metal Hinged Enclosures Type 3/4/12 (IP66)

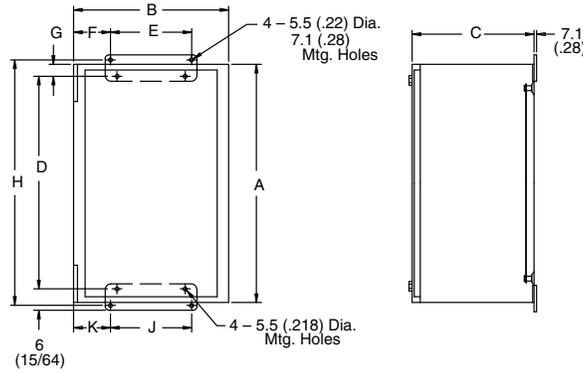


Contactor Size	A Height	B Width	C Depth	D	E (Mtg.)	F	G (dia.)
IP66 (Type 3/4/12) Metal Hinged Enclosure for Bulletins 105 and 120E (Without Transformer)							
C09...C23	250 (9-13/16)	250 (9-13/16)	160 (6-5/16)	186 (7-5/16)	76 (3)	87 (3-13/32)	5.5 (7/32)
C30...C43	300 (11-13/16)	300 (11-13/16)	160 (6-5/16)	236 (9-5/16)	178 (7)	61 (2-13/32)	5.5 (7/32)
C60...C72	350 (13-25/32)	400 (15-3/4)	210 (8-9/32)	315 (12-13/32)	178 (7)	111 (4-3/8)	5.5 (7/32)
C85	610 (24)	406 (16)	230 (9-1/16)	572 (22-1/2)	368 (14-1/2)	19 (3/4)	11 (7/16)
IP66 (Type 3/4/12) Metal Hinged Enclosure for Bulletins 105 and 120E (With Transformer)							
C09...C23	300 (11-13/16)	300 (11-13/16)	160 (6-5/16)	236 (9-5/16)	178 (7)	61 (2-13/32)	5.5 (7/32)
C30...C43	350 (13-25/32)	400 (15-3/4)	210 (8-9/32)	315 (12-13/32)	178 (7)	111 (4-3/8)	5.5 (7/32)
C60...C72	610 (24)	406 (16)	230 (9-1/16)	572 (22-1/2)	368 (14-1/2)	19 (3/4)	11 (7/16)
C85	762 (30)	610 (24)	281 (11-1/16)	724 (28-1/2)	572 (22-1/2)	19 (3/4)	11 (7/16)

Bulletin 100 Enclosed Starter Line
Accessories — Field Installed
 Approximate Dimensions

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

Bulletins 132 and 133 Metal Hinged Enclosures with Extra Space Type 3R (IP32)



2

Contactor Size	A Height	B Width	C Depth	D	E	F	G	H	J	K
IP 32 (Type 3R) Rainproof Metal Hinged Enclosure for Bulletins 132 and 133 (With and Without Transformer)										
C09...C43	584 (23)	320 (12-19/32)	187 (7-5/16)	711 (28)	105 (4-1/8)	108 (4-1/4)	679 (26-3/4)	667 (26-1/4)	105 (4-1/8)	105 (4-1/8)
C60...C72	864 (34)	447 (17-19/32)	238 (9-5/16)	991 (39)	105 (4-1/8)	171 (6-3/4)	959 (37-3/4)	946 (37-1/4)	105 (4-1/8)	169 (6-12/32)
B110	1067 (42)	762 (30)	305 (12)	1118 (44)	686 (27)	38 (1-1/2)	1092 (43)	1092 (43)	—	—
B180...B250	1219 (48)	914 (36)	305 (12)	1270 (50)	686 (27)	114 (4-1/2)	1245 (49)	1245 (49)	—	—



Molded Plastic Lift-Off



Metal Lift-Off



Metal Hinged Enclosure

Enclosures for IEC Starters

The Allen-Bradley Bulletin 198E Starter Enclosures are designed for a multitude of IEC starter configurations. The Bulletin 198E Enclosures are available in metal or plastic, and are suitable for either indoor or outdoor environments. The enclosures are rated UL Type 1, 3, 4, 4X, 12, 12K (IP42 to IP66).

Plastic Enclosures for IEC Starters

Cat. Nos. 198E-A_ and 198E-C_ plastic enclosures are designed to save installation time and to expand flexibility using the many available configurations.

- Two types available:
 - IP66 – UL General Purpose: High-grade acrylonitrile butadiene styrene (ABS) for indoor use
 - IP66 – UL 4, 4X, 12K: Heavy-duty polycarbonate (PC) for harsh indoor or outdoor environmental conditions
- Knockouts for 20 mm and 25 mm metric cable glands
- Sealable cover screws
- Non-corrosive parts
- Easy to access terminals and molded connection kits
- Reduces installation time and complexity

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Cat. Nos. 198E-A_ and 198E-C_ plastic enclosures
 EN / IEC 62208
 EN / IEC 60947-4-1
 UL 50
 UL 508
 CSA 22.2, No. 14
Approvals
Cat. Nos. 198E-A_ and 198E-C_ plastic enclosures
 CE Marked
 cULus Listed

Product Selection

IP66 (IEC Only) — General Purpose Molded Plastic Lift-Off Enclosure										
Bulletin No.								Enclosure w/ Reset Cat. No.	Enclosure w/ Start & Stop/Reset Cat. No.	Enclosure w/ Start & Stop/Reset Cat. No.
103C	107C	105	106	109	112	113	120E			
—	—	—	—	C09...C23	—	—	—	198E-A0S1	198E-A0S4	—
IP66 (UL Type 4, 4X, 12) — Raintight, Dusttight, Corrosion-Resistant, Molded Plastic Enclosure										
Bulletin No.								Enclosure w/ Reset Cat. No.	Enclosure w/ Start & Stop/Reset Cat. No.	Enclosure only Cat. No.
103C	107C	105	106	109	112	113	120E			
—	—	—	—	C09...C23	—	—	—	198E-C0S1	198E-C0S4	—
—	—	—	—	C09...C43	—	—	—	—	—	198E-C2S4
—	—	C09...C23	—	—	—	—	—	—	—	198E-C0S4R
C09...C16	C09...C16	—	—	—	—	—	—	—	—	* 198E-C0C4R

* When used with Cat. No. 198-SHB or 198-SHRY operating handle, rating is IP66 (Type 3/3R/12K).

IP42 (Type 1) — General Purpose Metal Lift-off Enclosure

Bulletin No.						Enclosure Cat. No.	Mounting Plate Cat. No.
105	106	109	112	113	120E		
—	—	C09...C23*	—	—	—	198E-BA966	—
C09...C23*	—	—	—	—	C09...C23*	198E-BA996	—
—	—	C09...C23,* C30, C37, C43*	—	—	—	198E-BA1176	—
C09...C23,* C30, C37, C43*	—	C30, C37, C43*	—	—	C09...C23,* C30, C37, C43*	198E-BA11116	—
—	—	C60...C72*	—	—	—	198E-BA1278	—
C30, C37, C43,* C60...C72*	—	C60...C72*	—	—	C30, C37, C43,* C60...C72*	198E-BA12138	—
—	—	C85**	—	—	—	198E-BA23108	198E-P2310

* Without control circuit transformer.

** With control circuit transformer.

IP42 (Type 1) — General Purpose Metal Hinged Enclosure

Bulletin No.						Enclosure Cat. No.	Mounting Plate Cat. No.
105	106	109	112	113	120E		
—	—	—	C09...C23‡§	—	—	198E-DA1488T	198E-P148T
—	C09...C43‡§	—	C30...C43‡§	—	—	198E-DA14168T	198E-P1416T

IP66 (Type 3, 4, 12) — Raintight, Dusttight, Metal Hinged Enclosure

Bulletin No.						Enclosure Cat. No.	Mounting Plate Cat. No.
105	106	109	112	113	120E		
C09...C23‡	—	—	—	—	C09...C23‡	198E-DF10106	198E-P1010
—	—	C09...C23‡	—	—	—	198E-DF1286	198E-P128
C09...C23§	—	C09...C23§	—	—	C09...C23§	198E-DF12126	198E-P1212
C09...C23‡	—	C30...C43§	—	—	C09...C23‡		
—	—	C60...C72‡	—	—	—	198E-DF1488	198E-P148
C60...C72§	—	C60...C72§	—	—	C60...C72§	198E-DF14168	198E-P1416
C60...C72‡	—	—	—	—	C60...C72‡		
—	—	—	C09...C23‡§	—	—	198E-DF1488T	198E-P148T
—	C09...C43‡§	—	C30...C43‡§	—	—	198E-DF14168T	198E-P1416T

‡ Without control circuit transformer.

§ With control circuit transformer.



Bulletin 194 Line Overview

2

			
	Bulletin 194E	Bulletin 194L	Bulletin 194R Next Generation
Product Type	Inductive load-rated load switch	Inductive load-rated control/load switch	Fused and non-fused rotary disconnects
Current Range	16...315 A	12...40 A	30 A, 60 A
Main Applications	<ul style="list-style-type: none"> UL, CSA ratings "suitable as at-motor disconnect" 	<ul style="list-style-type: none"> UL, CSA ratings "suitable as at-motor disconnect" 	<ul style="list-style-type: none"> UL 98 ratings "suitable as service entrance disconnecting means" UL 508, CSA ratings "suitable as at-motor disconnect"
Functionality	<ul style="list-style-type: none"> 3- or 6-pole switch configurations for OFF-ON or changeover applications (16...100 A switches) 3- or 4-pole switch configurations for OFF-ON or changeover applications (125...315 A switches) 	<ul style="list-style-type: none"> 1- to 6-pole multifunction switch control configurations for OFF-ON, changeover, Star-Delta (Wye-Delta), reversing, ammeter, voltmeter, and step switch applications Also available in custom control configurations up to 16 circuits for any unique control switching application. 	<ul style="list-style-type: none"> 3- or 4-pole fusible or non-fusible disconnect for standard OFF-ON or emergency stop in a main panel disconnect application 4th pole available as modular accessory Test mode switch position
Mounting Styles	Front/door or base/DIN Rail mounting	Front/door or base/DIN Rail mounting	Base/DIN Rail mounting
Handles	<ul style="list-style-type: none"> Handle colors in grey/black and red/yellow and padlockable versions Legend plates available in 0-I international markings and text styles 	<ul style="list-style-type: none"> Uniformly styled handles: selector knob, disk style, rectangular style, and key-operated versions (Type 1/12/3R, IP66) Handle colors in grey/black and red/yellow and padlockable versions Legend plates available in 0-I international markings and text styles 	<ul style="list-style-type: none"> Available in rotary styles, UL Type 1/3R/4/4X/12, IP66, standard, or test mode versions Handle colors in black and red/yellow and padlockable versions 30 A/60 A legend markers (optional) — uses Cat. No. 1492-MS6X12 markers
Open Switch or Enclosed	<ul style="list-style-type: none"> Open switch (large frame Bul. 194E — open style only) Enclosed: IP66 thermoplastic enclosure or UL/CSA rated enclosure 	<ul style="list-style-type: none"> Open switch 	<ul style="list-style-type: none"> Open switch Enclosed: UL/CSA rated enclosure
UL/CSA Electrical Ratings:			
Rated Voltage U_e	600V AC	600V AC	600V AC
Rated Current I_e	16...315 A @ 600V	12...40 A @ 600V	30 A, 60 A @ 600V
Rated Power P_e [FLA]	Varies w/ 1- or 3-phase switch, voltage	Varies w/ 1- or 3-phase switch, voltage	Varies w/ 1- or 3-phase switch, voltage
Short-Circuit Ratings	5 kA	5 kA	200 kA
Switching Rate [ops/h]	120	120	180
Mechanical Life [ops]	<ul style="list-style-type: none"> 0.2 million (16...100 A switches) 0.1 million (125 A and 160 A switches) 0.075 million (250 A and 315 A switches) 	<ul style="list-style-type: none"> 1 million 	<ul style="list-style-type: none"> 10 000
IEC Rated Current I_e			
AC-1	16...315 A @ 600V	12...40 A @ 600V	20...63 A @ 690V
AC-21A	16...315 A @ 600V	12...40 A @ 600V	Varies w/ 1- or 3-phase switch, voltage
AC-22A	16...315 A @ 600V	12...40 A @ 600V	Varies w/ 1- or 3-phase switch, voltage
Ambient Operational Temp.	-25...+60 °C (-13...+140 °F)	-25...+60 °C (-13...+140 °F)	-20...+60 °C (-4...+140 °F)
Ambient Enclosed Temp.	-20...+60 °C (-4...+140 °F)	-20...+60 °C (-4...+140 °F)	-20...+60 °C (-4...+140 °F)
Ambient Storage Temp.	-40...+80 °C (-40...+176 °F)	-40...+80 °C (-40...+176 °F)	-40...+65 °C (-40...+149 °F)
Protection class per IEC 529	<ul style="list-style-type: none"> Switch bodies: IP2 	<ul style="list-style-type: none"> Switch bodies: IP2 	<ul style="list-style-type: none"> Switch bodies: IP2 Fuse carriers: IP30
Optional Accessories	<ul style="list-style-type: none"> IP66 handles Multi-length shafts and shaft extension kits Terminal covers 	<ul style="list-style-type: none"> IP66 handles Multi-length shafts and shaft extension kits Terminal covers 	<ul style="list-style-type: none"> IP66 handles Multi-length shafts Auxiliary contacts Terminal covers NFPA 79 internal handle
Standards/Certifications	<ul style="list-style-type: none"> UL 508 CSA C22.2, No. 14 IEC 60947-3 Low Voltage Switchgear and Controlgear part 3 CE 	<ul style="list-style-type: none"> UL 508 CSA C22.2, No. 14 IEC 60947-3 Low Voltage Switchgear and Controlgear part 3 CE 	<ul style="list-style-type: none"> UL 98, UL 508 CSA C22.2, No. 14 IEC 60947-3 Low Voltage Switchgear and Controlgear part 3 CE
Product Selection	Page 2-405	Page 2-435	Page 2-454



Bulletin 194E IEC Load Switches

- Suitable as At-Motor Disconnect Switch (UL508)
- 16, 25, 32, 40, 63, 80, 100 A Inductive Load-Rated Switches
- IP66/ UL Type 1/3/3R/12 Operating Handles
- IP2LX Finger-Safe Terminals
- 3- and 6-Pole Versions; Add-on Accessory Poles to Make 4-, 5-, 7- and 8-Pole Units
- Front/Door or DIN/Base Mounting Configurations
- Available in OFF-ON and Changeover Configurations
- 3- and 6-Pole Enclosed Switches
- Optional Thermoplastic Enclosures
- Positive-Guided Actuation
- Padlockable Handles Available (up to 3 padlocks)

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Standards Compliance

IEC 60947-1
 IEC 60947-3 Low-voltage
 switchgear and control gear
 part 3
 UL 508
 CSA: C22.2 No. 14

Certifications

UL Listed (File No. E14841, Guide NLRV)
 CSA Certified (LR 13908)
 IEC, VDE and BS
 CE
 RINA — Italian Naval Registry
 CCC

Description

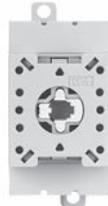
Bulletin 194E load switches are designed for use as local motor isolation and disconnect switch applications. Available with 3- and 6-pole versions with add-on additional poles, grounding and neutral terminals and auxiliary contacts, Bulletin 194Es share the same operating handles as the Bulletin 194L Control and Load Switches. Bulletin 194E switches are offered in two mounting styles, Front/Door and Base/DIN configurations for a variety of installations. Switch body styles for Bulletin 194E base-mounted switches include standard interlock shaft; Bulletin 194E front-mounted switches include standard shaft. Two-position OFF-ON switch is used to connect or disconnect a variety of inductive loads, including solenoids, valves, magnetic starters, relays, and motors. Handles featuring marked legend plates are available in Selector-Knob, Disk-Style, Rectangular-Style and Key-Operated versions. Selector-Knob versions are available in three sizes. Most handles are available in colors of Grey/Black or Red/Yellow and have padlockable versions.

Cat. No. Explanation

194E 16...100 A Small-Frame Switches (Handles listed on page 2-400)



3-Pole Base Mount



3-Pole Front Mount



6-Pole Base Mount



6-Pole Front Mount

194E – A 32 – 1753

a

Installation Type	
Code	Description
A	Base/DIN Mounting
E	Front/Door Mounting

b

Load Size	
Code	Description
16	16 A
25	25 A
32	32 A
40	40 A
63	63 A
80	80 A
100	100 A

c

Function/Circuit Diagram Ref. #			
Code	Function	Description	Circuit Diagram Ref. #
1753	OFF/ON	3-Pole, 2-Position (90°)	1753
1756	OFF/ON	6-Pole, 2-Position (90°)	1756
1783	OFF/ON	3-Pole, 2-Position (90° - inverted)	1783
3753	Changeover	3-Pole, 3-Position (90°)	3753

Frequently Ordered* OFF-ON 3-Pole Switch (includes operating shaft) (Handles listed on page 2-406)

Function Switching Angle	No. of Circuits	Contact Target Configuration X = Contact Closed O = Contact Open		Handle Position	Rated Current [A]	AC23A Rated Power [kW] at 690V AC 50 Hz	Hp @ 480V AC 60 Hz 3 Ø	OFF-ON 3-Pole Switch (includes operating shaft)	
		OFF/0	ON/1					Base-Mounted	Front-Mounted
								Cat. No.	Cat. No.
	1	O	X		16	7.5	7.5	194E-A16-1753	194E-E16-1753
	2	O	X		25	11	10	194E-A25-1753	194E-E25-1753
	3	O	X		32	15	15	194E-A32-1753	194E-E32-1753
		O	X		40	18.5	20	194E-A40-1753	194E-E40-1753
		O	X		63	22	25	194E-A63-1753	194E-E63-1753
		O	X		80	37	40	194E-A80-1753	194E-E80-1753
		O	X		100	45	50	194E-A100-1753	194E-E100-1753

Frequently Ordered* OFF-ON 6-Pole Switch (includes operating shaft) (Handles listed on page 2-406)

Function Switching Angle	No. of Circuits	Contact Target Configuration X = Contact Closed O = Contact Open		Handle Position	Rated Current [A]	AC23A Rated Power [kW] at 690V AC 50 Hz	Hp @ 480V AC 60 Hz 3 Ø	OFF-ON 6-Pole Switch (includes operating shaft)	
		OFF/0	ON/1					Base-Mounted	Front-Mounted
								Cat. No.	Cat. No.
	1	O	X		16	7.5	7.5	194E-A16-1756	194E-E16-1756
	2	O	X		25	11	10	194E-A25-1756	194E-E25-1756
	3	O	X		32	15	15	194E-A32-1756	194E-E32-1756
	4	O	X		40	18.5	20	194E-A40-1756	194E-E40-1756
	5	O	X		63	22	25	194E-A63-1756	194E-E63-1756
	6	O	X		80	37	40	194E-A80-1756	194E-E80-1756
		O	X		100	45	50	194E-A100-1756	194E-E100-1756

* See Catalog No. Explanation for more load size and change-over switch options.

Bulletin 194E
IEC Load Switches, 16...100 A
Product Selection/Catalog Number Explanation

Bulletin 194E/194L Handles (for use with Bulletin 194E Switches)

Color	Handles (Includes Legend Plate and Control Knob)			
Red/Yellow (Emergency Stop colors)	 Type I (IP66, UL Type 3/3R/12)	 Type L (IP66, UL Type 3/3R/12) With Locking For One Padlock (Padlock Not Included)	 Type N (IP66, UL Type 3/3R/12)§	Bulletin 194L handles are available in both screw fixing and 22.5 mm mounting hole style.
Black/Grey (Standard Operation colors)	 Type A (IP66, UL Type 3/3R/12)	 Type E (IP66, UL Type 3/3R/12) With Locking For One Padlock (Padlock Not Included)	 Type G (IP66, UL Type 3/3R/12)§	

§ These handles are for use with -175 and -178 (ON-OFF) switches only and are dual marked with ON-OFF and 1-0.

Cat. No. Explanation

194L - HE 6 N - 175

a

Code	Installation Type
HC	22.5 mm Mounting Hole Style Handle* (for use with front-mounted switches)
HE	Screw-Mounting Handle (for use with front- and base-mounted switches)

a b c d

Code	Legend Plate Type	Color
A	Square	Grey/Black
I	Square	Red/Yellow
E	Square/Lockable	Grey/Black
L	Square/Lockable	Red/Yellow
G	Disc/Lockable (up to 3 locks)	Grey/Black
N	Disc/Lockable (up to 3 locks)	Red/Yellow
S	Large Square with extra legend area	Grey/Black

b

Code	Use with Handle Type	Handle Legend Plate Size	Use With 194E Switch Size
4	A, E, I, L*	48 mm x 48 mm (1-57/64 in. x 1-57/64 in.)	194E-16...63 A
	S	48 mm x 62 mm (1-57/64 in. x 2-7/16 in.)	194E-25...63 A
6	A, E, I, L	64 mm x 64 mm (2-33/64 in. x 2-33/64 in.)	194E-25...100 A
	G, N*‡	67 mm x 67 mm (2-41/64 in. x 2-41/64 in.)	194E-25...100 A
	S	64 mm x 78 mm (2-33/64 in. x 3-5/64 in.)	194E-25...100 A
8	A, I	88 mm x 88 mm (3-15/32 in. x 3-15/32 in.)	194E-40...100 A
	G, N§	90 mm x 90 mm (3-35/64 in. x 3-35/64 in.)	194E-40...100 A

* For 22.5 mm mounting hole style handle (code HC), select either handle type A, E, I, or L with 48 x 48 mm legend plate size (code 4) only or handle type G or N with 64 x 64 mm legend plate size (code 6) only.
 * Order 194E- 16 A Type G and N handles as Cat. No. 194E-HE4N-175 or 194E-HE4G-175
 ‡ Use Type G and N with ON-OFF function only (selection "d", code -175)
 § Cat. No. 194R-HE front-mounting switch only

d

Code	Description	Legend Marking
175	O-I	
175I	OFF-ON	
350	1-0-2 (Reversing)	
375	1-0-2 (90 degrees) (Changeover)	
178	O-I	
178I	OFF-ON	

Frequently Ordered 194L Handles — OFF-ON Base/Front-Mounted 3- and 6-Pole Switch Handles (Switch Body listed on page 2-405)

Handle Type	Degree of Protection	Handle Color	Bezel Plate Size	For Use With	Legend Plate Marking	Cat. No.
E	IP66 (UL Type 1) (UL Type 3/3R/12)	Black/Grey	48 x 48 mm (1-57/64 x 1-57/64 in.)	194E-16...63 A 194L-E12...40 A, -1753 194L-A12...40 A, -1753	0-1 OFF-ON	194L-HE4E-175 194L-HE4E-175I
L		Red/Yellow	48 x 48 mm (1-57/64 x 1-57/64 in.)	194E-16...63 A 194L-E12...40 A, -1753 194L-A12...40 A, -1753	0-1 OFF-ON	194L-HE4L-175 194L-HE4L-175I
G	IP66 (UL Type 3/3R/12)	Black/Grey	54 x 54 mm (2-1/8 x 2-1/8 in.)	194E-16 A	0-1 OFF-ON	194E-HE4G-175
			67 x 67 mm (2-41/64 x 2-41/64 in.)	194E-25...100 A 194L-E12...40 A, -1753 194L-A12...40 A, -1753	0-1 OFF-ON	194L-HE6G-175
			88 x 88 mm (3-15/32 x 3-15/32 in.)	194E-40...100 A	0-1 OFF-ON	194L-HE8G-175
N		Red/Yellow	54 x 54 mm (2-1/8 x 2-1/8 in.)	194E-16 A	0-1 OFF-ON	194E-HE4N-175
			67 x 67 mm (2-41/64 x 2-41/64 in.)	194E-25...100 A 194L-E12...40 A, -1753 194L-A12...40 A, -1753	0-1 OFF-ON	194L-HE6N-175
			88 x 88 mm (3-15/32 x 3-15/32 in.)	194E-40...100 A	0-1 OFF-ON	194L-HE8N-175
L	IP66 (UL Type 3/3R/12)	Red/Yellow	48 x 48 mm (1-57/64 x 1-57/64 in.)	194L-E12...40 A, -1753	0-1 OFF-ON	194L-HC4L-175 194L-HC4L-175I

Bulletin 194E Open and Enclosed Switch Kits

Cat. No. Explanation

194E - Y 32 -1753- 6N

a b c d

<i>a</i>		<i>b</i>		<i>c</i>		<i>d</i>	
Code	Installation Type	Code	Load Size	Code	Configuration	Code	Handle Style
A	Base/DIN Mounting, open type switch	16	16 A*	1753	3-Pole OFF/ON (90°)	4N	194E-HE4N-175 (use with 16 A Switch)
E	Front/Door Mounting, open type switch	25	25 A	1756	6-Pole OFF/ON (90°)	4G	194E-HE4G-175 (use with 16 A Switch)
Y	Enclosed Base Mounting Switch With Handle (Uses IP66 ABS thermoplastic enclosure)	32	32 A			4A	194L-HE4A-175 (use with 16...100 A Switch)
		40	40 A			6N	194L-HE6N-175 (use with 25...100 A Switch)
		63	63 A			6G	194L-HE6G-175 (use with 25...100 A Switch)
		80	80 A			6A	194L-HE6A-175 (use with 25...100 A Switch)
		100	100 A				

* For 16 A Enclosed Switch: use "16M" (3-pole enclosure has M16/20 knockouts, 6-pole 16 A enclosure has M25/32 knockouts). For 25/32 A Enclosed Switch with M20/25 metric knockouts: use "25M" or "32M".

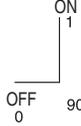
Frequently Ordered Switch Kits — OFF-ON Front- and Base-Mounted 3-Pole Switch With Cat. No. 194L-HE6N-175 Red/Yellow Handle

	Function Switching Angle	Rated Current [A]	AC23A Rated Power [kW] at 690V AC	HP @ 480V AC 60 Hz, 3 Ø	Base-Mounted Cat. No.	Front-Mounted Cat. No.
		25	7.5	10	194E-A25-1753-6N	194E-E25-1753-6N
		32	11	15	194E-A32-1753-6N	194E-E32-1753-6N
		63	18.5	25	194E-A63-1753-6N	194E-E63-1753-6N

Base-Mounting Distribution Switches (handles are pre-assembled to switch)

	Function Switching Angle	No. of Circuits	Contact Target		Handle Color	Legend Plate Marking	Lockable (One Padlock)	Rated Current [A]	AC23A Rated Power [kW] at 690V AC	Hp @ 480V AC 60 Hz, 3 Ø	Cat. No.
			OFF/0	ON/1							
		1 2 3	O O O	X X X	Red/Yellow	0-1	Yes	25	11	—	194E-A25-1753-R
					Black/Grey	0-1	No				194E-A25-1753-Q
					Red/Yellow	0-1	Yes	32	15	—	194E-A32-1753-R
					Black/Grey	0-1	No				194E-A32-1753-Q

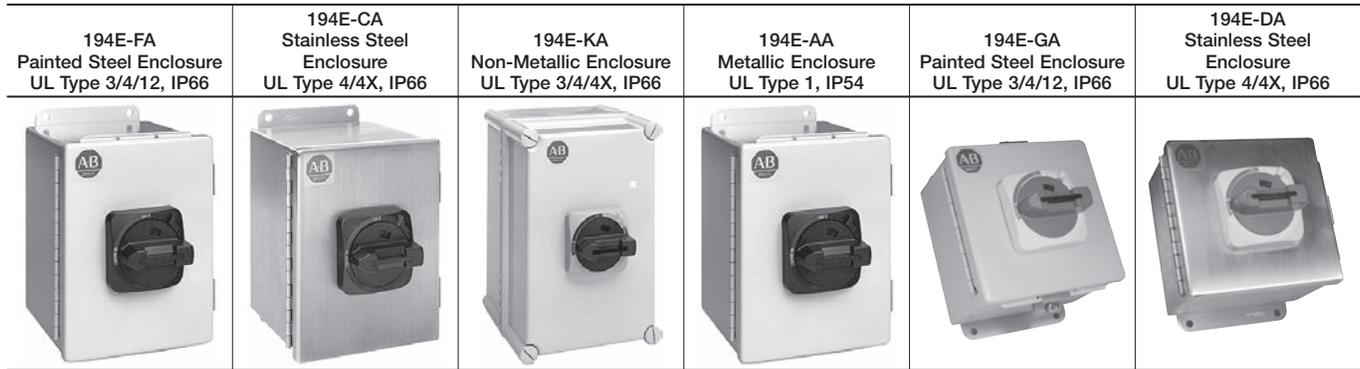
Frequently Ordered Enclosures — 3- and 6-Pole Enclosed Switches With Cat. No. 194L-HE6N-175 Red/Yellow Operating Handles

	No. of Poles	Function Switching Angle	Rated Current [A]	Handle Color	Cat. No.
 <p>Uses Base-Mounted Switches</p>	3		16	Red/Yellow	194E-Y16-1753-4N
			25		194E-Y25-1753-6N
			32		194E-Y32-1753-6N
			40		194E-Y40-1753-6N
	6		25	Red/Yellow	194E-Y25-1756-6N



Bulletin 194E
IEC Load Switches, 16...100 A
 Product Selection/Catalog Number Explanation

Bulletin 194E Enclosed Disconnect Load Switches with 194R Handles (with Defeater, suitable for 3 padlocks)



2

Cat. No. Explanation *§

194E - FA 32 E - P11 - P11 - 6
 a b c d d e

a	
Code	Enclosure Type
FA	UL Type 3/4/12, IP66 Painted Steel, Hinged, for 16...100 A switches
GA	UL Type 3/4/12, IP66 Painted Steel, Hinged, in 6 x 6 x 4 in. size, for 16...32 A 3-pole switches ‡
CA	UL Type 4/4X, IP66 Stainless Steel, Hinged, for 16...100 A switches
DA	UL Type 4/4X, IP66 Stainless Steel, Hinged, in 6 x 6 x 4 in. size, for 16...32 A 3-pole switches ‡
KA	UL Type 3/4/4X, IP66 Non-Metallic, for 16...100 A switches
AA	UL Type 1, IP54 Painted Steel, Hinged, for 16...100 A switches (Same enclosure as FA without gasketing)

b	
Code	Load Size
16	16 A
20	25 A
32	32 A
40	40 A
63	63 A
80	80 A
00	100 A

c	
Code	Handle Color (194R-HS _ _)
Blank	Grey/Black
E	Red/Yellow

d	
Code	Left Side + Right Side Modifications*
Blank	No Option
-P11	1 N.O. + 1 N.C. Auxiliary Contacts
-PL11	1 N.O. + 1 N.C.L.B. Auxiliary Contacts
-P22	2 N.O. + 2 N.C. Auxiliary Contacts
-PD10	1 N.O. E.B.
-NP	Additional Pole
-PE	Grounding Pole
-TN	Neutral Pole

e	
Code	Switch Type
Blank	3-pole switch
-6	6 Pole switch§

- * Modifications: Up to two suffix codes may be added to an enclosed disconnect load switch. See Guidelines, page 2-409. If only one accessory is chosen, it is mounted on the left side of the switch.
- § To order the cat. no. 194E-FA40/FA63 or 194E-CA40/CA63 in the larger 80/100A sized enclosure, add an "X" after the handle color. For example, Cat. No. **194E-FA40E** becomes Cat. No. **194E-FA40EX**.
- ‡ GA and DA type enclosures: use with 3-pole 16...32 A switches only.
- § Special order; allow for longer delivery time.

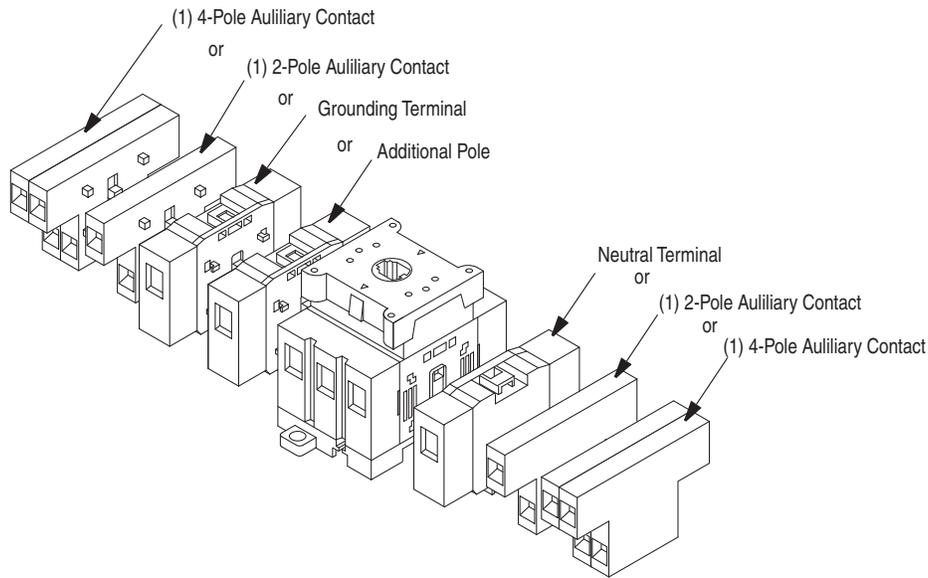
Frequently Ordered Bulletin 194E Enclosed Switches with Bulletin 194R Handle

Description	Rated Current (A)	Dimension Reference	Handle Color	Cat. No.*
Stainless steel enclosure, IP66/Type 4/4X	25	A1	Black	194E-CA20
			Red/Yellow	194E-CA20E
	32	A1	Black	194E-CA32
			Red/Yellow	194E-CA32E
	63	A1	Black	194E-CA63
			Red/Yellow	194E-CA63E
Painted steel enclosure, IP66/Type 3/4/12	25	A1	Black	194E-FA20
			Red/Yellow	194E-FA20E
	32	A1	Black	194E-FA32
			Red/Yellow	194E-FA32E
	40	A1	Black	194E-FA40
			Red/Yellow	194E-FA40E
Non-metallic enclosure, IP66/Type 4/4X	25	C1	Black	194E-KA20
			Red/Yellow	194E-KA20E

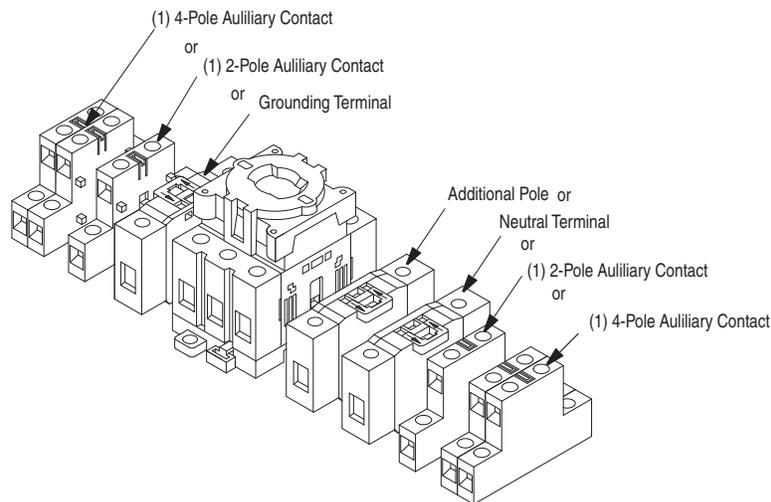
- * Modifications: Up to two suffix codes may be added to an enclosed disconnect load switch. See Guidelines, page 2-409. If only one accessory is chosen, it is mounted on the left side of the switch.

IEC Load Switch Accessories

194E-E16...100 A, Front/Door Mounting



194E-A16...100 A, Base/DIN Rail Mounting



Accessory Configuration Guidelines

Accessory drawings represent modular, snap-on features of Bulletin 194E accessories. They are not suggesting possible accessory configurations. Use the following guidelines for choosing 194E accessory configurations.

- Up to two accessories may be added to the Bulletin 194E switch body.
- For the 194E 16, 25, 32, 40, or 63 A switches, the early break auxiliary contact (-PD10) may only be used in the following configurations:
 - As a single unit on either side of the switch
 - As a single unit on a side when used with a switch + 4th pole (-NP)
 - As a single unit on a side when used with a switch + ground terminal (-PE)
 - As a single unit on a side when used with a switch + neutral terminal (-TN)
 - No other auxiliary contact may be used in combinations with an early break auxiliary contact (-PD10)
- Other combinations of auxiliary contacts are permissible.
- For the 194E 80 and 100 A switches, any combination of auxiliary contacts, 4th pole, ground terminal, neutral terminal, and -PD10 is permissible.

Bulletin 194E
IEC Load Switches, 16...100 A
 Accessories

2

Auxiliary Contacts	No. of Auxiliary Contacts	For Use With	Cat. No.*
	1 N.O. + 1 N.C.	194E-A16...100	194E-A-P11
		194E-E16...100	194E-E-P11
	1 N.O. + 1 N.C.L.B.	194E-A16...100	194E-A-PL11
		194E-E16...100	194E-E-PL11
	2 N.O. + 2 N.C.	194E-A16...100	194E-A-P22
		194E-E16...100	194E-E-P22
	1 N.O.E.B.	194E-A16	194E-A16-PD10
		194E-A25...100	194E-A-PD10
		194E-E16	194E-E16-PD10
		194E-E25...100	194E-E-PD10

Additional Pole, 1 N.O.	For Use With	Cat. No.*
	194E-A16	194E-A16-NP
	194E-A25	194E-A25-NP
	194E-A32	194E-A32-NP
	194E-A40	194E-A40-NP
	194E-A63	194E-A63-NP
	194E-A80	194E-A80-NP
	194E-A100	194E-A100-NP
	194E-E16	194E-E16-NP
	194E-E25	194E-E25-NP
	194E-E32	194E-E32-NP
	194E-E40	194E-E40-NP
	194E-E63	194E-E63-NP
	194E-E80	194E-E80-NP
	194E-E100	194E-E100-NP

Earthing/Grounding Terminal	For Use With	Cat. No.*
	194E-A16	194E-A16-PE
	194E-A25/32	194E-A32-PE
	194E-A40/63	194E-A63-PE
	194E-A80/100	194E-A100-PE
	194E-E16	194E-E16-PE
	194E-E25/32	194E-E32-PE
	194E-E40/63	194E-E63-PE
	194E-E80/100	194E-E100-PE

6-Pole Mechanical Coupling*	For Use With	Cat. No.
	194E-16	194E-G3821
	194E-25/32	194E-G3660
	194E-40/63	194E-G3661
	194E-80/100	194E-G3662

Neutral Terminal	For Use With	Cat. No.*
	194E-A16	194E-A16-TN
	194E-A25/32	194E-A32-TN
	194E-A40/63	194E-A63-TN
	194E-A80/100	194E-A100-TN
	194E-E16	194E-E16-TN
	194E-E25/32	194E-E32-TN
	194E-E40/63	194E-E63-TN
	194E-E80/100	194E-E100-TN

* A maximum of two side-mount accessories may be added to a 194E switch (one on each side).

ABS Thermoplastic Enclosure — IP66, For High-Impact Applications (grounding screw included)	Description	No. of Poles	For Use With	Cat. No.
	For PG cable glands	3...4	194E-A25/32	194L-G3572
		3...4	194E-A40/63	194E-G3663
		6	194E-A25/32	
		6	194E-A40/63	194E-G3665
	For metric cable glands	3...4	194E-A80/100	194L-G3572M
		3...4	194E-A25/32	194E-G3663M
		3...4	194E-A40/63	
		6	194E-A25/32	194E-G3665M
		6	194E-A40/63	
		3...4	194E-A80/100	

Noryl Thermoplastic Enclosures — IP66, For Corrosion-Prone Applications (grounding screw included)	Description	No. of Poles	For Use With	Cat. No.
	For PG cable glands	3...4	194E-A25/32	194L-G3576
		6	194E-A25/32	194E-G3664
		3...4	194E-A40/63	
		6	194E-A40/63	194E-G3666
		3...4	194E-A80/100	
		For metric cable glands	3...4	194E-A25/32
	6		194E-A25/32	194E-G3664M
	3...4		194E-A40/63	
	6		194E-A40/63	194E-G3666M
	3...4	194E-A80/100		

Description	For Use With	Pkg. Qty.	Cat. No.
Additional Earth/Ground and Neutral Terminals — For Thermoplastic Enclosure	194L-G3663, G3664, G3665, G3666	5	194E-G3673
	194L-G3572 and G3676	5	194E-G3653

Terminal Covers	No. of Poles	For Use With	Cat. No.
	1	194E-16	194E-16-C1
	3	194E-16	194E-16-C3
		194E-25/32	194E-25-C3
		194E-40/63	194E-40-C3
	4	194E-80/100	194E-80-C3
		194E-25/32	194E-25-C4
		194E-40/63	194E-40-C4
	194E-80/100	194E-80-C4	

* User must order (2) Bulletin 194E 3-Pole Switches separately.

* Coupling for changeover switch not available. Changeover switch must be ordered as a factory-assembled device (e.g., 194E-A25-3753).

