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

Bulletin 140M Motor Protection Circuit Breakers

- Current Range 0.1…630 A
- UL Listed for Motor Loads
  - – Short Circuit Protection
  - – Overload Protection
- Visible Trip Indication
- High Current Limiting
- High Switching Capacity

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.

Your order must include: cat. no. of the Motor Protection Circuit Breaker selected and, if required, cat. no. of any accessories.

Table of Contents

Standards Compliance

IEC/EN 60947-1, -2, -4-1, -5-1
IEC/EN 60204-1
CSA, C22.2 No.14
UL 508
UL 489

Certifications

CE Marked
cULus Listed (File No. E197878, E205542, Guide DIVQ/DIVQ7, NKJH/NKJH7)
CCC
CSA Certified

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 2-17 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 2-17 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	25 A	25 A	45 A	90 A	205 A	250 A	630 A
Current Rating	0.1…25 A	1.6…25 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	✓	✓	✓	✓	—	—	—
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.)	✓	✓	✓	✓	—	—	—
UL 508 Manual, Self Protected (Type E)	✓	✓	✓	—	—	—	—
UL 508 (Overload Protection)	✓	✓	✓	✓	✓	✓	✓
UL 489	—	—	—	—	✓	✓	✓
IEC 60947-1, -2	✓	✓	✓	✓	✓	✓	✓
IEC 60947-4-1	✓	✓	✓	✓	✓	✓	✓
CE	✓	✓	✓	✓	✓	✓	✓
ATEX	✓	✓	—	—	—	—	—
CCC	✓	✓	✓	—	—	—	—
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 – E – A63 – KN – CC – GJ

a b c d e f g h

a

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

b

Frame Size and Rating	
Code	Description
C	25 A
D	25 A
F	45 A
I	205 A
J	250 A
L	400 A and 600 A

c

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

d

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

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

f

Miscellaneous See page 2-33

g

Aux/Trip Contacts See page 2-33

h

UV and Shunt Trips See page 2-33

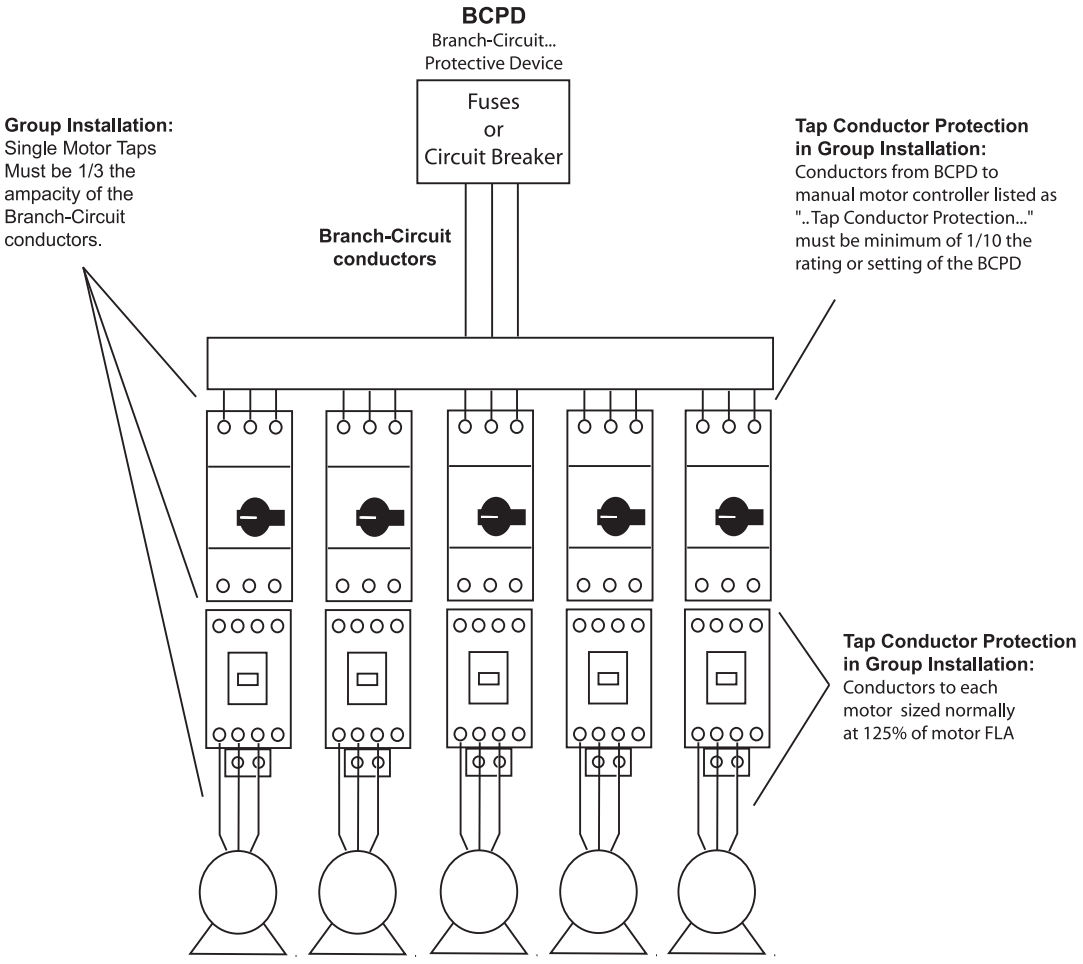
Group Installation with MPCBs

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 more motors or one or more motors and other loads to be connected to the same branch-circuit...". The most restrictve 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.



Group Motor Installation

3-Phase Power Supply

Multiple Motor Installation with MPCBs

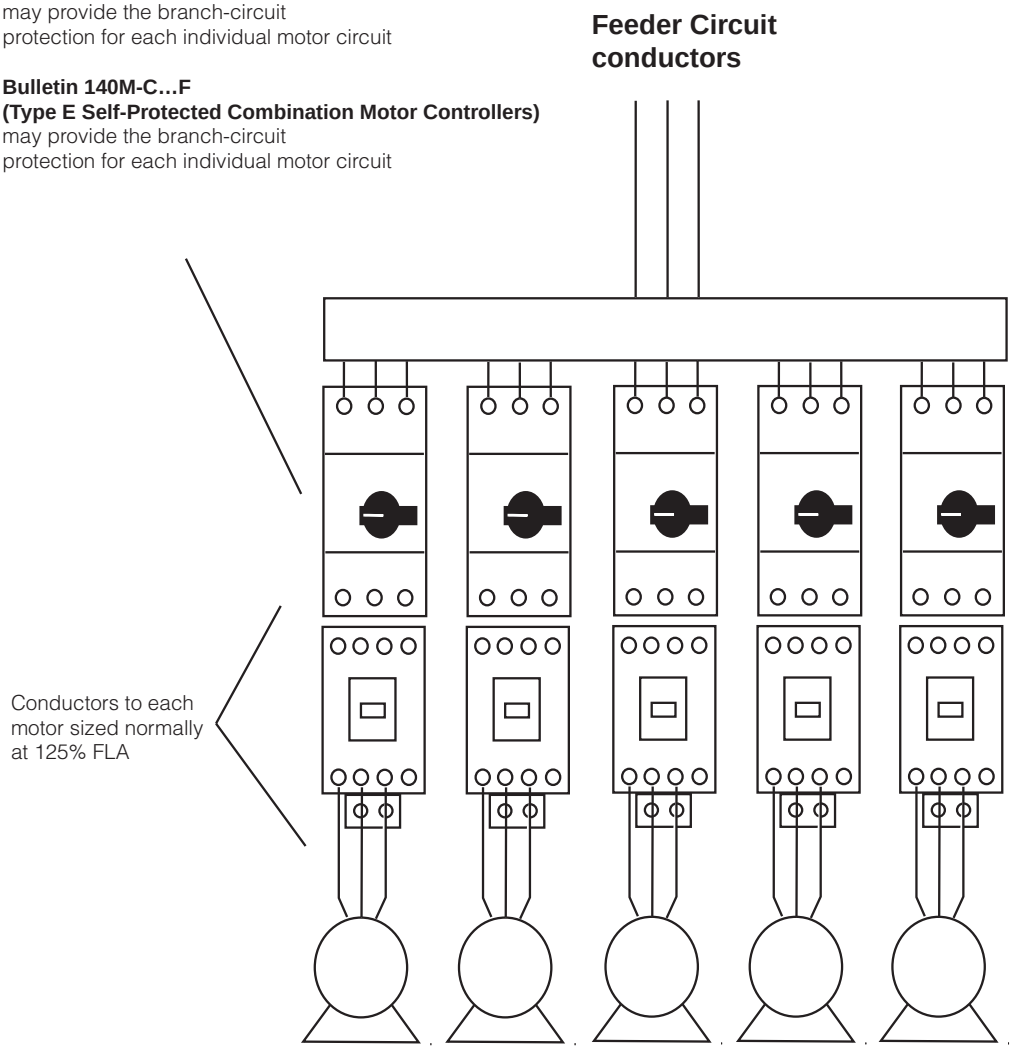
Each Motor has an Individual Branch Circuit Protective Device

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 cuircuits, 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).

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



Multi-Motor Installation

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.

2

Product Selection — Motor Protection Circuit Breakers

- Short Circuit Protection — Standard Magnetic Trip (Fixed at 13 x I_e)
- Overload Protection — Trip Class 10

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]	Ultimate Interrupting Current [kA] (I_{cu})		Max. 3-phase Hp Ratings*				Max. kW, 3-Phase*				Cat. No.
			400V	480V	200V	230V	460V	575V	230V	400/415V	500V	690V	
C-Frame													
0.16	0.10…0.16	2.1	100	65	—	—	—	—	—	0.02	—	—	**140M-C2E-A16**
0.25	0.16…0.25	3.3	100	65	—	—	—	—	—	0.06	—	—	**140M-C2E-A25**
0.4	0.25…0.40	5.2	100	65	—	—	—	—	—	0.09	—	—	**140M-C2E-A40**
0.63	0.40…0.63	8.2	100	65	—	—	—	—	0.09	0.18	0.18	0.25	**140M-C2E-A63**
1	0.63…1.0	13	100	65	—	—	0.5	0.75	0.12	0.25	0.37	0.55	**140M-C2E-B10**
1.6	1.0…1.6	21	100	65	—	—	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	50	30	5	5	10	15	4	7.5	10	13	**140M-C2E-C16**
20	14.5…20	260	15	30	5	7.5	15	20	5.5	10	11	17	**140M-C2E-C20**
25	18…25	325	15	25	7.5	7.5	15	20	—	11	15	22	**140M-C2E-C25**
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	50	65	5	7.5	15	20	5.5	10	11	17	**140M-D8E-C20**
25	18…25	325	50	30	7.5	7.5	15	20	—	11	15	22	**140M-D8E-C25**
F-Frame													
10	6.3…10	130	65	65	3	3	7.5	10	2.2	4	6.3	7.5	**140M-F8E-C10**
16	10…16	208	65	65	5	5	10	15	4	7.5	10	13	**140M-F8E-C16**
20	14.5…20	260	65	65	5	7.5	15	20	5.5	10	11	17	**140M-F8E-C20**
25	18…25	325	65	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	25	**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 and, in North America, service factor.**

Visit our website: www.ab.com/catalogs
Preferred availability cat. nos. are printed in **bold**

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 [A] (I_e)	Motor Current Adjustment Range [A]	Magnetic Trip Current [A]	Ultimate Interrupting Current [kA] (I_{cm})		3-phase Hp Ratings∗				Max. kW, 3-Phase∗				Cat. No.
			400V	480V	200V	230V	460V	575V	230V	400/415 V	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**
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
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 and, in North America, service factor.**

❄ For IEC approvals and CE marking, add an "E" to the end of the Cat. No. Example: 140M-18E-C80E.

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

§ Overload Protection — fixed Trip Class 10.

Motor Protection Circuit Breakers

- Short Circuit Protection — High Magnetic Trip (Fixed at 16…20 x I_e)
- Overload Protection — Trip Class 10

Cat. No. 140M-C

Cat. No. 140M-D

Cat. No. 140M-F

Rated Operational Current [A] (I_e)	Motor Current Adjustment Range [A]	Magnetic Trip Current [A]	Ultimate Interrupting Current [kA] (I_{cm})		Max. 3-phase Hp Ratings*				Max kW, 3-Phase*				Cat. No.
			400V	480V	200V	230V	460V	575V	230V	400/415V	500V	690V	
C-Frame													
0.16	0.10…0.16	3.3	100	65	—	—	—	—	—	0.02	—	—	140M-C2T-A16
0.25	0.16…0.25	5.2	100	65	—	—	—	—	—	0.06	—	—	**140M-C2T-A25**
0.4	0.25…0.40	8.2	100	65	—	—	—	—	—	0.09	—	—	**140M-C2T-A40**
0.63	0.40…0.63	13	100	65	—	—	—	—	0.09	0.18	0.18	0.25	**140M-C2T-A63**
1	0.63…1.0	21	100	65	—	—	0.5	0.75	0.12	0.25	0.37	0.55	**140M-C2T-B10**
1.6	1.0…1.6	33	100	65	—	—	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	50	30	3	3	7.5	10	2.2	4	6.3	7.5	**140M-C2T-C10**
16	10…16	260	15	30	5	5	10	15	4	7.5	10	13	**140M-C2T-C16**
D-Frame													
16	10…16	260	50	65	5	5	10	15	4	7.5	10	13	**140M-D8T-C16**
20	14.5…20	325	50	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	25	**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 and, in North America, service factor.**

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)

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

Certifications (3…1200 A)

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

Table of Contents

Standards Compliance

IEC/EN 60947-1, 2, -4-1, -5-1
IEC/EN 60204-1
CSA, C22.2 No.14
UL 508
UL 489

Your order must include: cat. no. of the Motor Circuit Protector selected and, if required, cat. no. of any accessories.

2

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 2-19 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 2-19. 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	25 A	45 A	100 A	250 A	600 A	1200 A
Current Rating	0.16…2.5 A	2.5…25 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	✓	✓	✓	—	—	—	—
Accessories							
Ext. Rotary Operator	✓	✓	✓	✓	✓	✓	✓
Flex Cable Operator	—	—	—	✓	✓	✓	✓
Auxiliary Contacts	✓	✓	✓	✓	✓	✓	✓
Trip Indication Contacts	✓	✓	✓	✓	✓	✓	✓

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	25 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 x In)
P	Adj Mag Only (less than 13 x In)- MCPs
R	Adj Mag Only (greater than 13 x In) - 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

f

Miscellaneous See page 2-33

g

Aux/Trip Contacts See page 2-33

h

UV and Shunt Trips See page 2-33

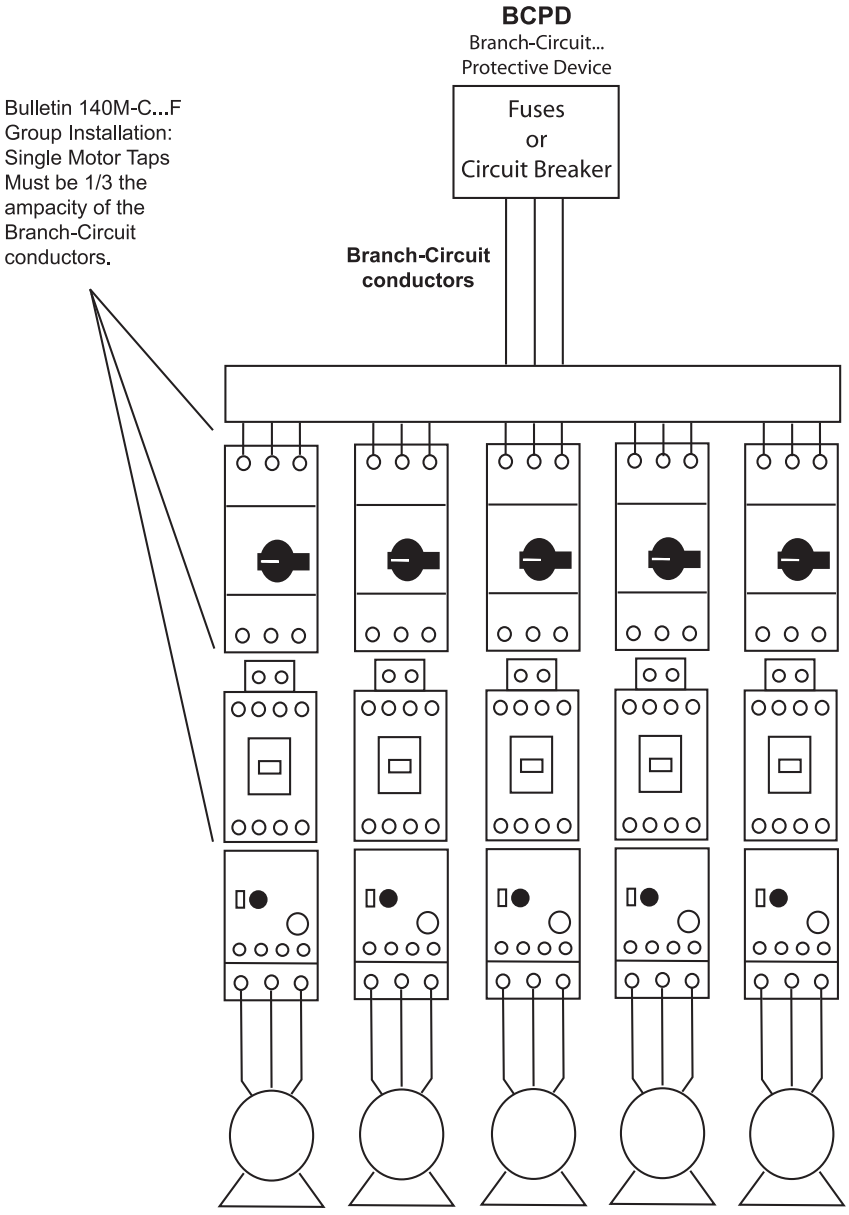
Group Installation with MCPs

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 more motors or one or more motors and other loads to be connected to the same branch-circuit...". The most restrictve 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, MCP's cannot be UL/CSA listed for Tap Conductor Protection in Group Installations.



Group Motor Installation

3-Phase Power Supply

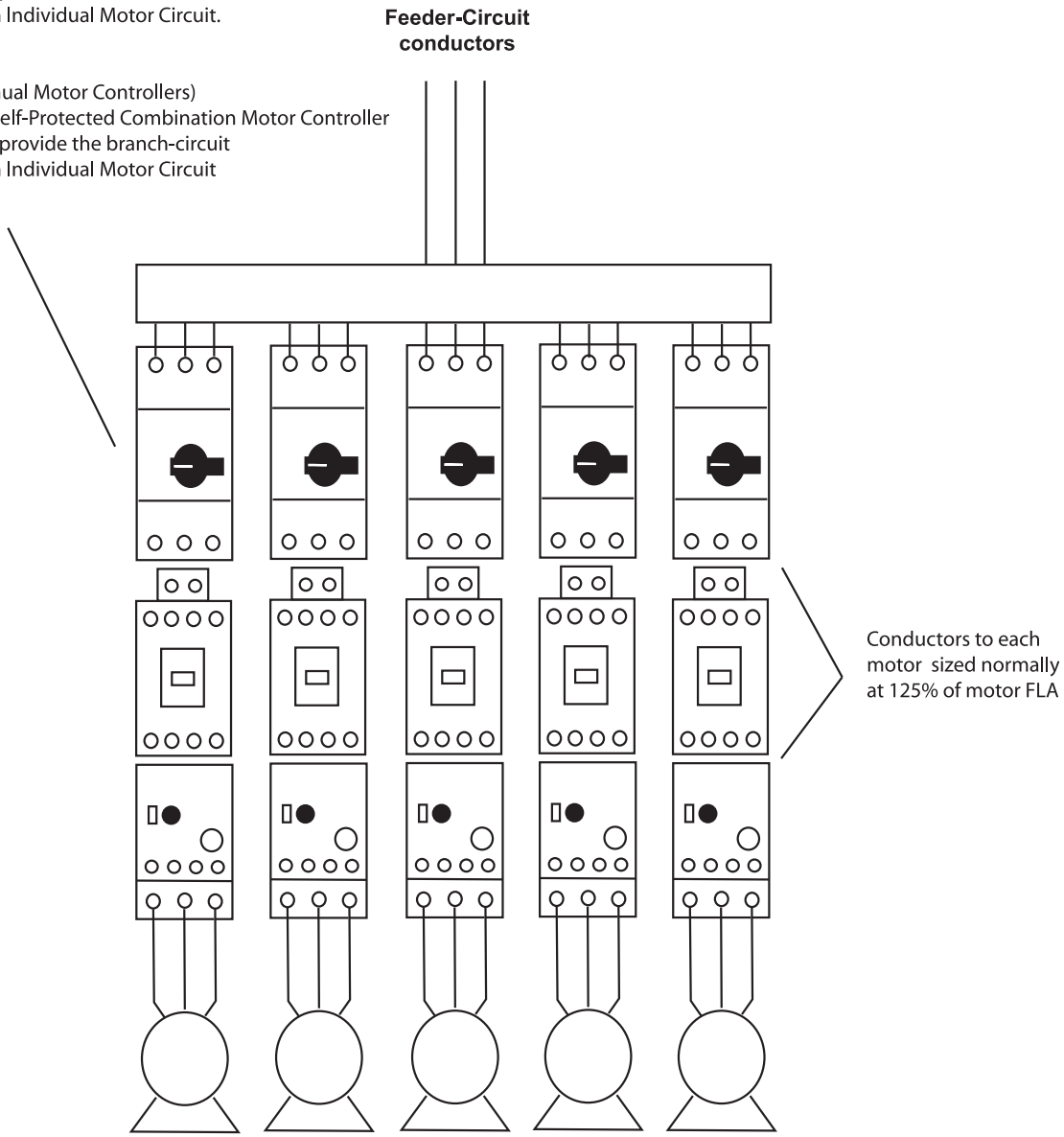
Multiple Motor Installation with MCPs

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

Motor Circuit Protectors

- Short-circuit protection — standard magnetic trip (fixed at 13 x I_e)
- Overload protection — none (magnetic trip only)
- For Trip Class 10 motor applications‡

Cat. No. 140M-C

Cat. No. 140M-D

Cat. No. 140M-F

Rated Operational Current [A] (I_e)	Magnetic Trip Current [A]	Ultimate Interrupting Current [kA], (I_{cm})		Max. 3-phase Hp Ratings[1]				3-phase kW Ratings∗				Cat. No.
		400V	480V	200V	230V	460V	575V	230V	400/415V	500V	690V	
C-Frame												
0.16	2.1	100	65	—	—	—	—	—	0.02	—	—	140M-C2N-A16
0.25	3.3	100	65	—	—	—	—	—	0.06	—	—	**140M-C2N-A25**
0.4	5.2	100	65	—	—	—	—	—	0.09	—	—	**140M-C2N-A40**
0.63	8.2	100	65	—	—	—	—	0.09	0.18	0.18	0.25	**140M-C2N-A63**
1	13	100	65	—	—	0.5	0.75	0.12	0.25	0.37	0.55	**140M-C2N-B10**
1.6	21	100	65	—	—	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	50	65	7.5	7.5	15	20	—	11	15	22	**140M-D8N-C25**
F-Frame												
25	325	65	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	25	**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 and, in North America, service factor.**

‡ For heavy-duty starting applications (exceeding Trip Class 10), please consult your local Rockwell Automation sales office or Allen-Bradley distributor.

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 [A] (I_e)	Magnetic Trip Current [A] Cam Setting									3-phase Hp Ratings∗				3-phase kW Ratings∗				Cat. No.❄
	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-H8R-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	4660	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

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	
	Group Motor Installation			Motor Disconnect		Tap Conductor Protection					
	Max. Fuse or C.B. per NEC	Max. Short Circuit Current [kA]		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‡	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	—	—	—	—	—	—
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	—	—	—
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-D60	—	—	—	—	—	—	—	—	—	25	18
140M-L2E-D63	—	—	—	—	—	—	—	—	—	25	18
140M-L8E-D25	—	—	—	—	—	—	—	—	—	65	25
140M-L8E-D40	—	—	—	—	—	—	—	—	—	65	25
140M-L8E-D60	—	—	—	—	—	—	—	—	—	65	25
140M-L8E-D63	—	—	—	—	—	—	—	—	—	65	25

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

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

Cat. No.	UL 508 Manual Motor Controller							UL 508 Self-Protected (Type E) Combination Motor Controller	
	Group Motor Installation			Motor Disconnect		Tap Conductor Protection			
	Max. Fuse or C.B. per NEC	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.

UL Listed Application Ratings — Motor Circuit Protectors Only§

Cat. No.	Manual Motor Controller					UL 489 Instantaneous Trip Circuit Breaker (Magnetic Only)	
	Group Motor Installation			Motor Disconnect		Motor Circuit Protector	
	Max. Fuse or C.B. per NEC	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	—	—
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	25
140M-H8P-B70	—	—	—	—	—	65	25
140M-H8P-C15	—	—	—	—	—	65	25
140M-H8P-C30	—	—	—	—	—	65	25
140M-H8P-C50	—	—	—	—	—	65	25
140M-H8P-C70	—	—	—	—	—	65	25
140M-H8P-D10	—	—	—	—	—	65	25
140M-H8R-D10	—	—	—	—	—	65	25
J-Frame							
140M-J8P-C70	—	—	—	—	—	65	25
140M-J8P-C90	—	—	—	—	—	65	25
140M-J8P-D10	—	—	—	—	—	65	25
140M-J8P-D12	—	—	—	—	—	65	25
140M-J8P-D15	—	—	—	—	—	65	25
140M-J8P-D17	—	—	—	—	—	65	25
140M-J8P-D20	—	—	—	—	—	65	25
140M-J8P-D22	—	—	—	—	—	65	25
140M-J8P-D25	—	—	—	—	—	65	25
L-Frame							
140M-L8P-D22	—	—	—	—	—	65	25
140M-L8P-D25	—	—	—	—	—	65	25
140M-L8P-D30	—	—	—	—	—	65	25
140M-L8P-D35	—	—	—	—	—	65	25
140M-L8P-D40	—	—	—	—	—	65	25
140M-L8P-D45	—	—	—	—	—	65	25
140M-L8P-D50	—	—	—	—	—	65	25
140M-L8P-D60	—	—	—	—	—	65	25
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.

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		
	Group Motor Installation				Motor Disconnect							
	Max. Fuse or C.B. per NEC	Minimum Contactor Size	Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]		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§
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	—
140M-C2E-B40	450	100-C09	65	25	65	25	100-C09	65	30	—	—	—
140M-C2E-B63	450	100-C09	65	30	65	30	100-C09	65	—	—	—	—
140M-C2E-C10	450	100-C09	65	30	65	30	100-C09	65	—	—	—	—
140M-C2E-C16	450	100-C12	30	30	30	30	100-C12	30	—	—	—	—
140M-C2E-C20	450	100-C16	30	30	10	10	100-C23	10	—	—	—	—
140M-C2E-C25	450	100-C23	25	10	10	10	—	—	—	—	—	—
140M-C2E-C25	450	100-C30	25	10	10	5	—	—	—	—	—	—
D-Frame												
140M-D8E-B25	450	100-C09	65	30	65	30	100-C09	65	30	100-C09	65	—
140M-D8E-B25	—	—	—	—	—	—	—	—	—	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	30	30	30	30	100-C23	65	—	100-C30	30	—
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.

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		
	Group Motor Installation				Motor Disconnect				
	Max. Fuse or C.B. per NEC	Minimum Contactor Size	Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]		Minimum Contactor Size	Max. Short Circuit Current [kA]	Max. Short Circuit Current [kA]
			480V	600V	480V	600V		480Y/277V❄	600Y/347V❄
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	—
140M-D8N-B25	—	—	—	—	—	—	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	—
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 above277V 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 Trip	High Trip	Mag Only Trip	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**	—	—	—
140M-C2E-C25	—	—	—	—
		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
		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

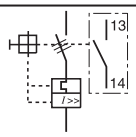
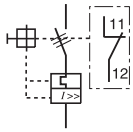
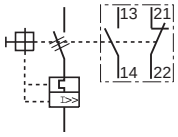
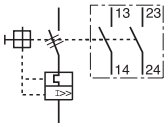
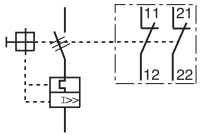
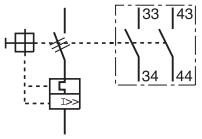
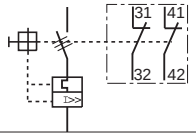
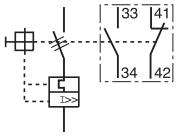
Type 2 Coordination 480V

Cat. No.			Max. Short Circuit Current [kA]	For Use With Contactors Below (or larger)
Standard Trip	High Trip	Mag Only Trip	480V	
		C-Frame		
140M-C2E-A16	—	140M-C2N-A16	65	100-K05, 100-C09
140M-C2E-A25	140M-C2T-A16	**140M-C2N-A25**	65	100-K05, 100-C09
140M-C2E-A40	**140M-C2T-A25**	**140M-C2N-A40**	65	100-K05, 100-C09
140M-C2E-A63	**140M-C2T-A40**	**140M-C2N-A63**	65	100-K05, 100-C09
140M-C2E-B10	**140M-C2T-A63**	**140M-C2N-B10**	65	100-K05, 100-C09
140M-C2E-B16	**140M-C2T-B10**	**140M-C2N-B16**	65	100-K05, 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
		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
		F-Frame		
140M-F8E-C10	—	—	65	100-C09
140M-F8E-C16	—	—	65	100-C12
140M-F8E-C20	—	—	65	100-C16
140M-F8E-C25	—	**140M-F8N-C25**	65	100-C23
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

2

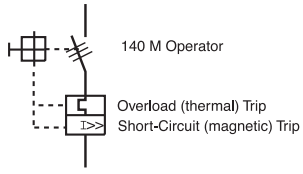
Type 2 Coordination 600V

Cat. No.			Max. Short Circuit Current [kA]	Max Fuse or C.B per NEC	For Use With Contactors Below (or larger)
Standard Trip	High Trip	Mag Only Trip	600V		
C-Frame					
140M-C2E-A16	—	140M-C2N-A16	47	450	100-K05, 100-C09
140M-C2E-A25	140M-C2T-A16	**140M-C2N-A25**	47	450	100-K05, 100-C09
140M-C2E-A40	**140M-C2T-A25**	**140M-C2N-A40**	47	450	100-K05, 100-C09
140M-C2E-A63	**140M-C2T-A40**	**140M-C2N-A63**	47	450	100-K05, 100-C09
140M-C2E-B10	**140M-C2T-A63**	**140M-C2N-B10**	47	450	100-K05, 100-C09
140M-C2E-B16	**140M-C2T-B10**	**140M-C2N-B16**	47	450	100-K05, 100-C09
140M-C2E-B25	**140M-C2T-B16**	**140M-C2N-B25**	10	450	100-C16
140M-C2E-B40	**140M-C2T-B25**	—	10	450	100-C16
140M-C2E-B63	**140M-C2T-B40**	—	5	450	100-C23
140M-C2E-C10	**140M-C2T-B63**	—	5	450	100-C30
140M-C2E-C16	**140M-C2T-C10**	—	5	450	100-C30
140M-C2E-C20	**140M-C2T-C16**	—	5	450	100-C30
140M-C2E-C25	—	—	5	450	100-C30
D-Frame					
140M-D8E-B25	—	**140M-D8N-B25**	30	450	100-C30
140M-D8E-B40	—	**140M-D8N-B40**	30	450	100-C30
140M-D8E-B63	—	**140M-D8N-B63**	30	450	100-C30
140M-D8E-C10	—	**140M-D8N-C10**	30	450	100-C30
140M-D8E-C16	—	**140M-D8N-C16**	30	450	100-C30
140M-D8E-C20	**140M-D8T-C16**	—	5	450	100-C30
140M-D8E-C25	**140M-D8T-C20**	**140M-D8N-C25**	5	450	100-C30
F-Frame					
140M-F8E-C10	—	—	30	600	100-C30
140M-F8E-C16	—	—	30	600	100-C30
140M-F8E-C20	—	—	30	600	100-C30
140M-F8E-C25	—	**140M-F8N-C25**	30	600	100-C30
140M-F8E-C32	**140M-F8T-C25**	**140M-F8N-C32**	30	600	100-C30
140M-F8E-C45	**140M-F8T-C32**	**140M-F8N-C45**	10	600	100-C37
CMN-Frame					
140-CMN-2500	—	—	42	1000	100-C16
140-CMN-4000	—	—	42	1000	100-C30
140-CMN-6300	—	—	18	1000	100-C43
140-CMN-9000	—	—	10	1000	100-C72

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

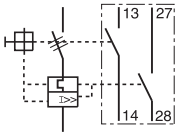
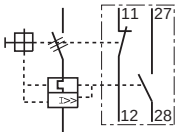
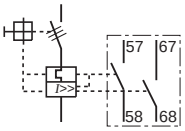
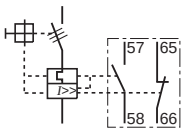
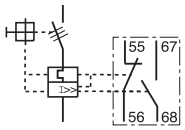
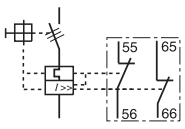
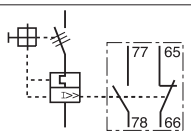
✶ X = Contact Closed; O = Contact Open

❄



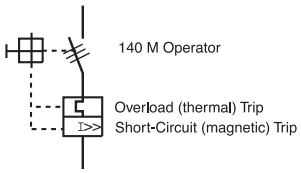
Motor Protection Circuit Breakers and Motor Circuit Protectors

Accessories, Continued

Description		Operator Position ✶			Term. No.	Description	Connection Diagram ❄	For Use With	Cat. No.
		OFF	ON	Tripped					
	**Front-Mounted Trip Contact** 2-pole Indicates tripping of device No additional space required	O	X	O	13-14	N.O. Aux		140M-C, D, F	**140M-C-AFAR10A10**
		O	O	X	27-28	N.O. Trip (Short-Circuit & Overload)			
		X	O	X	11-12	N.C. Aux		140M-C, D, F	**140M-C-AFAR10A01**
		O	O	X	27-28	N.O. Trip (Short-Circuit & Overload)			
	**Right-Side Mounted Trip Contact** 2-pole Indicates tripping of Motor Protection Circuit Breaker Adds 9 mm to the width of the circuit breaker - Only 1 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			
		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			
		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			
		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			
		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

❄



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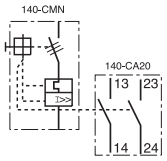
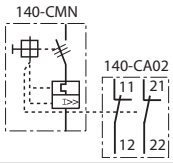
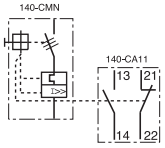
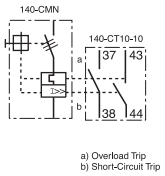
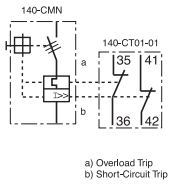
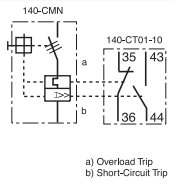
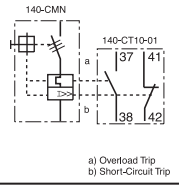
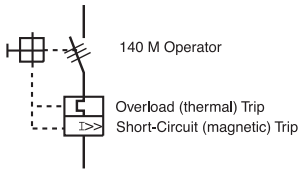
Description		Operator Position*			Term. No.	Description	Connection Diagram❄	For Use With	Cat. No.
		OFF	ON	Tripped					
	**Front-Mounted Auxiliary Contact** Internal 2-pole -1 per MPCB	O	X	O	13-14	N.O. Aux		140-CMN	**140-CA20**
		O	X	O	23-24	N.O. Aux			
		X	O	X	11-12	N.C. Aux		140-CMN	**140-CA02**
		X	O	X	21-22	N.C. Aux			
		O	X	O	13-14	N.O. Aux		140-CMN	**140-CA11**
		X	O	X	21-22	N.C. Aux			
	**Front-Mounted Trip-Indicating Auxiliary Contact** Internal 2-pole -1 per MPCB	O	O	X	37-38	N.O. Trip (Overload)		140-CMN	**140-CT10-10**
		O	O	X	43-44	N.O. Trip (Short-Circuit)			
		X	X	O	35-36	N.C. Trip (Overload)		140-CMN	**140-CT01-01**
		X	X	O	41-42	N.C. Trip (Short-Circuit)			
		X	X	O	35-36	N.C. Trip (Overload)		140-CMN	**140-CT01-10**
		O	O	X	43-44	N.O. Trip (Short-Circuit)			
		O	O	X	37-38	N.O. Trip (Overload)		140-CMN	**140-CT10-01**
		X	X	O	41-42	N.C. Trip (Short-Circuit)			

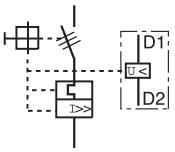
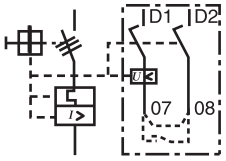
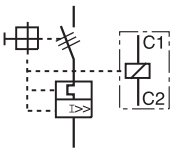
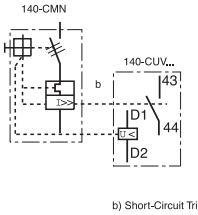
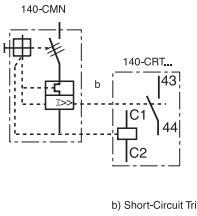
* X = Contact Closed
O = Contact Open

❄

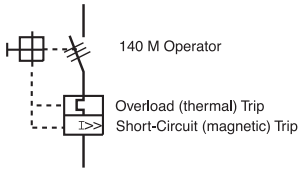


Motor Protection Circuit Breakers and Motor Circuit Protectors

Accessories, Continued

Description		Connection Diagram*	Trip Rating	For Use With	Cat. No.
	Undervoltage Trip 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
	**Undervoltage Trip** 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, 60 Hz	140M-C, D, F	140M-C-UCJ
			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
	Shunt Trip Left-side mounted Adds 18 mm to the width of the circuit breaker Provides remote tripping of the MPCB/MCP		24V, 60 Hz	140M-C, D, F	140M-C-SNJ
			24V, 50 Hz		140M-C-SNK
			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**
	**Undervoltage Trip Unit** Internal, front-mounted Integrated short-circuit trip indication Automatically trips MPCB when voltage falls below 35…70%	 b) Short-Circuit Trip	24V, 50/60 Hz	140-CMN	140-CUV-KJ
			110V, 50 Hz/120V, 60 Hz		**140-CUV-D**
			220V, 50 Hz/240V, 60 Hz		140-CUV-A
	**Shunt Trip Unit** Internal, front-mounted Integrated short-circuit trip indication Provides remote tripping of the MPCB	 b) Short-Circuit Trip	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

*



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	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 1 padlock 4…6 mm (1/4 in.) dia. shackle Can be locked in OFF position	Black	140M-C, D, F	**140M-C-KN**
		Red/Yellow	140M-C/-D	**140M-C-KRY**
		Red/Yellow	140M-F	**140M-F-KRY**
	**Padlockable Operating Knob** Accepts 8 mm (5/16 in.) padlock — 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 (adapter-door): 140-C: 105.5 mm ± 5 mm (4.5 in. ± 3/16 in.) 140-D: 114.5 mm ± 5 mm (4.5 in. ± 3/16 in.) 140-F: 137.1 mm ± 5 mm (5.4 in. ± 3/16 in.)	Black	140M-C, D, F	**140M-C-DN66**
			140-CMN	**140-CDN66**
		Red/Yellow	140M-C, D, F	**140M-C-DRY66**
			140-CMN	**140-CDRY66**
	**Extension Shaft** Cut to required length for mounting depth (adapter-door): 140M-C: 117…338 mm (4.6 in.…13.3 in.) 140M-D: 126…347 mm (5.0 in.…13.7 in.) 140M-F: 149…369 mm (5.4 in.…14.5 in.) 140-CMN: 180…403 mm (7.1 in.…15.9 in.)		140M-C-DN66, 140M-C-DRY66, 140-CDN66, 140-CDRY66	**140M-C-DS**
	Extension Shaft (Extended Length) Cut to required length for mounting depth (adapter-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 (5.4…20.4 in.) 140-CMN: 180…553 mm (7.1…21.8 in.)		140M-C-DN66, 140M-C-DRY66, 140-CDN66, 140-CDRY66	**140M-C-DSL**
	**Coupler** Included with Cat. Nos. 140M-C-DN66 and 140M-C-DRY66		140M-C, D, F	140M-C-DNC
	**Legend Plate** Marking: "Hauptschalter" and "Main Switch" Marking: "Not-Aus" and "Emergency Off"		140-CDN66	**140M-C-DFCN**
			140-CDRY66	**140M-C-DFCRY**
	**Locking Tag** Padlock attachment to the lockable handles Up to three padlocks 4…8 mm (5/16 in.) shackle		140M-C-KN 140M-C-KRY 140M-F-KRY	**140M-C-M3**
	**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 approval)	Black Handle	140M-C	**198E-AYTG2**
		Red/Yellow Handle	140M-C	**198E-AYTJ2**
	**Terminal Cover** For covering of unused commoning link terminals IP2X finger protection		140M-C, 140M-D	**140M-C-WS**
			140M-F	140M-F-WS
	**Screw Adapter** For screw arrangement of a Motor Protection Circuit Breaker	10 pcs/pkg	140M-C, D, F	**140M-C-N45**

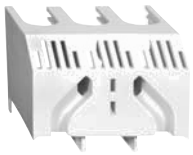
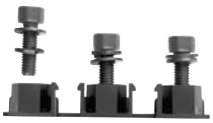
Motor Protection Circuit Breakers and Motor Circuit Protectors

Accessories, Continued

	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 MPCB 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**
	Connecting Modules — 25 and 45 A Contactor and MPCB **MUST BE** mounted separately on (2) DIN Rails Electrical interconnection between 140M MPCB and 100-C contactors (with AC coils)		140M-C to 100-C09…C23	**140M-C-PNC23**
			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		140M-C, -D	**140M-C-TE1**
			140M-F	**140M-F-TE**
	**Compact Busbar Feeder Block** Supply of compact busbars Increases terminal capacity		140M-C, -D	**140M-C-WBE**
			140M-F	**140M-F-WBE**
	**Compact Busbar Feeder Terminal** For supply of commoning links Top feed — overlaps commoning link Meets UL Type E spacing requirements		140M-C, -D	**140M-C-WTE**
			140M-F	**140M-F-WTE**
	**Three-Phase Compact Busbar for 25 A Motor Protection Circuit Breakers — 63 A Max. Continuous Current** 45 mm spacing For use with front-mounted auxiliary contact	2 connections	140M-C, -D	**140M-C-W452**
		3 connections		**140M-C-W453**
		4 connections		**140M-C-W454**
		5 connections		**140M-C-W455**
	Three-Phase Compact Busbar for 25 A Motor Protection Circuit Breakers — 63 A Max. Continuous Current 54 mm spacing For use with side-mounted auxiliary contact	2 connections	140M-C, -D	**140M-C-W542**
		3 connections		**140M-C-W543**
		4 connections		**140M-C-W544**
		5 connections		**140M-C-W545**
	Three-Phase Compact Busbar for 25 A Motor Protection Circuit Breakers — 63 A Max. Continuous Current 63 mm spacing For use with side-mounted undervoltage trip and shunt trip	2 connections	140M-C, -D	**140M-C-W632**
		3 connections		**140M-C-W633**
		4 connections		**140M-C-W634**
		5 connections		**140M-C-W635**
	**Jumper for 140M-D to 140M-C** Accommodates difference in depth from Bul. 140M-D to 140M-C 54 mm spacing Can be used with all other commoning links	2 connections	140M-D to 140M-C	**140M-C-WD542**
	**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	**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	140M-F	**140M-F-W632**
		3 connections		**140M-F-W633**
		4 connections		**140M-F-W634**
	**DIN (#3) symmetrical Rail** 35 mm x 7.5 mm x 1 m long	10 pcs/kg	140M-D 140M-F	**199-DR1**
	**DIN (#3) Symmetrical Rail** 35 mm x 15 mm x 1 m long Top Hat Rail (DIN #3 Symmetrical Rail)	5 pcs/kg	140M-C 140M-D 140M-F 140-CMN	**1492-DR9**

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 33.

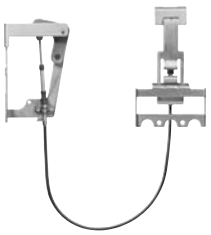
Description		For Use With	Pkg. Quantity	Cat. No.
	**Terminal End Cover — 0.25 in.**	140M-I	1	140U-I-TC2
	Terminal End Cover — 0.41 in.			**140U-I-TC4**
	**Terminal Shields (Plastic)** IP20 Ingress Protection	140M-I	1	**140U-I-TS1**
	**Padlockable Handle Lock Hasp — Off only** Padlocking Hasp Lock-OFF 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, Continued

Description		For Use With	Pkg. Quantity	Cat. No.
	**Extension Shafts**	140M-I	1	
	Standard Enclosure Working Depth [mm (in.)]			
	Minimum 203 (8)			**194R-R3**
	Maximum 305 (12)			
	Extended			
	Minimum 203 (8)			**194R-R4**
	Maximum 508 (20)			

2

Description			For Use With	Pkg. Quantity	Cat. No.
	**Flex-Cable Operating Mechanism** NEMA Type 1/3/12/4/4X Flange-Mount Handle	3 ft. (0.9 m) Cable	140M-I	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

140M Factory Modifications (Open)

Note: For modifications add (option code *) for desired features to cat. no.

f

Miscellaneous		
Code	Description	Frame Size
KN	Black Lockable Knob	C, D, F, CMN
KY	Red/Yellow Lockable Knob	C, D, F, CMN
TE	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
P	Shunt Trip	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, 50 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

2

140M Factory Modifications (Open); Continued

Note: For modifications add (option code *) for desired features to cat. no.

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
		C	525…600V AC
Left Front		Shunt Voltage	
P	Shunt Trip	J	12…60V AC/DC
		D	110…240V AC/DC
		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

IEC Performance Data

		Cat. No. 140M-C2E-												
		A16	A25	A40	A63	B10	B16	B25	B40	B63	C10	C16	C20	C25
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
Magnetic Release Current	[A]	2.1	3.3	5.2	8.2	13	21	33	52	82	130	208	260	325
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	4.0/5.5	—
400/415V	[kW]	0.02	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	5.5/7.5	7.5/10	11
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	11	15
690V	[kW]	—	—	—	0.25	0.37/0.55	0.75/1.1	1.8	2.2/3.0	4.0	5.5/7.5	11/13	15/17	18.5/22
Back-Up Fuses														
gG, gL, only if $I_{cc} \geq I_{cu}$														
230/240V	[A]	∗	∗	∗	∗	∗	∗	∗	∗	∗	∗	∗	100	100
400/415V	[A]	∗	∗	∗	∗	∗	∗	∗	∗	∗	∗	80	100	100
440/460V	[A]	∗	∗	∗	∗	∗	∗	∗	∗	∗	∗	80	80	80
500V	[A]	∗	∗	∗	∗	∗	∗	∗	∗	∗	80	80	80	80
690V	[A]	∗	∗	∗	∗	∗	16	20	35	50	50	63	63	63
Ultimate Short Circuit Breaking Capacity														
I_{cu}														
230/240V	[kA]	100	100	100	100	100	100	100	100	100	100	100	50	50
400/415V	[kA]	100	100	100	100	100	100	100	100	100	100	65	50	15
440/460V	[kA]	100	100	100	100	100	100	100	100	100	50	10	6	6
500V	[kA]	100	100	100	100	100	100	100	100	100	50	10	6	6
690V	[kA]	100	100	100	100	100	8	8	8	4	4	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
400/415V	[kA]	100	100	100	100	100	100	100	100	100	100	50	15	15
440/460V	[kA]	100	100	100	100	100	100	100	100	100	50	6	6	6
500V	[kA]	100	100	100	100	100	100	100	100	100	50	6	6	6
690V	[kA]	100	100	100	100	100	8	8	8	4	4	3	3	3

∗ No back-up fuse required.

IEC Performance Data, Continued

		Cat. No. 140M-D8E-							Cat. No. 140M-F8E-					
		B25	B40	B63	C10	C16	C20	C25	C10	C16	C20	C25	C32	C45
Rated Operational Current, I_e	[A]	2.5	4.0	6.3	10	16	20	25	10	16	20	25	32	45
Magnetic Release Current	[A]	33	52	82	130	208	260	325	130	208	260	325	416	585
Switching of Standard Three-Phase Motors														
AC-2, AC-3														
230/240V	[kW]	0.37	0.55/0.75	1.1/1.5	2.2	3.0/4.0	4.0/5.5	—	2.2	3.0/4.0	4.0/5.5	5.5/6.3	7.5	11/13
400/415V	[kW]	0.75	1.1/1.5	2.2	3.0/4.0	5.5/7.5	7.5/10	11	3.0/4.0	5.5/7.5	7.5/10	11	15	18.5/22
500V	[kW]	1.1	1.5/2.2	2.5/3.0	4.0/6.3	7.5/10	11	15	4.0/6.3	7.5/10	11	15	15/20	22/30
690V	[kW]	1.8	2.2/3.0	4.0	5.5/7.5	11/13	15/17	18.5/22	5.5/7.5	11/13	15/17	18.5/22	22/25	30/40
Back-Up Fuses														
gG, gL, only if $I_{cc} \geq I_{cu}$														
230/240V	[A]	*	*	*	*	*	*	*	*	*	*	*	*	*
400/415V	[A]	*	*	*	*	*	100	100	80	100	100	100	125	125
440/460V	[A]	*	*	*	*	*	100	100	80	100	100	100	125	125
500V	[A]	*	*	*	*	80	100	100	80	100	100	100	125	125
690V	[A]	20	35	50	50	63	63	63	63	80	80	80	100	100
Ultimate Short Circuit Breaking Capacity														
I_{cu}														
230/240V	[kA]	100	100	100	100	100	100	100	100	100	100	100	100	100
400/415V	[kA]	100	100	100	100	100	65	65	65	65	65	65	65	65
440/460V	[kA]	100	100	100	100	65	65	65	65	65	65	65	65	50
500V	[kA]	100	100	100	100	50	50	50	50	50	50	50	50	50
690V	[kA]	10	10	10	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	100	100	100	100	100	100
400/415V	[kA]	100	100	100	100	50	25	25	50	50	50	50	50	50
440/460V	[kA]	100	100	100	100	50	25	25	50	50	50	50	50	50
500V	[kA]	100	100	100	100	50	25	25	50	50	50	50	50	50
690V	[kA]	10	10	10	6	4	4	4	10	10	10	10	6	6

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-2, 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.

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-2, AC-3								
230/240V	[kW]	—	—	—	0.06/0.09	0.12	0.18/0.25	0.37
400/415V	[kW]	0.02	0.06	0.09	0.12/0.18	0.25	0.37/0.55	0.75
500V	[kW]	—	—	—	0.18	0.25/0.37	0.55/0.75	1.1
690V	[kW]	—	—	—	0.25	0.37/0.55	0.75/1.1	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.

IEC Performance Data, Continued

		Cat. No. 140M-D8N-						Cat. No. 140M-F8N-		
		B25	B40	B63	C10	C16	C25	C25	C32	C45
Rated Operational Current, I_e	[A]	2.5	4.0	6.3	10	16	25	25	32	45
Magnetic Release Current	[A]	32	52	82	130	208	325	325	416	585
Switching of Standard Three-Phase Motors										
AC-2, AC-3										
230/240V	[kW]	0.37	0.55/0.75	1.1/1.5	2.2	3.0/4.0	—	5.5/6.3	7.5	11/13
400/415V	[kW]	0.75	1.1/1.5	2.2	3.0/4.0	5.5/7.5	11	11	15	18.5/22
500V	[kW]	1.1	1.5/2.2	2.5/3.0	4.0/6.3	7.5/10	15	15	15/20	22/30
690V	[kW]	1.8	2.2/3.0	4.0	5.5/7.5	11/13	18.5/22	18.5/22	22/25	30/40
Back-Up Fuses										
gG, gL, only if $I_{cc} \geq I_{cu}$										
230/240V	[A]	∗	∗	∗	∗	∗	∗	100	125	125
400/415V	[A]	∗	∗	∗	∗	∗	100	100	125	125
440/460V	[A]	∗	∗	∗	∗	80	100	100	125	125
500V	[A]	∗	∗	∗	∗	80	80	100	125	125
690V	[A]	20	35	50	50	63	63	80	100	100
Ultimate Short Circuit Breaking Capacity										
I_{cu}										
230/240V	[kA]	100	100	100	100	100	100	100	100	100
400/415V	[kA]	100	100	100	100	100	50	65	65	65
440/460V	[kA]	100	100	100	100	50	50	65	65	50
500V	[kA]	100	100	100	100	50	25	50	50	50
690V	[kA]	10	10	10	6	6	6	10	10	10
Rated Service Short Circuit Breaking Capacity										
I_{cs}										
230/240V	[kA]	100	100	100	100	100	100	100	100	100
400/415V	[kA]	100	100	100	100	50	25	50	50	50
440/460V	[kA]	100	100	100	100	50	25	50	50	50
500V	[kA]	100	100	100	100	50	25	50	50	50
690V	[kA]	10	10	10	6	4	4	10	6	6

∗ No back-up fuse required.

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-2, AC-3					
230/240V ❄	[kW]	3.0/4.0	4.0/5.5	5.5/6.3	7.5
400/415V ❄	[kW]	5.5/7.5	7.5/10	11	15
500V ❄	[kW]	7.5/10	11	15	15/20
690V ❄	[kW]	11/13	15/17	18.5/22	22/25
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]	65	65	65	65
440/460V	[kA]	65	65	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.

IEC Performance Data, Continued

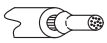
		Cat. No. 140M-C2T-										
		A16	A25	A40	A63	B10	B16	B25	B40	B63	C10	C16
Rated Operational Current, I_e	[A]	0.16	0.25	0.40	0.63	1.0	1.6	2.5	4.0	6.3	10	16
Magnetic Release Current	[A]	3.2	5.2	8.2	13	21	32	52	82	130	208	260
Switching of Standard Three-Phase Motors												
AC-2, AC-3												
230/240V	[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	0.12/0.18	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	4.0	5.5/7.5	11/13
Back-Up Fuses												
gG, gL, only if $I_{cc} \geq I_{cu}$												
230/240V	[A]	✶	✶	✶	✶	✶	✶	✶	✶	✶	✶	✶
400/415V	[A]	✶	✶	✶	✶	✶	✶	✶	✶	✶	✶	80
440/460V	[A]	✶	✶	✶	✶	✶	✶	✶	✶	✶	✶	80
500V	[A]	✶	✶	✶	✶	✶	✶	✶	✶	✶	80	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	50	10
500V	[kA]	100	100	100	100	100	100	100	100	100	50	10
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	50	6
500V	[kA]	100	100	100	100	100	100	100	100	100	50	6
690V	[kA]	100	100	100	100	100	8	8	8	4	4	3

✶ No back-up fuse required.

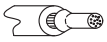
General Data

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 (motor starts)			max. 20
Ambient Temperature					
Storage	[°C]	-40 … +80			-25… +80
Operation	[°C]	-25… +60			
Resistance to Climatic Change		IEC 68-2			C IV (acc. to IEC 68)
Moisture/heat resistance		40 °C, 92% relative humidity, 56 days			
Moisture/change resistance		23 °C, 83%/40 °C, 92%, 50 cycles			
Site Altitude	[m]	to 2000 N.N.			
Protection Class		IP20, when wired			
Resistance to Shock	[g]	30, 11 ms			30, 11 ms
Resistance to Vibration		IEC 68-2			
Frequency range	[Hz]				10…150
in all directions	[g]				under testing
Rated Thermal Current I_{th}					
IEC, SEV, VDE 0660					
up to 40 °C ambient temperature	[A]	0.1…25	1.6…25	6.3…45	16… 90
up to 60 °C ambient temperature	[A]	0.1…25	1.6…25	6.3…45	16… 90
Rated Supply Current I_e	[A]	0.1…25	1.6…25	6.3…45	16… 90
Number of setting ranges		13	7	6	4
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 60947-4-1 Motor protection
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		fixed setting 13 x I_e max. (for 140M-C2E, 140M-D8E, 140M-F8E, 140M-C2N, 140M-D8N, 140M-F8N) 16…20 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…8	6…8	9…16	33
Main Circuit Breaker Application		Usable as main circuit breaker according to IEC 204 with corresponding accessories			

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; -4-1; EN 60947-1; -2; -4-1; 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 2. conductor	[mm²]/[AWG] [mm²]/[AWG]	1…4/No. 16…10 1…4/No. 16…10		2.5…16/No. 14…4 2.5…10/No. 14…4	2.5…35
 1. conductor 2. conductor	[mm²]/[AWG] [mm²]/[AWG]	1.5…6/No. 16…8 1.5…6/No. 16…8		2.5…16/No. 14…4 2.5…10/No. 14…4	4…50 / 12…2
 1. conductor 2. conductor	[mm²]/[AWG] [mm²]/[AWG]	1…6/No. 16…10 1…6/No. 16…10		2.5…25/No. 14…4 2.5…16/No. 14…4	4…50 / 12…2
Tightening torque	[Nm]/[lb•in]	2…2.5/18…22		3…3.5/27…30	6…10/55…90

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 at 60 °C ambient temperature	[A] [A]	5 4			10 6				
Contact Class Coordination According to NEMA (UL/CSA Standards)	AC DC	B 300 Q 300			B 600 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 2. conductor	[mm²]/[AWG] [mm²]/[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 2. conductor	[mm²]/[AWG] [mm²]/[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 2. conductor	[mm²]/[AWG] [mm²]/[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				

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…1.1 x U_s	0.85…1.1 x U_s	0.7…1.1 x U_s
Drop-out		0.7…0.35 x U_s	0.7…0.35 x U_s	
Rated Control Voltage	min.	21V 50 Hz, 24V 60 Hz	21V 50 Hz, 24V 60 Hz	21V 50 Hz, 24V 60 Hz
	max.	600V 50 Hz	600V 50 Hz	600V 50 Hz
On-Time		100%	100%	100%
Coil Rating	Pull-in	8.5 VA, 6 W	8.5 VA, 6 W	8.5 VA, 6 W
	Hold	3 VA, 1.2 W	3 VA, 1.2 W	3 VA, 1.2 W
Terminal Parts				
Type of terminals				
Screwdriver		Pozidriv No. 2/Blade No. 3		
1. conductor	[mm²]/[AWG]	0.5…2.5/No. 18…14		
2. conductor	[mm²]/[AWG]	0.75…2.5/No. 18…14		
1. conductor	[mm²]/[AWG]	0.75…2.5/No. 18…14		
2. conductor	[mm²]/[AWG]	0.75…2.5/No. 18…14		
1. conductor	[mm²]/[AWG]	0.75…2.5/No. 18…14		
2. conductor	[mm²]/[AWG]	0.75…2.5/No. 18…14		
Tightening torque	[N•m]/[lb•in]	1.25…1.5/10.6…13.3		

		Commoning Link Feeder Terminal 140M-C-WTE		Commoning Link	
Rated Thermal Current I_{th} at 60 °C ambient temperature		140M-C-WTE	140M-F-WTE	140M-C-W	140M-F-W
	[A]	64	120	64	120
1. conductor	[mm²]/[AWG]	1.5…16	4…50/12…110	—	—
1. conductor	[mm²]/[AWG]	1.5…25/No. 14…4	2.5…50/12…110	—	—
1. conductor	[mm²]/[AWG]	1.5…25/No. 14…4		—	—
Tightening torque	[N•m]/[lb•in]	3/27	5…6/45…54	—	—

Weights

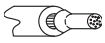
Description	Weight [g]	Cat.No.
Motor Protection Circuit Breakers	317	140M-C2E-…
	373	140M-D8E-…
	782	140M-F8E-…
	315	140M-C2N-…
	365	140M-D8N-…
	782	140M-F8N-…
	315	140M-C2T-…
	365	140M-D8T-…
	782	140M-F8T-…
	1845	140-CMN-…
Auxiliary Contacts	10	140M-C-AFA10
		140M-C-AFA01
		140M-C-AFA11
		140M-C-AFA20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

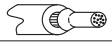
	Weight [g]	Cat.No.
Anti-Tamper Cover	2	140M-C-CA
Lockable Twist Knob	5	140M-C-KN
		140M-C-KRY
Locking Tag	30	140M-C-M3
Door Coupling Handle	123	140M-C-DN66
		140M-C-NRY66
Extension Shaft	46	140M-C-DS
Legend Plate	4	140M-C-DFC…
Feeder Terminal	172	140M-C-WT
		140M-F-WT
Commoning Links	47	140M-C-W452
	80	140M-C-W453
	104	140M-C-W454
	132	140M-C-W455
	52	140M-C-W542
	86	140M-C-W543
	118	140M-C-W544
	154	140M-C-W545
	56	140M-C-W632
	92	140M-C-W633
	134	140M-C-W634
	170	140M-C-W635

Accessories for Bulletin 140-CMN Circuit Breakers

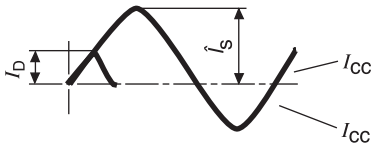
		Cat. No. 140-CT Trip Contact Block for Flush Mounting on Cat. No. 140-CMN Circuit Breakers	Cat. No. 140-CRT, 140-CUV Undervoltage Trip and Shunt Trip for Flush Mounting on Cat. No. 140-CMN Circuit Breakers
Rated Thermal Current I_{th} up to 40 °C ambient temperature up to 60 °C ambient temperature	[A] [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.conductor 2.conductor	[mm2]/[AWG] [mm2]/[AWG]	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.conductor 2.conductor	[mm2]/[AWG] [mm2]/[AWG]	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 Drop-out		[VA/W] [VA/W]	11 / 8 4 / 1	12 / 7 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



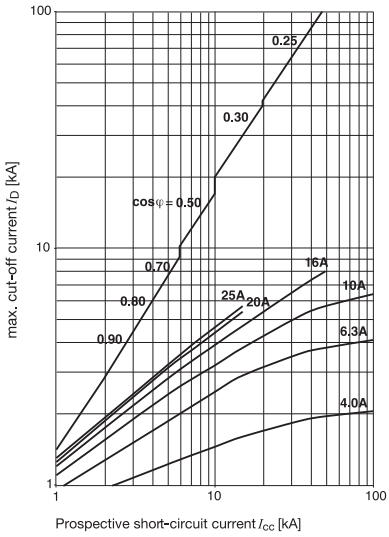
asymmetrical

symmetrical

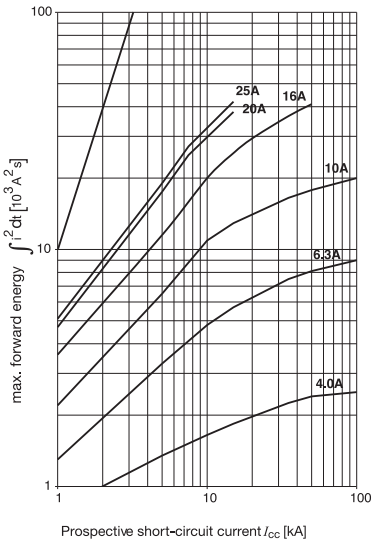
The Bulletin 140-M limits solid short-circuit current I_{CC} (prospective short-circuit current). ID is the maximum cut-off current (highest instantaneous value of the limited short-circuit current). This value is indicated in the following diagrams as a function of the progressive system short-circuit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

Bulletin 140M-C Circuit Breaker

Maximum cut-off current
Rated operating voltage 415V

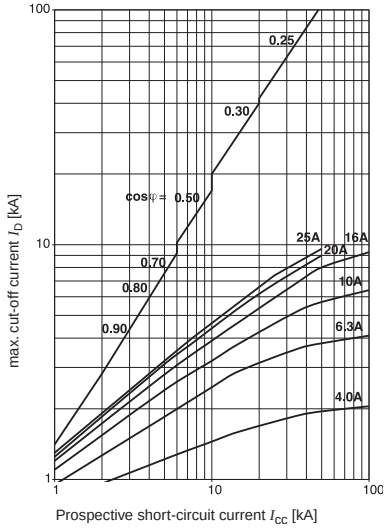


Maximum forward energy
Rated operating voltage 415V

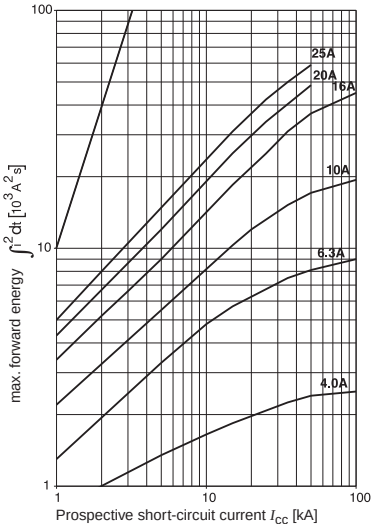


Bulletin 140M-D Circuit Breaker

Maximum cut-off current
Rated operating voltage 415V



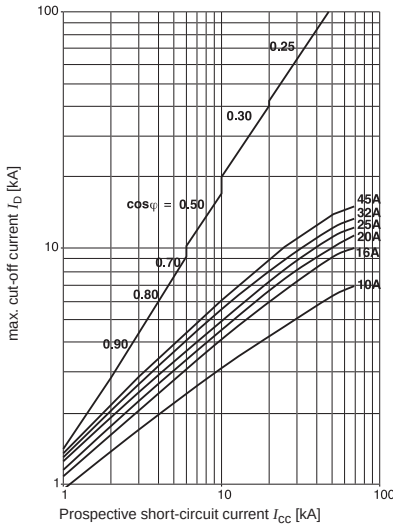
Maximum cut-off current
Rated operating voltage 415V



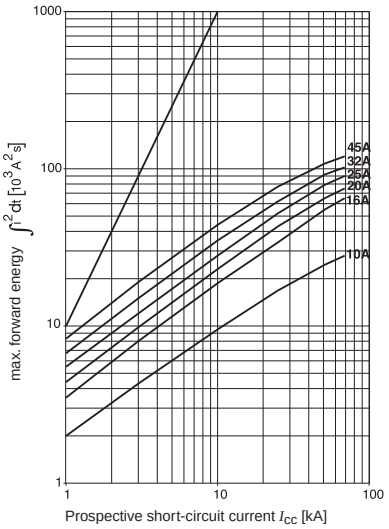
2

Bulletin 140M-F Circuit Breaker

Maximum cut-off current
Rated operating voltage 415V

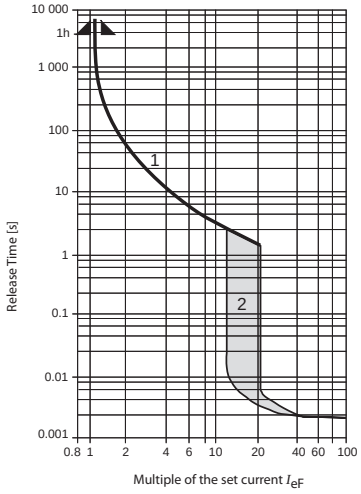


Maximum cut-off current
Rated operating voltage 415V

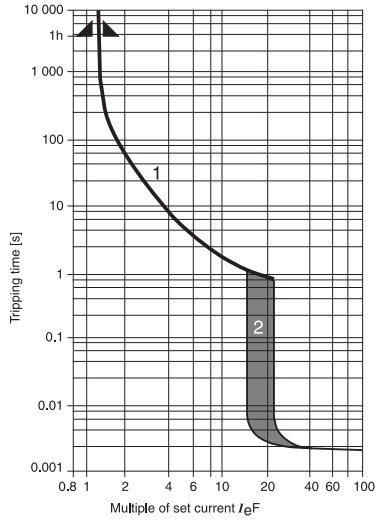


Time-Current Characteristic

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 times the maximum value of setting range. (Transformer protection up to 20 x I_e max.) At a lower setting it is correspondingly higher.

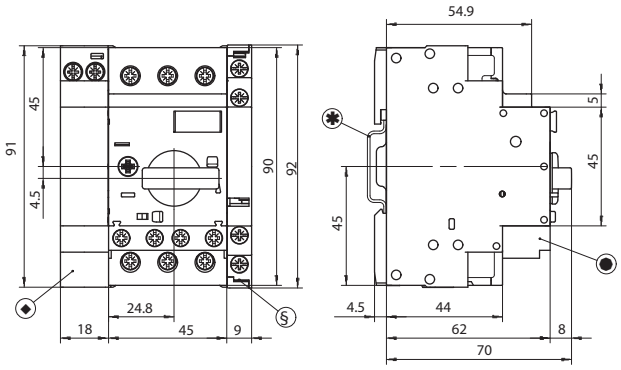
Current Setting I_{eF}

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.

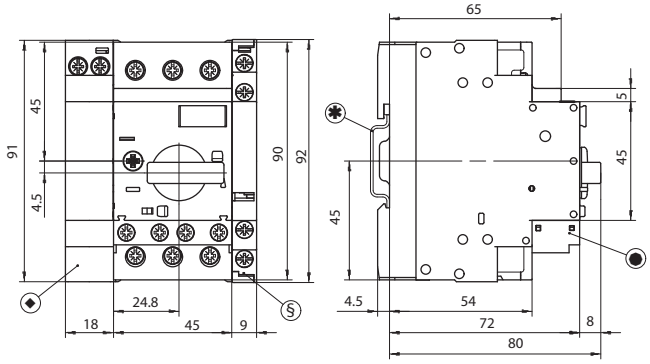
Cat. No. 140M-C, -D, -F

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

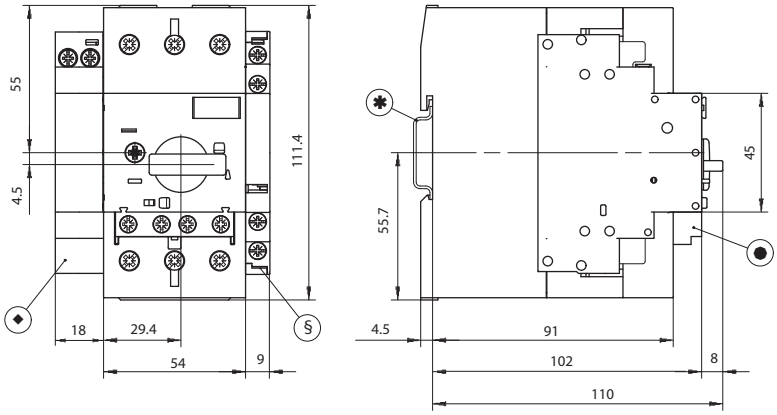
Cat. No. 140M-C2…



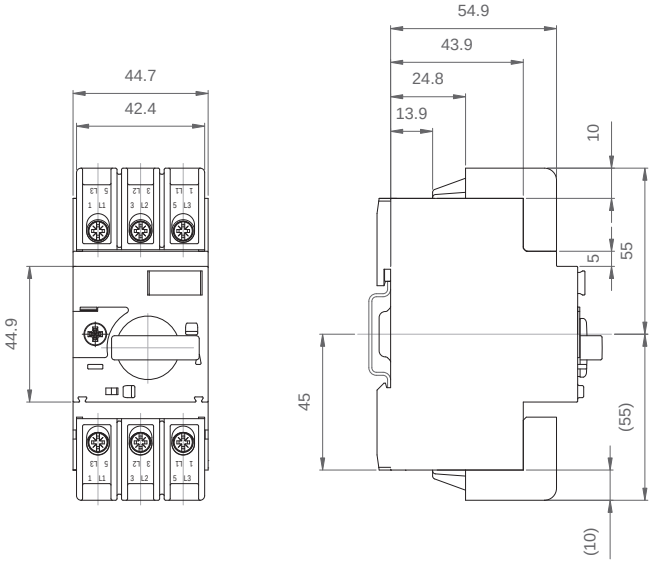
Cat. No. 140M-D8…



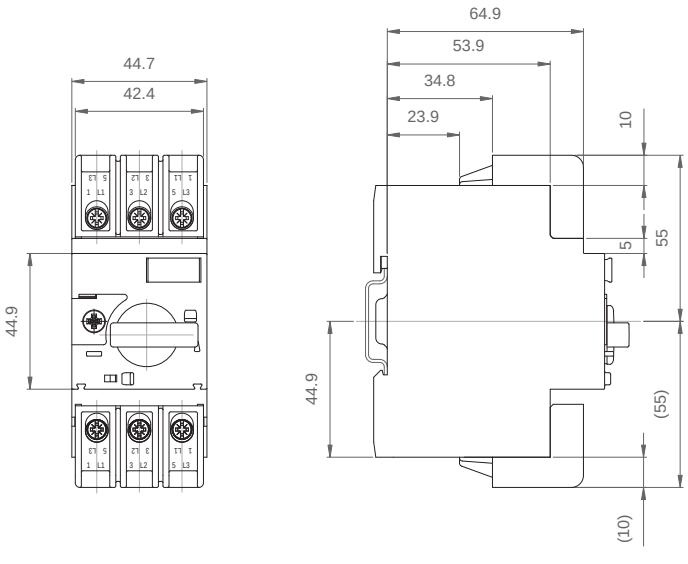
Cat. No. 140M-F8…



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

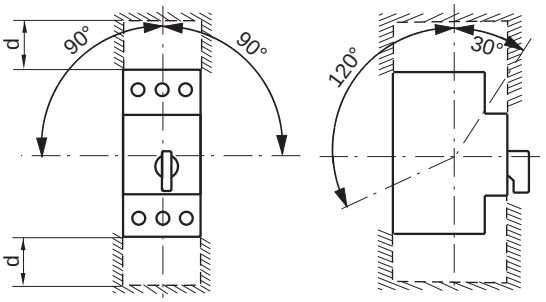


Cat. No. 140M-C-TE1 Type E adapter on Cat. No. 140M-C2E…

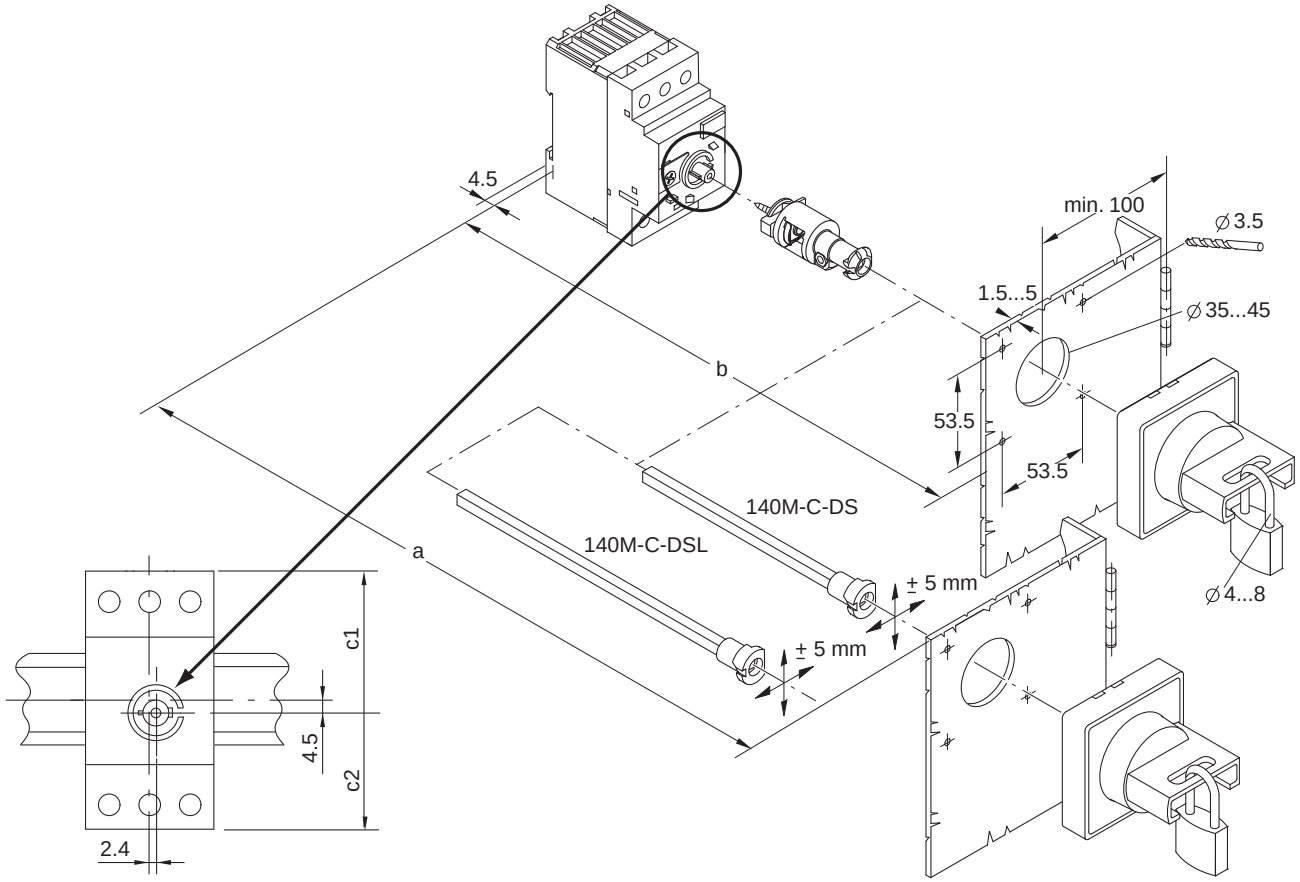


Cat. No. 140M-C-TE1 Type E adapter on Cat. No. 140M-D8E…

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



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



140M-C-D...66

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

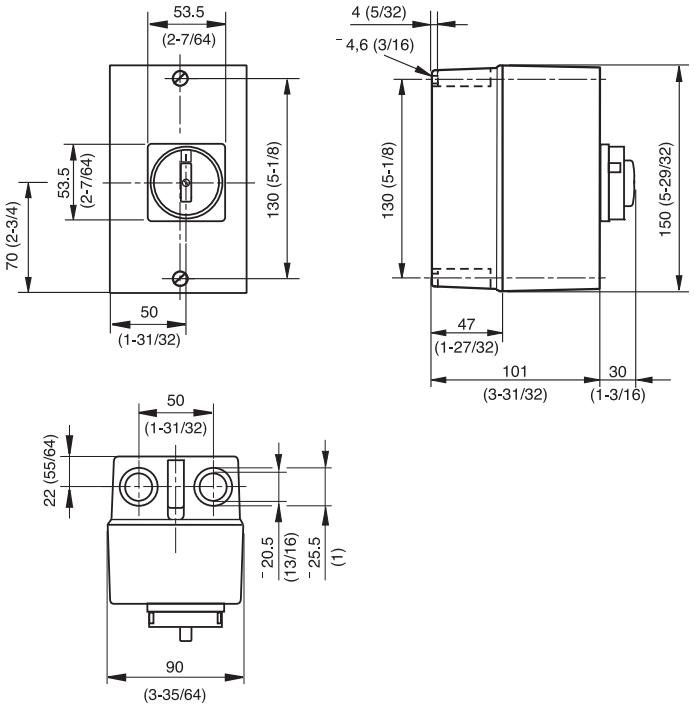
Cat. No.	a	b	c1	c2	d
140M-C	117...338	105.5 ±5	49.5	40.5	25
140M-D	126...347	114.5 ±5	49.5	40.5	25
140M-F	148.6...369.6	137.1 ±5	59.35	50.35	30

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

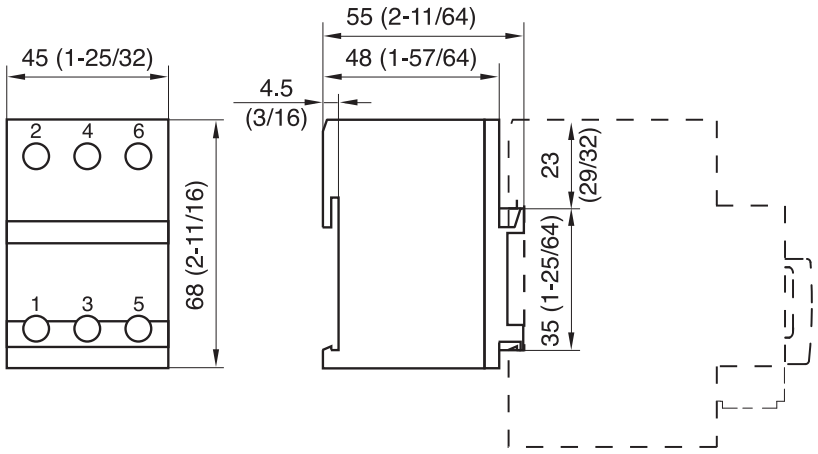
Cat. No.	a	b	c1	c2	d
140M-C	117...438	105.5 ±5	49.5	40.5	25
140M-D	126...497	114.5 ±5	49.5	40.5	25
140M-F	148.6...519	137.1 ±5	59.35	50.35	30

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

Cat. No. 198E...



198E-AYT...



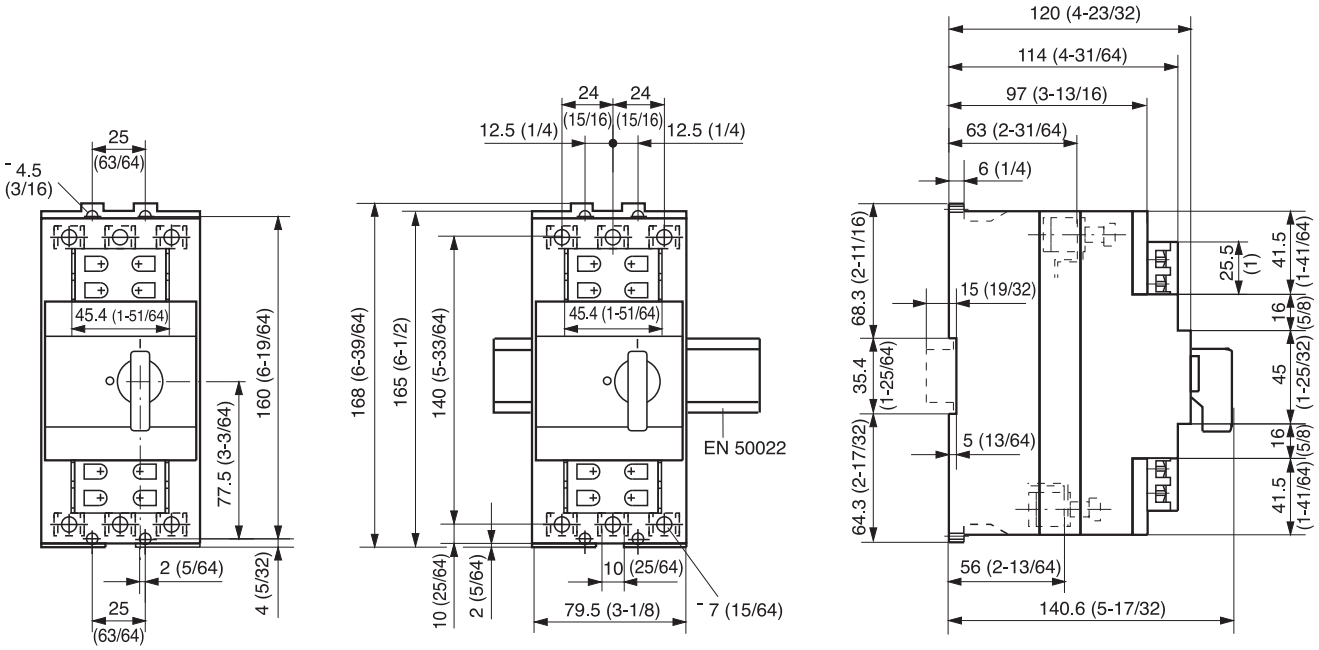
140M-C-WB

Motor Protection Circuit Breakers and Motor Circuit Protectors

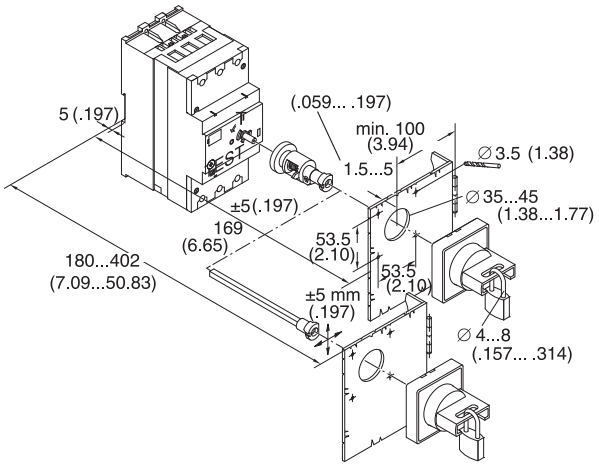
Approximate Dimensions, Continued

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

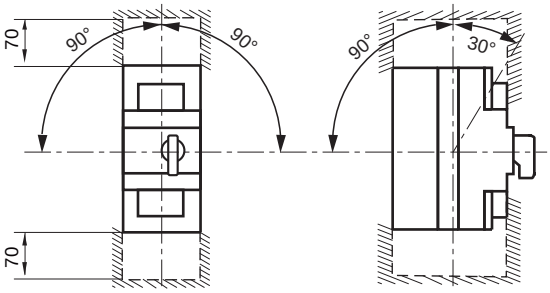
Cat. No. 140-CMN...



140-CMN



140-CD...

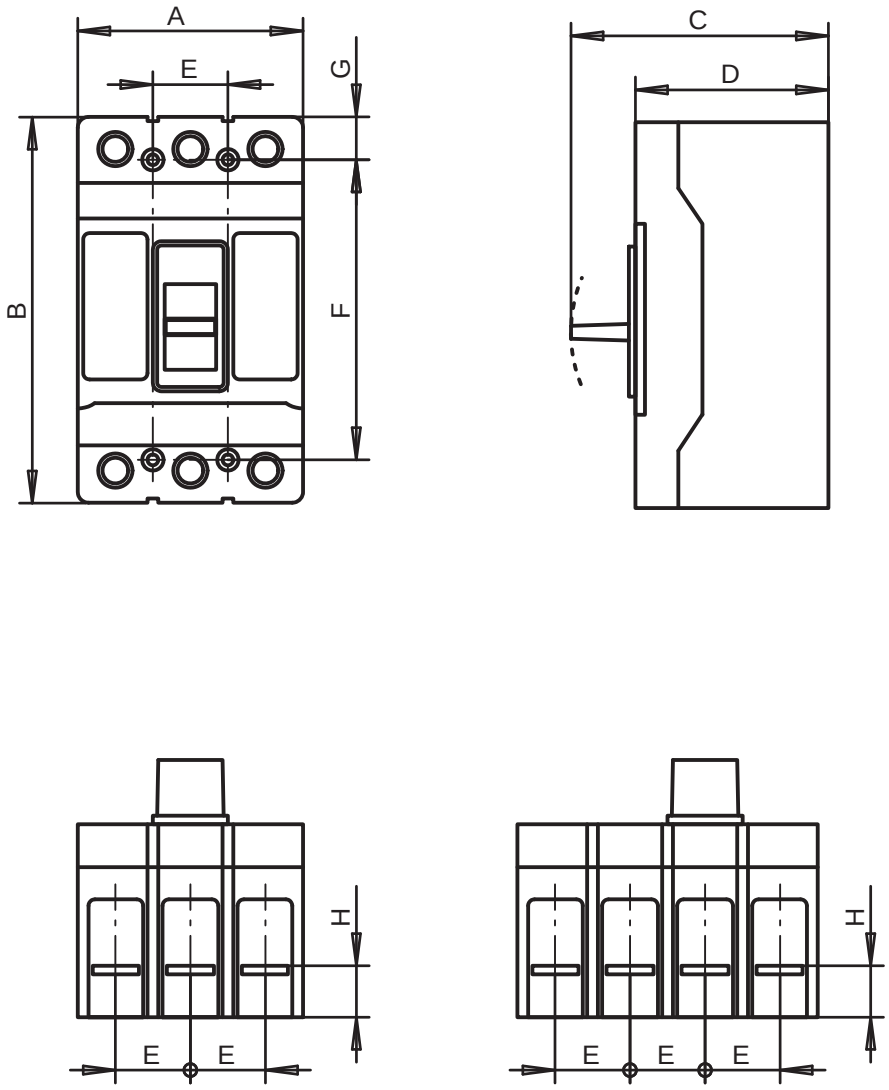


Mounting position/safety clearance of Cat. No. 140-CMN

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

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)

Bulletin 140U Molded Case Circuit Breakers

- 15…1200 A Molded Case Circuit Breakers
  - Thermal-Magnetic 15…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 22.2, No. 5
EN/IEC 60947-2

Table of Contents

Certifications

UL Listed
CSA Certified
CE Marked
KEMA-KEUR

Product Line Overview

							
Frame Reference	**G-Frame**	**H-Frame**	**J-Frame**	**K-Frame**	**L-Frame**	**M-Frame**	**N-Frame**
Max. Current I_n	100 A	125 A	250 A	400 A	600 A	800 A	1200 A
Current Range	15…100 A	15…125 A	70…250 A	100…400 A	300…600 A	300…800 A	600…1200 A
Thermal Magnetic	✓	✓	✓	✓	✓	✓	—
Electronic:							
LS	—	—	✓	✓	✓	✓	✓
LSI	—	—	✓	✓	✓	✓	✓
LSG	—	—	✓	✓	✓	✓	✓
LSIG	—	—	✓	✓	✓	✓	✓
Interrupting Ratings:							
380…415V (I_{cu})	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
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							
UL 489	✓	✓	✓	✓	✓	✓	✓
UL File E197878, Guide No. DIV Q	✓	✓	✓	✓	✓	✓	✓
CSA 22.2, No. 5	✓	✓	✓	✓	✓	✓	✓
CSA File Nos. 216034, 216035, 219884 Class No. 1432-01	✓	✓	✓	✓	✓	✓	✓
IEC 60947-2	✓	✓	✓	—	✓	✓	✓
CE	✓	✓	✓	—	✓	✓	✓
KEMA-KEUR	✓	✓	✓	✓	✓	✓	✓

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
H	125 A
J	250 A
K	400 A
L	600 A
M	800 A
N	1200 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)
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 2-92

Molded Case Circuit Breakers

Catalog Number Explanation, Continued

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*

a

Bulletin No.	
Code	Description
140U	Molded Case Circuit Breaker

b

Frame/Rating	
Code	Description
J	250 A
K	400 A
Q	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/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)
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

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Preferred availability cat. nos. are printed in **bold**

- 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 1 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	2 Poles w/ 1 aux. contact
			208V AC	240V AC	480V AC	125/250V DC	Cat. No.	Cat. No.
15	15	150	65	65	14	10	**140U-G1C2-C15**	**140U-G1C2-C15-A**
20	20	200	65	65	14	10	**140U-G1C2-C20**	140U-G1C2-C20-A
25	25	250	65	65	14	10	**140U-G1C2-C25**	140U-G1C2-C25-A
30	30	300	65	65	14	10	**140U-G1C2-C30**	140U-G1C2-C30-A
35	35	350	65	65	14	10	140U-G1C2-C35	140U-G1C2-C35-A
40	40	400	65	65	14	10	**140U-G1C2-C40**	140U-G1C2-C40-A
45	45	450	65	65	14	10	140U-G1C2-C45	140U-G1C2-C45-A
50	50	500	65	65	14	10	**140U-G1C2-C50**	140U-G1C2-C50-A

∗ 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	3 Poles w/ 1 aux. contact
			208V AC	240V AC	480V AC	125/250V DC	Cat. No.	Cat. No.
15	15	150	65	65	22	10	**140U-G2C3-C15**	**140U-G2C3-C15-A**
20	20	200	65	65	22	10	**140U-G2C3-C20**	**140U-G2C3-C20-A**
25	25	250	65	65	22	10	**140U-G2C3-C25**	140U-G2C3-C25-A
30	30	300	65	65	22	10	**140U-G2C3-C30**	**140U-G2C3-C30-A**
35	35	350	65	65	22	10	**140U-G2C3-C35**	140U-G2C3-C35-A
40	40	400	65	65	22	10	**140U-G2C3-C40**	140U-G2C3-C40-A
45	45	450	65	65	22	10	**140U-G2C3-C45**	140U-G2C3-C45-A
50	50	500	65	65	22	10	**140U-G2C3-C50**	140U-G2C3-C50-A
60	60	600	65	65	22	10	**140U-G2C3-C60**	140U-G2C3-C60-A
70	70	700	65	65	22	10	**140U-G2C3-C70**	140U-G2C3-C70-A
80	80	800	65	65	22	10	**140U-G2C3-C80**	140U-G2C3-C80-A
90	90	900	65	65	22	10	**140U-G2C3-C90**	140U-G2C3-C90-A
100	100	1000	65	65	22	10	**140U-G2C3-D10**	140U-G2C3-D10-A

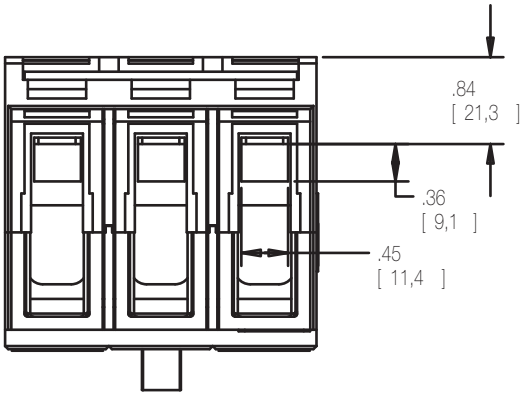
∗ Time constant is 8 ms min. and 2 poles of a 3-pole circuit breaker.

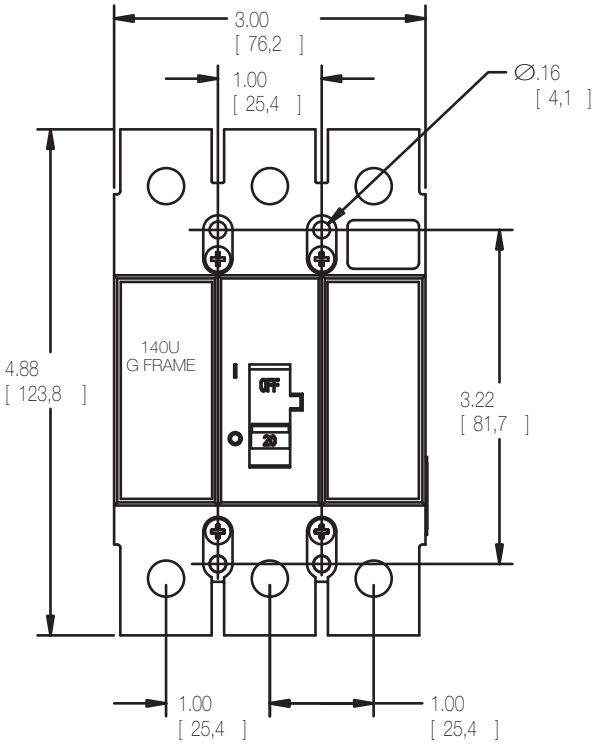
Accessories

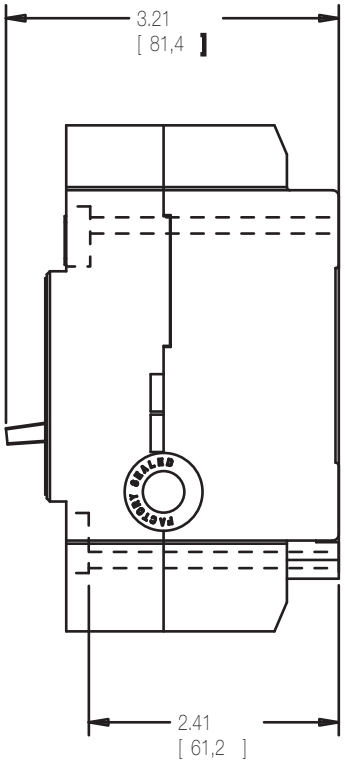
External Accessories

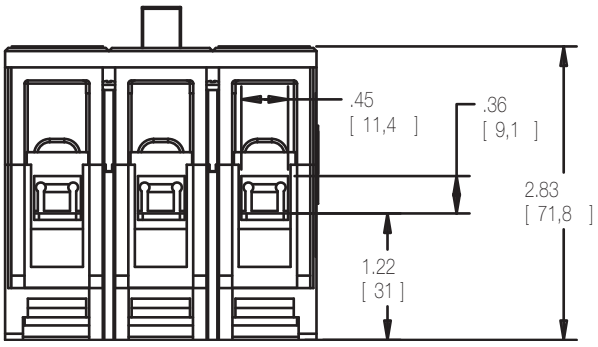
	Description		Cat. No.
	**Rotary, Variable-Depth Operating Mechanism** UL Type 3/12/4/4X, IP 66 Rotary handle 12 in. (30.48 cm) operating rod	Black Handle	140U-G-RVM12B
		Red/Yellow Handle	140U-G-RVM12R
	**DIN Rail Adapter** Allows 2-pole G-frame MCCB to mount to 35 mm DIN Rail	Qty: 1	**140U-G-DRA2**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

3-Pole Dimensions





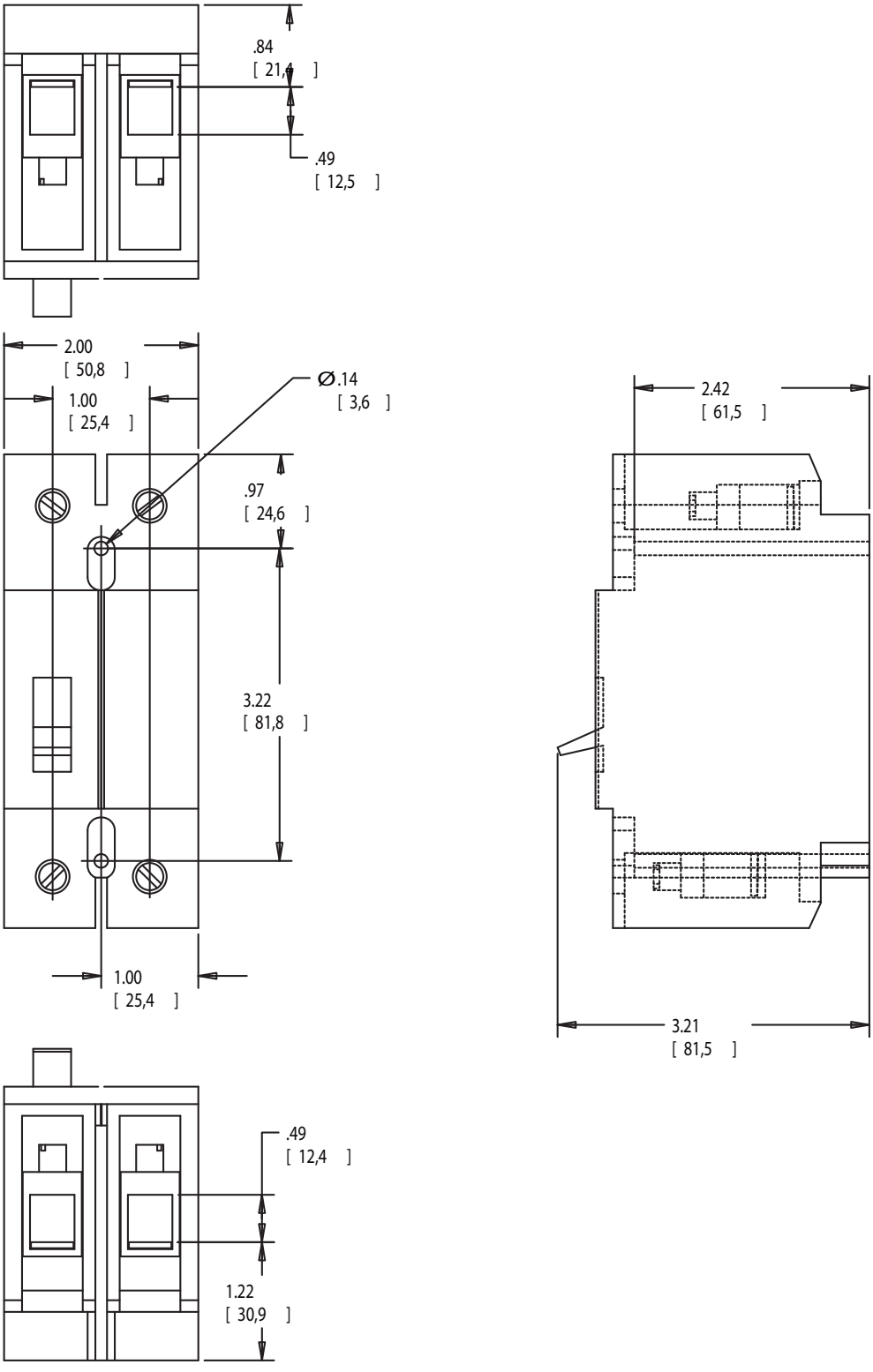




Dimensions are in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

2-Pole Dimensions

15-100 AMP, PRESSURE COLLAR TERMINALS



Product Selection — 125 A, H-Frame

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

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

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Preferred availability cat. nos. are printed in **bold**

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

Rated Current I_n [A]	Thermal Trip [A] $I_r = I_n$ (Fixed)	Magnetic Trip [A] $I_m = 10 \times I_n$	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] $I_r = I_n$ (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] $I_r = I_n$ (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	40	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**

2

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

Rated Current I_n [A]	Thermal Trip [A] $I_r = I_n$ (Fixed)	Magnetic Trip [A] $I_m = 10 \times I_n$	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] $I_r = I_n$ (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] $I_r = I_n$ (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**

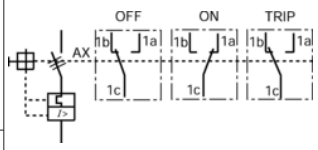
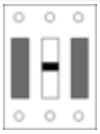
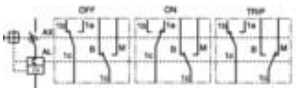
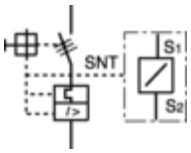
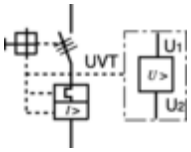
‡ Current Limiting

Molded Case Switch — UL 1087

Rated Current I_n [A]	Thermal Trip [A] $I_r = I_n$ (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**

Accessories — 125 A, H-Frame

Internal Control Modules — Field Installed

	Description		Diagram	Mounting Location	Cat. No.
	**Auxiliary Contact (AX)** Electrically indicates "ON/OFF" status of breakers	(1) 1a-1b		 ***Left AND Right side***	**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-H-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-H-EA1R1**
	**Shunt Trip (SNT)** Provides remote tripping of the circuit breaker Undervoltage trip not available when shunt trip is used	12V DC		 ***Left side ONLY***	140U-H-SNZQ
		24…60V, 50/60/DC			**140U-H-SNJ**
		110…240V, 50/60/DC			**140U-H-SND**
		380…440V AC, 220…250V DC			140U-H-SNN
		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 2-92

125 A, H-Frame, Continued

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		**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	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
	Flex-Cable Operating Mechanism Includes handle, cable, operating, and bail mechanism Pre-assembled and adjusted Stainless Steel - Type 4/4X Flange Mount Operating Handle	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
	**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-H-RVM12B**
		Red/Yellow Handle	**140U-H-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-H-RVM21B
		Red/Yellow Handle	140U-H-RVM21R
	**Rotary, Variable-Depth Operating Mechanism with Internal NFPA 79 Operating Handle** Type 3/4/4X/12 IP66 Rotary Handle 12 in. (30.48 cm) operating rod	Black Handle	140U-H-NVM12B
		Red/Yellow Handle	140U-H-NVM12R
	Rotary, Variable-Depth Operating Mechanism with Internal NFPA 79 Operating Handle Type 3/4/4X/12 IP66 Rotary Handle 21 in. (53.34 cm) operating rod	Black Handle	140U-H-NVM21B
		Red/Yellow Handle	140U-H-NVM21R
	**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-H-EOPD**
	Motor Operator Remotely opens, closes, and resets the circuit breaker 24V DC	For use with 3- or 4-Pole MCCBs, 24V DC	**140U-H-EOPZ**
	**Mounting Hardware** (4) M4 - 0.7 x 75 mm	For use with 3- or 4-Pole MCCBs	140U-H-MHM