Operating Shafts

	Length	Construction	Pkg. Qty.	Cat. No.
 <i>Standard Shaft (for front-mount switches)</i>	34 mm (1-11/32 in.)	Plastic	5	194L-G3380
		Metal	5	194E-G3688
 <i>Interlock Shaft (for base-mount switches)</i>	44 mm (1-47/64 in.) (Standard Length)	Plastic	5	194L-G2830
		Metal		194E-G3687
	52 mm (2-3/64 in.)	Plastic		194L-G3194
		Metal		194E-G3707
57 mm (2-15/64 in.)	Plastic	194L-G3195		

Bulletin 194E Load Switch Cat. No. Shaft Selection for use with 194E and 194L Thermoplastic Enclosures

Rated Current [A]	3-Pole Switches (-1753 suffix)		6-Pole Switches (-1756 suffix)		Changeover Switches (-3753 suffix)	
	194E-E...	194E-A...	194E-E...	194E-A...	194E-E...	194E-A...
16	plastic shaft (Cat. No. 194L-G3380)	plastic shaft (Cat. No. 194L-G2830)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)
25	plastic shaft (Cat. No. 194L-G3380)	plastic shaft (Cat. No. 194L-G2830)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)
32	plastic shaft (Cat. No. 194L-G3380)	plastic shaft (Cat. No. 194L-G2830)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)
40	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)
63	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194L-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)
80	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)
100	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)

Bulletin 194E
IEC Load Switches, 16...100 A
 Accessories/Other Accessories

Shaft Extension Kits

 Shaft Extension	Length	For Use With	Pkg. Qty.	Cat. No.
	24 mm (15/16 in.) Per Extension	194E-A...	10	194L-G2853

Metal Shaft Extensions — With Padlock Provision in OFF Position

	Length	For Use With	Pkg. Qty.	Cat. No.
	110...235 mm (4-21/64...9-1/4 in.)	194E-A...	1	194L-G3393
230...350 mm (9-3/64...13-51/64 in.)	194L-G3394			

Metal Shaft Adaptor Kits — For use with 194R Type 4/4X Handles

	Metal shaft adaptor kits — for use with 194R Type 4/4X handles kit includes bezel adaptor and 194R-R1 operating shaft. Operating handle (Cat. No. 194R-HS4) must be ordered separately.	For Use With	Pkg. Qty.	Cat. No.
		194E-A...	1	194E-G3675
	Metal Shaft Extension For modification of Cat. No. 194L-G3393/ G3394 when used with any switches other than 2-position, 90° rotation.	194E-A...	10	194L-G3399

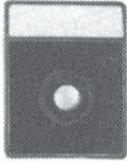
Other Accessories

194L/194E 22.5 mm Mounting Hole Style Handles (Type B, D) (For Front-Mounted Switches)

 Type B	Description		Cat. No.
	22.5 mm Mounting Hole Style Handles (IP65) Handle Style: Knob Lever with Latch (For Use With 194E-E25...100 A, -1753) or 194L-E12...40 A		194L-HCB-001
 Type D	22.5 mm Mounting Hole Style Handles Key Removal Position (Includes Latch) For Use With 194L-E 12...40 A, 194E-E16...63 A, -1753		194L-HCDC-001
	22.5 mm Mounting Hole Style Handles Key Removal Position (Includes Latch) For Use With 194L-E 12...40 A, 194E-E16...63 A, -1753		194L-HCDD-001
	22.5 mm Mounting Hole Style Handles Key Removal Position (Includes Latch) For Use With 194L-E 12...40 A, 194E-E16...63 A, -1753		194L-HCDG-001

Accessory Description	Pkg. Qty.	Cat. No.	Cat. No.
 Control Knob, Black, with Locking Facility (Use 1/4 in. max. hasp lock.) (Locks in 0°, 90°, 180°, and 270° positions)	10	*	194L-G2864N
Control Knob, Red, with Locking Facility (Use 1/4 in. max. hasp lock)		*	194L-G2864R

* These locking knobs can only be added to the "HE" style actuators. If a locking knob is desired on a "HC" style actuator, it has to be ordered as part of the main catalog number. For example, Cat. No. 194L-HC4E-175.

Accessory Description		Pkg. Qty.	Cat. No.
	Control Knob, Type P Control Knob, Black, 31 mm (1-7/32 in.) Diameter	5	194L-G2888N
	Control Knobs, Type P Control Knob, Red, 31 mm (1-7/32 in.) Diameter		194L-G2888R
	Control Knob, Black, L = 37.5 mm (1-31/64 in.)	5	194L-G3154N
	Control Knob, Black, L = 48 mm (1-57/64 in.)		194L-G3155N
	Control Knob, Red, L = 37.5 mm (1-31/64 in.)		194L-G3154R
	Control Knob, Red, L = 48 mm (1-57/64 in.)		194L-G3155R
	Rectangular front frame with blank nameplate L = 48 x 62 mm (1-57/64 x 2-7/16 in.)	10	194L-G3196
	Rectangular front frame with blank nameplate L = 64 x 78 mm (2-33/64 x 3-5/64 in.)		194L-G3197

Additional Legend Plates/Frames

	Color	Legend Size	For Use With	Pkg. Quantity	Legend Plate Marking	Cat. No.
	Black/Grey	19.2 mm x 49 mm 3/4 in. x 1-59/64 in.	Size 6 Type G and N style handles, Cat. Nos. 194L- HE6G/N	5	(Blank)	194L-G3667
					MAIN SWITCH	194L-G3667A
					HAUPTSCHALTER	194L-G3667B
					INTERR. PRINCIPALE	194L-G3667C
					INTERR. PRINCIPAUX	194L-G3667D
					INTERR. PRINCIPAL	194L-G3667E
					HUVUDBRYTARE	194L-G3667F
					WAHLSCHALTER	194L-G3667G
	EMERGENCY OFF	194L-G3667H				
	Black/Grey	18 x 84 mm 11/16 x 3-5/16 in.	Size 8 Type G and N style handles, Cat. Nos. 194L- HE8G/N	5	(Blank)	194L-G3515
					MAIN SWITCH	194L-G3515A
					HAUPTSCHALTER	194L-G3515B
					INTERR. PRINCIPALE	194L-G3515C
					INTERR. PRINCIPAUX	194L-G3515D
INTERR. PRINCIPAL					194L-G3515E	
HUVUDBRYTARE					194L-G3515F	
WAHLSCHALTER					194L-G3515G	
EMERGENCY OFF	194L-G3515H					

Legend Plates with Bezel	Legend Plate Color	Pkg. Quantity	Legend Plate Marking *		
			0-1	OFF-ON	Blank Legend Plate
			Cat. No.	Cat. No.	Cat. No.
	Silver	10	194L-A4-175	194L-A4-175I	194L-A4-000
			194L-A6-175	194L-A6-175I	194L-A6-000
			194L-A8-175	194L-A8-175I	194L-A8-000
	Yellow		194L-I4-175	194L-I4-175I	194L-I4-000
			194L-I6-175	194L-I6-175I	194L-I6-000
			194L-I8-175	194L-I8-175I	194L-I8-000

* Custom-Engraved legend plates available. To order, use publication 194L-PP002_-EN-P.

Shaft for Enclosures

Enclosure Type	Suitable For			Suitable For		
	194L (Base-Mounted Switches)	No. of Contacts	Shaft	Use with 194E Switch	No. of Poles	Shaft Required
194L-G3572	194L-A12(16)	1/2	194L-G3195	194E-A25(32)	3 and 4	194L-G3194
194L-G3576	194L-A12(16)	3/4	Standard			
(95 x 150 x 86 mm)	194L-A20(25)	1/2	194L-G3194			
	194L-A20(25)	3/4	Standard			
194L-G3573	194L-A12(16)	5/6	194L-G3195			
194L-G3577	194L-A12(16)	7/8	194L-G3194	—	—	—
(95 x 150 x 111 mm)	194L-A12(16)	9/10	Standard			
	194L-A20(25)	5/6	194L-G3194			
	194L-A20(25)	7/8	Standard			
194E-G3663	—	—	—	194E-A40(63)	3 and 4	194L-G3194
194E-G3664	—	—	—	194E-A25(32)	6	Standard
(125 x 180 x 105 mm)						
194E-G3665	—	—	—	194E-A80(100)	3 and 4	194E-G3707
194E-G3666	—	—	—	194E-A40(63)	6	Standard
(175 x 230 x 120 mm)						

Accessory Combinations in Enclosure

Enclosure Type	Switch	No. of Poles	Shaft	Aux. Contacts (single or double)	Additional Pole Block	On Switch		On Enclosure	
						Neutral Terminal Block	Ground Terminal Block	Neutral Terminal Block	Ground Terminal Block
194L-G3572 (ABS) 194L-G3576 (Noryl)	194E-A25(32)	3	194L-G3194	X	X				
				X		X			
				X			X		
					X		X		
				X				X	
				X					X
(95 x 150 x 86 mm)									
194E-G3663 (ABS) 194E-G3664 (Noryl)	194E-A40(63)	3	194L-G3194	X	X			X	X
				X		X		X	X
				X			X	X	X
					X		X	X	X
					X		X	X	X
					X		X	X	X
(125 x 180 x 105 mm)	194E-A25(32)	6	194E-G3707					X	X
194E-G3665 (ABS) 194E-G3666 (Noryl)	194E-A80(100)	3	194E-G3707	X	X			X	X
				X		X		X	X
				X			X	X	X
					X		X	X	X
					X		X	X	X
					X		X	X	X
(175 x 230 x 120 mm)	194E-A40(63)	6	194E-G3707	1L+1R				X	X

Electrical Ratings

Performance Data				16 A	25 A	32 A	40 A	63 A	80 A	100 A	Aux. Contacts		
IEC Applications													
Rated operational voltage (U_e): IEC*				[V]	690	690	690	690	690	690	690	690	
Rated operational voltage (U_e): UL, CSA				[V]	600	600	600	600	600	600	600		
Rated isolation voltage (U_i): IEC/UL, CSA				[V]	690/600	690/600	690/600	690/600	690/600	690/600	690/600		
Rated impulse voltage (U_{imp}): UL, CSA				[kV]	8	8	8	8	8	8	8		
Test voltage, (U_i) 1 minute				[kV]	2.5	2.5	2.5	2.5	2.5	2.5	2.5		
Lost power per pole				[W]	0.58	1.0	1.5	1.6	2.4	3.6	5.5	0.4	
Rated frequency				[Hz]	50/60	50/60	50/60	50/60	50/60	50/60	50/60		
Conventional free air thermal current I_{th} *				[A]	25	40	50	63	75	100	120	12	
Conventional enclosed thermal current I_e *				[A]	20	32	40	50	63	80	100	10	
Rated current I_e*													
AC-1/	Non-inductive or only slightly inductive loads			[A]	16	25	32	40	63	80	100	10	
AC-21A	Switching of resistive loads with slight overload												
Rated power P_e													
AC-23A	Occasional switching of 3Ø motors and other highly inductive loads (criterion for selecting main switches)	230V	[kW]	5.5	7.5	7.5	15	18.5	22	30	—		
		400V	[kW]	7.5	11	15	22	30	37	55	—		
		690V	[kW]	7.5	11	15	18.5	22	37	45	—		
AC-3	Squirrel-cage motors; starting and stopping of running motors	230V	[kW]	4	5.5	7.5	11	15	18.5	22	—		
		400V	[kW]	5.5	7.5	11	15	18.5	30	37	—		
		690V	[kW]	5.5	7.5	11	15	18.5	30	22	—		
Short circuit current (co-ordination type 2)				[kA]	20	20	15	20	15	30	25	—	
Rated conditional short-circuit current													
Maximum fuse rating of circuit (type g,G)				400/415V	[A]	20	25	35	50	63	80	100	—
Rated short-time current I_{cw} (1 s)				[A]	800	900	900	1300	1300	2500	2500	—	
Rated breaking capacity AC23A (cosφ 0.45)													
				230V	[A]	156	296	296	484	484	780	780	—
				400V	[A]	120	256	256	504	504	800	800	—
				690V	[A]	70	136	136	196	196	376	376	—
DC switching capacity													
Rated current I_e	1 pole	24/48V	[A]	20	25	32	40	63	80	100	—		
		110V	[A]	5	5	6	8	10	16	20	—		
		220V	[A]	1	1	1	1.5	1.5	3	3	—		
		440V	[A]	0.5	0.5	0.5	0.6	0.6	0.7	0.7	—		
DC-21A	2 poles in series	96V	[A]	20	25	32	40	63	80	100	—		
		110V	[A]	20	23	25	32	50	70	80	—		
		220V	[A]	5	5	6	8	10	16	20	—		
		440V	[A]	1	1	1	1.5	1.5	3	3	—		
	3 poles in series	600V	[A]	0.6	0.6	0.6	0.8	0.8	1	1	—		
		110V	[A]	20	25	32	40	63	80	100	—		
		220V	[A]	13	13	15	20	28	50	63	—		
		440V	[A]	2.2	2.2	2.2	3.6	3.6	6.5	6.5	—		
				600V	[A]	1.3	1.5	1.5	2	2	3	3	—
Rated power P_e													
DC-23A, DC-3, DC-5	3 poles in series	90V	[kW]	1	1.3	1.5	2.9	4.1	5.1	7.2	—		
		110V	[kW]	1	1.1	1.3	2.2	3.3	5.5	7	—		
		220V	[kW]	0.8	0.9	1.1	1.7	2	3.5	4.4	—		
		440V	[kW]	0.6	0.6	0.6	0.9	0.9	1.1	1.1	—		
		600V	[kW]	0.4	0.4	0.4	0.5	0.5	0.9	0.9	—		

* See standards compliance listed on page 2-404.

* Suitable also for SEV 500.



Bulletin 194E
IEC Load Switches, 16...100 A
 Specifications

Electrical Ratings, Continued

Performance Data		16 A	25 A	32 A	40 A	63 A	80 A	100 A	Aux. Contacts	
UL/CSA Applications										
Continuous current	[A]	16	25	32	40	63	80	100	—	
	Heavy Pilot Duty	[AC]	A600	A600	A600	—	—	—	A600	
	Standard Duty	[DC]	—	—	—	—	—	—	Q600	
	Motor rating 60 Hz	120V, 1P	FLA	16	16	16	24	34	56	80
			Hp	1	1	1	2	3	5	7.5
		240V, 1P	FLA	12	12	17	17	28	50	68
			Hp	2	2	3	3	5	10	15
		480V, 1P	FLA	8.5	8.5	14	21	26	34	68
			Hp	3	3	5	7.5	10	15	30
	600V, 1P	FLA	11.2	11.2	11.2	16	20	27	44	
		Hp	5	5	5	7.5	10	15	25	
	Single-phase (2 poles)	120V, 3P	FLA	13.6	13.6	19.2	30.4	40	56	84
Hp			2	2	3	5	7.5	10	15	
240V, 3P		FLA	9.6	15.2	22	28	42	68	80	
		Hp	3	5	7.5	10	15	25	30	
480V, 3P		FLA	11	14	21	27	34	52	65	
		Hp	7.5	10	15	20	25	40	50	
600V, 3P		FLA	11	11	17	22	27	52	52	
		Hp	10	10	15	20	25	50	50	
Three-phase		120V, 3P	FLA	13.6	13.6	19.2	30.4	40	56	84
			Hp	2	2	3	5	7.5	10	15
		240V, 3P	FLA	9.6	15.2	22	28	42	68	80
			Hp	3	5	7.5	10	15	25	30
	480V, 3P	FLA	11	14	21	27	34	52	65	
		Hp	7.5	10	15	20	25	40	50	
600V, 3P	FLA	11	11	17	22	27	52	52		
	Hp	10	10	15	20	25	50	50		

Mechanical Data

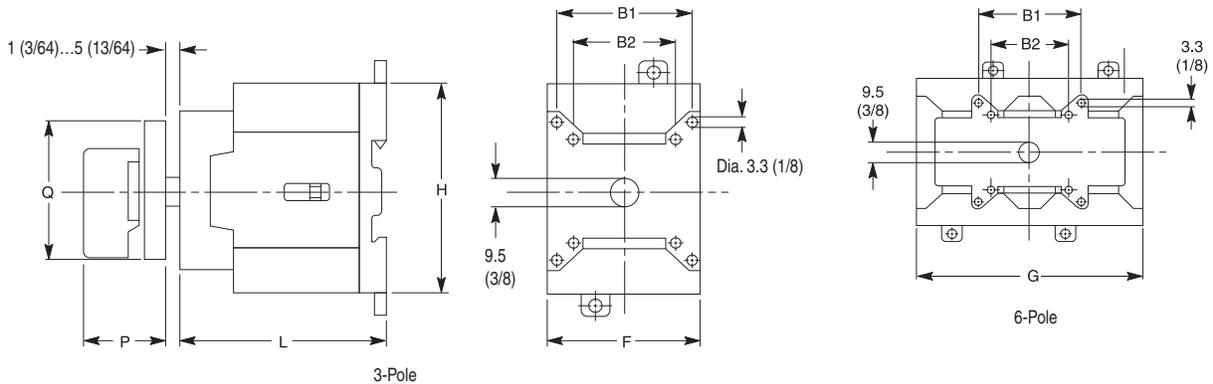
Performance Data		16 A	25...32 A	40...63 A	80...100 A	Aux. Contacts	
Protection class according to IEC 529							
Motor rating 60 Hz							
handles		IP66	IP66	IP66	IP66	IP66	
switch bodies		IP20	IP20	IP20	IP20	IP20	
Mechanical life	[million operations]	0.2	0.2	0.2	0.2	0.2	
Max wire gauges							
Terminal size per IEC 947-1							
rigid wire	1/2 conductor	AWG mm ²	A4	A6	A7	A9	2xA2
			(1)16...10/(2)16...12 (1)1...10/(2)1...4	(1)14...8/(2)14...10 (1)1.5...16/(2)1.5...6	(1)12...4/(2)12...8 (1)2.5...25/(2)2.5...16	(1)10...1/(2)10...4 (1)4...50/(2)4...25	18...14 0.75...2.5
fine strands	1/2 conductor	AWG mm ²	A4	A6	A7	A9	2xA2
			(1)16...8/(2)16...12 (1)1.5...6/(2)1.5...4	(1)14...8/(2)14...10 (1)1.5...10/(2)1...6	(1)12...4/(2)12...8 (1)2.5...16/(2)2.5...10	(1)10...1/(2)10...6 (1)4...35/(2)4...16	18...14 0.5...2.5

Environmental Data

Storage	-40...+80 °C (-40...+176 °F)
Operation	-25...+60 °C (-13...+140 °F)

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

Front Installation Cat. No. 194E-E...



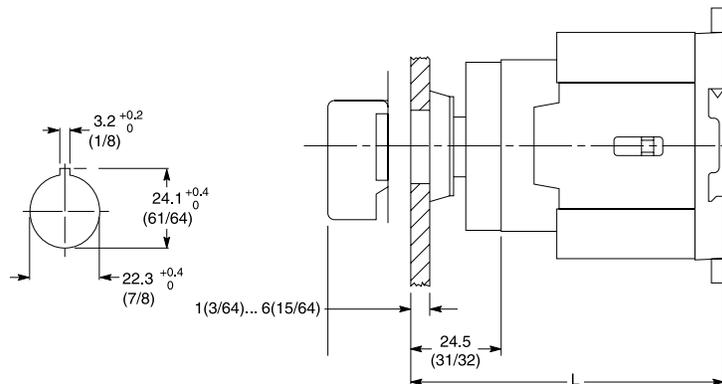
Cat. No.	Handles	
	P	Q
194L-HE4A	28 (1-7/64)	48 x 48 (1-57/64 x 1-57/64)
194L-HE4I	28 (1-7/64)	48 x 48 (1-57/64 x 1-57/64)
194L-HE4S	28 (1-7/64)	48 x 62 (1-57/64 x 2-7/16)
194E-HE4N	34 (1-11/32)	54 x 54 (2-1/8 x 2-1/8)
194E-HE4G	34 (1-11/32)	54 x 54 (2-1/8 x 2-1/8)
194L-HE6A	28 (1-7/64)	64 x 64 (2-33/64 x 3-5/64)
194L-HE6I	28 (1-7/64)	64 x 64 (2-33/64 x 3-5/64)
194L-HE6S	28 (1-7/64)	64 x 78 (2-33/64 x 3-5/64)
194L-HE6N	34 (1-11/32)	67 x 67 (2-41/64 x 2-41/64)
194L-HE6G	34 (1-11/32)	67 x 67 (2-41/64 x 2-41/64)

Use with Cat. No.	Switch Body					
	B1*	B2	F	H	L*	G
194E-E16	28 (1-7/64)	N/A	36 (1-37/64)	63 (2-31/64)	51 (2)	90 (3-35/64)
194E-E25/32	36 (1-27/64)	N/A	45 (1-25/32)	64 (2-33/64)	60 (2-3/8)	90 (3-1/2)
194E-E40/63	48 (1-57/64)	36 (1-27/64)	54 (2-1/8)	72 (2-27/32)	74 (2-29/32)	108 (4-1/4)
194E-E80/100	48 (1-57/64)	36 (1-27/64)	72 (2-27/32)	90 (3-35/64)	90 (3-35/64)	144 (5-11/16)

* Does not apply to 194E-40/63A, 6-Pole Switches. Use B2 dimensions for 6-pole devices.

* For 6-pole switches, add 1 in. to the "L" dimension.

Cat. No. 194E-E Switch Body with Cat. No. 194L-HC4A Handle for 22.5 mm Hole Mounting Style



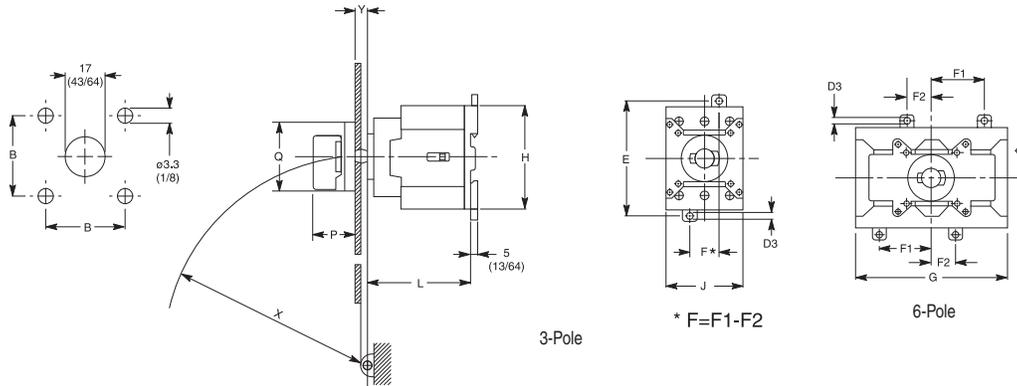
Type	L
194E-E16	76 (3)
194E-E25/32	84.5 (3-21/64)
194E-E40/63	98.5 (3-7/8)
194E-E80/100	114.5 (4-33/64)

Bulletin 194E
IEC Load Switches, 16...100 A
 Appropriate Dimensions

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

Base Mounting Cat. No. 194E-A...

2



Handles		
Cat. No.	P	Q
194L-HE4A	28 (1-7/64)	48 x 48 (1-57/64 x 1-57/64)
194L-HE4I	28 (1-7/64)	48 x 48 (1-57/64 x 1-57/64)
194L-HE4S	28 (1-7/64)	48 x 62 (1-57/64 x 2-7/16)
194E-HE4N	34 (1-11/32)	54 x 54 (2-1/8 x 2-1/8)
194E-HE4G	34 (1-11/32)	54 x 54 (2-1/8 x 2-1/8)
194L-HE6A	28 (1-7/64)	64 x 64 (2-33/64 x 3-5/64)
194L-HE6I	28 (1-7/64)	64 x 64 (2-33/64 x 3-5/64)
194L-HE6S	28 (1-7/64)	64 x 78 (2-33/64 x 3-5/64)
194L-HE6N	34 (1-11/32)	67 x 67 (2-41/64 x 2-41/64)
194L-HE6G	34 (1-11/32)	67 x 67 (2-41/64 x 2-41/64)

Cover Requirements				
For Use With	Y min.	X \geq	Y max.	X \geq
194E-A16	5 (13/64)	142 (5-19/32)	9.5 (3/8)	90 (3-35/64)
194E-A25/32	5 (13/64)	142 (5-19/32)	9.5 (3/8)	90 (3-35/64)
194E-A40/63	2.5 (7/64)	150 (5-29/32)	9.5 (3/8)	90 (3-35/64)
194E-A80/100	2.5 (7/64)	150 (5-29/32)	9.5 (3/8)	90 (3-35/64)

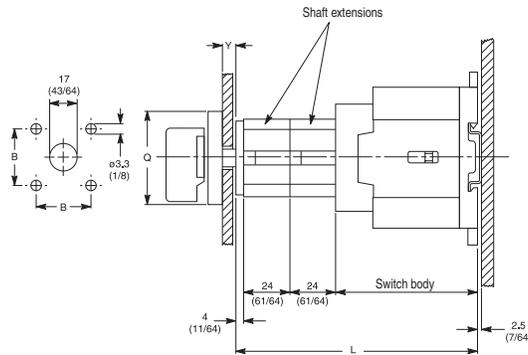
Switch Body								
Use With Cat. No.	D3	E	F1	F2	G	H	L *	J
194E-A16	4.5 (3/16)	70 (2-49/64)	45 (1-25/32)	12.5 (31/64)	90 (3-35/64)	63 (2-31/64)	80 (3-5/32)	36 (1-27/64)
194E-A25/32	4.5 (3/16)	70 (2-49/64)	30 (1-3/16)	15 (19/32)	90 (3-1/2)	64 (2-33/64)	59 (2-5/16)	45 (1-25/32)
194E-A40/63	4.5 (3/16)	80 (3-5/32)	37 (1-15/32)	17 (43/64)	108 (4-1/4)	72 (2-27/32)	73 (2-55/64)	54 (2-1/8)
194E-A80/100	5.6 (7/32)	95 (3-3/4)	48.5 (1-29/32)	23.5 (59/64)	144 (5-11/16)	90 (3-35/64)	89 (3-1/2)	72 (2-27/32)

* For 6-pole switches, add 1 in. to the "L" dimension.

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

Base Mounting Cat. No. 194E-A...

Cat. No. 194E-A... Switch Body with Cat. No. 194L-G2853 Shaft Extension



Switch Body				
L *	Cat. No.			
	194E-A 16	194E-A 25/32	194E-A 40/63	194E-A 80/100
With 1 shaft extension	79 (3-7/64)	88 (3-15/32)	102 (4-1/32)	118 (4-21/32)
With 2 shaft extensions	103 (4-37/64)	112 (4-27/64)	126 (4-31/32)	142 (5-19/32)
With 3 shaft extensions	127 (5)	136 (5-23/64)	150 (5-29/32)	166 (6-35/64)
With 4 shaft extensions	151 (6-61/64)	160 (6-5/16)	174 (6-55/64)	190 (7-31/64)
With 5 shaft extensions	175 (7-57/64)	184 (7-1/4)	198 (7-51/64)	214 (8-7/16)
With 6 shaft extensions	199 (8-27/32)	208 (8-13/64)	222 (8-3/4)	238 (9-3/8)

* For six-pole switches, add 1 in. to the "L" dimension.

Shaft	Y
194L-G2830	2.5...9.5 (7/64...3/8)
194L-G3194	9...18 (23/64...23/32)
194L-G3195	14...23 (9/16)...(29/32)

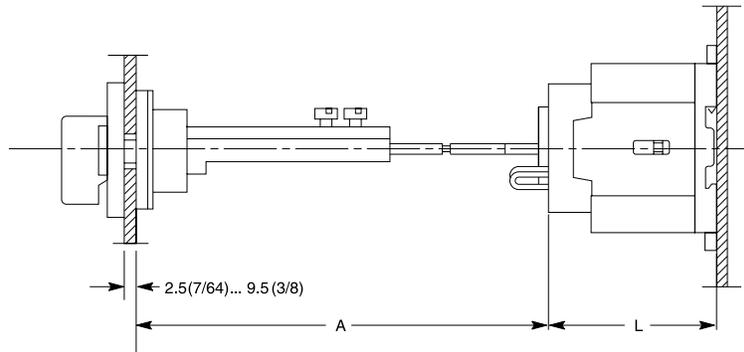
Handles			
Type	B	Q	P
194L-HE4A	36 (1-27/64)	48 x 48 (1-57/64 x 1-57/64)	28 (1-7/64)
194L-HE4I	36 (1-27/64)	48 x 48 (1-57/64 x 1-57/64)	28 (1-7/64)
194E-HE4G	28 (1-7/64)	54 x 54 (2-1/8 x 2-1/8)	34 (1-11/32)
194E-HE4N	28 (1-7/64)	54 x 54 (2-1/8 x 2-1/8)	34 (1-11/32)
194L-HE6A	48 (1-57/64)	64 x 64 (2-33/64 x 2-33/64)	28 (1-7/64)
194L-HE6I	48 (1-57/64)	64 x 64 (2-33/64 x 2-33/64)	28 (1-7/64)
194L-HE6N	48 (1-57/64)	67 x 67 (2-41/64 x 2-41/64)	34 (1-11/32)
194L-HE6G	48 (1-57/64)	67 x 67 (2-41/64 x 2-41/64)	34 (1-11/32)

Bulletin 194E
IEC Load Switches, 16...100 A
 Appropriate Dimensions

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

Base Installation Cat. No. 194E-A...

Cat. No. 194E-A Switch Body with Metal Shaft Extension



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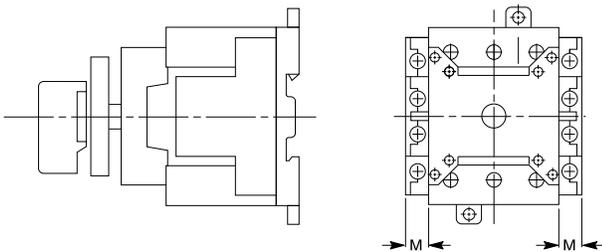
Cat. No.	A
194L-G3393	110...235 (4-11/32...9-1/4)
194L-G3394	230...350 (9-1/16...13-25/32)

Cat. No.	L*
194E-A16	51 (2)
194E-A25/32	60 (2-3/8)
194E-A40/63	74 (2-59/64)
194E-A80/100	90 (3-35/64)

* For 6-pole switches, add 1 in. to the "L" dimension.

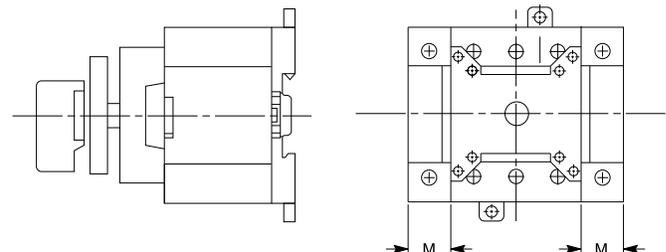
Base and Front Installation

Cat. No. 194E... with Auxiliary Contact Block Installed



Contacts	M
1 N.O. + 1 N.C.	9 (23/64)
2 N.O. + 2 N.C.	18 (23/32)

Cat. No. 194E... with 4-Pole, Ground and Neutral Terminals

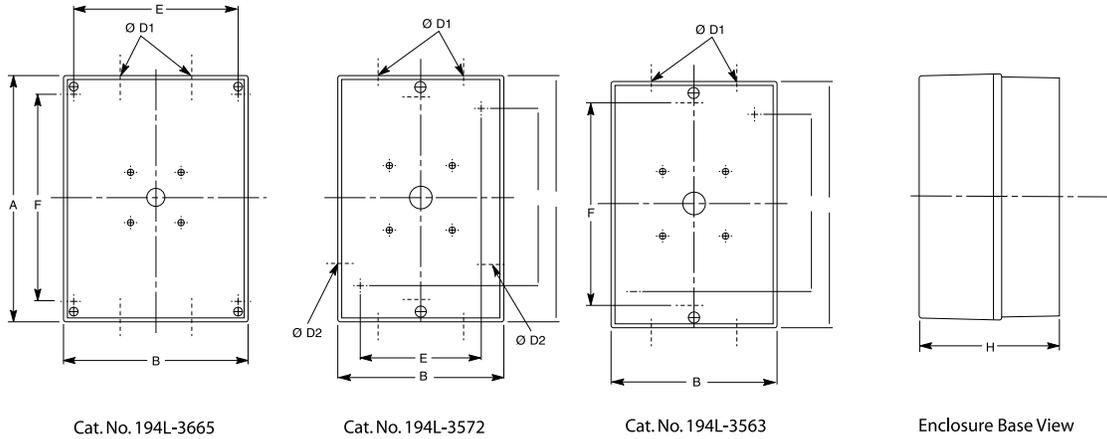


Cat. No.	M
194E-16	12.5 (31/64)
194E-25/32	14 (9/16)
194E-40/63	17.5 (11/16)
194E-80/100	22 (7/8)

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

Base Mounting Cat. No. 194E-A...

Thermoplastic Enclosures



Complete Switches	Enclosures		Height A	Width B	Knockouts* ØD1		Mounting Holes‡		Depth H	
	Cat. No.	Cat. No.					E	F		
194E-Y16	3 and 4	*	*	120 (4-23/32)	70 (2-3/4)	M16/M20 16/20 mm	PG11/PG16 18.5/22.5 mm	50 (1-31/32)	105 (4-9/64)	70 (2-49/65)
	6	194E-G3663	194E-G3664	180 (7-3/32)	125 (4-59/64)	M25/M30 25/30 mm	PG21/PG29 28.5/37.5 mm	On Center	145 (5-23/32)	105 (4-1/8)
194E-Y25/32	3 and 4	194L-G3572	194L-G3576	150 (5-29/32)	95 (3-3/4)	PG16/PG21 22.5/28.5 mm		60 (2-3/8)	115 (4-17/32)	86 (3-3/8)
	6	194E-G3663	194E-G3664	180 (7-3/32)	125 (4-59/64)	PG21/PG29 28.5/37.5 mm		On Center	145 (5-23/32)	105 (4-1/8)
194E-Y40/63	3 and 4	194E-G3663	194E-G3664	180 (7-3/32)	125 (4-59/64)	PG21/PG29 28.5/37.5 mm		On Center	145 (5-23/32)	105 (4-1/8)
	6	194E-G3665	194E-G3666	230 (9-1/16)	175 (6-57/64)	PG29/PG36 37.5/47.5 mm		155 (6-3/32)	195 (7-43/64)	120 (4-47/64)
194E-Y80/100	3 and 4	194E-G3665	194E-G3666	230 (9-1/16)	175 (6-57/64)	PG29/PG36 37.5/47.5 mm		155 (6-3/32)	195 (7-43/64)	120 (4-47/64)

* Empty enclosures not available for purchase.
 * Cat. No. 194E-A16 units have 1 knockout on each end. all others have 2 knockouts on each end. A letter "M" in the catalog number indicates metric knockouts; the unit is otherwise supplied with PG knockouts.
 ‡ All mounting holes have a 4.2 mm (5/32 in.) diameter.

No. of Extensions	Cat. No. 194E-A 20/32...	Cat. No. 194E-A 40/63...	Cat. No. 194E-A 80/00...
With 1 extension	96 (3-25/32)	107 (4-7/32)	114 (4-31/64)
With 2 extensions	120 (4-23/32)	131 (5-5/32)	138 (5-7/16)
With 3 extensions	144 (5-43/64)	155 (6-7/64)	162 (6-3/8)
With 4 * extensions	168 (6-39/64)	179 (7-3/64)	186 (7-21/64)
With 5 * extensions	192 (7-9/16)	203 (8)	210 (8-17/64)
With 6 * extensions	216 (8-1/2)	227 (8-15/16)	234 (9-7/32)

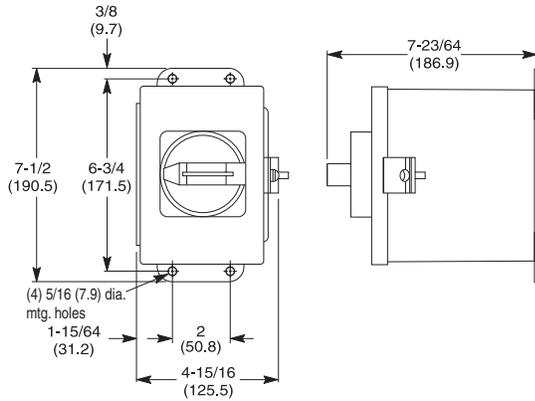
* When more than 4 modules are used, attach the first one to the switch body using the screws supplied with the extension (Cat. No. 194L-G2853).

Bulletin 194E
IEC Load Switches, 16...100 A
 Appropriate Dimensions

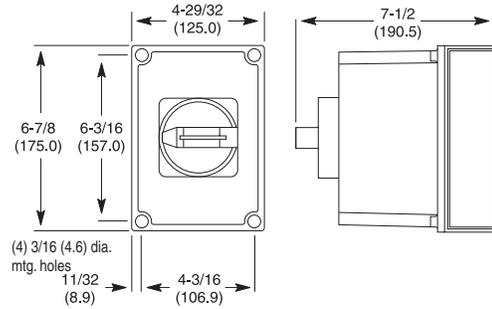
Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

194E Enclosed Switches with 194R Handles

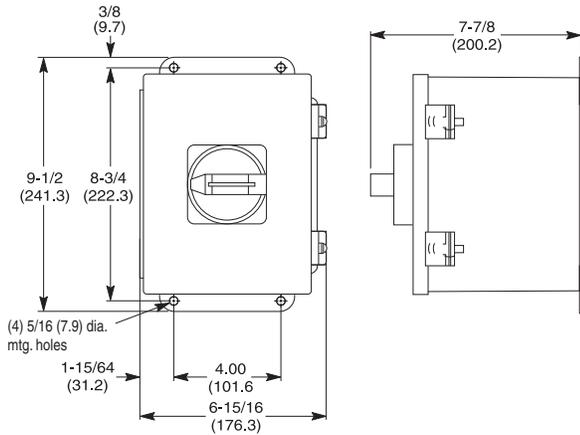
2



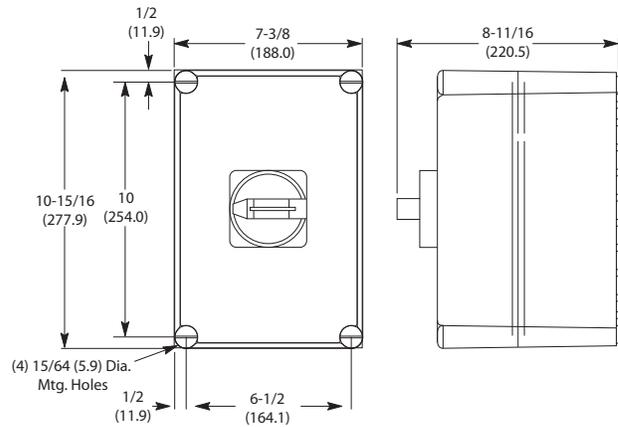
Cat. Nos. 194E-CA16...63, 194E-FA16...63, 194E-AA16...63



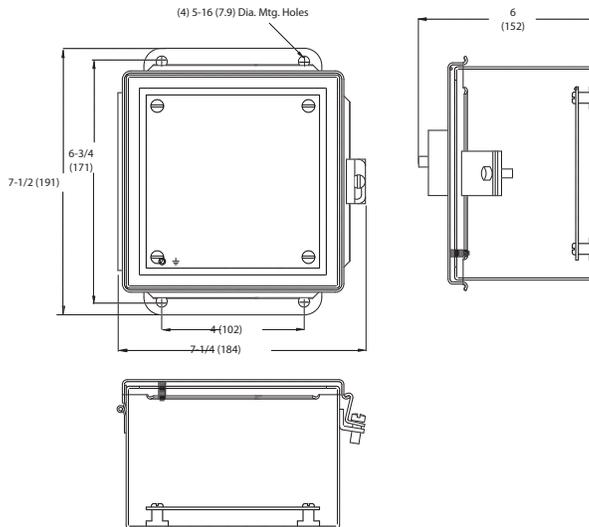
Cat. No. 194E-KA16...63



Cat. Nos. 194E-CA80...00, 194E-FA80...00, 194E-AA80...00
 Cat. Nos. 194E-CA40X...63X, 194E-FA40X...63X, 194E-AA40X...63X



Cat. No. 194E-KA80...00



Cat. No. 194E-DA16...32, 194E-GA16...32

	<p>Bulletin 194E IEC Load Switches</p> <ul style="list-style-type: none"> At-Motor Disconnect Switch (UL508) 125, 160, 250, 315 A Versions of Inductive Load-Rated Switches IP66/UL Type 1/3/3R/12 Operating Handles IP2LX Finger-Safe Terminals 3- and 4-Pole Versions Front/Door or DIN/Base Mounting Configurations Updated Black Appearance OFF-ON Configurations Box Lug and Bolt-on Terminals Available Switches Include Operating Shaft Suitable as Motor Disconnect <p>Bulletin 194E load switches are designed for use as local motor isolation and for disconnect switch applications. They are available in 3- and 4-pole versions with add-on grounding and neutral terminals and auxiliary contacts.</p> <p>Bulletin 194E switches are offered in two mounting styles, Front/Door and Base/DIN configurations, for a variety of installations. Switch body styles for Bulletin 194E base-mounted switches include standard interlock shaft; Bulletin 194E front-mounted switches include standard shaft.</p>	<p>Table of Contents</p> <p>Product Selection 2-424</p> <p>Accessories..... 2-424</p> <p>Specifications..... 2-426</p> <p>Approximate Dimensions..... 2-429</p> <p>Standards Compliance</p> <p>IEC 207 IEC 60947-1 IEC 60947-3 Low-voltage switchgear and control gear part 3 UL 508 CSA C22.2, No. 14</p> <p>Certifications</p> <p>cULus Listed (Box Lug Version) (UL File No. E14841, Guide NLRV, NLRV7) UR Recognized (Bolt-on Version) (UL File No. E 14841 NLRV2, NLRV8) CE</p>
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Bulletin 194E Switches — 125...315 A

OFF-ON Switch — with Box Lugs (UL Listed)		OFF-ON Switch — with Bolt-on Wiring (UR Recognized)	
 <i>3-pole Base Mounted</i>	 <i>3-pole Front Mounted</i>	 <i>3-pole Base Mounted</i>	 <i>3-pole Front Mounted</i>
 <i>4-pole Base Mounted</i>	 <i>4-pole Front Mounted</i>	 <i>4-pole Base Mounted</i>	 <i>4-pole Front Mounted</i>

Catalog Number Explanation

194E – A 125 – 1753

a
b
c

a

Installation Type	
Code	Description
A	Base Mounting w/Box Lugs — UL Listed*
B	Base Mounting w/Bolt-on Wiring — UR Recognized*
E	Front Mounting w/Box Lugs — UL Listed
F	Front Mounting w/Bolt-on Wiring — UR Recognized

b

Load Size	
Code	Description
125	125 A
160	160 A
250	250 A
315	315 A

c

Configuration		
Code	Function	Description
1753	OFF-ON	3-Pole, 2-position (90 degrees)
1754	OFF-ON	4-Pole, 2-position (90 degrees)

*20 cm shaft included with switch

Bulletin 194E
IEC Load Switches, 100...315 A
 Product Selection/Accessories

Frequently Ordered 194E Switches

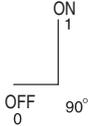
(see Cat. No. Explanation for additional load sizes in 3- and 4-pole configurations)

Description	No. of Poles	Rated Current	AC23 Rated kw 690V AC 50 Hz	Hp @ 480V AC 60 Hz 3 Ø	Cat. No.
Base-mounting switch w/ box lugs — 125 A	3	125	45	60	* 194E-A125-1753
Base-mounting switch w/ box lugs — 160 A		160	55	60	* 194E-A160-1753
Base-mounting switch w/ box lugs — 250 A		250	90	75	* 194E-A250-1753
Base-mounting switch w/ box lugs — 315 A	4	315	110	100	* 194E-A315-1754
Base-mounting switch w/ bolt-on wiring — 250 A	3	250	45	75	* 194E-B250-1753
Base-mounting switch w/ bolt-on wiring — 315 A		315	45	100	* 194E-B315-1753
Front-mounting switch w/ box lugs — 160 A		160	37	60	194E-E160-1753
Front-mounting switch w/ bolt-on wiring — 160 A	4	160	37	60	194E-F160-1754
Front-mounting switch w/ bolt-on wiring — 250 A		250	45	75	194E-F250-1754
Front-mounting switch w/ bolt-on wiring — 315 A		315	45	100	194E-F315-1754

* 20 cm shaft included with switch.

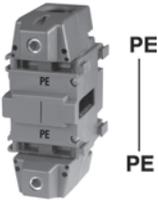
Accessories

Handles 194E - 125...315 A

Handles with Screw Fixing (Includes Legend Plate and Control Knob)	Degree of Protection	Color	Legend Plate Size	For Use With	Legend Marking	Cat. No.
 Type A	IP65 (UL Type 3/3R/12)	Black/Grey	88 x 88 mm 3-15/32 x 3-15/32 in.	194E-125...315 A		194E-HE8A-175
			130 x 130 mm 5-1/8 x 5-1/8 in.			194E-HE13A-175
Red/Yellow		88 x 88 mm 3-15/32 x 3-15/32 in.	194E-HE8I-175			
		130 x 130 mm 5-1/8 x 5-1/8 in.	194E-HE13I-175			
 Type G		Black/Grey	90 x 90 mm 3-35/64 x 3-35/64 in.	194E-125...315 A		194E-HE8G-175
			135 x 135 mm 5-5/16 x 5-5/16 in.			194E-HE13G-175
 Type N		Red/Yellow	90 x 90 mm 3-35/64 x 3-35/64 in.			194E-HE8N-175
			135 x 135 mm 5-5/16 x 5-5/16 in.			194E-HE13N-175

Accessories 194E - 125...315 A

Auxiliary Contacts - 2 N.O. / 1 N.C.	For Use With	Cat. No.
	194E-A125-160,194E-B125-160	194E-AB-P21-160
	194E-A250-315,194E-B250-315	194E-AB-P21-315
	194E-E125-160,194E-F125-160	194E-EF-P21-160
	194E-E250-315,194E-F250-315	194E-EF-P21-315

Earthing/Grounding Terminal	For Use With	Cat. No.
	194E-A125-160,194E-E125-160	194E-AE160-PE
	194E-A250-315,194E-E250-315	194E-AE315-PE
	194E-B125-160,194E-F125-160	194E-BF160-PE
	194E-B250,194E-F250	194E-BF250-PE
	194E-B315,194E-F315	194E-BF315-PE

Neutral Terminal	For Use With	Cat. No.
	194E-A125-160,194E-E125-160	194E-AE160-TN
	194E-A250-315,194E-E250-315	194E-AE315-TN
	194E-B125-160,194E-F125-160	194E-BF160-TN
	194E-B250,194E-F250	194E-BF250-TN
	194E-B315,194E-F315	194E-BF315-TN

Shaft Extension	Length	For Use With	Cat. No.
	40 cm	194E-A or 194E-B 125...315 A Base-Mounted Switches	194E-AB40

Terminal Cover	For Use With		Cat. No.
	194E-A125-160 194E-E125-160	2 covers per pole	194E-AE125-C1
	194E-A250-315 194E-E250-315	2 covers per pole	194E-AE250-C1
	194E-B125-160 194E-F125-160	2 covers per pole	194E-BF125-C1
	194E-B250-315 194E-F250-315	2 covers per pole	194E-BF250-C1

Legend

Additional Name Plate and Frame

	Color	Legend Size	For Use With	Legend Marking	Pkg. Qty.	Cat. No.
	Black/Grey	18 x 84 mm 11/16 x 3-5/16 in.	Size 8 Type G and N Style Handles, Cat. Nos. 194L-HE8G/N 88 mm x 88 mm 90 mm x 90 mm 130 mm x 130 mm 135 mm x 135 mm legend frames	MAIN SWITCH	5	194L-G3515A
				HAUPTSCHALTER		194L-G3515B
	INTERR. PRINCIPALE			194L-G3515C		
	INTERR. PRINCIPAUX			194L-G3515D		
	INTERR. PRINCIPAL			194L-G3515E		
	HUVUDBRYTARE			194L-G3515F		
	WAHLSCHALTER			194L-G3515G		
	EMERGENCY OFF			194L-G3515H		
	Black/Grey					

Bulletin 194E
IEC Load Switches, 100...315 A
 Specifications

IEC Performance Data for 194E

			194E-125	194E-160	194E-250	194-315
Rated insulation voltage U_i : *	[V]		1000	1000	1000	1000
Rated impulse withstand voltage U_{imp}	[kV]		8	8	8	8
Test voltage 1 min	[kV]		3.5	3.5	3.5	3.5
Rated voltage U_e *⊛	[V]		1000	1000	1000	1000
Rated frequency	[Hz]		50/60	50/60	50/60	50/60
Rated thermal current I_{th} open	[A]		125	160	250	315
Rated thermal current I_{the} enclosed	[A]		125	160	250	315
Rated current I_e						
AC-1 / Non-inductive or slightly induct. load						
AC-21A Switching of resistive loads with slight overload	[A]		125	160	250	315
Rated power P_e						
AC-23A Occasional switching of motor and other highly inductive loads	230V	[kW]	30	30	37	55
	400V	[kW]	45	55	90	110
	690V	[kW]	37	37	45	45
AC-3 Squirrel-cage motors: starting and stopping of running motors	230V	[kW]	22	30	37	45
	400V	[kW]	37	45	55	75
	690V	[kW]	30	37	45	45
Conditional rated short-circuit current	400/415V	[kA]	30	30	30	30
Max. fuse rating of circuit (type gG)	[A]		125	160	250	315
Rated short-time current I_{cw} 1S	[A]		2500	3000	4600	5800
Rated breaking capacity	230V	[A]	800	900	1600	1800
	400V	[A]	750	850	1380	1650
AC-23A ($\cos \phi$ 0.45)	690V	[A]	340	340	400	400

* Valid for line with grounded common neutral termination, overvoltage category III, pollution degree 3. Other values on request.

⊛ Not suitable for load-switching applications (AC-20 A) above 690V.

DC Switching Capacity

				194E-125	194E-160	194E-250	194E-315
Rated current I_e	Rated voltage [V]	No. Poles in series					
DC-21A	60	3	[A]	125	160	250	315
For resistive loads $T \leq 1$ ms	110	3	[A]	110	140	220	280
	220	3	[A]	45	55	85	110
	Rated voltage [V]	No. Poles in series					
	110	4	[A]	125	160	250	315
	220	4	[A]	80	100	150	200
	440	4	[A]	16	20	32	40
Rated power P_e	Rated voltage [V]	No. Poles in series					
DC-22A, DC-3	24	4	[kW]	3	3.8	6	7.5
For Inductive loads $T \leq 2.5$ ms	48	4	[kW]	6	7.5	12	15
	60	4	[kW]	7.5	9.5	15	19
	110	4	[kW]	10	12.5	20	25
	220	4	[kW]	4.5	5.5	8	10
Rated Power P_e	Rated voltage [V]	No. Poles in series					
DC-23A, DC-5	24	4	[kW]	3	3.8	6	7.5
For Inductive loads $T \leq 15$ ms	48	4	[kW]	6	7.5	12	15
	60	4	[kW]	7.5	9.5	15	19
	110	4	[kW]	8.8	11	17.5	22
	220	4	[kW]	2.5	3.5	5.5	7



UL CSA Performance Data for 194E

		194E-125	194E-160	194E-250	194E-315		
Rated Insulation Voltage	[V]	600	600	600	600		
Rated voltage	[V]	600	600	600	600		
Continuous current	[A]	150	200	250	300		
Ampere rating for general use	[A]	150	200	250	300		
Heavy Pilot Duty	[AC]						
Standard Duty	[DC]						
Motor rating 60Hz							
1-phase (2 poles)	120V, 1 P	[FLA]	80	100	135	180	
		[Hp]	7.5	10	15	20	
	240V, 1 P	[FLA]	88	110	136	155	
		[Hp]	20	25	30	35	
	480V, 1 P	[FLA]	78	88	99	108	
		[Hp]	35	40	45	50	
	600V, 1 P	[FLA]	62	70	86	104	
		[Hp]	35	40	50	60	
	3-Phase	120V, 3 P	[FLA]	84	108	160	208
			[Hp]	15	20	30	40
		240V, 3 P	[FLA]	8	104	154	192
			[Hp]	30	40	60	75
480V, 3 P		[FLA]	77	77	96	124	
		[Hp]	60	60	75	100	
600V, 3 P		[FLA]	62	62	77	99	
		[Hp]	60	60	75	100	



Mechanical Data

		194E-125	194E-160	194E-250	194E-315	
Handles		IP66	IP66	IP66	IP66	
Protection class according to IEC 529		—	—	—	—	
Front side Front unit		IP66	IP66	IP66	IP66	
Box lugs*		IP20	IP20	IP20	IP20	
Bolt-on	straight version*	IP20	IP20	IP20	IP20	
	bent version	—	—	—	—	
Mechanical life	[Million operations]	0.1	0.1	0.075	0.075	
Box lugs — max. wire gauges		—	—	—	—	
Terminal sizes according to IEC 947-1	Gauge No.	B11	B11	B14	B14	
Fine strands, 1 conductor	Max.	[mm ²]	70	70	150	150
	Min.	[mm ²]	16	16	25	25
Rigid wire, 1 conductor	Max.	[mm ²]	95	95	185	185
	Min.	[mm ²]	10	10	16	16
Wire gauges according to UL/CSA	Max.	[AWG]	3/0	3/0	—	—
		[MCM]	—	—	350	350
	Min.	[AWG]	8	8	4	4
Tightening torque	[N•m]/[lb•in]	14/130	14/130	16/142	16/142	

* When provided with terminal covers.

Bulletin 194E
IEC Load Switches, 100...315 A
 Specifications/Approximate Dimensions

Certifications

Catalog No. or Designation		UL-Listed (marked with UL)	UR-Recognized (marked with UR)	UL-Listed for Canada (marked with cUL)	UR-Recognized for Canada (marked with cUR)	CE
194E-A125	194E-E125	A	—	A	—	A
194E-A160	194E-E160	A	—	A	—	A
194E-A250	194E-E250	A	—	A	—	A
194E-A315	194E-E315	A	—	A	—	A
194E-B125	194E-F125	—	A	—	A	A
194E-B160	194E-F160	—	A	—	A	A
194E-B250	194E-F250	—	A	—	A	A
194E-B315	194E-F315	—	A	—	A	A
Aux. switch blocks		Z	Z	Z	Z	Z
Ground terminal		Z	Z	Z	Z	Z
Neutral terminal		Z	Z	Z	Z	Z

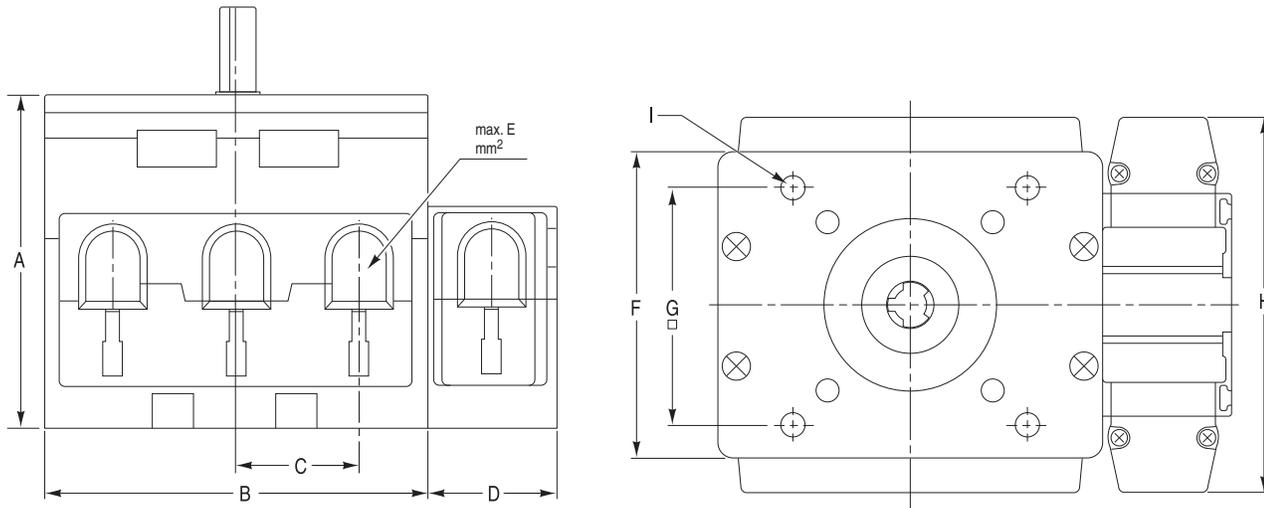
A = Certified

Z = accessories are covered by the approval for the switch

Approximate Dimensions

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

Front-Installation Box Lugs, 3- and 4-Pole



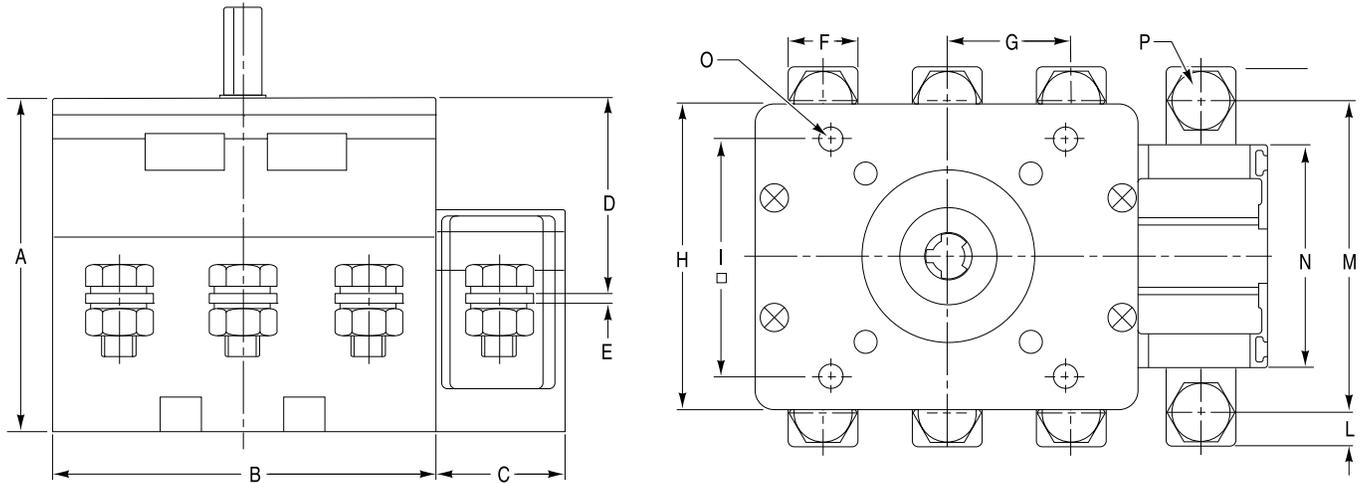
Switch Body 194E-E

[A]	A	B	C	D	E	F	G	H	I*
125	91 (3-19/32)	112 (4-13/32)	36 (1-13/32)	38 (1-1/2)	95 (3-23/64)	88 (3-7/16)	68 (2-11/16)	108 (4-1/4)	M5
160	91 (3-19/32)	112 (4-13/32)	36 (1-13/32)	38 (1-1/2)	95 (3-23/64)	88 (3-7/16)	68 (2-11/16)	108 (4-1/4)	M5
250	103 (4-3/64)	145 (5-23/32)	44 (1-23/32)	52.5 (2-1/16)	185 (7-9/32)	88 (3-7/16)	68 (2-11/16)	120 (4-11/16)	M5
315	103 (4-3/64)	145 (5-23/32)	44 (1-23/32)	52.5 (2-1/16)	185 (7-9/32)	88 (3-7/16)	68 (2-11/16)	120 (4-11/16)	M5

* M5 x 0.8 bolts supplied with switch. Threaded hole.

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

Front-Installation Bolt-on Terminals, 3- and 4-Pole

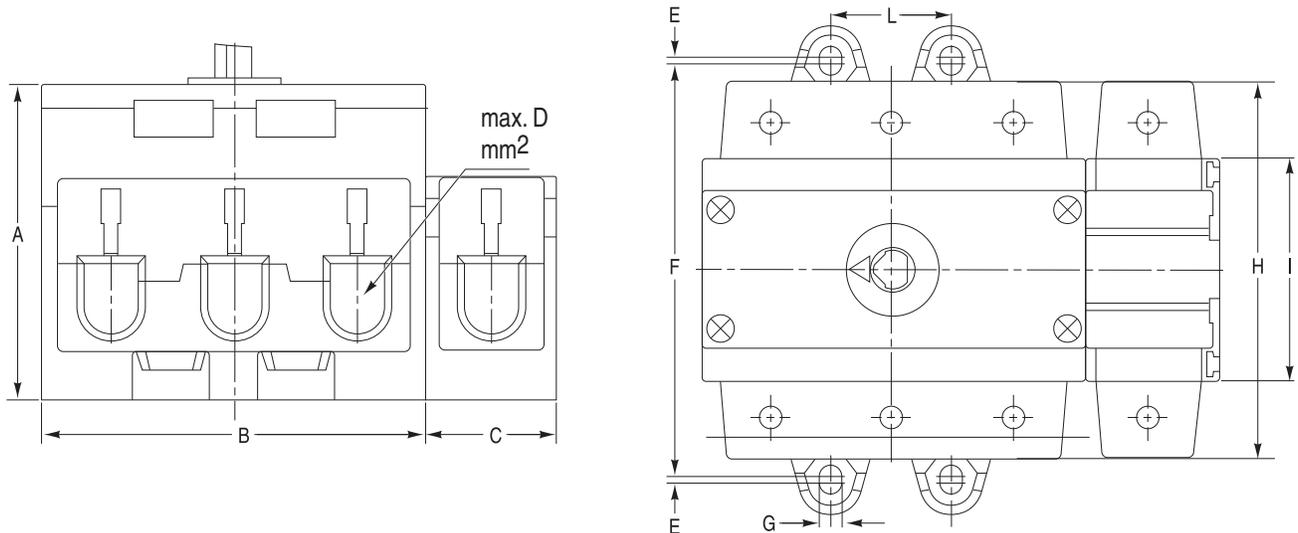


Switch Body 194E-F

[A]	A	B	C	D	E	F	G	H	I	L	M	N	O*	P*
125	91 (3-19/32)	112 (4-3/32)	38 (1-1/2)	65.5 (2-9/16)	3 (1/8)	2 (3/32)	36 (1-13/32)	88 (3-7/16)	68 (2-11/16)	10 (13/32)	90 (3-17/32)	64 (2-17/32)	M5	M10
160	91 (3-19/32)	112 (4-3/32)	38 (1-1/2)	65.5 (2-9/16)	3 (1/8)	2 (3/32)	36 (1-13/32)	88 (3-7/16)	68 (2-11/16)	10 (13/32)	90 (3-17/32)	64 (2-17/32)	M5	M10
250	103 (4-3/64)	145 (5-23/32)	52.5 (1-22/32)	60.4 (2-3/8)	4 (5/32)	2 (3/32)	44 (1-23/32)	88 (3-7/16)	68 (2-11/16)	13 (1/2)	100 (3-15/16)	70 (2-3/4)	M5	M12
315	103 (4-3/64)	145 (5-23/32)	52.5 (1-22/32)	60.4 (2-3/8)	4 (5/32)	2 (3/32)	52 (2-1/16)	88 (3-7/16)	68 (2-11/16)	13 (1/2)	100 (3-15/16)	70 (2-3/4)	M5	M12

* M5 x 0.8 bolts supplied with switch. Threaded hole.
 * Bolts and nuts supplied with switch. Through-hole.

Base-Mounting Box Lugs, 3- and 4-Pole



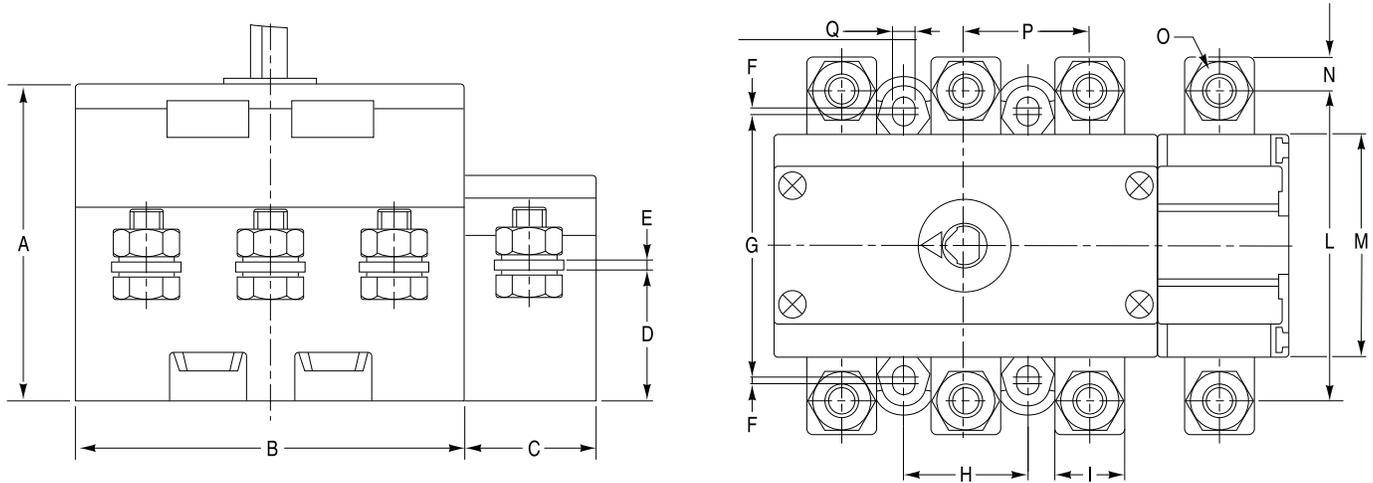
Switch Body 194E-A

[A]	A	B	C	D	E	F	G	H	I	L
125	91 (3-19/32)	112 (4-13/32)	38 (1-1/2)	95 (3-23/64)	2 (3/32)	118 (4-5/8)	6.4 (1/4)	108 (4-1/4)	64 (2-17/32)	36 (1-13/32)
160	91 (3-19/32)	112 (4-13/32)	38 (1-1/2)	95 (3-23/64)	2 (3/32)	118 (4-5/8)	6.4 (1/4)	108 (4-1/4)	64 (2-17/32)	36 (1-13/32)
250	98 (3-27/32)	145 (5-23/32)	52.5 (1-23/32)	185 (7-9/32)	2 (3/32)	140 (5-1/2)	6.4 (1/4)	126 (4-15/16)	70 (2-3/4)	44 (2-1/16)
315	98 (3-27/32)	145 (5-23/32)	52.5 (1-23/32)	185 (7-9/32)	2 (3/32)	140 (5-1/2)	6.4 (1/4)	126 (4-15/16)	70 (2-3/4)	44 (2-1/16)

Bulletin 194E
IEC Load Switches, 100...315 A
 Approximate Dimensions

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

Base-Mounting Bolt-on Terminals, 3- and 4-Pole

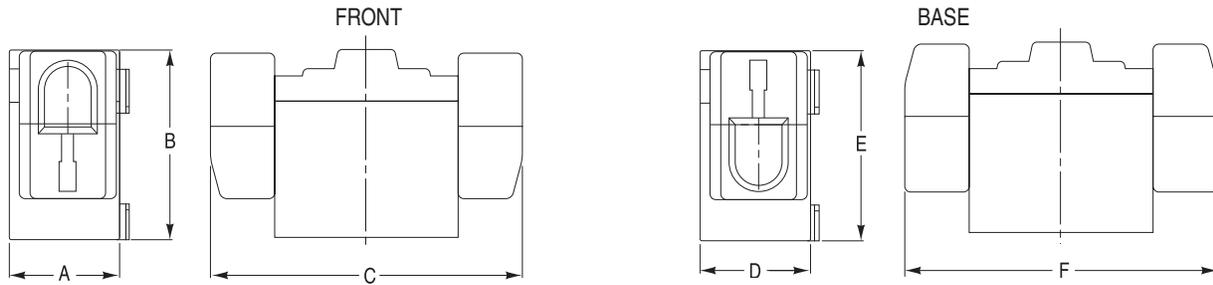


2

Switch Body 194E-B

[A]	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q
125	91 (3-19/32)	112 (4-3/32)	38 (1-1/2)	36.5 (1-7/16)	3 (1/8)	2 (3/32)	76 (3)	36 (1-13/32)	20 (3/4)	90 (3-17/32)	64 (2-17/32)	10 (13/32)	M10 (3/8)	36 (1-13/32)	6.4 (1/4)
160	91 (3-19/32)	112 (4-3/32)	38 (1-1/2)	36.5 (1-7/16)	3 (1/8)	2 (3/32)	76 (3)	36 (1-13/32)	20 (3/4)	90 (3-17/32)	64 (2-17/32)	10 (13/32)	M10 (3/8)	36 (1-13/32)	6.4 (1/4)
250	98 (3-27/64)	145 (5-23/32)	52.5 (1-22/32)	38.6 (1-1/2)	4 (5/32)	2 (3/32)	80 (3-1/8)	44 (1-23/32)	26 (1-1/64)	100 (3-15/16)	70 (2-3/4)	13 (1/2)	M12 (15/32)	44 (1-23/32)	6.4 (1/4)
315	98 (3-27/64)	145 (5-23/32)	52.5 (1-22/32)	38.6 (1-1/2)	4 (5/32)	2 (3/32)	80 (3-1/8)	44 (1-23/32)	26 (1-1/64)	100 (3-15/16)	70 (2-3/4)	13 (1/2)	M12 (15/32)	52 (2-1/16)	6.4 (1/4)

Box Ground and Neutral Terminal

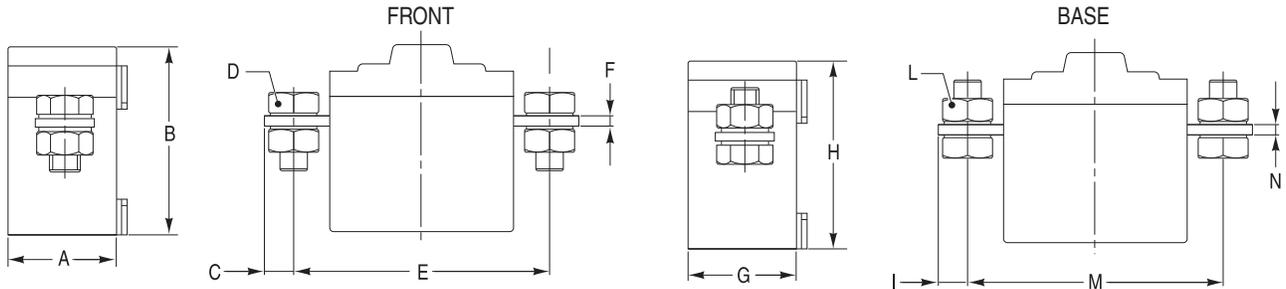


Switch Body 194E-F

[A]	A	B	C	D	E	F
125	37.8 (1-1/2)	64 (2-17/32)	108 (4-1/4)	37.8 (1-1/2)	64 (2-17/32)	108 (4-1/4)
160	37.8 (1-1/2)	64 (2-17/32)	108 (4-1/4)	37.8 (1-1/2)	64 (2-17/32)	108 (4-1/4)
250	52.3 (2-1/16)	71.1 (2-25/32)	126 (4-15/16)	52.3 (2-1/16)	80.6 (3-1/8)	126 (4-15/16)
315	52.3 (2-1/16)	71.1 (2-25/32)	126 (4-15/16)	52.3 (2-1/16)	80.6 (3-1/8)	126 (4-15/16)

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

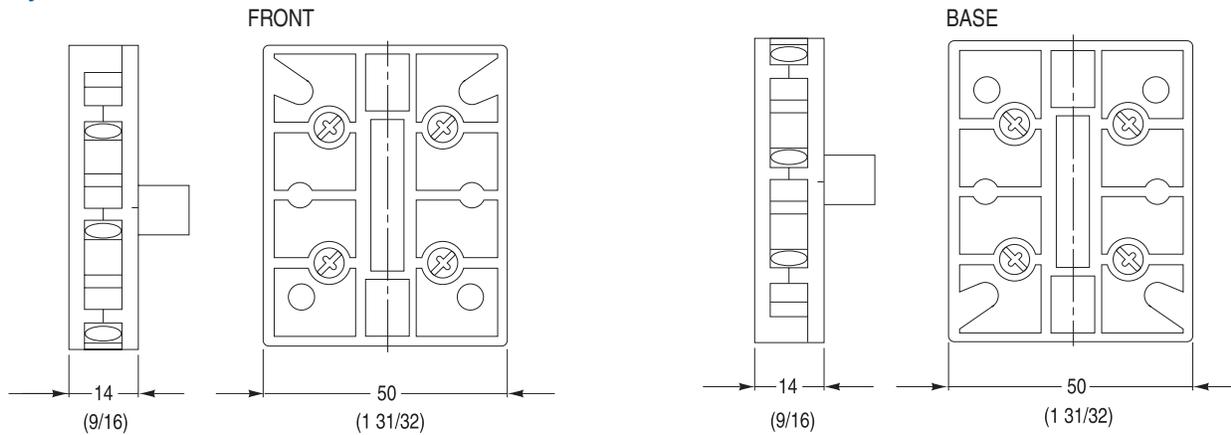
Bolt Ground and Neutral Terminal



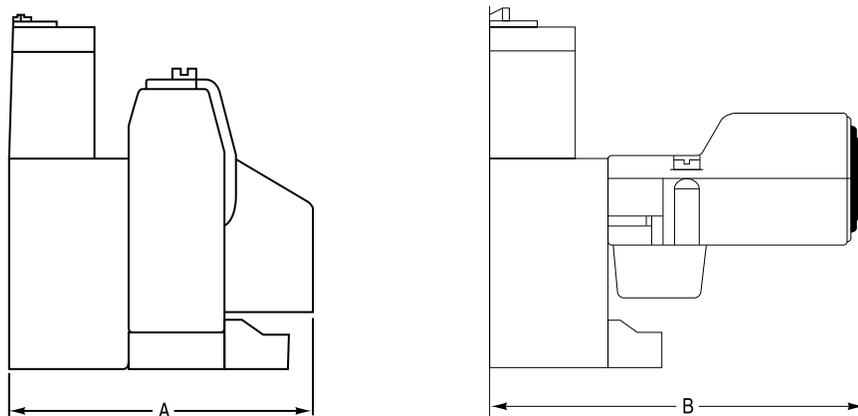
Switch Body 194E-F

[A]	A	B	C	D	E	F	G	H	I	L	M	N
125	37.8 (1-1/2)	64 (2-17/32)	10 (13/32)	M10 (13/32)	90 (3-17/32)	3 (1/8)	37.8 (1-1/2)	64 (2-17/32)	10 (13/32)	M10 (13/32)	90 (3-17/32)	3 (1/8)
160	37.8 (1-1/2)	64 (2-17/32)	10 (13/32)	M10 (13/32)	90 (3-17/32)	3 (1/8)	37.8 (1-1/2)	64 (2-17/32)	10 (13/32)	M10 (13/32)	90 (3-17/32)	3 (1/8)
250	52.3 (2-1/16)	68 (2-21/32)	13 (1/2)	M12 (15/32)	100 (3-15/16)	4 (5/32)	52.3 (2-1/16)	68 (2-21/32)	13 (1/2)	M12 (15/32)	100 (3-15/16)	4 (5/32)
315	52.3 (2-1/16)	68 (2-21/32)	13 (1/2)	M12 (15/32)	100 (3-15/16)	4 (5/32)	52.3 (2-1/16)	68 (2-21/32)	13 (1/2)	M12 (15/32)	100 (3-15/16)	4 (5/32)

Auxiliary Contacts



Terminal Cover



Switch Body 194E-F

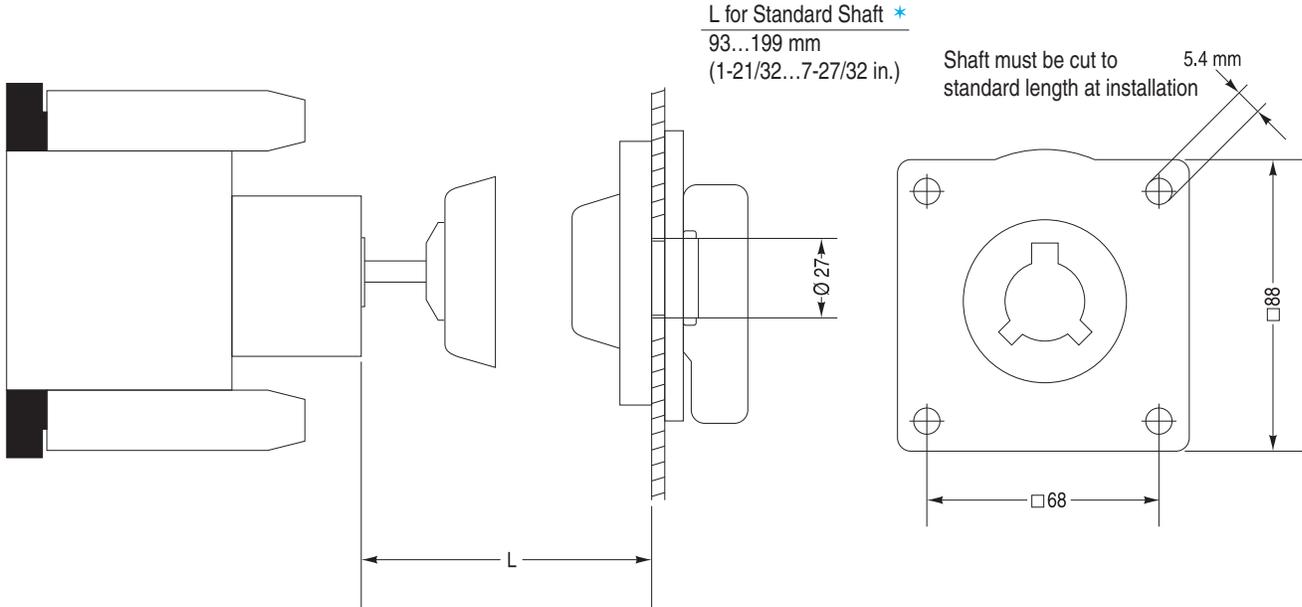
[A]	A	B
125	76.2 (3)	95 (3-3/4)
160	76.2 (3)	95 (3-3/4)
250	88 (3-15/32)	109.5 (4-5/16)
315	88 (3-15/32)	109.5 (4-5/16)

Bulletin 194E
IEC Load Switches, 100...315 A
 Approximate Dimensions

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

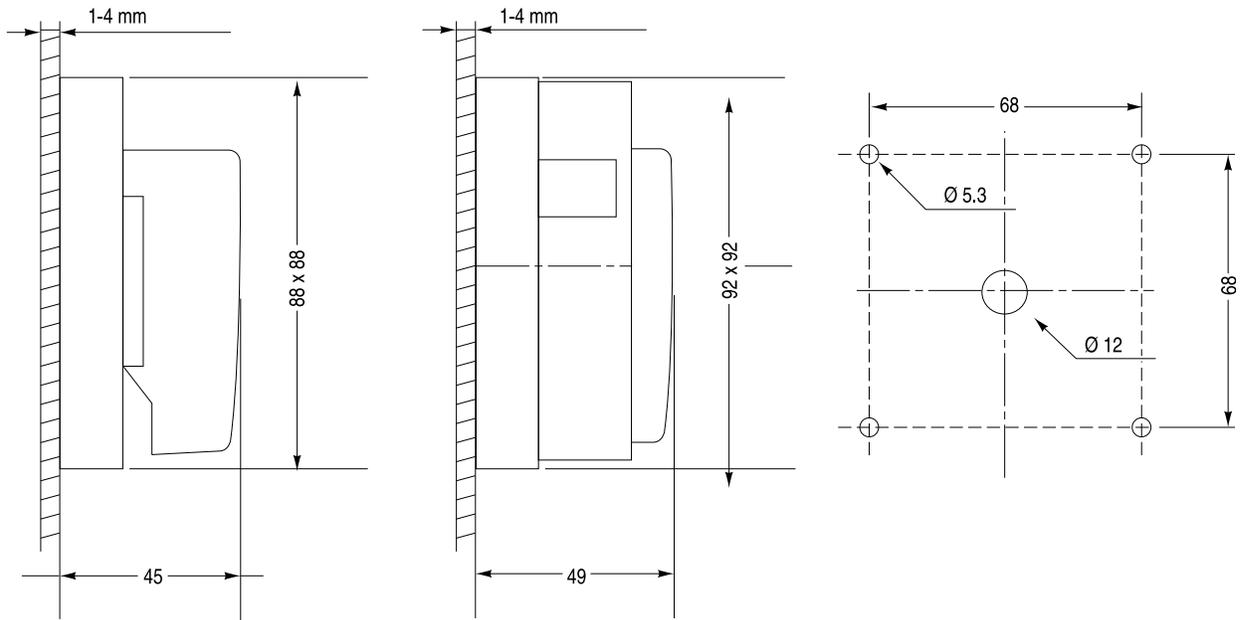
Door Clutches

2



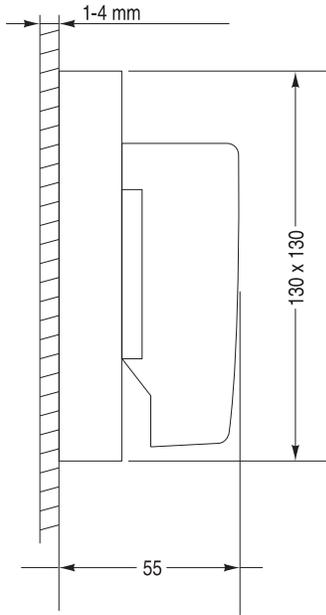
* Use Cat. No. 194E-AB40 shaft extension accessory to extend beyond the standard shaft length.

Handles (Type 194E-HE-8A-8I-8G-8N)

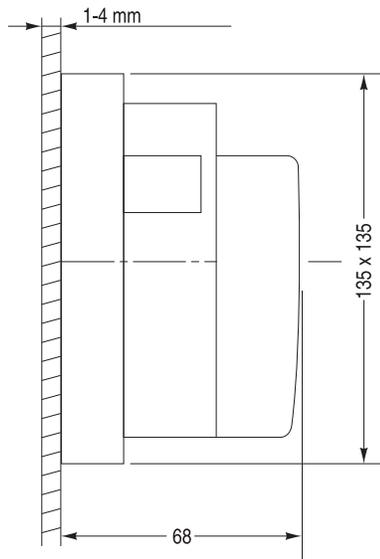


Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

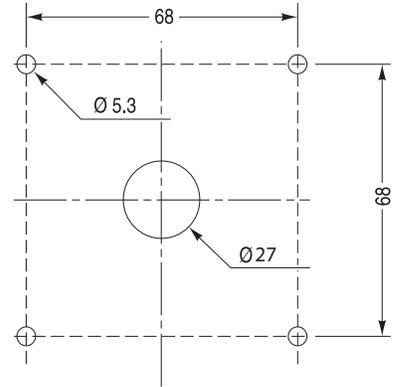
Handles (Type 194E-HE-13A-13I-13G-13N)



Type A and I



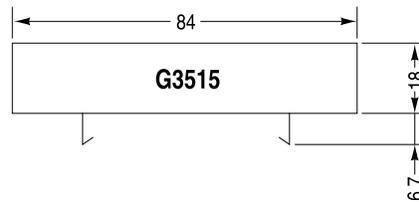
Type G and N

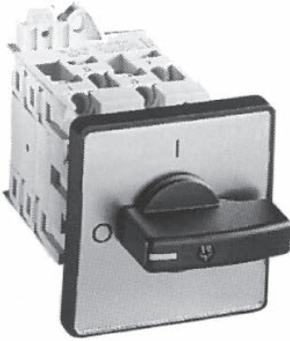


2

Additional Name Plate

Frame and legend snaps on to handle bezel. Fits size 8 and 13 handles.





Bulletin 194L IEC Control and Load Switches

- 12, 16, 20, 25, 32, and 40 A inductive load-rated switch
- IP66 water spray and dustproof handles
- IP20 finger-safe terminals
- Switches available for OFF-ON, changeover, star-delta (wye-delta), reversing, ammeter, voltmeter and step switch configurations
- 1...6-Pole versions
- Front/door- or base/ DIN Rail-mounting configurations
- Thermoplastic enclosures IP66
- Suitable as motor disconnect (UL 508)

Bulletin 194L control and load switches are flexible, adaptable, time- and space-saving devices. Switches are available as front/door- or Base/DIN rail-mounting versions. Uniformly styled handles, featuring marked legend plates, are available in Selector-Knob, Disk-Style, Rectangular-Style and Key-Operated versions. Selector-Knob versions are available in three sizes. Most handles are available in grey/black or red/yellow and have padlockable versions.

A new thermoplastic enclosure features constructions of impact-resistant ABS or corrosion resistant NORYL materials. Both shallow and deep versions include 35 mm DIN mounting Rail, grounding and neutral terminals, and captive cover screws. Enclosures may be ordered with or without cover openings for handle mounting. Enclosures are rated for use in IP66 (UL Type 1, 3, 3R, 12) environments.

Table of Contents

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 Product Selection 2-435
 Accessories..... 2-440
 Switching Diagrams.. 2-442
 Specifications..... 2-448
 Approximate Dimensions..... 2-449

Standards Compliance

IEC 60947-3 Low-voltage switchgear and control gear part 3
 UL 508
 CSA: C22.2 No. 14

Certifications

UL Listed (File No. E14841, Guide NLRV)
 CSA Certified (LR 13908)
 Meets IEC, VDE and BS Standard requirements
 CE

Product Overview



OFF-ON Switch

OFF-ON Switch

Two-position switch used to connect or disconnect a variety of inductive loads including: solenoids, handles, valves, magnetic starters and relays.