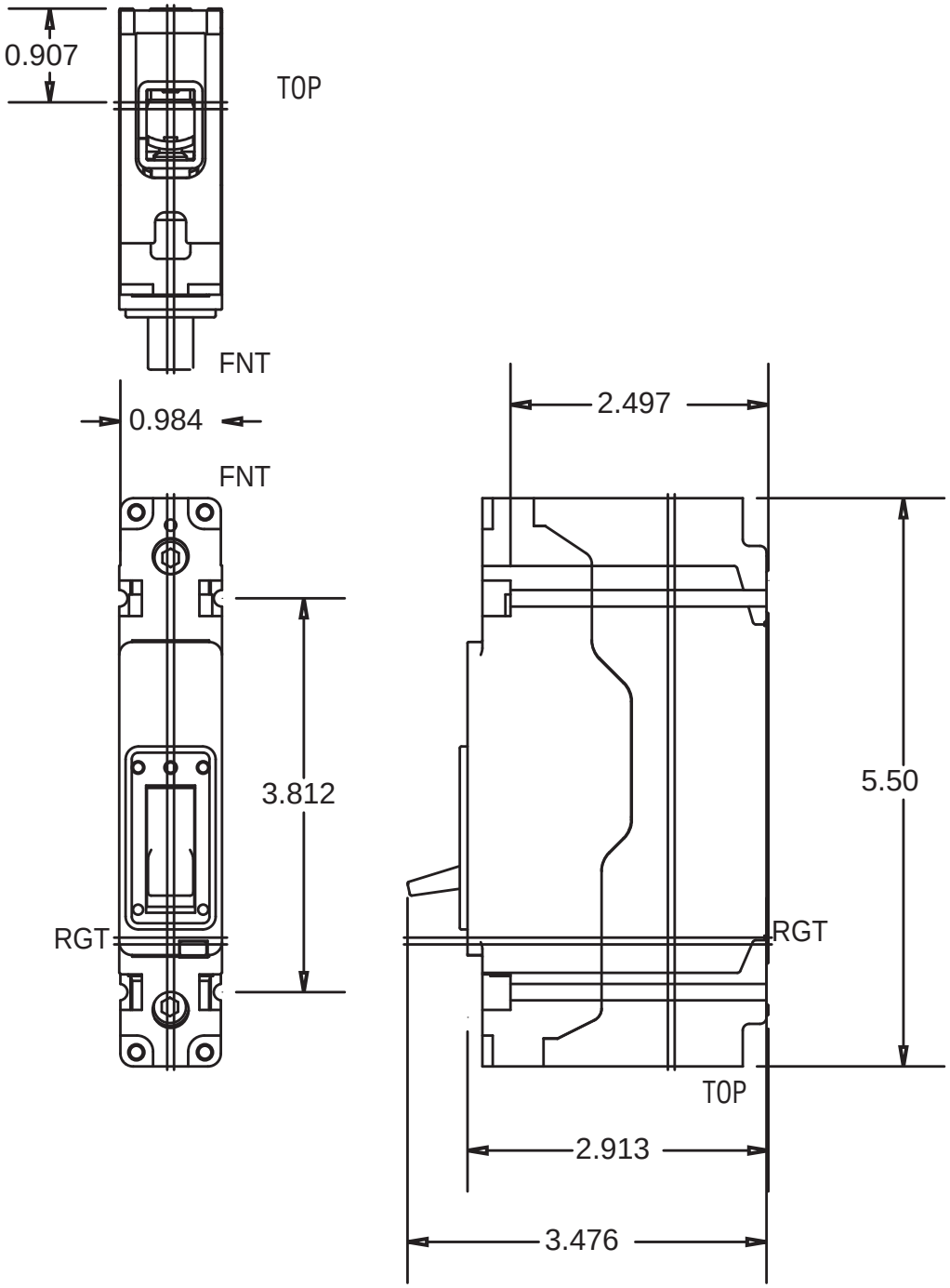
125 A, H-Frame, Continued

External Accessories, Continued

	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		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 H-frame MCCB to mount to 35 mm DIN Rail	For use with 3-Pole H-Frame MCCBs	Qty: 1	**140U-H-DRA**
 *Cat. No. 140U-H-MTL3AN*	**Multi-Tap Terminal Lug Kit —** with IP20 terminal cover	(3) #14…2 AWG or (3) 2.5…35 mm²	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 mm²	Qty: 3 with terminal shield	**140U-H-MTL6A**
		(6) #14…6 AWG or (6) 2.5…10 mm²	Qty: 3	**140U-H-MTL6AN**

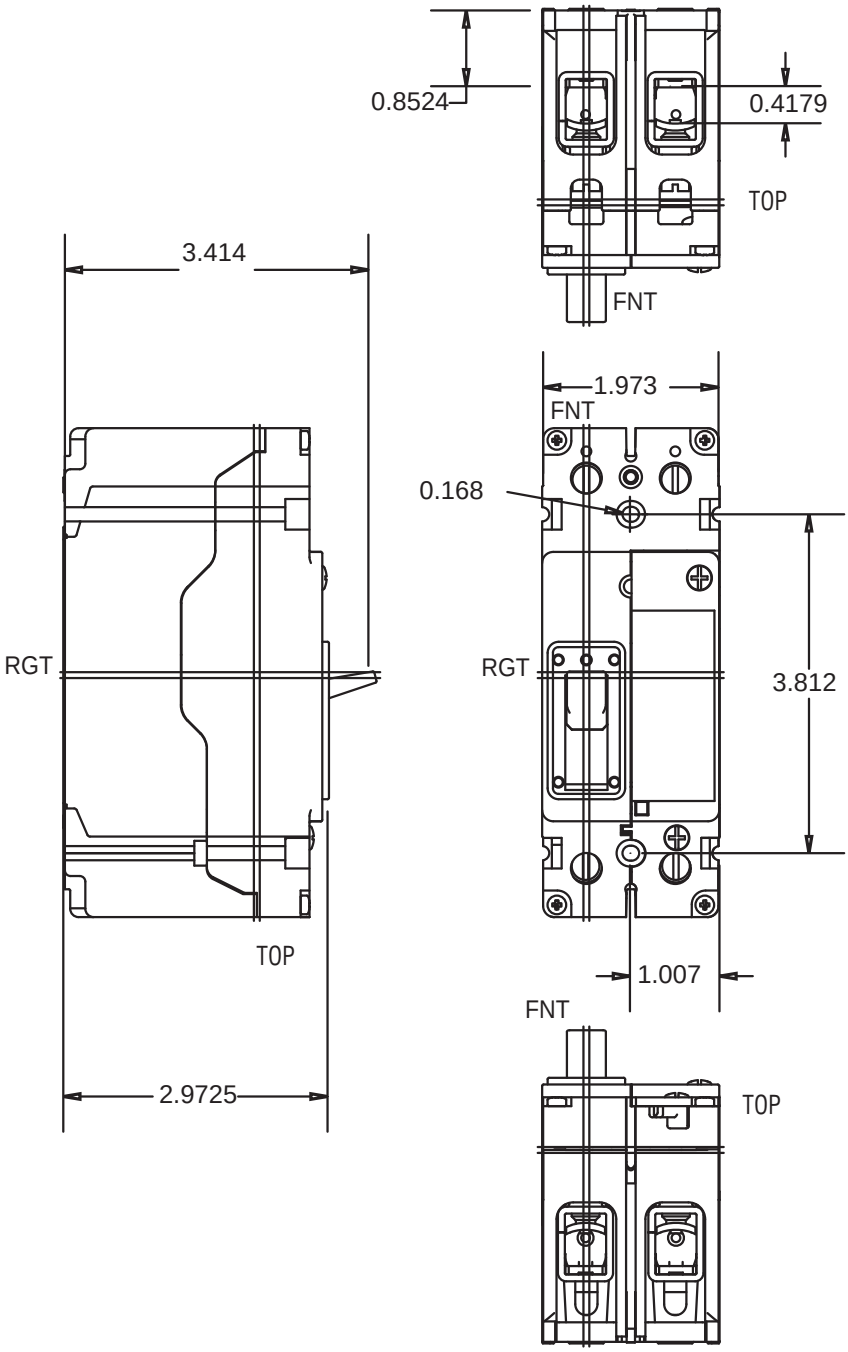
Dimensions are in inches. Dimensions are not intended to be used for manufacturing purposes.

1-Pole Molded Case Circuit Breakers



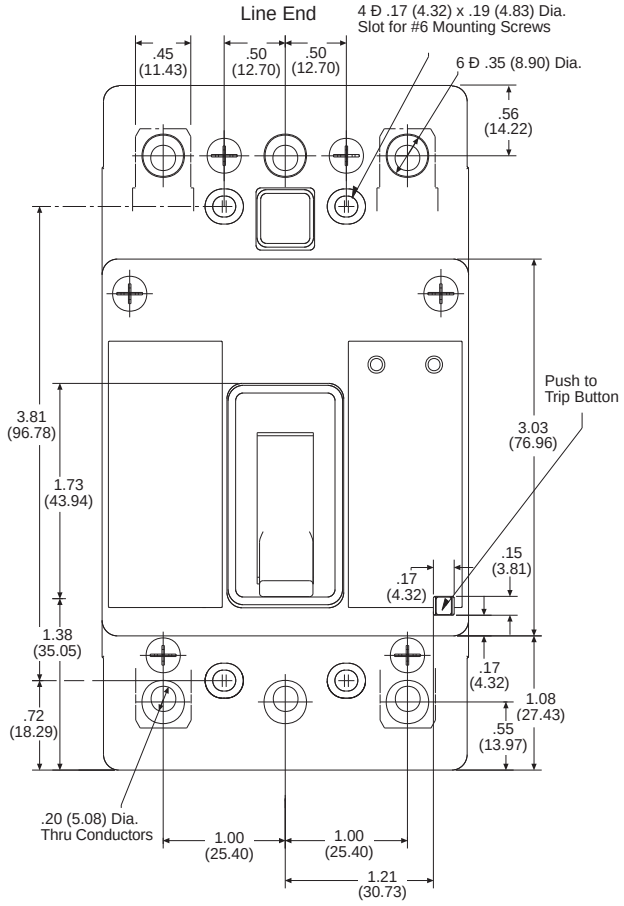
Dimensions are in inches. Dimensions are not intended to be used for manufacturing purposes.

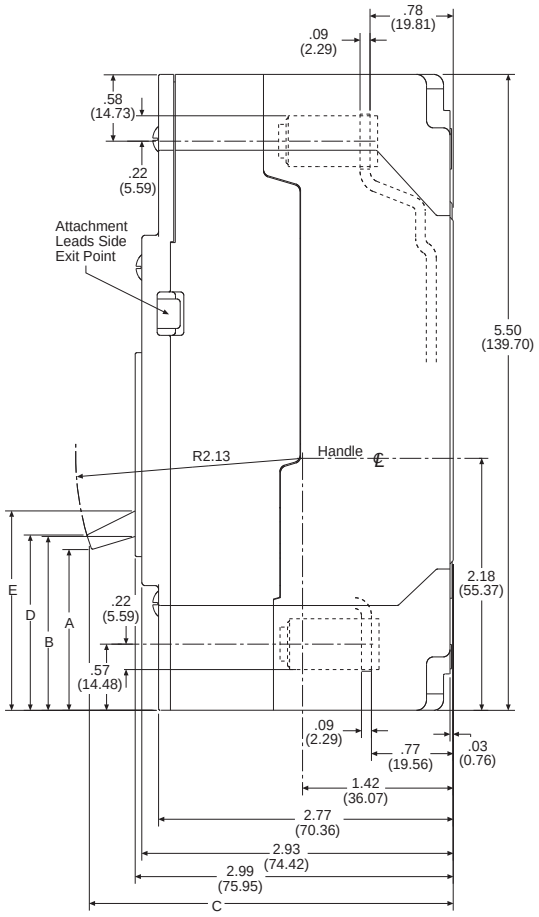
2-Pole Molded Case Circuit Breakers

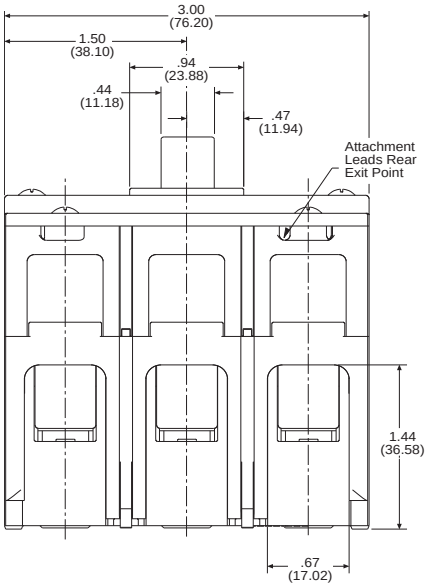


Dimensions are in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

3-Pole Molded Case Circuit Breakers







Breaker Status	Dimension				
	A	B	C	D	E
On	2.71 (68.83)	2.53 (64.26)	3.46 (87.88)	2.83 (71.88)	2.75 (69.85)
Off	1.54 (39.12)	1.62 (41.15)	3.46 (87.88)	1.66 (42.16)	1.84 (46.74)
Tripped	2.33 (59.18)	2.23 (56.64)	3.54 (89.92)	2.46 (67.48)	2.45 (62.23)
Reset	1.39 (35.31)	1.49 (37.85)	3.42 (86.87)	1.52 (38.61)	1.70 (43.18)

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

Note: Terminal box lugs must be ordered separately. See page 2-72

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

Thermal-Magnetic

Rated Current I_n [A]	Adjustment Range [A]		Cat. No.
	Thermal Trip $I_r = I_n$ (Fixed)	Magnetic Trip I_m = 5…10 x 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**

Electronic

Rated Current I_n [A]	Adjustment Range [A]		Protection Type	Cat. No.
	Thermal Trip I_r = 0.4…1.0 x I_n	Magnetic Trip I_m = 2…14 x 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

❄ Full ratings are found in the breaker frames table on this page

Assembled Circuit Breakers with Electronic Trip Units

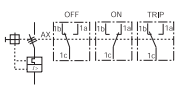
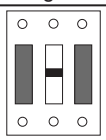
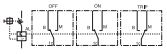
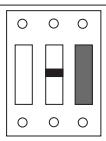
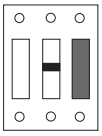
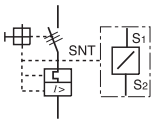
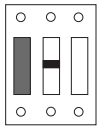
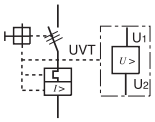
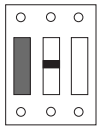
Rated Current I_n [A]	Protection Type	Breaking Capacity/ Interrupting Rating [kA]❄ 400V	480V	Cat. No.	Breaking Capacity/ Interrupting Rating [kA]❄ 400V	480V	Cat. No.	Breaking Capacity/ Interrupting Rating [kA]❄ 400V	480V	Cat. No.
50	LS	25	25	140U-J2L3-C50	40	35	**140U-J3L3-C50**	70	65	140U-J6L3-C50
50	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

❄ Full ratings are found in the breaker frames table on page 2-69

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] 220…240V		380…415V		500V		690V		Interrupting Rating (60 Hz) [kA] 240V	480V	600V	Cat. No.
250	—	2500	100	100	70	70	42	20	7	3	100	65	25	**140U-J6S3-D25**

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		***Left AND Right side***	**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	12V DC		 ***Left side ONLY***	140U-H-SNZQ
		24…60V, 50/60/DC			**140U-H-SNJ**
		110…240V, 50/60/DC			**140U-H-SND**
		380…440V AC, 220…250V DC			140U-H-SNN
		380…600V, 50/60 Hz			140U-H-SNB
		12V DC			140U-H-SNZQ
	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 2-92

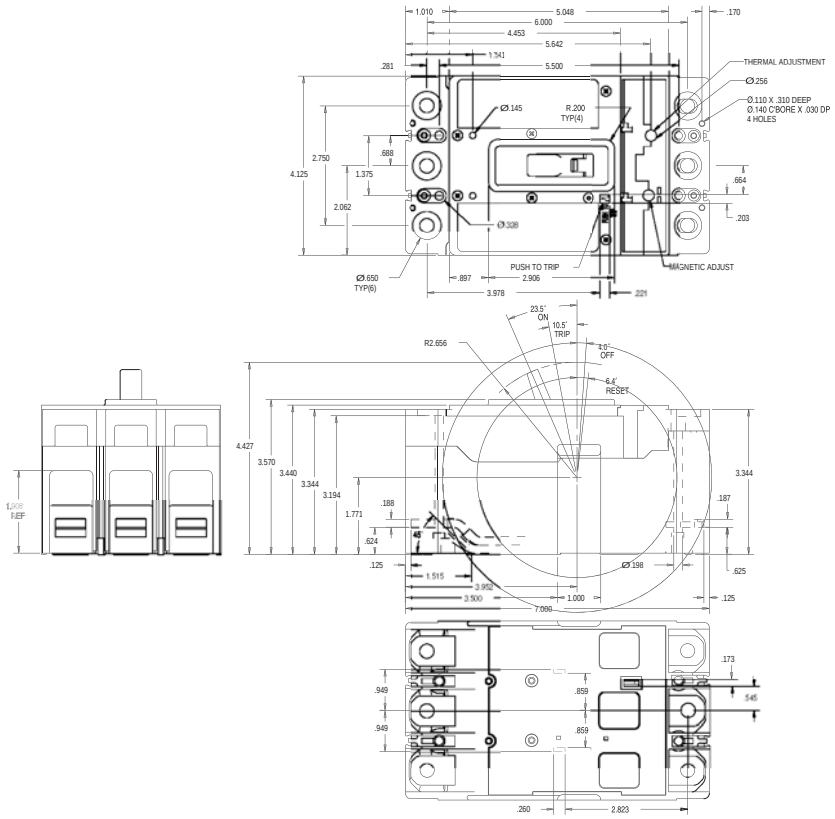
Terminal Lugs

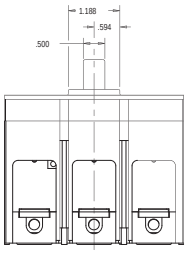
	Description			Frame Size	Cat. No.
	**Terminal Lugs**	Aluminum lugs, Al or Cu wire (1) 4…350 MCM or (1) 25…185 mm²	Qty: 1	J	**140U-J-TLA1**
		Stainless Steel Box Lugs, Cu wire Only (1) 4…350 MCM or (1) 25…185 mm²	Qty: 1	J	**140U-J-TLS1**

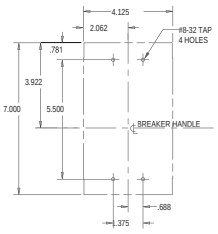
External Accessories

	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
	**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** 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 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 mm²	Qty: 3	**140U-J-MTL3A**
		(6) #14…#6 AWG or (6) 2.5…10 mm²	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
	**Mounting Hardware** (4) M4 - 0.7 x 90 mm		For use with 3- or 4-Pole MCCBs	140U-J-MHM

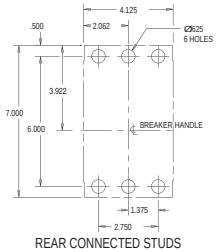
Dimensions are in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.



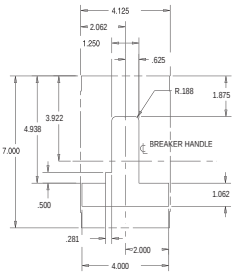




FRONT CONNECTED DRILL PLAN



REAR CONNECTED STUDS



2

Molded Case Circuit Breakers

Product Selection — 400 A, K-Frame

- UL 489
- CSA 22.2, No. 5
- IEC 157-1
- KEMA-KEUR

Note: Terminal lugs must be ordered separately. See page 2-75

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	50	**140U-K0X3**

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 x 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]	Adjustment Range [A]		Protection Type	Cat. No.
	Thermal Trip I_r = 0.5…1.0 x I_n	Magnetic Trip I_m = 2…8 x I_r		
400	200…400∗	400…3200	LS	140U-KTL3-D40
			LSI	**140U-KTH3-D40**
			LSG	140U-KTG3-D40
			LSIG	140U-KTI3-D40

Rating Plugs

Thermal Trip I_n	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**

❄ Full ratings are found in the breaker frames table on this page

Assembled Circuit Breakers, Electronic Trip Units

Rated Current I_n [A]	Thermal Trip I_r = 0.5…1.0 x I_n	Protection Type	Breaking Capacity/ Interrupting Rating [kA]❄ 400V	480V	Cat. No.	Breaking Capacity/ Interrupting Rating [kA]❄ 400V	480V	Cat. No.	Breaking Capacity/ Interrupting Rating [kA]❄ 400V	480V	Cat. No.
400	100…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

∗ Select proper rating plug to cover thermal trip requirement.
❄ Full ratings are found in the breaker frames table on page 2-74

Molded Case Switch — UL 489

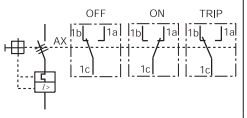
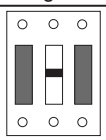
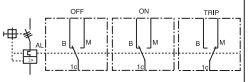
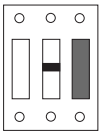
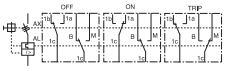
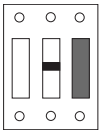
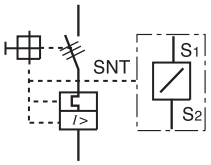
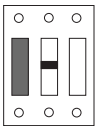
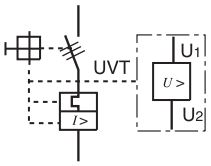
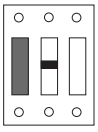
Rated Current I_n [A]	Magnetic Trip 10 x I_n	Breaking Capacity (50 Hz) I_{cu} /I_{cs} [kA] 220…240V		380…415V		500V		690V		Interrupting Rating (60 Hz) [kA] 240V	480V	600V	Cat. No.
400	4000	100	100	65	65	50	38	13	6	100	65	35	**140U-K6S3-D40**

Optional Terminal Lug Kits

	Description		Pkg. Quantity	Cat. No.
	**Terminal Lugs**	Aluminum lug, Al or Cu wire (1) 3…350 MCM or (1) 30…185 mm²	1	140U-K-TLA1A
		Aluminum lug, Al or Cu wire (1) 250…500 MCM or (1) 120…240 mm²		**140U-K-TLA1**
		Aluminum lug, Al or Cu wire (2) 3/0…250 MCM or (2) 95…120 mm²	3 (includes shield)	**140U-K-TLA2**
	**Terminal Lugs**	Copper lug, Cu wire only (1) 3…350 MCM or (1) 30…185 mm²	1	140U-K-TLC1A
		Copper lug, Cu wire only (1) 250…500 MCM or (1) 120…240 mm²		**140U-K-TLC1**
		Copper lug, Cu wire only (2) 3/0…250 MCM or (2) 95…120 mm²	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 mm² or (1) 70…240 mm²	3 (includes shield)	140U-K-TLA2A
		Aluminum lug, Al or Cu wire (1) 500…750 MCM or (1) 300…400 mm²		140U-K-TLA1B
	**Terminal Lugs**	Copper lug, Cu wire only (1) 500…750 MCM or (1) 300…400 mm²	3 (includes shield)	140U-K-TLC1B
	**Multi-Tap Terminal Lug Kit —** with IP20 terminal cover	(3) #12…2/0 AWG or (3) 4…67 mm²	3	**140U-K-MTL3A**
		(6) #14…#2 AWG or (6) 2.5…33 mm²	3	**140U-K-MTL6A**

2

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-K-EA1**
		(2) 1a-1b		***Left AND Right side***	**140U-K-EA2**
	Alarm Contact (AL) Electrically indicates when the breaker is in the "TRIPPED" state	(1) 1M (make)-1B (break)		 ***Right side ONLY***	**140U-K-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-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		 ***Left side ONLY***	**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
		110…127V, 50/60 Hz			140U-K-UD
		208…240V, 50/60 Hz			140U-K-UA
		380…500V, 50/60 Hz		***Left side ONLY***	**140U-K-UB**

Note: For Factory-Installed internal control modules, please see page 2-92

External Accessories

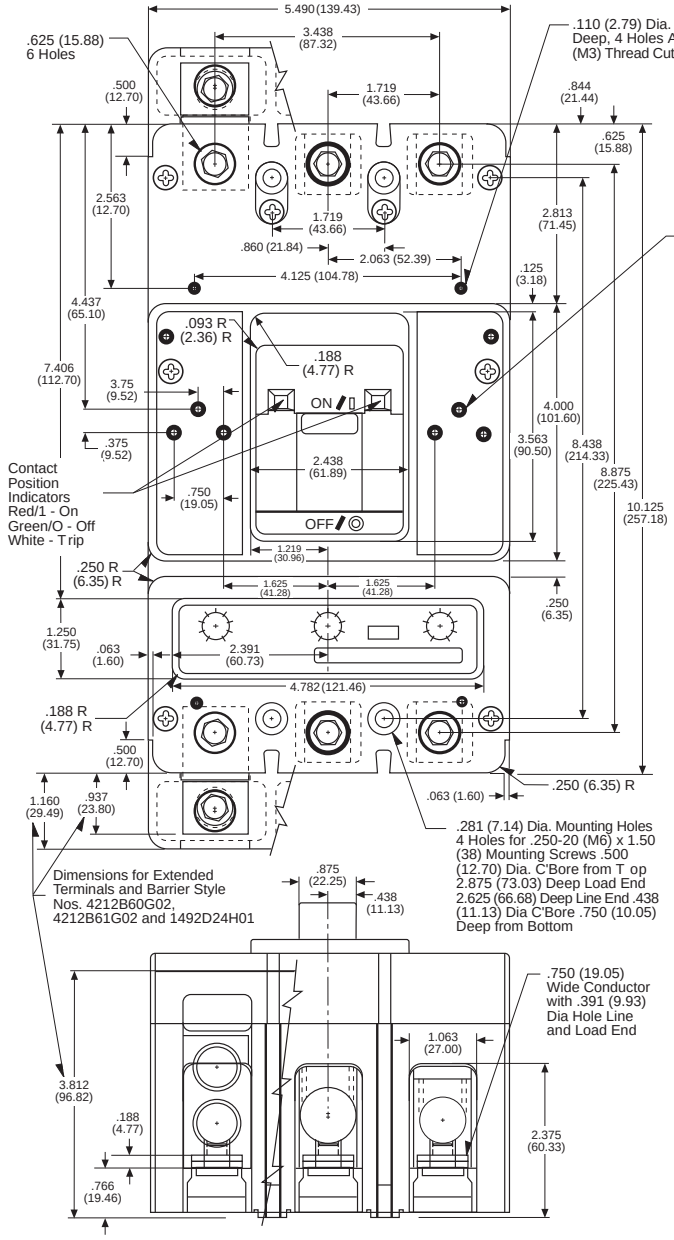
	Description		Cat. No.
	Terminal Shields		**140U-K-TS**
	**Flex-Cable Operating Mechanism** Includes handle, cable, operating, and bail mechanism Pre-assembled and adjusted UL Type 1/3/12/4/4X Flange-Mount Operating Handle Non-Metallic	4 ft (1.3 m) Cable	**140U-K-FCX04**
		6 ft (1.9 m) Cable	140U-K-FCX06
		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 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 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**
	Rotary, Direct Couple Operating Mechanism Type 1 Rotary Handle Breaker Mounted	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**
	**Phase Barriers** Provides additional phase clearance when special connections that extend past the circuit breaker housing are required	Qty: 2	**140U-K-PB**
	**Mounting Hardware** (4) M6 - 1.0 x 45 mm	1	140U-K-MHM

Molded Case Circuit Breakers

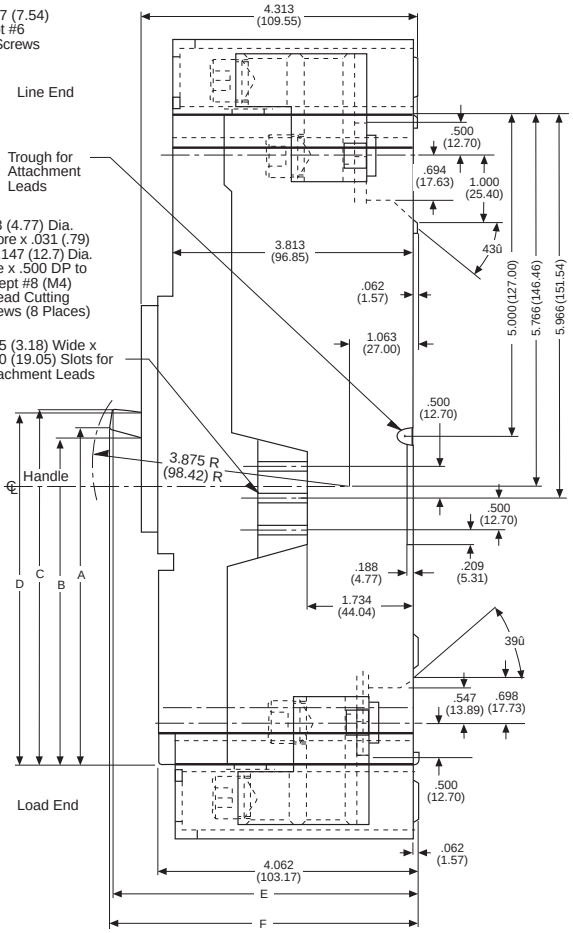
Approximate Dimensions — 400 A, K-Frame

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

Front View



Side View



Breaker Status	Dimensions						Handle Force①
	A	B	C	D	E	F	
On	5.39 (136.9)	5.20 (132.1)	5.69 (144.5)	5.61 (142.5)	4.72 (119.9)	4.77 (121.2)	30 lbs. (13.61 kgs.)
Tripped	4.77 (121.2)	4.69 (119.1)	5.08 (129.0)	5.11 (129.8)	4.89 (124.2)	4.89 (124.2)	N/A
Off	4.16 (105.7)	4.21 (106.9)	4.46 (113.3)	4.64 (117.9)	4.95 (125.7)	4.91 (124.7)	25 lbs. (11.34 kgs.)
Reset	4.07 (103.4)	4.14 (105.2)	4.57 (116.1)	4.56 (115.8)	4.95 (125.7)	4.90 (124.5)	35 lbs. (15.87 kgs.)

① All handle forces measured approximately 0.125 (3.17) from top of handle.

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

Note: Terminal box lugs must be ordered separately. See page 2-80

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	85	85	45	45	25	13	20	10	65	35	25	**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

Thermal-Magnetic			
Rated Current I_n [A]	Adjustment Range [A]		Cat. No.
	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

Electronic				
Rated Current I_n [A]	Adjustment Range [A]		Protection Type	Cat. No.
	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
			LSG	140U-LTG3-D25
			LSIG	140U-LTI3-D25
400	160…400	320…4000	LS	140U-LTL3-D40
			LSI	140U-LTH3-D40
			LSG	140U-LTG3-D40
			LSIG	140U-LTI3-D40
600	240…600	480…6000	LS	140U-LTL3-D60
			LSI	140U-LTH3-D60
			LSG	140U-LTG3-D60
			LSIG	140U-LTI3-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

❄ Full ratings are found in the breaker frames table on this page

Assembled Circuit Breakers, Electronic Trip Units

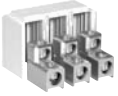
Rated Current I_n [A]	Thermal Trip I_r = 0.5…1.0 x I_n	Protection Type	Breaking Capacity/ Interrupting Rating [kA]❄ 400V	480V	Cat. No.	Breaking Capacity/ Interrupting Rating [kA]❄ 400V	480V	Cat. No.
250	100…250	LS	45	35	140U-L3L3-D25	70	65	**140U-L6L3-D25**
		LSI	45	35	140U-L3H3-D25	70	65	**140U-L6H3-D25**
		LSG	45	35	140U-L3G3-D25	70	65	**140U-L6G3-D25**
		LSIG	45	35	140U-L3I3-D25	70	65	**140U-L6I3-D25**
400	160…400	LS	45	35	140U-L3L3-D40	70	65	**140U-L6L3-D40**
		LSI	45	35	140U-L3H3-D40	70	65	**140U-L6H3-D40**
		LSG	45	35	140U-L3G3-D40	70	65	**140U-L6G3-D40**
		LSIG	45	35	140U-L3I3-D40	70	65	**140U-L6I3-D40**
600	240…600	LS	45	35	140U-L3L3-D60	70	65	140U-L6L3-D60
		LSI	45	35	140U-L3H3-D60	70	65	140U-L6H3-D60
		LSG	45	35	140U-L3G3-D60	70	65	**140U-L6G3-D60**
		LSIG	45	35	140U-L3I3-D60	70	65	140U-L6I3-D60

❄ Full ratings are found in the breaker frames table on page 2-79

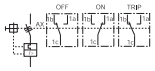
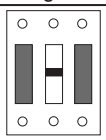
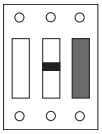
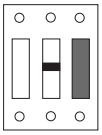
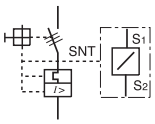
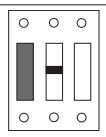
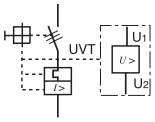
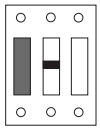
Molded Case Switch — UL 489

Rated Current I_n [A]	Magnetic Trip I_m = 10 x I_n [A]	Breaking Capacity (50 Hz) I_{cu} /I_{cs} [kA] 220…240V		380…415V		500V		690V		Interrupting Rating (60 Hz) [kA] 240V	480V	600V	Cat. No.
600	6000	100	100	70	70	50	38	25	13	100	65	35	140U-L6S3-D60

Terminal Lugs

	Description			Cat. No.
	**Terminal Lugs**	Aluminum lug, Al or Cu wire (1) 500…750 MCM or (1) 240…380 mm²	Qty: 3 (includes shield)	**140U-L-TL6A1**
		Copper lug, Cu wire only (1) 500…750 MCM or (1) 240…380 mm²	Qty: 3 (includes shield)	140U-L-TL6C1
		Aluminum lug, Al or Cu wire (2) 2…500 MCM or (2) 35…240 mm²	Qty: 3 (includes shield)	**140U-L-TL6A2**
	**Terminal Lugs**	Copper lug, Cu wire only (2) 2…500 MCM or (2) 35…240 mm²	Qty: 3 (includes shield)	**140U-L-TL6C2**
		Aluminum lug, Al or Cu wire (1) 2…500 MCM or (1) 35…240 mm²	Qty: 1	**140U-L-TL4A1**
		Copper lug, Cu wire only (1) 2…500 MCM or (1) 35…240 mm²	Qty: 1	**140U-L-TL4C1**

Internal Control Modules — Field Installed

	Description		Diagram	Mounting Location	Cat. No.
	**Auxiliary Contact (AX)** Electrically indicates "ON/OFF" status of breakers	(1) 1a-1b		 ***Left AND Right side***	**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…60V, 50/60/DC		 ***Left side ONLY***	**140U-H-SNJ**
		110…240V, 50/60/DC			**140U-H-SND**
		380…440V AC, 220…250V DC			140U-H-SNN
		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

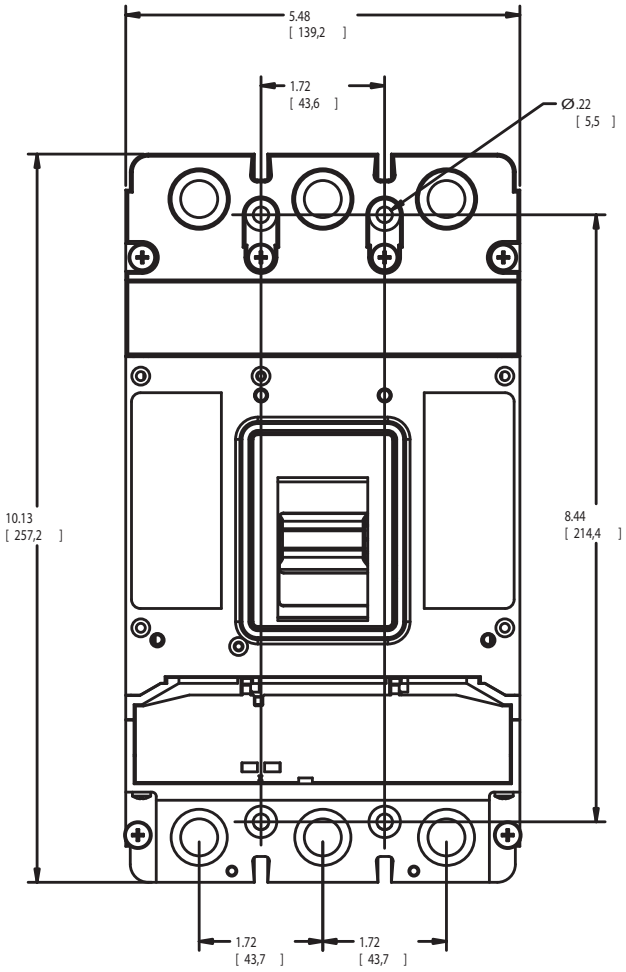
Note: For Factory-Installed internal control modules, please see page 2-92

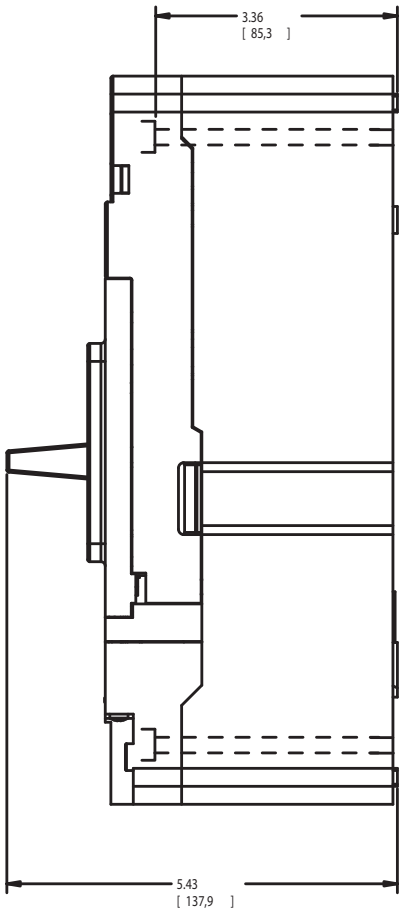
2

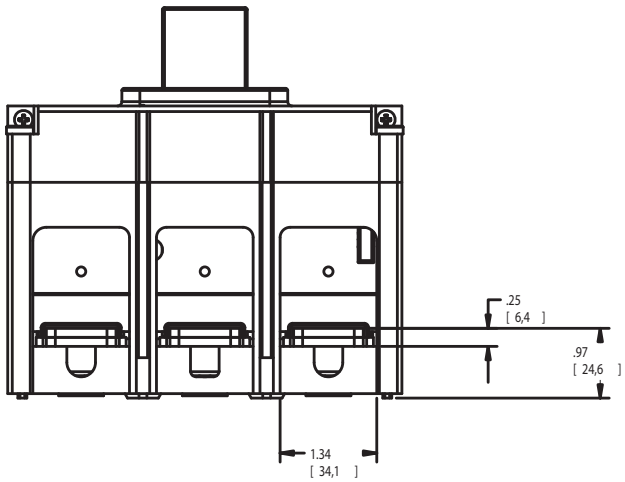
External Accessories

	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 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 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
	**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 to1.0 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
	**Mounting Hardware** (4) M5 - 0.8 x 100 mm		For use with 3- or 4-Pole MCCBs	140U-L-MHM

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







Molded Case Circuit Breakers

Product Selection — 800 A, M-Frame

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

Note: Terminal box lugs must be ordered separately. See page 2-86

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

Thermal-Magnetic

Rated Current I_n [A]	Adjustment Range [A]		Cat. No.
	Thermal Trip $I_r = I_n$	Magnetic Trip I_m = 5…10 x 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**

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	—	—

Electronic

Rated Current I_n [A]	Adjustment Range [A]		Protection Type	Cat. No.
	Thermal Trip I_r = 0.5… 1.0 x I_n	Magnetic Trip I_m = 2…8 x 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**

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**

❄ Full ratings are found in the breaker frames table on this page

Assembled Circuit Breakers, Electronic Trip Units

Rated Current I_n [A]	Thermal Trip I_r = 0.5…1.0 x I_n	Protection Type	Breaking Capacity/ Interrupting Rating [kA]❄		Cat. No.	Breaking Capacity/ Interrupting Rating [kA]❄		Cat. No.
			400V	480V		400V	480V	
800	200…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.

❄ Full ratings are found in the breaker frames table on this page

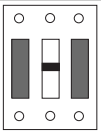
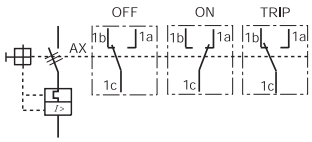
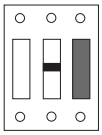
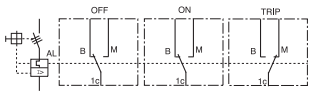
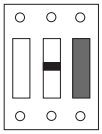
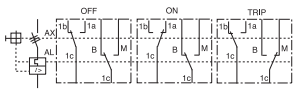
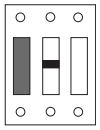
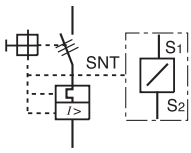
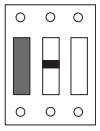
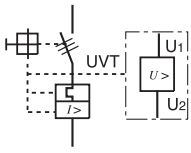
Visit our website: www.ab.com/catalogs

Preferred availability cat. nos. are printed in **bold**

Molded Case Switch — UL 489

Rated Current I_n [A]	Magnetic Trip [A] I_m = 10 x 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**

Internal Control Modules — Field Installed

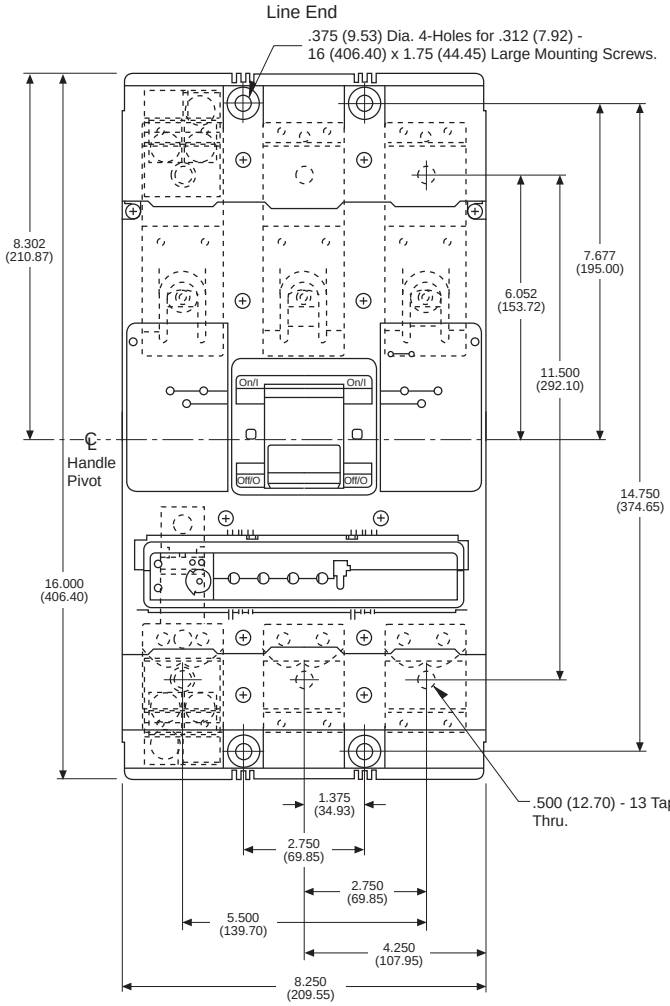
	Description		Mounting Location	Diagram	Cat. No.
	**Auxiliary Contact (AX)** Electrically indicates "ON/OFF" status of breakers	(1) 1a-1b			**140U-M-EA1**
		(2) 1a-1b	***Left AND Right Side***		**140U-M-EA2**
	Alarm Contact (AL) Electrically indicates when the breaker is in the "TRIPPED" state	(1) 1M (make)-1B (break)			**140U-M-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-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	***Left Side Only***		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	***Left Side Only***		140U-M-UB

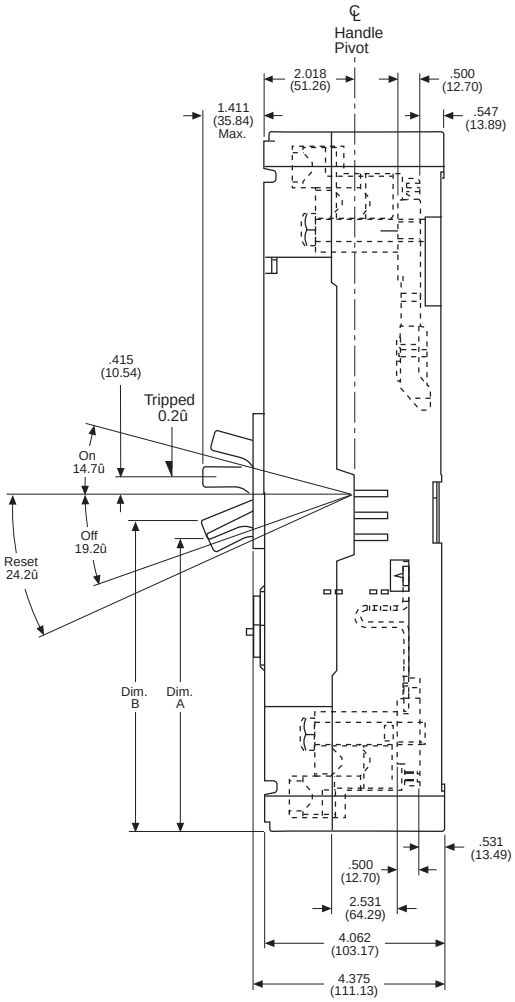
Note: For Factory-Installed internal control modules, please see page 2-92

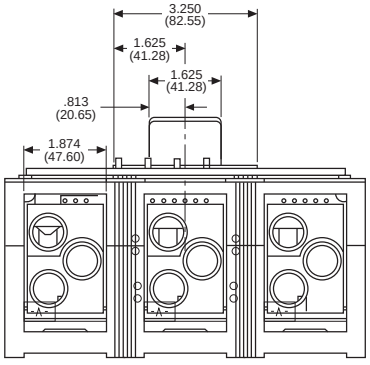
External Accessories

	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
	**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 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 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 mm²	Qty: 1	**140U-M-TLC3**
		Aluminum lug, Al or Cu wire (3) 3/0…400 MCM or (3) 95…185 mm²	Qty: 1	**140U-M-TLA3**
	**Terminal Lugs**	Aluminum lug, Al or Cu wire (2) 1…500 MCM or (2) 50…240 mm²	Qty: 1	140U-M-TLA2
		Aluminum lug, Al or Cu wire (2) 500…750 MCM or (2) 240…400 mm²	Qty: 1	**140U-M-TLA2A**
		Copper lug, Cu wire only (2) 2/0…500 MCM or (2) 70…240 mm²	Qty: 1	140U-M-TLC2
	**Phase Barriers** Provides additional phase clearance when special connections that extend past the circuit breaker housing are required		Qty: 2	**140U-M-PB**
	**Padlock Kit** Padlocking Hasp Lock-OFF only		Qty: 1	140U-M-PL
	**Mounting Hardware** (4) M8 - 1 x 35 mm		For use with 3- or 4-Pole MCCBs	140U-M-MHM

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







Breaker Status	Dimension A	Dimension B
On	8.72 (221.49)	9.17 (232.92)
Off	6.72 (170.69)	7.14 (181.36)
Tripped	7.86 (199.64)	8.30 (210.82)
Reset	6.44 (163.58)	6.84 (173.74)

Molded Case Circuit Breakers

Product Selection — 1200 A, N-Frame

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

Note: Terminal box lugs must be ordered separately. See page 2-90

Assembled Circuit Breakers, Electronic Trip Units

Rated Current I_n [A]	Adjustment Range I_r [A]		Protection Type	Breaking Capacity (50 Hz) I_{cu} / I_{cs} [kA]								Interrupting Rating (60 Hz) [kA]			Cat. No.
	Thermal Trip I_r = 0.5...1.0 x I_n	Magnetic Trip I_m = 2...8 x I_n		220...240V		380...415V		500V		690V		240V	480V	600V	
1200	600...1200∗	1200...10600	LS	85	85	50	50	40	20	20	10	65	50	25	**140U-N5L3-E12**
			LS	100	100	70	50	50	25	25	13	100	65	35	**140U-N6L3-E12**
1200	600...1200	1200...10600	LSI	100	100	70	50	50	25	25	13	100	65	35	140U-N6H3-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
1200	600...1200∗	1200...10600	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
			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

∗ Select proper rating plug to cover thermal trip equipment.