Star-Delta (Wye-Delta) Switch

Star-Delta (Wye-Delta) Switch

Three-position (Off-Wye-Delta) switch used to manually control reduced-voltage motor starting. Operating the switch manually changes the wiring configuration of the motor from a star configuration to delta configuration after the controller operator has determined that the motor is up to operating speed.



Ammeter Switch

Ammeter Switch

Multi-position switch used to connect one or more phases of an electrical supply to an ammeter, so that the current in each phase can be displayed on one ammeter.



Step Switch

Step Switch

Multi-position switch used to connect a variety of loads to an electrical supply in a pre-determined logical sequence. A typical application would be temperature control of a heating oven or furnace.



Changeover Switch

Changeover Switch

Two-position switch used in control applications to change between alternate power supplies. This device can typically be used to manually switch power supplies from a primary source to a stand-by/emergency supply in the event of a power outage.



Voltmeter Switch

Voltmeter Switch

Multi-position switch used to connect two lines of the electrical supply system to a voltmeter so that the voltage between the lines (phase-to-phase or phase-to-neutral) can be displayed on one voltmeter.



Reversing Switch

Reversing Switch

Three-phase, three-position (Forward-Off-Reverse) switch used to manually control a motor's direction of rotation. Operating the switch changes the wiring configuration of the motor to operate in the forward or reverse direction.

IEC Control and Load Switches

Product Selection/Catalog Number Explanation

Bulletin 194L Control and Load Switches

Base/DIN Rail Mounting	Front/Door Mounting	Base/DIN Rail Mounting	Front/Door Mounting	Front/Door Mounting
				
12...25 A Base Mount	12...25 A Front Mount	32 A and 40 A Base Mount	32 A and 40 A Front Mount	32 A and 40 A Front Mount, for use with 22.5 mm mounting hole style handle

Catalog Number Explanation

194L - A 16 - 175 3

a b c d



a

Installation Type	
Code	Description
A	Base/DIN Mounting
E	Front/Door Mounting
C	Front/Door Mounting (For use with 32 A and 40 A switches only. Use when selecting 22.5 mm hole-mounting style handle.)

b

Load Size			
Code	Description	Code	Description
12	12 A	25	25 A
16	16 A	32	32 A
20	20 A	40	40 A

c

Code	Function	Configuration	Use with Switch Style*⊛:	Circuit Diagram Ref. No.
150	On/Off	2-Position (60 degrees)	194L-E, 12...40 A, 1...6 poles	1501...1506
175		2-Position (90 degrees)	194L-E or 194L-A, 12...40 A, 1...6 poles	1751...1756
178		2-Position (90 degrees-inverted)	194L-E or 194L-A, 12...40 A, 1...4 poles	1781...1784
225	Change-Over	1-2 (without 0, 45 degrees)	194L-E, 12...40 A, 1...5 poles or 194L-A, 12...40 A, 1...2 poles	2251...2255
250		1-2 (without 0, 60 degrees)	194L-E, 12...40 A, 1...5 poles	2501...2505
300		1-0-2 (with 0, 30 degrees, spring return)	194L-E, 12 A, 1...3 poles	3001...3003
325		1-0-2 (with 0, 45 degrees)	194L-E or 194L-A, 12...40 A, 1...4 poles	3251...3254
326		1-0-2 (with 0, 45 degrees, spring return)	194L-E, 12 A, 1...3 poles	3261...3263
350		1-0-2 (with 0, 60 degrees)	194L-E, 12...40 A, 1...4 poles	3501...3504
375		1-0-2 (with 0, 90 degrees)	194L-E, 12...40 A, 1...4 poles	3751...3754
425	Step Switch	1-2-3 (45 degrees)	194L-E or 194L-A, 12...40 A, 1 pole 194L-E, 12...40 A, 2...3 poles	4251...4253
426		1-2-3-4 (45 degrees)	194L-E, 12...40 A, 1...3 poles 194L-A, 12...40 A, 2 poles	4261...4263
427		1-2-3-4-5 (45 degrees)	194L-E or 194L-A, 12...40 A, 1 pole	4271
428		1-2-3-4-5-6 (45 degrees)	194L-E or 194L-A, 12...40 A, 1 pole	4281
450		1-2-3 (60 degrees)	194L-E, 12...40 A, 1...3 poles	4501...4503
451		1-2-3-4 (60 degrees)	194L-E, 12...40 A, 1...3 poles	4511...4513
452		1-2-3-4-5 (60 degrees)	194L-E, 12...40 A, 1 pole	4521
453		1-2-3-4-5-6 (60 degrees)	194L-E, 12...40 A, 1 pole	4531
500		0-1-2-3-4 (30 degrees)	194L-E, 12...40 A, 1...3 poles	5001...5003
501		0-1-2-3-4-5 (30 degrees)	194L-E, 12...40 A, 1...3 poles	5011...5013
525		0-1-2 (45 degrees)	194L-E or 194L-A, 12...40 A, 1 pole	5251...5253
526		0-1-2-3 (45 degrees)	194L-E or 194L-A, 12...40 A, 1 pole	5261...5263
527		0-1-2-3-4 (45 degrees)	194L-E, 12...40 A, 2...3 poles	5271...5273
528		0-1-2-3-4-5 (45 degrees)	194L-E, 12...40 A, 2...3 poles	5281...5283
550		0-1-2 (60 degrees)	194L-E, 12...40 A, 1...3 poles	5501...5503
551		0-1-2-3 (60 degrees)	194L-E, 12...40 A, 1...3 poles	5511...5513
552		0-1-2-3-4 (60 degrees)	194L-E, 12...40 A, 1...3 poles	5521...5523
553		0-1-2-3-4-5 (60 degrees)	194L-E, 12...40 A, 1...3 poles	5531...5533
725		Star-Delta (Wye-Delta)	0-Y-Δ (45/90 degrees)	194L-E or 194L-A, 12...40 A, 3 poles
732	0-Y-Δ (45/90 degrees)		194L-E or 194L-A, 12...40 A, 3 poles	7323
750	0-Y-Δ (60 degrees)		194L-E, 12...40 A, 3 poles	7503
730	Reversing	1-0-2 (45 degrees)	194L-E or 194L-A, 12...40 A, 3 poles	7303
754		1-0-2 (60 degrees)	194L-E, 12...40 A, 3 poles	7543
825	Voltmeter	0-RN-SN-TN-TR-ST-RS (45 degrees)	194L-E or 194L-A, 12 A, 1 pole	8251
827		0-RS-ST-TR (45 degrees)	194L-E or 194L-A, 12 A, 1 pole	8271
875	Ammeter	0-1-2-3 (90 degrees)	194L-E or 194L-A, 12 A, 1 pole	8751
876		0-1-2-3-4 (90 degrees)	194L-E or 194L-A, 12 A, 1 pole	8761
877		0-1 (90 degrees inverted)	194L-E or 194L-A, 12 A, 1 pole	8771

d

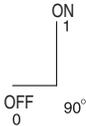
No. of Poles	
Code	Description
1	1 Pole
2	2 Poles
3	3 Poles
4	4 Poles
5	5 Poles
6	6 Poles

* Not all possible configurations are available. Some configurations may have longer delivery times and minimum order quantities.
 ⊛ When choosing front mount style 194L-E for 32 A or 40 A, use the 194L-C code only if a 194L-HC style handle is being used.

Bulletin 194L
IEC Control and Load Switches
 Product Selection

Frequently Ordered 194L Switches — Base/Front-Mounted Switches
 (Switch Handles listed on page 2-437)

2

ON-OFF Switch Body (Includes Shaft)	No. of Poles	No. of Circuits	Contact Target Configuration X = Contact Closed O = Contact Open		Rated Current [A]	Mounting Type	Cat. No.
			Control Knob Position				
			OFF/0	ON/1			
							
1-Circuit ON-OFF Switch	1	1	O	X	20	Front/Door	194L-E20-1751
					25	Base/DIN	194L-A25-1751
						Front/Door	194L-E25-1751
2-Circuit ON-OFF Switch	2	1 2	O O	X X	12	Base/DIN	194L-A12-1752
					16	Front/Door	194L-E12-1752
					20	Base/DIN	194L-A20-1752
					25	Front/Door	194L-E25-1752
3-Circuit ON-OFF Switch	3	1 2 3	O O O	X X X	12	Base/DIN	194L-A12-1753
					16	Front/Door	194L-E12-1753
					20	Base/DIN	194L-A20-1753
					25	Front/Door	194L-E25-1753
4-Circuit ON-OFF Switch	4	1 2 3 4	O O O O	X X X X	12	Base/DIN	194L-A12-1754
					20	Base/DIN	194L-A20-1754
						Front/Door	194L-E20-1754
					25	Base/DIN	194L-A25-1754
						Front/Door	194L-E25-1754
6-Circuit ON-OFF Switch	6	1 2 3 4 5 6	O O O O O O	X X X X X X	16	Front/Door	194L-E16-1756
					20	Base/DIN	194L-A20-1756
						Front/Door	194L-E20-1756
					25	Base/DIN	194L-A25-1756
						Front/Door	194L-E25-1756

Reversing Switch Body (Includes Shaft)	No. of Poles	No. of Circuits	Contact Target Configuration X = Contact Closed O = Contact Open			Rated Current [A]	Mounting Type	Cat. No.
			Control Knob Position					
			1	0	2			
								
5-Circuit Reversing Switch	3	1 2 3 4 5	O X X O X	O O O O O	X O O X X	25	Front/Door	194L-E25-7543

Bulletin 194L Handles (for use with Bulletin 194L Switches)

Color	Handles (Includes Legend Plate and Control Knob)			
Red/Yellow (Emergency Stop colors)	 Type I	 Type L With Locking For One Padlock (Padlock Not Included)	 Type N *	Bulletin 194L handles are available in both screw fixing and 22.5 mm mounting hole style. IP66, UL Type 3/3R/12 for all 194L Handles
Black/Grey (Standard Operation colors)	 Type A	 Type E With Locking For One Padlock (Padlock Not Included)	 Type G*	

* These handles are for use with -175 and -178 (ON-OFF) switches only and are dual marked with ON-OFF and 1-0.

Catalog Number Explanation

194L – HE 6 N – 175
a b c d

a

Code	Installation Type
HC	22.5 mm Mounting Hole Style Handle (for use with front-mounted switches)
HE	Screw-Mounting Handle (for use with front- and base-mounted switches)

b

Code	Use with Handle Type	Handle Legend Plate Size	Use With 194L Switch Size
4	A, E, I, L	48 mm x 48 mm (1-57/64 in. x 1-57/64 in.)	194L-A12...A25 194L-E12...E25 194L-C32...C40
	S	48 mm x 62 mm (1-57/64 in. x 2-7/16 in.)	
6	A, E, I, L	64 mm x 64 mm (2-33/64 in. x 2-33/64 in.)	
	G, N*	67 mm x 67 mm (2-41/64 in. x 2-41/64 in.)	194L-A12...40 A 194L-E12...40 A
	S	64 mm x 78 mm (2-33/64 in. x 3-5/64 in.)	

* Use Type G and N with ON-OFF function only (selection "d").

c

Code	Legend Plate Type	Color
A	Square	Grey/Black
I	Square	Red/Yellow
E	Square/Lockable	Grey/Black
L	Square/Lockable	Red/Yellow
G	Disc/Lockable (up to 3 locks)	Grey/Black
N	Disc/Lockable (up to 3 locks)	Red/Yellow
S	Large Square with extra legend area	Grey/Black

d

See Table on the next page.

d

2

Code	Description	Legend Marking	Code	Description	Legend Marking	Code	Description	Legend Marking
150	O-I		426	1-2-3-4 (45° Step Switch)		551	0-1-2-3 (60° Step Switch)	
150I	OFF-ON		427	1-2-3-4-5 (45° Step Switch)		552	0-1-2-3-4 (60° Step Switch)	
175	O-I		428	1-2-3-4-5-6 (45° Step Switch)		553	0-1-2-3-4-5 (60° Step Switch)	
175I	OFF-ON		450	1-2-3 (60° Step Switch)		725	0-Y-Δ (45°/90° Star-Delta Switch)	
178	O-I		451	1-2-3-4 (60° Step Switch)		732	0-Y-Δ (45°/90° Star-Delta Switch)	
178I	OFF-ON		452	1-2-3-4-5 (60° Step Switch)		750	0-Y-Δ (60° Star-Delta Switch)	
225	1-2 (45° Changeover without O)		453	1-2-3-4-5-6 (60° Step Switch)		754	Same as Code 350. Use order code 350.	
250	1-2 (60° Changeover without O)		500	0-1-2-3-4 (30° Step Switch)		825	0-RN-SN-TN-TR-ST-RS (45° Voltmeter Switch)	
300	1-0-2 (30° Changeover with spring return)		501	0-1-2-3-4-5 (30° Step Switch)		827	0-RS-ST-TR (45° Voltmeter Switch)	
325	1-0-2 (45° Changeover with O)		525	0-1-2 (45° Step Switch)		875	0-1-2-3 (90° Ammeter Switch — 3 c.t.'s)	
326	Same as Code 325. Use order code 325.		526	0-1-2-3 (45° Step Switch)		876	1-2-3-4 (90° Ammeter Switch — 4 c.t.'s)	
350	1-0-2 (Reversing 45° Changeover with O)		527	0-1-2-3-4 (45° Step Switch)		877	0-1 (90° Ammeter Switch — 1 c.t.)	
375	1-0-2 (90° Changeover with O)		528	0-1-2-3-4-5 (45° Step Switch)				
425	1-2-3 (45° Step Switch)		550	0-1-2 (60° Step Switch)				

Frequently Ordered 194L Handles — Base/Front-Mounted Switch Handles
 (Switch Body listed on page 2-435)

Handle Type	Degree of Protection	Handle Color	Legend Plate Size	For Use With	Legend Plate Marking	Cat. No.*
A	IP66	Black/Grey	48 mm x 48 mm (1-57/64 in. x 1-57/64 in.)	194L-E12...40 A, -7543	1-0-2	194L-HC4A-350
			48 mm x 48 mm (1-57/64 in. x 1-57/64 in.)	194L-E12...40 A, -7543 194L-A12...40 A, -7543		194L-HE4A-350
			64 mm x 64 mm (2-33/64 in. x 2-33/64 in.)	194L-E12...40 A, -7543 194L-A12...40 A, -7543		194L-HE6A-350
E		Black/Grey	48 x 48 mm (1-57/64 x 1-57/64 in.)	194E-16...63 A	0-1	194L-HE4E-175
194L-E12...40 A, -1753 194L-A12...40 A, -1753				OFF-ON	194L-HE4E-175I	
L		Red/Yellow	48 x 48 mm (1-57/64 x 1-57/64 in.)	194E-16...63 A	0-1	194L-HE4L-175
194L-E12...40 A, -1753 194L-A12...40 A, -1753	OFF-ON			194L-HE4L-175I		
G	IP66 (UL Type 3/3R/12)	Black/Grey	67 x 67 mm (2-41/64 x 2-41/64 in.)	194E-25...100 A	0-1 OFF-ON	194L-HE6G-175
N				194L-E12...40 A, -1753 194L-A12...40 A, -1753		
L	IP66 (UL Type 3/3R/12)	Red/Yellow	48 x 48 mm (1-57/64 x 1-57/64 in.)	194E-25...100 A	0-1 OFF-ON	194L-HE6N-175
				194L-E12...40 A, -1753 194L-A12...40 A, -1753		194L-HC4L-175
				194L-E12...40 A, -1753	OFF-ON	194L-HC4L-175I

* For 22.5 mm mounting hole style (code HC), select either handle type A, E, I, or L with 48 x 48 mm legend plate size (code 4) only or handle type G or N with 64 x 64 mm legend plate size (code 6) only.

Rectangular Knob Handle (Includes Legend Plate and Control Knob)	Color	Locking Provision	Legend Plate Size	For Use With	Fixing	Legend Marking	Cat. No.
	Black/Grey	None	48 mm x 48 mm (1-57/64 in. x 1-57/64 in.)	194L-A 12...40 A switches ONLY	Screw	0-1	194L-HE4P-175
						OFF-ON	194L-HE4P-175I

22.5 mm Mounting Hole Style Knob and Keyed Type Handles

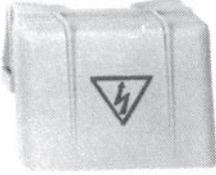
	Description	Fixing	Pkg. Qty.	Cat. No.
 Type B	22.5 mm Mounting Hole Style Handles (IP65) Handle Style: Knob Lever with Latch (For Use With 194E-E25...100 A, -1753) or 194L-E12...40 A	22.5 mm Mounting Hole Style	1	194L-HCB-001
 Type D	22.5 mm Mounting Hole Style Handles Key Removal Position (Includes Latch) For Use With 194L-E 12...40 A, 194E-E16...63 A, - 1753	22.5 mm Mounting Hole Style	1	194L-HCDC-001
	22.5 mm Mounting Hole Style Handles Key Removal Position (Includes Latch) For Use With 194L-E 12...40 A, 194E-E16...63 A, - 1753			194L-HCDD-001
	22.5 mm Mounting Hole Style Handles Key Removal Position (Includes Latch) For Use With 194L-E 12...40 A, 194E-E16...63 A, - 1753			194L-HCDG-001
	22.5 mm Mounting Hole Style Handles Key Removal Position (Includes Latch) For Use With 194L-E 12...40 A, 194E-E16...63 A - 1753			194L-HCDH-001



IEC Control and Load Switches

Accessories

2

 Standard Black Control Knob	Description	Pkg. Qty.	Cat. No.	Cat. No.
 Rectangular Front Frame	Control Knob, Black, L = 37.5 mm (1-31/64 in.)	5		194L-G3154N
	Control Knob, Black, L = 48 mm (1-57/64 in.)	5		194L-G3155N
	Control Knob, Red, L = 37.5 mm (1-31/64 in.)	5		194L-G3154R
	Control Knob, Red, L = 48 mm (1-57/64 in.)	5		194L-G3155R
	Rectangular front frame with blank nameplate L = 48 x 62 mm (1-57/64 x 2-7/16 in.)	10		194L-G3196
	Rectangular front frame with blank nameplate L = 64 x 78 mm (2-33/64 x 3-5/64 in.)	10		194L-G3197
	Control Knob, Black, with Locking Facility (Use 1/4 in. max. hasp lock.) (Locks in 0°, 90°, 180°, and 270° positions)	10	*	194L-G2864N
 Control Knob, With Locking Facility	Control Knob, Red, with Locking Facility (Use 1/4 in. max. hasp lock)		*	194L-G2864R
	Control Knob, Type P Control Knob, Black, 31 mm (1-7/32 in.) Diameter	5		194L-G2888N
	Control Knobs, Type P Control Knob, Red, 31 mm (1-7/32 in.) Diameter			194L-G2888R
	Large Control Knob, 41 mm (1-5/8 in.) Diameter; IP40, Black	5		194L-G2851N
	Control Knob, 41 mm (1-5/8 in.) Diameter; IP65, Black	5		194L-G2854N
	Use Bulletin 800F Legend Frames and Inserts	—		—
	Blank Legend Plate, 48 mm x 48 mm (1-57/64 in. x 1-57/64 in.)	10		194L-B4
	Blank Legend Plate, 64 mm x 64 mm (2-33/64 in. x 2-33/64 in.)			194L-B6
	Terminal Cover — Base/DIN For Cat. No. 194L-A12...16	10		194L-A12-C34
	Terminal Cover — Front (Door) For Cat. No. 194L-E12...16			194L-E12-C34
	Terminal Cover — Base/DIN For Cat. No. 194L-A20...25	10		194L-A20-C34
	Terminal Cover — Front (Door) For Cat. No. 194L-E20...25			194L-E20-C34

* These locking knobs can only be added to the "HE" style actuators. If a locking knob is desired on a "HC" style actuator, it has to be ordered as part of the main catalog number. For example, Cat. No. 194L-HC4E-175.

IP66	Use With Switch	Number of Contacts*	ABS	Required Shaft	Noryl Material	Required Shaft	
			Cat. No.	Cat. No.	Cat. No.	Cat. No.	
	194L-A12/16	1...2	194L-G3572	194L-G3195	194L-G3576	194L-G3195	
		3...4	194L-G3572	194L-G2830	194L-G3576	194L-G2830	
		5...6	194L-G3573	194L-G3195	194L-G3577	194L-G3195	
	194L-A20/25	1...2	194L-G3572	194L-G3194	194L-G3576	194L-G3194	
		3...4	194L-G3572	194L-G2830	194L-G3576	194L-G2830	
		5...6	194L-G3573	194L-G3194	194L-G3577	194L-G3194	
	194L-E12/16	1...4	*	194L-G3574	194L-G3380	194L-G3578*	194L-G3380
		5...8	*	194L-G3575	194L-G3380	194L-G3579*	194L-G3380
	194L-E20/25	1...4	*	194L-G3574	194L-G3380	194L-G3578*	194L-G3380
		5...8	*	194L-G3575	194L-G3380	194L-G3579*	194L-G3380

Use With Size 6 Handles

* Covers must be drilled for operating handle by user. Does not include earth/ground — neutral terminal.
 * Refer to the switching diagrams that follow to determine the number of switch contacts.

	Description	Pkg. Qty.	Cat. No.
	Metal Shaft Extension with Padlock Provision ON Switch in OFF Position L = 110...235 mm (4-21/64....9-1/4 in.)	1	194L-G3393
	Metal Shaft Extension with Padlock Provision ON Switch in OFF Position L = 230...350 mm (9-3/64....13-51/64 in.)	1	194L-G3394
	Metal Shaft Extension For modification of Cat. No. 194L-G3393/ G3394 when used with any switches other than 2-position, 90° rotation.	10	194L-G3399
	Standard Interlock Shaft For Use With 194L-A12...40 = 44 mm (1-47/64 in.)	5	194L-G2830*
	Interlock Shaft For Use With 194L-A12...40 = 52 mm (2-3/64 in.)		194L-G3194*
	Interlock Shaft For Use With 194L-A12...40 = 57 mm (2-15/64 in.)		194L-G3195*
	Shaft Extension Including Coupling For Use With 194L-A12...40 = 24 mm (15/16 in.)	10	194L-G2853
	Standard Shaft For Use With 194L-E12...40 = 34 mm (1-11/32 in.)	5	194L-G3380

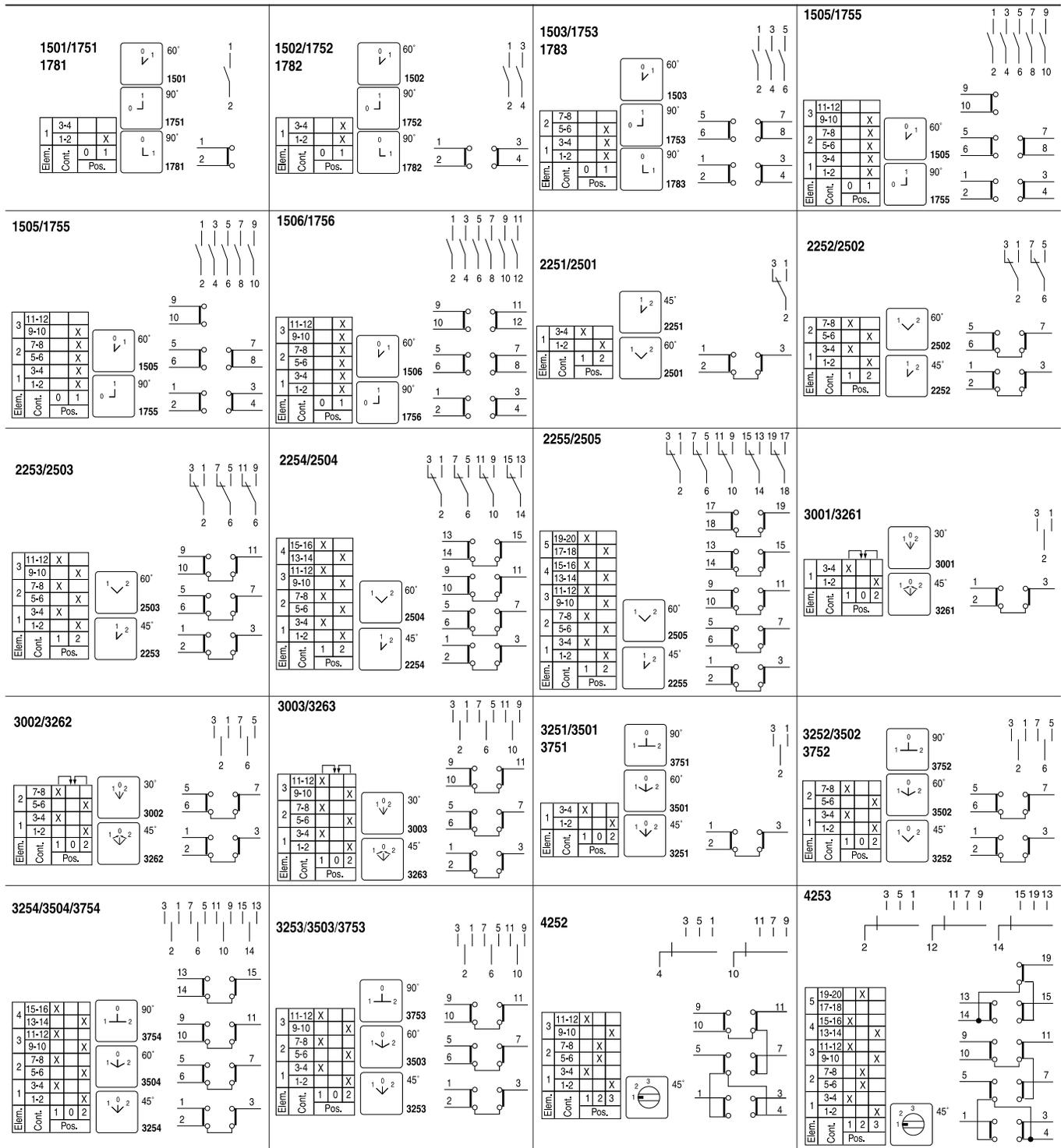
* For Use With **194L-A...** Base-Mounted switches only.

Bulletin 194L
IEC Control and Load Switches
 Switching Diagrams

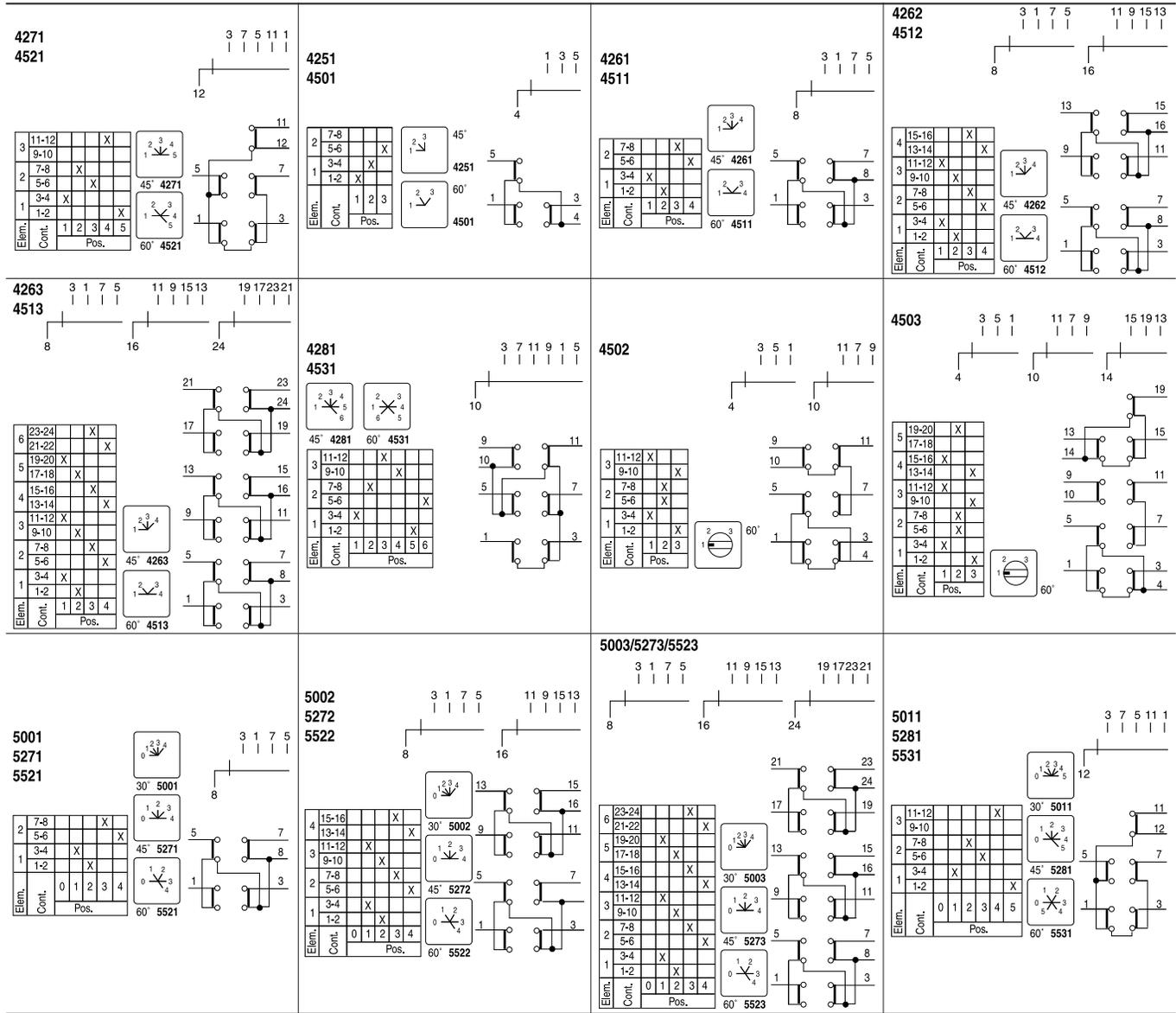
Circuit Diagram Nos. 1501...4253

Contact target tables: X = Contact Closed
 [Blank] = Contact Open

2

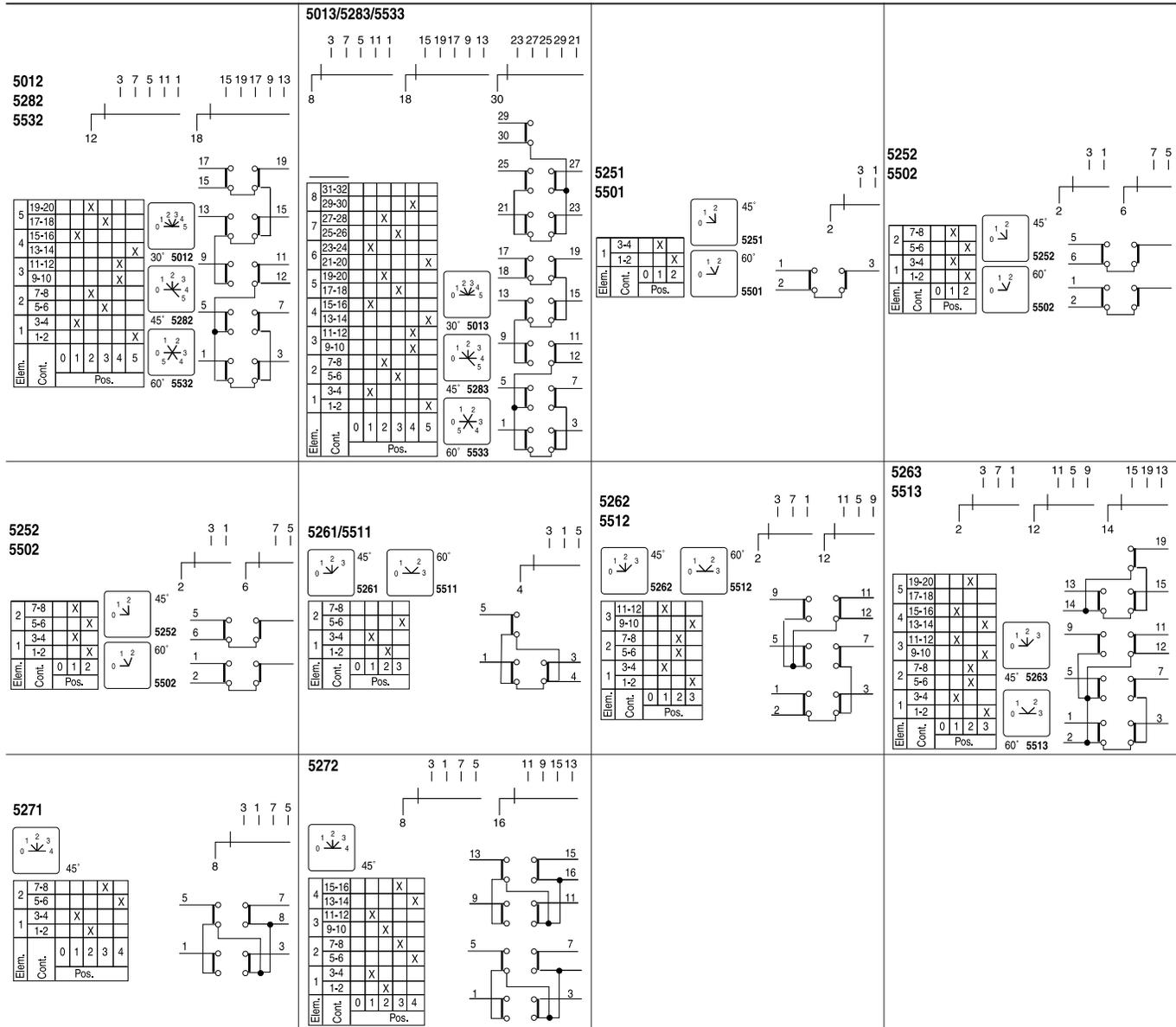


Circuit Diagram Nos. 4271...5531



Circuit Diagram Nos. 5012...5272

2



Circuit Diagram Nos. 5273...8771

5273

6	23-24			X
5	21-22	X		X
5	19-20	X		
4	15-16		X	X
4	13-14		X	
3	11-12	X		
3	9-10		X	
2	7-8			X
2	5-6			X
1	3-4	X		
1	1-2		X	

7253
7323
7503

4	15-16	X	X
3	13-14	X	X
3	11-12		
2	9-10	X	
2	7-8	X	
2	5-6	X	
1	3-4	X	X
1	1-2	X	X

7303
7543

3	11-12	X	X
2	7-8	X	
2	5-6	X	
1	3-4	X	
1	1-2		X

8251

3	11-12	X			
2	9-10	X	X	X	
2	7-8	X	X		
2	5-6			X	X
1	3-4	X	X		
1	1-2	X	X		X

871

3	11-12		X	X
2	9-10		X	X
2	7-8	X	X	X
1	3-4	X	X	X
1	1-2	X	X	X

8271

2	7-8	X	X
1	3-4	X	X
1	1-2		X

8751

3	11-12		X	X
2	9-10		X	X
2	7-8	X	X	X
1	3-4	X	X	X
1	1-2	X	X	X

8771

1	3-4	X	X
1	1-2	X	X



Bulletin 194L
IEC Control and Load Switches
 Specifications

Electrical Ratings

Performance Data		12 A	16 A	20 A	25 A	32 A	40 A								
IEC Applications															
Rated voltage U_e *	IEC-947	[V]	690	690	690	690	690								
Isolating conditions acc. to VDE fulfilled up to rated impulse voltage U_{imp}		[kV]	6	6	6	8	8								
Thermal rated current I_{th} * 40 °C	IEC-947	[A]	16	20	25	30	32	45							
Thermal rated current I_{the} 60 °C	IEC-947	[A]	12	16	20	25	32	45							
Rated current I_e *															
AC-1/ AC-21A	Non-inductive or slightly inductive loads/ switching of resistive loads with slight overload	IEC-947 690V	[A]	12	16	20	25	32	40						
AC-1	Non-inductive or slightly inductive loads	SEV 660V	[A]	12	16	20	25	32	40						
AC22A	Switching of mixed resistive and inductive loads with slight overload	IEC-947 220...500V 690V	[A] [A]	12 12	16 16	20 20	25 25	32 32	40 40						
AC-15	Switching of inductive drives, motors, valves, and electromagnets.	IEC-947 220...240V 380...415V 500V	[A] [A] [A]	5 3 2	6 4 2.5	7 5 3	8 6 4	—	—						
DC switching capacity	Contacts in series														
Rated current I_e															
Rated Voltage [V]	1	2	3	4	5	6	8								
	24	48	72	96	120	144	192	[A]	12	16	20	22	—	—	
	48	96	144	192	240	288	384	[A]	10	12	16	18	—	—	
	60	120	180	240	300	360	450	[A]	8	10	12	14	32	40	
DC-21A	For resistive loads, $T \leq 1$ ms	110	220	330	440	550	660	—	[A]	2	2.5	4	5	—	—
		220	440	660	—	—	—	—	[A]	0.5	0.6	0.7	0.8	—	—
	U_e max = 600V	440	—	—	—	—	—	—	[A]	0.4	0.4	0.5	0.5	—	—
Rated making/breaking capacity (= 1.5 x I_e)															
		25.2	50.4	75.6	100.8	126	151.2	201.6	[A]	18	24	30	33	—	—
	1.05 x Rated voltage [V]	50.4	100.8	151.2	201.6	252	302.4	403.2	[A]	15	21	24	27	—	—
	For resistive loads, $T I_{th}$ 1ms	63	126	189	252	315	378	504	[A]	12	18	18	21	48	60
		115.5	231	346.5	462	577.5	—	—	[A]	3	4.5	6	7.5	—	—
	U_e max = 600V	231	462	—	—	—	—	—	[A]	0.75	1.12	1.05	1.2	—	—
		462	—	—	—	—	—	—	[A]	0.52	0.78	0.47	0.75	—	—
Rated current I_e															
Rated voltage [V]	24	48	72	96	120	144	192	[A]	8	10	12	14	16	16	
	30	60	90	120	150	180	240	[A]	4.5	5.5	7	8	—	—	
	For inductive loads $T = 50$ ms	48	96	144	192	240	288	384	[A]	1.5	2	2.5	3	8	8
Rated voltage [V]	60	120	180	240	300	360	450	[A]	1	1.2	1.5	1.8	4.8	4.8	
	110	220	330	440	550	660	—	[A]	0.4	0.5	0.6	0.7	2	2	
	220	—	—	—	—	—	—	[A]	—	—	—	—	0.6	0.6	
Rated making/breaking capacity (= 1.1 x I_e)															
	1.1 x Rated voltage [V]	26.4	52.8	79.2	105.6	132	158.4	184.8	[A]	8.8	11	13.2	1.54	—	17.6
		33	66	99	132	165	198	231	[A]	4.95	6.05	7.7	8.8	—	—
	For inductive loads $T = 50$ ms	52.8	105.6	158.4	211.2	264	316.8	369.6	[A]	1.65	2.2	2.75	3.3	8.8	8.8
	U_e max = 600V	66	132	198	264	330	396	462	[A]	1.1	1.32	1.65	1.98	5.28	5.28
		121	242	363	484	605	—	—	[A]	4.95	6.05	7.7	8.8	2.2	2.2
Power Lost								[W]	0.3	0.5	0.6	0.9	0.8	1.4	
Rated power P_e	Contacts in series														
	24			1				[kW]	0.12	0.15	0.20	0.25	0.30	0.30	
	24			2				[kW]	0.20	0.25	0.30	0.37	—	—	
	48			2				[kW]	0.25	0.30	0.37	0.50	0.50	0.50	
	48			3				[kW]	0.30	0.37	0.50	0.75	—	—	
Rated voltage [V]	60			2				[kW]	0.25	0.30	0.37	0.50	1.00	1.00	
DC-23A, DC-3, DC-5	60			4				[kW]	0.37	0.50	0.75	1.00	—	—	
For inductive loads, $T \leq 1$ ms	110			4				[kW]	0.50	0.75	1.00	1.20	—	—	
	110			6				[kW]	1.00	1.20	1.40	1.60	—	—	
	220			4				[kW]	0.37	0.50	0.75	1.00	—	—	
	220			6				[kW]	1.00	1.20	1.40	1.50	—	—	

* See standards compliance listed on page page 2-428.

* 32 and 40 A data for one contact in series.



Electrical Ratings

Performance Data, Continued				12 A	16 A	20 A	25 A	32 A	40 A	
IEC Applications, Continued										
Rated making/breaking capacity (= 4 x I _e)				Contacts in series						
	Rated Voltage [V]									
DC-23A, DC-3, DC-5 For inductive loads, T ≤ 7.5 ms	25.2	1	[A]	20.0	25.0	33.3	41.6	50.0	50.0	
	25.2	2	[A]	33.3	41.6	50.0	61.6	—	—	
	50.4	2	[A]	21.0	25.0	30.8	41.6	41.6	41.6	
	50.4	3	[A]	25.0	30.8	42.0	62.4	—	—	
	63	2	[A]	16.6	20.0	24.6	33.2	66.6	66.6	
	63	4	[A]	24.6	33.3	50.0	66.4	—	—	
	115.5	4	[A]	18.1	27.2	36.4	44.0	—	—	
	115.5	6	[A]	36.4	43.6	51.0	58.2	—	—	
	231	4	[A]	6.7	9.1	13.6	18.2	—	—	
	231	6	[A]	18.1	21.8	25.2	27.2	—	—	
Rated breaking capacity		at 220V	[A]	72	96	128	176	296	296	
		0.45 [cos φ]								
		at 380V	[A]	72	96	128	176	280	336	
Rated power P _e *		0.45 [cos φ]								
		at 660V	[A]	53	72	86	112	196	196	
		0.45[cos φ]								
AC-2	Slip-ring motors: starting, reversing and electric braking; star/delta starting	IEC-947								
		3 Ø 3-pole	240V	[kW]	3	4	5.5	5.5	—	—
			380V	[kW]	5.5	7.5	9	13	—	—
			415V	[kW]	5.5	7.5	9	13	—	—
			440V	[kW]	5.5	7.5	9	13	—	—
			500V	[kW]	7.5	10	11	15	—	—
			660V	[kW]	7.5	10	11	15	—	—
AC-3	Squirrel-cage motors: starting and stopping of running motors	IEC-947								
		3 Ø 3-pole	220...240V	[kW]	2.2	3	4.5	5.5	7.5	7.5
			380...440V	[kW]	4	5.5	7.5	11	15	18.5
			500V	[kW]	5.5	7.5	10	13	—	—
			660V	[kW]	5.5	7.5	8	11	18.5	18.5
		1 Ø 2-pole	110V	[kW]	0.75	1.1	1.2	1.6	—	—
			220...240V	[kW]	1.3	2.2	2.5	3.2	4	4
380...440V	[kW]		2.2	3.7	4.5	5.5	8	16		
AC-4	Squirrel-cage motors: starting, reversing, electric braking, inching	IEC-947								
		3 Ø 3-pole	220...240V	[kW]	0.75	1.5	3	4	5.5	5.5
			380...415V	[kW]	1.5	2.2	3.7	5.5	7.5	7.5
			440...550V	[kW]	1.5	2.2	3.7	5.5	7.5	11
		1 Ø 2-pole	110V	[kW]	0.18	0.37	0.55	0.75	—	—
			240V	[kW]	0.37	0.75	1.5	2.2	—	—
			380V	[kW]	0.75	1.1	1.8	3	—	—
440V	[kW]		0.75	1.1	1.8	3	—	—		

* See standards compliance listed on page 2-428.



Bulletin 194L
IEC Control and Load Switches
 Specifications

Electrical Ratings

Performance Data, Continued					12 A	16 A	20 A	25 A	32 A	40 A
IEC Applications, Continued										
AC-23A	Occasional switching of motors and other highly inductive loads (criterion for selecting main switches)	IEC-947	220...240V	[kW]	2.2	3	4.5	5.5	11	11
		3Ø	380...440V	[kW]	4	5.5	7.5	11	18.5	22
		3-pole	500V	[kW]	5.5	7.5	10	13	—	—
			660V	[kW]	5.5	7.5	8	11	22	22
1Ø	110V	[kW]	0.75	1.1	1.2	1.6	—	—		
2-pole	220...240V	[kW]	1.3	2.2	2.5	3.2	5.5	5.5		
	380...440V	[kW]	2.2	3.7	4.5	5.5	11	11		
Short-circuit ratings		(gL characteristic)	[kA _{rms}]	[A]	0.48	0.48	0.6	0.75	0.8	0.8
Rated short-time current (1s)					20*	20*	20*	25*	35	40
Strongest series fuse, not in enclosure					6	6	5	5	5	5
Conditional rated short-circuit			[kA]							
Switch Rate		electrical		[ops/h]	120	120	120	120	120	120
CSA and UL Applications										
Rated Voltage U_e			[V AC]		600	600	600	600	600	600
Ampere Rating	Pilot Duty	Contact class		[A]	A600	A600	—	—	—	—
	General Use	Non-inductive or slightly inductive load*			12	16	20	25	32	40
Rated power P_e †		UL (CSA)		(FLA)	(FLA)	(FLA)	(FLA)			
Standard motor DOL rating (similar to AC-3)	3Ø	120V	[Hp]	1 (7.2)	1.5 (12)	2 (13.6)	3 (19.2)	5 (30.4)	5 (30.4)	
		240V	[Hp]	2 (6.8)	3 (9.6)	4 (12.4)	6 (18)	7.5 (22)	10 (28)	
	3-pole	480V	[Hp]	5 (7.6)	7.5 (11)	8 (11.6)	12 (17)	20 (27)	25 (34)	
		600V	[Hp]	5 (6.1)	7.5 (9)	10 (11)	15 (17)	20 (22)	25 (27)	
	1Ø	120V	[Hp]	0.5 (9.8)	.75 (13.8)	1 (16)	1.5 (20)	2 (24)	2 (24)	
		240V	[Hp]	1 (8.0)	1.5 (10.0)	2 (12)	3 (17)	5 (28)	5 (28)	
2-pole	480V	[Hp]	2 (6.0)	3 (8.5)	4 (11.2)	6 (17)	7.5 (21)	10 (26)		
600V	[Hp]	3 (6.8)	3 (6.8)	5 (11.2)	7.5 (16)	10 (20)	15 (27)			
Heavy motor load, reversing Rating (similar to AC-4)		3Ø	120V	[Hp]	—	—	—	—	—	
Max. back-up fuse		3-pole	240V	[Hp]	—	—	—	—	—	
		(gG characteristic)		[A]	35	55	60	80		
Short Circuit Ratings	Maximum Short Circuit Prospective Fault Current			[kA]	5	5	5	5		
	Maximum Fuse Size			[A]	35	55	60	80		
Switching Rate		electrical		[ops/h]	120	120	120	120	120	120

Mechanical Data

Performance Data				12/16 A	20/25 A	32/40 A
Protection class acc. to IEC 529	Handles Switch Bodies			IP66 IP20	IP66 IP20	IP66 IP20
Mechanical Endurance		[mil.ops]	1	1	1	
Switching rate	mechanical	[ops/h]	1200	1200	1200	
Maximum Wire Gauges						
rigid wire	AWG		(2)18...12	(2)16...10	(2)12...8	
	[mm ²]		(2)1...2.5	(2)1.5...6	(2)4...10	
fine strands	AWG		(2)18...12	(2)16...10	(2)14...10	
	[mm ²]		(2)1...2.5	(2)1.5...4	(2)2.5...6	

Environmental Data

Performance Data		12/16/20/25 A	32/40 A
Ambient temperature			
Operation		-25...+60 °C (-13...+140 °F)	-25...+60 °C (-13...+140 °F)
	Storage	-40...+80 °C (-40...+176 °F)	-40...+80 °C (-40...+176 °F)

* Does not apply to switches in enclosure.

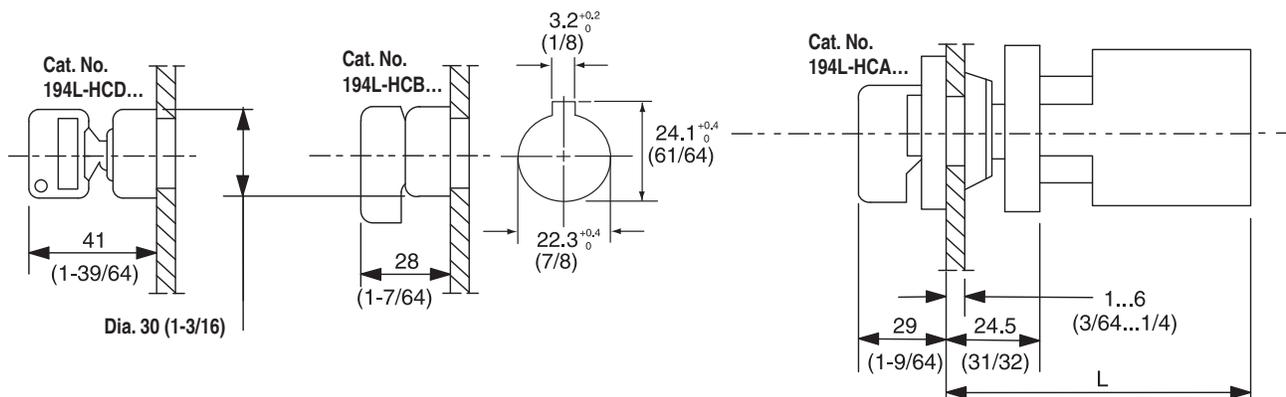
‡ Suitable for switching off-load (AC-20) above 660V, but only up to 660V for switches with screws at the rear.

† See standards compliance listed on page 2-434.



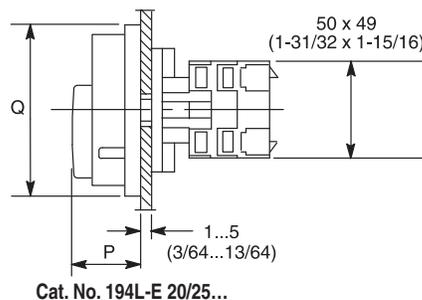
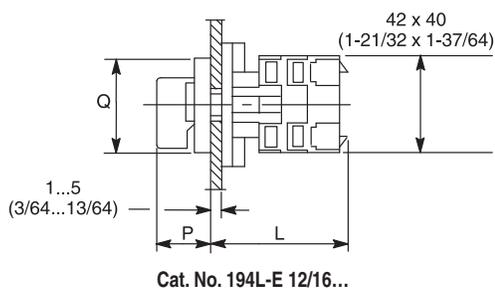
Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Cat. No. 194L-C... for Central Fixing (194L-HC...)

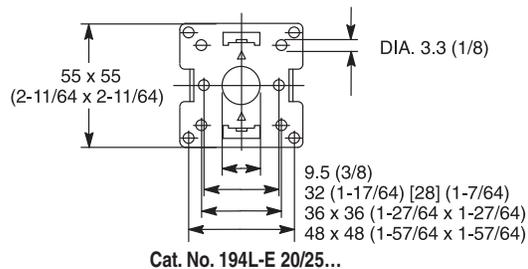
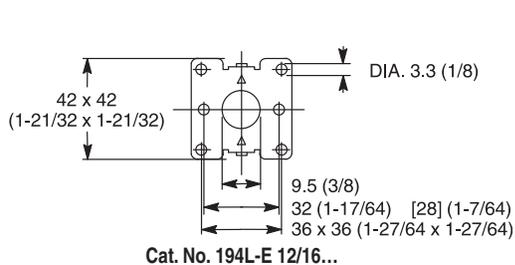


Cat. No.	L				
	No. of Contacts				
	1...2	3...4	5...6	7...8	9...10
194L-C32/40...	86 (3-25/64)	103.5 (4-5/64)	121 (4-49/64)	138.5 (5-29/64)	156 (6-9/64)

Cat. No. 194L... for Front (Door) Installation



Mounting Dimensions



Cat. No.	L				
	No. of Contacts				
	1...2	3...4	5...6	7...8	9...10
194L-E12/16...	44 (1-47/64)	54 (2-1/8)	64 (2-33/64)	74 (2-29/32)	84 (3-5/16)
194L-E20/25...	44.5 (1-3/4)	57 (2-1/4)	69.5 (2-3/4)	82 (3-15/64)	94.5 (3-23/32)
194L-E32/40...	43 (1-11/16)	58.5 (2-5/16)	76 (2-63/64)	93.5 (3-11/16)	111 (4-3/8)

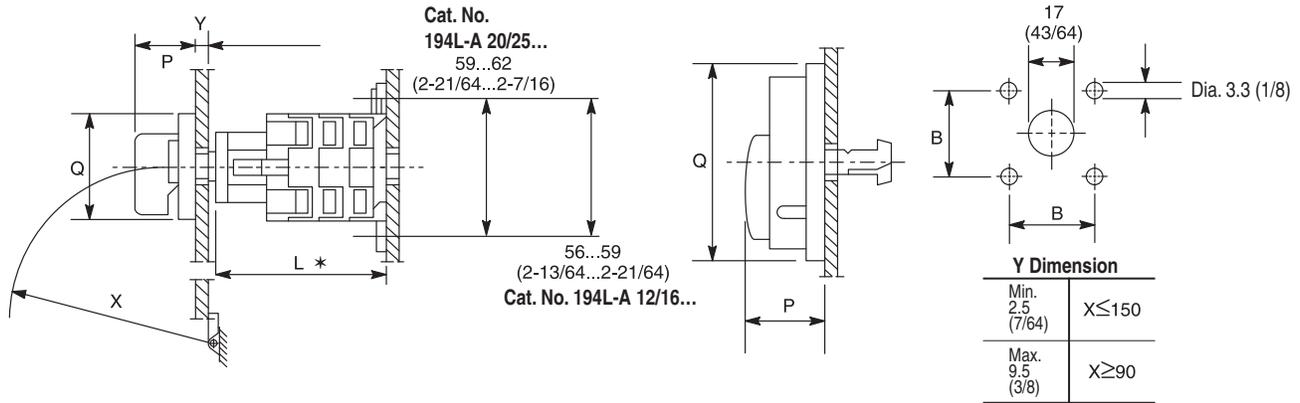
Bulletin 194L
IEC Control and Load Switches
 Approximate Dimensions

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

Control Knob

Cat. No.	P	Q
194L-HE4A...	28 (1-7/64)	48 (1-57/64) x 48 (1-57/64)
194L-HE4L...		48 (1-57/64) x 62 (2-7/16)
194L-HE4S...		64 (2-33/64) x 64 (2-33/64)
194L-HE6A...		64 (2-33/64) x 78 (3-5/64)
194L-HE6L...		64 (2-33/64) x 78 (3-5/64)
194L-HE6N...		67 (2-41/64) x 67 (2-41/64)
194L-HE6G...		34 (1-11/32)

Cat. No. 194L-A... for Base/DIN Rail Installation



Cat. No.	L *			
	No. of Contacts			
	1...2	3...4	5...6	7...8
194L-A12/16...	58 (2-9/32)	68 (2-11/16)	78 (3-5/64)	88 (3-15/32)
194L-A20/25...	58 (2-9/32)	71.5 (2-13/16)	84 (3-5/16)	96.5 (3-51/64)
194L-A32/40...	67.5 (2-21/32)	85 (3-11/32)	102.5 (4-1/32)	120 (4-47/64)

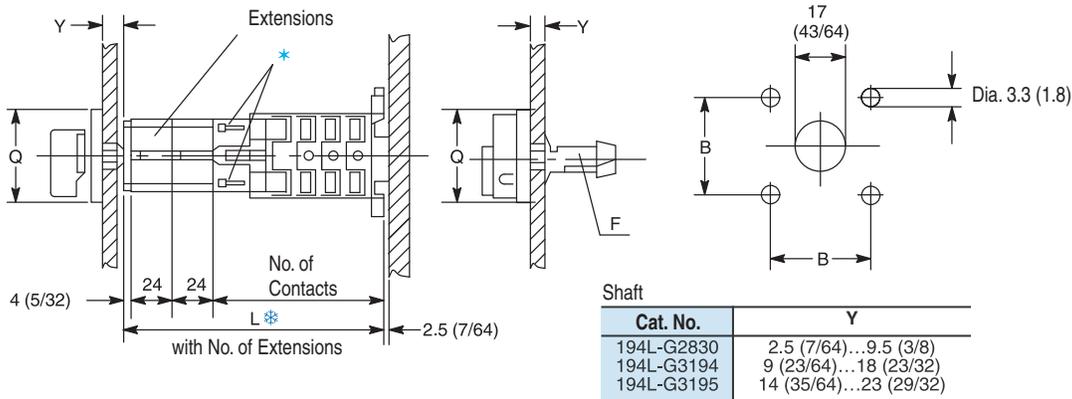
Control Knob

Cat. No.	P	B	Q	
194L-HE4A...	28 (1-7/64)	36 (1-27/64)	48 (1-57/64) x 48 (1-57/64)	
194L-HE4L...			48 (1-57/64) x 62 (2-7/16)	
194L-HE4S...		48 (1-57/64)	64 (2-33/64) x 64 (2-33/64)	
194L-HE6A...			64 (2-33/64) x 78 (3-5/64)	
194L-HE6L...			64 (2-33/64) x 78 (3-5/64)	
194L-HE6N...		34 (1-11/32)	48 (1-57/64)	67 (2-41/64) x 67 (2-41/64)
194L-HE6G...				67 (2-41/64) x 67 (2-41/64)

* With DIN 46 277 (35) Rail + 2.5 mm (7/64)

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

Cat. No. 194L-A... With Shaft Extension Cat. No. 194L-G2853



No. of Extensions	Cat. No. 194L-A12/16... 10mm (0.39)				Cat. No. 194L-A20/25... 12.5mm (0.49)				Cat. No. 194L-A32/40			
	L											
	No. of Contacts											
	1...2	3...4	5...6	7...8	1...2	3...4	5...6	7...8	1...2	3...4	5...6	7...8
With 1 extension	82 (3-15/64)	92 (3-5/8)	102 (4-1/64)	112 (4-13/32)	83 (3-17/64)	95.5 (3-49/64)	108 (4-1/4)	120.5 (4-3/4)	91.5 (3-15/64)	108 (4-1/4)	126.5 (5-63/64)	144 (6-43/64)
With 2 extensions	106 (4-11/64)	116 (4-37/64)	126 (4-31/32)	136 (5-23/64)	107 (4-7/32)	119.5 (4-45/64)	132 (5-13/64)	144.5 (5-11/16)	115.5 (5-35/64)	133 (5-15/64)	150.5 (6-5/16)	168 (7-5/8)
With 3 extensions	130 (5-1/8)	140 (5-33/64)	150 (5-29/32)	160 (6-19/64)	131 (5-5/32)	143.5 (5-21/32)	156 (6-9/64)	168.5 (6-5/8)	135.5 (5-11/32)	157 (6-3/16)	174.5 (7-7/8)	182 (8-9/16)
With 4 * extensions	154 (6-1/16)	164 (6-15/32)	174 (6-55/64)	184 (7-15/64)	155 (6-7/64)	167.5 (6-19/32)	180 (7-3/32)	192.5 (7-37/64)	163.5 (6-7/16)	181 (7-1/8)	198.5 (8-53/64)	216 (9-33/64)
With 5 * extensions	178 (7-1/64)	188 (7-13/32)	198 (7-51/64)	208 (8-3/16)	179 (7-3/64)	191.5 (7-35/64)	204 (8-1/32)	216.5 (8-33/64)	187.5 (7-3/8)	205 (8-5/64)	222.5 (9-49/64)	240 (9-29/64)
With 6 * extensions	202 (7-61/64)	212 (8-23/64)	222 (8-3/4)	232 (9-1/8)	203 (7-63/64)	215.5 (8-31/64)	228 (8-63/64)	240.5 (9-15/32)	211.5 (8-21/64)	229 (12)	246.5 (10-23/32)	264 (10-13/32)

Control Knob

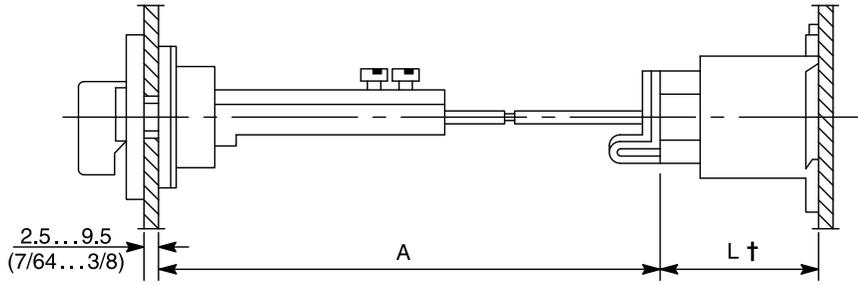
Cat. No.	Q	B
194L-HE4A...	48 (1-57/64) x 48 (1-57/64)	36 (1-27/64)
194L-HE4I...		
194L-HE6A...	64 (2-33/64) x 64 (2-33/64)	48 (1-57/64)
194L-HE6I...		
194L-HE6N...		
194L-HE6G...		
	67 (2-41/64) x 67 (2-41/64)	

* When more than 4 modules are used, attach the first one to the switch body using the screws supplied with the extension (Cat. No. 194L-G2853).
 * Mounting on DIN 46 277 (35) Rails.

Bulletin 194L
IEC Control and Load Switches
 Approximate Dimensions

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

Cat. No. 194L-A... With Metal Shafts



Cat. No.	A
194L-G3393...	110 (4-21/64)...235(9-1/4)
194L-G3394...	230 (9-1/16)...350 (13-25/32)

2

Cat. No.	L*			
	No. of Contacts			
	1...2	3...4	5...6	7...8
194L-A12/16...	54 (2-1/8)	64 (2-33/64)	74 (2-29/32)	84 (3-5/16)
194L-A20/25...	55 (2-11/64)	67.5 (2-21/32)	80 (3-5/32)	92.5 (3-41/64)
194L-A32/40...	63.5 (2-31/64)	81 (3-3/16)	88.5 (3-7/8)	116 (4-9/16)

Modular Shaft Extensions (Cat. No. 194L-G2853)

Select No. of Extension Modules and Shaft for use with enclosures.

No. of Extension Modules	Required End Shaft	Enclosure Mounting Depth‡	
		Cat. No. 194L-A12/16...	Cat. No. 194L-A20/25...
0	44 (1-47/64) §	71.5...77.5 (2-13/16...3-1/16)	75...80.5 (2-61/64...3-11/64)
	52 (2-3/64)	77...87 (3-1/32...3-27/64)	80...90 (3-5/32...3-35/64)
	57 (2-1/4)	82...92 (3-15/64...3-5/8)	85...95 (3-11/32...3-3/4)
1	44 (1-47/64) §	95.5...101.5 (3-49/64...4)	99...105 (3-29/32...4-9/64)
	52 (2-3/64)	97.5...111 (3-27/32...4-3/8)	101...114.5 (3-63/64...4-33/64)
	57 (2-1/4)	102.5...116 (4-3/64...4-37/64)	106...119.5 (4-11/64...4-45/64)
2	44 (1-47/64) §	119.5...125.5 (4-45/64...4-61/64)	123...129 (4-27/32...5-5/64)
	52 (2-3/64)	121.5...135 (4-51/64...5-5/16)	125...138.5 (4-59/64...5-29/64)
	57 (2-1/4)	126.5...140 (4-63/64...5-33/64)	130...143.5 (5-1/8...5-21/32)
3	44 (1-47/64) §	143.5...149.5 (5-21/32...5-57/64)	147...153 (5-51/64...6-1/32)
	52 (2-3/64)	145.5...159 (5-47/64...6-17/64)	149...162.5 (5-7/8...6-13/32)
	57 (2-1/4)	150.5...164 (5-15/16...6-15/32)	154...167.5 (6-1/16...6-19/32)
4	44 (1-47/64) §	167.5...173.5 (6-19/32...6-27/32)	171...177 (6-47/64...6-31/32)
	52 (2-3/64)	169.5...183 (6-43/64...7-13/64)	173...186.5 (6-13/16...7-11/32)
	57 (2-1/4)	174.5...188 (6-7/8...7-13/32)	178...191.5 (7-1/64...7-35/64)
5	44 (1-47/64) §	191.5...197.5 (7-35/64...7-25/32)	195...201 (7-43/64...7-59/64)
	52 (2-3/64)	193.5...207 (7-5/8...8-5/32)	197...210.5 (7-49/64...8-19/64)
	57 (2-1/4)	198.5...212 (7-53/64...8-23/64)	202...215.5 (7-61/64...8-31/64)
6	44 (1-47/64) §	215.5...221.5 (8-31/64...8-23/32)	219...225 (8-5/8...8-55/64)
	52 (2-3/64)	217.5...231 (8-37/64...9-3/32)	221...234.5 (8-45/64...9-15/64)
	57 (2-1/4)	222.5...236 (8-49/64...9-19/64)	226...239.5 (8-29/32...9-7/16)

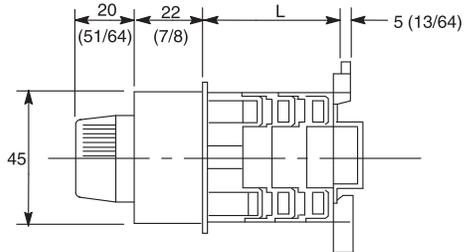
* When more than 4 modules are used, attach the first one to the switch body using the screws supplied with the extension (**Cat. No. 194L-G2853**).

‡ With DIN 46 277 (35) Rail + 2.5 mm (7/64)

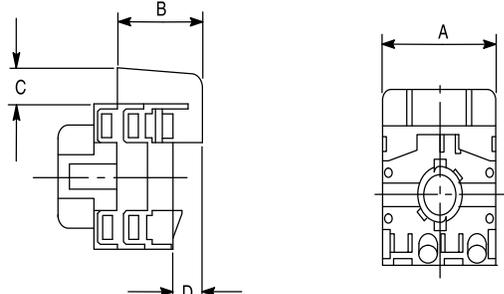
† For DIN Rail-mounted devices, remember to deduct the offset distance provided by the rail. For example, deduct 2.5 mm (7/64 in.) from the mounting depth for Bulletin 194L switch body mounted on DIN 46277 rail.

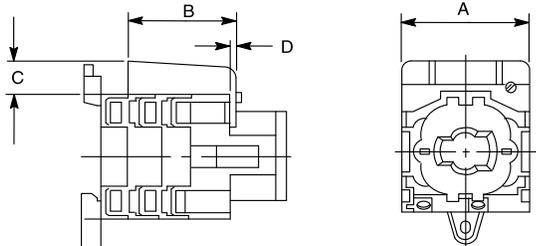
§ One 44 mm (1-47/64 in) end shaft is supplied with all Bulletin 194L Switch Bodies.

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

Cat. No. 194L-A... With Cat. No. 194L-HE4P-... Installation on DIN 46277 (35 mm) Rails + 2.5 mm (7/64 in.)	Cat. No.	L			
		No. of Contacts			
		1...2	3...4	5...6	7...8
	194L-A12/16...	35 (1-3/8)	45 (1-49/64)	55 (2-11/64)	65 (2-9/16)
	194L-A20/25...	33.5 (1-21/64)	48 (1-57/64)	60.5 (2-3/8)	73 (2-7/8)
	194L-A32/40...	43 (1-11/16)	61 (2-13/32)	79 (3-7/64)	97 (3-53/64)

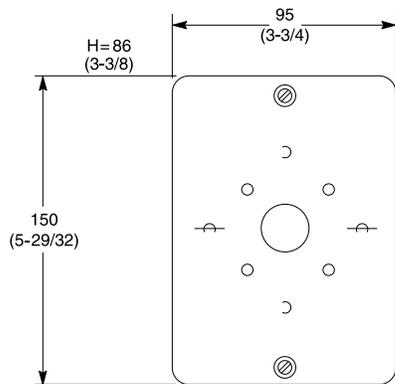
2

Cat. No. 194L-E... With Terminal Cover	Cat. No.	A	B	C	D
	194L-E12/16...	40 (1-37/64)	42.5 (1-43/64)	12 (15/32)	2.5 (7/64)
	194L-E20/25...	49 (1-15/16)	37.5 (1-31/64)	12 (15/32)	2.5 (7/64)
	194L-E32/40...	59 (2-21/64)	50 (1-31/32)	15 (19/32)	2.5 (7/64)

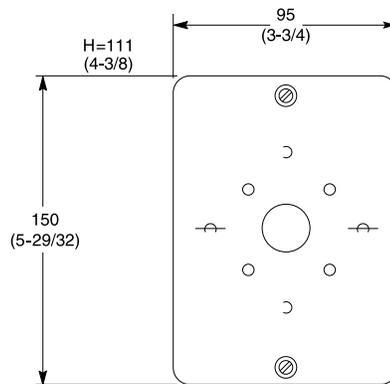
Cat. No. 194L-A... With Terminal Cover	Cat. No.	A	B	C	D
	194L-A12/16...	40 (1-37/64)	42.5 (1-43/64)	12 (15/32)	2.5 (7/64)
	194L-A20/25...	49 (1-15/16)	37.5 (1-31/64)	12 (15/32)	2.5 (7/64)
	194L-A32/40...	63.5 (2-1/2)	49 (1-53/64)	12 (15/32)	2 (5/64)

Enclosure

Cat. No. 194L-G3572...Cat. No. 194L-G3579



Cat. No. 194L-G3572/G3576
G3574/G3578



Cat. No. 194L-G3573/G3577
G3575/G3579



Bulletin 194R Next Generation Global Fused and Non-Fused Disconnects

- 20 A...63 A Sizes
- Fused switch versions:
 - BS88 - DIN
 - CSA HRCII-C - CSA HRCI-MISC
 - UL Class J - UL Class CC
 - NFC
- Non-fused switches
- Operating handle ingress ratings:
 - IP42 (Type 1)
 - IP66 (Type 3R, 3, 12, 4, 4X)
- Handle with or without test mode
- Padlockable handle for up to three padlocks
- Up to 6 auxiliary contacts can be added per switch
- Suitable as service entrance disconnecting means (UL 98)
- Suitable as at-motor disconnecting means (UL 508)

Certifications

UL Listed (File No. E 14841, Guide NLRV; File No. E 47426, Guide WHTY)
 CSA Certified (File No. LR1234)
 CE

Table of Contents

Product Selection —
 Open Switches this page
 NFPA 79 Operating
 Shaft/Handle Kits..... 2-461
 Specifications..... 2-463
 Proper Selection of
 Disconnect Switches 2-473
 Fuse Description 2-474

Standards Compliance

IEC 60947/EN60947-3
 BS EN60947-3
 VDE 0660
 CSA 22.2 No. 4
 NEMA KS-1
 UL 98
 UL 508

The Bulletin 194R line of fused and non-fused global disconnect switches provides the flexibility to meet worldwide applications. These rod-operated disconnect switches incorporate removable fuse carriers that have high short circuit protection ratings. The disconnect switches are UL Listed and CSA Certified and are designed to meet IEC 60947-3, VDE, DIN, BS and applicable NEMA requirements.

Product Selection — Open Switches

Catalog Number Explanation



Cat. No. 194R-J30-1753

194R - J 30 - 1753 S
 a b c d

a

Fuse Type	
Code	Description
C	UL Class CC, CSA Type HRCI-MISC (30 A)
J	UL Class J, CSA Type HRCI-J (30 A or 60 A)
H	CSA Type HRCII-C (30 A or 60 A)
B	BS88 (20 A, 32 A, or 63 A)
D	DIN (32 A or 63 A)
F	NFC (25 A, 32 A, or 63 A)
N	Non-fused (30 A or 60 A)

b

Load Size		
Code	Description	Dimensional Ref.
20	20 A (BS88)	A1
25	25 A (NFC)	A1
30	30 A (CC, J, HRCI-J)	A1
	30 A (non-fused) *	A2
	30 A (HRCII-C)	B1
32	32 A (BS88, NFC)	A1
	32 A (DIN)	B1
60	60 A (J, HRCI-J, HRCII-C)	B1
60	60 A (non-fused) *	B2
63	63 A (BS88, DIN, NFC)	B1

c

No. of Poles	
Code	Description
1753	3-pole switch

d

Fuse Indication	
Code	Configuration
Blank	No fuse status indication
S	Fuse status indication

* See page 2-469 for dimensional reference data.

* Non-fused disconnect switches must use separately installed fuses for upstream short-circuit protection

Fourth pole, additional auxiliary contacts and handle options available in accessory section.

Limit of 6 total auxiliary contact blocks total for test and standard positions.



UL/CSA Fused Disconnect Switches



Cat. No. 194R-J30-1753

2

Rated Current [A]	Maximum Hp Ratings *							Fuse	Dim. Ref.	Cat. No.
	1-Phase (60 Hz)		3-Phase (60 Hz)			DC				
	120V	240V	240V	480V	600V	125V	250V			
UL Class CC and CSA HRCI-MISC Fuses										
30	2	3	7.5	15	20	3	5	30 A CC, HRCI-Misc	A1	194R-C30-1753
UL Class J and CSA HRCI-J Fuses										
30	2	3	7.5	15	20	3	5	30 A Class J, HRCI-J	A1	194R-J30-1753
60	3	10	15	30	50	5	10	60 A Class J, HRCI-J	B1	194R-J60-1753
CSA HRCII-C Fuses										
30	2	3	7.5	15	20	3	5	30A HRCII-C	B1	194R-H30-1753
60	3	10	15	30	50	5	10	60A HRCII-C	B1	194R-H60-1753

* Time delay fuses may be required to utilize the disconnect switch at its maximum horsepower rating.

Non-Fused Disconnect Switches



Cat. No. 194R-N30-1753

Non-Fused										
Fuse Description	Rated Current*	Maximum Hp Ratings							Dim. Ref.	Cat. No.
		1-Phase (60 Hz)		3-Phase (60 Hz)			DC			
		120V	240V	240V	480V	600V	125V	250V		
Non-fused disconnect switches must use separately installed fuses for upstream short circuit protection.	30	2	3	7.5	15	20	3	5	A2	194R-N30-1753
	60	3	10	15	30	40	5	10	B2	194R-N60-1753

* 30 A UL-rated device has I_{the} of 40 A per IEC. 60 A UL-rated device has I_{the} of 80 A per IEC.

IEC Fused Disconnect Switches



Cat. No. 194R-F32-1753

Cat. No. 194R-F63-1753

BS88 Fused Disconnect Switches

Load Rating I_e [A]	Ratings (AC23)			Fuse	Dim. Ref.	Cat. No.
	With Fuse Links					
	3-Phase Maximum kW (50 Hz)					
	200/230V	380/400/415V	660/690V			
20	5.5	11	15	BS88 A1	A1	194R-B20-1753
32	9	18.5	30	BS88 A2	A1	194R-B32-1753
63	18.5	30	55	BS88 A3	B1	194R-B63-1753

DIN Fused Disconnect Switches

Load Rating I_e [A]	Ratings (AC23)			Fuse	Dim. Ref.	Cat. No.
	With Fuse Links					
	3-Phase Maximum kW (50 Hz)					
	200/230V	380/400/415V	660/690V			
32	9	18.5	30	NH 000	B1	194R-D32-1753
63	18.5	30	55	NH 000	B1	194R-D63-1753

NFC Fused Disconnect Switches

Load Rating I_e [A]	Ratings (AC23)			Fuse	Dim. Ref.	Cat. No.
	With Fuse Links					
	3-Phase Maximum kW (50 Hz)					
	200/230V	380/400/415V	660/690V			
25	7.5	11	22	NFC 14x51 mm	A1	194R-F25-1753
32	9	18.5	30	NFC 14x51 mm	A1	194R-F32-1753
63	18.5	30	55	NFC 22x58 mm	B1	194R-F63-1753



Accessories

4th Pole Modules

Rated Current [A]	Maximum Hp Ratings*							Fuse	Dim. Ref.	Cat. No.§
	1-Phase (60 Hz)		3-Phase (60 Hz)			DC				
	120V	240V	240V	480V	600V	125V	250V			
Non-Fused										
30*	2	3	7.5	15	20	3	5	—	A2	194R-30-NN
60‡	3	10	15	30	40	5	10	—	B2	194R-60-NN
UL Class CC and CSA HRCI-MISC Fuses										
30	2	3	7.5	15	20	3	5	30 A CC, HRCI-Misc	A1	194R-30-NC
UL Class J and CSA HRCI-J Fuses										
30	2	3	7.5	15	20	3	5	30 A J, HRCI-J	A1	194R-30-NJ
60	3	10	15	30	50	5	10	60 A J, HRCI-J	B1	194R-60-NJ
CSA HRCII-C Fuses										
30	2	3	7.5	15	20	—	—	30A HRCII-C	B1	194R-30-NH
60	3	10	15	30	50	—	—	60A HRCII-C	B1	194R-60-NH

* Time delay fuses may be required to utilize the disconnect at its maximum horsepower rating.

* 30 A UL, 40 A IEC

‡ 60 A UL, 80 A IEC

BS88 Fuses

Load Rating I _e [A]	Ratings (AC23)			Fuse	Dim. Ref.	Cat. No.§
	With Fuse Links					
	3-Phase Maximum kW (50 Hz)					
	200/230V	380/400/415V	660/690V			
20	5.5	11	15	BS88 A1	A1	194R-20-NB
32	9	18.5	30	BS88 A2	A1	194R-32-NB
63	18.5	30	55	BS88 A3	B1	194R-63-NB

DIN Fuses

Load Rating I _e [A]	Ratings (AC23)			Fuse	Dim. Ref.	Cat. No.
	With Fuse Links					
	3-Phase Maximum kW (50 Hz)					
	200/230V	380/400/415V	660/690V			
32	9	18.5	30	NH 000	B1	194R-32-ND
63	18.5	30	55	NH 000	B1	194R-63-ND

NFC Fuses

Load Rating I _e [A]	Ratings (AC23)			Fuse	Dim. Ref.	Cat. No.
	With Fuse Links					
	3-Phase Maximum kW (50 Hz)					
	200/230V	380/400/415V	660/690V			
25	7.5	11	22	NFC 14 x 51 mm	A1	194R-25-NF
32	9	18.5	30	NFC 14 x 51 mm	A1	194R-32-NF
63	18.5	30	55	NFC 22 x 58 mm	B1	194R-63-NF

§ For fuse status indication add **S** to catalog number, example: 194R-30-NN becomes 194R-30-NNS.

IEC Fused and Non-Fused Disconnects, 30 & 60 A

Product Selection

Operating Handles (Accepts 3 Padlocks)

	For Use With	Description	Color	Degree of Protection		Cat. No.
				(Type 3R, 3, 12, 4, 4X) IP66	(Type 1) IP42	
	A1, A2, B1, B2	Test mode handle with defeater	Black	(Type 3R, 3, 12, 4, 4X) IP66	194R-HST4	
			Red/Yellow	(Type 3R, 3, 12, 4, 4X) IP66	194R-HST4E	
	A1, A2, B1, B2	Standard handle with defeater	Black	(Type 3R, 3, 12, 4, 4X) IP66	194R-HS1	
			Red/Yellow	(Type 3R, 3, 12, 4, 4X) IP66	194R-HS1E	
Standard handle without defeater		Black	(Type 3R, 3, 12, 4, 4X) IP66	194R-HS1-N2		
		Red/Yellow	(Type 3R, 3, 12, 4, 4X) IP66	194R-HS1E-N2		

2

OSHA Lockout/Tag Out Compliance (LOTO)

OSHA CFR36 Section 1910 mandates that disconnects be able to be locked out while in the OFF position during servicing. All Bulletin 194R handles comply with this important safety requirement.



(Please see NFPA Article 430 for disconnect requirements of motor applications)

Operating Shafts

	Disconnect Switch Dim. Ref.	Operating Shaft Type	Operating Shaft Length Approx. Dim. [mm (in.)]	Enclosure Working Depth			Cat. No.
				Disconnect Switch Dim. Ref.	Minimum Approx. Dim. [mm (in.)]	Maximum Approx. Dim. [mm (in.)]	
	A1, A2, B1, B2	Standard Length	263 (10.3)	A1, B1	148 (5.8)	260 (10.2)	194R-R1
				A2, B2	111 (4.4)	260 (10.2)	
		Extended Length	457 (18.0)	A1, B1	148 (5.8)	454 (17.8)	194R-R2
				A2, B2	111 (4.4)	454 (17.8)	

Complete UL/CSA Disconnect Switch Kits

Includes disconnect switch, operating handle with defeater mechanism and operating shaft, NFPA handle, auxiliary contacts, and padlock attachment.

Product Selection — Kits

Catalog Number Explanation



Switch body



Operating handle



NFPA Handle and shaft

194R – J 30 – 1753 S§ – TY N1
 a b c d e f

a

Fuse Type	
Code	Description
C	UL Class CC, CSA Type HRCI-MISC (30 A)
J	UL Class J, CSA Type HRCI-J (30 A or 60 A)
H	CSA Type HRCII-C (30 A or 60 A)
B	BS88 (20 A, 32 A, or 63 A)
D	DIN (32 A or 63 A)
F	NFC (25 A, 32 A, or 63 A)
N	Non-fused (30 A or 60 A)

c

No. of Poles	
Code	Description
1753	3-pole switch

d

Fuse Indication Configuration	
Code	Description
Blank	No fuse status indication
S§	Fuse status indication

§ Class C and J fuses only

f

Shaft & NFPA79 Handle	
Code	Description
R1	Cat. No. 194-R1 shaft (12 in.)
R2	Cat. No. 194-R2 shaft (21 in.)
N1	Cat. No. 194-NHR1 NFPA79 handle with 12 in. shaft and guard tube
N2	Cat. No. 194-NHR2 NFPA79 handle with 21 in. shaft and guard tube

b

Load Size		
Code	Description	Dimensional Ref.*
20	20 A (BS88)	A1
25	25 A (NFC)	A1
30	30 A (CC, J, HRCI-J)	A1
	30 A (Non-Fused) †	A2
	30 A (HRCII-C)	B1
32	32 A (BS88, NFC)	A1
	32 A (DIN)	B1
60	60 A (J, HRCI-J, HRCII-C)	B1
	60 A (Non-Fused) †	B2
63	63 A (BS88, DIN, NFC)	B1

e

External Handle	
Code	Description
PY	Std/pistol red/yellow handle, 4/4X, IP66 (Cat. No. 194R-HS4E)
PB	Std/pistol black handle, 4/4X, IP66 (Cat. No. 194R-HS4)
TY	Test mode red/yellow handle, 4/4X, IP66 (Cat. No. 194R-HST4E)
TB	Test mode black handle, 4/4X, IP66 (Cat. No. 194R-HST4)
LY	Extended length red/yellow handle, 4/4X, IP66 (Cat. No. 194R-HS4EL)
LB	Extended length black handle, 4/4X, IP66 (Cat. No. 194R-HS4L)

* See page 2-469 for dimensional reference data.

† Non-fused disconnect switches must use separately installed fuses for upstream short-circuit protection

IEC Fused and Non-Fused Disconnects, 30 & 60 A

Catalog Number Explanation

UL Enclosed Disconnect Switches (Fused and Non-Fused)

Catalog Number Explanation



194R - C J 30 - 1753 S§ - TB - P

a
b
c
d
e
f
g

a

Enclosure Type	
Code	Description
K	Thermoplastic, Type 4/4X
F	Painted metal, Type 3/4/12
C	Stainless steel, Type 4/4X

d

No. of Poles	
Code	Description
1753	3-pole switch

f

External Handle	
Code	Description
PY	Std/pistol red/yellow handle, 4/4X, IP66 (Cat. No. 194R-HS4E)
PB	Std/pistol black handle, 4/4X, IP66 (Cat. No. 194R-HS4)
TY	Test mode red/yellow handle, 4/4X, IP66 (Cat. No. 194R-HST4E)
TB	Test mode black handle, 4/4X, IP66 (Cat. No. 194R-HST4)
LY	Extended length red/yellow handle, 4/4X, IP66 (Cat. No. 194R-HS4EL)
LB	Extended length black handle, 4/4X, IP66 (Cat. No. 194R-HS4L)

b

Fuse Type	
Code	Description
C	UL Class CC, CSA Type HRCI-MISC (30 A)
J	UL Class J, CSA Type HRCI-J (30 A or 60 A)
H	CSA Type HRCII-C (30 A or 60 A)
B	BS88 (20 A, 32 A, or 63 A)
D	DIN (32 A or 63 A)
F	NFC (25 A, 32 A, or 63 A)
N	Non-fused (30 A or 60 A)

e

Fuse Indication	
Code	Configuration
Blank	No fuse status indication
S	Fuse status indication

§ Class C and J fuses only

g

Other Accessories	
Code	Configuration
Blank	No accessory
P	Padlock attachment

c

Load Size		
Code	Description	Dimensional Ref.
20	20 A (BS88)	A1
25	25 A (NFC)	A1
30	30 A (CC, J, HRCI-J)	A1
	30 A (Non-Fused) *	A2
	30 A (HRCII-C)	B1
32	32 A (BS88, NFC)	A1
	32 A (DIN)	B1
60	60 A (J, HRCI-J, HRCII-C)	B1
	60 A (Non-Fused) *	B2
63	63 A (BS88, DIN, NFC)	B1

* See page 2-469 for dimensional reference data.