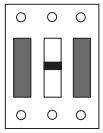
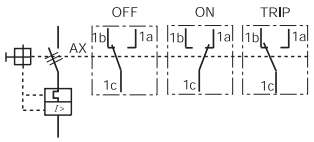
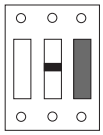
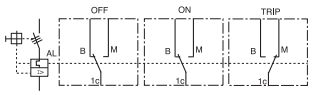
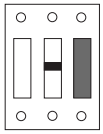
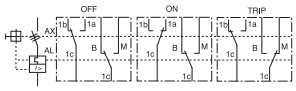
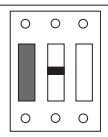
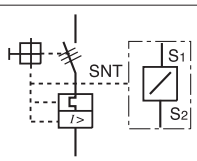
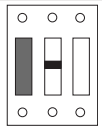
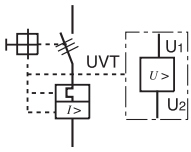
Rating Plugs

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 x 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

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-N-EA1**
		(2) 1a-1b	***Left AND Right side***		**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, 110…125V DC			140U-N-SND
		380…440V AC, 220…250V DC			140U-N-SNN
		480…600V, 50/60 Hz			140U-N-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-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

Note: For Factory-Installed internal control modules, please see page 2-92

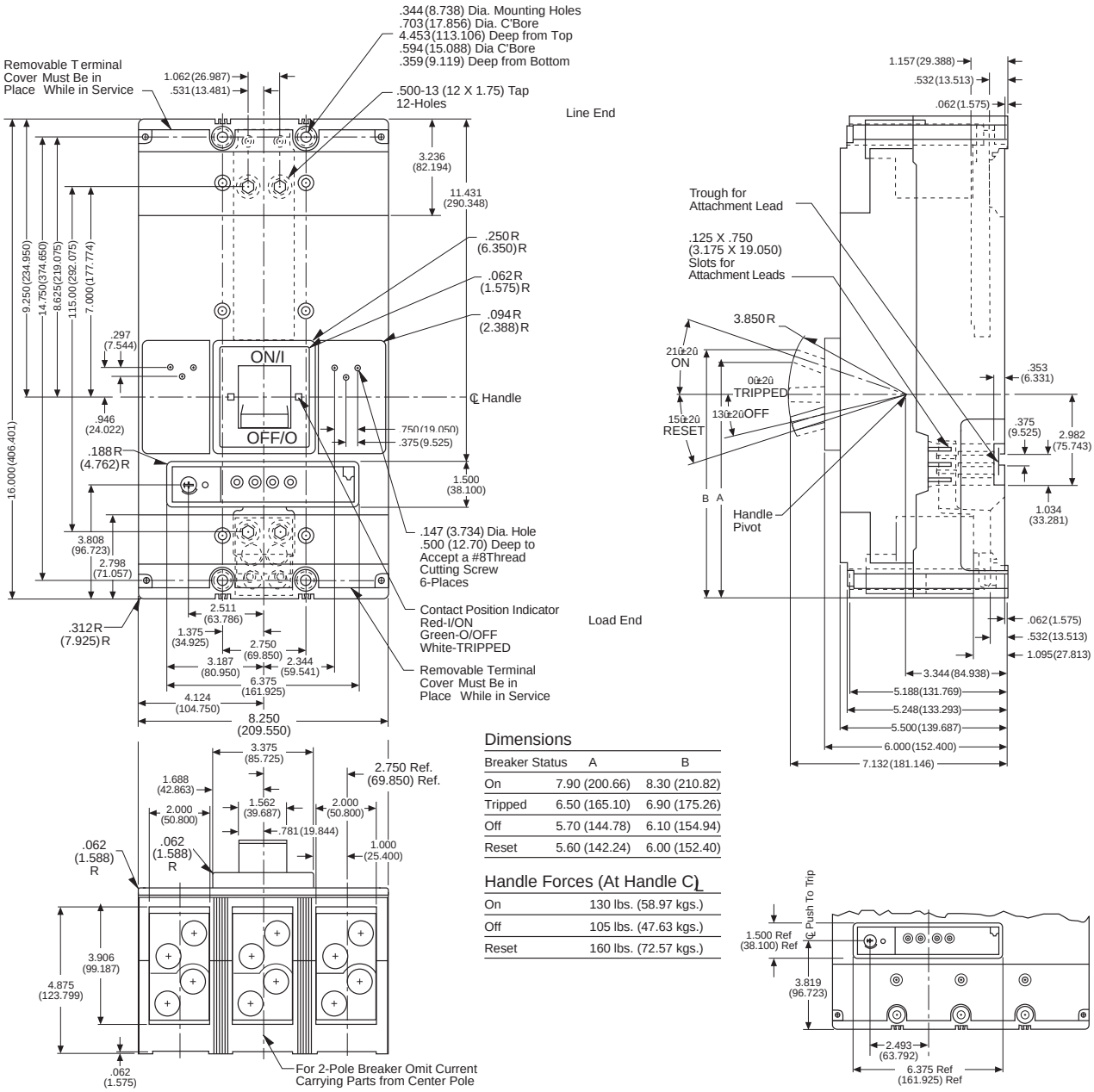
External Accessories

	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 12 in. (30.48 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**
	**Mounting Hardware** (4) M8 - 1 x 35 mm	For use with 3- or 4-Pole MCCBs	140U-M-MHM

Terminal Lugs

	Description		Pkg. Quantity	Cat. No.
	**Terminal Lugs**	Aluminum lug, Al or Cu wire (2) 1…500 MCM or (2) 50…240 mm²	Qty: 1	140U-N-TLA2
		Aluminum lug, Al or Cu wire (3) 3/0…400 MCM or (3) 95…185 mm²	Qty: 1	140U-N-TLA3
		Aluminum lug, Al or Cu wire (4) 4/0…500 MCM or (4) 120…300 mm²	Qty: 1	**140U-N-TLA4**
		Aluminum lug, Al or Cu wire (3) 500…750 MCM or (3) 300…400 mm²	Qty: 1	140U-N-TLA3A
		Copper lug, Cu wire only (2) 2/0…500 MCM or (2) 70…240 mm²	Qty: 1	140U-N-TLC2
		Copper lug, Cu wire only (3) 3/0…500 MCM or (3) 95…240 mm²	Qty: 1	140U-N-TLC3
		Copper lug, Cu wire only (4) 3/0…400 MCM or (4) 95…185 mm²	Qty: 1	**140U-N-TLC4**

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



Dimensions

Breaker Status	A	B
On	7.90 (200.66)	8.30 (210.82)
Tripped	6.50 (165.10)	6.90 (175.26)
Off	5.70 (144.78)	6.10 (154.94)
Reset	5.60 (142.24)	6.00 (152.40)

Handle Forces (At Handle ℄)

On	130 lbs. (58.97 kgs.)
Off	105 lbs. (47.63 kgs.)
Reset	160 lbs. (72.57 kgs.)

2

Internal Control Modules — Factory Installed
For use with G-Frame Molded Case Circuit Breakers

2-Pole Breaker

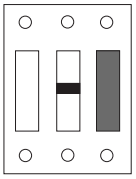
Mounting Location

Left side only

(1) Auxiliary contact (AX)
or
(1) Alarm contact (AL)
or
(1) Alarm contact (AL) + Auxiliary contact (AX)

Right side only

(1) Auxiliary contact (AX)



3-Pole Breaker

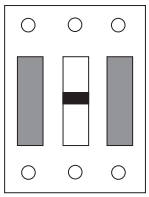
Mounting Location

Left side only

(1) Auxiliary contact (AX)
or
(1) Alarm contact (AL)
or
(1) Alarm contact (AL) + Auxiliary contact (AX)

Right side only

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



Auxiliary and Alarm Contacts	Suffix	
	2-Pole	3-Pole
(1) AX	- A	- A

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

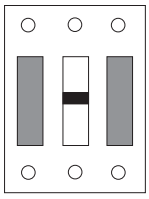
Mounting Location

Left side only

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

Right side only

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



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

Shunt Trip Combinations	Suffix
(1) SNT only	- P⊗
(1) AX + (1) SNT	- Q⊗
(2) AX + (1) SNT	- R⊗
(1) AX + (1) AL + (1) SNT	- T⊗
(1) AL + (1) SNT	- V⊗

⊗Standard Voltage Suffix Codes∗

Voltage [V]	12…24	110…240	380…600
AC, 50/60 Hz	J	D	B
Voltage [V]	12…24	110…125	—
DC	J	D	—

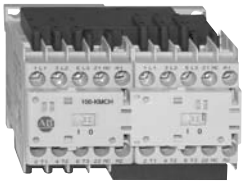
∗ For additional voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

Contactors

					
Bulletin	**100-K/104-K**	**100-C/104-C**	**100Q-C**	**100-D/104-D**	**100-G**
Screw Terminals	✓	✓	✓	Thru-hole	Thru-hole
Max. Current I_e	12 A	85 A	37 A	860 A	1200 A
Current Rating	5…12 A	9…85 A	16, 32 A	95…860 A	550…1200 A
Features	• 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	• 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	• 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	• Panel mounting only • Made of environmentally friendly materials • AC or DC coil control (conventional or electronic) • Integrated PLC interface (electronic coil)	• 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 front- or 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-D95…D180** AC: 24…550V 50 Hz, 24…600V 60Hz, 100…277V 50/60Hz DC: 24…250V DC **Electronic Coils** **Cat. Nos. 100-D95…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	• Front-mount auxiliary contacts • Surge suppressors • Electronic timers • Mechanical interlocks	• Front or side-mount auxiliary contacts • Surge suppressors • Electronic or pneumatic timers • Mechanical interlocks • Mechanical latches	• Side-mount auxiliary contacts • Surge suppressors • Electronic timers	• Side-mount auxiliary contacts • Surge suppressors • IP20 terminal blocks • Terminal shields • Terminal covers • Connecting components • Terminal lugs • Mechanical/electrical interlocks	• Auxiliary contact • 4th pole • Vertical interlock • Horizontal interlock • Mechanical latch
Standards/ Certifications	UL CSA IEC CE Marked	UL CSA IEC CE Marked	UL CSA IEC CE Marked	UL CSA IEC CE Marked	UL CSA IEC CE Marked
Product Selection	**Page 2-95**	**Page 2-99**	**Page 2-105**	**Page 2-111**	**Page 2-120**

Safety Contactors

		
Bulletin	**100S-C/104S-C**	**100S-D**
Screw Terminals	✓	Thru-hole
Max. Current I_e	85 A	860 A
Current Rating	9…85 A	95…860 A
Features	• Positively guided/mechanically linked auxiliary contacts • Front-mounted auxiliary contacts: - Permanently fixed - Protective cover to prevent manual operation - Red contact housing for easy identification - Incorporates IEC 947-5-1 “Mechanically Linked” symbol • AC and DC operating coils • SUVA third-party certification	• 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 AC, 50/60Hz DC = 12…250V DC	**Conventional Coils** **Cat. Nos. 100S-D95…D180** AC: 24…550V, 50 Hz; 24…600V, 60Hz; 100…277V, 50/60Hz DC: 24…250V **Electronic Coils** **Cat. Nos. 100S-D95…D300** AC: 24…500V, 50/60 Hz DC: 24…255V **Cat. Nos. 100S-D420** AC: 42…500V 50/60 Hz DC: 48…255V **Cat. Nos. 100S-D630…D860** AC: 100…600V, 50/60 Hz DC: 110…255V
Optional Accessories	• Side-mount auxiliary contacts • Surge suppressors • Electronic timers • Mechanical interlocks	• 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	cULus Listed (File No. E3125; Guide NLDX, NLDX7) SUVA Third-Party Certified CE Marked	cULus Listed (File No. E3125; Guide No. NLDX, NLDX7) SUVA Third-Party Certified CE Marked
Product Selection	**Page 2-102**	**Page 2-115**



Bulletin 100-K/104-K IEC 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

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.

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

Table of Contents

Standards Compliance

IEC/EN 60947-1,-4-1,-5-1,-5-4
UL 508
CSA 22.2. No. 14
NF F 62-000

Certifications

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

2

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.
	3Ø kW (50 Hz)				Hp (60 Hz)									
40 °C					1Ø		3Ø							
AC-1	230V	400/415V	500V	690V	115V	230V	200V	230V	460V	575V	N.O.	N.C.		
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**
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
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

∗ 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 the table on page 2-96 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.
	3Ø kW (50 Hz)				Hp (60 Hz)									
40 °C					1Ø		3Ø							
AC-1	230V	400/415V	500V	690V	115V	230V	200V	230V	460V	575V	N.O.	N.C.		
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
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
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 the table on page 2-96 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 ∗		
	3Ø kW (50 Hz)				Hp (60 Hz)								
40 °C					1Ø		3Ø						
AC-1	230V	400/415V	500V	690V	115V	230V	200V	230V	460V	575V	N.O.	N.C.	Cat. No.
20	1.5	2.2	2.2	2.2	—	—	1-1/2	1-1/2	3	3	0	1	**104-K05⊗02**
20	3	4	4	4	—	—	2	2	5	5	0	1	**104-K09⊗02**
20	3	5.5	5.5	5.5	—	—	3	3	7-1/2	7-1/2	0	1	**104-K12⊗02**

∗ Used for electrical interlocking

⊗ The Cat. No. as listed is incomplete. Select a standard Coil Voltage Code from the table below to complete the Cat. No.
Example: 230V, 50/60 Hz: Cat. No. **104-K05⊗02** 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).

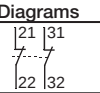
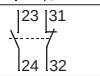
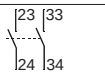
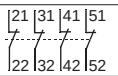
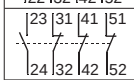
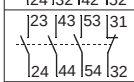
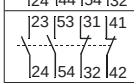
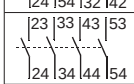
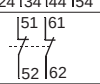
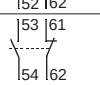
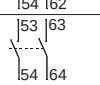
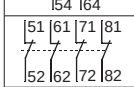
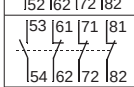
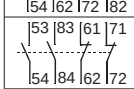
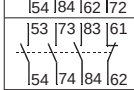
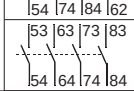
⊗ Coil Voltage Code

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. 100-K09⊗10** becomes **Cat. No.100-K09D10**.

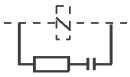
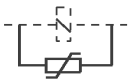
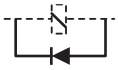
AC Voltages [V]	24	110	120	230	240	400	480	600
50 Hz	—	D	—	—	—	—	—	—
60 Hz	—	—	D	—	—	—	B	VC
50/60 Hz	**KJ**	—	—	KF	**KA**	**KN**	—	—

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

Auxiliary Contact Blocks

	Description	Connection Diagrams	N.O.	N.C.	For Use With	Pkg. Qty.	Cat. No.
	**Front-Mounted Auxiliary Contacts** Auxiliary contact blocks 2- and 4-pole versions Choice of contact configurations Snap on, no tools required Electronic-compatible bifurcated contacts for signals down to 15V/2 mA Mirror Contact performance per IEC 60947-4-1		0	2	100-K05…K12⊗10	1	100-KFC02
			1	1	100-K05…K12⊗10	1	**100-KFC11**
			2	0	100-K05…K12⊗10	1	100-KFC20
			0	4	100-K05…K12⊗10	1	100-KFC04
			1	3	100-K05…K12⊗10	1	100-KFC13
			3	1	100-K05…K12⊗10	1	100-KFC31
			2	2	100-K05…K12⊗10	1	**100-KFC22**
			4	0	100-K05…K12⊗10	1	**100-KFC40**
			0	2	100/104-K, 700-K	1	100-KFA02E
			1	1	100/104-K, 700-K	1	100-KFA11E
			2	0	100/104-K, 700-K	1	100-KFA20E
			0	4	100/104-K, 700-K	1	**100-KFA04E**
			1	3	100/104-K, 700-K	1	100-KFA13E
			2	2	100/104-K, 700-K	1	**100-KFA22Z**
			3	1	100/104-K, 700-K	1	**100-KFA31Z**
			4	0	100/104-K, 700-K	1	**100-KFA40E**

Control Modules

	Description			Connection Diagrams	For Use With	Pkg. Qty.	Cat. No.
	**Mechanical Interlock** 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
	**Surge Suppressor** Plug-in Type Limits surge voltage on coil drop-off	**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** 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.	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 Hinged Marker Card**	5	**1492-MH6X12**

Bulletin 100-C/104-C IEC Contactors

- Compact sizes from 4…45 kW/5…60 Hp (9…85 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 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.

Table of Contents

Standards Compliance

EN/IEC 60947-4-1, 60947-5-1
IEC 60947 Type "2" Coordination
CSA C22.2 No. 14
UL 508

Certifications

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

2

3-Pole AC- and DC-Operated Contactors

I_e [A]		Ratings for Switching AC Motors — AC-2, AC-3, AC-4										Aux. Contacts		
		3Ø kW (50 Hz)				Hp (60 Hz)								
						1Ø		3Ø						
AC-3	AC-1	230V	400V/415V	500V	690V	115V	230V	200V	230V	460V	575V	N.O.	N.C.	Cat. No.
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**
												0	1	100-C30⊗01
37	65	11	18.5/20	20	18.5	3	5	10	10	25	30	0	0	100-C37⊗00
												1	0	**100-C37⊗10**
												0	1	100-C37⊗01
43	85	13	22	25	22	3	7-1/2	10	15	30	30	0	0	100-C43⊗00
												1	0	**100-C43⊗10**
												0	1	100-C43⊗01
60	100	18.5	32	37	32	5	10	15	20	40	50	0	0	100-C60⊗00
												1	0	**100-C60⊗10**
												0	1	100-C60⊗01
72	100	22	40	45	40	5	15	20	25	50	60	0	0	100-C72⊗00
												1	0	**100-C72⊗10**
												0	1	100-C72⊗01
85	100	25	45	55	45	7-1/2	15	25	30	60	60	0	0	100-C85⊗00
												1	0	**100-C85⊗10**
												0	1	100-C85⊗01

⊗Coil voltage code and terminal position—see page 2-101

4-Pole AC- and DC-Operated Contactors

I_e [A]		Ratings for Switching AC Motors — AC-2, AC-3										Contact Configuration, Main Pole		
		3Ø kW (50 Hz)∗				Hp (60 Hz)								
						1Ø		3Ø ∗						
AC-3	AC-1	230V	400V/415V	500V	690V	115V	230V	200V	230V	460V	575V	N.O.	N.C.	Cat. No.
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.

⊗Coil voltage code and terminal position—see page 2-101

Visit our website: www.ab.com/catalogs

Preferred availability cat. nos. are printed in **bold**

Allen-Bradley

Reversing AC- and DC-Operated Contactors

- Includes Mechanical/Electrical Interlock
- Includes Reversing Power Wiring

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		
		3Ø kW (50 Hz)				Hp (60 Hz)								
						1Ø		3Ø						
AC-3	AC-1	230V	400V/415V	500V	690V	115V	230V	200V	230V	460V	575V	N.O.	N.C.∗	Cat. No.
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**

∗ 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**.

[V] / Hz	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	—	—	—	—

DC Voltages [V]		9	12	24	36	48	60	64	72	80	110	115	125	220	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	—	—	EJ	—	—	—	—	—	—	—	—	—	—	—	—
100-C60…C85	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

Bulletin 100S/104S 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.

Table of Contents

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

Certifications

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

3-Pole AC- and DC-Operated Contactors

I_e [A]		Ratings for Switching AC Motors — AC-2, AC-3, AC-4										Aux. Contacts		
		3Ø kW (50 Hz)				Hp (60 Hz)								
						1Ø		3Ø						
AC-3	AC-1	230V	400V/ 415V	500V	690V	115V	230V	200V	230V	460V	575V	N.O.	N.C.	Cat. No.∗❄
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**

∗ 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...C85** conform to mirror contact performance only.

⊗Coil voltage code and terminal position—see page 2-104

Visit our website: www.ab.com/catalogs
Preferred availability cat. nos. are printed in **bold**

4-Pole AC- and DC-Operated Contactors

I_e [A]		Ratings for Switching AC Motors										Contact Configuration				
		AC-2, AC-3, AC-4										Main Pole		Auxillary Contacts		
		3Ø kW (50 Hz)❄				Hp (60 Hz)										
						1Ø		3Ø ❄								
AC-3	AC-1	230V	400V/ 415V	500V	690V	115V	230V	200V	230V	460V	575V	N.O.	N.C.	N.O.	N.C.	Cat. No.∗‡
9	32	3	4	4	4	1/2	1-1/2	2	2	5	7-1/2	4	0	0	4	
												3	1	0	4	
12	32	4	5.5	5.5	5.5	1/2	2	3	3	7-1/2	10	4	0	0	4	
												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 2-104

Safety Contactors

Product Selection, Continued

Reversing AC- and DC-Operated Contactors

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

I_e [A]		Ratings for Switching AC Motors AC-2, AC-3, AC-4										Aux. Contacts Installed per Contactor		
		3Ø kW (50 Hz)				Hp (60 Hz)								
						1Ø		3Ø						
AC-3	AC-1	230V	400V/ 415V	500V	690V	115V	230V	200V	230V	460V	575V	N.O.	N.C. ‡	Cat. No.∗❄
9	32	3	4	4	4	1/2	1-1/2	2	2	5	7-1/2	0	6	104S-C09⊗012BC
												1	5	104S-C09⊗210BC
12	32	4	5.5	5.5	5.5	1/2	2	3	3	7-1/2	10	0	6	104S-C12⊗012BC
												1	5	104S-C12⊗210BC
16	32	5.5	7.5	7.5	7.5	1	3	5	5	10	15	0	6	104S-C16⊗012BC
												1	5	104S-C16⊗210BC
23	32	7.5	11	13	10	2	3	5	7-1/2	15	15	0	6	104S-C23⊗012BC
												1	5	**104S-C23⊗210BC**
30	65	10	15	15	15	2	5	7-1/2	10	20	25	0	5	**104S-C30⊗010BC**
												1	5	**104S-C30⊗210BC**
37	65	11	18.5/20	20	18.5	3	5	10	10	25	30	0	5	**104S-C37⊗010BC**
												1	5	**104S-C37⊗210BC**
43	85	13	22	25	22	3	7-1/2	10	15	30	30	0	5	**104S-C43⊗010BC**
												1	5	**104S-C43⊗210BC**
60	100	18.5	32	37	32	5	10	15	20	40	50	0	5	§ **104S-C60⊗010BC**
												1	5	§ **104S-C60⊗210BC**
72	100	22	40	45	40	5	15	20	25	50	60	0	5	§ **104S-C72⊗010BC**
												1	5	§ **104S-C72⊗210BC**
85	100	25	45	55	45	7-1/2	15	25	30	60	60	0	5	§ **104S-C85⊗010BC**
												1	5	§ **104S-C85⊗210BC**

∗ 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-C09⊗05BC** becomes Cat. No. **104S-C09⊗05C**.

‡ 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…C85** 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

[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	60	64	72	80	110	115	125	220	230	250
100S-C09…C43	Standard	DC	ZR	ZQ	ZJ	ZW	ZY	ZZ	ZB	ZG	ZE	ZD	ZP	ZS	ZA	ZF	ZT
	with Integrated Diode		—	—	DJ	—	—	—	—	—	—	—	—	—	—	—	—
	Electronic with Integrated Diode		—	—	EJ	—	—	—	—	—	—	—	—	—	—	—	—
100S-C60…C85	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.**

Cat. No. 100S-C09⊗05C Line Side

Cat. No. 100S-C09U⊗05C Load Side

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Preferred availability cat. nos. are printed in **bold**

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

Standards Compliance

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

Certifications

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

2

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		
230V	240V	400V	415V	500V	690V	230V	240V	400V	415V	500V	690V	N.O.	N.C.	Cat. No.
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		
230V	240V	400V	415V	500V	690V	230V	240V	400V	415V	500V	690V	N.O.	N.C.	Cat. No.
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		
115V	230V	200V	230V	460V	600V	N.O.	N.C.	Cat. No.
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] Hz	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	—	—	—	—

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	—	—	—	—	—	—	—	—	—	—	—	—
Electronic with Integrated Diode	—	—	EJ	—	—	—	—	—	—	—	—	—	—	—	—

Maximum Operational Rates

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

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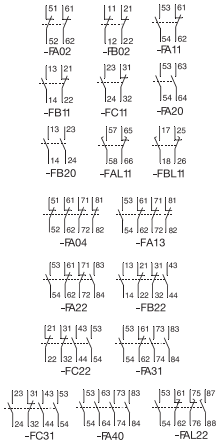
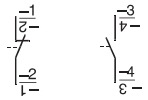
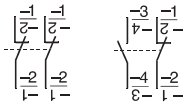
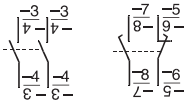
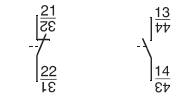
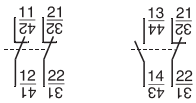
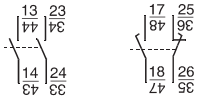
Auxiliary Contacts (For 100-C09…C85 contactors)

	Description	N.O.	N.C.	Connection Diagrams	For Use With	Standard Auxiliary Contact Cat. No.	Bifurcated Auxiliary Contact Cat. No.
 	**Auxiliary Contact Blocks for Front Mounting**∗ • 2- and 4-pole • Quick and easy mounting without tools • Electronic-compatible contacts down to 17V, 5 mA • Mechanically linked performance between N.O. and N.C. poles and to the main contactor poles (except for L types) • Models with equal function with several terminal numbering choices • 1L = Late break N.C./early make N.O. • Bifurcated version for switching down to 8V, 5 mA also available	0	2	 -FA02 -FB02 -FA11 -FB11 -FC11 -FA20 -FB20 -FAL11 -FBL11 -FA04 -FA13 -FA22 -FB22 -FC22 -FA31 -FC31 -FA40 -FAL22	100-C all	**100-FA02**	100-FAB02
					C30⊗00…C85⊗00	**100-FB02**	100-FBB02
		1	1		100-C all	**100-FA11**	100-FAB11
					C30⊗00…C85⊗00	**100-FB11**	100-FBB11
					C09⊗10…C23⊗10	**100-FC11**	100-FCB11
		2	0		100-C all	**100-FA20**	**100-FAB20**
					C30⊗00…C85⊗00	**100-FB20**	100-FBB20
		1L	1L		C30⊗00…C85⊗00	**100-FAL11**	—
					C30⊗00…C85⊗00	**100-FBL11**	—
		0	4		100-C all	**100-FA04**	100-FAB04
		1	3		100-C all	**100-FA13**	100-FAB13
		2	2		100-C all	**100-FA22**	**100-FAB22**
					C30⊗00…C85⊗00	**100-FB22**	100-FBB22
					C09⊗10…C23⊗10	**100-FC22**	100-FCB22
		3	1		100-C all	**100-FA31**	100-FAB31
					C09⊗10…C23⊗10	**100-FC31**	100-FCB31
		4	0		100-C all	**100-FA40**	**100-FAB40**
		1+1L	1+1L		100-C all	**100-FAL22**	—
 	**Auxiliary Contact Blocks for Side Mounting without Sequence Terminal Designations**∗ • 1- and 2-pole • Two-way numbering for right or left mounting on the contactor • Quick and easy mounting without tools • Electronic-compatible contacts down to 17V, 10 mA • Mirror contact performance to the main contactor poles • 1L = Late break N.C./early make N.O.	0	1	 -SA01 -SA10	100-C all	**100-SA01**	—
		1	0		100-C all	**100-SA10**	—
		0	2	 -SA0 -SA11	100-C all	**100-SA02**	—
		1	1		100-C all	**100-SA11**	—
		2	0	 -SA20 -SAL11	100-C all	**100-SA20**	—
		1L	1L		100-C all	**100-SAL11**	—
 	**Auxiliary Contact Blocks for Side Mounting with Sequence Terminal Designations**∗ • 1- and 2-pole • Two-way numbering for right or left mounting on the contactor • Quick and easy mounting without tools • Electronic-compatible contacts down to 17V, 10 mA • Mirror contact performance to the main contactor poles • 1L = Late break N.C./early make N.O.	0	1	 -SB01 -SB10	100-C	**100-SB01**	—
		1	0		100-C❄	**100-SB10**	—
		0	2	 -SB02 -SB11	100-C❄	**100-SB02**	—
		1	1		100-C❄	**100-SB11**	—
		2	0	 -SB20 -SBL11	100-C❄	**100-SB20**	—
		1L	1L		100-C❄	**100-SBL11**	—

∗ Max. number of auxiliary contacts that may be mounted:
AC coil contactors — max. 4 N.O. contacts on the front of the contactor, 2 N.O. contacts on the side, 4 N.C. front or side, 6 total.
DC coil contactors — max. 4 N.O. contacts on the front of the contactor or max 2 N.O. contacts on the side, 4 N.C. front or side, 4 total.

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

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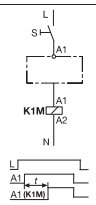
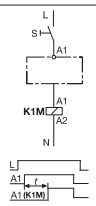
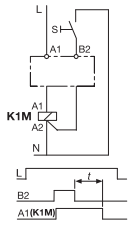
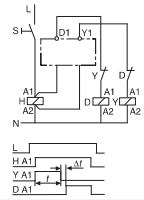
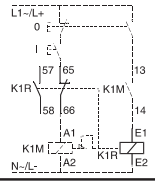
Control Modules (For 100-C09…C85 contactors)

	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 control relay continue to operate without delay.	**On-Delay** 0.3…30 s Range		100-C with AC coils, 700-CF all	**100-FPTA30**
		1.8…180 s Range			**100-FPTA180**
		Off-Delay 0.3…30 s Range		100-C all, 700-CF all	**100-FPTB30**
		1.8…180 s Range			**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		100-C (all), 700-CF 110…240V 50/60 Hz 110…250V DC	**100-ETA3**
		1…30 s Range			**100-ETA30**
		10…180 s Range			**100-ETA180**
		0.1…3 s Range		100-C with 24…48V DC coils, 700-CF with DC coils	**100-ETAZJ3**
		0.1…3 s Range			**100-ETA3**
		10…180 s Range			**100-ETAZJ180**
	**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		100-C09…C37 with 24V 50/60 Hz coils, 700-CF with AC coils	**100-ETBKJ3**
		1…30 s Range			100-ETBKJ30
		10…180 s Range			100-ETBKJ180
		0.3…3 s Range		100-C with 110…240V 50/60 Hz coils, 700-CF with AC coils	**100-ETB3**
		1…30 s Range			**100-ETB30**
		10…180 s Range			**100-ETB180**
	**Electronic Timing Modules** Delay of the contactor solenoid. Contactor K 3 (Y) is de-energized (off) and K 2 (D) is energized (on) after the end of the set Y end time. (Switching delay at 50 ms.) Continuous adjustment range High repeat accuracy	**Transition Time Y Contactor** 1…30 s Range		100-C with 110…240V AC, 50/60 Hz coils	**100-ETY30**
	**Mechanical Interlocks** For interlocking of two contactors. Common interlock for all Bul. 100-C contactor sizes Interlocking of different sizes possible Mechanical and electrical interlocking possible in one module by means of integrated auxiliary contacts 9 mm dovetail connector included	Mechanical only without auxiliary contacts		100-C (except 100-C40, -C90)	**100-MCA00**
		Mechanical/ electrical with 2 N.C. auxiliary contacts		100-C (except 100-C40, -C90)	**100-MCA02**
	**Mechanical Latch** Following contactor latching, the contactor coil is immediately de-energized (off) by the N.C. auxiliary contact (65-66). Electrical or manual release 1 N.O. + 1 N.C. auxiliary contacts Suitable for all Bul. 100-C contactor sizes, 9…85 A	Maximum command duration 0.03…10 s		100-C with AC coils (except 100-C90)	**100-FL11⊗**

⊗ 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	T	—	N	G	B	—
60 Hz	J	—	—	—	D	—	A	T	—	—	N	B

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

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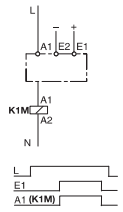
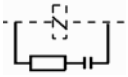
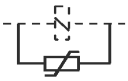
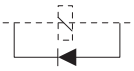
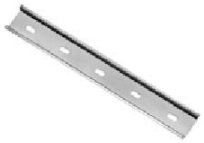
Control Modules (For 100-C09…C85 contactors), Continued

	Description		Voltage Range	Connection Diagrams	For Use With	Cat. No.
	**DC Interface (Electronic)** 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** For limitation of coil switching transients. Plug-in, coil mounted Suitable for all Bul. 100-C contactor sizes, 9…85 A RC, varistor and diode versions	**RC Module** AC operating mechanism	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	**100-FSV55**
			56…136V AC/ 78…180V DC		100-C	**100-FSV136**
			137…277V AC/ 181…350V DC		100-C	**100-FSV277**
			278…575V AC		100-C	**100-FSV575**
		Diode Module DC operating mechanism	12…250V DC		100-C with DC coils	**100-FSD250**

Assembly Components (For 100-C09…C85 contactors)

	Description	For Use With	Pkg. Quantity*	Cat. No.
 *Cat. No. 100-S0*	**Dovetail Connectors** For use in contactor and starter assemblies. Single Connector — 0 mm Spacing	100-C	10	**100-S0**
	Dovetail Connectors For use in contactor and starter assemblies. Dual Connector — 9 mm Spacing			**100-S9**
 *Cat. No. 100-SCCA*	**Protective Covers** Provides protection against unintended manual operation 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** For reversing connection with a solid-state or thermal overload relay	100-C09…C23	1	**105-PW23**
		100-C30…C37		**105-PW37**
		100-C43		**105-PW43**
		100-C60…85		**105-PW85**
	**DIN (#3) symmetrical Rail** 35 mm x 7.5 mm x 1 m long	140M-D 140M-F	10	**199-DR1**

* Must be ordered in multiples of package quantities.

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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-				
								Delta		Wye		
230V	380/415V	500V	690V	200V	230V	460V	575V	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**

Marking Systems (For 100-C09…C85 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	100	**100-FMA1**
	Marking Tag Adapters To be used with marking tag	100	**100-FMA2**

∗ Must be ordered in multiples of package quantities.

Terminal Kits (For 100-C09…C85 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…C85 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 mm²❄, fine stranded w/ ferrule) 45 A (4…25 mm², 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 mm²❄, fine stranded w/ ferrule) 45 A (4…25 mm², 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 side)	IEC @ 40 °C IEC @ 40 °C UL/CSA (Encl.)	60 A (4…16 mm²❄, fine stranded w/ ferrule) 60 A (4…25 mm², 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 mm², fine stranded w/ ferrule) 90 A (6…50 mm², coarse stranded/solid) 75 A (#8…2 AWG, stranded/solid)	3	**100-CT43**
	1-Pole Terminal Lug Kit For Cat. No. 100-C60…C85	IEC @ 40 °C IEC @ 40 °C UL/CSA (Encl.)	130 A (10…70 mm², fine stranded w/ ferrule) 130 A (10…95 mm², 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 mm², fine stranded w/ ferrule) 100 A (35…95 mm², 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 mm², fine stranded w/ ferrule) 150 A (35…95 mm², 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.

Bulletin 100-D IEC Contactors

- 50…500 kW @ 400V
- 60…600 Hp @ 460V
- 75…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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IEC 60947 Type “2” Coordination
CSA C22.2 No. 14
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Certifications

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

2

2

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

I_e [A] 60 °C	I_e [A] 40 °C	Switching of 3-phase motors — AC-2, AC-3 kW (50 Hz)						Hp (60 Hz)				Auxiliary contacts N.O.	Auxiliary contacts N.C.	Non-Reversing Contactor Cat. No.	Reversing Contactor Cat. No.
AC-3	AC-1	230V	400V	415V	500V	690V	1000V	200V	230V	460V	575V				
95	160	30	50	55	63	90	45	25	30	60	75	0	0	100-D95⊗00	—
												1	1	**100-D95⊗11**	—
												2	4	—	104-D95⊗24
110	160	32	55	63	75	100	55	40	40	75	100	0	0	100-D110⊗00	—
												1	1	**100-D110⊗11**	—
												2	4	—	104-D110⊗24
140	250	45	75	80	80	110	75	40	50	100	125	0	0	100-D140⊗00	—
												1	1	**100-D140⊗11**	—
												2	4	—	104-D140⊗24
180	250	55	90	100	90	132	90	50	60	150	150	0	0	100-D180⊗00	—
												1	1	**100-D180⊗11**	—
												2	4	—	104-D180⊗24
210	350	63	110	125	150	200	110	60	75	150	200	0	0	100-D210⊗00	—
												1	1	**100-D210⊗11**	—
												2	4	—	104-D210⊗24
250	350	80	132	150	160	250	132	75	100	200	250	0	0	100-D250⊗00	—
												1	1	**100-D250⊗11**	—
												2	4	—	104-D250⊗24
300	450	90	160	160	200	300	160	100	125	250	300	0	0	100-D300⊗00	—
												1	1	**100-D300⊗11**	—
												2	4	—	104-D300⊗24
420	540	132	220	250	300	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	450	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	560	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-D95...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-D95…100-D110	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.

Visit our website: www.ab.com/catalogs
Preferred availability cat. nos. are printed in **bold**

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				
95	160	30	50	55	63	90	45	25	30	60	75	0	0	100-D95⊗00	—
												1	1	**100-D95⊗11**	—
												2	1/1L	**100-D95⊗22L**❄	—
												2	4	—	104-D95⊗24
												2	2/2L	—	104-D95⊗24L❄
110	160	32	55	63	75	100	55	40	40	75	100	0	0	100-D110⊗00	—
												1	1	**100-D110⊗11**	—
												2	1/1L	**100-D110⊗22L**❄	—
												2	4	—	104-D110⊗24
												2	2/2L	—	104-D110⊗24L❄
140	250	45	75	80	80	110	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
												2	2/2L	—	104-D140⊗24L❄
180	250	55	90	100	90	132	90	50	60	150	150	0	0	100-D180⊗00	—
												1	1	**100-D180⊗11**	—
												—	—	**100-D180⊗22L**❄	—
												2	4	—	104-D180⊗24
												2	2/2L	—	104-D180⊗24L❄
210	350	63	110	125	150	200	110	60	75	150	200	0	0	100-D210⊗00	—
												1	1	**100-D210⊗11**	—
												2	4	—	104-D210⊗24
250	350	80	132	150	160	250	132	75	100	200	250	0	0	100-D250⊗00	—
												1	1	**100-D250⊗11**	—
												2	4	—	104-D250⊗24
300	450	90	160	160	200	300	160	100	125	250	300	0	0	100-D300⊗00	—
												1	1	**100-D300⊗11**	—
												2	4	—	104-D300⊗24
420	540	132	220	250	300	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	450	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	560	600	—	250	300	600	700	0	0	100-D860⊗00	—
												1	1	100-D630⊗11	—
												2	4	—	104-D860⊗24

⊗ Coil Voltage Codes for DC Control

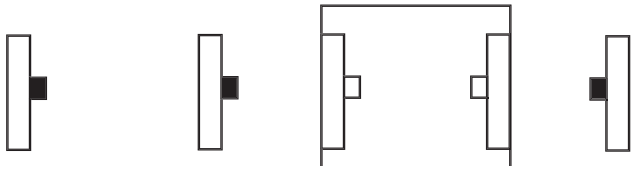
Conventional Coil	[V]	24	48	110	125	220
	DC	ZJ	ZY	ZD	ZS	ZA

Electronic Coil w/ EI Interface ♣	[V]	24	48…72	110…130	200…255
100-D95...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.

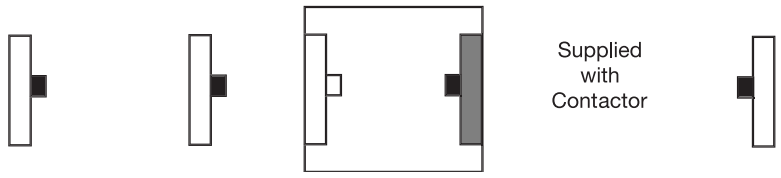
Auxiliary contacts with sequence numbering.

Cat. Nos. 100-D95…D420 — Electronic and Conventional AC Coils, Electronic DC Coils



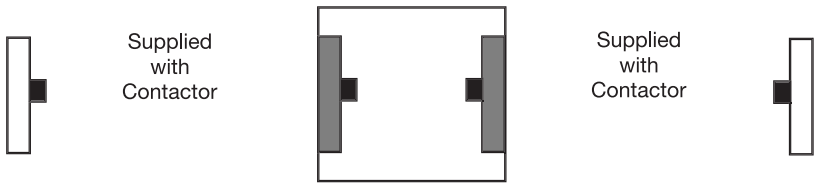
Contact Configuration		Auxiliary contact configurations				
		Left Side Mounting			Right Side Mounting	
N.O.	N.C.	Outside Cat. No.	Inside Cat. No.	For Use With	Inside Cat. No.	Outside Cat. No.
8	0	100-DS2-20	100-DS1-20	100-D…00	100-DS1-20	100-DS2-20
Sequence starts with…		7/8	3/4		1/2	5/6
7	1	100-DS2-20	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-D95…D420 — Electronic and Conventional AC Coils, Electronic DC coils



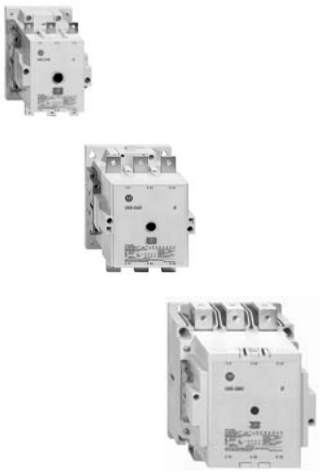
Contact Configuration		Auxiliary contact configurations				
		Left Side Mounting			Right Side Mounting	
N.O.	N.C.	Outside Cat. No.	Inside Cat. No.	For Use With	Inside Cat. No.	Outside Cat. No.
8	0	—	—	100-D…11	—	—
Sequence starts with…		—	—		—	—
7	1	100-DS2-20	100-DS1-20	100-D…11	100-DS1-11	100-DS2-20
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-D95…D180 — Conventional DC coils



Contact Configuration		Auxiliary contact configurations				
		Left Side Mounting			Right Side Mounting	
N.O.	N.C.	Outside Cat. No.	Inside Cat. No.	For Use With	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

- 50…500 kW @400V
- 60…600 Hp @460V
- 75…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.

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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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

2

3-Pole AC-Operated Contactors

I_e [A]		Switching of 3-phase motors AC-2, AC-3										Auxiliary contacts		
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			Cat. No.➢
95	160	25	50	50	55	90	45	25	30	60	75	2	2	100S-D95⊗22BC
110	160	32	55	55	63	100	55	40	40	75	100	2	2	100S-D110⊗22BC
140	250	45	75	75	80/100‡	110/132‡	75	40	50	100	125	2	2	100S-D140⊗22BC
180	250	55	90	100	90/125‡	132/160‡	90	50	60	150	150	2	2	100S-D180⊗22BC
210	350	63	110	110	150	200	110	60	75	150	200	2	2	100S-D210⊗22BC
250	350	80	132	150	160	250	133	75	100	200	250	2	2	100S-D250⊗22BC
300	450	90	160	160	200	300	160	100	125	250	300	2	2	100S-D300⊗22BC
420	540	132	220	250	300	425	220	150	175	350	400	2	2	100S-D420⊗22BC
630	800	200	355	355	450	500	—	200	250	500	600	2	2	100S-D630⊗22BC
860	1000	250	500	500	560	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 front-mount auxiliary contacts are required, remove the letter "B" before the letter "C" in the cat. no. Example: Cat. No. **100S-D95⊗22BC** becomes Cat. No. **100S-D95⊗22C**.

⊗Coil voltage code—see page 2-116

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⊗ Coil Voltage Codes

Conventional Coil	[V]	24	48	100	110	120	200	208	220 …230	230	240	277	380 …400	415	440	480	500	550	600
100S-D95…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-D95…100S-D110	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_e: 24V DC/I_e: 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			
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			Conventional Coil Cat. No.	Electronic Coil Cat. No.➢
95	160	25	50	50	55	90	45	25	30	60	75	2	2	100S-D95⊗33LC‡	100S-D95⊗22BC
110	160	32	55	55	63	100	—	40	40	75	100	3	2/1L	100S-D110⊗33LC‡	100S-D110⊗22BC
140	250	45	75	75	80/100§	110/132§	—	40	50	100	125	3	2/1L	100S-D140⊗33LC‡	100S-D140⊗22BC
180	250	55	90	100	90/125§	132/160§	90	50	60	150	150	3	2/1L	100S-D180⊗33LC‡	100S-D180⊗22BC
210	350	63	110	110	150	200	110	60	75	150	200	2	2	—	100S-D210⊗22BC
250	350	80	132	150	160	250	133	75	100	200	250	2	2	—	100S-D250⊗22BC
300	450	90	160	160	200	300	160	100	125	250	300	2	2	—	100S-D300⊗22BC
420	540	132	220	250	300	425	220	150	175	350	400	2	2	—	100S-D420⊗22BC
630	800	200	355	355	450	500	—	200	250	500	600	2	2	—	100S-D630⊗22BC
860	1000	250	500	500	560	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-D95⊗22BC becomes Cat. No. 100S-D95⊗22C.

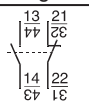
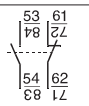
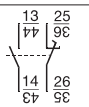
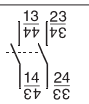
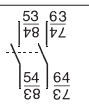
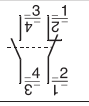
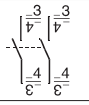
⊗ Coil Voltage Codes

Conventional Coil	[V]	24	48	110	125	220	250
100S-D95…100S-D180	DC	ZJ	ZY	ZD	ZS	ZA	ZT

Electronic Coil w/ EI Interface ♣	[V]	24	48…72	110…130	200…255
100S-D95…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_e: 24V DC/I_e: 15 mA
Pick-up voltage: 13.0V DC…30.2V DC
Drop-out voltage: -3.0V DC…+5.0V DC

Auxiliary Contacts

	Description	No. of N.O. Contacts	No. of N.C. Contacts	Connection Diagram	For Use With	Standard Auxiliary Contact Cat. No.	Bifurcated Auxiliary Contact Cat. No.
	**Auxiliary Contacts** Side-mounted With 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 outside mounting	**100-DS2-B11H**	**100-DS2-B11H**
		1	1L		100-D left or right inside mounting	**100-DS1-L11**	**100-DS1-BL11H**
		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 Electronically 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 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**
	Auxiliary Contacts Electronically 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**	—

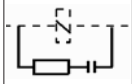
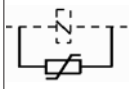
Marking Systems (For 100-D95…D860 contactors)

	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 System 1492 W	100 100	**100-FMA1** **100-FMA2**

* Must be ordered in multiples of package quantities.

2

Suppressor Modules

	Description	Connection Diagram	Suppressor Rating	For Use With	Cat. No.
	**Suppressor Module for Bul. 100-D Contactors** • For limiting surge voltage when coil circuits are interrupted • Can be plugged into all Bul. 100-D contactors • Supplied as standard on all conventional DC coil contactors and all electronic coil contactors (as part of the supply module or delivered with separate suppressor module)		**RC Module (AC control) for contactors with conventional coil** 21...48V, 50 Hz; 24...55V, 60 Hz	100-D95...100-D180	**100-DFSC48**
			95...110V, 50 Hz; 110...127V, 60 Hz		**100-DFSC110**
			180...277V, 50 Hz; 208...277V, 60 Hz		**100-DFSC240**
			380...550V, 50 Hz; 440...600V, 60 Hz		**100-DFSC550**
			**Varistor Module for contactors with conventional coil** 55V AC	100-D95...100-D180	**100-DFSV55**
			56...136V AC		**100-DFSV136**
			137...277V AC		**100-DFSV277**
			278...600V AC		**100-DFSV575**
			208...277V AC∗	100-D95...100-D180	**100-DFSV550**

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

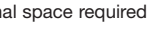
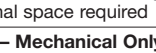
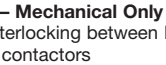
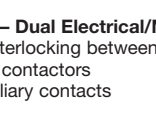
Connecting Components

	Description	Output Connection	For Use With			Terminal Connection	Cat. No.
			100-D95…180	100-D210…420	100-D630…860		
	Reversing: Input Connection Wye-Delta: Main-Delta connection	50 mm²	X			Lugs, 100-DL…	**100-D180-VL**
		120 mm²		X			**100-D420-VL**
		350 mm²			X		100-D860-VL
		50 mm²	X			Terminal Blocks, 100-DTB…	**100-D180-VLTB**
		120 mm²		X			**100-D420-VLTB**
	Reversing: Output Connection Wye-Delta: Delta-Wye connection	50 mm²	X			Lugs, 100-DL…	**100-D180-VT**
		120 mm²		X			**100-D420-VT**
		350 mm²			X		100-D860-VT
		50 mm²	X			Terminal Blocks, 100-DTB…	**100-D180-VTTB**
		120 mm²		X			100-D420-VTTB
	Delta-Wye connection if 100-D95…180 is used as a Wye contactor	80 mm²	—	X		Terminal Blocks, 100-DTB…	**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-D95…D100-D180 • Reversing • Two-speed, or changeover • Wye-Delta/Star-Delta					100-DPW180 100-D180-VL 100-DPY180
		For D100-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

Connecting Components, Continued

	Description	For Use With		Cat. No.
	**Terminal Lugs** Set of 2 Protection class IP2X per IEC 60529 and DIN 40 050	100-D95, 100-D110		**100-DTB110**
		100-D140, 100-D180, 100-D95E…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 3	100-D95, 100-D110		**100-DL110**
		100-D95E, 100-D110E, 193-EC_F, 193-EE_F		**100-DLE110**
		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 mm²	Connects to Cat. Nos. 100-D95...D180		**100-DAT1**
		Connects to Cat. Nos. 100-D210...D420		**100-DAT2**
	**Terminal Shields** Set of 2 Protection class IP10 per IEC 60529 and DIN 40 050 For direct-on-line, reversing, two-speed, and wye-delta/star-delta assemblies	100-D95, 100-D110		**100-DTS110**
		100-D140, 100-D180, 100-D95-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-D95…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**
	**Mounting Plate** Galvanized steel plate for starter combinations For direct-on-line, reversing, two-speed, wye-delta/star-delta, and Dahlander assemblies	100-D95...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…C85 and 100-D95…D180 contactors		100-DMU85

Interlocks

	Description	Circuit Diagram	For Use With	Cat. No.
	**Interlock — Mechanical Only** No additional space required		100-D95…100-D420	**100-DMA00**
	**Interlock — Dual Electrical/Mechanical** No additional space required 2 N.C. auxiliary contacts		100-D95…100-D860	**100-DMD02**
	Interlock — Mechanical Only No additional space required		100-D95…100-D860	**100-DMD00**
	Interlock — Mechanical Only Provides interlocking between Bul. 100-C and Bul. 100-D contactors		100-C60…100-C85 between 100-D95…100-D180	**100-DMC00**
	Interlock — Dual Electrical/Mechanical Provides interlocking between Bul. 100-C and Bul. 100-D contactors 2 N.C. auxiliary contacts		100-C60…100-C85 between 100-D95…100-D180	**100-DMC02**

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

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.

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.

Table of Contents

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		
I_e [A]	kW (50 Hz)‡				Hp (60 Hz)						
40 °C	230V	400V	500V	690V	200V	230V	460V	575V	N.O.	N.C.	Cat. No.
760	160	315	400	500	150	150	350	350	2	2	100-G550⊗22
1000	220	400	500	630	200	250	500	500	2	2	100-G700⊗22
1100	280	500	630	710	250	300	600	600	2	2	100-G860⊗22
1200	315	560	750	850	—	—	—	—	2∗	2	❄ 100-G1000⊗12
1350	375	710	850	1000	450	450	900	900	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

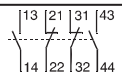
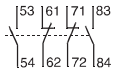
The Cat. No. as listed is incomplete. Select a coil voltage code from the table below to complete the Cat. No. Example: 120V, 50/60Hz: **Cat. No. 100-G550⊗22** becomes **Cat. No.100-G550KD22**.

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	—	—	—	—

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** For mounting between T1 & T2 or between T2 & T3 Adjustable; provides normal, delayed, or overlapping contacts Max. 2 blocks/contactor Alternate terminal marking tags included 2 N.O. and 2 N.C. contacts	 ***Standard Terminal marking for mounting between T1 & T2***  ***Alternate terminal marking for mounting between T2 & T3***	100-G550…100-G860	**100-EF22**
 *2-Pole*	**Auxiliary Contact Block** For side mounting on either side of the contactor Max. 4 blocks/contactor Alternate terminal marking tags included 1 N.O. and 1 N.C. contact	 ***Standard terminal marking***  ***Alternate terminal markings***	100-G1000…100-G1200	**100-EB11**
	**Fourth Add-On Neutral Switching Pole** Left- or right-side mountable Note: no UL/cUL	I_{th} AC-1 500 A	100-G550	100-NP500-5
			100-G700, 100-G860	100-NP500-6
			100-G700, 100-G860	100-NP1000-6
		I_{th} AC-1 1000A	100-G1000, 100-G1200	100-NP1000-7
	**Mechanical Latch** 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

⊗ 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.