* Non-fused disconnect switches must use separately installed fuses for upstream short-circuit protection



NFPA 79 Operating Shaft/Handle Kits

An internal handle that permits operation of the disconnect switch when the panel door is open, in compliance with NFPA 79.

	Description	Shaft Length [mm (in.)]	Disconnect Switch Dim Ref.	Pkg. Qty.	Cat. No.
	NFPA 79 Handle Kit Includes NFPA 79 handle, operating shaft, and Cat. No. 194R-PLA1 padlocking attachment	305 (12)	A1, A2, B1, B2	1	194R-NHR1
		533 (21)	A1, A2, B1, B2	1	194R-NHR2

Other Accessories

	Description	Disconnect Switch Dim Ref.	Pkg. Qty.	Cat. No.
	Operating Shaft Guide — Allows easier coupling of shaft to operating handle if misalignment occurs between switch and enclosure after assembly installation	A1, A2, B1, B2	1	194R-HSG1
	Shaft Guard — Provides extra protection against contact with shaft	A1, A2, B1, B2	1	194R-R1G
	Operating Shaft Coupler — Used with Cat. Nos. 194R-R1 and 194R-R2 shafts to extend shaft length an additional 4.75 in.	A1, A2, B1, B2	1	194R-SC1
	Operating Handle Instruction Label — Describes the function of the operating handle for opening the enclosure door with the disconnect switch in the ON and OFF position	ALL	10	194R-L1

Replacement Mounting Hardware

	Pkg. Qty.	Description	For Use With	Cat. No.
	2	(1) M4 x .7 set screw, (1) shaft clip and (2) M4 x .7 mounting screws	A1, A2	194R-30-HDWR
	4	(1) M4 x .7 set screw, (1) shaft clip and (4) M4 x .7 mounting screws	B1, B2	194R-60-HDWR

Replacement Fuse Hardware

Description	For Use With	Pkg. Qty.	Cat. No.
M4 x .7 Fuse screws	194R BS88 Fuse Types	2	194R-BS88-M4
M5 x .6 Fuse screws	194R BS88 Fuse Types	2	194R-BS88-M5

Terminal Shields

	Description	Disconnect Switch Dim Ref.	Quantity Required Per Disconnect Switch	Pkg. Qty.	Cat. No.
	30 A Terminal Shield (three terminals)	A1, A2	2	2	194R-30-C3
	60 A Terminal Shield (three terminal)	B1, B2	2	2	194R-60-C3
	30 A Terminal Shield (one terminal)	A1, A2	2	2	194R-30-C1
	60 A Terminal Shield (one terminal)	B1, B2	2	2	194R-60-C1

* For use on either line or load side of disconnect switch.

Disconnect Switch Padlock Accessory

	Disconnect Switch Dim Ref.	Pkg. Qty.	Cat. No.†
	A1, A2, B1, B2	1	194R-PLA1

† For padlock with ø 3...6 mm

Replacement Fuse Carriers

	Description	Pkg. Quantity	Cat. No.*
 <p>194R-J30-FC</p> <p>194R-J30-FCS</p>	30 A CC Fuse Carrier	1	194R-C30-FC
	30 A J Fuse Carrier	1	194R-J30-FC
	60 A J Fuse Carrier	1	194R-J60-FC
	20 A BS88 Fuse Carrier	1	194R-B20-FC
	32 A BS88 Fuse Carrier	1	194R-B32-FC
	63 A BS88 Fuse Carrier	1	194R-B63-FC
	30 A CSA HRCII-C Fuse Carrier	1	194R-H30-FC
	60 A CSA HRCII-C Fuse Carrier	1	194R-H60-FC
	32 A DIN Fuse Carrier	1	194R-D32-FC
	63 A DIN Fuse Carrier	1	194R-D63-FC
	25 A NFC Fuse Carrier	1	194R-F25-FC
	32 A NFC Fuse Carrier	1	194R-F32-FC
	63 A NFC Fuse Carrier	1	194R-F63-FC
	30 A Non-Fuse Carrier	1	194R-N30-FC
	60 A Non-Fuse Carrier	1	194R-N60-FC

* For fuse status indication add **S** to catalog number, example: 194R-J30-FC becomes 194R-J30-FCS.

Auxiliary Contact Blocks*

	Description	Contact Material	Pkg. Quantity	Cat. No.
 <p>Cat. No. 800F-X10</p>	Contact Block Note: Sold only in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces. Latch not included.	N.O.	10	800F-X10
		N.C.		800F-X01
		N.O.E.M.		800F-X10E
		N.C.L.B.		800F-X01L
		N.O. with stab terminals		800F-X10T
		N.C. with stab terminals		800F-X01T
		N.O. spring-clamp		800F-Q10
		N.C. spring-clamp		800F-Q01

* Also used for test mode function.

Multi-tap Lugs

	Description	Wire Size	Dimension Reference	Pkg. Quantity	Cat. No.
	Multi-Tap Terminal Lugs Load side only	(3) 14...4 AWG (3) 0.75...25 mm ²	A1 (194R-J30), A2 (194R-N30)	3	194R-30-MTL3
		(3) 14...4 AWG (3) 0.75...25 mm ²	B1 (194R-JG0), B2 (194R-NG0)	3	194R-60-MTL3

Fused Disconnect Switches For UL Class Fuses and CSA HRCI-J

2

Electrical Ratings							
Cat. No.		194R-C30-1753		194R-J30-1753		194R-J60-1753	
CSA Fuse Type/UL Fuse Type		Class CC/HRCI-MISC *		Class J/HRCI-J		Class J/HRCI-J	
Maximum Fuse Cartridge Size	[A]	30		30		60	
Maximum Voltage	AC	600		600		600	
	DC	250		250		250	
Ampere Rating	[A]	30		30		60	
Maximum Short Circuit Prospective Fault Current	[kA]	200		200		200	
Fuse Operating Characteristics		Time Delay	Non-Time Delay	Time Delay	Non-Time Delay	Time Delay	Non-Time Delay
Maximum Hp, 3-Phase AC							
200V, 60 Hz	[Hp]	5	3	7.5	3	15	7.5
240V, 60 Hz	[Hp]	5	3	7.5	3	15	7.5
480V, 60 Hz	[Hp]	10	5	15	5	30	15
600V, 60 Hz	[Hp]	10	7.5	20	7.5	50	15
Maximum Hp, 1-Phase AC							
120V, 60 Hz	[Hp]	0.75	0.5	2	0.5	3	1.5
240V, 60 Hz	[Hp]	2	1.5	3	1.5	10	3
Maximum Hp, DC							
125V DC	[Hp]	2	3	3	2	5	5
250V DC	[Hp]	3	5	5	5	10	10

Mechanical Data					
Cat. No.		194R-C30-1753, 194R-J30-1753		194R-J60-1753	
Degree of Protection (per IEC 60947-3)					
Switch Only		IP20		IP20	
Switch with Terminal Shield & Fuse Carriers		IP20		IP20	
Mechanical Endurance ‡	Operations	10 000		10 000	
Operating Torque (Maximum)	N•m	3.5		3.5	
	lb•in	35		35	
Terminal Capacity	mm ²	2.5...10		2.5...25	
	AWG	#14...#8		#14...#4	
Auxiliary Contact Terminals	mm ²	2.5...4		2.5...4	
	AWG	#14...#12		#14...#12	
Maximum Number of Auxiliary Circuits		6		6	
Approximate Weight	kg	0.92		1.32	
	lbs	2.03		2.9	
Minimum Enclosure Size Approximate dimensions in millimeters (inches)	Height	248 (9-3/4)		248 (9-3/4)	
	Width	171 (6-3/4)		197 (7-3/4)	
	Depth	148 (5-13/16)		148 (5-13/16)	
Switch Dimension Reference (See dimension drawings.)		A1		B1	

* CSA HRCI-MISC fuses must also be UL Listed as Class CC fuses.

‡ Based on Rockwell Automation tests in accordance with the requirements as defined in CSA C22.2 No. 4, IEC 60947-3 and UL 98.

IEC Fused and Non-Fused Disconnects, 30 & 60 A Specifications

Non-Fused Disconnect Switches For CSA and UL Class Applications§

2

Cat. No.		Electrical Ratings			
		194R-N30-1753		194R-N60-1753	
Maximum Fuse Cartridge Size		30*		60*	
Maximum Voltage	AC [V]	600		600	
	DC [V]	250		250	
Ampere Rating		30		60	
Maximum Short Circuit Prospective Fault Current		200		200	
Fuse Operating Characteristics		Time Delay	Non-Time Delay	Time Delay	Non-Time Delay
Maximum Hp, 3-Phase AC	200V, 60 Hz [Hp]	7.5	3	15	7.5
	240V, 60 Hz [Hp]	7.5	3	15	7.5
	480V, 60 Hz [Hp]	15	5	30	15
	600V, 60 Hz [Hp]	20	7.5	50	15
Maximum Hp, 1-Phase AC	120V, 60 Hz [Hp]	2	0.5	3	1.5
	240V, 60 Hz [Hp]	3	1.5	10	3
Maximum Hp, DC	125V DC [Hp]	3	2	5	5
	250V DC [Hp]	5	5	10	10
Power Lost		2		6	

§ Non-fused disconnect switches must be used with separately installed fuses.

* When using CSA HRCI-J, HRCI-MISC (also UL Listed as Class CC) or HRCI-T fuses, and UL Class J, CC or T fuses.

> Based on Rockwell Automation tests in accordance with the requirements as defined in CSA C22.2 No. 4, IEC 60947-3, UL 1087 and UL 98.

Cat. No.		Mechanical Data	
		194R-N30-1753	194R-N60-1753
Degree of Protection (per IEC 60947-3)		IP20	
Switch Only		IP20	
Switch with Terminal Shield & Fuse Carriers		IP20	
Mechanical Endurance † Operations		10 000	
Operating Torque (Maximum)	N•m	3.5	
	lb•in	35	
Terminal Capacity	mm ²	2.5...10	
	AWG	#14...#8	
Auxiliary Contact Terminals	mm ²	2.5...10	
	AWG	#14...#8	
Maximum Number of Auxiliary Circuits		6	
Approximate Weight	kg	0.81	
	lbs	1.78	
Minimum Enclosure Size	Height	248 (9-3/4)	
	Width	171 (6-3/4)	
	Depth	111 (4-3/8)	
Switch Dimension Reference (See dimension drawings)		A2	
		B2	

† Non-fused disconnect switches must be used with separately installed fuses.

All Bulletin 194R Disconnect Switch Cat. Nos., 20...63 A Range

Environmental Data	
Ambient Temperature	
Open°C (°F)	-2...+55 (-4...+131)
Enclosed°C (°F)	-20...+40 (-4...+104)
Storage°C (°F)	-40...+65 (-40...+149)
Altitude (per IEC 60947-1)	
2,000	
Relative Humidity (per IEC 60947-1)	
90% @ +20 °C (+68 °F)	
50% @ +40 °C (+104 °F)	



Fused Disconnect Switches For CSA HRCII-C Fuses

Cat. No.			Electrical Ratings	
			194R-H30-1753	194R-H60-1753
CSA Fuse Type			HRCII-C	
Maximum Fuse Cartridge Size	[A]		30	60
Maximum Voltage	AC [V]		600	600
Ampere Rating	[A]		30	60
Maximum Short Circuit Prospective Fault Current	[kA]		200	200
Maximum Hp, 3-Phase AC				
	200V, 60 Hz [Hp]		7.5	15
	240V, 60 Hz [Hp]		7.5	15
	480V, 60 Hz [Hp]		15	30
	600V, 60 Hz [Hp]		20	50
Maximum Hp, 1-Phase AC				
	120V, 60 Hz [Hp]		2	3
	240V, 60 Hz [Hp]		3	10

Cat. No.			Mechanical Data	
			194R-H30-1753	194R-H60-1753
Degree of Protection (per IEC 60947-3)				
Switch Only			IP 20	IP 20
Switch with Terminal Shield & Fuse Carriers			IP 20	IP 20
Mechanical Endurance*	Operations		10 000	10 000
Operating Torque (Maximum)	N•m		3.5	3.5
	lb•in		35	35
Terminal Capacity				
Power Terminals	mm ²		2.5...10	2.5...25
	AWG		#14...#8	#14...#4
Auxiliary Contact Terminals	mm ²		2.5...4	2.5...4
	AWG		#14...#12	#14...#12
Maximum Number of Auxiliary Circuits			6	6
Approximate Weight	kg		1.18	1.18
	lbs		2.60	2.60
Minimum Enclosure Size				
Approximate dimensions in millimeters (inches)			248 (9-3/4)	248 (9-3/4)
Width			171 (6-3/4)	197 (7-3/4)
Depth			148 (5-13/16)	148 (5-13/16)
Switch Dimension Reference (See dimension drawings.)			B1	B1

* Based on Rockwell Automation tests in accordance with the requirements as defined in CSA C22.2 No. 4 and IEC 60947-3.



Fused Disconnect Switches For BS88 Fuses

Note: Table continued on pages 2-484...2-488.

		Electrical Ratings				
Cat. No.		194R-B20-1753		194R-B32-1753	194R-B63-1753	
Fuse Type	BS88 Dimension	A1		A2	A2, A3	
Rated Insulation Voltage (U _i)	[V]	1000		1000	1000	
Rated Conditional Short-Circuit Current (r.m.s.) at 415V	[kA]	100		100	100	
Rated Operational Current AC-22A (I _o)		Fuse Links	Shorting Links	Fuse Links	Fuse Links	Shorting Links
200/230V 50 Hz	[A]	20	32	32	63	63
380/400/415V 50 Hz	[A]	20	32	32	63	63
500V 50 Hz	[A]	20	32	32	63	63
660/690V 50 Hz	[A]	20	32	32	63	63
Rated Operational Current AC-23A (I _o)						
200/230V 50 Hz	[A]	20	32	31	60.5	60
380/400/415V 50 Hz	[A]	22	32	35	57	57
500V 50 Hz	[A]	20	32	32.5	57	57
660/690V 50 Hz	[A]	17	32	32.5	57	57
Rated Thermal Current (I _{the})	[A]	20	32	32	63	63
Maximum kW, AC-23A 3-Phase						
200/230V 50 Hz	[kW]	5.5	9	9	18.5	18.5
380/400/415V 50 Hz	[kW]	11	18.5	18.5	30	30
500V 50 Hz	[kW]	11	18.5	18.5	30	30
660/690V 50 Hz	[kW]	15	30	30	55	55
Maximum Fuse Rating	[A]	20	—	32	63	—
Maximum Motor Circuit Fuse Link		20M32	—	32M63	63M100	—
Maximum Fuse Cut-off Current*	[kA]	7.5	7.5	7.5	10	10
Rated Short Time Current, 1 Second	[kA]	1		1	1	

		Mechanical Data				
Cat. No.		194R-B20-1753		194R-B32-1753	194R-B63-1753	
Degree of Protection (per IEC 60947-3)						
Switch Only		IP20		IP20	IP20	
Switch with Terminal Shield & Fuse Carriers		IP20		IP20	IP20	
Mechanical Endurance Operations ‡		10 000		10 000	10 000	
Operating Torque (Maximum)	N•m lb•in	3.5 35		3.5 35	3.5 35	
Terminal Capacity						
Power Terminals	mm ²	2.5...10 #14...#8		2.5...10 #14...#8	2.5...25 #14...#4	
Auxiliary Contact Terminals	mm ² AWG	2.5...4 #14...#12		2.5...4 #14...#12	2.5...4 #14...#12	
Maximum Number of Auxiliary Circuits		6		6	6	
Approximate Weight	kg lbs	0.83 1.84		0.83 1.84	1.18 2.60	
Minimum Enclosure Size						
Approximate dimensions in millimeters (inches)	Height Width Depth	248 (9-3/4) 171 (6-3/4) 148 (5-13/16)		248 (9-3/4) 171 (6-3/4) 148 (5-13/16)	248 (9-3/4) 197 (7-3/4) 148 (5-13/16)	
Switch Dimension Reference		A1		A1	B1	
(See dimension drawings.)						

* Fuses must be selected with regard to the maximum prospective fault current of the system and the maximum cut-off current of the fuse when subjected to that maximum fault current. The maximum fuse cut-off current as specified for each disconnect switch must not be exceeded.

‡ Based on Rockwell Automation tests in accordance with the requirements as defined in IEC 60947-3.

Fused Disconnect Switches For DIN Fuses

Cat No.		Electrical Ratings	
		194R-D32-1753	194R-D63-1753
Fuse Type	DIN Dimension	00	0, 00
Rated Insulation Voltage (U _i)	[V]	1000	1000
Rated Conditional Short-Circuit Current (r.m.s.) at 415V	[kA]	100	100
Rated Operational Current AC-22A (I _e)		Fuse Links	Fuse Links
200/230V 50 Hz	[A]	32	63
380/400/415V 50 Hz	[A]	32	63
500V 50 Hz	[A]	32	63
660/690V 50 Hz	[A]	32	63
Rated Operational Current AC-23A (I _e)			
200/230V 50 Hz	[A]	31	60.5
380/400/415V 50 Hz	[A]	35	57
500V 50 Hz	[A]	32.5	57
660/690V 50 Hz	[A]	32.5	57
Rated Thermal Current (I _{the})	[A]	40	63
Maximum kW, AC-23A 3-Phase			
200/230V 50 Hz	[kW]	9	18.5
380/400/415V 50 Hz	[kW]	18.5	30
500V 50 Hz	[kW]	18.5	30
660/690V 50 Hz	[kW]	30	55
Maximum Fuse Rating	[A]	32	63
Maximum Motor Circuit Fuse Link		—	—
Maximum Fuse Cut-off Current*	[kA]	14	20
Rated Short Time Current, 1 Second	[kA]	1	1

Cat. No.		Mechanical Data	
		194R-D32-1753	194R-D63-1753
Degree of Protection (per IEC 60947-3)			
Switch Only		IP20	IP20
Switch with Terminal Shield & Fuse Carriers		IP20	IP20
Mechanical Endurance*	Operations	10 000	8 000
Operating Torque (Maximum)	N•m lb•in	3.5 35	3.5 35
Terminal Capacity			
Power Terminals	mm ² AWG	2.5...25 #14...#4	2.5...25 #14...#4
Auxiliary Contact Terminals	mm ² AWG	2.5...4 #14...#12	2.5...4 #14...#12
Maximum Number of Auxiliary Circuits		6	6
Approximate Weight	kg lbs	1.18 2.60	1.18 2.60
Minimum Enclosure Size	Height	248 (9-3/4)	248 (9-3/4)
Approximate dimensions in millimeters (inches)	Width	197 (7-3/4)	197 (7-3/4)
	Depth	148 (5-13/16)	148 (5-13/16)
Switch Dimension Reference (See dimension drawings.)		B1	B1

* Fuses must be selected with regard to the maximum prospective fault current of the system and the maximum cut-off current of the fuse when subjected to that maximum fault current. The maximum fuse cut-off current as specified for each disconnect switch must not be exceeded.

* Based on Rockwell Automation tests in accordance with the requirements as defined in IEC 60947-3.

2

UL LISTED, CSA CERTIFIED	DIMENSION REFERENCE	CIRCUIT
Cat. No.		
194R-C30-1753	A1	
194R-J30-1753	A1	
194R-J60-1753	B1	
194R-H30-1753	B1	
194R-H60-1753	B1	
194R-N30-1753	A2	
194R-N60-1753	B2	

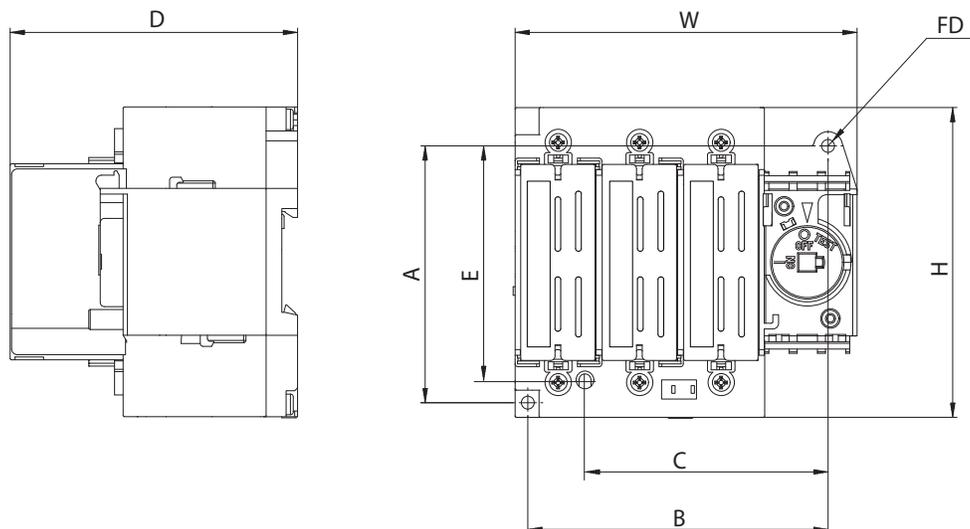
IEC SWITCHES	DIMENSION REFERENCE	CIRCUIT
Cat. No.		
194R-B20-1753	A1	
194R-B32-1753	A1	
194R-B63-1753	B1	
194R-D32-1753	B1	
194R-D63-1753	B1	
194R-F25-1753	A1	
194R-F32-1753	A1	
194R-F63-1753	B1	
194R-★-1754	(See 3-pole Dimension Reference) for Fused Switches	

IEC Fused and Non-Fused Disconnects, 30 & 60 A

Approximate Dimensions

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

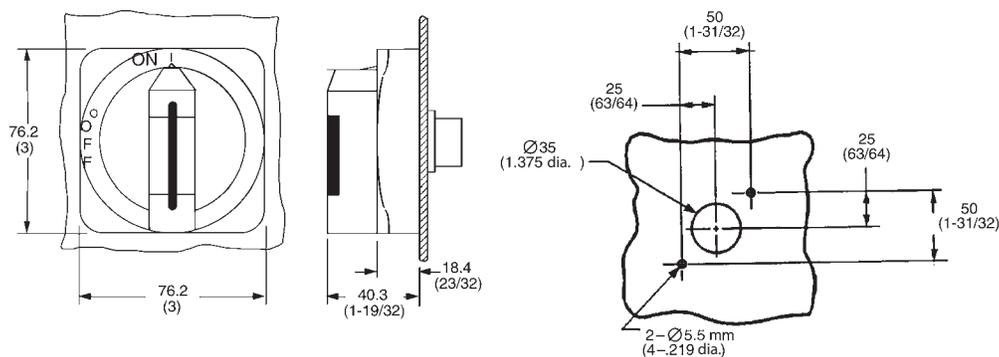
Disconnect Switch Dimension References A1, A2, B1, and B2 (30 A and 60 A)



Disconnect Switch Dimension Reference	Approximate Dimensions mm (in)							
	H	W	D	A	B	C*	E*	FD
A1	108 (4-1/4)	120 (4-3/4)	101 (4)	90 (3-9/16)	105 (4-1/8)	85 (3-11/32)	82 (3-15/64)	2-M4, 2-#8
A2	108 (4-1/4)	120 (4-3/4)	80 (3-1/8)	90 (3-9/16)	105 (4-1/8)	85 (3-11/32)	82 (3-15/64)	2-M4, 2-#8
B1	113 (4-29/64)	142 (5-19/32)	114 (4-31/64)	100 (3-15/16)	120 (4-23/32)	N/A	N/A	4-M4, 4-#8
B2	113 (4-29/64)	142 (5-19/32)	93 (3-43/64)	100 (3-15/16)	120 (4-23/32)	N/A	N/A	4-M4, 4-#8

* Mounting holes for backward compatibility with Bulletin 194R legacy switches.

Operating Handles — Cat. No. 194R-HS.../HST



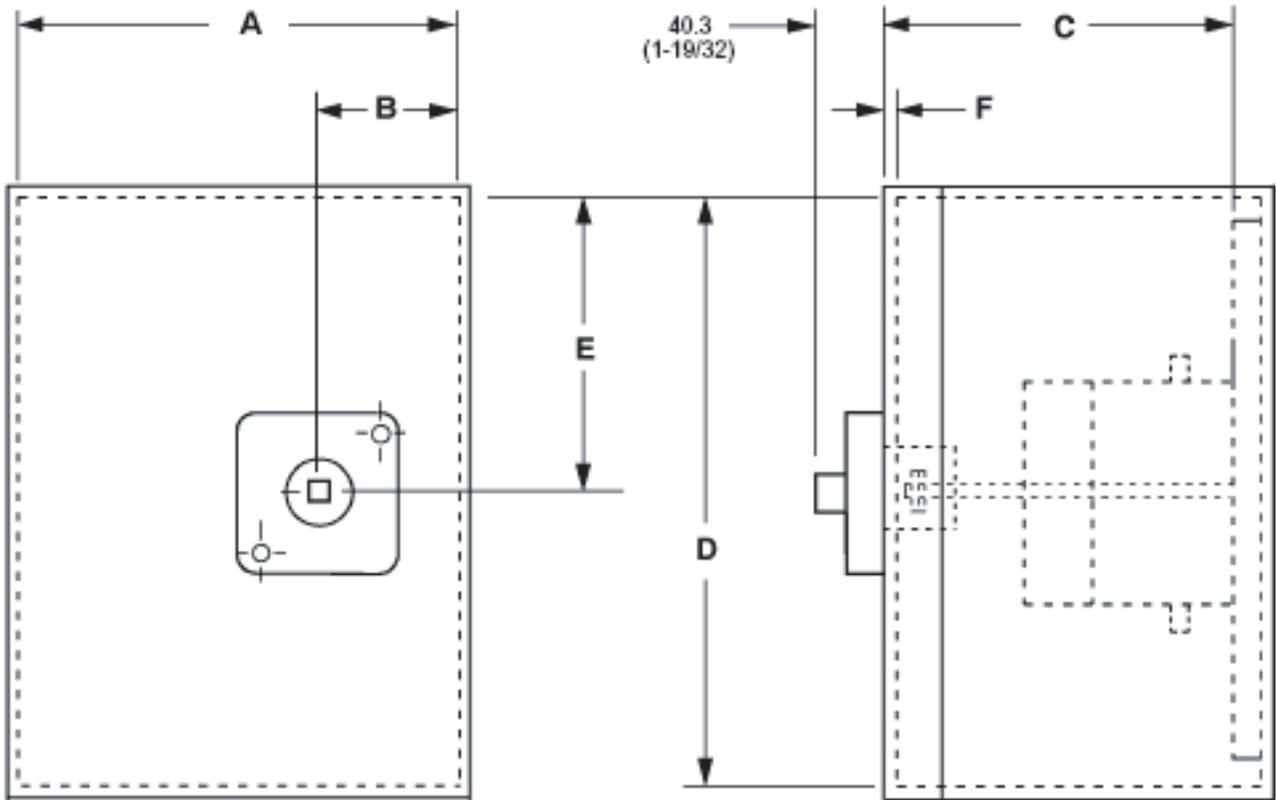
IEC Fused and Non-Fused Disconnects, 30 & 60 A

Approximate Dimensions

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

Disconnect Switch Dim. Ref.: A1, A2, B1, B2 (30 A and 60 A) Enclosure and Operating Handle

2



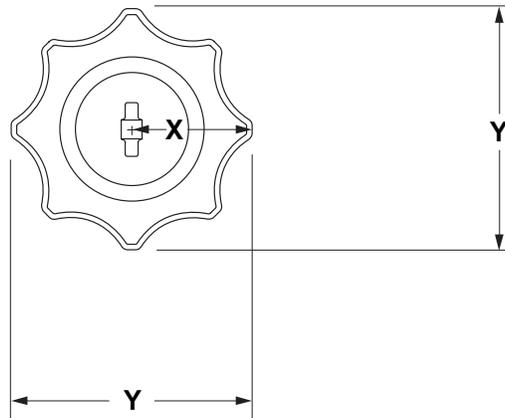
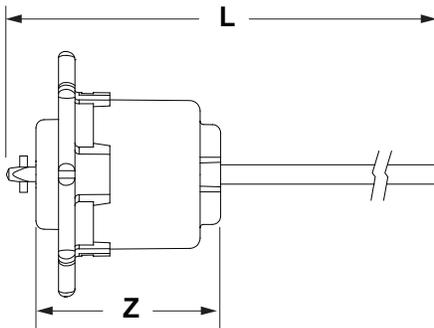
Enclosure Installation Dimensions

Cat. No.	Dimension Reference	A	B	C		D	E	F	
		Maximum	Minimum	Minimum	Maximum	Minimum	Minimum	Minimum	Maximum
194R-B20-1753	A1	171 (6-3/4)	45 (1-49/64)	147.6 (5-13/16)	454 (17-7/8)	248 (9-3/4)	89 (3-1/2)	1.4 (1/16)	4/78 (3/16)
194R-B32-1753									
194R-C30-1753									
194R-F32-1753									
194R-J30-1753									
194R-N30-1753	A2	171 (6-3/4)	45 (1-49/64)	111 (4-3/8)	454 (17-7/8)	248 (9-3/4)	89 (3-1/2)	1.4 (1/16)	4/78 (3/16)
194R-B63-1753	B1	197 (7-3/4)	45 (1-49/64)	147.6 (5-13/16)	454 (17-7/8)	248 (9-3/4)	105 (4-9/64)	1.4 (1/16)	4/78 (3/16)
194R-D32-1753									
194R-D63-1753									
194R-F63-1753									
194R-H30-1753									
194R-H60-1753									
194R-J60-1753									
194R-N60-1753	B2	197 (7-3/4)	45 (1-49/64)	111 (4-3/8)	454 (17-7/8)	248 (9-3/4)	105 (4-9/64)	1.4 (1/16)	4/78 (3/16)

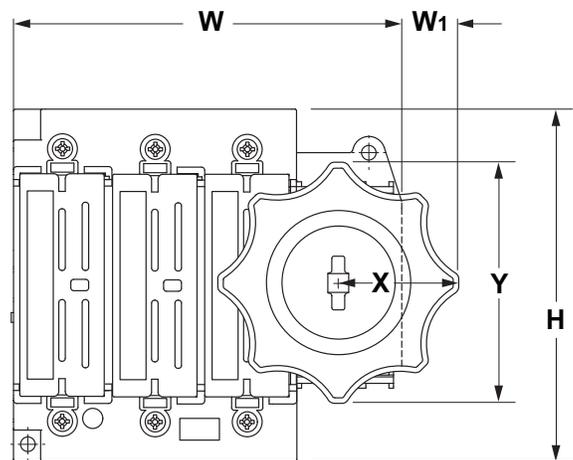
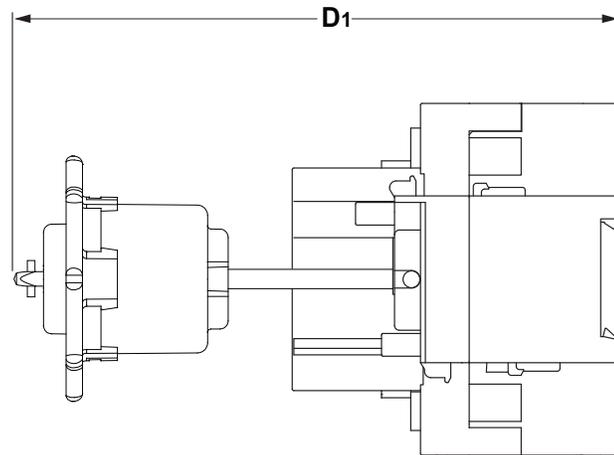


Dimensions in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Universal Internal Handle Dimensions



Catalog No.		L (max)	X	Y	Z
194R -NHR1	mm (in.)	305 (12)	38 (1-1/2)	76 (3)	57 (2-1/4)
194R -NHR2	mm (in.)	533 (21)	38 (1-1/2)	76 (3)	57 (2-1/4)



Catalog No.	Dim. Ref.		H	W	W ₁	D ₁ (min)	X	Y
194R-B20-* 194R-F25-* 194R-B32-* 194R-F32-* 194R-C30-* 194R-J30-*	A1	mm (in.)	108 (4-1/4)	120 (4-3/4)	19 (3/4)	184 (7-1/4)	38 (1-1/2)	76 (3)
194R-N30-*	A2	mm (in.)	108 (4-1/4)	120 (4-3/4)	19 (3/4)	160 (6-5/16)	38 (1-1/2)	76 (3)
194R-B63-* 194R-H30-* 194R-D32-* 194R-H60-* 194R-D63-* 194R-J60-* 194R-F63-*	B1	mm (in.)	113 (4-29/64)	142 (5-19/32)	19 (3/4)	196 (7-49/64)	38 (1-1/2)	76 (3)
194R-N60-*	B2	mm (in.)	113 (4-29/64)	142 (5-19/32)	19 (3/4)	176 (6-59/64)	38 (1-1/2)	76 (3)

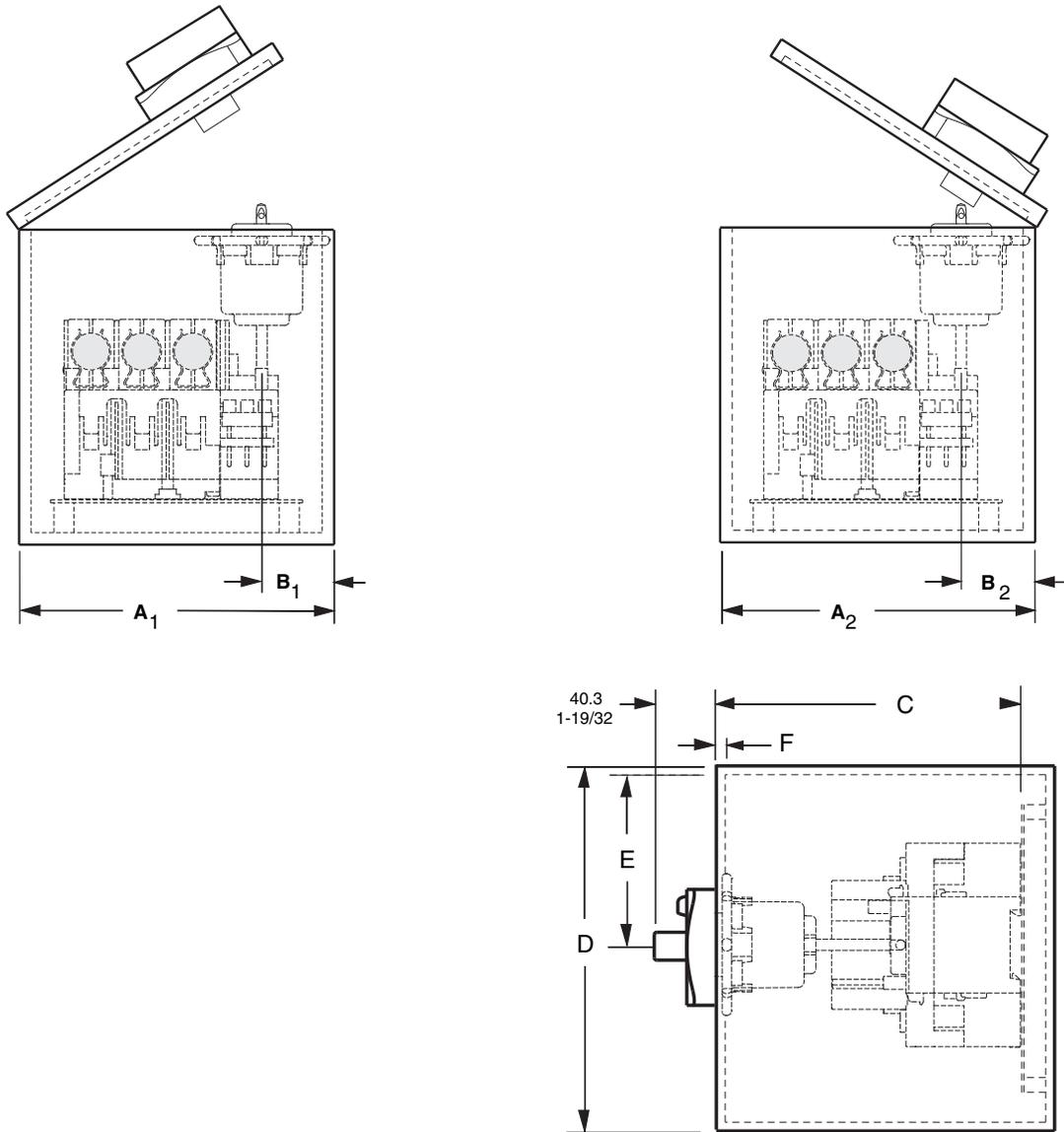
IEC Fused and Non-Fused Disconnects, 30 & 60 A

Approximate Dimensions

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

Enclosure Installation Dimensions

2



ENCLOSURE INSTALLATION DIMENSIONS

CAT.	DIM. REF.		A ₁	A ₂	B	B	C		D	E	F	
			MINIMUM	MINIMUM	MINIMUM	MINIMUM	MINIMUM	MAXIMUM	MINIMUM	MINIMUM	MINIMUM	MAXIMUM
194R-B20-* 194R-F25-* 194R-C30-* 194R-B32-* 194R-J30-* 194R-F32-*	A1	mm	171	203	45	76	178	454	248	89	1.4	4.78
		in.	6-3/4	7-63/64	1-49/64	3	7	17-7/8	9-3/4	3-1/2	1/16	3/16
194R-N30-*	A2	mm	171	203	45	76	178	454	248	89	1.4	4.78
		in.	6-3/4	7-63/64	1-49/64	3	7	17-7/8	9-3/4	3-1/2	1/16	3/16
194R-D32-* 194R-B63-* 194R-H60-* 194R-D63-* 194R-H30-* 194R-F63-* 194R-J60-*	B1	mm	197	228	45	76	178	454	248	105	1.4	4.78
		in.	7-3/4	8-63/64	1-49/64	3	7	17-7/8	9-3/4	4-9/64	1/16	3/16
194R-N60-*	B2	mm	197	228	45	76	178	454	248	105	1.4	4.78
		in.	7-3/4	8-63/64	1-49/64	3	7	17-7/8	9-3/4	4-9/64	1/16	3/16

*Dimensions common for R1 or R2 shaft lengths



Proper Selection of Disconnect Switches

Applications Within Canada and the United States

General

The requirements for disconnect switches used in motor branch circuits rated 600V and less are defined in Article 430, Part J of the U.S. National Electrical Code (NEC), NFPA70. Canadian Electrical Code (CEC) requirements are very similar in the area of motor branch circuit disconnect requirements. For simplicity, we will treat the NEC and CEC requirements as being the same — and reference specific sections of the U.S. National Electrical Code.

The requirements for properly sizing a disconnect switch are dependent on the type of application. The NEC refers to two types of applications: single motor and combination loads. A combination load consists of an application where two or more motors are used together or where one or more motors are used in combination with other loads, such as resistance heaters.

Single Motor Applications

Section 430-110 Paragraph (a) states that the disconnect switch must have an ampere rating of at least 115% of the full-load current rating of the motor.

Example 1: For a motor with a full-load current of 22 A, the disconnect switch must be rated at least 25.3 A (22 x 1.15). If the disconnecting means under evaluation is rated in horsepower, the selection of the disconnect switch is even more straightforward; a disconnect switch must have a horsepower rating equal to, or greater than the horsepower rating of the motor at the applicable voltage.

Example 2: For a motor with a 10 Hp rating at 460V AC, the disconnect switch must be rated at least 10 Hp at 460V AC. If the disconnect switch is rated in horsepower, and UL Listed, UL Component Recognized, or CSA Certified, it will meet the requirements for the 115% full load current rating stipulated by the NEC.

Combination Load Applications

Section 430-110 Paragraph (c) addresses the rating of the disconnecting means for combination loads. This paragraph essentially requires that the loads that “may be simultaneous on a single disconnecting means” be combined to provide equivalent full-load and locked-rotor currents for what is then to be considered as a single motor for the purpose of selecting the appropriate disconnecting means. This means that it is necessary to identify the particular combination of connected loads which can be operating simultaneously and will result in the maximum full-load and locked-rotor current sums.

The individual full-load current values are to be selected from Tables 430-148, 430-149, or 430-150 and the locked-rotor values are to be from Table 430-151.

The equivalent single motor full-load current is the sum of the simultaneously operating motor full-load currents and the rating in amperes of other loads operating at the same time. The equivalent locked-rotor current is the sum of the simultaneously started motors' locked-rotor currents and the full-load currents of the remaining operating motor and non-motor loads.

The disconnecting means shall have a current rating equal to or greater than 115% of the equivalent single motor full-load current and have a horsepower rating equal to or greater than the horsepower rating determined from the equivalent locked-rotor summation.

Consider the following 460V application:

Load	Hp	Full-Load Current [A]
Motor 1	5	7.6 (simultaneous)
Motor 2	10	14.0 (not included)*
Motor 3	15	21.0 (simultaneous)
Motor 4	20	27.0 (simultaneous)
Other		7.0 (simultaneous)
Total Equivalent		62.6 (simultaneous)

* Motor 2 is not included in the total since it cannot operate simultaneously with the other motors, therefore, the disconnect switch must be rated at least 72 A (1.15 x 62.6).

Consider now the locked-rotor current analysis for the same application:

Load	Hp	Full-Load Current [A]
Motor 1	5	(7.6FLA) 45.6 (simultaneous)
Motor 2	10	84.0 (not included)*
Motor 3	15	126.0 (simultaneous)*
Motor 4	20	162.0 (simultaneous)*
Other		7.0 (simultaneous)
Total Equivalent		302.6 (simultaneous)

* Note again that Motor 2 cannot operate simultaneously with the other loads.

* The largest equivalent locked-rotor current occurs when motors 3 and 4 start together while the other loads marked “simultaneous” are already operating. Since Motor 1 is not starting with Motors 3 and 4, its full-load current will be added to the total instead of its locked-rotor current.

Table 430-151, which provides the correlation between locked-rotor currents and Hp ratings, shows that a 40 Hp rating is the equivalent for 302.6 locked-rotor amperes.

Therefore, the disconnect selected for this application must have a current rating of at least 72 A and a Hp rating of at least 40 Hp. In this case a Bulletin 194R rated for 100 A and 60 Hp at 460V would be an appropriate choice. What can be seen from this analysis is that, depending upon the number of motors that can start simultaneously, the actual size of the required disconnect is sometimes determined by the equivalent full load current (72 A) and other times by the equivalent horsepower determined from the locked rotor analysis (40 Hp).