Bulletin 100/104-K, 100/104-C, 100/104-D, 100S/104S-C, 100S-D Specifications

			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		—	—	—	—	—	—	—	—	—	—	—	—	—
AC-1 Active Power Load (50 Hz); Ambient temperature 40 °C															
I_e	≤ 500V	[A]	20	20	20	32	32	32	32 (40)∗	65	65	75	75	85	100
	690V	[A]	20	20	20	32	32	32	32 (40)∗	65	65	75	75	85	100
	1000V	[A]	—	—	—	—	—	—	—	—	—	—	—	—	—
	230V	[kW]	8	8	8	13	13	13	13	26	26	30	30	34	40
	240V	[kW]	8.3	8.3	8.3	13	13	13	13	27	27	31	31	35	42
	400V	[kW]	14	14	14	22	22	22	22	45	45	52	52	59	69
	415V	[kW]	14	14	14	23	23	23	23	47	47	54	54	61	72
	500V	[kW]	17	17	17	28	28	28	28	56	56	65	65	74	87
	690V	[kW]	24	24	24	38	38	38	38	78	78	90	90	102	120
	1000V	[kW]	—	—	—	—	—	—	—	—	—	—	—	—	—
Ambient temperature 60 °C															
I_e	≤ 500V	[A]	16	16	16	32	32	32	32	65	65	60	60	80	100
	690V	[A]	16	16	16	32	32	32	32	65	65	60	60	80	100
	1000V	[A]	—	—	—	—	—	—	—	—	—	—	—	—	—
	230V	[kW]	6.4	6.4	6.4	13	13	13	13	26	26	24	24	25	40
	240V	[kW]	6.7	6.7	6.7	13	13	13	13	27	27	25	25	26	42
	400V	[kW]	11	11	11	22	22	22	22	45	45	42	42	44	69
	415V	[kW]	12	12	12	23	23	23	23	47	47	43	43	45	72
	500V	[kW]	14	14	14	28	28	28	28	56	56	52	52	55	87
	690V	[kW]	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	11.3	11.3	12	15	20	26.5	35	38	38	38	44	62
	240V	[A]	6.3	11.3	11.3	12	15	20	26.5	35	38	38	38	44	62
	400V	[A]	4.9	8.5	11.5	9	12	16	23	30	37	37	37	43	60
	415V	[A]	4.9	8.5	11.5	9	12	16	23	30	37	37	37	43	60
	500V	[A]	3.9	6.8	9.2	7	10	14	20	25	30	29	30	38	55
	690V	[A]	2.8	4.9	6.7	5	7	9	12	18	21	9	21	25	34
	1000V	[A]	—	—	—	—	—	—	—	—	—	—	—	—	—
	230V	[kW]	1.5	3	3	3	4	5.5	7.5	10	11	11	11	13	18.5
	240V	[kW]	1.5	3	3	3	4	5.5	7.5	10	11	11	11	13	18.5
	400V	[kW]	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	5.5	4	5.5	7.5	11	15	20	20	20	22	32
	500V	[kW]	2.2	4	5.5	4	5.5	7.5	13	15	20	18.5	20	25	37
	690V	[kW]	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]	12	15	18	25	25	30	30	55	60	60	60	75	90
Rated power (enclosed)															
1-phase	115V	[A]	9.8	9.8	13.8	9.8	9.8	16	24	24	34	34	34	34	56
	230V	[A]	8	10	12	10	12	17	17	28	28	28	28	40	50
	115V	[Hp]	0.5	0.5	0.75	0.5	0.5	1	2	2	3	3	3	3	5
	230V	[Hp]	1	1.5	2	1.5	2	3	3	5	5	5	5	7.5	10
3-phase	200V	[A]	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	9.6	6.8	9.6	15.2	22	28	28	28	28	42	54
	460V	[A]	4.8	7.6	11	7.6	11	14	21	27	34	34	34	40	52
	575V	[A]	3.9	6.1	9	9	11	17	17	27	32	17	32	32	52
	200V	[Hp]	1.5	2	3	2	3	5	5	7.5	10	10	10	10	15
	230V	[Hp]	1.5	2	3	2	3	5	7.5	10	10	10	10	15	20
	460V	[Hp]	3	5	7.5	5	7.5	10	15	20	25	25	25	30	40
	575V	[Hp]	3	5	7.5	7.5	10	15	15	25	30	15	30	30	50

∗ Values in ( ) with increased cross-section and cable lug

100/104-C, 100S/104S-C				100/104-D, 100S-D											
72	85	90*200	90*400	95	110	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	X
AC-1 Active Power Load (50 Hz); Ambient temperature 40 °C															
100	100	130	130	160	160	250	250	250	250	350	350	450	540	800	1000
100	100	130	130	160	160	250	250	250	250	350	350	450	540	800	1000
—	—	—	—	160	160	250	250	250	250	350	350	450	540	—	—
40	40	52	52	64	64	100	100	100	100	139	139	179	199	319	398
42	42	54	54	67	67	104	104	104	104	145	145	187	208	333	416
69	69	90	90	111	111	173	173	173	173	242	242	312	346	554	693
72	72	93	93	115	115	180	180	180	180	252	252	323	359	575	719
87	87	113	113	139	139	217	217	217	217	303	303	390	433	693	866
120	120	155	155	191	191	299	299	299	299	418	418	538	598	956	1195
—	—	—	—	277	277	433	433	433	433	606	606	779	866	—	—
Ambient temperature 60 °C															
100	100	110	110	135	135	210	210	210	210	300	300	380	425	—	—
100	100	110	110	135	135	210	210	210	210	300	300	380	425	—	—
—	—	—	—	135	135	210	210	210	210	300	300	380	425	—	—
40	40	44	44	54	54	84	84	84	84	120	120	151	169	—	—
42	42	46	46	56	56	87	87	87	87	125	125	158	177	—	—
69	69	76	76	94	94	145	145	145	145	208	208	263	294	—	—
72	72	79	79	97	97	151	151	151	151	216	216	273	305	—	—
87	87	95	95	117	117	182	182	182	182	260	260	329	368	—	—
120	120	131	131	161	161	251	251	251	251	359	359	454	508	—	—
—	—	—	—	234	234	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	95	110	140	140	180	180	210	250	300	420	630	860
72	85	85	85	95	110	140	140	180	180	210	250	300	420	630	860
72	85	85	85	95	110	140	140	180	180	210	250	300	420	630	860
72	85	85	85	95	110 (130)‡	140 (155)‡	140 (155)‡	180 (189)‡	180 (189)‡	210 (227)‡	250 (258)‡	300 (315)‡	420	630	860
67	80	80	80	95	110	115	140	140	180	210	250	300	420	630	753
42	49	22	49	95	110	115	140	140	180	210	250	300	420	492	—
—	—	—	—	33	40	55	55	65	65	80	95	115	160	—	—
22	25	25	25	30	34	45	45	57	57	67	80	97	135	200	250
22	25	25	25	31	36	47	47	60	60	70	83	101	141	200	250
40	45	45	45	53	61	78	78	101	101	118	140	170	238	355	500
40	45	45	45	55	63 (75)‡	82 (90)‡	82 (90)‡	105 (110)‡	105 (110)‡	122 (132)‡	145 (150)‡	176 (185)‡	250	355	500
45	55	55	55	66	76	80	98	98	126	147	177	213	298	450	560
40	45	18.5	45	92	106	111	135	135	176	205	250	293	424	500	—
—	—	—	—	45	55	75	75	90	90	110	132	160	225	—	—
Load Carrying Capacity per UL/CSA															
General Purpose Current (enclosed)															
90	100	125	130	160	160	220	220	220	220	300	300	340	420	630	860
Rated power (enclosed)															
56	80	80	80	80	100	135	135	—	—	—	—	—	—	—	—
68	68	68	68	68	110	136	136	176	176	216	—	—	—	—	—
5	7.5	7.5	7.5	7.5	10	15	15	—	—	—	—	—	—	—	—
15	15	15	15	15	25	30	30	40	40	50	—	—	—	—	—
62.1	78.2	78.2	78.2	78.2	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	77	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	25	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	60	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-3 and AC-4 lifespan -25 %

Contactors

Specifications, Continued

IEC Specifications

			100/104-K			100/104-C, 100S/104S-C							
			05	09	12	09	12	16	23	30	37	43	60
	Conventional		X	X	X	X	X	X	X	X	X	X	X
Coil Type :	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]	—	—	—	—	—	—	—	—	—	—	—
Electronic — EI													
	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]	—	—	—	—	—	—	—	—	—	—	—
AC-4 at approximately 200,000 operations	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	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	95	110	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
Switching of 3-phase Motors, (50Hz); Ambient temperature 60 °C, AC-4													
72	85	95	110	140	140	180	180	210	250	300	420	—	—
72	85	95	110	140	140	180	180	210	250	300	420	—	—
72	85	95	110	140	140	180	180	210	250	300	420	—	—
72	85	95	110 (130)❄	140 (155)❄	140 (155)❄	180 (189)‡	180 (189)‡	210 (227)❄	250 (258)❄	300 (315)❄	420	—	—
67	80	85	105	115	140	140	170	210	250	300	360	—	—
42	49	85	105	115	140	140	170	210	250	300	360	—	—
—	—	33	40	55	55	65	65	80	95	115	160	—	—
22	25	30	34	45	45	57	57	67	80	97	135	—	—
22	25	31	36	47	47	60	60	70	83	101	141	—	—
40	45	53	61	78	78	100	100	118	140	170	238	—	—
40	45	55	63 (75)❄	82 (90)❄	82 (90)❄	105 (110)❄	105 (110)❄	125 (132)❄	145 (150)❄	176 (185)❄	250	—	—
45	55	59	73	80	98	98	119	147	177	213	255	—	—
40	45	81	102	110	135	135	167	205	250	293	356	—	—
—	—	45	55	75	75	90	90	110	132	160	225	—	—
Electronic — EI													
31	38	43	50	60	60	67	67	85	105	140	170	—	—
31	38	43	50	60	60	67	67	85	105	140	170	—	—
31	38	43	50	60	60	67	67	85	105	140	170	—	—
31	38	43	50	60	60	67	67	85	105	140	170	—	—
31	38	43	50	60	60	67	67	85	105	140	170	—	—
—	—	19	23	37	37	43	43	60	72	85	105	—	—
7.5	11	13	15	17	17	20	20	25	32	45	55	—	—
7.5	11	13	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	25	32	40	40	45	45	55	75	100	110	—	—
25	32	40	45	55	55	63	63	80	100	132	160	—	—
—	—	22	30	50	50	55	55	80	100	110	150	—	—
120	120	120	120	120	120	100	100	120	100	70	70	—	—
Electronic — EI													
40	50	40	60	60	60	75	75	100	125	175	250	—	—
50	60	50	60	75	75	100	100	125	175	200	250	—	—
100	125	100	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	62.1	78	92	92	120	120	150	150	177	221	—	—
54.0	68.0	68.0	80	104	104	130	130	130	154	192	248	—	—
52.0	65.0	65.0	77	96	96	124	124	156	180	180	240	—	—
52.0	62.0	62.0	77	77	77	99	99	125	144	192	242	—	—
15	20	20	25	30	30	40	40	50	50	60	75	—	—
20	25	25	30	40	40	50	50	50	60	75	100	—	—
40	50	50	60	75	75	100	100	125	150	150	200	—	—
50	60	60	75	75	75	100	100	125	150	200	250	—	—
Star-Delta Starting (50 Hz)													
125	147	165	191	242	242	312	312	364	433	520	727	—	—
125	147	165	191	242	242	312	312	364	433	520	727	—	—
125	147	165	191	242	242	312	312	364	433	520	727	—	—
125	147	165	191 (225)❄	242 (268)❄	242 (268)❄	312 (332)‡	312 (332)‡	364 (393)❄	433 (447)❄	520 (546)❄	727	—	—
116	139	165	191	199	242	312	312	364	433	520	727	—	—
73	85	165	191	199	242	312	312	364	433	520	727	—	—
—	—	57	69	95	95	113	113	139	165	200	277	—	—
37	45	45	55	75	75	90	90	110	132	160	220	—	—
40	50	50	63	80	80	100	100	125	150	160	250	—	—
63	80	80	100	132	132	160	160	200	250	300	425	—	—
63	80	80 (90)❄	100 (132)❄	132 (160)❄	132 (160)❄	160	160	220	250	315 (335)❄	425	—	—
80	90	100	132	132	160	200	200	250	315	375	530	—	—
63	80	132	160	200	220	300	300	355	425	530	750	—	—
—	—	75	90	132	132	160	160	200	220	280	400	—	—

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

Contactors

Specifications, Continued

IEC Specifications

			100/104-K			100/104-C, 100S/104S-C							
			05	09	12	09	12	16	23	30	37	43	60
	Conventional		X	X	X	X	X	X	X	X	X	X	X
Coil Type :	Electronic — EI		—	—	—	—	—	—	—	—	—	—	—
Switching of Power Transformers, AC-6a (50 Hz)													
Inrush Current / Rated transformer current		= n											
	≤ 230V	[A]	2.9	5.4	5.4	10.9	10.9	10.9	10.9	20	20	23	40.8
	≤ 240V	[A]	2.9	5.4	5.4	10.9	10.9	10.9	10.9	20	20	23	40.8
	≤ 400V	[A]	2.4	4.1	5.4	10.9	10.9	10.9	10.9	20	20	23	40.8
	≤ 415V	[A]	2.4	4.1	5.4	10.9	10.9	10.9	10.9	20	20	23	40.8
	≤ 500V	[A]	1.8	3.2	3.2	10.9	10.9	10.9	10.9	20	20	23	40.8
	≤ 690V	[A]	—	—	—	10.9	10.9	10.9	10.9	20	20	23	40.8
n = 30	≤ 1000V	[A]	—	—	—	—	—	—	—	—	—	—	—
	230V	[kVA]	1.2	2	2	4.3	4.3	4.3	4.3	8	8	9.2	16
	240V	[kVA]	1.2	2	2	4.5	4.5	4.5	4.5	8.3	8.3	10	17
	400V	[kVA]	1.7	2.8	3.4	7.5	7.5	7.5	7.5	14	14	16	28
	415V	[kVA]	1.7	2.8	3.4	7.8	7.8	7.8	7.8	14	14	17	29
	500V	[kVA]	1.7	2.8	3.4	9.4	9.4	9.4	9.4	17	17	20	35
	690V	[kVA]	2	4	5	13	13	13	13	24	24	27	49
	1000V	[kVA]	—	—	—	—	—	—	—	—	—	—	—
n = 20	≤ 690V	[A]	—	—	—	16.3	16.3	16.3	16.3	30	30	34.5	61.3
n = 15	≤ 690V	[A]	—	—	—	22	22	22	22	40	40	46	82
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	95	110	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
Switching of Power Transformers, AC-6a (50 Hz)													
Inrush Current													
Rated transformer current													
40.8	40.8	53	60	70	70	85	85	105	125	150	210	—	—
40.8	40.8	53	60	70	70	85	85	105	125	150	210	—	—
40.8	40.8	53	60	70	70	85	85	105	125	150	210	—	—
40.8	40.8	53	60	70	70	85	85	105	125	150	210	—	—
40.8	40.8	53	60	70	70	85	85	105	125	150	210	—	—
40.8	40.8	53	60	70	70	85	85	105	125	150	210	—	—
—	—	53	60	70	70	85	85	105	125	150	210	—	—
16	16	21	24	28	28	34	34	42	50	60	84	—	—
17	17	22	25	29	29	35	35	44	52	62	87	—	—
28	28	37	42	48	48	59	59	73	87	104	145	—	—
29	29	38	43	50	50	61	61	75	90	108	151	—	—
35	35	46	52	61	61	74	74	91	108	130	182	—	—
49	49	64	72	84	84	102	102	125	149	179	251	—	—
—	—	92	104	121	121	147	147	182	217	260	364	—	—
61.3	61.3	80	90	105	105	128	128	158	188	225	315	—	—
82	82	107	120	140	140	170	170	210	250	300	420	—	—
60 Hz Peak Inrush/peak rated transformer current													
40.8	40.8	53	60	70	70	85	85	105	125	150	210	—	—
14.4	14.4	18.4	20.8	24.2	24.2	29.4	29.4	36.4	43.3	52.0	72.7	—	—
14.7	14.7	19.1	21.6	25.2	25.2	30.6	30.6	37.8	45.0	54.0	75.7	—	—
17.0	17.0	22.0	24.9	29.1	29.1	35.3	35.3	43.6	52.0	62.4	87.3	—	—
33.9	33.9	44.1	49.9	58.2	58.2	70.7	70.7	87.3	104	125	175	—	—
42.4	42.4	55.1	62.4	72.7	72.7	88.3	88.3	109	130	156	218	—	—
46.6	46.6	60.6	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	80	90	105	105	128	128	158	188	225	315	—	—
21.2	21.2	27.7	31.2	36.4	36.4	44.3	44.3	54.7	65.1	77.9	109	—	—
22.1	22.1	28.8	32.4	37.8	37.8	46.1	46.1	56.9	67.7	81.1	113	—	—
25.5	25.5	33.3	37.4	43.6	43.6	53.2	53.2	65.7	78.2	93.5	131	—	—
51.0	51.0	66.5	74.8	87.3	87.3	106	106	131	156	187	262	—	—
63.7	63.7	83.1	93.5	109	109	133	133	164	195	234	327	—	—
70.1	70.1	91.5	103	120	120	146	146	131	215	257	360	—	—
60 Hz Peak Inrush/peak rated transformer current													
82	82	107	120	140	140	170	170	210	250	300	420	—	—
28.4	28.4	37.1	41.6	48.5	48.5	58.9	58.9	72.7	86.6	104	145	—	—
29.5	29.5	38.5	43.2	50.4	50.4	61.2	61.2	75.7	90.1	108	151	—	—
34.1	34.1	44.5	49.9	58.2	58.2	70.7	70.7	87.3	104	125	175	—	—
68.2	68.2	89.0	99.8	116	116	141	141	175	208	249	349	—	—
85.2	85.2	111	125	145	145	177	177	218	260	312	436	—	—
93.7	93.7	122	137	160	160	194	194	240	286	343	480	—	—

Contactors

Specifications, Continued

IEC Specifications

			100/104-K			100/104-C, 100S/104S-C									
			05	09	12	09	12	16	23	30	37	40*200	40*400	43	60
	Conventional		X	X	X	X	X	X	X	X	X	X	X	X	X
Coil Type :	Electronic — EI		—	—	—	—	—	—	—	—	—	—	—	—	—
Switching of 3-phase Capacitors, AC-6b (50 Hz)∗															
	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
Single capacitor 40 °C	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]	—	—	—	—	—	—	—	—	—	—	—	—	—
	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
60 °C	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]	—	—	—	—	—	—	—	—	—	—	—	—	—
	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
Group capacitors 40 °C	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]	—	—	—	—	—	—	—	—	—	—	—	—	—
	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
60 °C	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															
	10 kA	[µF]	750	750	750	1 000	1 000	1 000	1 000	2 700	2 700	—	—	3 200	4 000
Short-circuit current of	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)															
	230V	[A]	20	20	20	32	32	32	32	45	45	—	—	63	—
AC-7a	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)															
	230V	[A]	6	11	11	10.5	14	19	23	30	—	—	—	—	—
AC-7b	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	95	110	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	X
Switching of 3-phase Capacitors, AC-6b (50 Hz)															
28	28	—	—	45	45	70	70	70	70	98	98	125	139	—	—
29	29	—	—	47	47	73	73	73	73	102	102	131	145	—	—
48	48	—	—	78	78	121	121	121	121	170	170	218	242	—	—
50	50	—	—	81	81	126	126	126	126	176	176	226	252	—	—
55	60	—	—	97	97	152	152	152	152	212	212	273	303	—	—
55	60	—	—	134	134	209	209	209	209	293	293	376	418	—	—
—	—	—	—	194	194	303	303	303	303	424	424	546	606	—	—
28	28	—	—	38	38	59	59	59	59	84	84	106	119	—	—
29	29	—	—	39	39	61	61	61	61	87	87	111	124	—	—
48	48	—	—	65	65	102	102	102	102	145	145	184	206	—	—
50	50	—	—	68	68	106	106	106	106	151	151	191	214	—	—
50	55	—	—	82	82	127	127	127	127	182	182	230	258	—	—
50	55	—	—	113	113	176	176	176	176	251	251	318	356	—	—
—	—	—	—	164	164	255	255	255	255	364	364	461	515	—	—
28	28	—	—	42	45	70	70	70	70	98	98	125	139	—	—
29	29	—	—	43	47	73	73	73	73	102	102	131	145	—	—
48	48	—	—	44	56	76	76	111	111	170	170	218	242	—	—
50	50	—	—	44	56	76	76	112	112	170	176	226	252	—	—
50	50	—	—	44	56	76	76	113	113	172	212	273	303	—	—
50	50	—	—	45	57	78	78	114	114	174	247	356	418	—	—
—	—	—	—	46	58	79	79	116	116	177	251	361	606	—	—
28	28	—	—	38	38	59	59	59	59	84	84	106	119	—	—
29	29	—	—	39	39	61	61	61	61	87	87	111	124	—	—
48	48	—	—	44	56	76	76	102	102	145	145	184	206	—	—
50	50	—	—	44	56	76	76	106	106	151	151	191	214	—	—
50	50	—	—	44	56	76	76	113	113	172	182	230	258	—	—
50	50	—	—	45	57	78	78	114	114	174	247	318	356	—	—
—	—	—	—	46	58	79	79	116	116	177	251	361	515	—	—
60 Hz Single Capacitor — 40 °C															
28	28	—	—	39	39	61	61	61	61	85	85	109	121	—	—
29	29	—	—	45	45	70	70	70	70	98	98	125	139	—	—
50	50	—	—	89	89	139	139	139	139	195	195	251	279	—	—
50	50	—	—	116	116	182	182	182	182	255	255	327	364	—	—
60 Hz Group Capacitors — 40 °C															
28	28	—	—	39	39	61	61	61	61	85	85	109	121	—	—
29	29	—	—	42	45	70	70	70	70	98	98	125	139	—	—
50	50	—	—	44	56	76	76	112	112	171	195	251	279	—	—
50	50	—	—	45	57	77	77	114	114	173	246	327	364	—	—
Switching of Lamps															
85	90	115	115	144	144	225	225	225	225	315	315	405	450	—	—
81	90	95	95	122	122	189	189	189	189	270	270	342	383	—	—
Individually compensated:															
Max. capacitance at expected															
4 000	4 700	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2 000	2 350	—	—	—	—	—	—	—	—	—	—	—	—	—	—
800	940	—	—	—	—	—	—	—	—	—	—	—	—	—	—
70	76	60	75	107	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)															
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Contactors

Specifications, Continued

Specifications

			100/104-K			100/104-C, 100S/104S-C									
			05	09	12	09	12	16	23	30	37	40*200	40*400	43	60
	Conventional		X	X	X	X	X	X	X	X	X	X	X	X	X
Coil Type :	Electronic — EI		—	—	—	—	—	—	—	—	—	—	—	—	—
Switching of Hermetically Sealed Cooling Compressor Motors - manual reset of overload release (50 Hz)															
	400V	[A]	11	18	18	12	16	22	32	38	45	—	—	63	72
AC-8a	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															
	400V	[A]	—	—	—	5.5	7	9.3	12	13	14	—	—	16	24
AC-8b	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 at 60 °C															
	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
1 pole	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
	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
2 poles in series	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
	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
3 poles in series	110V	[A]	6	9	9	25	25	32	32	45	45	—	45	63	90
	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															
	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
3 poles in series	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															
	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
3 poles in series	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 control	[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 control	[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	10
Mechanical DC control		[Mil. operations]	15	15	15	13	13	13	13	13	13	10	10	13	10
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-Reversing	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)	—	—	0.51 (1.12)	1.45 (3.20)
	Reversing	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-Reversing	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)	—	—	1.0 (2.20)	1.47 (3.24)
	Reversing	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-D, 100S-D											
72	85	90*200	90*400	95	110	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	X
Switching of Hermetically Sealed Cooling Compressor Motors - manual reset of overload release (50 Hz)															
85	100	—	—	—	—	—	—	—	—	—	—	—	—	—	—
85	100	—	—	—	—	—	—	—	—	—	—	—	—	—	—
67	80	—	—	—	—	—	—	—	—	—	—	—	—	—	—
- automatic reset of overload release															
30	35	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30	35	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30	35	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Switching of DC Loads															
80	80	80	80	135	135	210	210	210	210	300	300	380	425	—	—
40	40	40	40	135	135	210	210	210	210	300	300	380	425	—	—
11	11	11	11	135	135	210	210	210	210	300	300	380	425	—	—
2	2	1.8	1.8	3	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	0.6	0.6	0.75	0.75	0.75	0.75	1	1	1	1.2	—	—
80	80	80	80	135	135	210	210	210	210	300	300	380	425	—	—
80	80	80	80	135	135	210	210	210	210	300	300	380	425	—	—
80	80	80	80	135	135	210	210	210	210	300	300	380	425	—	—
15	15	15	15	135	135	210	210	210	210	300	300	380	425	—	—
1.5	1.5	1.5	1.5	3	3	3.3	3.3	3.3	3.3	4.9	4.9	4.9	5.2	—	—
90	100	—	100	135	135	210	210	210	210	300	300	380	425	—	—
90	100	—	100	135	135	210	210	210	210	300	300	380	425	—	—
90	100	—	100	135	135	210	210	210	210	300	300	380	425	—	—
80	80	—	80	135	135	210	210	210	210	300	300	380	425	—	—
5	5	—	5	11	11	11	11	11	11	14	14	14	15	—	—
Shunt-wound Motors Starting, reverse current braking, reversing, stepping DC-3, 60 °C															
90	100	—	—	135	135	210	210	210	210	300	300	380	425	—	—
70	80	—	—	135	135	210	210	210	210	300	300	380	425	—	—
70	80	—	—	135	135	210	210	210	210	300	300	380	425	—	—
25	30	—	—	135	135	210	210	210	210	300	300	380	425	—	—
0.6	0.6	—	—	3	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	—	—	135	135	210	210	210	210	300	300	380	425	—	—
70	80	—	—	135	135	210	210	210	210	300	300	380	425	—	—
70	80	—	—	135	135	210	210	210	210	300	300	380	425	—	—
25	30	—	—	135	135	210	210	210	210	300	300	380	425	—	—
0.6	0.6	—	—	1.2	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	1040	1040	1240	1360	1480	1480	2360	2520	2840	4700	—	—
Resistance and Power Dissipation															
0.9	0.9	0.8	0.7	0.4	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	10.8	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	20.8 (16.8)	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	18.8 (16.8)	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															
10	10	10	10	10	10	10	10	10	10	10	10	10	10	2	2
10	10	10	10	10	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)	—	—	3.3 (7.28) [3.8 (8.38)]*	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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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)	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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

Contactors

Specifications, Continued

Coil Type :			100/104-K			100/104-C, 100S/104S-C										
			05	09	12	09	12	16	23	30	37	40	43	60	72	85
	Conventional		X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Electronic — EI		—	—	—	—	—	—	—	—	—	—	—	—	—	—
Conductor Cross Sections - Main Contacts Terminal type					✶				✶			❄				‡
	(1) conductor (2) conductors	[mm²] [mm²]	0.75…2.5 0.75…2.5			1…4 1…4				2.5…10 2.5…10		2.5…16 2.5…16		2.5…35 2.5…25		
	(1) conductor (2) conductors	[mm²] [mm²]	1…4 1…2.5+ 1…4			1.5…6 1.5…6				2.5…16 2.5…16		2.5…25 2.5…16		2.5…50 2.5…35		
	b max.	[mm]	—			—				—		—		—		
	c max.	[mm]	—			—				—		—		—		
	s max.	[mm]	—			—				—		—		—		
	Ø min.	[mm]	—			—				—		—		—		
Recommended torque		[N•m]	1.2			1.5…2.5				2.5…3.5		2.5…3.5		3.5…6		
Cross section per UL/CSA		[AWG]	18…12			16…10				14…4		14…6	14…4	14…1		
Recommended torque		[lb-in]	10.6			13.3…22				22…31		22…31		31…53		
With terminal lug kit			—			—				—		—	—	—		
Cross section per UL/CSA		[AWG]	—			—				—		—	—	—		
Recommended torque		[lb-in]	—			—				—		—	—	—		
With Frame Terminal Block			—			—				—		—	—	—		
	top opening bottom opening	[mm²] [mm²]	—			—				—		—	—	—		
	top opening bott. opening	[mm²] [mm²]	—			—				—		—	—	—		
	b max. s top s bottom	[mm] [mm] [mm]	—			—				—		—	—	—		
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

100-D, 100S-D											
95	110	95	110	140	180	210	250	300	420	630	860
X	X	—	—	X	X	—	—	—	—	—	—
—	—	X	X	X	X	X	X	X	X	X	X
 §		 §				 §				 §	
— —		— —				— —				— —	— —
— —		— —				— —				— —	— —
20		25				30				52	52
10		12.5				15				22	22
5		5				6				2 x 8	2 x 8
6.1		8.3				10.5				13	13
9		22				43				68	68
—		—				—				—	—
80		195				380				600	600
100-DL110‡		100-DLE110‡		100-DL180‡		100-DL420‡				100-DL630	100-DL860
8…2/0		8…2/0		6…300 MCM		(2x) 4…350 MCM				(2X) 2/0…500MCM	(4X) 2/0…500MCM
90		90		250		250				400	400
100-DTB110‡		100-DTB180‡				100-DTB420✶				—	—
16…35 16…70		16…35 16…95				25…240♣ 25…240				—	—
16…50 16…95		16…50 16…120				25…300 25…300				—	—
16 3…9 3…12		20 3…9 3…14				25 4…20 4…20				—	—
12		14				25				—	—
6…1 / 0 AWG		6…1 / 0 AWG				4 AWG…600 MCM				—	—
6…3 / 0 AWG		6 AWG…250 MCM				4 AWG…600 MCM				—	—
106		124				220				—	—

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

Contactors

Specifications, Continued

Short-Circuit Coordination Data‡

		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
	Conventional	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Coil Type :	Electronic – EI	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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∗
Type "2" (400V)	[A]	16	20	20	25	35	35	40	80	80	63	80	100	160	160	160	160∗	100∗
Type "2" (690V)	[A]	—	—	—	25	35	35	40	80	80	63	80	100	160	160	160	160∗	100∗
BS88 Fuses		65 kA Available Fault Current																
Type "1" (415V)	[A]	—	—	—	25	32	40	50	63	80	—	—	80	100	160	160	—	—
Type "2" (415V)	[A]	—	—	—	20	25	32	50	63	80	—	—	80	100	125	160	—	—
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
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		100 kA Available Fault Current																
UL verified combination to IEC 60947-4-1 "Type 2"	[A]	—	—	—	15	20	20	30	—	—	—	—	—	—	—	—	—	—
UL Class J and CSA HRCI-J Fuses		100 kA Available Fault Current																
UL verified combination to IEC 60947-4-1 "Type 2"	[A]	—	—	—	15	20	20	30	40	50	—	—	50	80	100	100	—	—
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	—	—
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]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
UL Inverse-Time Circuit Breaker		42 kA Available Fault Current																
UL Listed Combination (600V)	[A]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

∗ 50 kA available fault current.

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

100/104-D, 100S-D											
95/110	140/180	95	110	140	180	210	250	300	420	630	860
X	X	—	—	—	—	—	—	—	—	—	—
—	—	X	X	X	X	X	X	X	X	X	X
50 kA Available Fault Current											
250	315	250	250	315	355	500	500	630	630	❄	❄
200	250	200	200	250	315	400	400	500	500	❄	❄
200	250	200	200	250	315	400	400	500	500	❄	❄
65 kA Available Fault Current											
160	250	200	200	250	250	355	355	450	630	❄	❄
160	250	200	200	250	250	355	355	450	560	❄	❄
5 kA Available Fault Current											
—	—	—	—	—	—	—	—	—	—	—	—
10 kA Available Fault Current											
225/250	350/450	225	250	350	450	500	—	—	—	—	—
18 kA Available Fault Current											
—	—	—	—	—	—	—	700	700	1000	—	—
30 kA Available Fault Current											
—	—	—	—	—	—	—	—	—	—	2500	—
42 kA Available Fault Current											
—	—	—	—	—	—	—	—	—	—	—	2500
100 kA Available Fault Current											
—	—	—	—	—	—	—	—	—	—	—	—
100 kA Available Fault Current											
❄	❄	❄	❄	❄	❄	❄	❄	❄	❄	❄	❄
5 kA Available Fault Current											
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
10 kA Available Fault Current											
125/150	200/250	125	150	200	250	300	—	—	—	—	—
18 kA Available Fault Current											
—	—	—	—	—	—	—	350	400	500	—	—
30 kA Available Fault Current											
—	—	—	—	—	—	—	—	—	—	1200	—
42 kA Available Fault Current											
—	—	—	—	—	—	—	—	—	—	—	1200

❄ To be determined.

Contactors

Specifications, Continued

Coil Data

			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
	Conventional		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
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*]	0.85…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*]	—			0.1…0.5								—					
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]	—			10/22				10/22		12/28			—			—	
	hold-in	[W]	—			1.5						2.5			—			—	
Operating Times																			
AC	closing delay	[ms]	15…40			15…30		15…30		15…30		15…30		15…30	20…40			20…30	
	opening delay	[ms]	15…33			10…60		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	10…60			20…40	
DC (conventional)	closing delay	[ms]	18…40			40…70		40…70		50…80		50…80		50…80	20…40			15…25	20…25
	opening delay	[ms]	6…12			7…15		7…15		7…15		7…15		7…15	—			20…25	
With integ. diode	opening delay	[ms]	8…12			14…20		17…23		17…23		—		17…23	≤ 220V 20…35			—	
With external diode	opening delay	[ms]	35…50			70…95		80…125		80…125		—		80…125	≤ 220V 80…125			—	
DC (electronic)	closing delay	[ms]	—			20…40									—			—	
	opening delay	[ms]	—			20…40									—			—	
Max. Ripple			—			± 15%									—			—	—

§ For 9, 12, 24, and 110V DC coils

			100/104-D, 100S-D											
			95/110	140/180	95	110	140	180	210	250	300	420	630	860
	Conventional		X	X	—	—	—	—	—	—	—	—	—	—
Coil Type	Electronic — EI		—	—	X	X	X	X	X	X	X	X	X	X
Operating Limits														
50 Hz, 60 Hz, 50/60 Hz	pick-up	[x *Us*]	0.85…1.1		0.85…1.1								0.8…1.1	
	dropout	[x *Us*]	0.3…0.6		0.3…0.5								0.3…0.8	
DC control	pick-up	[x *Us*]	0.85…1.1		0.85…1.1								0.85…1.1	
	dropout	[x *Us*]	0.3…0.6		0.3…0.5								0.3…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								60…100	
	opening delay	[ms]	6…12		25…110								70…145	
With RC module	opening delay	[ms]	9…18		—								—	
DC	closing delay	[ms]	27…47		25…50								60…100	
	opening delay	[ms]	12…20		35…110								70…145	
With integrated diode	opening delay	[ms]	12…20		—								—	
With 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 and Auxiliary Contact Blocks

			100-K		100-C, 100S-C				100-D, 100S-D		
									Side-mounted		
			Internal	Front-mounted	Internal	Front-mounted	Front-mounted (Bifurcated)	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	3	2	2	
	110V DC	[A]	0.55	0.55	1.2	1.2	0.6	1.2	0.7	0.7	
	220V DC	[A]	0.27	0.27	0.6	0.6	0.3	0.6	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/ 2 mA	17V/10 mA	17V/5 mA	8V/5 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	P 300/Q 600	Q 600		Standard pilot duty (P 600)	Standard pilot duty (Q 600)	0.1

General

		100-K	100-C, 100S-C	100-D, 100S-D
		05…12	09…85	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	8	12
Rated Voltage U_e				
AC 50/60 Hz	[V]	230, 240, 400, 415, 500, 690	115, 230, 400, 500, 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	IEC 60068-2	IEC 60068-2
Max. Altitude of Installation Site	[m]	2000 NN, per IEC 60947-4	2000 NN, per IEC 60947-4	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
Contactor 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-C09…C23, 100S-C09…C85, 100-C + 100-FA/FB/FC (except L11, L22), 100-C09…C43 + 100-FAB/FBB/FCB	—
Mirror Contacts IEC 60947-4 Annex F		100-K… + 100-KF…	100-C09…C23, 100S-C09…C85, 100-C + 100-FA/FB/FC + 100-SA/SB, 100-C60…C85 + 100-FAB/FBB/FCB, 100S-C + 100-SA/SB	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 in prep.	CE, cULus, CCC	CE, cULus, CCC

Electrical Data

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							
	≤ 690V	[A]	605	800	870	960	1,085
	230V	[kW]	241	319	347	382	432
	240V	[kW]	251	333	362	399	451
I_e	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 General Purpose Rating 40 °C		**[A]**	520	700	810	—	1215
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
	230V	[kW]	179	228	280	326	391
50 Hz/60 °C	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							
	230/240V	[A]	140	180	210	260	300
	400/415V	[A]	140	180	210	260	300
	230V	[kW]	45	57	67	83	97
50 Hz	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%.

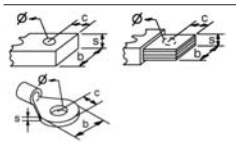
Electrical Data, Continued

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 Staring							
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
	690V	[kVar]	580	700	800	875	1000
Capacitor Banks 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
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 · 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

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]	50	60	75	60	60
		[ft.-lb]	37	44	55	44	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]	42	62	62	56	56
		[lb•in]	375	550	550	500	500
Auxiliary Contact		[mm²]	(2) x 2.5	(2) x 2.5	(2) x 2.5	(2) x 2.5	(2) x 2.5
Coils		[mm²]	(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	

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		[V]	1,000V			690V	
UL/CSA			600V			600V	
Impulse Voltage U_{imp}							
1 minute per IEC 947-4		[KV]	3,500V			2,500V	
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…+60 °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.

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.

2

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:

Lmixed = Lac3/[1 + Pac4*(Lac3/Lac4 – 1)], where:

Lmixed 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	cosϕ	I_c/I_e	U_r/U_e	cosϕ
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 A I_e > 17 A	6 6	1 1	0.65 0.35	1 1	0.17 0.17	0.65 0.35
AC-4	**Squirrel - cage motors:** Starting, plugging✶, inching❄	I_e < 17 A I_e > 17 A	6 6	1 1	0.65 0.35	6 6	1 1	0.65 0.35
AC-15	**Soleniods:** Contactors, valves and lifting magnets		10	1	0.7	1	1	0.4

I_e Rated operational current — I Making Current
U_e Rated voltage — Ic 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.

Life-Load Curves

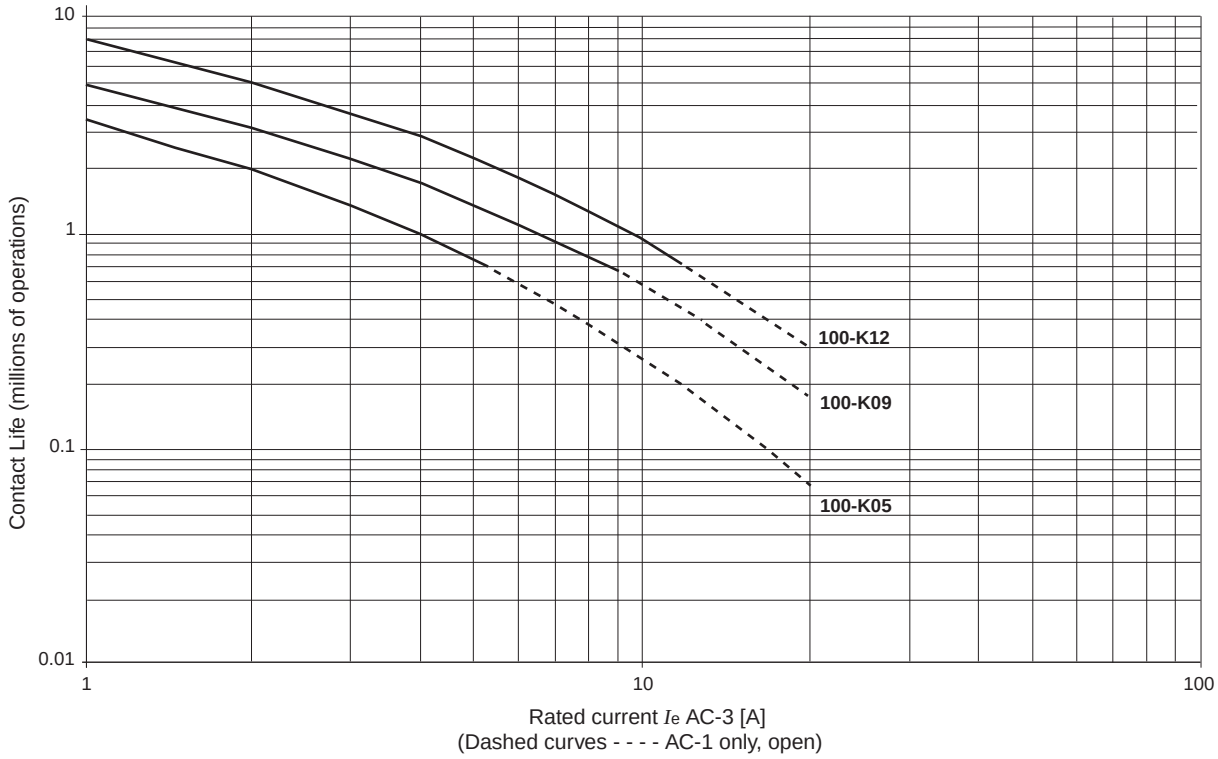
Electrical life; U_e = 400…460V AC

AC-3

Switching of squirrel-cage motors while starting

AC-1

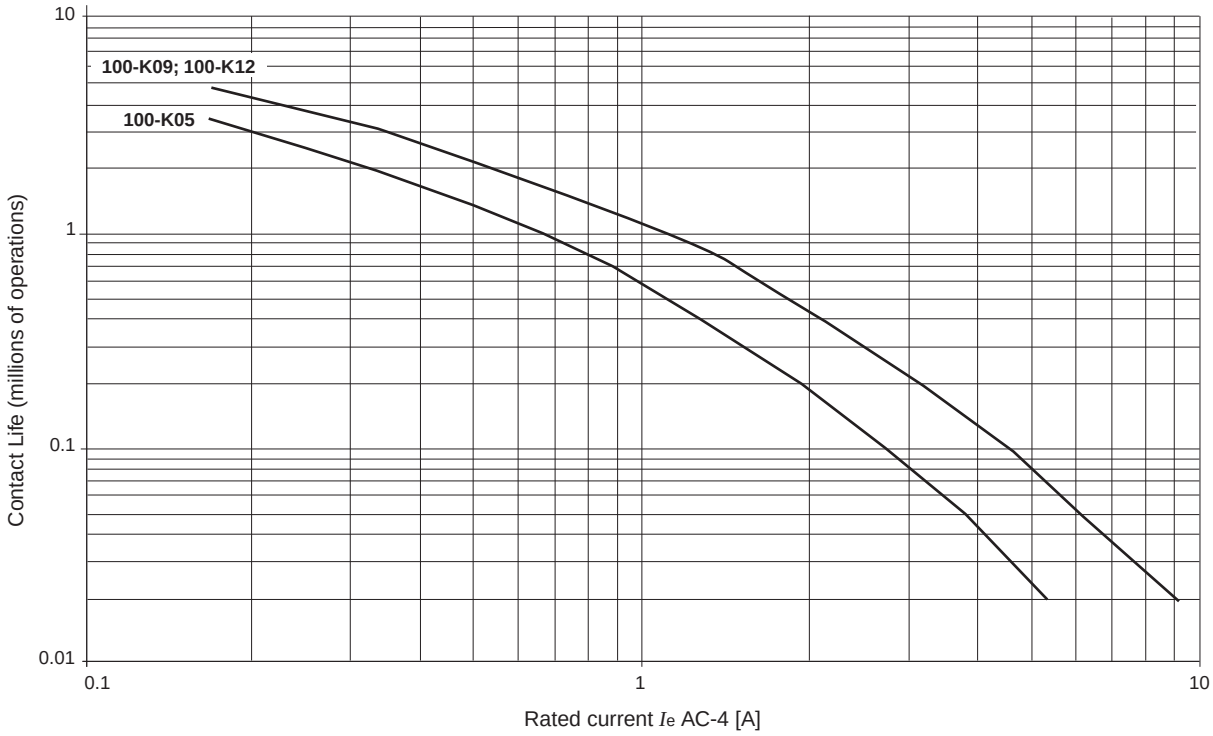
Non- or slightly inductive loads, resistance furnaces



Electrical life; U_e = 400…460V AC

AC-4

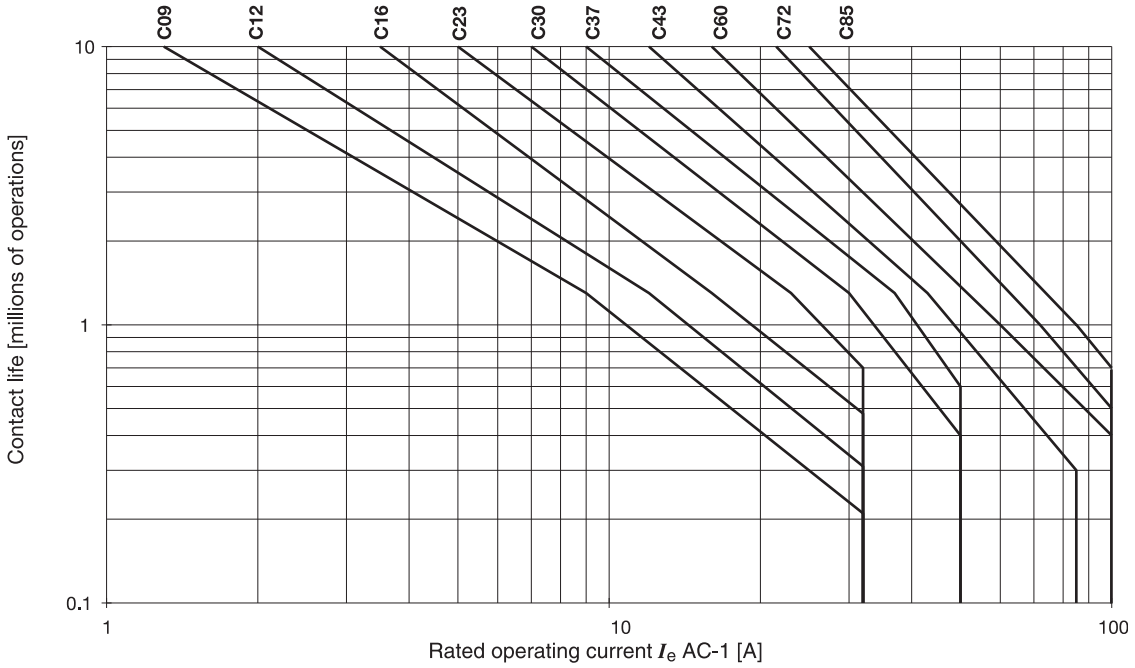
Stepping of squirrel-cage motors



Life-Load Curves

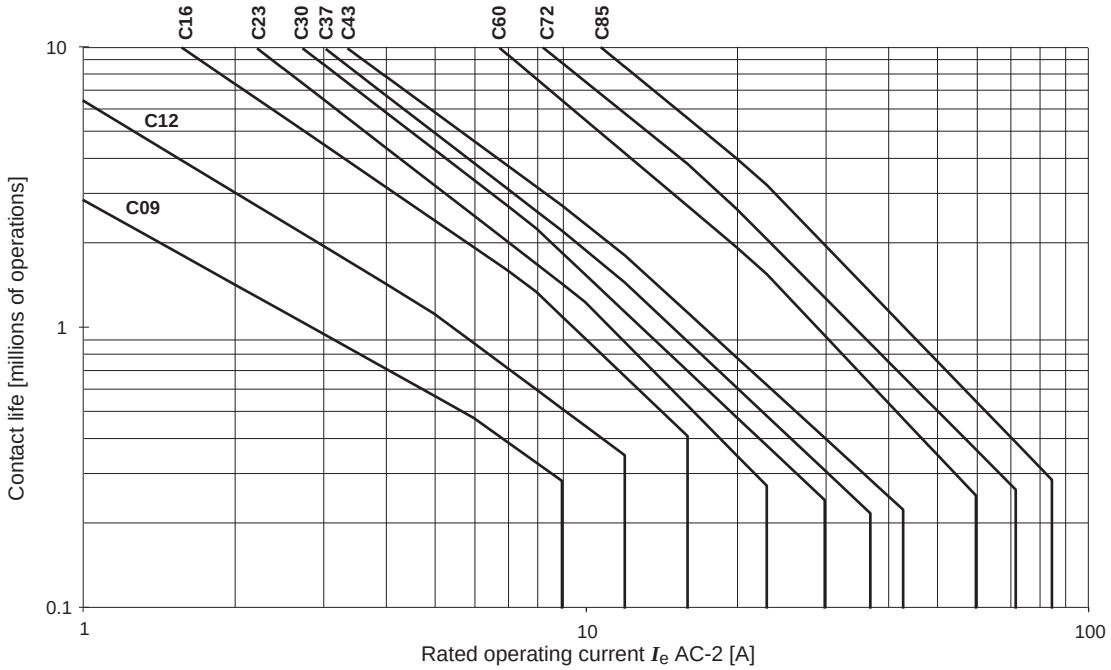
AC-1

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



AC-2

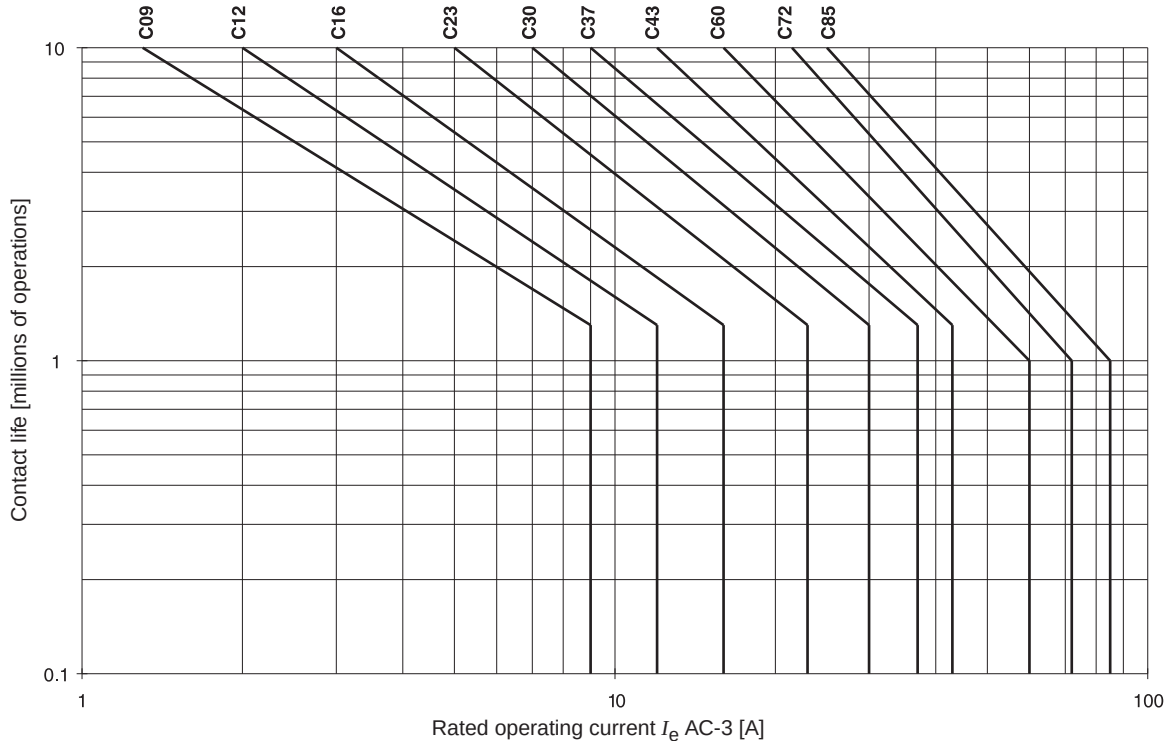
Switching of slip-ring motors; U_e = 230…400…460V