Applications Outside the United States and Canada

General

Disconnect switches designed to IEC Standards and used in applications outside of North America are selected based on the ampere, horsepower, or kilowatt rating of the disconnect switch, under various utilization categories. Utilization categories for disconnect switches are as follows:

Nature of Current	Utilization Category		Typical Applications
	Frequent Operation	Infrequent Operation	
AC	AC-20A*	AC-20B*	Connecting and disconnecting under no load conditions
	AC-21A	AC-21B	Switching of resistive loads including moderate overloads
	AC-22A	AC-22B	Switching of mixed resistive and inductive loads, including moderate overloads
	AC-23A	AC-23B	Switching of motor loads or other highly inductive loads

* The use of these utilization categories is not permitted in the U.S.

For any application, the disconnect switch rating (A, Hp, or kW) must be greater than or equal to the application full-load current or power (Hp or kW), in the appropriate utilization category.

Example 1: For a 380V 50 Hz distribution application (AC-22A), with a 63 A full load current, the disconnect switch must be rated at least 63 A at 380V 50 Hz for use in AC-22A applications.

Example 2: For a 415V 50 Hz motor application (AC-23A), with a 75 kW rating, the disconnect switch must be rated at least 75 kW at 415V 50 Hz for use in AC-23A applications.

Fuse Description

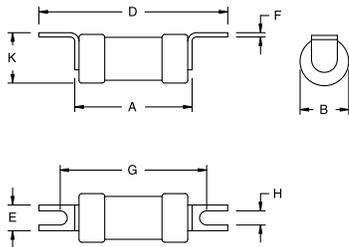
With Bulletin 194R Fused Disconnect Switches

Bulletin 194R Fused Disconnect Switches have been designed to accept a variety of fuses for worldwide application flexibility. Following is a brief summary of typical fuse specifications, where the fuses are typically used, and which Bulletin 194R disconnect switches will accommodate each fuse type. Fuse manufacturers should be contacted for more specific information about each fuse type. **Fuses are not available from Rockwell Automation. BS88 Fuses (63 A shown)**

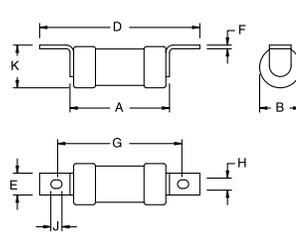
Dimensions in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

- IEC fuse type: Fuse-link for bolted connection
- Voltage rating: 660/690V AC
- Interrupting rating: 80 kA
- Standard cartridge sizes: A1, A2, A3, A4, B1, B2, B3, B4
- Typical ampere ratings: 2...400 A
- Construction: Blade type for bolted connection
- Can be installed on Bulletin 194R disconnect switch
- **Cat. Nos: 194RNA100P3, NA200P3, NA300P3, NA380P3, NA400P3, NB200P3, NB300P3**
- Where used: United Kingdom, Australia, New Zealand, Asia

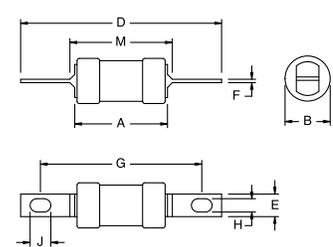
2



Standard cartridge size A1



Standard cartridge sizes A2, A3, A4



Standard cartridge sizes B1, B2, B3, B4

Dim. Ref.	Ampere Range [A]	A	B	D	E	F	G	H	K
A1	2...20	36.50 (1-7/16)	13.90 (35/64)	55.60 (2-3/16)	11.10 (7/16)	0.80 (1/32)	4.50 (1-3/4)	4.40 (11/64)	14.30 (9/16)

Dim. Ref.	Ampere Range [A]	A	B	D	E	F	G	H	J	K
A2	2...20	56.40 (2-7/32)	23.80 (15/16)	85.80 (3-3/8)	8.70 (11/32)	1.20 (3/64)	73.00 (2-7/8)	5.20 (13/64)	7.10 (9/32)	23.80 (15/16)
A3	35...63	56.40 (2-7/32)	23.80 (15/16)	85.80 (3-3/8)	8.70 (11/32)	1.20 (3/64)	73.00 (2-7/8)	5.20 (13/64)	7.10 (9/32)	23.80 (15/16)
A4	80...100	70.00 (2-3/4)	34.90 (1-3/8)	111.00 (4-3/8)	19.10 (3/4)	2.40 (3/32)	93.70 (3-11/16)	8.70 (11/32)	10.30 (13/32)	34.90 (1-3/8)

Dim. Ref.	Ampere Range [A]	A	B	D	E	F	G	H	J	M
B1	2...20	70.00 (2-3/4)	34.90 (1-3/8)	136.50 (5-3/8)	19.10 (3/4)	3.20 (1/8)	111.00 (4-3/8)	8.70 (11/32)	11.90 (15/32)	79.40 (3-1/8)
B2	125...200	77.00 (3-1/32)	41.30 (1-5/8)	136.50 (5-3/8)	19.10 (3/4)	3.20 (1/8)	111.00 (4-3/8)	8.70 (11/32)	11.90 (15/32)	79.40 (3-1/8)
B3	250...315	83.00 (3-9/32)	54.00 (2-1/8)	136.50 (5-3/8)	25.40 (1)	3.20 (1/8)	111.00 (4-3/8)	8.70 (11/32)	11.90 (15/32)	82.00 (3-1/4)
B4	355...400	70.00 (2-3/4)	61.10 (2-13/32)	136.50 (5-3/8)	25.40 (1)	6.30 (1/4)	111.00 (4-3/8)	8.70 (11/32)	11.90 (15/32)	85.80 (3-3/8)

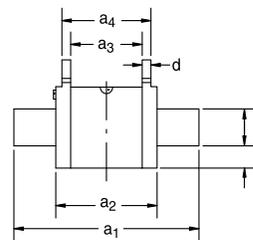
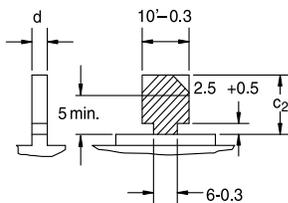
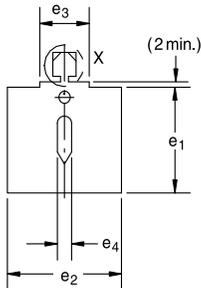


DIN Fuses (100 A shown)

Dimensions in millimeters only.
 Dimensions are not intended to be used for manufacturing purposes.

- IEC fuse type: Fuse-link with blade contacts
- Voltage rating: 660/690V AC
- Interrupting rating: 120,000 A
- Standard cartridge sizes: 00, 0, 1 and 2
- Typical ampere ratings: 2...400 A

- Construction: Blade type
- Can be installed on Bulletin 194R disconnect switch Cat. Nos: 194RND072P3, ND138P3, ND250P3, ND300P3
- Where used: Europe, South America, Middle East and India



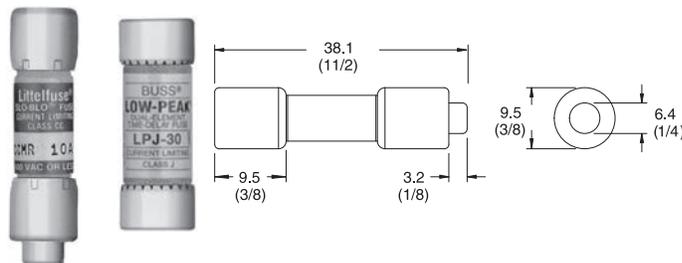
Size	Max. Rated Current [A]	a1	a2	a3	a4	b (min.)	d	e1 (max.)	e2 (max.)	e3	e4 ±0.2	f
00	100	78.5 ± 1.5	53	45 ± 1.5	49 ± 1.5	15	2 ± 0.5	48	30	20 ± 5	6	12.5
0	160	125 ± 2.5	67	62 +3 -1.5	68 +1.5 -3	15	2 +1.5 -0.5	48	40	20 ± 5	6	11.5
1	250	135 ± 2.5	71	62 ± 2.5	68 ± 2.5	20	2.5 +1.5 -0.5	53	52	20 +5 -2	6	10
2	400	150 ± 2.5	72	62 ± 2.5	68 ± 2.5	25	2.5 +1.5 -0.5	61	60	20 +5 -2	6	10

With Bulletin 194R Fused Disconnect Switches, Continued

CSA HRCI and UL Class Fuses (10 A shown)

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

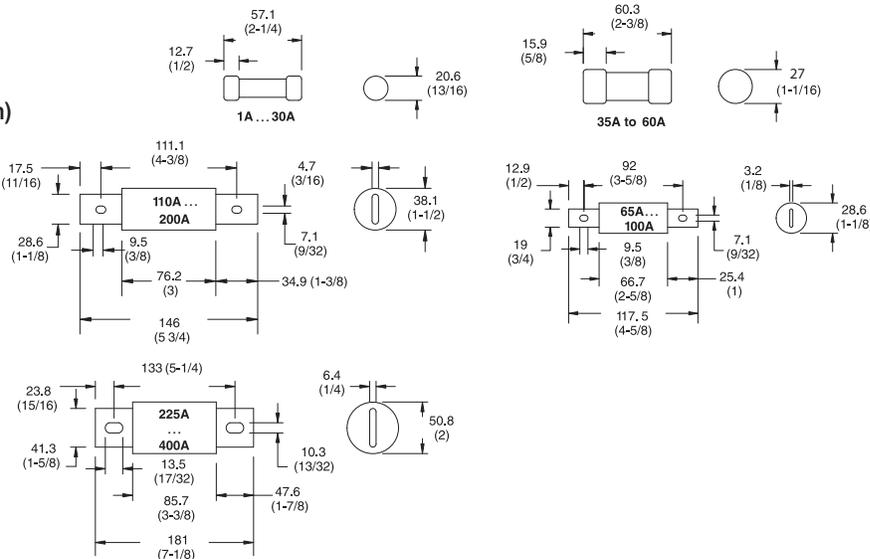
- UL fuse type: Class CC
- CSA fuse type: HRCI-MISC
- Voltage rating: 600V AC
- Interrupting rating: 200 000 A
- Standard cartridge sizes: 30 A
- Typical ampere ratings: 1...30 A
- Construction: Ferrule type
- Can be installed on Bulletin 194R disconnect switch
Cat. No: 194R-NC030P3
- Where used: North America



CSA HRCI and UL Class Fuses (30 A shown)

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

- CSA fuse type: HRCI-J
- UL fuse type: Class J
- Voltage rating: 600V AC
- Interrupting rating: 200 000 A
- Standard cartridge sizes: 30, 60, 100, 200, and 400 A
- Typical ampere ratings: 1...600 A; Blade type for bolted connection
- Can be installed on Bulletin 194R disconnect switch **Cat. Nos: 194R-NJ030P3, NJ060P3, NJ100P3, NJ200P3, NJ400P3**
- Where used: North America



Fuse Description

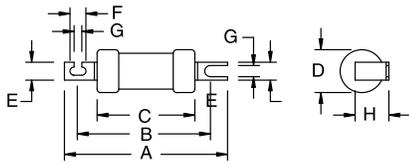
CSA HRCII Fuses (100 A shown)

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

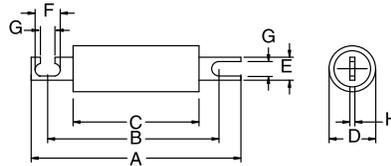
- CSA fuse type: HRCII-C
- Voltage rating: 600V AC
- Interrupting rating: 200 000 A
- Standard cartridge sizes: 30, 60, 100, 200, and 400 A
- Typical ampere ratings: 1...400 A
- Construction: Blade type for bolted connection
- Can be installed on Bulletin 194R disconnect switch
- **Cat. Nos: 194R-NA200P3, NA300P3, NH100P3, NH200P3, NH400P3**
- Where used: Canada



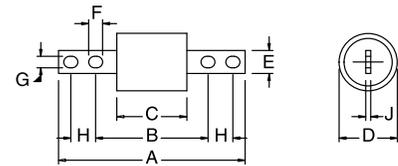
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Standard Cartridge Sizes 30, 60, and 100 A



Standard Cartridge Size 200 A



Standard Cartridge Size 400 A

Current Range [A]	A	B	C	D	E	F	G	H	J
0...30	84.14 (3-5/16)	71.04 (2-51/64)	50.8 (2)	20.64 (13/16)	8.73 (11/32)	7.54 (19/64)	5.56 (7/32)	23.81 (15/16)	1.59 (1/16)
31...60	88.9 (3-1/2)	71.04 (2-51/64)	50.8 (2)	20.64 (13/16)	12.7 (1/2)	7.54 (19/64)	5.56 (7/32)	26.99 (1-1/16)	1.59 (1/16)
61...100	109.54 (4-5/16)	92.47 (3-41/64)	60.72 (2-25/64)	34.13 (1-11/32)	19.05 (3/4)	11.91 (15/32)	8.73 (11/32)	34.93 (1-3/8)	2.38 (3/32)
101...200	134.94 (5-5/16)	109.14 (4-19/64)	76.2 (3)	38.1 (1-1/2)	19.05 (3/4)	11.91 (15/32)	8.73 (11/32)	3.18 (1/8)	—
201...400	207.96 (8-3/16)	133.35 (5-1/4)	76.2 (3)	60.33 (2-3/8)	25.4 (1)	12.7 (1/2)	9.53 (3/8)	25.4 (1)	4.76 (3/16)
401...600	207.96 (8-3/16)	133.35 (5-1/4)	76.2 (3)	76.2 (3)	25.4 (1)	15.08 (19/32)	10.32 (13/32)	25.4 (1)	9.53 (3/8)

IEC Fused and Non-Fused Disconnects, 100...400 A

Overview/Product Selection



Bulletin 194R Global Fused and Non-Fused Disconnects

- 100 A...400 A sizes
- Open or enclosed switches
- Fused switch versions:
 - BS88 - DIN
 - CSA HRCII-C - CSA HRCI-J
 - UL Class J - UL Class CC
- Non-fused switches
- Operating handle ingress ratings:
 - IP42 (Type 1)
 - IP66 (Type 3R, 3, 12, 4, 4X)
- Handle with or without defeater mechanism
- Padlockable handle with up to three padlocks
- Up to 8 auxiliary contacts can be added per switch
- Suitable as service entrance disconnecting means (UL 98)

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Standards Compliance

IEC 60947-4-1/EN60947-3
 BS EN60947-3
 VDE 0660
 CSA 22.2 No. 4
 NEMA KS-1
 UL 98

Certifications

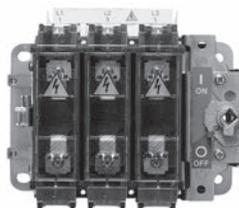
UL Listed (File No. E 47426, Guide WHTY)
 CSA Certified (File No. LR1234)
 CE
 ASTA Certified
 LOVAG Certified

The Bulletin 194R line of fused and non-fused global disconnect switches provides the flexibility to meet worldwide applications. These rod-operated disconnect switches incorporate onboard fuse carriers thus reducing panel space requirements and have high short circuit protection ratings. The disconnect switches are UL Listed, CSA, ASTA and LOVAG Certified and are designed to meet IEC 60947-3, VDE, DIN, BS and applicable NEMA requirements.

Your order must include: 1) the desired disconnect switch Cat. No. Note the disconnect switch dimension reference, 2) the appropriate operating handle and operating shaft Cat. No. corresponding to the dimension reference of the disconnect switch, 3) if required, Cat. No. of any accessories.

Product Selection

UL/CSA Fused Disconnect Switches



Cat. No. 194R-NJ100P3

Rated Current [A]	Maximum Hp Ratings *								Fuse	Dim. Ref.	Cat. No.
	1-Phase (60 Hz)		3-Phase (60 Hz)				DC				
	115V	230V	200V	230V	460V	575V	125V	250V			
CSA HRCII-C FUSES											
100	—	15	25	30	60	75	—	—	100 A HRCII-C	D1	194R-NH100P3
200	—	30	50	60	125	150	—	—	200 A HRCII-C	E1	194R-NH200P3
400	—	50	100	125	250	300	—	—	400 A HRCII-C	F1	194R-NH400P3
UL CLASS J AND CSA HRCI-J FUSES ‡											
100	7.5	15	25	30	60	75	—	20	100 A CLASS J	C1	§ 194R-NJ100P3
200	—	25	50	60	125	150	—	40	200 A CLASS J	D1	194R-NJ200P3
400	—	50	100	125	250	300	—	50	400 A CLASS J	F1	194R-NJ400P3

* Time delay fuses may be required to utilize the disconnect switch at its maximum horsepower rating.
 ‡ Only CSA Certified HRCI-J and UL Listed Class J fuses are suitable for use with these disconnect switches.
 § Line and load terminals use 4 mm Allen-type wrench; will not accept terminal lugs.

UL/CSA Non-Fused Disconnect Switches



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Non-Fused											
Fuse Description	Rated Current [A]	Maximum Hp Ratings								Dim. Ref.	Cat. No.
		1-Phase (60 Hz)		3-Phase (60 Hz)				DC			
		115V	230V	200V	230V	460V	575V	125V	250V		
Non-fused disconnect switches must use separately installed fuses for upstream short circuit protection.	100	7-1/2	15	25	30	60	75	—	20	C1	‡ 194R-NN100P3
	200	—	25	50	60	125	150	—	40	D1	194R-NN200P3
	400	—	—	100	125	250	300	—	50	F1	194R-NN400P3

‡ Line and Load Terminals use 4 mm Allen-type wrench; will not accept terminal lugs.

BS88 Fused Disconnect Switches



Ratings (AC23)												
Load Rating I_e [A]	With Fuse Links				Load Rating I_e [A]	With Shorting Links				Fuse	Dim. Ref.	Cat. No.
	3-Phase Maximum kW (50 Hz)					3-Phase Maximum kW (50 Hz)						
	200/230V	380/400/415V	500V	660/690V		200/230V	380/400/415V	500V	660/690V			
75	22	37	45	55	75	22	37	45	55	BS88 A3	C1	194R-NA380P3
138	37	75	90	110	138	37	75	90	110	BS88 A4	D1	194R-NA400P3
245	75	132	160	160	245	75	132	160	160	BS88 B1, B2	E1	194R-NB200P3
300	90	160	200	200	300	40	160	200	200	BS88 B1, B2 B3, B4	F1	194R-NB300P3

DIN Fused Disconnect Switches



Ratings (AC23)							
Load Rating I_e [A]	With Fuse Links				Fuse	Dim. Ref.	Cat. No.
	3-Phase Maximum kW (50 Hz)						
	200/230V	380/400/415V	500V	660/690V			
75	22	37	45	55	DIN 00	C2	194R-ND072P3
138	37	75	90	110	DIN 0, 00*	D2	194R-ND138P3
245	75	132	160	160	DIN 1	E2	194R-ND250P3
300	90	160	200	200	DIN 1, 2	F1	194R-ND300P3

* Series C only.

Operating Handles (Accepts 3 Padlocks)

	For Use With	Description	Color	Degree of Protection	Cat. No.
	C1, C2, D1, D2, E1, E2, F1	Standard orientation with defeater	Black/Grey	IP42 (Type 1)	194R-HM1
				IP66 (Type 3R, 3, 12, 4, 4X)	194R-HM4
			Red/Yellow	IP42 (Type 1)	194R-HM1E
				IP66 (Type 3R, 3, 12, 4, 4X)	194R-HM4E
		Standard orientation without defeater	Black/Grey	IP42 (Type 1)	194R-HM1-N2
				IP66 (Type 3R, 3, 12, 4, 4X)	194R-HM4-N2
			Red/Yellow	IP42 (Type 1)	194R-HM1E-N2
				IP66 (Type 3R, 3, 12, 4, 4X)	194R-HM4E-N2
	C1, C2, D1, D2, E1, E2, F1	90° rotated orientation with defeater	Black/Grey	IP42 (Type 1)	194R-HM1-N1
				IP66 (Type 3R, 3, 12, 4, 4X)	194R-HM4-N1
			Red/Yellow	IP42 (Type 1)	194R-HM1E-N1
				IP66 (Type 3R, 3, 12, 4, 4X)	194R-HM4E-N1
		90° rotated orientation without defeater	Black/Grey	IP42 (Type 1)	194R-HM1-N3
				IP66 (Type 3R, 3, 12, 4, 4X)	194R-HM4-N3
			Red/Yellow	IP42 (Type 1)	194R-HM1E-N3
				IP66 (Type 3R, 3, 12, 4, 4X)	194R-HM4E-N3

IEC Fused and Non-Fused Disconnects, 100...400 A

Product Selection

NFPA 79 Operating Shaft/Handle Kits

An internal handle that permits operation of the disconnect switch when the panel door is open, in compliance with NFPA 79.

	Description	Disconnect Switch Dim. Ref.	Operating Shaft Type	Operating Shaft Length [mm (in.)]	Cat. No.
	NFPA 79 Handle Kit Includes NFPA 79 handle and operating shaft	C1, C2, D1, D2	8 mm square size	305 (12)	194R-NHR3
				533 (21)	194R-NHR4
	E1, E2, F1	9.5 mm square size	305 (12)	194R-NHR5	
533 (21)			194R-NHR6		

2

Operating Shafts

	Disconnect Switch Dim. Ref.	Operating Shaft Type	Operating Shaft Length Approx. Dim. [mm (in.)]	Enclosure Working Depth			Cat. No.
				Disconnect Switch Dim. Ref.	Minimum Approx. Dim. [mm (in.)]	Maximum Approx. Dim. [mm (in.)]	
	C1, C2, D1, D2	Standard Length	200 (7.9)	C1, C2 D1, D2	183 (7.2)	254 (10.0)	194R-R3
		Extended Length	403 (15.9)		183 (7.2)	457 (18.0)	194R-R4
	E1, E2, F1	Standard Length	278 (10.9)	E1, E2, F1	243 (9.6)	356 (14.0)	194R-R5
		Extended Length	532 (20.9)		243 (9.6)	610 (24.0)	194R-R6

Complete UL/CSA Disconnect Switch Kits

Includes Disconnect Switch, Operating Handle with Defeater Mechanism and Operating Shaft



Rated Current [A]	Maximum Horsepower Ratings*				Disconnect Switch*		Operating Shaft Type	Operating Handle		Cat. No.
	3-Phase (60 Hz)				Fuse	Dim. Ref.		Degree of Protection	Handle Color	
	200V	230V	460V	575V						
100	25	30	60	75	None	C1	Standard Length	!P66 (Type 3, 3R, 4, 4X, 12)	Black/Grey	194R-NN100P34R3
									Red/Yellow	194R-NN100P34ER3
200	25	30	60	75	100 A Class J	C1			Black/Grey	194R-NJ100P34R3
									Red/Yellow	194R-NJ100P34ER3
	50	60	125	150	None	D1			Black/Grey	194R-NN200P34R3
									Red/Yellow	194R-NN200P34ER3
400	50	60	125	150	200 A Class J	D1			Black/Grey	194R-NJ200P34R3
									Red/Yellow	194R-NJ200P34ER3
	100	125	250	300	None	F1			Black/Grey	194R-NN400P34R5
									Red/Yellow	194R-NN400P34ER5
400	100	125	250	300	400 A Class J	F1	Black/Grey	194R-NJ400P34R5		
							Red/Yellow	194R-NJ400P34ER5		

* Time delay fuses may be required to utilize the disconnect switch at its maximum horsepower ratings.

* Only UL Listed Class J and CSA Certified HRCI-J fuses are suitable for use with these disconnect switches.



UL Enclosed Disconnect Switches (Fused and Non-Fused)



Stainless Steel Enclosure

2

Rated Current [A]	Maximum Horsepower Ratings						Fuse Type	Dim. Ref.	IP66 (Type 3/4/12) Watertight Dusttight Sheet Metal Enclosure	IP66 (Type 4/4X) Watertight, Corrosion- Resistant Stainless Steel Enclosure	IP66 (Type 4/4X) Watertight, Corrosion- Resistant Non-Metallic Enclosure
	1-Phase (60Hz)		3-Phase (60Hz)								
	115V	230V	200V	230V	460V	575V					
100	7-1/2	15	25	30	60	75	Class J Fused	C1	194R-FJ100P3	194R-CJ100P3	194R-KJ100P3
							None	C1	194R-FN100P3	194R-CN100P3	194R-KN100P3
200	—	25	50	60	125	150	Class J Fused	D1	194R-FJ200P3	194R-CJ200P3	194R-KJ200P3
							None	D1	194R-FN200P3	194R-CN200P3	194R-KN200P3
400	—	50	100	125	250	300	Class J Fused	F1	194R-FJ400P3	194R-CJ400P3	194R-KJ400P3
							None	F1	194R-FN400P3	194R-CN400P3	194R-KN400P3

* Black operating handles supplied as standard. To order Red/Yellow Handles, add string suffix **E** to the Cat. No. Example: Cat. No. 194R-FJ100P3E.

Accessories

Modifications for Enclosed Bulletin 194R Switches (max. 4 contact blocks/8 auxiliary contacts per switch)

Description	Uses Cat. No.	Suffix Code
Auxiliary Contact (1 N.O. + 1 N.C.)	195-GA11	-989
Auxiliary Contact (1 N.O.)	195-GA10	-98
Auxiliary Contact (1 N.C.)	195-GA01	-99

Accessories

	Description	Disconnect Switch Dim Ref.	Pkg. Qty.	Cat. No.
	Shaft Guard — Provides extra protection against contact with shaft	C1, C2, D1, D2, E1, E2, F1	1	194R-R3G

Fuse Covers

2

 Cat. No. 194R-FCD1	Disconnect Switch Dim Ref.	Quantity Required Per Disconnect Switch	Cat. No.	
	C1		3	194R-FCC1
	C2			194R-FCC2
	D1, D2			194R-FCD1
	E1, E2			194R-FCE1
F1	‡ 194R-FCF1			

‡ When using the 194R-FCF1 on a 194R-NJ400P3 or 194R-NH400P3, the switch shall be de-rated to 300 A.

Terminal Shields*

	Disconnect Switch Dim Ref.	Quantity Required Per Disconnect Switch	Cat. No.
	C1, C2	2	194R-LNC3
	D1, D2	2	194R-LNC4
	E1, E2	2	194R-LNC5
	F1	2	194R-LNC6

* For use on either Line or Load Side of Disconnect Switch. Disconnect switch **Cat. Nos: 194R-NN**P3** and **194R-NJ**P3** are provided as standard with a line side terminal shield.

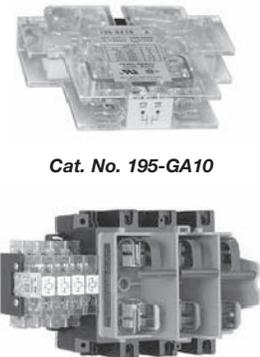
Terminal Lugs

	Disconnect Switch Dim Ref.	Conductor Range	Pkg. Qty.	Cat. No.
	D1 (194R-NH100P3)	#8...1/0 AWG 10 mm ² ...50 mm ²	3	199-LE1
	D1 (194R-NJ200P3, -NN200P3, -NA400P3) D2	#6...250 MCM AWG 16 mm ² ...120 mm ²		199-LF1
	E1, E2, F1	#4...500 MCM AWG 25 mm ² ...240 mm ²		199-LG1
	F1	Two 1/0...350 MCM AWG Two 50 mm ² ...150 mm ²		199-LH1

Multi-tap Lugs

	Description	Rated Current	Wire Size	Dimension Reference	Pkg. Quantity	Cat. No.
	Multi-Tap Terminal Lugs Load side only	100	(3) 14...4 AWG (3) 0.75...25 mm ²	C1 (194R-MN100, -NJ100, -NA380, -ND072)	3	194R-100-MTL3
		200	(6) 14...4 AWG (6) 0.75...25 mm ²	D1 (194R-NJ200, -NN200, -NA400)	3	194R-200-MTL6
	Multi-Tap Terminal Lugs Load side only	400	(12) 14...4 AWG (6) 0.75...25 mm ²	F1 (194R-NH400, -NJ400, -NN400, -NB300, -ND300)	3	194R-400-MTL12

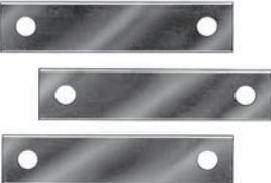
Auxiliary Contacts*

	Disconnect Switch Dim Ref.	Description	No. of Auxiliary Contacts	Cat. No.
 <p>Cat. No. 195-GA10</p>	C1, C2, D1, D2, E1, E2, F1, F2	Auxiliary contact (side-mounted)‡	1 N.O.	195-GA10
			1 N.C.	195-GA01
	C1, C2, D1, D2, E1, E2, F1, F2	Two-pole auxiliary contact for disconnect switch‡	1 N.O./1 N.C.	195-GA11
	C1, C2, D1, D2, E1, E2, F1, F2	2 N.O.‡	2 N.O.	195-GA20
	C1, C2, D1, D2, E1, E2, F1, F2	Two-pole N.C. auxiliary contact for disconnect switch‡	2 N.C.	195-GA02
	C1, C2, D1, D2, E1, E2, F1, F2	Auxiliary support for 5...8 circuits per switch	—	194R-A1

* See page 2-489 for contact ratings.

‡ A maximum of four (4) contact blocks (8 auxiliary contacts) can be installed on each disconnect switch. When more than two (2) contact blocks are used, a support kit **Cat. No. 194R-A1** must be used.

Shorting Links For BS Switches Only

	Disconnect Switch Dim Ref.	Description	For Use with Cat. No.	Cat. No.
	D1	BS88 Size A4	194R-NA400P3	194R-SLA4
	E1	BS88 Size B1, B2	194R-NB200P3	194R-SLB2
	F1	BS88 Size B3, B4	194R-NB300P3	

IEC Fused and Non-Fused Disconnects, 100...400 A Specifications

Fused Disconnect Switches For BS88 Fuses

Electrical Ratings									
Cat. No.		194R-NA380P3		194R-NA400P3		194R-NB200P3		194R-NB300P3	
Fuse Type	BS88 Dimension	A3		A4		B1, B2		B1, B2, B3, B4	
Rated Insulation Voltage (U_i)	[V]	660		660		660		660	
Maximum Short Circuit Prospective Fault Current	[kA]	80		80		80		80	
Rated Operational Current AC-22A (I_a)		Fuse Links	Shorting Links	Fuse Links	Shorting Links	Fuse Links	Shorting Links	Fuse Links	Shorting Links
200/230V 50 Hz	[A]	100	100	200	160	250	250	400	400
380/400/415V 50 Hz	[A]	100	100	200	160	250	250	400	400
500V 50 Hz	[A]	100	100	200	160	250	250	400	400
660/690V 50 Hz	[A]	100	100	200	160	250	250	400	400
Rated Operational Current AC-23A (I_a)		Fuse Links	Shorting Links	Fuse Links	Shorting Links	Fuse Links	Shorting Links	Fuse Links	Shorting Links
200/230V 50 Hz	[A]	75	75	130	130	240	240	300	300
380/400/415V 50 Hz	[A]	75	75	138	138	245	245	300	300
500V 50 Hz	[A]	65	65	130	130	220	220	290	290
660/690V 50 Hz	[A]	61	61	118	118	170	170	220	220
Rated Thermal Current (I_{the})	[A]	100	100	160	160	200	250	400	400
Maximum kW, AC-23A 3-Phase		Fuse Links	Shorting Links	Fuse Links	Shorting Links	Fuse Links	Shorting Links	Fuse Links	Shorting Links
200/230V 50 Hz	[kW]	22	22	37	37	75	75	90	90
380/400/415V 50 Hz	[kW]	37	37	75	75	132	132	160	160
500V 50 Hz	[kW]	45	45	90	90	160	160	200	200
660/690V 50 Hz	[kW]	55	55	110	110	160	160	200	200
Maximum Fuse Rating	[A]	100	—	200	—	200	—	400	—
Maximum Motor Circuit Fuse Link		100M125	—	200M250	—	ED355	—	400M450	—
Maximum Fuse Cut-off Current*	[kA]	14	14	20	20	33	33	40	40
Rated Short Time Current, 1 Second	[kA]	2		4		7.5		12	

Mechanical Data									
Cat. No.		194R-NA380P3		194R-NA400P3		194R-NB200P3		194R-NB300P3	
Degree of Protection (per IEC 947)		IP00		IP00		IP00		IP00	
Switch Only		IP20		IP20		IP20		IP20	
Switch with Terminal Shield & Fuse Cover(s)		IP20		IP20		IP20		IP20	
Mechanical Endurance ⚡	Operations	10 000		8 000		8 000		8 000	
Operating Torque (Maximum)	N•m lb•in	17.5 155		20.3 180		31.4 275		31.4 275	
Terminal Capacity	mm ² AWG	2.5...35 #14...#2		16...120 #6-250MCM		25...240 #4-500MCM		Two 50...150 Two 1/0...350MCM	
Auxiliary Contact Terminals	mm ² AWG	2.5...4 #14...#12		2.5...4 #14...#12		2.5...4 #14...#12		2.5...4 #14...#12	
Maximum Number of Auxiliary Circuits		8		8		8		8	
Approximate Weight	kg lbs	4.03 8.88		6.16 13.59		9.30 20.50		23.83 30.50	
Minimum Enclosure Size	Height	330 (13)		560 (22)		610 (24)		762 (30)	
Approximate dimensions in millimeters (inches)	Width	301 (11-27/32)		344 (13-17/32)		394 (15-33/64)		424 (16-45/64)	
	Depth	162 (6-3/8)		178 (7)		227 (8-15/16)		243 (9-9/16)	
Switch Dimension Reference		C1		D1		E1		F1	
(See dimension drawings on pages 2-490 and 2-492...2-494.)									

* Fuses must be selected with regard to the maximum prospective fault current of the system and the maximum cut-off current of the fuse when subjected to that maximum fault current. The maximum fuse cut-off current as specified for each disconnect switch must not be exceeded.

⚡ Based on Rockwell Automation tests in accordance with the requirements as defined in IEC 60947-3.

Fused Disconnect Switches For DIN Fuses

Electrical Ratings					
Cat No.		194R-ND072P3	194R-ND138P3	194R-ND250P3	194R-ND300P3
Fuse Type	DIN Dimension	00	0, 00*	1	1, 2
Rated Insulation Voltage (U_i)	[V]	660	660	660	660
Maximum Short Circuit Prospective Fault Current	[kA]	100	100	100	100
Rated Operational Current AC-22A (I_e)		Fuse Links	Fuse Links	Fuse Links	Fuse Links
200/230V 50 Hz	[A]	85	160	250	400
380/400/415V 50 Hz	[A]	85	160	250	400
500V 50 Hz	[A]	85	160	250	400
660/690V 50 Hz	[A]	85	160	250	400
Rated Operational Current AC-23A (I_e)					
200/230V 50 Hz	[A]	75	130	240	300
380/400/415V 50 Hz	[A]	72	138	245	300
500V 50 Hz	[A]	65	130	220	290
660/690V 50 Hz	[A]	61	118	170	220
Rated Thermal Current (I_{the})	[A]	85	160	250	400
Maximum kW, AC-23A 3-Phase					
200/230V 50 Hz	[kW]	22	37	75	90
380/400/415V 50 Hz	[kW]	37	75	132	160
500V 50 Hz	[kW]	45	90	160	200
660/690V 50 Hz	[kW]	55	110	160	200
Maximum Fuse Rating	[A]	100	200	250	400
Maximum Motor Circuit Fuse Link		100	200	250	400
Maximum Fuse Cut-off Current*	[kA]	14	20	33	40
Rated Short Time Current, 1 Second	[kA]	2	4	7.5	12

Mechanical Data					
Cat No.		194R-ND072P3	194R-ND138P3	194R-ND250P3	194R-ND300P3
Degree of Protection (per IEC 947)					
Switch Only		IP00	IP00	IP00	IP00
Switch with Terminal Shield & Fuse Cover(s)		IP20	IP20	IP20	IP20
Mechanical Endurance*	Operations	10 000	8 000	8 000	8 000
Operating Torque (Maximum)	N•m lb•in	17.5 155	20.3 180	31.4 275	31.4 275
Terminal Capacity					
Power Terminals	mm ² AWG	2.5...35 #14...#2	16...120 #6...250MCM	25...240 #4...500MCM	Two 50...150 Two 1/0...350MCM
Auxiliary Contact Terminals	mm ² AWG	2.5...4 #14...#12	2.5...4 #14...#12	2.5...4 #14...#12	2.5...4 #14...#12
Maximum Number of Auxiliary Circuits		8	8	8	8
Approximate Weight	kg lbs	4.15 9.16	6.17 13.61	9.41 20.75	14.06 31.00
Minimum Enclosure Size	Height	330 (13)	560 (22)	712 (28)	762 (30)
Approximate dimensions in millimeters (inches)	Width	301 (11-27/32)	344 (13-17/32)	394 (15-33/64)	424 (16-45/64)
	Depth	168 (6-5/8)	183 (7-7/32)	227 (8-15/16)	243 (9-9/16)
Switch Dimension Reference (See dimension drawings on pages 2-490 and 2-492...2-494.)		C2	D2	E2	F1

* Fuses must be selected with regard to the maximum prospective fault current of the system and the maximum cut-off current of the fuse when subjected to that maximum fault current. The maximum fuse cut-off current as specified for each disconnect switch must not be exceeded.

* Based on Rockwell Automation tests in accordance with the requirements as defined in IEC 60947-3.



Fused Disconnect Switches For CSA HRCII-C Fuses

				Electrical Ratings		
Cat. No.				194R-NH100P3	194R-NH200P3	194R-NH400P3
CSA Fuse Type				HRCII-C		HRCII-C
Maximum Fuse Cartridge Size	[A]			100	200	400
Maximum Voltage	AC [V]			600	600	600
Ampere Rating	[A]			100	200	400
Maximum Short Circuit Prospective Fault Current	[kA]			100	100	100
Maximum Hp, 3-Phase AC						
	200V 60 Hz [Hp]			25	50	100
	230V 60 Hz [Hp]			30	60	125
	460V 60 Hz [Hp]			60	125	250
	575V 60 Hz [Hp]			75	150	300
Maximum Hp, 1-Phase AC						
	115V 60 Hz [Hp]			—	—	—
	230V 60 Hz [Hp]			15	30	50

				Mechanical Data		
Cat. No.				194R-NH100P3	194R-NH200P3	194R-NH400P3
Degree of Protection (per IEC 947)						
Switch Only				IP00	IP00	IP00
Switch with Terminal Shield & Fuse Cover(s)				IP20	IP20	IP20
Mechanical Endurance*	Operations			10 000	8 000	8 000
Operating Torque (Maximum)	N•m lb•in.			20.3 180	31.4 275	31.4 275
Terminal Capacity						
Power Terminals	mm ²			10...50	25...240	Two 50...150
	AWG			#8...#1/0	#4...500MCM	Two 1/0...350MCM
Auxiliary Contact Terminals	mm ²			2.5...4	2.5...4	2.5...4
	AWG			#14...#12	#14...#12	#14...#12
Maximum Number of Auxiliary Circuits				8	8	8
Approximate Weight						
	kg lbs.			6.16 13.59	9.30 20.50	13.83 30.50
Minimum Enclosure Size						
Approximate dimensions in millimeters (inches)						
	Height			384 (15-1/8)	610 (24)	762 (30)
	Width			344 (13-17/32)	394 (15-33/64)	424 (16-45/64)
	Depth			178 (7)	227 (8-15/16)	243 (9-9/16)
Switch Dimension Reference (See dimension drawings on 2-484, 2-485, 2-486 and 2-486.)				D1	E1	F1

* Based on Rockwell Automation tests in accordance with the requirements as defined in CSA C22.2 No. 4 and IEC 60947-3.

Fused Disconnect Switches For CSA HRCI-J and UL Class Fuses*

Electrical Ratings						
Cat. No.		194R-NJ100P3	194R-NJ200P3	194R-NJ400P3		
CSA Fuse Type/UL Fuse Type		HRCI-J/Class J	HRCI-J/Class J	HRCI-J/Class J		
Maximum Fuse Cartridge Size	[A]	100	200	400		
Maximum Voltage	AC [V] DC [V]	600 250	600 250	600		
Ampere Rating	[A]	100	200	400		
Maximum Short Circuit Prospective Fault Current	[kA]	100	100	100		
Fuse Operating Characteristics		Time Delay	Non-Time Delay	Time Delay	Non-Time Delay	Time Delay
Maximum Hp, 3-Phase AC						
200V 60 Hz	[Hp]	25	15	50	25	100
230V 60 Hz	[Hp]	30	15	60	25	125
460V 60 Hz	[Hp]	60	25	125	50	250
575V 60 Hz	[Hp]	75	30	150	60	300
Maximum Hp, 1-Phase AC						
115V 60 Hz	[Hp]	7.5	—	—	—	—
230V 60 Hz	[Hp]	15	7.5	25	15	50
Maximum Hp, DC						
125V DC	[Hp]	—	—	—	—	—
250V DC	[Hp]	20	20	40	40	50

* Only CSA Certified HRCI-J and HRCI-MISC (also UL Listed as Class CC) fuses and UL Listed Class J and CC fuses are suitable for use with these disconnect switches.

Mechanical Data				
Cat. No.		194R-NJ100P3	194R-NJ200P3	194R-NJ400P3
Degree of Protection (per IEC 947)				
Switch Only		IP00	IP00	IP00
Switch with Terminal Shield & Fuse Cover(s)		IP20	IP20	IP20
Mechanical Endurance†	Operations	10 000	8 000	8 000
Operating Torque (Maximum)	N•m lb•in	17.5 155	20.3 180	31.4 275
Terminal Capacity	mm ² AWG	2.5...35 #14...#2	16...120 #6...250MCM	Two 50...150 Two 1/0...350MCM
Auxiliary Contact Terminals	mm ² AWG	2.5...4 #14...#12	2.5...4 #14...#12	2.5...4 #14...#12
Maximum Number of Auxiliary Circuits		8	8	8
Approximate Weight	kg. lbs	4.12 9.08	6.16 13.59	13.83 30.50
Minimum Enclosure Size	Height	330 (13)	560 (22)	762 (30)
Approximate dimensions in millimeters (inches)	Width	301 (11-27/32)	344 (13-17/32)	424 (16-45/64)
	Depth	162 (6-3/8)	178 (7)	243 (9-9/16)
Switch Dimension Reference		C1	D1	F1
(See dimension drawings on 2-490, 2-492 and 2-492.)				