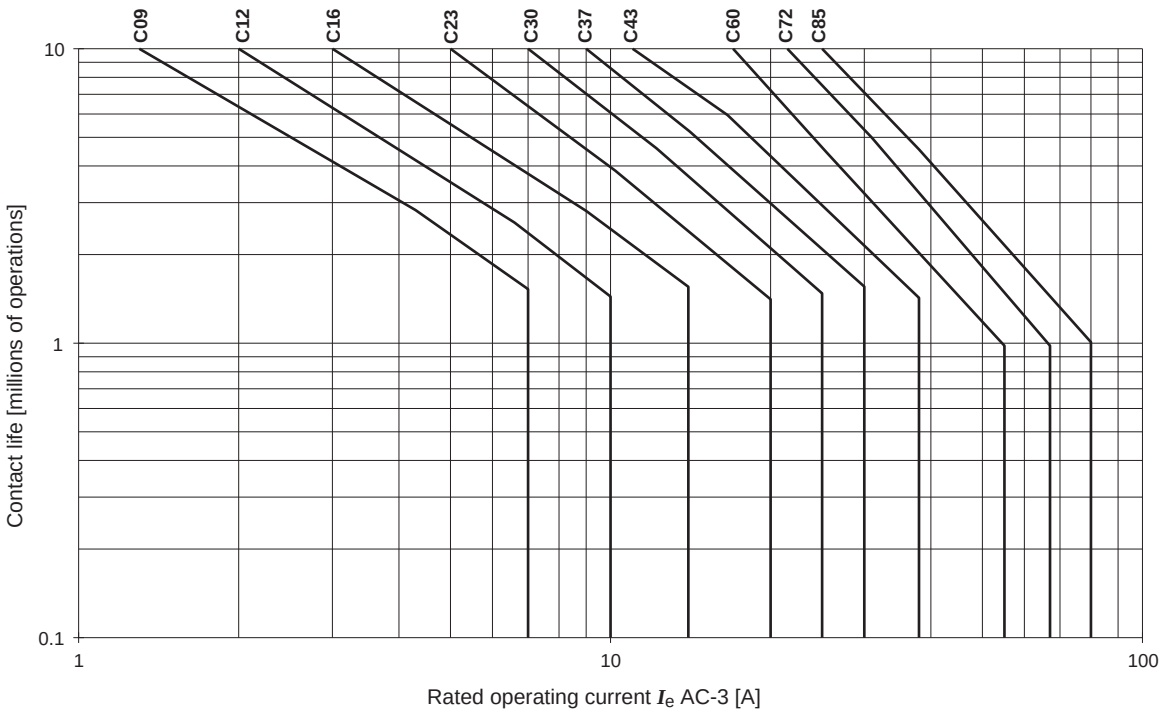
Life-Load Curves

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

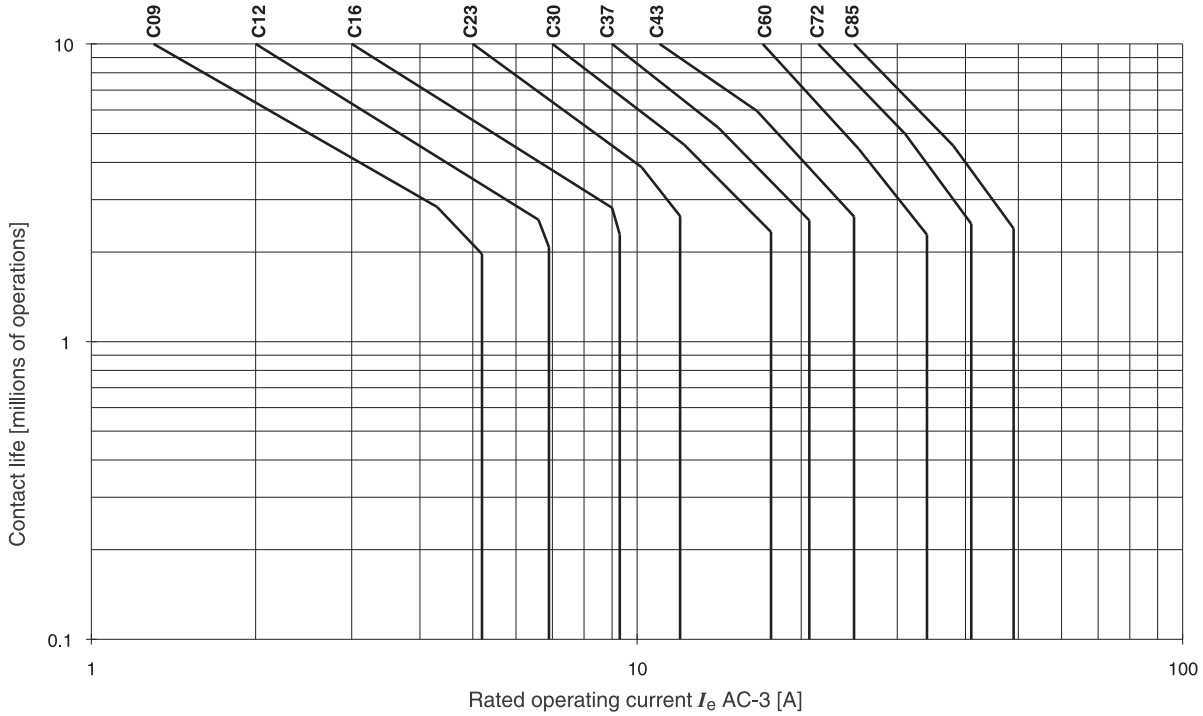


2

Life-Load Curves

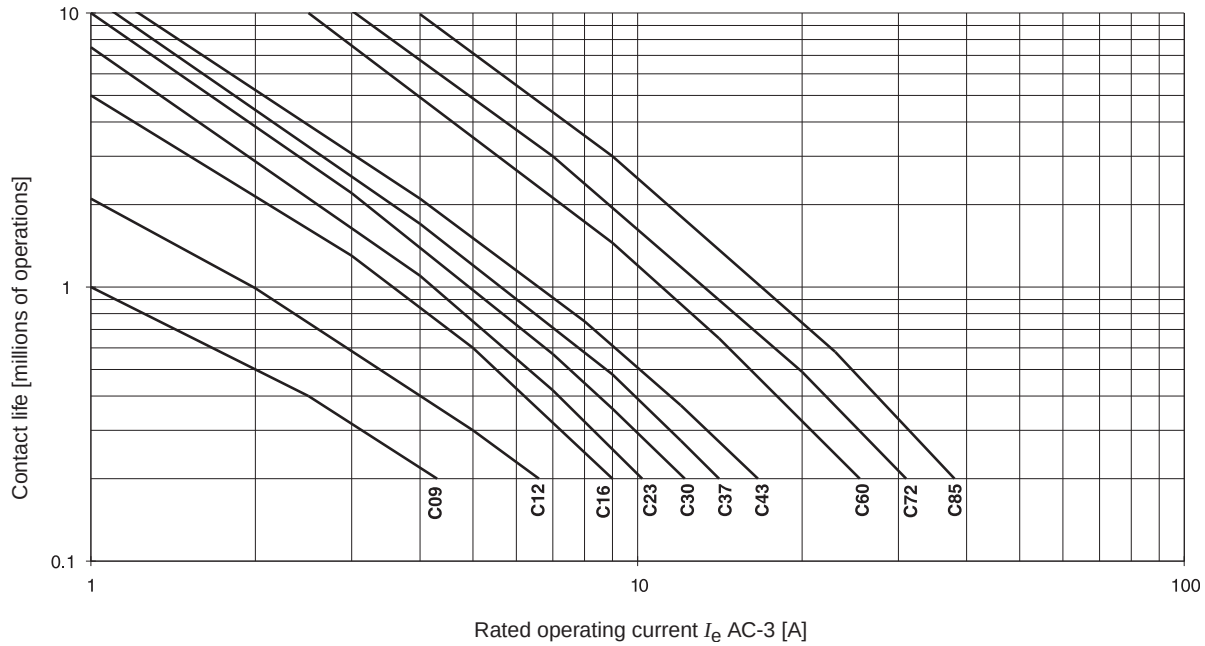
AC-3

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



AC-4

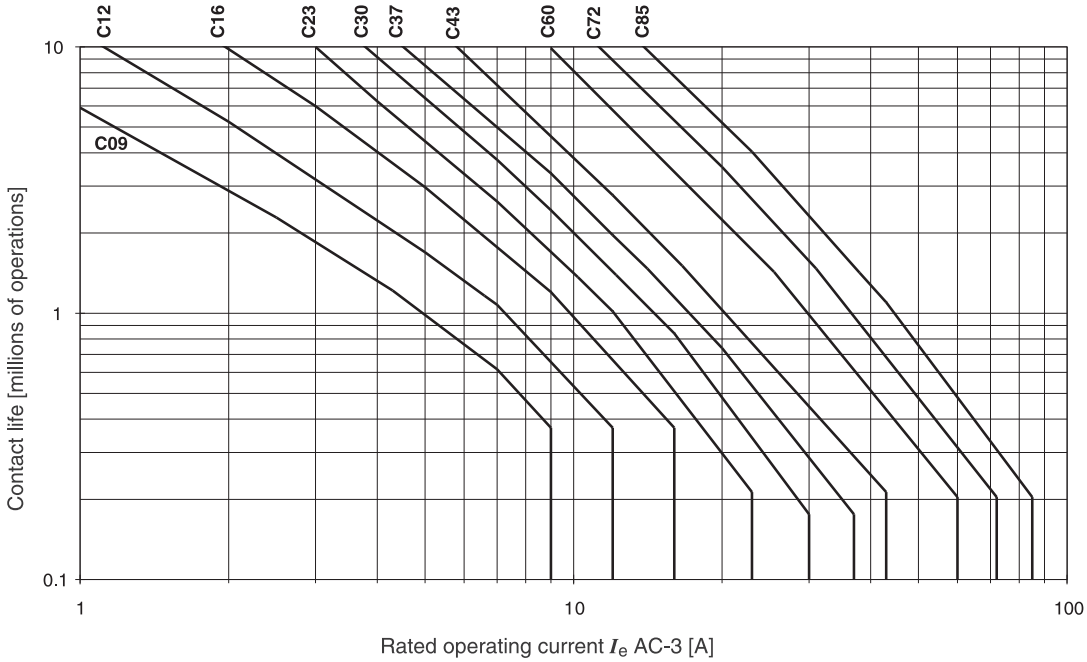
Switching of squirrel-cage motors; U_e = 230...690V



Life-Load Curves

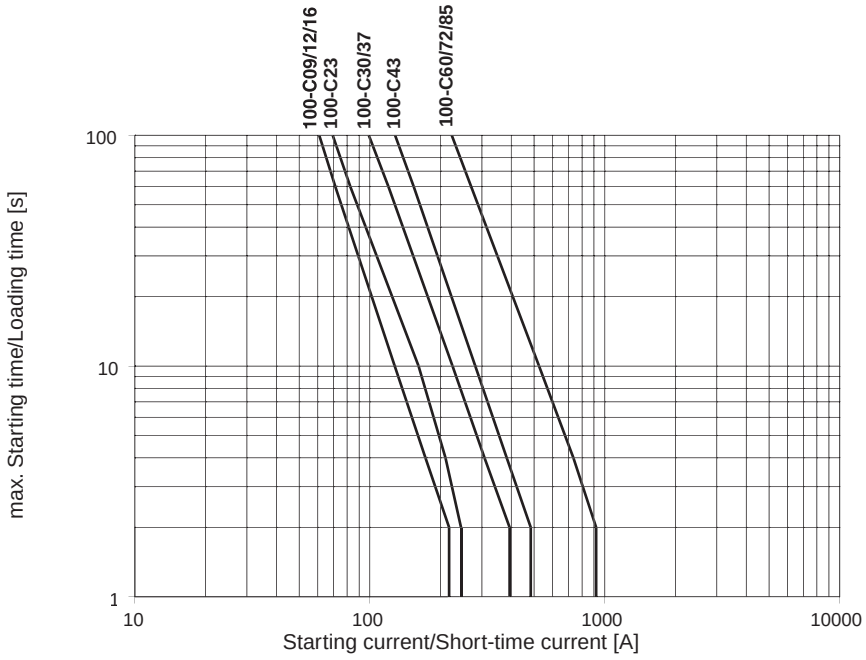
AC-3 & AC-4

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



Heavy Duty Starting and Regular Short-time Operation

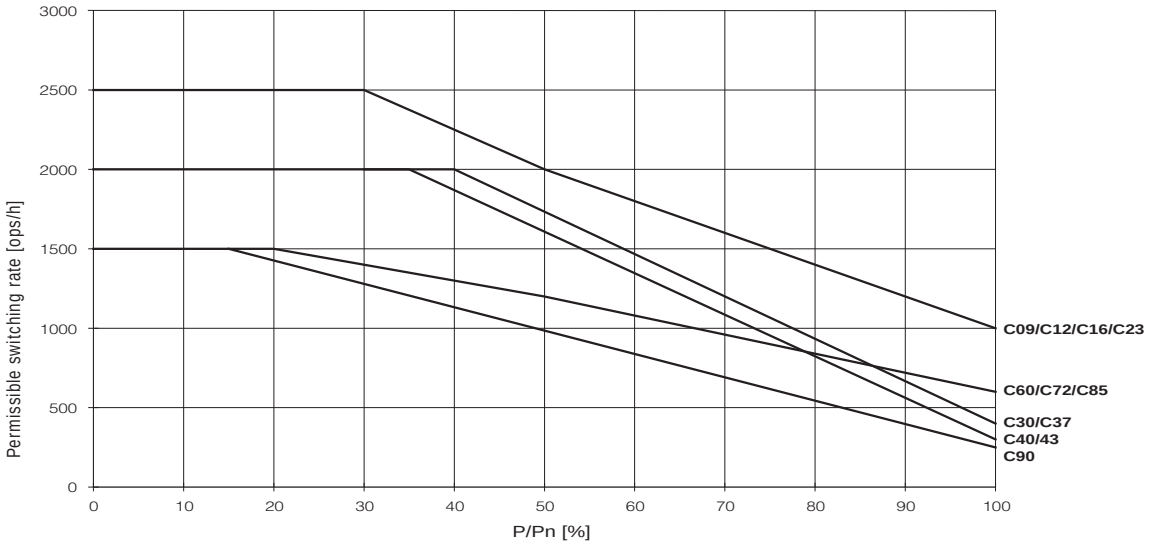
Bulletin 100-C Contactors



Maximum Operating Rates

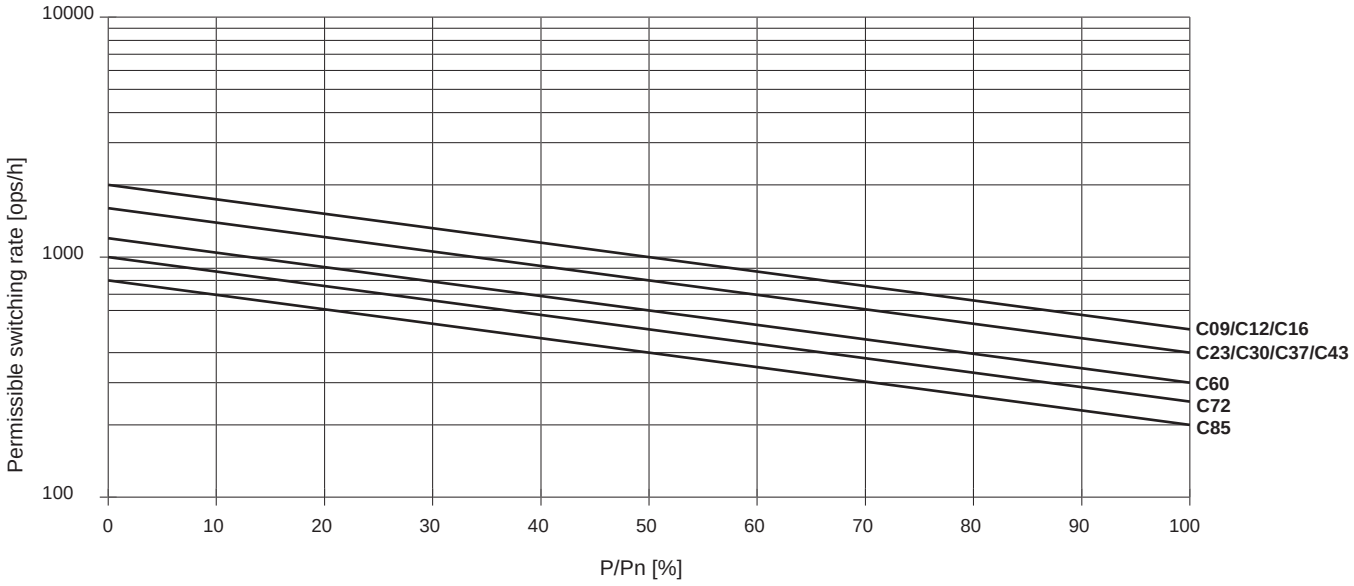
AC-1

40 °C Non- or slilghtly inductive loads, resistance furnaces; U_e = 230…690V



AC-2

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

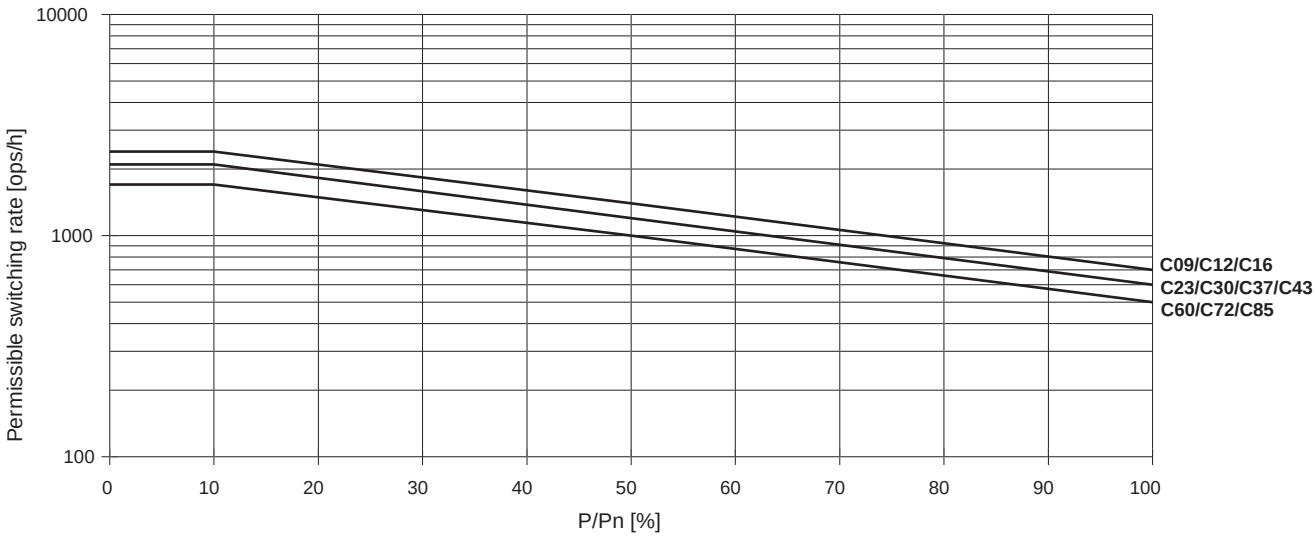


Maximum Operating Rates

AC-3

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

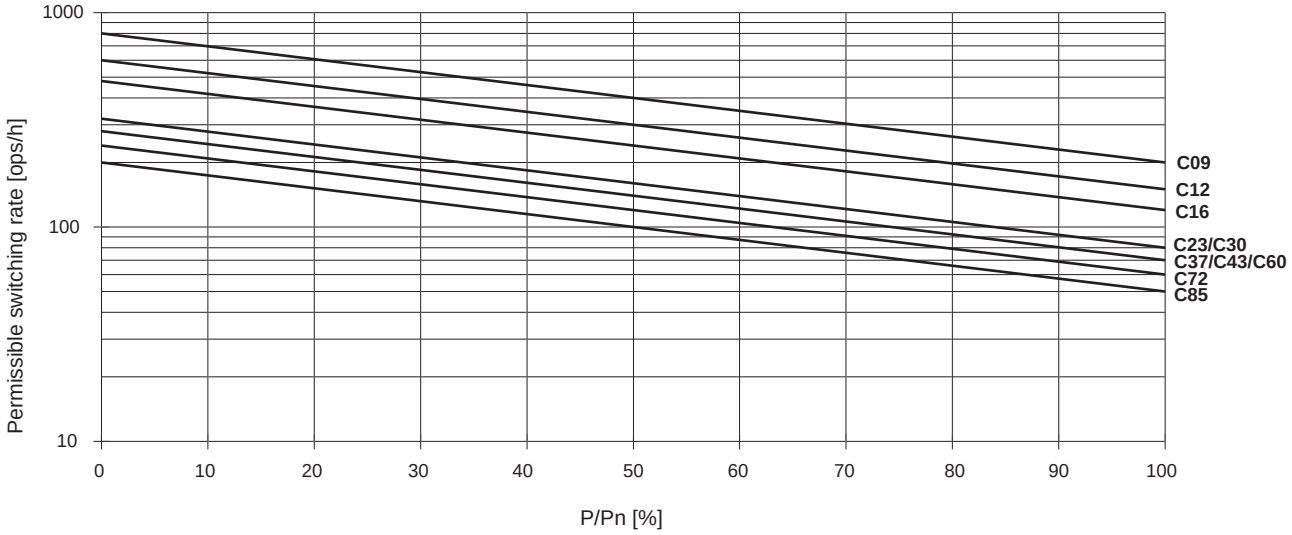
Relative operating time 40%, Starting time t_A = 0.25 s



AC-4

Stepping of squirrel-cage motors; U_e = 230…460V

Starting time t_A = 0.25 s



2

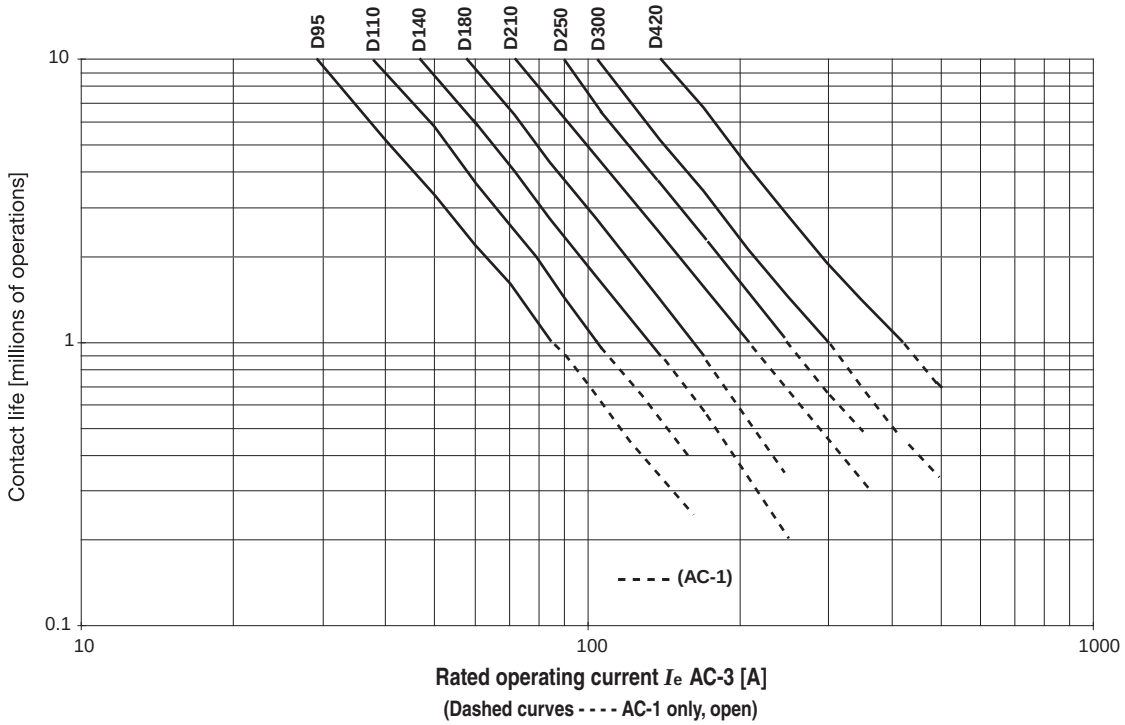
Bulletin 100-D/104-D Life-Load Curves

AC-3

Switching of squirrel-cage motors while starting

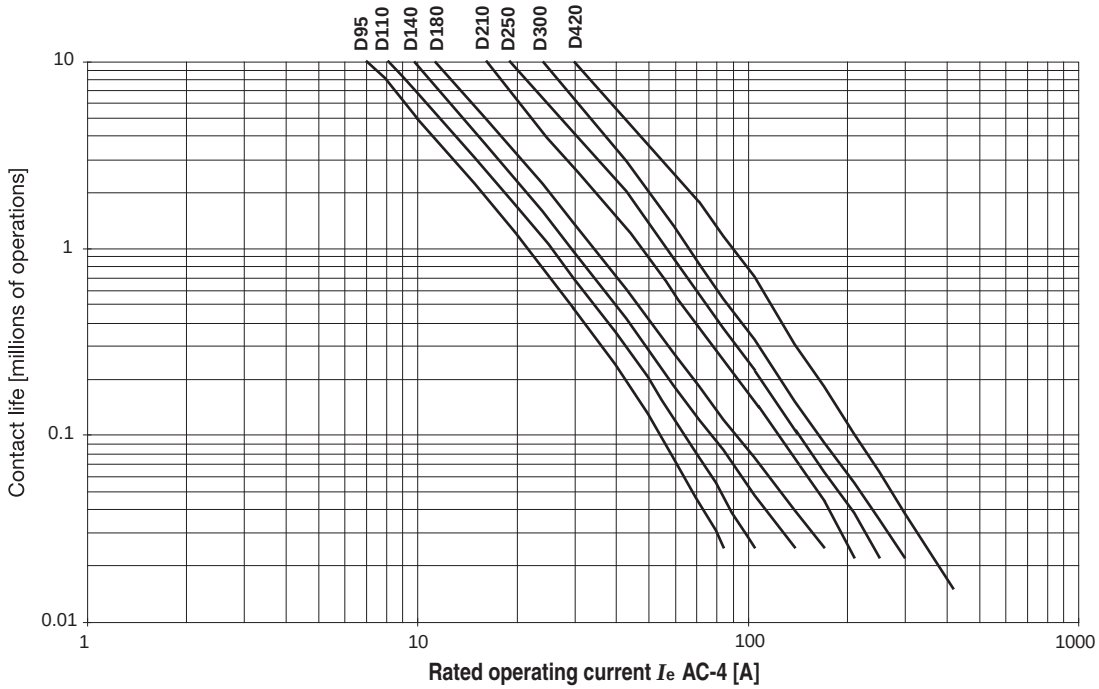
AC-1

Non- or slightly inductive loads, resistance furnaces; U_e = 400V



AC-4

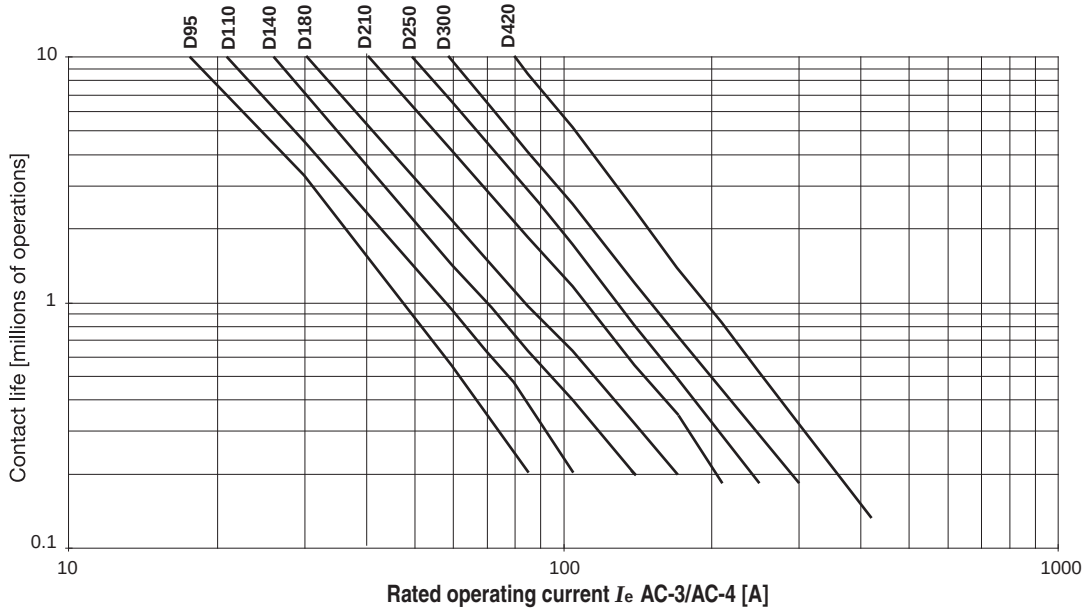
Stepping of squirrel-cage motors; U_e = 400V



Life-Load Curves

AC-3 90% & AC-4 10%

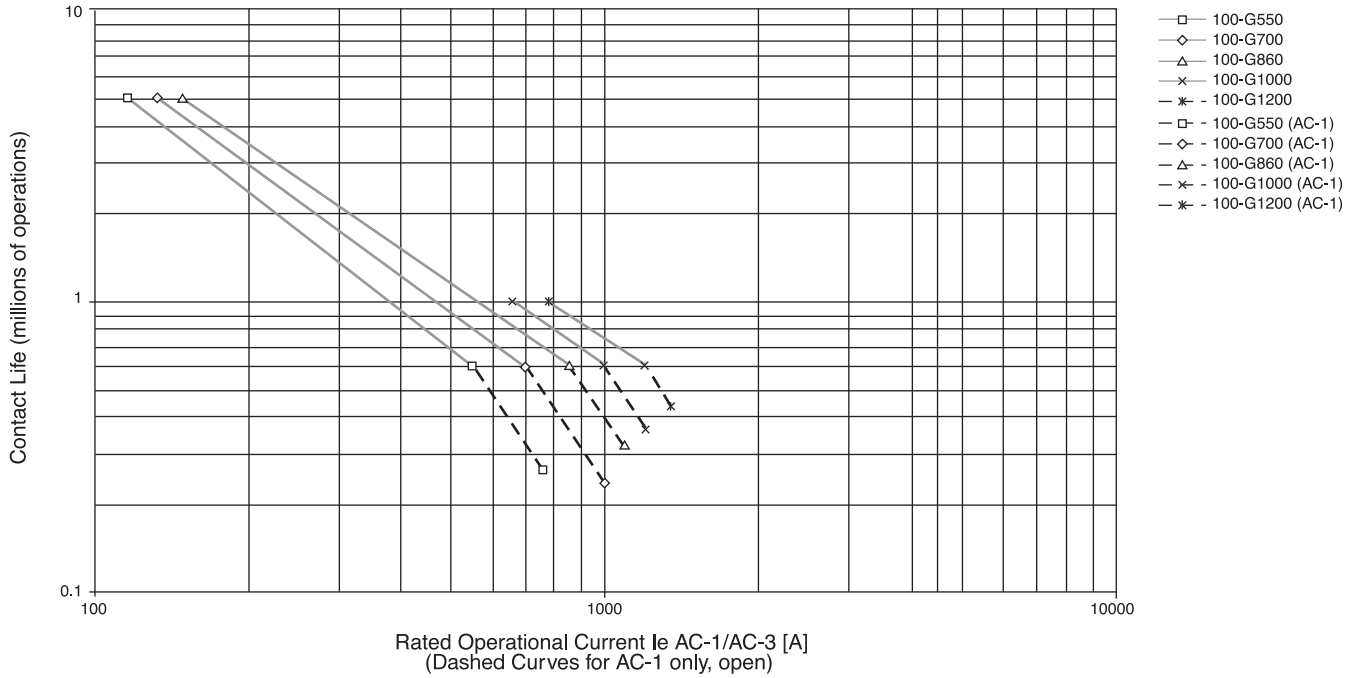
mixed operation of squirrel-cage motors; U_e = 400V



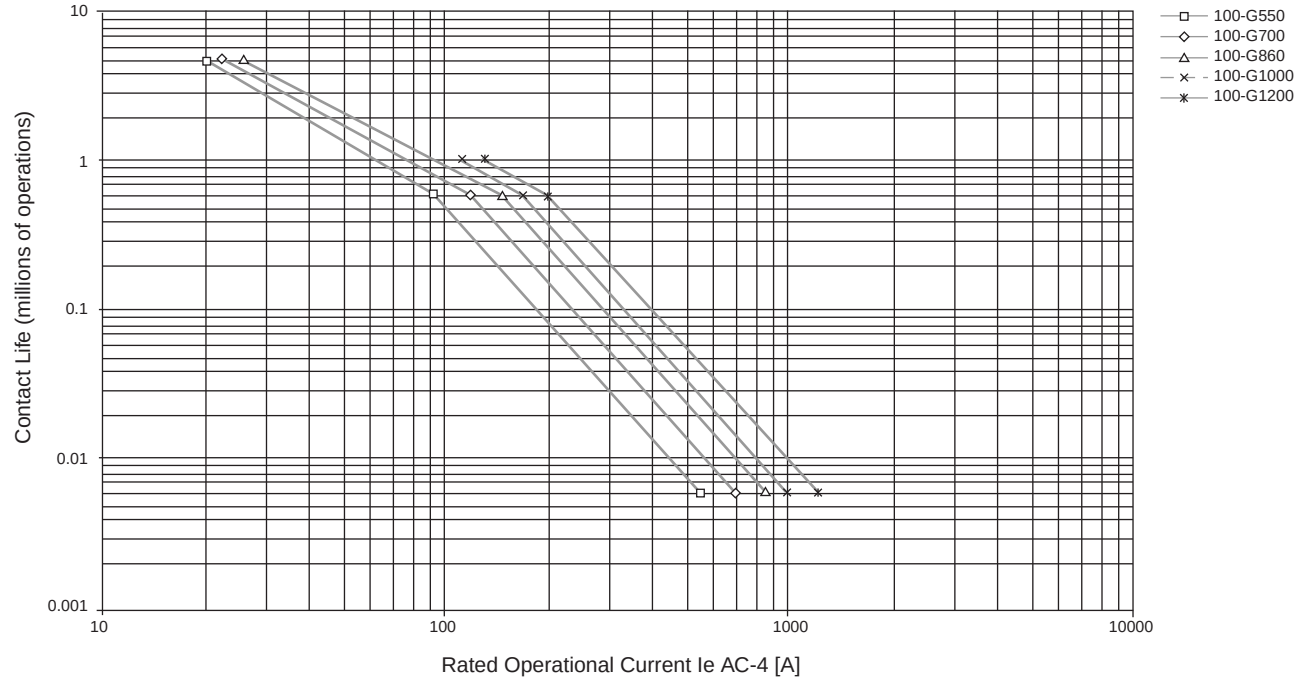
Life-Load Curves

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



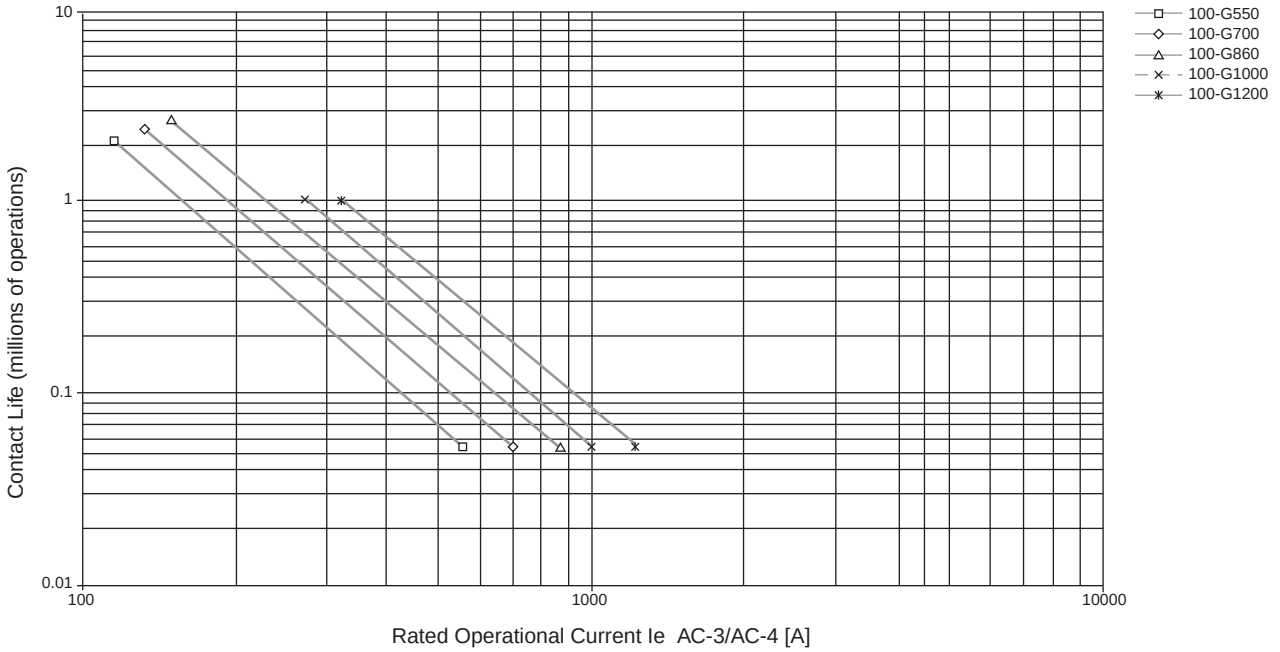
AC-4 Jogging of Squirrel-cage Motors, U_e = 380…460V AC



Life-Load Curves, Continued

100-G550…100-G1200

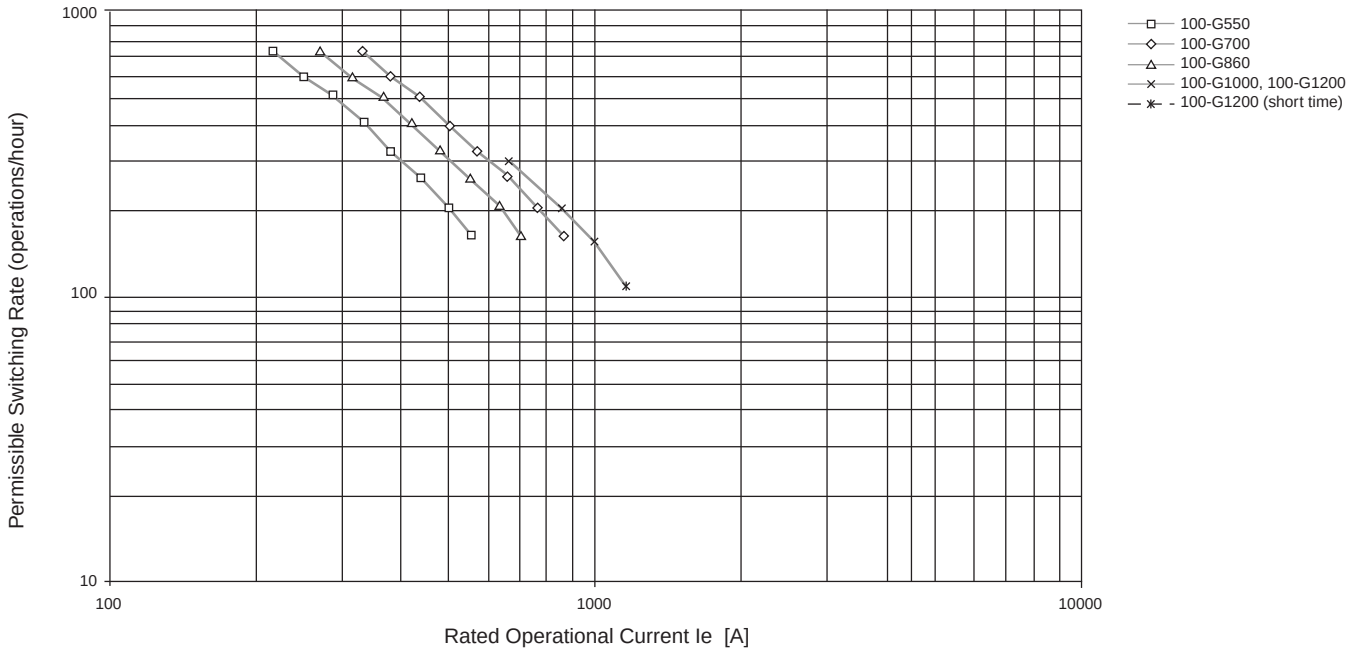
AC-3 90% Switching of Running Motors, U_e = 380…460V AC
AC-4 10% Jogging



Permissable Switching Rate

100-G550…100-G1200

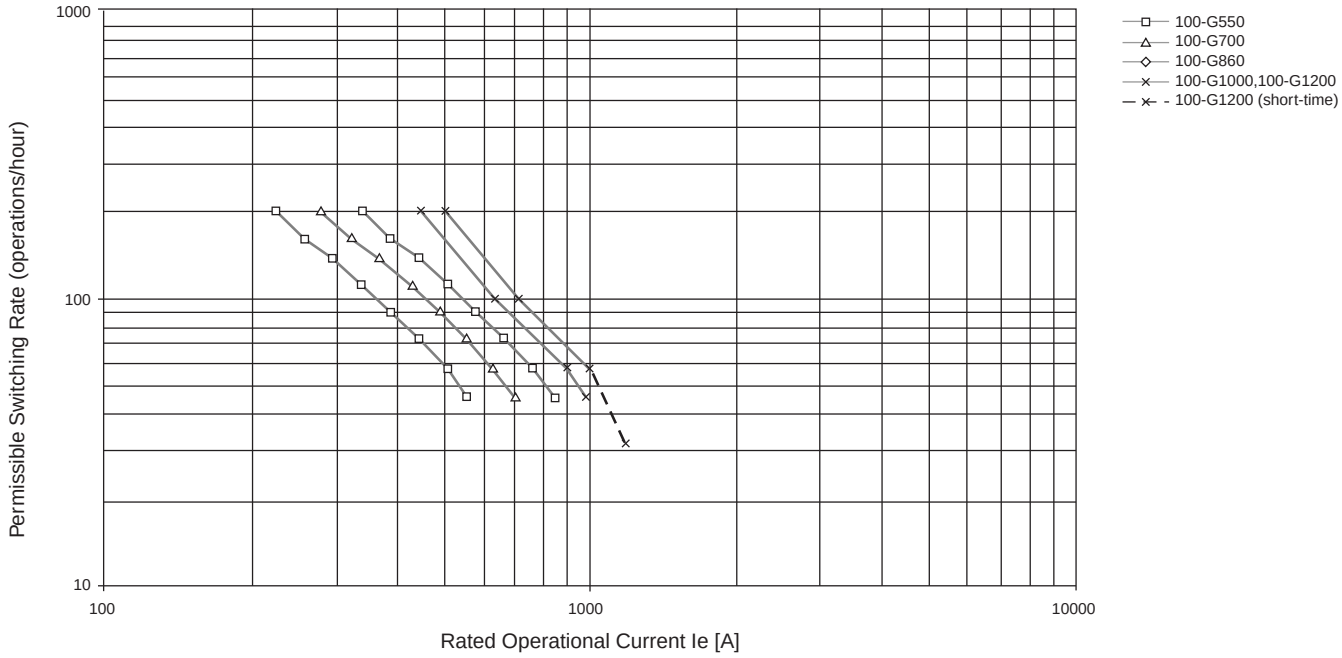
Switching of Running Squirrel-cage Motors AC-3, U_e = 380…460V AC
Starting Time t_s = 0.25 s, Relative Running Time 40%



Permissable Switching Rate, Continued

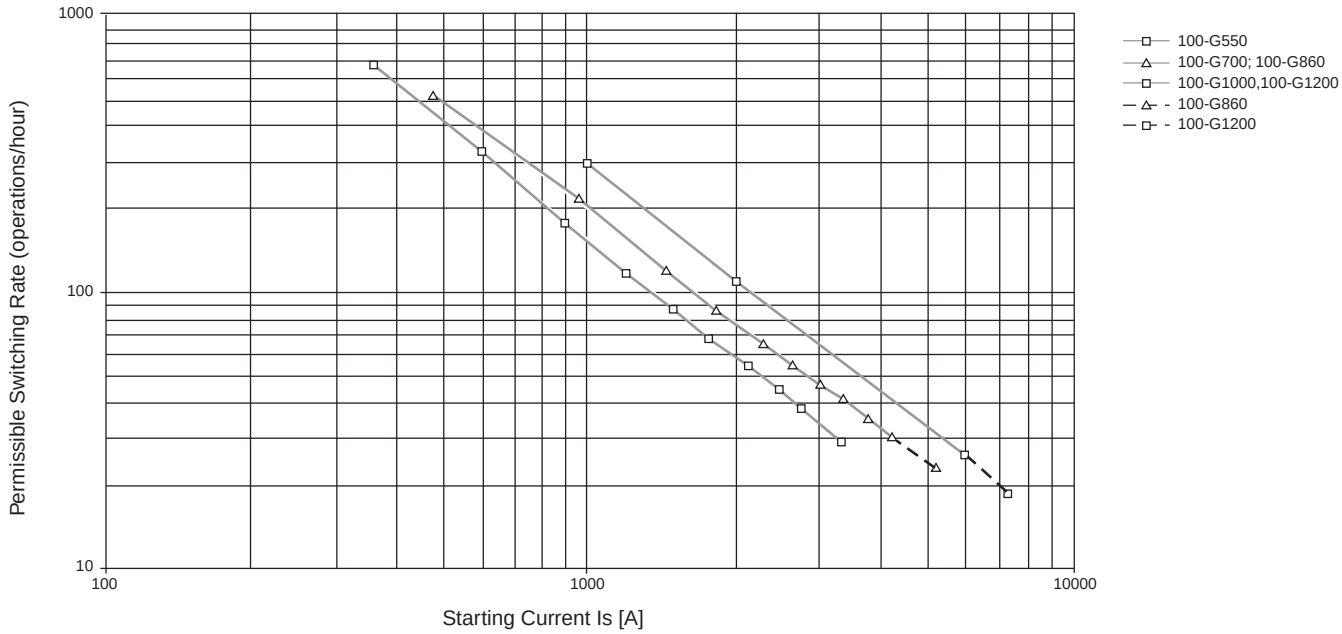
100-G550…100-G1200

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



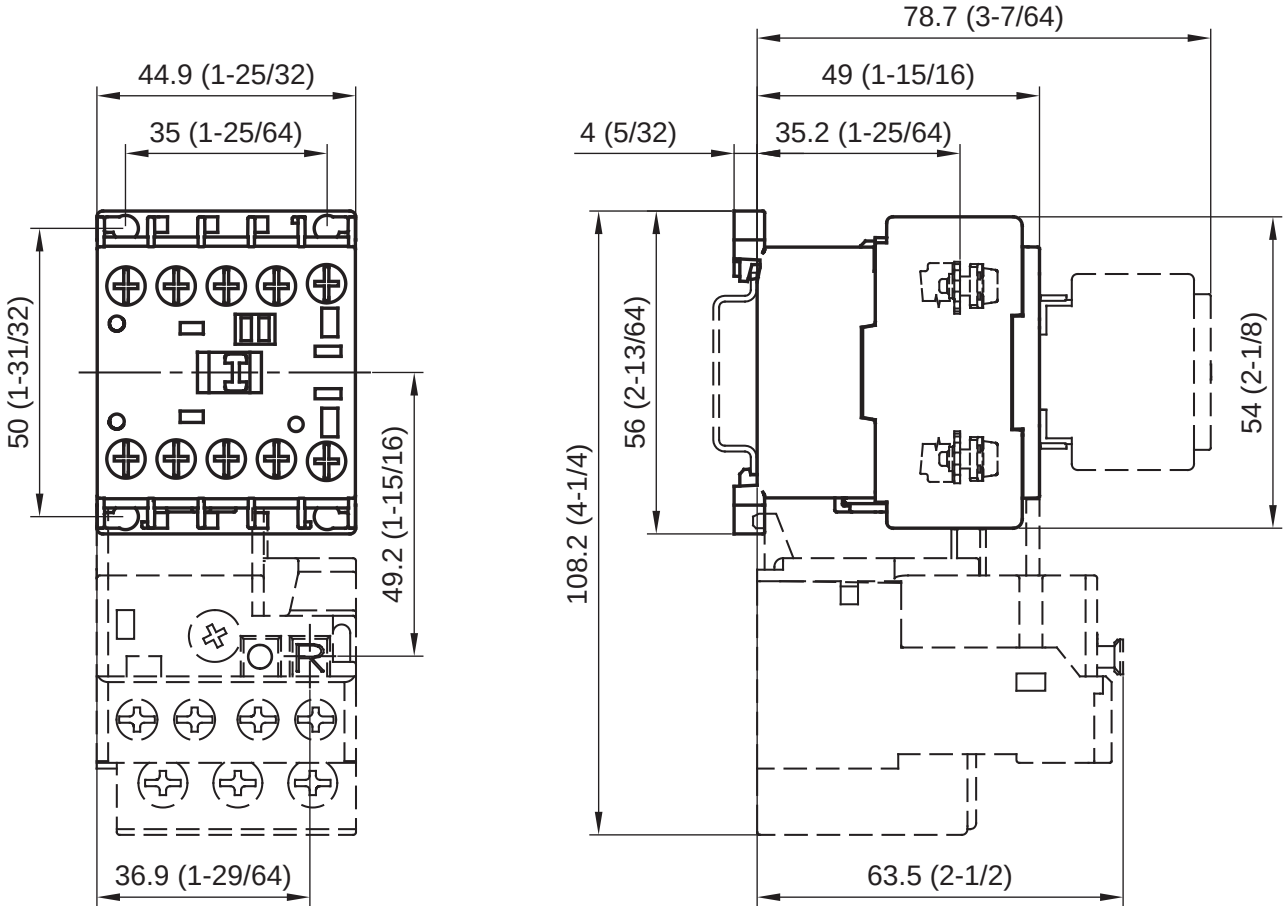
100-G550…100-G1200

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



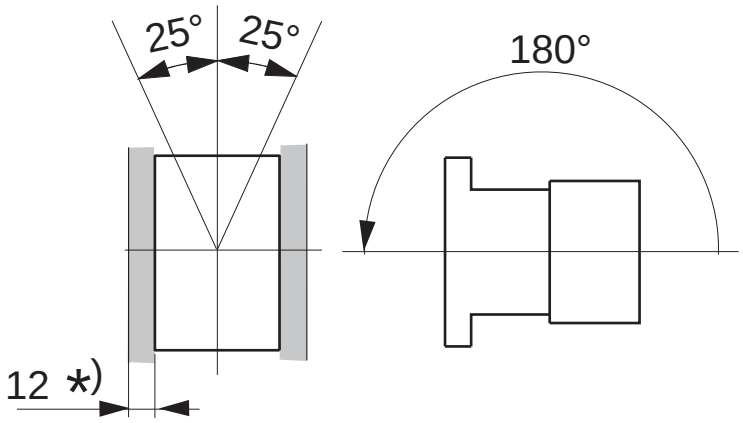
Bulletin 100-K Contactors and Accessories, Bulletin 193-K Overload Relays

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



Mounting Position

With Accessories

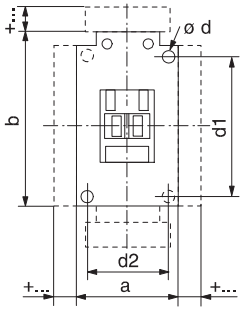


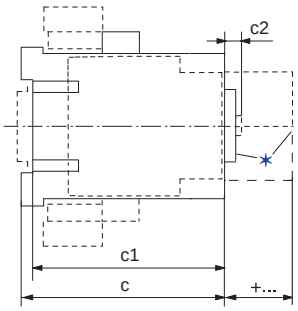
*) -Minimum distance to grounded parts or walls

2

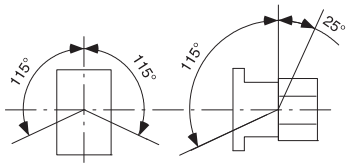
Bulletin 100-C Contactors and Accessories

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

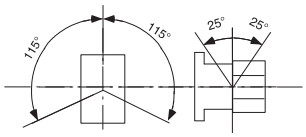




Mounting Position



AC contactors and DC contactors with electronic coils



DC contactors

AC Contactors and DC Contactors with 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-C85	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

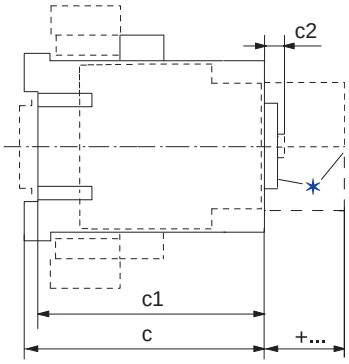
Cat. No.	a	b	c	c1	c2	Ød	d1	d2
100-C09Z...100-C16Z	45 (1-25/32)	81 (3-3/16)	106.5 (4-3/16)	101.5 (4)	6 (15/64)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)
100-C23Z	45 (1-25/32)	81 (3-3/16)	123.5 (4-55/64)	119 (4-43/64)	6 (15/64)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)
100-C30...100-C37	45 (1-25/32)	81 (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-C85D	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)	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)

Accessories

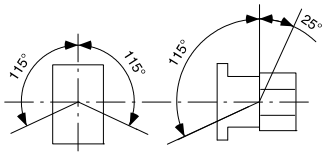
Contactors with		mm	(inches)
Auxiliary contact block for front mounting	2- or 4-pole	c/c1 + 39	(c/c1 + 1-37/64)
Auxiliary contact block for side mounting	1- or 2-pole	a + 9	(a + 23/64)
Pneumatic Timing Module		c/c1 + 58	(c/c1 + 2-23/64)
Electronic Timing Module	on coil terminal side	b + 24	(b + 15/16)
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...C85	b + 99	(b + 3-7/8)
Paralleling Links	100-C09...C23	b + 78	(b + 3-1/16)
		c + 9/5	(c + 3/8)
	100-C30...C37	b + 85	(b + 3-11/32)

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

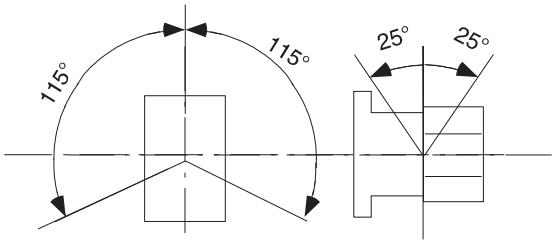
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



Mounting Position



AC contactors and DC contactors with electronic coils



DC contactors

2

AC Contactors and DC Contactors with 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-C85	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

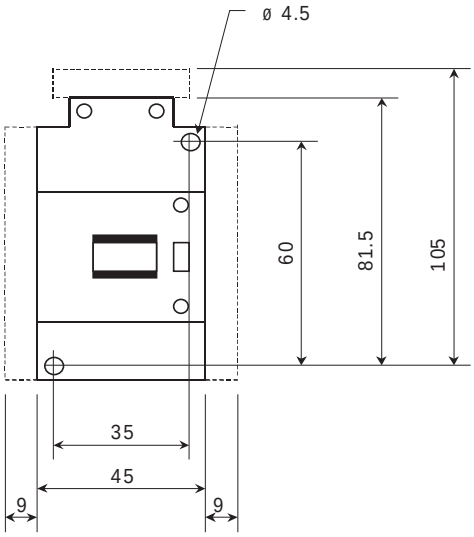
Cat. No.	a	b	c	c1	c2	Ød	d1	d2
100S-C09Z...100S-C16Z	45 (1-25/32)	81 (3-3/16)	145.5 (5-49/64)	140.5 (5-37/64)	6 (15/64)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)
100S-C23Z	45 (1-25/32)	81 (3-3/16)	162.5 (6-7/16)	158 (6-1/4)	6 (15/64)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)
100S-C30Z...100S-C37Z	45 (1-25/32)	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-C85D	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)

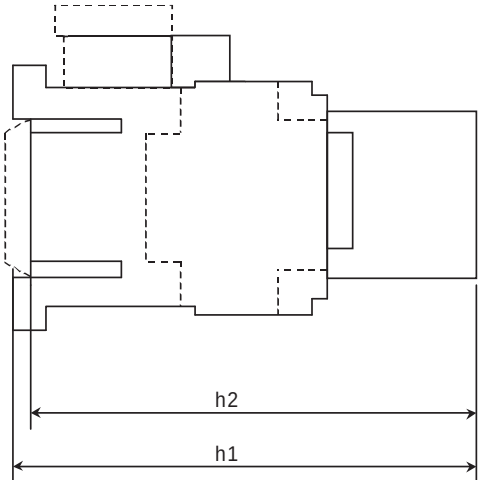
Accessories

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 marking tag sheet with clear cover marking tag adapter for System V4 / V5 marking tag adapter for System Bul. 1492W	+ 0 + 0 + 5.5 + 5.5	(+ 0) (+ 0) (+ 7/32) (+ 7/32)

Bulletin 100Q-C Contactors

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

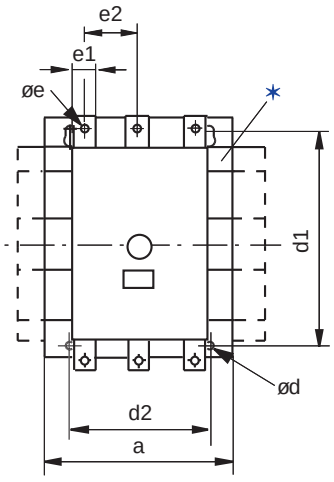


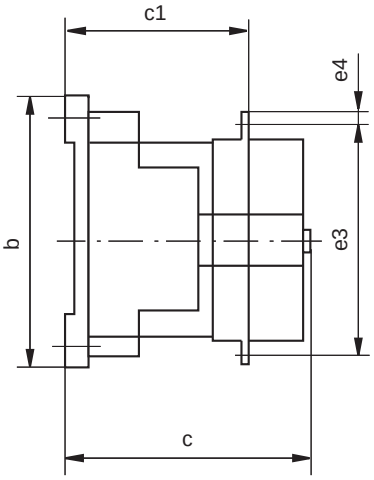


Cat No.	AC-Operated		DC-Operated	
	h1	h2	h1	h2
100Q-C16	120 (4-23/32)	115 (4-17/32)	146 (5-3/4)	141 (5-9/16)
100Q-C37	137 (5-3/8)	132 (5-3/16)	181 (7-1/8)	176 (6-15/16)

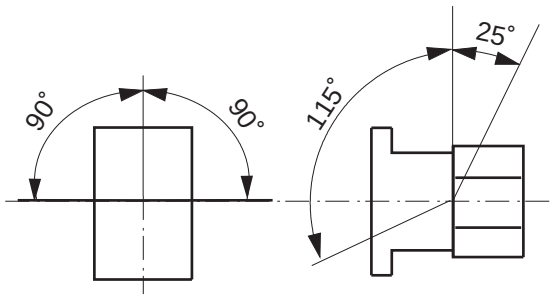
Bulletin 100-D Contactors and Accessories

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





Mounting Position



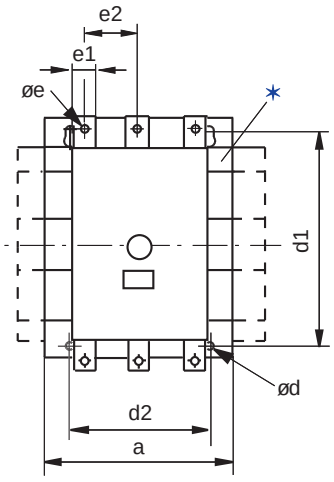
Cat. No.	a	b	c	c1	Ød	d1	d2	Øe	e1	e2	e3	e4
100-D95, 100-D110	120	170	156	110.5	5.2	145	100	M6	16	38.5	147	8
D100-D95E…100-D180E, 100-D140, 100-D180	120	170	156	110.5	5.2	145	100	M8	20	39	160	10
100-D120E…100-D420E	155	205	180	110.5	6.5	180	130	M10	25	48	193	12.5
100-D630E…100-D860E	255	310	265	110.5	10	230	225	M12	40	70	291	22

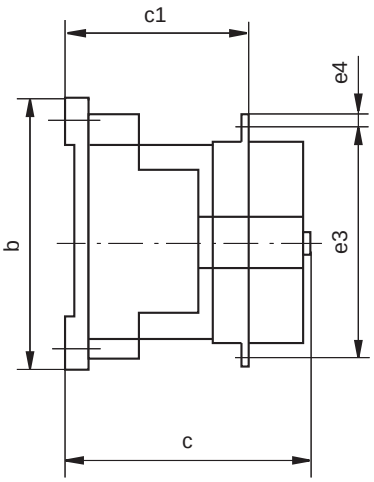
Contactor with		mm
Auxiliary contact block ∗	100-DS1… 100-DS2…	a a + 13.5 each
Mechanical Interlock	100-DM…	a + a
Frame terminal block	100-DTB110 100-DTB180 100-DTB420	b + 7 each b + 7 each b + 8.5 each
Label holder		c…+ 5

∗ 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.

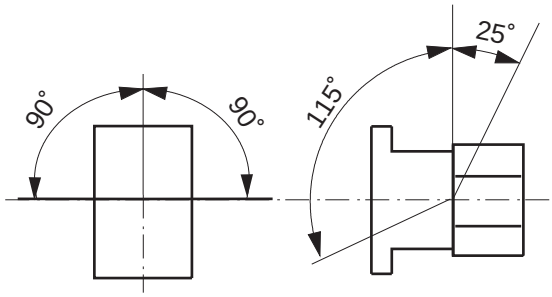
Bulletin 100S-D Contactors and Accessories

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





Mounting Position



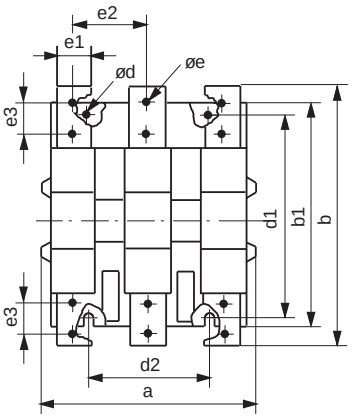
Cat. No.	a	b	c	c1	Ød	d1	d2	Øe	e1	e2	e3	e4
100S-D95, 100S-D110	120	170	156	110.5	5.2	145	100	M6	16	38.5	147	8
D100S-D95E…100S-D180E, 100S-D140, 100S-D180	120	170	156	110.5	5.2	145	100	M8	20	39	160	10
100S-D120E…100S-D420E	155	205	180	110.5	6.5	180	130	M10	25	48	193	12.5
100S-D630E…100S-D860E	255	310	265	110.5	10	230	225	M12	40	70	291	22

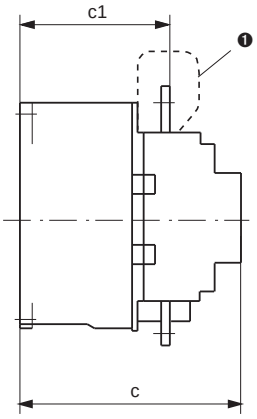
Contactor with		mm
Auxiliary contact block ∗	100-DS1… 100-DS2…	a a + 13.5 each
Mechanical Interlock	100-DM…	a + a
Frame terminal block	100-DTB110 100-DTB180 100-DTB420	b + 7 each b + 7 each b + 8.5 each
Label holder		c…+ 5

∗ 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.

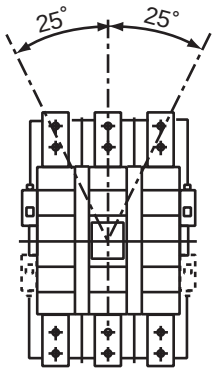
Bulletin 100-G Contactors and Accessories

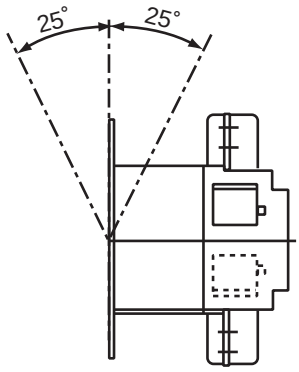
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.





Mounting Position





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

Coils

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
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	—	—	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

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
		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 193 Overload Relays with Current Transformers

For Use With	Panel Adapter Assembly Cat. No.	Overload Relay Only Cat. No.
193-HPD110	40781-607-01	193-NX23
193-DPC88	40781-607-01	193-NX24
193-DPD120	40781-607-01	193-NX25
193-DPD200	40781-607-01	193-NX26
193-EPD180	40781-607-01	193-NX27
193-EPD300	40781-607-01	193-NX28
193-FPD240	40781-607-01	193-NX29
193-FPD40	40781-607-01	193-NX30
193-GPD378∗	40781-607-01	193-NX32
193-GPD630∗	40781-607-01	193-NX33

∗ Contact kits for Cat. Nos. 100-A09...100-A30 are not available as replacement parts.

AC Operating Coils Used with 193-GPD Devices		
Voltage	Frequency [Hz]	Cat. No.
24V AC	50	HA407
24V AC	60	HA013
110V AC	50	HA473
110 V AC	60	—
120 V AC	50	—
120V AC	60	HA473
208 V AC	50	—
208V AC	60	HA049
220V AC	50	HA474
220V AC	60	HA051
240V AC	50	HA442
240V AC	60	HA474
277V AC	60	HA060
380V AC	50	HA454
380 V AC	60	—
415V AC	50	HA457
440V AC	50	**HA475**
440V AC	60	HA071
480 V AC	50	—
480V AC	60	**HA475**
500V AC	50	HA464
500 V AC	60	—
600V AC	60	HA476

	Description	Coil Type	For Use With	Cat. No.
	**Arc Chambers for Contactors** For 3-pole 100-D Contactors	Conventional	100-D95	100-DA-95
			100-D110	100-DA-110
			100-D140	100-DA-140
			100-D180	100-DA-180
		Electronic	100-D95	100-DAE-95
			100-D110	100-DAE-110
			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** Set for 3-pole 100-D Contactors	Conventional	100-D95	100-DC-95
			100-D110	**100-DC-110**
			100-D140	**100-DC-140**
			100-D180	**100-DC-180**
		Electronic	100-D95	**100-DCE-95**
			100-D110	**100-DCE-110**
			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-D95…D110	100-DHF110
			100-D140…D180	100-DHF180
		Electronic	100-D95…D180	100-DHF180
			100-D210…D420	100-DHF420
			100-D630…D860	100-DHF860

Replacement coils for 100-D contactors

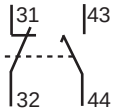
Conventional AC							Conventional DC				
AC Standard Control Voltages			AC Coil Code	100-D95…D180	100-D210…D420	100-D630…D860	DC Standard Control Voltages	DC Coil Code	100-D95…D180	100-D210…D420	100-D630…D860
50 Hz	60 Hz	50/60 Hz		Cat. No.	Cat. No.	Cat. No.			Cat. No.	Cat. No.	Cat. No.
24V	—	—	K	TG407	—	—	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-D95…D300	100-D420	100-D630…D860	DC Standard Control Voltage	DC Coil Code	100-D95…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	TJE862	200…255V	EZA	TGE781	THE781	—
—	—	208…277V	EA	TGE866	THE866	TJE866		EA	—	—	TJE866
—	—	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					
—	600V	—	EC	—	—	TJE870					

∗ Applies to 100-D95…-D110 contactors only. Not available with 100-D140…-D180 contactors.
❄ Not available on 100/104-D300.

IEC Renewal Parts

Renewal Parts, Continued

	Description	For Use With	Cat. No.
	**Arcing Chamber** For 3 poles	100-G550	100-AC550
		100-G700, 100-G860	100-AC860
	**Arcing Chamber** For 1 pole	100-G1000, 100-G1200	**100-AC1200**
	**Main Contact Set** Set for 1 pole	100-G550	100-CP550
		100-G700	100-CP700
		100-G860	**100-CP860**
		100-G1000	100-CP1000
		100-G1200	**100-CP1200**
	**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 Coil Cat. No.∗	100-G550 Supply Module Cat. No.	100-G700...100-G860 Coil Cat. No.∗	100-G700...100-G860 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.∗	100-G1000...100-G1200 Supply Module Cat. No.
110…115V	KD	TZ734	TZS734
220…230V	KF	TZ747	TZS747
380…400V	KN	TZ779	TZS779
440V	KB	TZS780	TZS780

Electronic Overload Relay Code Selection

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
					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
C85	C72	C60								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
					C30∗	C23	C16	C12	C09	0.1…0.5	E1P
										3.2…16	E1R
										5.4…27	E1S
			C43	C37	C30					9.0…45	E1T
C85	C72	C60								18…90	E1U

∗ 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.

Bimetallic 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 — Starter Size										Full Load Current Range [A]‡		Overload Relay Code
C85	C72	C60	C43	C37	C30	C23	C16	C12	C09	Min.	Max.	
										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

∗ Not available on Bulletin 109 Molded Plastic Enclosed Starters.
‡ 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.

				
Bulletin	**193-ED**	**193-EE**	**193-EC1**	**193-EC2/EC3**
Type	E1 Plus Electronic Overload Relay	E1 Plus Electronic Overload Relay	E3 Electronic Overload Relay	E3 Plus Electronic Overload Relay
Rated Current (Range)	0.1…27 A	0.1…800 A	0.4…5000 A	0.4…5000 A
NEMA Operating Voltage, Nominal	—	600V		
IEC Operating Voltage, Nominal	690V	690/1000V	690/1000V	
Overload Type	Solid-State	Solid-State	Microprocessor-Based	Microprocessor-Based
Trip Class (Fixed)	10	—	—	—
Trip Class (Adjustable)	—	10, 15, 20, 30	5…30	5…30
Ambient Temperature Compensated	✓	✓	✓	✓
Reset Type	Manual only	Automatic and Manual	Automatic and Manual	Automatic and Manual
Adjustment Range	5:1	5:1	5:1	5:1
Phase Loss	3 s	3 s	Adjustable Delay	Adjustable Delay
Ground (Earth) Fault	—	Optional	—	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
No. of Inputs	—	—	2	4
ODVA (DeviceNet) Conformance	—	Optional	✓	✓
Variable Frequency Drive (VFD) Compatible	—	—	✓	✓
Product Selection	**Page 2-174**	**Page 2-174**	**Page 2-187**	**Page 2-187**

			
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 2-209**	**Page 2-204**	**Page 2-214**

E1 Plus Solid-State Overload Relays

Overview

E1 Plus Solid-State Overload Relays

- 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…27 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
- Optional cage clamp control terminals (Bul. 193R-EE only)

Table of Contents

Standards Compliance

- IEC/EN 60947-4-1
- IEC/EN 60947-5-1
- CSA 22.2 No. 14
- UL 508

Certifications

- CE
- cULus Listed
- ATEX (pending)
- 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

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.

Side-Mount Expansion Modules

Through the use of optional side-mounted accessory 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 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 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 Solid-State Overload Relays

Catalog Number Explanation/Product Selection

Catalog Number Explanation

193	–	EE	C	B
		a	*b*	*c*	*d*

a

Bulletin Number	
Code	Description
193	IEC Three-Phase
193R	IEC Three-Phase, Cage Clamp
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

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	—	—
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
F	D95…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**
Integrated panel/DIN Rail mount and pass-through wiring	1.0…5.0	**193-ED1CP**
	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-C85	18…90	‡	**193-EEGE**
100-D95…100-D180	18…90	❄	**193-EEGF**
	30…150	❄	**193-EEHF**
	40…200	❄	**193-EEJF**
	55…110	❄	**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-through wiring	1.0…5.0	‡	**193-EECP**
	3.2…16	‡	**193-EEDP**
	5.4…27	‡	**193-EEEP**

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…27.0	**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-through wiring	1.0…5.0	**193S-EEPP**
	3.2…16	**193S-EERP**
	5.4…27.0	**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.
§ Order panel adapter, **Cat. No. 193-EPB**, separately.

‡ **Cage Clamp Control Terminals** – To order, change the Bulletin number in the listed cat. no. from 193 to 193R (Example: **Cat. No. 193-EEFD** becomes **Cat. No. 193R-EEFD**).
❄ Does not include terminal lugs. See Accessories.

Visit our website: www.ab.com/catalogs
Preferred availability cat. nos. are printed in **bold**

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, 193-EE_Z	1	**193-EPB**
		193-EE_D		**193-EPD**
		193-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-ATR08Rod
	**Terminal Lugs** Set of 2 Protection class IP2X per IEC 60529 and DIN 40050	100-D140, 100-D180, 100-D95E…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 3	100-D95E, 100-D110E, 193-EC_F, 193-EE_F	3	**100-DLE110**
			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
			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-D95…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
	**Phase Barriers** Set of 4	100-D630…D860, 193-EC_H, 193-EE_H	4	100-DPB860
	**DeviceNet Configuration Terminal** Used to interface with objects on a DeviceNet network. Includes 1 m communications cable (193-CB1).	193-EC (all), 592-EC (all); 280/281/283/284 ArmorStart	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**

E1 Plus Solid-State Overload Relays

Accessories, Continued

	Description	Size	For Use With	Pkg. Quantity	Cat. No.
	**Core Balanced Ground Fault Sensor** • 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

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)
Manual/Automatic Reset		X	X	X	X	X	X
Selectable Trip Class		10	X	X	X	X	X
		15	X	X	X	X	X
		20	X	X	X	X	X
		30	X	X	X	X	X
Jam Protection	On or Off	—	X	—	X	—	—
	Trip Level	—	Adjustable 150/200/300/400%	—	Fixed @ 400%	—	—
	Trip Delay	—	Adjustable 0.5/1.0/2.0/4.0 s	—	Fixed @ 0.5 s	—	—
	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
Fault Indication		—	—	X	X	X	—

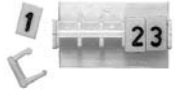
‡ Dynamic Inhibit: Protective function is enabled after the motor current goes above 150% and then falls to below 125%.
∗ Requires use of an external ground fault sensor, **Cat. No. 193-CBCT_**.
§ From 20…100 mA for resistive loads only.

	Description	For Use With	Pkg. Quantity	Cat. No.
	**E1 Plus DeviceNet Module** Provides motor diagnostics and device status information, as well as integrated I/O to allow the simplification of the network architecture.	193-EE (all), 592-EE (all), 193S-EE (all), 592S-EE (all)	1	**193-EDN**
	**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 of up to 6 PTC thermistor sensors. These sensors react to actual temperature and therefore provide enhanced motor 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-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
	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 at a time.
‡ Requires use of an external ground fault sensor (**Cat. No. 193-CBCT_**).

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:	100	100-FMA2

❄ Must be ordered in multiples of package quantities.

E1 Plus Solid-State Overload Relays

Specifications

		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_e) 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 mm² 2.5 N•m	2.5…16 mm² 2.5 N•m	4…35 mm² 24 N•m	—	—	—
	Two Conductor Torque	2.5…10 mm²❄ 3.4 N•m	2.5…10 mm²❄ 3.4 N•m	4…25 mm² 4 N•m	—	—	—
Coarse-Stranded/Solid	Single Conductor Torque	2.5…25 mm² 2.5 N•m	2.5…25 mm² 2.5 N•m	4…50 mm² 4 N•m	16…150 mm² 28 N•m	—	—
	Two Conductor Torque	6…16 mm²❄ 3.4 N•m	6…16 mm²❄ 3.4 N•m	4…35 mm² 4 N•m	—	25…185 mm2 28 N•m	70…240 mm2 45 N•m
	Four Conductor Torque	6…16 mm²❄ 3.4 N•m	6…16 mm²❄ 3.4 N•m	4…35 mm² 4 N•m	—	—	70…240 mm2 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.
Pozidriv 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_e) 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					
Flexible-Stranded with Ferrule	Single Conductor Torque	0.5…2.5 mm² 0.55 N•m					
	Two Conductor Torque	0.25…1.5 mm² 0.55 N•m			0.2…0.75 mm² 0.55 N•m		
Coarse-Stranded/Solid	Single Conductor Torque	0.5…4 mm² 0.55 N•m					
	Two Conductor Torque	0.2…2.5 mm² 0.55 N•m			0.2…1.5 mm² 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 mm²					
Coarse-Stranded/Solid		0.2…1.5 mm²					
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.

3-Pole Terminal Blocks

Cat. No. 100-DTB180	Cat. No. 100-DTB420
(A) 6…1/0 AWG, 16…50 mm² (B) 6 AWG…250 MCM, 16…120 mm² 90…110 lb•in., 10…12 N•m	(2) 4 AWG…600 MCM, 25…240 mm² 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 mm2 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

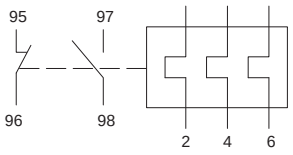
	Cat. No. 193-ED1_B, 193-EE_B	Cat. No. 193-EE_D	Cat. No. 193-EE_E
Standards	UL508, CSA C22.2 No. 14, NEMA ICS 2-1993 Part 4, EN 60947-4-1, EN 60947-5-1		
Certifications	CE, cULus, ATEX (pending), C-Tick, CCC		
Approximate Weights (unpackaged)	0.25 kg (0.55 lb)	0.25 kg (0.55 lb.)	0.52 kg (1.06 lb.)

External Current Transformers (for use with cat. nos. 193-EE_Z)

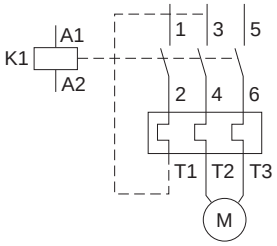
The user shall provide one current transformer (CT) for each motor phase,and shall connect the CT's secondary leads to the appropriate E1 Plus overload relay power terminals, as shown in current transformer's wiring diagrams. The CT shall have the appropriate ratio (refer to the product nameplate or 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 accomodate the high inrush currents associated with motor startup, and shall have an accuracy of <±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**

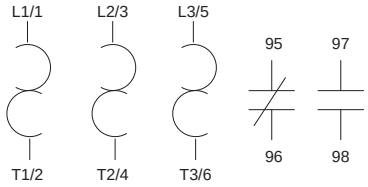
Wiring Schematic



Typical IEC Wiring Schematic



Typical Wiring for 1-Phase Applications

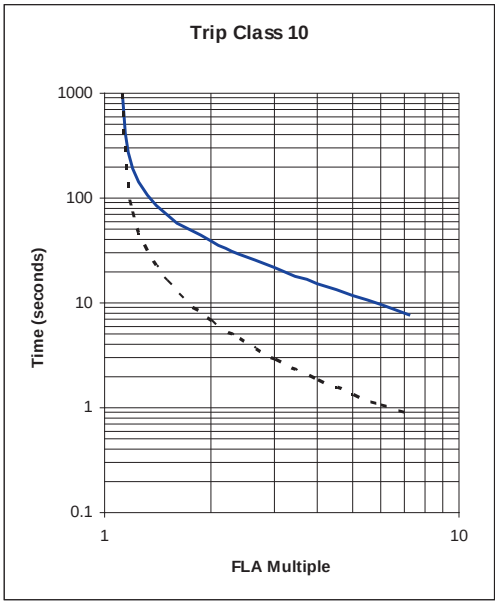


Typical NEMA Wiring Schematic

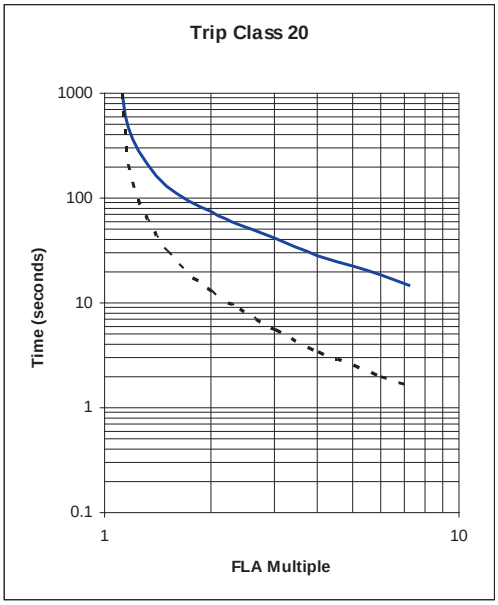
Trip Curves

Typical reset time for 193-EE devices set to automatic reset mode is 120 seconds.

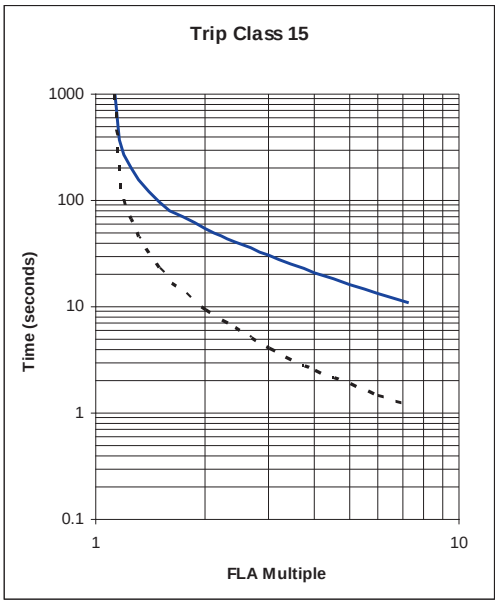
Trip Class 10



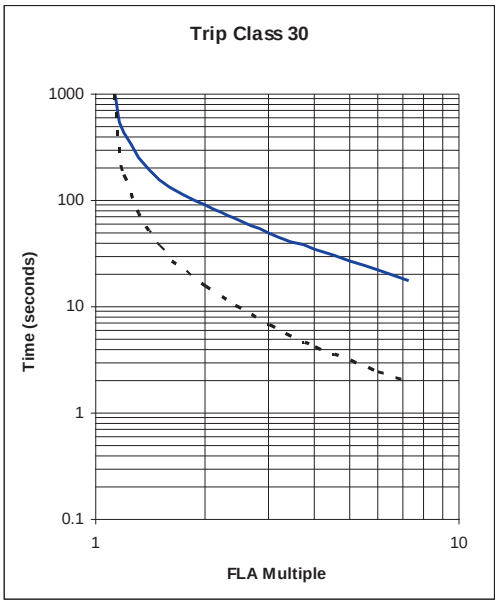
Trip Class 20



Trip Class 15



Trip Class 30



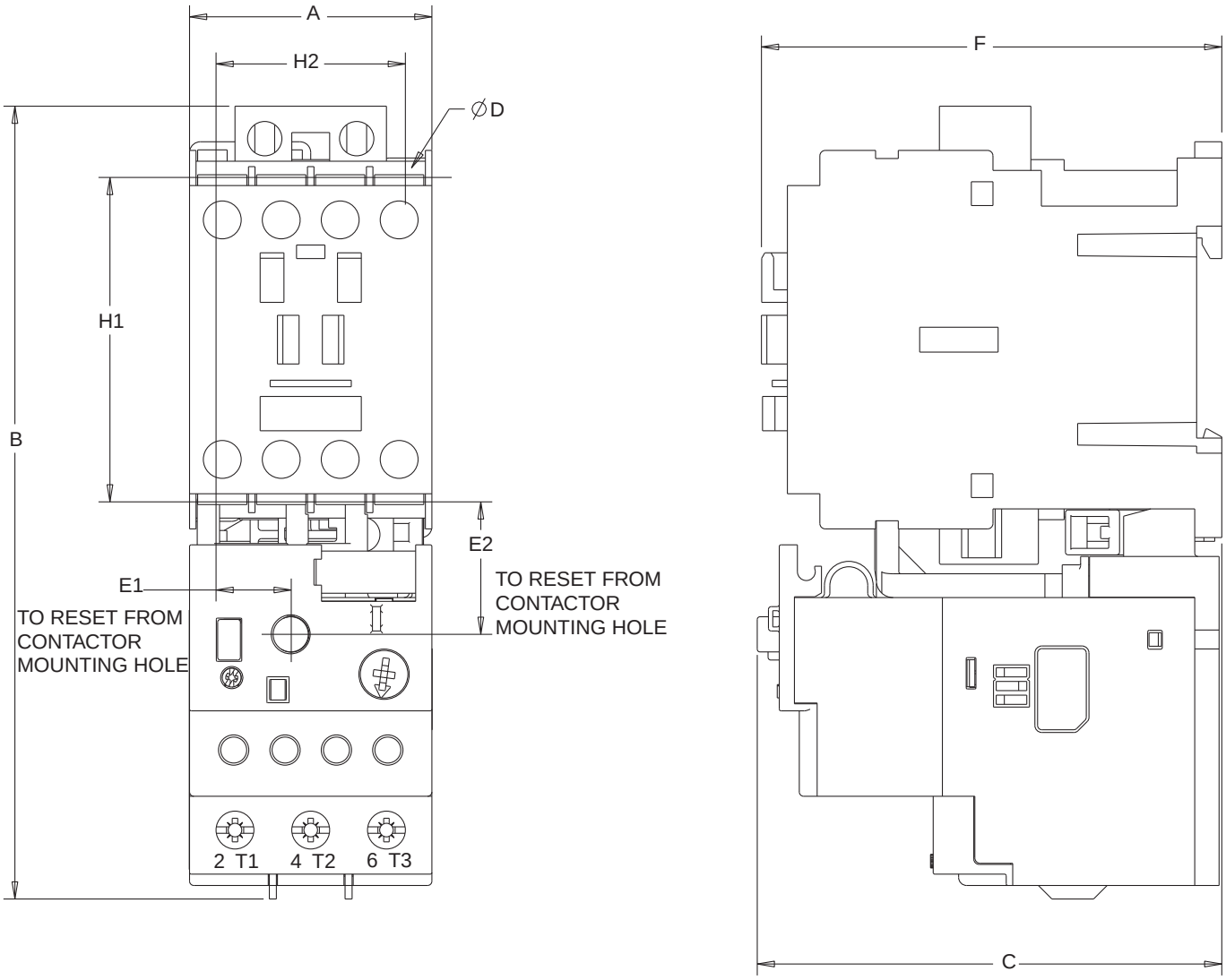
Trip Curve Legend: Cold Trip ——————
Hot Trip - - - - - - - - -

Visit our website: www.ab.com/catalogs

Preferred availability cat. nos. are printed in **bold**

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

Bulletin 100-C Contactor Mounted



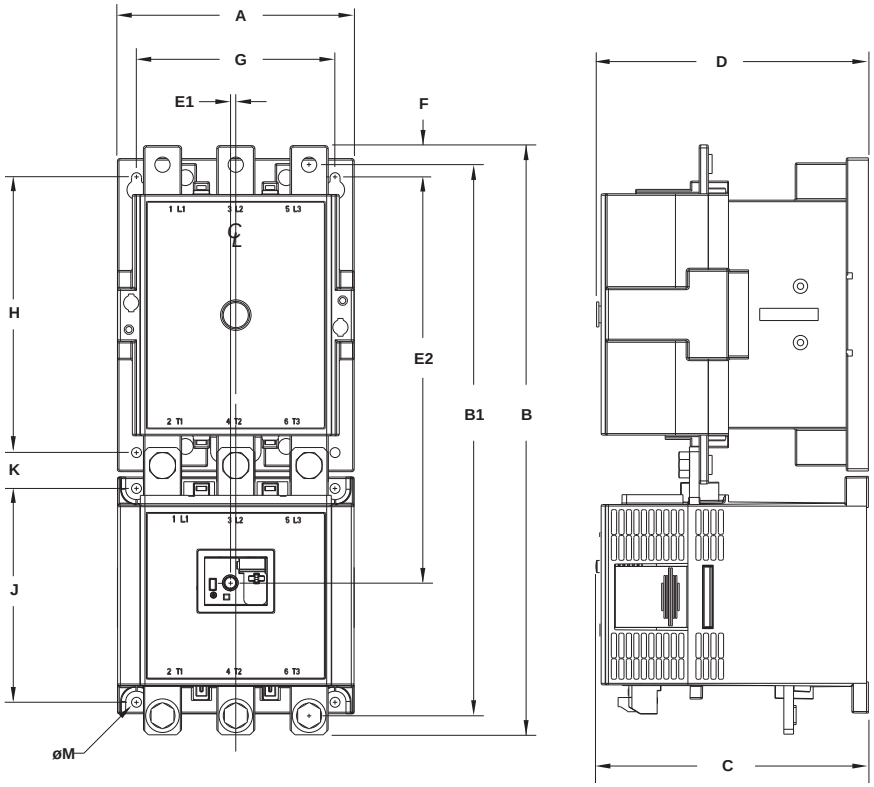
Overload Cat. No.	Contactor Cat. No.	Width A	Height B	Depth C	D	E1	E2	F	H1	H2
193-ED__B 193-EE__B 193R-EE__B 193S-EE__B	100-C09, -C12, -C16, -C23	45 (1-25/32)	146.6 (5-25/32)	85.2 (3-23/64)	4.5 (3/16)	13.9 (35/64)	24.5 (31/32)	86.5 (3-13/32)	60 (2-23/64)	35 (1-3/8)
193-EE__D 193R-EE__D 193S-EE__D	100-C30, -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 Solid-State Overload Relays

Approximate Dimensions, Continued

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

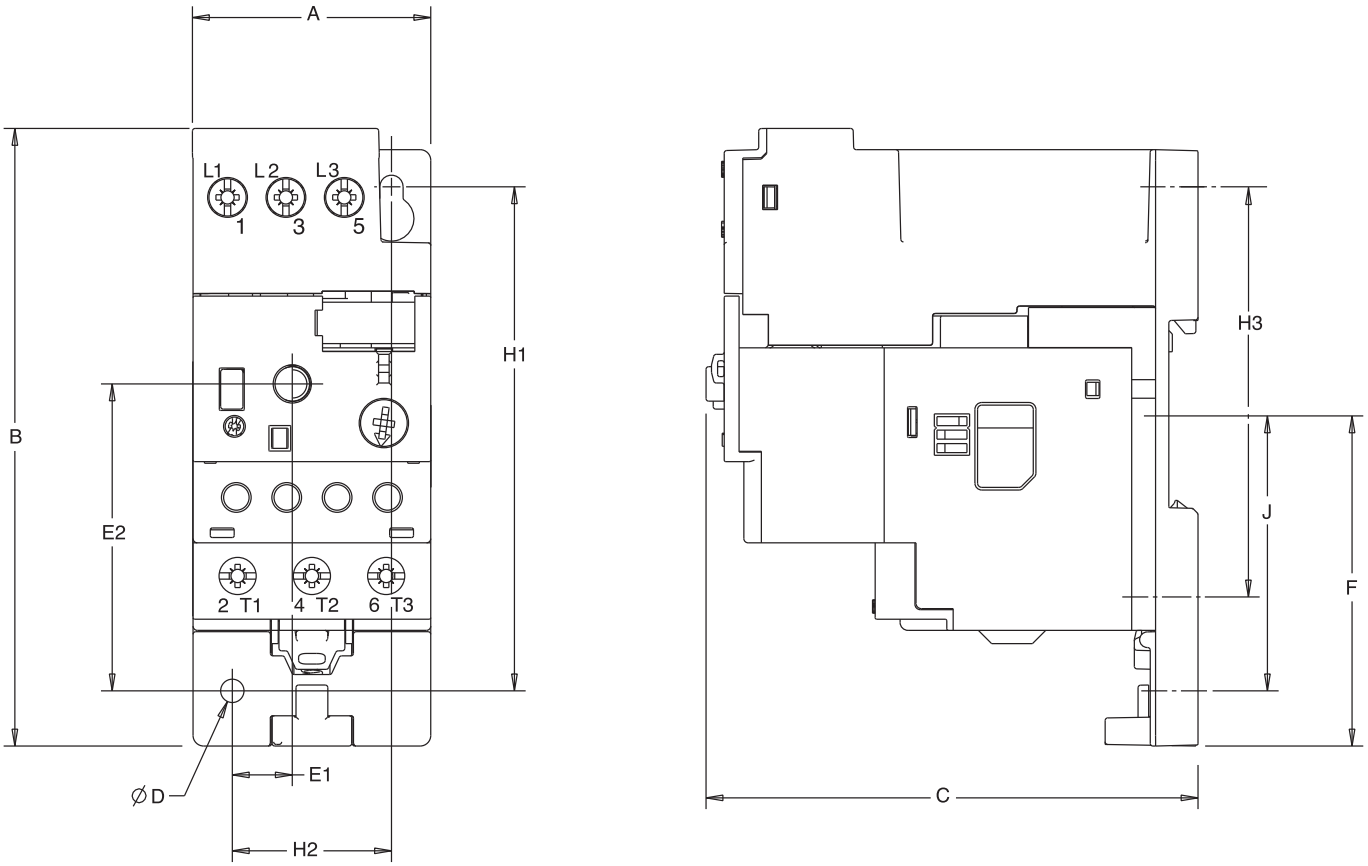
Bulletin 100-D Contactor Mounted



Overload Cat. No.	Contactor Cat. No.	Width A	Height B		Height B1	Depth C	D	E1	E2
			Without Terminal Covers	With Terminal Covers		(Reset)			
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)

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 mm²	2.5…16 mm²	4.0…35 mm²
	Torque	1.8 N•m	2.3 N•m	4.0 N•m
	Two Conductor	1.0…4.0 mm²	2.5…10 mm²	4.0…25 mm²
	Torque	1.8 N•m	2.3 N•m	4.0 N•m
Coarse-Stranded/Solid	Single Conductor	1.5…6.0 mm²	2.5…25 mm²	4.0…50 mm²
	Torque	1.8 N•m	2.3 N•m	4.0 N•m
	Two Conductor	1.5…6.0 mm²	2.5…16 mm²	4.0…35 mm²
	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.

2

Bulletin 193-EC — E3 & E3 Plus Solid-State Overload Relays

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 5 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. 193/592-EC4 Current Monitor Relay:
- Current monitoring for three independent channels

Table of Contents

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)
ATEX
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

The E3 Overload Relay is available in two configurations: the E3 and E3 Plus. The following table illustrates the functional differences between the two:

Feature	E3	E3 Plus
Inputs*	2	4
Outputs	1	2
Thermistor Input	No	Yes
Ground Fault Protection	No	Yes
DeviceLogix	No	Yes

* Inputs are rated 24V DC.

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 rating (FLA) 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.

Reset Modes

Flexibility is afforded the end-user in the ability to select between manual and automatic reset for an overload trip, allowing for broad application. The point of reset is user adjustable from 1…100% TCU.

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 word 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 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 windingembedded 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 iputs. 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

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 and 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: IN 3 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.

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:

- UCMM (Unconnected Message Manager) 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_-EN-P.

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 such as AND, OR, XOR, and NOT, 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.

DeviceNet™ Configuration Terminal

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.

Network Who

The 193-DNCT can be used with any DeviceNet device and has DeviceLogix, metering, graphing, and auto-display capabilities which can help ease troubleshooting by commissioning devices online through your network. The terminal searches for all devices on the network and provides device address, device name, and status of a device.

Monitoring & Editing

The DeviceNet Configuration Terminal can be used to upload, store, and download device configurations and DeviceLogix™ programs for DeviceNet devices via your network. 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 they can be monitored and edited.

Diagnostics

Ease troubleshooting using the DeviceNet Configuration Terminal. The 193-DNCT can present DeviceNet diagnostics, network utilization, and network statistics are available including baud rate, bus voltage, percentage of bus loading, and CAN errors.

DeviceLogix

The terminal allows you to enable, monitor, edit, or delete DeviceLogix programs.

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 E3's internal 24V circuitry.

Catalog Number Explanation

193 –	EC1	B	B
	a	*b*	*c*

a

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

b

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

c

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.

Bulletin 193-EC1 Electronic Motor Protection Relays – Direct Contactor Mount

• 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-C85	9…45	193-EC1DE
	18…90	**193-EC1EE**
100-D95…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 2-218.

Bulletin 193-EC3 Electronic Motor Protection Relay – Direct Contactor Mount

• 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
	5…25	193-EC3CB
100-C30…100-C43	1…5	**193-EC3AD**
	3…15	**193-EC3BD**
	5…25	193-EC3CD
	9…45	193-EC3DD
100-C60…100-C85	9…45	193-EC3DE
	18…90	193-EC3EE
100-D95…100-D180	28…140	❄ 193-EC3FF
	42…210	❄ 193-EC3GF
100-D210…100-D420	42…210	❄ 193-EC3GG
	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 2-218.

Bulletin 193-EC2 Electronic Motor Protection Relay – Direct Contactor Mount

• 4 Inputs • 2 Outputs
• PTC thermistor input • DeviceLogix (series B)
• 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-EC4 Current Monitor Relay – Direct Contactor Mount

• 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-EC4PB
	1…5	193-EC4AB
	3…15	193-EC4BB
	5…25	193-EC4CB
100-C30…100-C43	9…45	193-EC4DD
100-C60…100-C85	18…90	193-EC4EE
100-D95…100-D180	28…140	❄ 193-EC4FF
	42…210	❄ 193-EC4GF
100-D210…100-D420	42…210	❄ 193-EC4GG
	60…302	❄ 193-EC4HG
	84…420	❄ 193-EC4JG
100-D630…100-D860	125…630	❄ 193-EC4KH
	172…860	❄ 193-EC4LH

❄ Does not include terminal lugs. See Accessories, page 2-218.

Panel Mount Devices for use with External Current Transformers§

Description	Adjustment Range [A]	Cat. No.
• 2 Inputs • 1 Output	9…5000	**193-EC1ZZ**
• 4 Inputs • 2 Outputs • External Ground Fault Sensor Input • PTC Thermistor Input • DeviceLogix	9…5000	**193-EC3ZZ** **193-EC4ZZ**

§ Current transformers supplied by customer. Refer to Specifications, page 2-167, and CT Ratio to FLA chart below for proper current transformer selection.

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	—	—

2

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-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** • 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-C85 NEMA size 00…3		**193-CBCT2**
		100-C09…100-C85, 100-D95…100-D180 NEMA size 00…4		193-CBCT3
		100-C09…100-C85, 100-D95…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-EC (all), 592-EC (all); 280/281/283/284 ArmorStart	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**

♣ The electronic motor protection relay can be mounted separately to top-hat rail EN 50 022-35.
‡ Intended only for point-to-point configurations.

	Description	For Use With	Pkg. Qty.	Cat. No.
	**Terminal Lugs** Set of 2 Protection class IP2X per IEC 60529 and DIN 40050	100-D140, 100-D180, 100-D95E…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 3	100-D95, 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-D95…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

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:	100	100-FMA2

❄ Must be ordered in multiples of package quantities.

Specifications

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_e) IEC/UL	690V AC/600V AC		1000V AC/600V AC		
Rated Frequency	20…250 Hz		50/60 Hz		
Terminal Cross-Sections			—	—	—
Terminal Type Terminal Screws	.M5	M8			
Flexible-Stranded with Ferrule Single Conductor Torque	2.5…16 mm² 2.5 N•m	4…35 mm² 4 N•m			
Flexible-Stranded with Ferrule Multiple Conductor Torque	6…10 mm² 3.4 N•m	4…25 mm² 4 N•m			
Coarse-Stranded/Solid Single Conductor Torque	2.5…25 mm² 2.5 N•m	4…50 mm² 4 N•m			
Coarse-Stranded/Solid Multiple Conductor Torque	6…16 mm² 3.4 N•m	4…35 mm² 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 mm² B) 6 AWG…250 MCM, 16…120 mm² 90…110 lb•in., 10…12 N•m	(2) 4 AWG…600 MCM, 25…240 mm² 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 mm² 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 mm² 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 mm² 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 mm2 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

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_e)	250V AC
Rated Operating Current (I_e)	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 ± 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 Ω ± 150 Ω
Reset Resistance	1600 Ω ± 100 Ω
Short-Circuit Trip Resistance	25 Ω ± 10 Ω

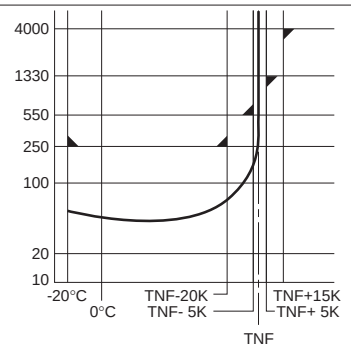
UL Short-Circuit Ratings

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

Control Circuits, Continued

Thermistor/PTC Input Ratings, Continued	
Max. Voltage @ PTC Terminals (R_{PTC} = 4 kΩ)	7.5V DC
Max. Voltage @ PTC Terminals (R_{PTC} = open)	30V DC
Response Time	500 ms
Sensor Characteristic	

Per IEC 34-11-2

Control and DeviceNet Terminal Cross-Sections	
Terminal Screws	M3
Flexible-Stranded with Ferrule – Single Conductor Torque	0.25…2.5 mm² 0.55 N•m
Flexible-Stranded with Ferrule – Multiple Conductor Torque	0.5…0.75 mm² 0.55 N•m
Coarse-Stranded/Solid– Single Conductor Torque	0.2…4.0 mm² 0.55 N•m
Coarse-Stranded/Solid– Multiple Conductor Torque	0.2…1.5 mm² 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.

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%

External Current Transformers (for use with Cat. Nos. 193-EC1ZZ1, 193-EC3ZZ, and 193-EC4ZZ)

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 accomodate the high inrush currents associated with motor startup, and shall have an accuracy of <±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**

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, ATEX (pending), CCC (pending)				

Protection and Warning Summary

	Trip Enable	Warning Enable	Trip Level Settings		Trip Delay Settings		Warning Level Settings		Inhibit Time Settings❄	
Protective Function	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.