* Only CSA Certified HRCI-J) fuses and UL Listed Class J fuses are suitable for use with these disconnect switches.

† Based on Rockwell Automation tests in accordance with the requirements as defined in CSA C22.2 No. 4, IEC 60947-3 and UL 98.



Non-Fused Disconnect Switches For CSA and UL Class Applications§

Electrical Ratings							
Cat. No.		194R-NN100P3		194R-NN200P3		194R-NN400P3	
Maximum Fuse Cartridge Size		100*		200*		400*	
Maximum Voltage	AC [V]	600		600		600	
	DC [V]	250		250		250	
Ampere Rating		100		200		400	
Maximum Short Circuit Prospective Fault Current		100		100		100	
Fuse Operating Characteristics >		Time Delay	Non-Time Delay	Time Delay	Non-Time Delay	Time Delay	Non-Time Delay
Maximum Hp, 3-Phase AC	200V 60 Hz [Hp]	25	15	50	25	100	50
	230V 60 Hz [Hp]	30	15	60	25	125	50
	460V 60 Hz [Hp]	60	25	125	50	250	100
	575V 60 Hz [Hp]	75	30	150	60	300	125
Maximum Hp, 1-Phase AC	115V 60 Hz [Hp]	—	—	—	—	—	—
	230V 60 Hz [Hp]	15	15	25	15	50	25
Maximum Hp, DC	125V DC [Hp]	—	—	—	—	—	—
	250V DC [Hp]	20	20	40	40	50	50
Power Lost		20		40		80	

§ Non-fused disconnect switches must be used with separately installed CSA Certified HRCI-J or HRCI-T fuses; or UL Listed Class J or T fuses.

* When using CSA HRCI-J or HRCI-T fuses, and UL Class J or T fuses.

> Based on Rockwell Automation tests in accordance with the requirements as defined in CSA C22.2 No. 4, IEC 947-3 and UL 98.

Mechanical Data							
Cat. No.		194R-NN100P3		194R-NN200P3		194R-NN400P3	
Degree of Protection (per IEC 947)		IP00		IP00		IP00	
Switch Only		IP20		IP20		IP20	
Switch with Terminal Shield & Fuse Cover(s)		IP20		IP20		IP20	
Mechanical Endurance ‡	Operations	10 000		8 000		8 000	
Operating Torque, Max.	N•m (lb•in)	17.5 (155)		20.3 (180)		31.4 (275)	
Terminal Capacity	mm ²	2.5...35		16...120		Two 50...150	
	AWG	#14...#2		#6...250MCM		Two 1/0...350MCM	
Auxiliary Contact Terminals	mm ²	2.5...4		2.5...4		2.5...4	
	AWG	#14...#12		#14...#12		#14...#12	
Maximum Number of Auxiliary Circuits		8		8		8	
Approximate Weight	kg	4.31		6.56		14.97	
	lbs	9.50		14.47		33.00	
Minimum Enclosure Size	Height	330 (13)		560 (22)		762 (30)	
	Width	301 (11-27/32)		344 (13-17/32)		424 (16-45/64)	
	Depth	162 (6-3/8)		178 (7)		243 (9-9/16)	
Switch Dimension Reference (See dimension drawings on 2-490, 2-492 and 2-492.)		C1		D1		F1	

* Non-fused disconnect switches must be used with separately installed CSA Certified HRCI-J, HRCI-T fuses; or UL Listed Class J or T fuses.

‡ Based on Rockwell Automation tests in accordance with the requirements as defined in CSA C22.2 No. 4, IEC 60947-3, and UL 98.

All Bulletin 194R Disconnect Switches, 100 A, 200 A, 400 A Range

Environmental Data	
Ambient Temperature	
Open	-2...+55 °C (-4...+131 °F)
Enclosed	-20...+40 °C (-4...+104 °F)
Storage	-40...+65 °C (-40...+149 °F)
Altitude (per IEC 947-1)	
2,000	
Relative Humidity (per IEC 947-1)	
90% @ +20 °C (+68 °F)	
50% @ +40 °C (+104 °F)	

Auxiliary Contact Ratings for Cat. No. 195-GA

AC11 Rating		DC11 Rating	
U_e [V]	I_e [A]	U_e [V]	I_e [A]
12...120	6	28	5.0
220...240	3	110	1.25
380...480	1.5	220	0.62
500...600	1.2	440	0.27
		600	0.20

Thermal Current — 10 Amperes. EEMAC/NEMA A600, P300.
Insulation Voltage IEC (U_i) — 660.

Wiring Schematic

U.L. CSA LISTED SWITCHES	DIMENSION REFERENCE	CIRCUIT
Cat. No.		
194R-NH100P3 194R-NH200P3 194R-NH400P3	D1 E1 F1	
194R-NJ100P3 194R-NJ100P3 194R-NJ100P3	C1 D1 F1	
194R-NN100P3 194R-NN200P3 194R-NN400P3	C1 D1 F1	
OTHER SWITCHES	DIMENSION REFERENCE	CIRCUIT
Cat. No.		
194R-NA380P3 194R-NA400P3 194R-NB200P3 194R-NB300P3	C1 D1 E1 F1	

Renewal Parts

Hardware Kits (Includes switch/fuse mounting hardware and operating rod cotter pin)

Disconnect Switch		Hardware Kit Part No.
Cat. No.	Dim. Ref.	
194R-NA380P3 194R-NN100P3 194R-NJ100P3	C1, C2	41022-800-03 41022-800-02 41022-800-01
194R-NA400P3 194R-NN200P3 194R-NJ200P3 194R-ND072P3	D1, D2	41022-800-07 41022-800-06 41022-800-05 41022-800-04

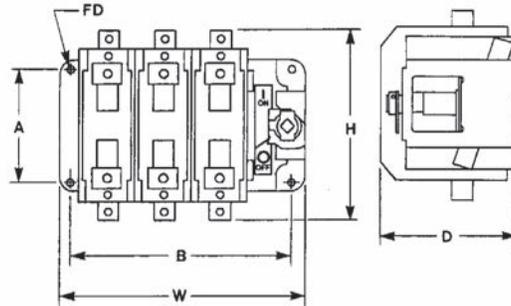
Disconnect Switch		Hardware Kit Part No.
Cat. No.	Dim. Ref.	
194R-NH200P3 194R-ND250P3 194R-NB200P3 194R-NH100P3 194R-ND138P3	E1, E2	41022-800-12 41022-800-11 41022-800-10 41022-800-09 41022-800-08
194R-NH400P3 194R-ND300P3 194R-NB300P3 194R-NN400P3 194R-NJ400P3	F1	41022-800-17 41022-800-16 41022-800-15 41022-800-14 41022-800-13

IEC Fused and Non-Fused Disconnects, 100...400 A

Approximate Dimensions

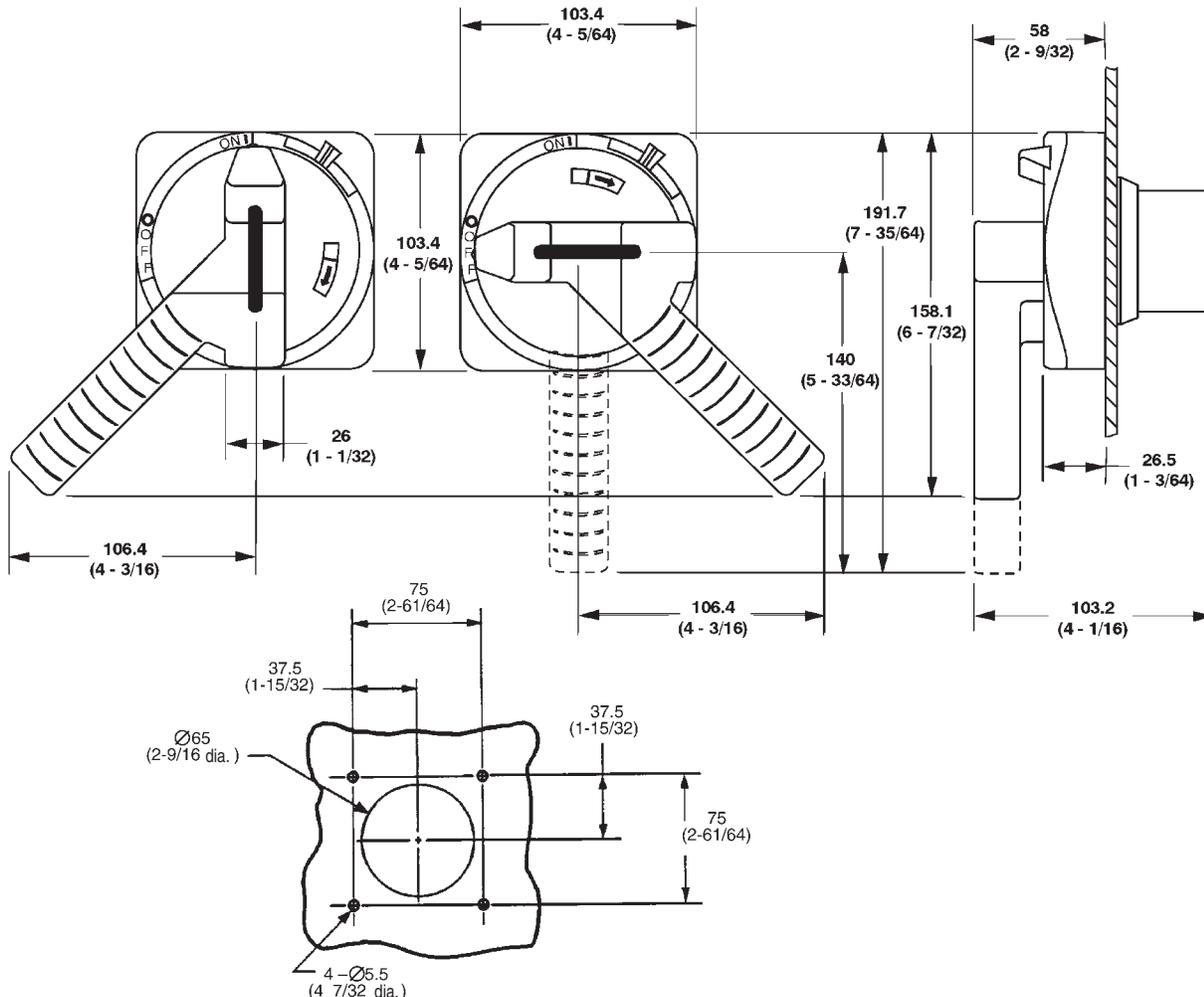
Dimensions in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Disconnect Switch Dimension References C1, C2, D1, D2, E1, E2 and F1 (100, 200, and 400 A)



Disconnect Switch Dimension Reference	Approximate Dimensions					
	H	W	D	A	B	FD
C1	148 (5-53/64)	194 (7-41/64)	130 (5-7/64)	106 (4-11/64)	170 (6-11/16)	4-M6 (4-1/4)
C2	148 (5-53/64)	194 (7-41/64)	136 (5-23/64)	106 (4-11/64)	170 (6-11/16)	4-M6 (4-1/4)
D1	184 (7-1/4)	236 (9-19/64)	148 (5-53/64)	106 (4-11/64)	212 (8-11/32)	4-M6 (4-1/4)
D2	184 (7-1/4)	236 (9-19/64)	153 (6-1/64)	106 (4-11/64)	212 (8-11/32)	4-M6 (4-1/4)
E1	220 (8-21/32)	278 (10-15/16)	213 (8-25/64)	150 (5-29/32)	252 (9-59/64)	4-M8 (4-5/16)
E2	220 (8-21/32)	278 (10-15/16)	213 (8-25/64)	150 (5-29/32)	252 (9-59/64)	4-M8 (4-5/16)
F1	250 (9-27/32)	308 (12-1/8)	213 (8-25/64)	150 (5-29/32)	282 (11-7/64)	4-M8 (4-5/16)

Operating Handles — Cat. No. 194R-HM.../190-HM

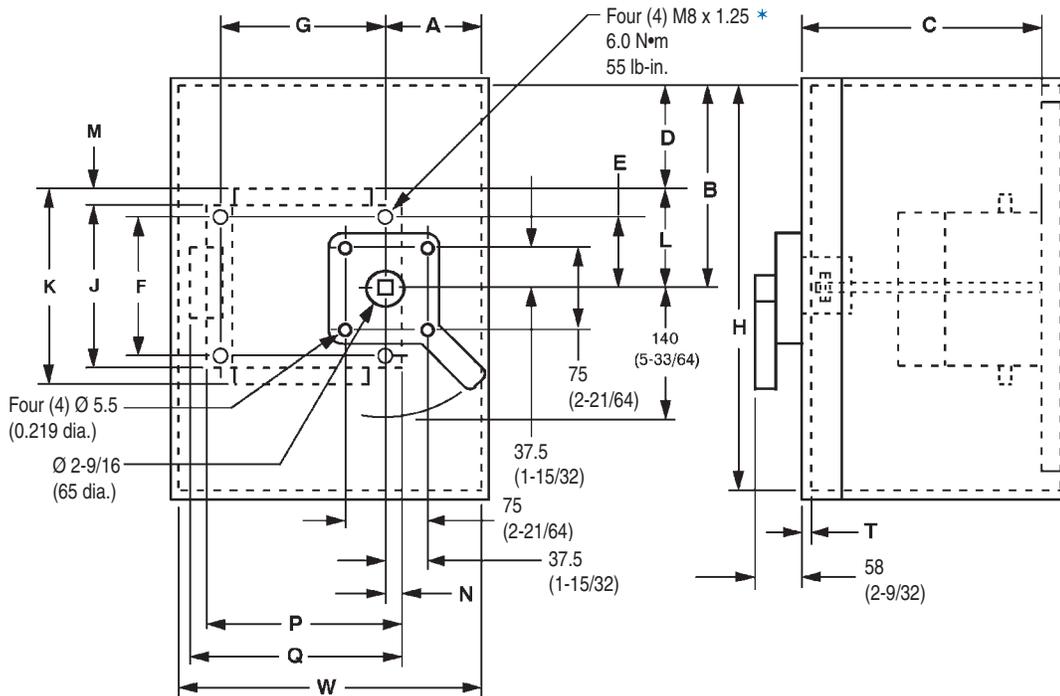


IEC Fused and Non-Fused Disconnects, 100...400 A

Approximate Dimensions

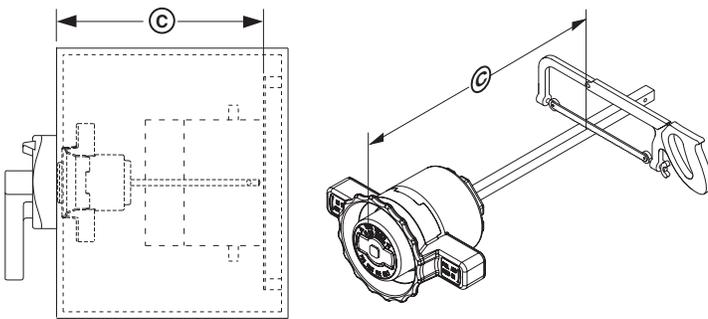
Dimensions in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Disconnect Switch Dim. Ref.: C1, C2, D1, D2 (100 A and 200 A)



*The switch is capable of accepting four (4) 6.4 diameter (1/4 dia.) screws for mounting.

NFPA 79 Operating Handles/Shfts Cat. Nos. 194R-NHR...



Disconnect			C
194R-NH100	194R-NJ200	194R-NA380	≥ 216 mm 8.5 in
194R-NJ100	194R-NN200	194R-ND072	
194R-NN100	194R-NA400	194R-ND138	
194R-NB200	194R-ND300	194R-NJ400	≥ 305 mm 12.0 in
194R-NB300	194R-NH200	194R-NN400	
194R-ND250	194R-NH400		

Enclosure Installation Dimensions

Dimension Reference	A		B		C		H		T		W	
	Minimum	Minimum	Minimum	Maximum	Minimum	Minimum	Minimum	Maximum	Minimum			
									Single Pole Aux. Cont.	Two Pole Aux. Cont.		
C1	108 (4-1/4)	162 (6-3/8)	162 (6-3/8)	457 (18)	330 (13)	1.6 (1/16)	4.8 (3/16)	301 (11-27/32)	313 (12-5/16)			
C2	108 (4-1/4)	162 (6-3/8)	168 (6-5/8)	457 (18)	330 (13)	1.6 (1/16)	4.8 (3/16)	301 (11-27/32)	313 (12-5/16)			
D1	108 (4-1/4)	280 (11)	178 (7)	457 (18)	560 (22)	1.6 (1/16)	4.8 (3/16)	344 (13-17/32)	356 (14)			
D2	108 (4-1/4)	280 (11)	183 (7-7/32)	457 (18)	560 (22)	1.6 (1/16)	4.8 (3/16)	344 (13-17/32)	356 (14)			

IEC Fused and Non-Fused Disconnects, 100...400 A

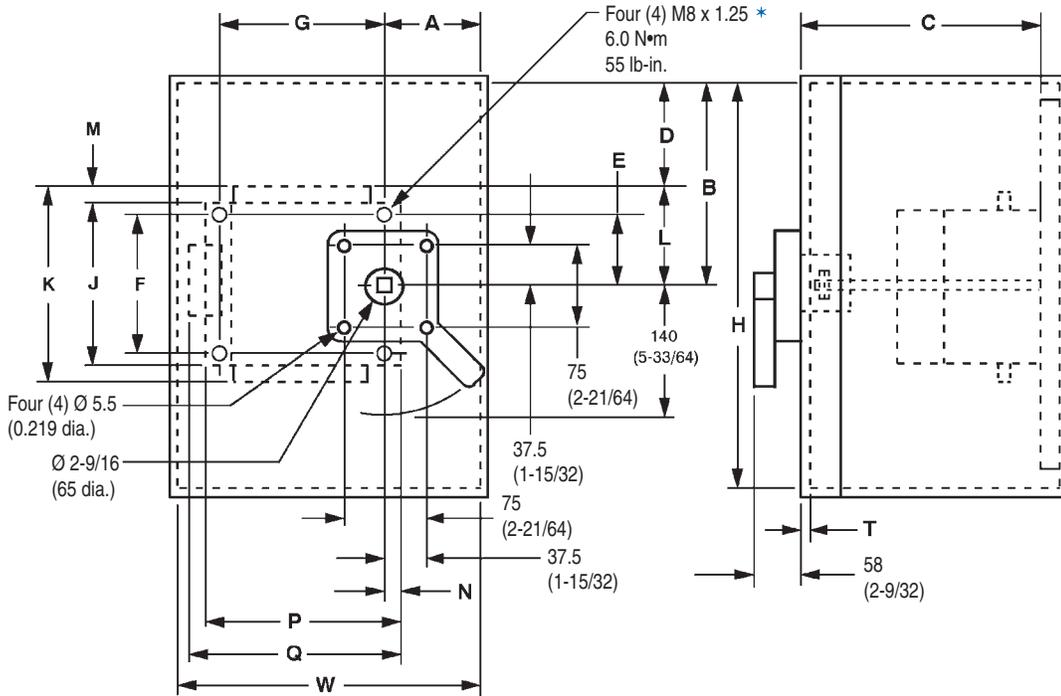
Approximate Dimensions

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

Disconnect Switch and Operating Handle Installation Dimensions

Dimension Reference	D	E	F	G	J	K	L	M	N	P	Q
C1, C2	74 (2-29/32)	53 (2-3/32)	106 (4-3/16)	170 (6-11/16)	148 (5-53/64)	176 (6-15/16)	88 (3-15/32)	13.5 (17/32)	12.7 (1/2)	194 (7-41/64)	206 (8-7/64)
D1, D2	162 (6-23/64)	53 (2-3/32)	106 (4-3/16)	212 (8-11/32)	184 (7-1/4)	236 (9-9/32)	118 (4-41/64)	26 (1-1/32)	12.7 (1/2)	236 (9-19/64)	248 (9-49/64)

Disconnect Switch Dim. Ref.: E1, E2, F1 (200 and 400 A)



* The switch is capable of accepting four (4) 7.9 diameter (5/16 dia.) screws for mounting.

Enclosure Installation Dimensions

Dimension Reference	A		B		C		H		T		W		
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum		
											Single Pole Aux. Cont.	Two Pole Aux. Cont.	
E1	108 (4-1/4)	610 (24)	305 (12)	610 (24)	227 (8-15/16)	610 (24)	610 (24)	1.6 (1/16)	4.8 (3/16)	1.6 (1/16)	4.8 (3/16)	394 (15-33/64)	406 (16)
E2	108 (4-1/4)	610 (24)	356 (14)	610 (24)	227 (8-15/16)	610 (24)	712 (28)	1.6 (1/16)	4.8 (3/16)	1.6 (1/16)	4.8 (3/16)	394 (15-33/64)	406 (16)
F1	108 (4-1/4)	610 (24)	381 (15)	610 (24)	243 (9-9/16)	610 (24)	762 (30)	1.6 (1/16)	4.8 (3/16)	1.6 (1/16)	4.8 (3/16)	606 (23-7/8)	606 (23-7/8)

Disconnect Switch and Operating Handle Installation Dimensions

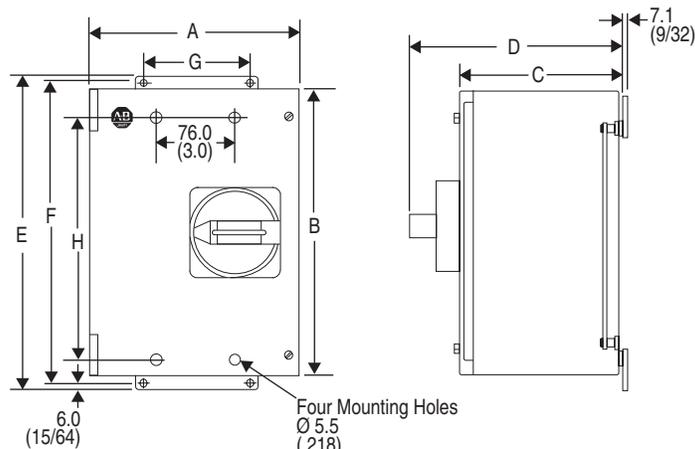
Dimension Reference	D	E	F	G	J	K	L	M	N	P	Q
E1	158 (6-7/32)	75 (2-61/64)	150 (5-29/32)	252 (9-59/64)	220 (8-21/32)	294 (11-37/64)	147 (5-25/32)	37 (1-29/64)	14 (35/64)	278 (10-15/16)	290 (11-13/32)
E2	209 (8-7/32)	75 (2-61/64)	150 (5-29/32)	252 (9-59/64)	220 (8-21/32)	294 (11-37/64)	147 (5-25/32)	37 (1-29/64)	14 (35/64)	278 (10-15/16)	290 (11-13/32)
F1	202 (7-61/64)	75 (2-61/64)	150 (5-29/32)	282 (11-7/64)	250 (9-27/32)	358 (14-3/32)	179 (7-3/64)	54 (2-1/8)	14 (35/64)	308 (12-1/8)	320 (12-19/32)

IEC Fused and Non-Fused Disconnects, 100...400 A

Approximate Dimensions

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

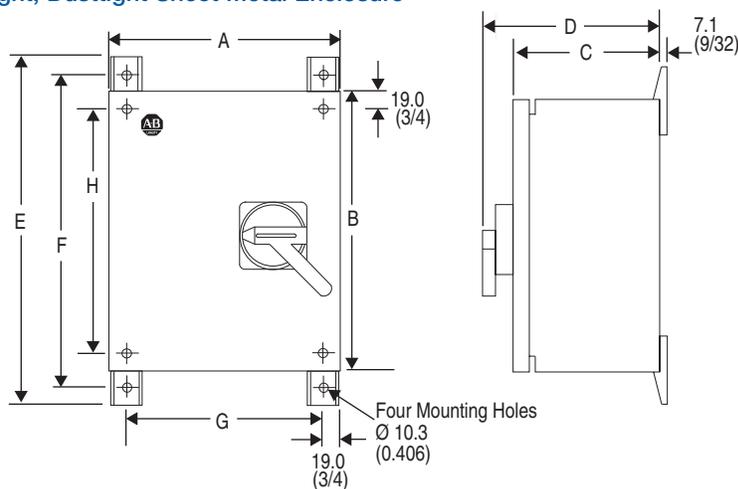
IP66 (Type 3/4/12) Watertight, Dusttight Sheet Metal Enclosure



External Mounting Feet Optional Cat. No. 198-F1

[A]	Type	Dim. Ref.	A	B	C	D	E	F	G	H
30	Non-Fused & Fused	A1 & A2	200 (7-7/8)	300 (11-13/16)	160 (6-19/64)	200 (7-7/8)	325 (12-51/64)	313 (12-21/64)	105 (4-1/8)	236 (9-9/32)
60	Non-Fused & Fused	B1 & B2	200 (7-7/8)	300 (11-13/16)	160 (6-19/64)	200 (7-7/8)	325 (12-51/64)	313 (12-21/64)	105 (4-1/8)	236 (9-9/32)
100	Non-Fused & Fused	C1	400 (15-3/4)	350 (13-25/32)	210 (8-9/32)	250 (9-27/32)	375 (14-3/4)	363 (14-19/64)	206 (8-1/8)	724 (28-1/2)

IP66 (Type 3/4/12) Watertight, Dusttight Sheet Metal Enclosure



External Mounting Feet Optional Cat. No. 198-F3

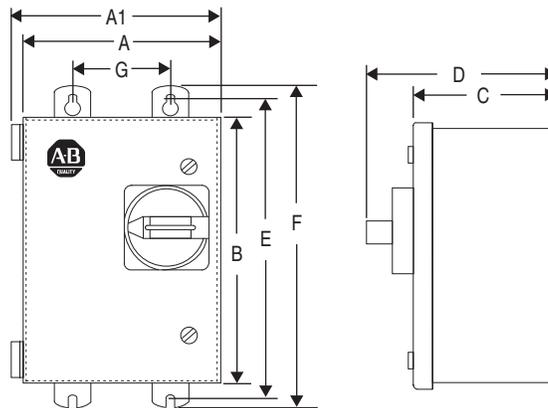
[A]	Type	Dim. Ref.	A	B	C	D	E	F	G	H
200	Non-Fused & Fused	D1	406 (16)	610 (24)	224 (8-51/64)	282 (11-5/64)	688 (27-5/64)	648 (25-1/2)	368 (14-1/2)	572 (22-1/2)
400	Non-Fused & Fused	F1	610 (24)	762 (30)	326 (12-51/64)	384 (15-5/64)	840 (33-5/64)	800 (31-1/2)	572 (22-1/2)	724 (28-1/2)

IEC Fused and Non-Fused Disconnects, 100...400 A

Approximate Dimensions

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

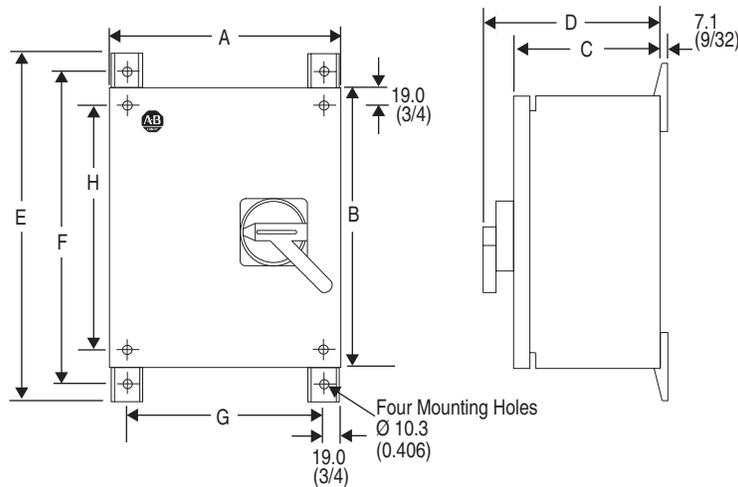
Type 4/4X Watertight, Corrosion-Resistant Stainless Steel Enclosure



External Mounting Feet Optional Cat. No. 198-F3

[A]	Type	Dim. Ref.	A	A1	B	C	D	E	F	G	H
30	Non-Fused	A1	159 (6-1/4)	170 (6-11/16)	240 (9-7/16)	123 (4-27/32)	163 (6-7/16)	254 (10)	273 (10-3/4)	83 (3-1/4)	—
	Fused	A2	214 (8-7/16)	225 (8-7/8)	265 (10-7/16)	125 (4-29/32)	165 (6-1/2)	279 (11)	298 (11-23/32)	83 (3-1/4)	—
60	Non-Fused & Fused	B1 & B2	214 (8-7/16)	225 (8-7/8)	265 (10-7/16)	125 (4-29/32)	165 (6-1/2)	279 (11)	298 (11-23/32)	83 (3-1/4)	—

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



External Mounting Feet Optional Cat. No. 198-F3

[A]	Type	Dim. Ref.	A	A1	B	C	D	E	F	G	H
100	Non-Fused & Fused	C1	508 (20)	—	406 (16)	224 (8-51/64)	282 (11-7/64)	484 (19-5/64)	444 (17-1/2)	470 (18-1/2)	368 (14-1/2)
200	Non-Fused & Fused	D1	610 (24)	—	406 (16)	224 (8-51/64)	282 (11-5/64)	484 (19-5/64)	444 (17-1/2)	572 (22-1/2)	368 (14-1/2)
400	Non-Fused & Fused	F1	762 (30)	—	610 (24)	326 (12-51/64)	384 (15-5/64)	840 (33-5/64)	800 (31-1/2)	724 (28-1/2)	572 (22-1/2)

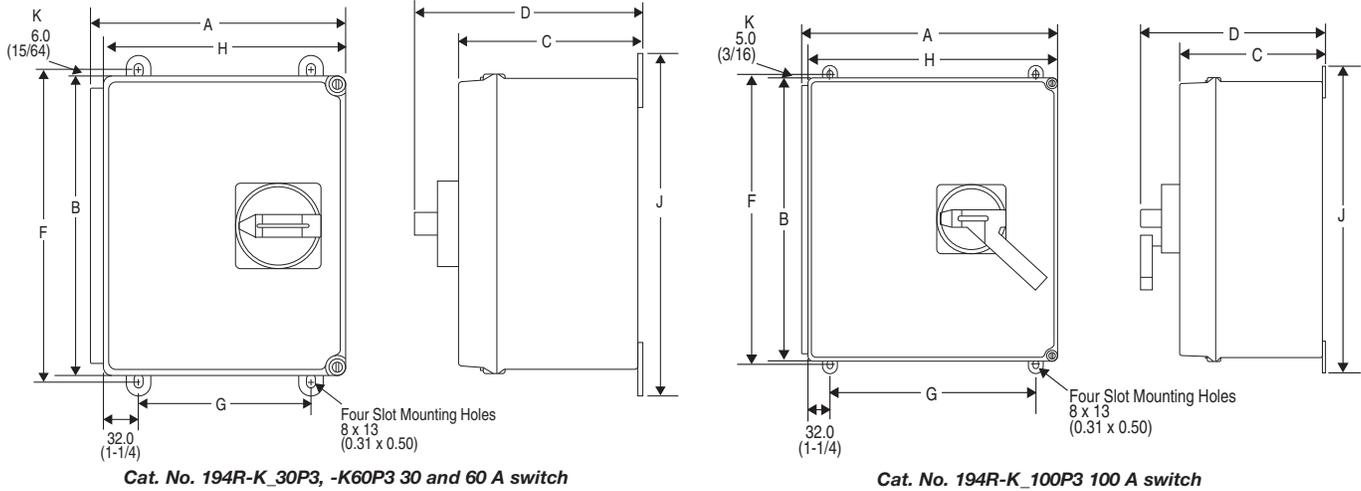


IEC Fused and Non-Fused Disconnects, 100...400 A

Approximate Dimensions

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

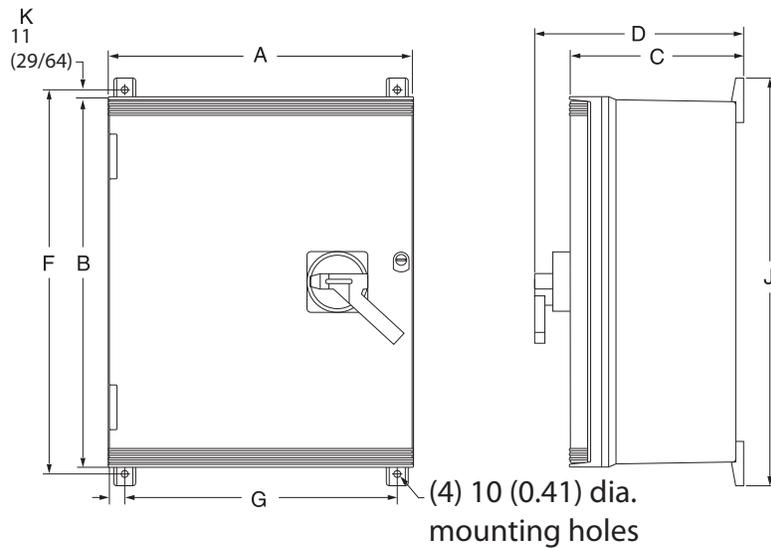
IP66 (Type 3/4/4X/12) Corrosion-Resistant, Non-Metallic Enclosure



2

Switch Size [A]	A	B	C	D	F	G	J	K
30/60	226 (8-59/64)	267 (10-1/2)	163 (6-27/64)	202 (7-61/64)	278 (10-61/64)	152 (6)	305 (12)	6 (15/64)
100	379 (14-15/16)	420 (16-1/4)	215 (8-31/64)	273 (10-49/64)	430 (16-61/64)	305 (12)	457 (18)	5 (13/64)

IP66 (Type 3/4/4X/12) Corrosion-Resistant, Non-Metallic Enclosure



Switch Size [A]	A	B	C	D	F	G	J	K
200	513 (20-13/64)	625 (24-5/8)	292 (11-31/64)	350 (13-25/32)	648 (25-1/2)	457 (18)	686 (27)	11 (7/16)
400	612 (24-1/8)	775 (30-33/64)	342 (13-31/64)	401 (15-25/32)	796 (31-11/32)	555 (21-7/8)	834 (32-27/32)	11 (27/64)

IEC Fused and Non-Fused Disconnects

Overview/Product Selection

2



Bulletin 194R-FC NFPA 79 Compliant IEC Fused and Non-Fused Disconnects with Cable-Operated Handle for Flange-Style Enclosures

- Cable-operated disconnect kit with interlock
- Open switches
- Compatible with all Bulletin 194R 30 and 60 A Next Generation fused and non-fused disconnects (sold separately)
- Uses Bulletin 1494F handles (sold separately)
 - IP66 (Type 3R, 3, 12, 4, 4X)
- Padlockable handle mounts to flange-styled enclosures
- Cable options available in 3...10 ft. lengths
- NFPA 2002 Compliant

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Product Selection this page
 Approximate Dimensions..... 2-497

Standards Compliance for Disconnect Switch

IEC 60947-4-1/EN60947-3
 BS EN60947-3
 VDE 0660
 CSA 22.2 No. 4
 NEMA KS-1
 UL 98

Certifications

UL Listed (File No. E 47426, Guide WHTY)
 CSA Certified (File No. LR1234)
 CE
 ASTA Certified
 LOVAG Certified

The Bulletin 194R-FC cable-operated disconnect with interlock is another Rockwell Automation exclusive, providing a fully compliant solution to the 2002 changes in the National Fire Protection Association 79 (NFPA 79).

The new 194R-FC combines the small size of the 194R IEC next generation disconnect with the flexibility of a cable-operated mechanism to provide an NFPA 79 IEC solution for flange style enclosures. The 194R-FC bracketed mechanism for 194R 30 and 60 A devices attaches to the 194R next generation disconnect switch base and operates the ON-OFF action via cable to a standard 1494F handle.

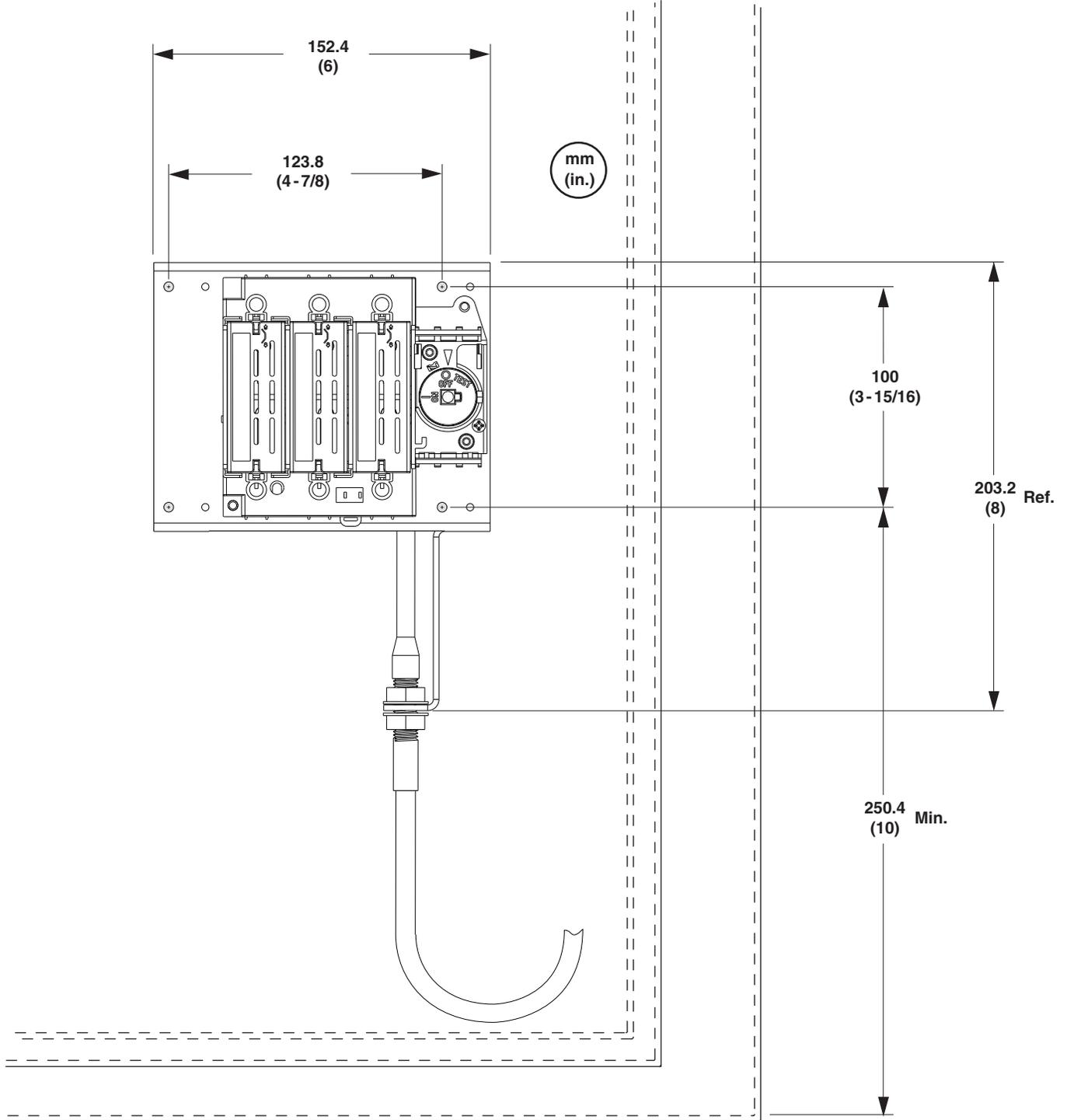
The 194R-FC handle/interlock mechanism provides the 'no-tools' operation and the secondary interlock as required by NFPA 79 2002 changes. The 194R-FC cable-operated disconnect is offered in 3...10 ft cable lengths, allowing a variety of placement options for the 194R disconnect within the enclosure. The handle (ordered separately) is available in 3 different styles: plastic, stainless steel, or painted metal.

Product Selection

Description	Cable Length	Cat. No.
Cable-operated disconnect switch with handle	3 ft.	194R-FC03
	4 ft.	194R-FC04
	6 ft.	194R-FC06
	10 ft.	194R-FC010

Approximate Dimensions

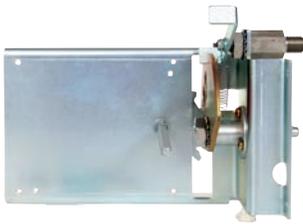
Dimensions are in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.



IEC Fused and Non-Fused Disconnects

Overview/Product Selection

2



Cat. No. 194R-SDK1
Side-Mount Disconnect Switch Kit
 for all Bul. 194R 30 and 60 A Next
 Generation switches and
 Cat. No. 194R-HS... handles

Cat. No. 194R-SDK1 NFPA 79 Compliant IEC Fused and Non-Fused Disconnects, Side-Mounted Kit

- Used with all 30/60 A Next Generation fused and non-fused disconnects and Bul 194R-HS handles (both sold separately)
- Open switches
- Operating handle ingress ratings:
 - IP66 (Type 3R, 3, 12, 4, 4X)
- Padlockable handle

The Cat. No. 194R-SDK1 side-mount handle provides NFPA 79 compliancy with a bracketed switch and interlock system that is another Allen-Bradley exclusive. The 194R-HS rotary handle is mounted to the side of the enclosure and attaches to the 194R next generation disconnect and interlock mechanism. The side handle remains connected to the switch and interlock mechanism at all times. This solution provides the single, side handle design with the NFPA 79 compliancy of the secondary interlock. This kit is used with the 194R-HS family of disconnect handles (sold separately).

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 Approximate
 Dimensions..... 2-499

Standards Compliance and Certifications

Standards Compliance for Disconnect Switch

IEC 60947-4-1/EN60947-3
 BS EN60947-3
 VDE 0660
 CSA 22.2 No. 4
 NEMA KS-1
 UL 489

Standards Compliance for Kit: Side-Mount Handle Mechanism with Disconnect Switch

UL 98
 CSA 22.2 No. 4

Certifications

UL Listed (File No. E119349, Guide WJAZ)
 CSA Certified (File No. LR1234)
 CE

Certifications for Kit: Side-Mount Handle Mechanism with Disconnect Switch

UL Listed (File No. E47426, Guide WHTY)
 CSA Certified (File No. LR1234)

Product Selection

Description	For Use With	Cat. No.
Side-Mounted Kit (Disconnect Mechanism and Bracket)	All Bul. 194R Next Generation 30/60 A disconnects and Bul. 194R-HS handles	194R-SDK1



Approximate Dimensions

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