Programming and Control Terminal

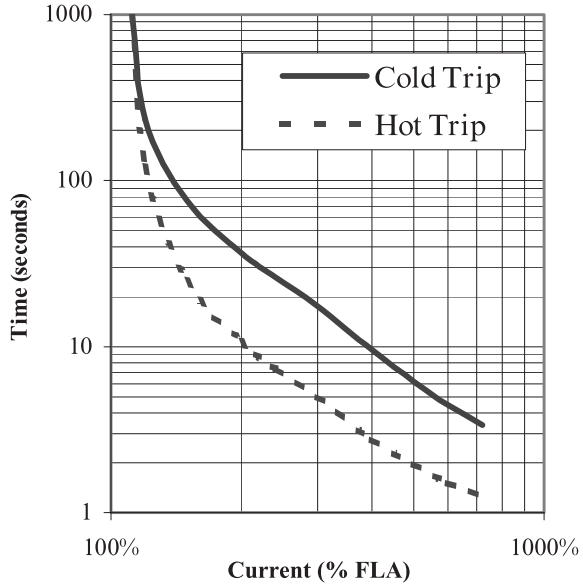
Display	
Display type	128x64 LCD with yellow-green backlighting
Viewing area	57 x 30 mm (2.24 x 1.18 in.)
Keypad	
Keypad type	Tactile embossed, domed keys, sealed membrane
Operation force	453 g (16 oz.)
Operational life	1 million operations
Communications	
Communication protocol	DeviceNet™ (125, 250, 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

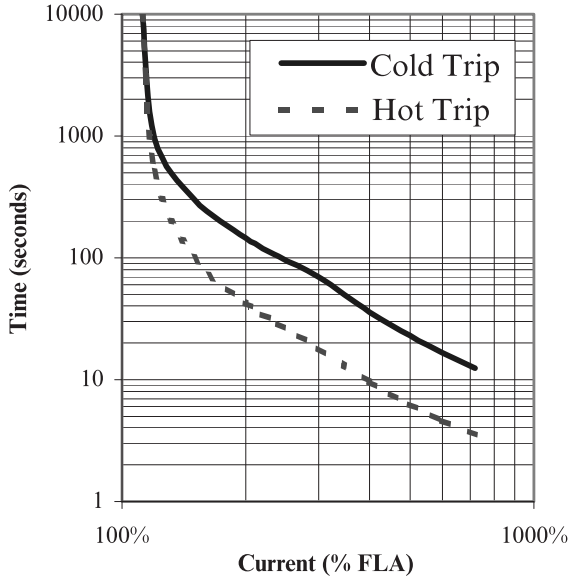
Electrical	
Number of inputs	4
Voltage category	110/120V AC
Operating voltage range	79…132V AC
Frequency range	47…63 Hz
Off-state voltage (max.)	20V AC
On-state voltage (min.)	79V AC
On-state current	2.0 mA @ 79V AC (min.), 10.0 mA @ 132V A (max.)
Inrush current (max.)	150 mA
Off-state current (max.)	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

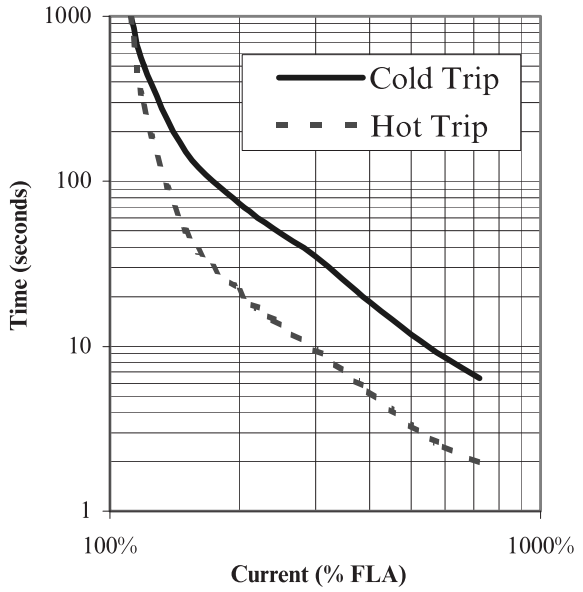
E3 & E3 Plus Overload Relay
Trip Class 5



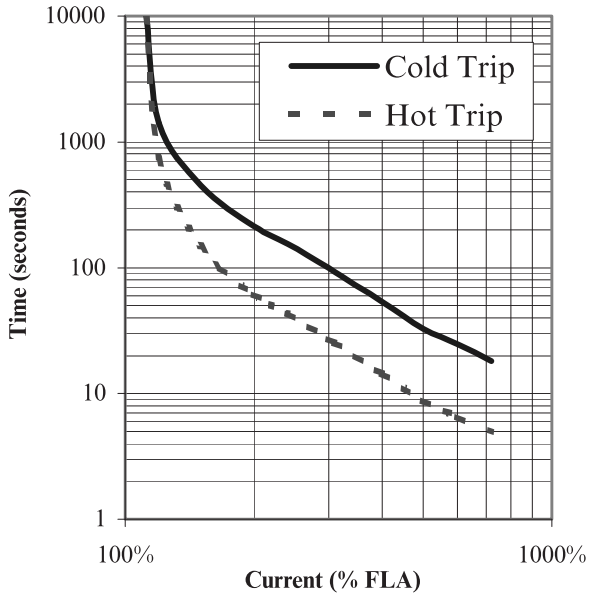
E3 & E3 Plus Overload Relay
Trip Class 20



E3 & E3 Plus Overload Relay
Trip Class 10

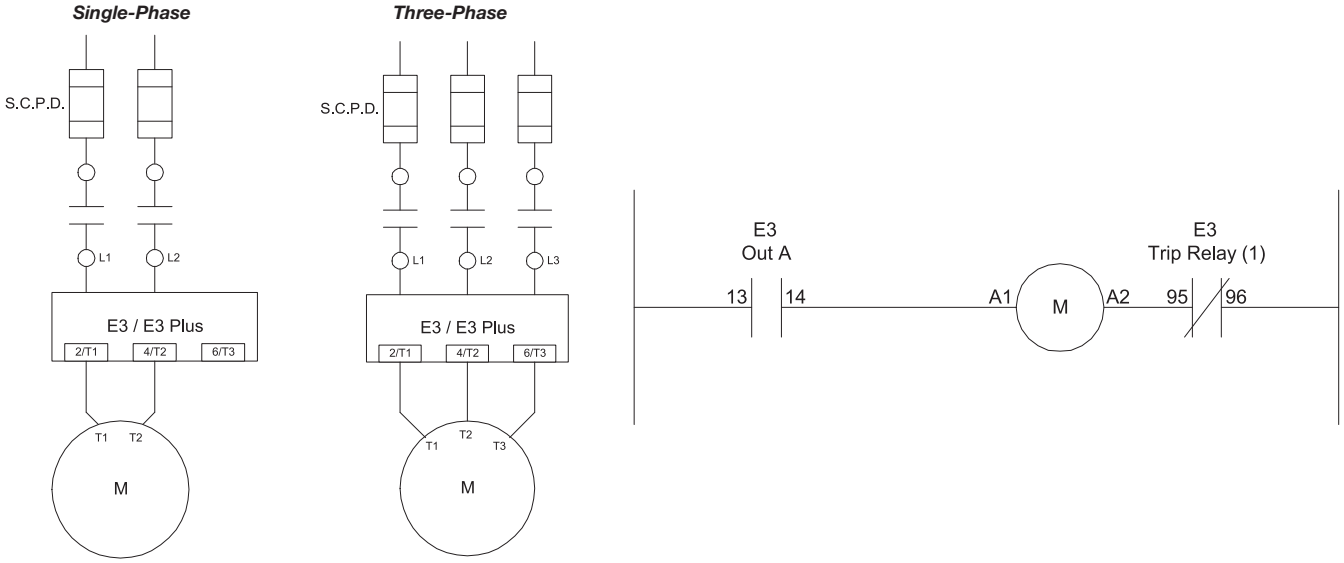


E3 & E3 Plus Overload Relay
Trip Class 30

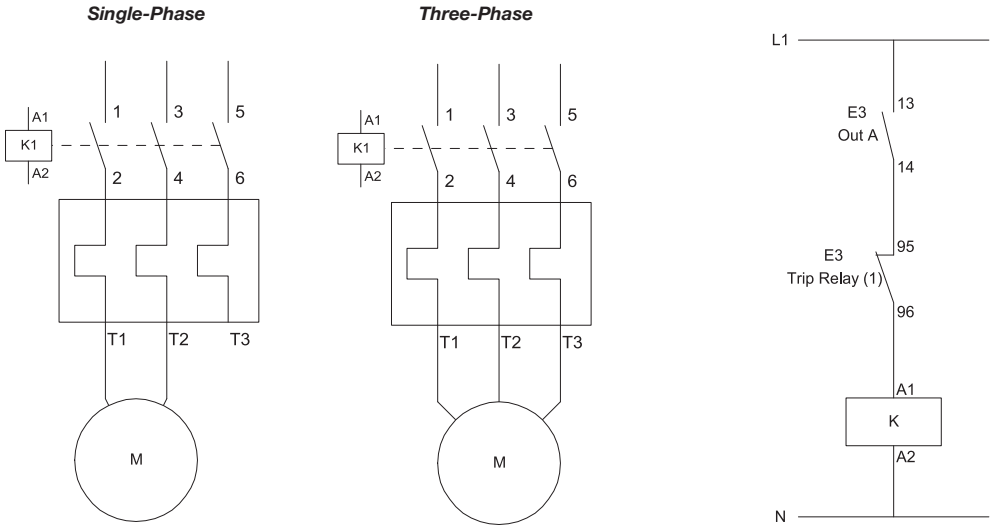


2

Typical Wiring Schematics – NEMA



Typical Wiring Schematics – IEC



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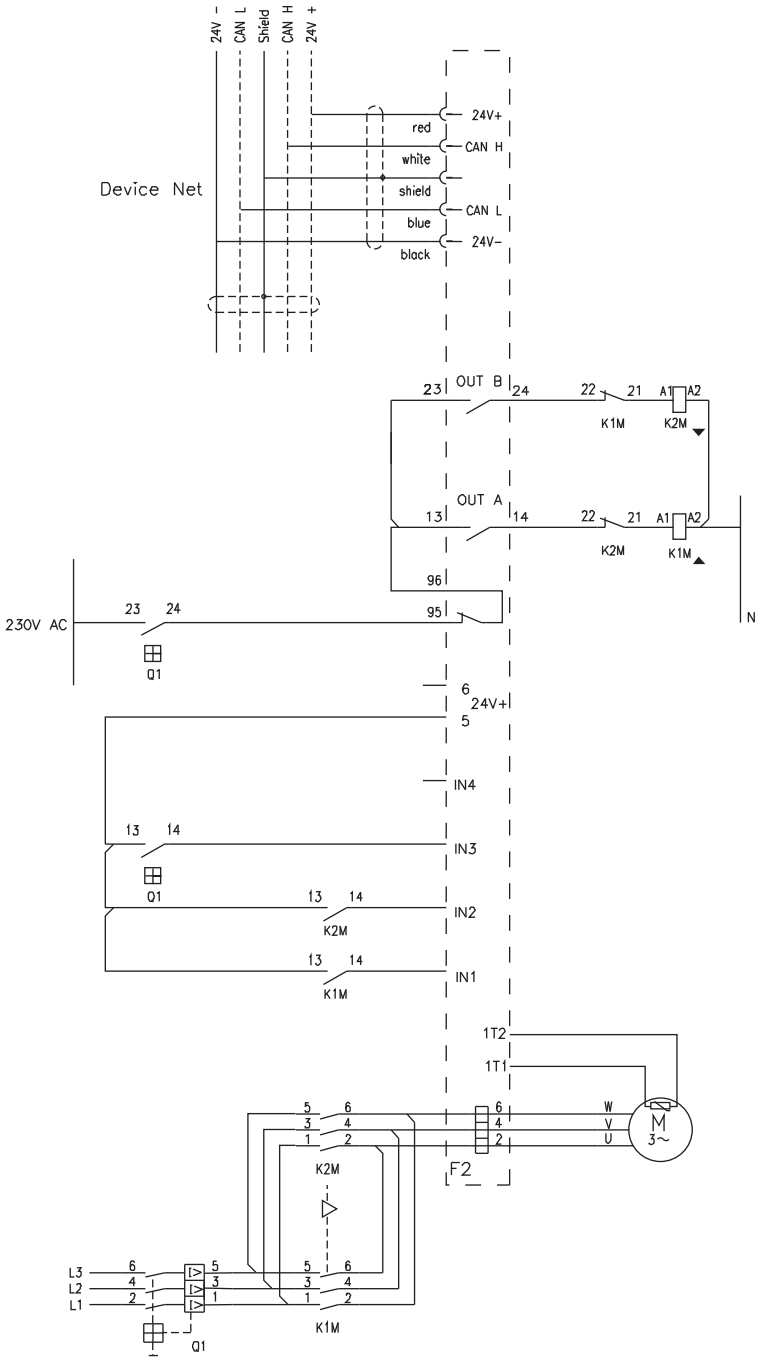
Preferred availability cat. nos. are printed in **bold**

Allen-Bradley

Typical Wiring Schematics – IEC

Reversing Starter Application

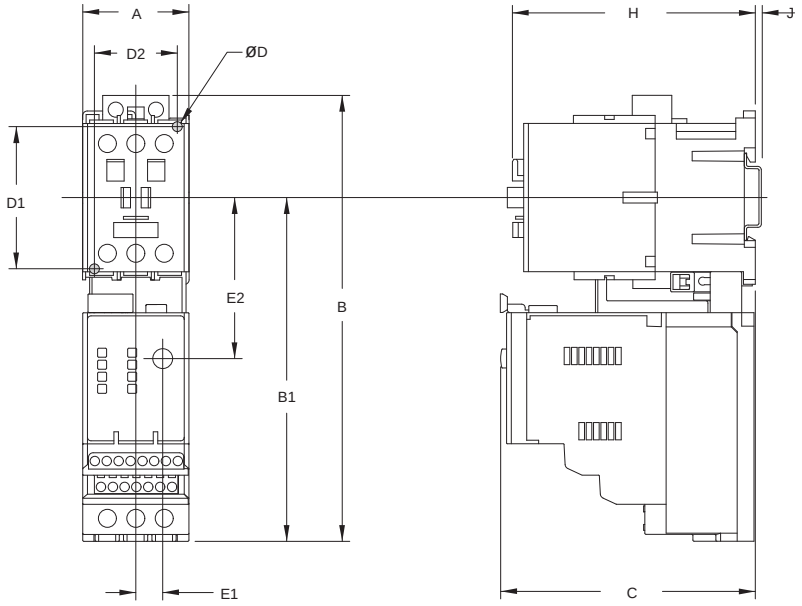


E3 and E3 Plus Solid-State Overload Relays

Approximate Dimensions

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

Bulletin 109 Starter Approximate Dimensions

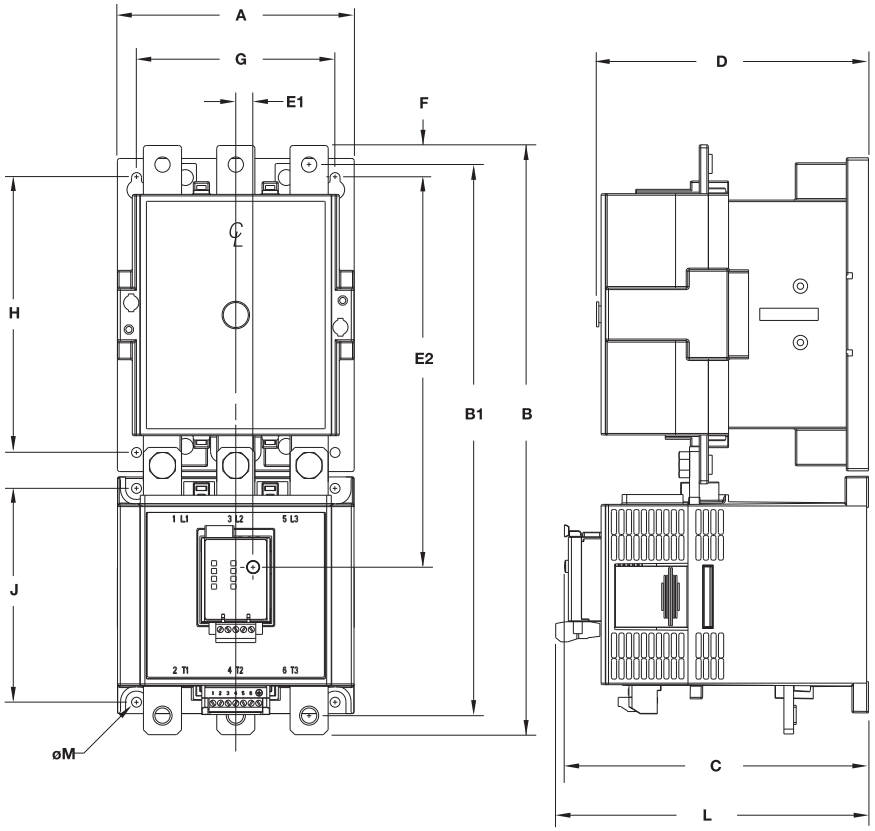


Overload Cat. No.	Contactor Cat. No.	Width A	Height B		B1	Depth C	E1	E2
			without 193-EIMD	with 193-EIMD				
193-EC_ _B	100-C09, -C12 -C16, -C23	45 (1-25/32)	188.3 (7-13/32)	207.7 (8-11/64)	145.1 (5-23/32)	107 (4-7/32)	11.4 (29/64)	67.9 (2-43/64)
193-EC_ _D	100-C30, -C37	45 (1-25/32	188.3 (7-13/32)	207.7 (8-11/64)	145.1 (5-23/32)	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)	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)	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)

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

Bulletin 109 Starter Approximate Dimensions, Continued

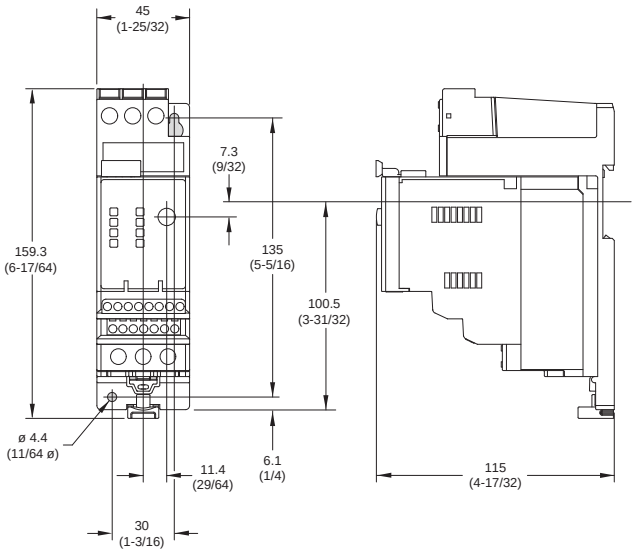


Overload Cat. No.	Contactor Cat. No.	A	Height B		B1	Depth C	D	E1	E2
			without Terminal Covers	with Terminal Covers					
193-EC_ _F	100-D95 100-D110	120 (4.72)	336.3 (13.24)	418 (16.45)	311.8 (12.27)	175.1 (6.89)	156 (5.14)	11.4 (0.45)	216.1 (8.51)
	100-D140 100-D182	120 (4.72)	339.8 (13.38)	418 (16.45)	317.8 (12.50)	175.1 (6.89)	156 (5.14)	11.4 (0.45)	216.1 (8.51)
193-EC_ _G	100-D210 100-D250 100-D300 100-D420	155 (6.10)	385.8 (15.19)	487.4 (19.19)	360.8 (14.2)	198.9 (7.83)	180 (7.09)	11.4 (0.45)	255 (10.04)
193-EC_ _H	100-D630 100-D850	255 (10.04)	552 (21.73)	915 (36.02)	508 (20)	291.7 (11.49)	270.7 (10.66)	11.4 (0.45)	373.9 (14.72)

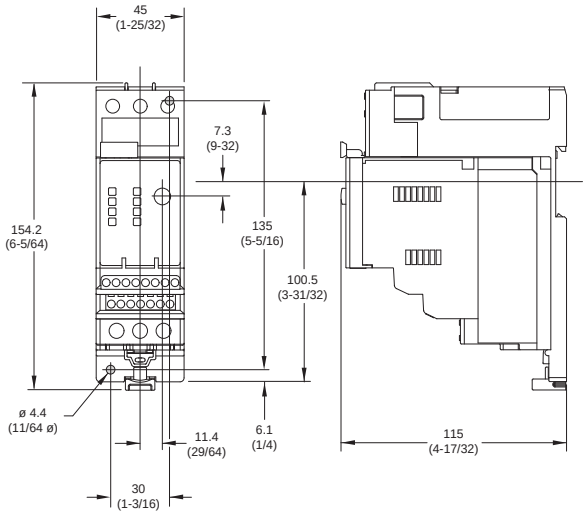
Overload Cat. No.	Contactor Cat. No.	F	G	H	J	K	L	M
193-EC_ _F	100-D95 100-D110	12.5 (0.49)	100 (3.94)	145 (5.71)	135 (5.31)	22.3 (0.88)	180.9 (7.12)	8 - 5.6 (8 - 0.22)
	100-D140 100-D182	16 (0.63)	100 (3.94)	145 (5.71)	135 (5.31)	22.3 (0.88)	180.9 (7.12)	8 - 5.6 (8 - 0.22)
193-EC_ _G	100-D210 100-D250 100-D300 100-D420	21 (0.83)	130 (5.12)	180 (7.09)	140 (5.51)	23.5 (0.93)	204.7 (8.06)	8 - 6.5 (8 - 0.26)
193-EC_ _H	100-D630 100-D850	52.5 (2.07)	226 (8.90)	230 (9.06)	108 (4.25)	109 (4.29)	297.5 (11.71)	8 - 13 (8 - 0.51)

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

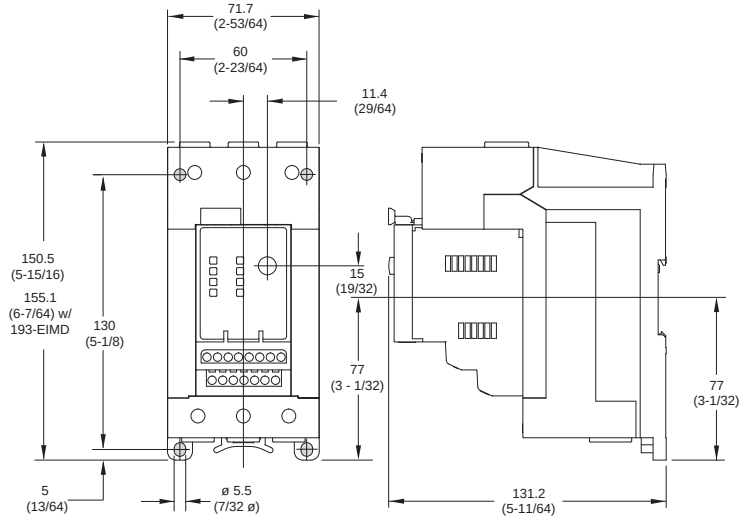
Panel Mount Adapters
(For Use With Cat. No. 193-EC_ _B)



(For Use With Cat. No. 193-EC_ _D, 193-EC_ZZ)



(For Use With Cat. No. 193-EC_ _E)



193-EF2B

193-EF2A

193-EF2C

Bulletin 193-EF

193-E1

- 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.

Table of Contents

Standards Compliance

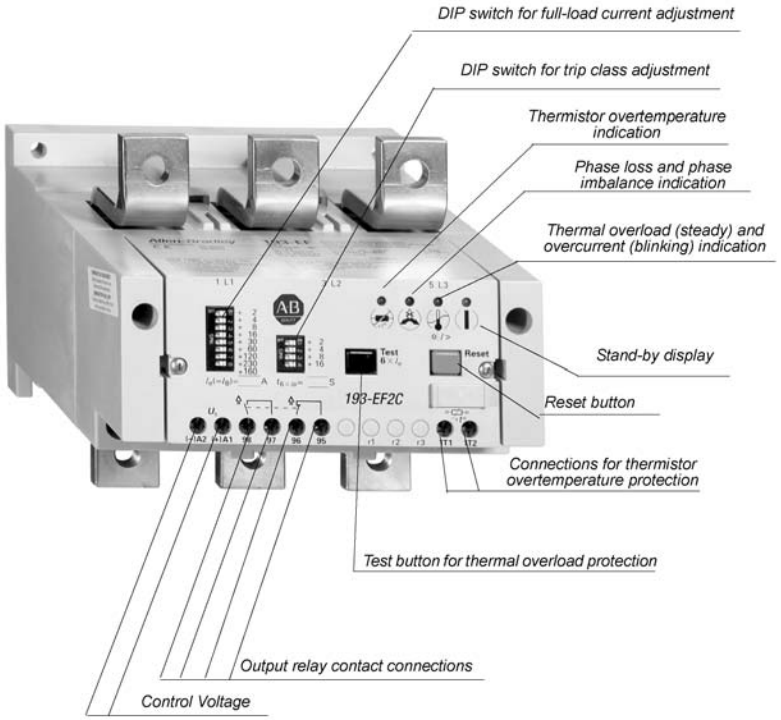
IEC 60947-4
CSA C22.2 No. 14
UL 508

Certifications

CE
CSA Certified (File No. LR13908)
UL Listed (File No. E33916, Guide NKCR)

2

Features



Catalog Number Explanation

193 – EF | 1 | A | KP – R F L

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

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 section.) Use cable support **Cat. No. 193-HD**.
§ Device ships with the External Indication Module accessory (**Cat. No. 193-CB1**) 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	—	—	—	—	—	—	—

♣ 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 section.) Use cable support **Cat. No. 193-HD**.

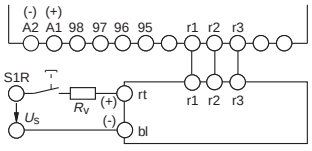
Factory Modification Options

Description	Suffix Code∗
Automatic Reset of overload and thermistor overtemperature protection	-R
Remote Reset‡	-F
External Indication§	-L

∗ Refer to the Catalog Number explanation section 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-CB1**) 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**
	**35 mm DIN Rail Mounting Adapter** For easy mounting of timer modules on standard DIN Rail (EN 50 022-35) and G-Rail	10	**196-MTM**

Mounting Materials

	Description	For Use With	Pkg. Qty.	Cat. No.
	Transparent Front Cover	193-EF1, 139-EF2	1	193-PA
	**Terminal Shields** Set of 2 Protection class IP10 per IEC 60529 and DIN 40 050 For direct-on-line, reversing, two-speed, and wye-delta/star-delta assemblies	100-D95, 100-D110	2	**100-DTS110**
		100-D140, 100-D180, 100-D95-E…100-D180-E		**100-DTS180**
		100-D210...100-D420		**100-DTS420**
	**Cable Support** Set of 6 Includes terminal and fixing screws Provides support of cable end when looping through current evaluation ports	193-EF1A, 193-EF2A	6	**193-HD**
	**Terminal Lugs** Set of 2 Protection class IP2X per IEC 60529 and DIN 40 050	100-D95, 100-D110	2	**100-DTB110**
		100-D140, 100-D180, 100-D95E…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 3	100-D95, 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 3 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 3 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 3 For mounting on Bul. 100-D95 and 100-D110 contactors with conventional coil	3	**825-MVS**
	**M8 lower connections** Set of 3 For mounting on Bul. 100-D140, 100-D180 conventional and Bul. 100-D95E…100-D180E contactors with electronic coil	3	**825-MVS2**

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:	100	100-FMA2

❄ Must be ordered in multiples of package quantities.

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 $6x/_e$ without the motor being connected. The test button must be held for longer than the set trip time $t_{6x/e}$.

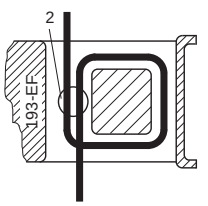
Device Installation and Commissioning
The operating instructions enclosed with the device provide all of the information necessary to set and commission it.

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

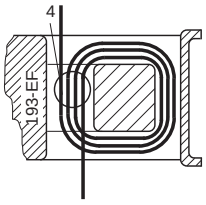
Setting the Rated Current (0.5…20 A) (193-EF1A and 193-EF2A Requires 193-HD)

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] x…number of loops



Motor supply wire looped twice



Motor supply wire looped 4 times

Recommended for I_e [A]	Motor Supply Cables	Cable Cross Section (Flexible Strand)	
		IEC [mm²]	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	❄

❄ CSA, UL: for I_e = 0.5…2.5 A, only factory-assembled wound devices should be installed

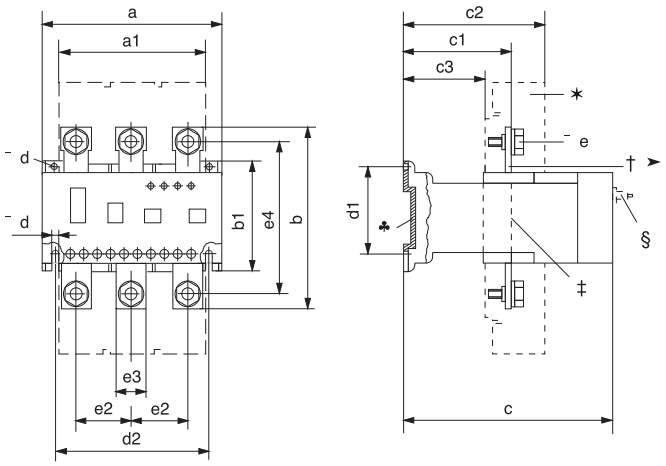
Rated Voltage Motor Circuit (primary circuit of current measuring device)					
IEC 947, EN 60947	[V]	1000			
CSA, UL	[V]	600			
Control Circuit					
IEC 947, EN 60947	[V]	440			
CSA, UL	[V]	240			
Rated Control Voltage U_S					
AC 50/60 Hz	[V]	24, 36, 48, 110, 120, 230, 240, 400, 415, 440, (0.8…1.1U_S)			
DC	[V]	24, 48 (0.9…1.2 U_S)			
Terminal Cross-section					
Control circuit	[mm²]	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 Storage Transport		-5…+60 °C -50…+60 °C -50…+85 °C			

Sensor Measurement Circuit			
Measurement circuit Cross section	[mm²]	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			

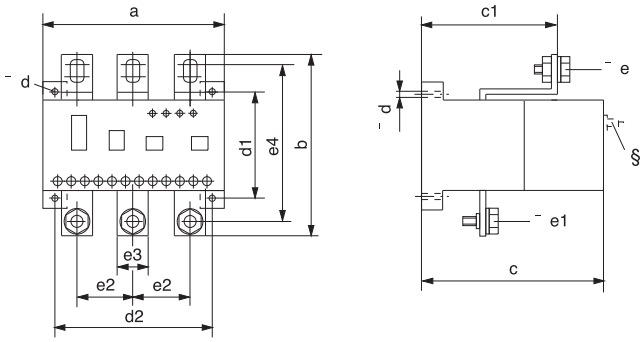
❄ Type of wiring: insulated control leads, screened > 200 m (shield connected with 1T1)

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

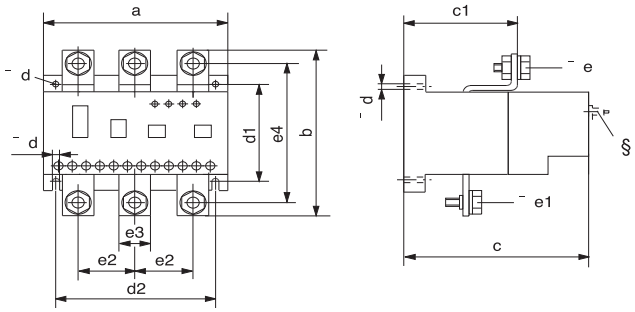
Cat. Nos. 193-EF1A, 193-EF2A (shown with cat. no. 825-MVM bus bar kit)



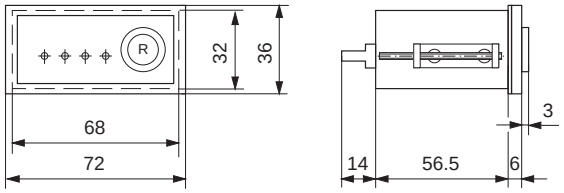
Cat. Nos. 193-EF1B, 193-EF2B



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 (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 (825-MVM2)

Bulletin 193-T1 — Bimetallic Overload Relays

- Overload protection Trip Class 10A
- Phase loss protection
- Ambient temperature compensation
- Auxiliary contact (1 N.O. and 1 N.C.)
- Manual/automatic reset
- Optional remote reset solenoid and external reset
- Stop button
- Test release
- Trip Indicator

Bulletin 193-T1 thermal overload relays are designed for use with Bulletin 100-C contactors and Bulletin 104-C reversing contactors. These class 10A ambient-compensated thermal overload relays include a differential mechanism for sensitivity to phase loss conditions. The trip setting is adjustable over the listed motor full load current range. The overload relay can be operated in a manual or automatic reset mode.

Table of Contents

Standards Compliance

IEC/EN 60497-1, -4-1, -5-1

UL508

CSA C22.2 No. 14

Certifications

cULus (File No. E33916, Guide NKCR, NKCR7)

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Thermal Overload Relays

For Use With∗	Setting Range [A]❄‡	Max. Back-up fuse [A] gL/gG 50 kA, 690V AC IEC/EN 60947-4-1 Coordination Type 1	Max. Back-up fuse [A] gL/gG 50 kA, 690V AC IEC/EN 60947-4-1 Coordination Type 2	Max. Back-up fuse [A] UL Class K5 5 kA, 600V AC UL 508	Cat. No.
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	1	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
	11.3…16	50	35	60	193-T1AC16
	15…20	80	40	80	193-T1AC20
	17.5…21.5	80	40	80	193-T1AC21
	21…25	80	40	100	193-T1AC25
100-C30…100-C37	15…20	80	40	80	193-T1BC20
	17.5…21.5	80	40	80	193-T1BC21
	21…25	80	40	100	193-T1BC25
	24.5…30	125	80	100	193-T1BC30
	29…36	125	80	125	193-T1BC36
	33…38	125	80	150	193-T1BC38
100-C43	17…25	160	100	100	193-T1CC25
	24.5…36	160	100	125	193-T1CC36
	35…47	160	100	175	193-T1CC47
100-C60…100-C85	35…47	250	160	175	193-T1DC47
	45…60	250	160	250§	193-T1DC60
	58…75	250	160	300§	193-T1DC75
	72…90	250	160	350§	193-T1DC90
Separate mounting required (Panel-mounted device)	35…47	250	160	175	193-T1DC47P
	45…60	250	160	250§	193-T1DC60P
	58…75	250	160	300§	193-T1DC75P
	72…90	250	160	350§	193-T1DC90P

∗Bulletin 193-T1 overload relays should not be used with conventional DC contactors. Use electronic DC 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

Add-On Modules

	Description	For Use With	Pkg. Quantity ✶	Cat. No.
	**DIN Rail/Panel Mounting Adapter** For separate mounting of overload relays Snaps on to 35 mm top hat rail	193-T1AA, 193-T1AB, 193-T1AC, 193-T1BC	1	193-T1APM
	**Screw Adapter** For screw fixing of the 193-T1APM panel adapter (2 required per adapter)	193-T1APM	10	**140M-C-N45**
	**Remote Reset Solenoid** For remote reset of 193-K and 193-T1 overload relays	193-K, 193-T1 (not for 193-T1DC_P)	1	193-T1R⊗
	**External Reset Button** For enclosed, through-the-door reset applications. Metal construction, IP66, non-illuminated. Refer to the 800F selection information for additional types.	All	1	**800FM-R611**
	Reset Rod Length 142 mm, adjustable range 141…159 mm	All	1	800F-ATR08
	**Reset Adapter** Expands the reset target area when using an external reset	All	1	193-RA3

✶ Must be ordered in multiples of package quantity.

⊗ 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	—

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

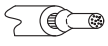
Main Circuits

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 Ie			
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 ≤ 1 kA prospective short-circuit-current		[A]	4
Min. contact load for reliable operation			15V, 2 mA
UL Rating			A600/Q300

Terminations

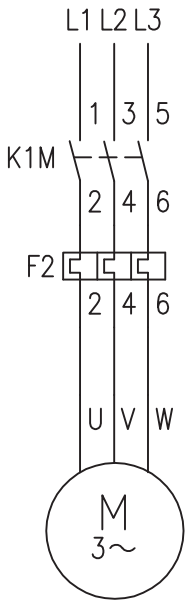
Cat. Nos.			Main Circuits						Control Circuits	Remote Reset
			193-T1A…	193-T1BC20… T1BC25	193-T1BC30… T1BC38	193-T1C…	193-T1D…	193-T1APM	193-T1… all	193-T1R…
Wiring cross section Terminal type										
Terminal screws			M4	M4	M4	M5	M6	M4	M3.5	M3.5
	Fine stranded with ferrule	[mm²]	2 x (1.5…4)	2 x (1.5…4)	1 x (2.5…10)	1 x (2.5…16)	1 x (10…35)	1 x (1.5…10)	2 x (1…4)	1 x (1.5…4)
	Solid or coarse stranded	[mm²]	2 x (1.5…6)	2 x (1.5…6)	1 x (2.5…16)	1 x (2.5…25)	1 x (10…35)	1 x (1.5…16)	2 x (1…4)	1 x (1.5…4)
		[AWG]	2 x (16…10)	2 x (14…10)	1 x (10…6)	1 x (10…6)	1 x (8…1)	1 x (16…6)	2 x (18…12)	1 x (16…12)
Recommended torque		[N•m]	1.5 … 2.2	2.2 … 2.5	2.2 … 3.5	2.5 … 3.5	3.5 … 6	1.8…2.8	1.2	1.2
		[lb-in]	13 … 20	20 … 22	22 … 31	22 … 31	31 … 53	16…25	10.6	10.6
Pozidrive screwdriver		Size	2	2	2	3	3	2	2	2
Slotted screwdriver		[mm]	1 x 6	1 x 6	1 x 6	1 x 6.5	1 x 6.5	1 x 6	1 x 6	1 x 6

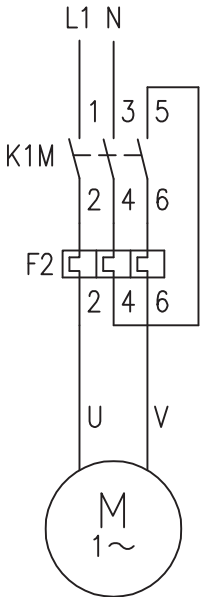
General

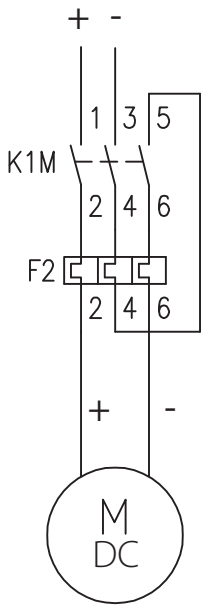
Cat. No.			193-T1…
Type of Overload Relay			Bimetallic, Ambient Compensated, Phase Loss Sensitive
Trip Rating (ultimate tripping current)			120% FLA
Phase loss sensitivity: Trip rating at phase loss			115% FLA
Trip Class		IEC/EN 60947-4-1	10A
		UL	10
Reset Mode			Automatic or Manual
Test release			Manual 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)		5…95% rel.humidity, non-condensing
Vibration	(per IEC/EN 60068-2-6), service		3g
	IEC/EN 61373 (vibration railways)		category 1, class B
	IEC/EN 60092-504 (vibration ships), service		0.7 g, all axes, 2…200 Hz
Shock	(per IEC/EN 68000-2-27), transport		30 g
	IEC/EN 60068-2-27 (Shock half-sinus), service		11 ms > 5 g all axes
	IEC/EN 61373 (shock railways)		category 1, class B, 5g 30 ms
Max. Altitude			2000 m
Pollution Degree			3
Degree of Protection, with wires connected			IP2X
Materials			RoHS compliant
Flame resistivity (Outer housing parts)		UL-94	V0
Approximate Weight (unpackaged)	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

2

Circuit Diagrams



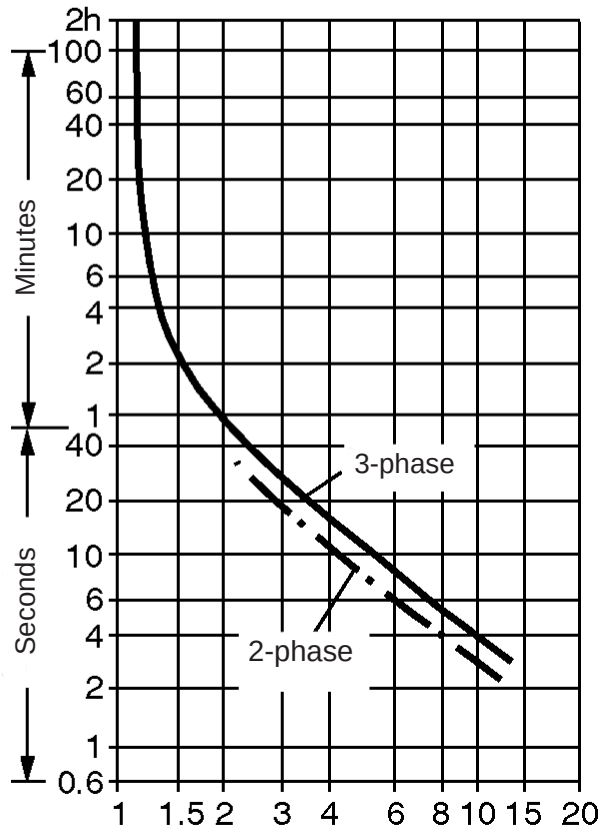




Trip Characteristics

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.

Trip Class 10A



FLA Multiple

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.

Table of Contents

Standards Compliance

IEC/EN 60947-1,-4-1,-5-1
UL 508
CSA 22.2. No. 14

Certifications

CE marked
cULus Listed (File No. E33916, Guide NKCR, NKCR7)

2

Miniature Bimetallic Overload Relays

Mounts to Contactor	Setting Range [A] ✶❄	Max. Current Rating of Backup Fuse [A] IEC Coordination Type 1	IEC Coordination Type 2	UL Class K5/5 kA, 600V AC UL 508	Cat. No.
100-K05...100-K12	0.10...0.16	35	—	1	193-KA16
	0.16...0.25	35	—	1	193-KA25
	0.25...0.40	35	2	1	193-KA40
	0.35...0.50	35	2	2	193-KA50
	0.45...0.63	35	2	2	193-KA63
	0.55...0.80	35	4	3	**193-KA80**
	0.75...1.0	35	4	3	**193-KB10**
	0.9...1.3	35	6	4	**193-KB13**
	1.1...1.6	35	6	5	**193-KB16**
	1.4...2.0	35	10	8	**193-KB20**
	1.8...2.5	35	20	10	**193-KB25**
	2.3...3.2	35	20	12	**193-KB32**
	2.9...4.0	35	20	15	**193-KB40**
	3.5...4.8	35	20	15	**193-KB48**
	4.5...6.3	35	20	20	**193-KB63**
100-K09...100-K12	5.5...7.5	35	20	25	193-KB75
	7.2...10.0	35	20	35	**193-KC10**
100-K12	9.0...12.5	35	20	50	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 overload relay		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	**800FM-R611**
		Rod	800F-ATR08

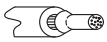
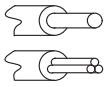
⊗ Coil Voltage Codes for Remote Reset Solenoid

[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	—

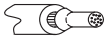
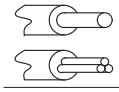
2

Specifications

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	[mm²]	2 x (1.5…4)
 Solid or coarse stranded	[mm²] [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

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 **Rated Operating Current I_e**			A600/Q300 **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		[mm²]	2 x (1…4)
 Solid or coarse stranded		[mm²] [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

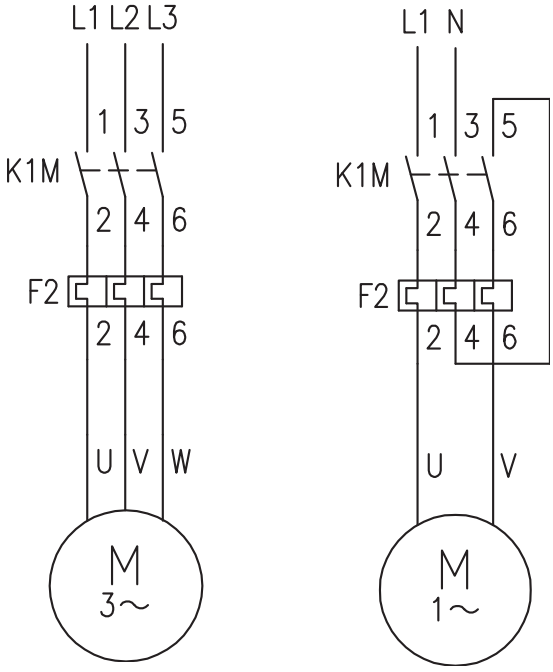
		193-K
Ambient Temperature	Storage Operating	-55…+80 °C (-67…+176 °F) -20…+60 °C (-4…+140 °F)
Humidity	Operating Damp Heat	5…95% Non-condensing per IEC/EN 60068-2-3 and IEC/EN 60068-2-30
Vibration (per IEC/EN 60068-2-6)		3 G
Shock (per IEC/EN 60068-2-27)		30 G
Max. Altitude		2000 m
Pollution Environment		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)

Thermal Overload Relays

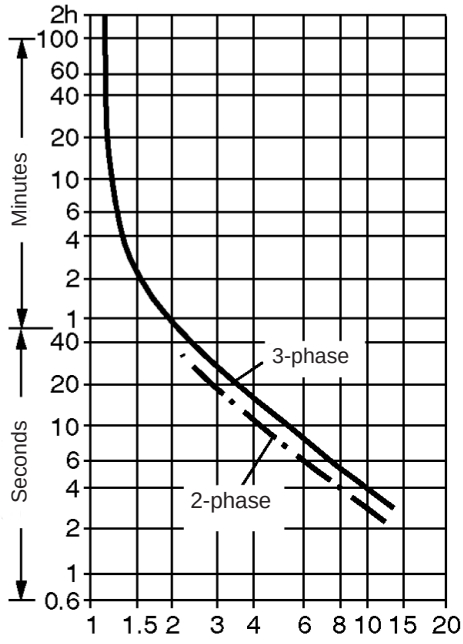
Circuit Diagrams



Trip Characteristics

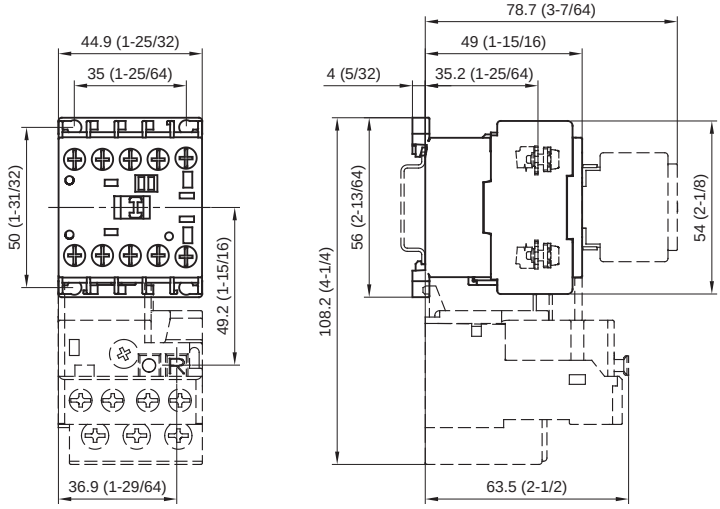
These trip characteristics refer to IEC 60947 and are average values from cold start at an ambient temperature of 20 °C. Trip time is pictured as a function of operating current. With the device at normal operating temperature, the trip time decreases to approximately 25% of the shown value.

Trip Class 10A



Bulletin 100-K, 193-K Approximate Dimensions

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



Bulletin 825-P

- 0.5…5000 A current range
- 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
- Comprehensive protection functions
- Built-in keypad and backlit 2-line LCD
- Test/Reset button
- Status LEDs
- Front accessible RS232 port
- 3 output relays
- 2 configurable inputs
- NEMA 12 (IP65) compatible

Table of Contents

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 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 (kWh)	% Thermal Capacity Utilization
Average Current	Avg. Line-Line Voltage	Reactive Power (kVAR)	Reactive Energy Forward (kVARh)	RTD Values
% Motor Load	Line-Neutral Voltages	Apparent Power (kVA)	Reactive Energy Reverse (kVARh)	—
Current Imbalance	Avg. Line-Neutral Voltage	Power Factor	Apparent Energy (kVAh)	—
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	—

Modular Protection System

Product Selection

	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**
		9…100 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	240V AC 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_-EN-P
		Basic Unit User Manual	825-UM004_-EN-P
		DeviceNet Card	825-UM005_-EN-P

∗ 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.ab.com/industrialcontrols/products/iec_motor_controls/overload_relays/825p.html

Accessories

	Description		Cat. No.
	**Bus Bars for 825-MCM180** Three-piece set includes terminals and screws	**M8 connections** Set of 3 4 x 16 x 102 mm (1/8 x 5/8 x 4-1/64 in.) (125 A max.) Universally applicable Weight: 230 g	**825-MVM**
		M8 connections Set of 3 4 x 20 x 117 mm (1/8 x 25/32 x 4-39/64 in.) (180 A max.) Universally applicable	**825-MVM2**
		**M6 lower connections** Set of 3 For mounting on Bul. 100-D95 and 100-D110 contactors with conventional coil	**825-MVS**
		**M8 lower connections** Set of 3 For mounting on Bul. 100-D140, 100-D180 conventional and Bul. 100-D95E…100-D180E contactors with electronic coil	**825-MVS2**
	**Terminal Shields** Set of 2 Protection class IP10 per IEC 60529 and DIN 40 050 For direct-on-line, reversing, two-speed, and wye-delta/star-delta assemblies	100-D95, 100-D110	**100-DTS110**
		100-D140, 100-D180, 100-D95-E…100-D180-E	**100-DTS180**
		100-D210...100-D420	**100-DTS420**
	**Terminal Lugs** Set of 2 Protection class IP2X per IEC 60529 and DIN 40 050	100-D95, 100-D110	**100-DTB110**
		100-D140, 100-D180, 100-D95E…D180E, 193-EC_F, 193-EE_F	**100-DTB180**
		100-D210...100-D420, 193-EC_G, 193-EF2C, 193-EE_G	**100-DTB420**
	**Thermal Utilization Meter**	For display of percent thermal capacity utilized Requires the use of an Expansion I/O Card	825-MTUM
—	**Connection Cable (Replacement)** Bul. 825-P to Bul. 825-MCM connection		**825-MCA**

Electrical Ratings

Main Circuits						
Rated Operating Voltage U_e	825-MCM2 825-MCM5		825-MCM20	825-MCM180 825-MCM420 825-MCM630N		
IEC CSA/UL	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 ±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 ±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 ±5 Hz			—		
Max. Power Consumption	40VA (AC) / 15W (DC)			15 W		
Output Relays						
Type of Contacts — Trip	Form C SPDT					
Type of Contacts — 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_e — 120V AC	3 A					
Rated Operating Current I_e — 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 ±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 Ω ± 150 Ω					
Reset Resistance	1500…1650 Ω					
Short-Circuit Trip Resistance	25 Ω ± 10 Ω					

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 mm² (#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

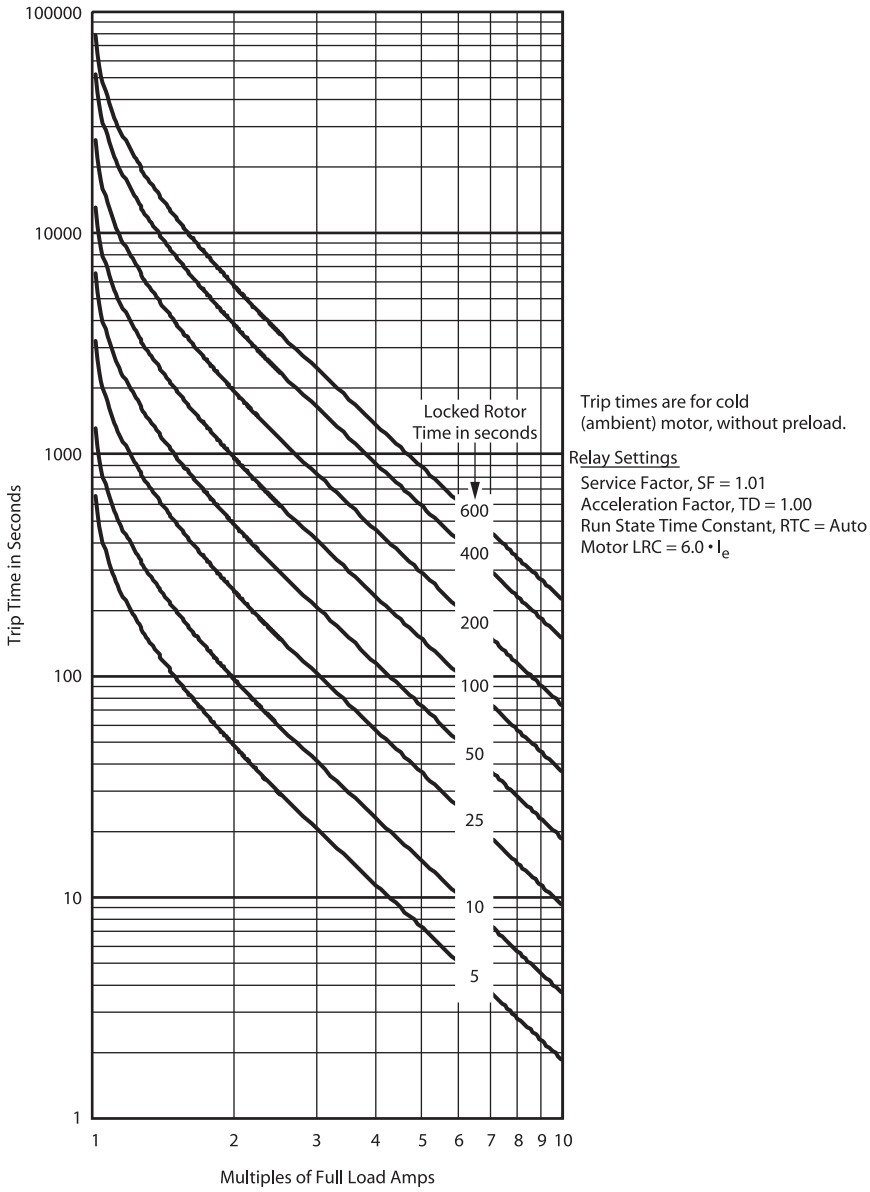
‡ Performance Criteria 1 requires the DUT to experience no degradation or loss of performance.
❄ Environment 2.

RTD Scanner Module

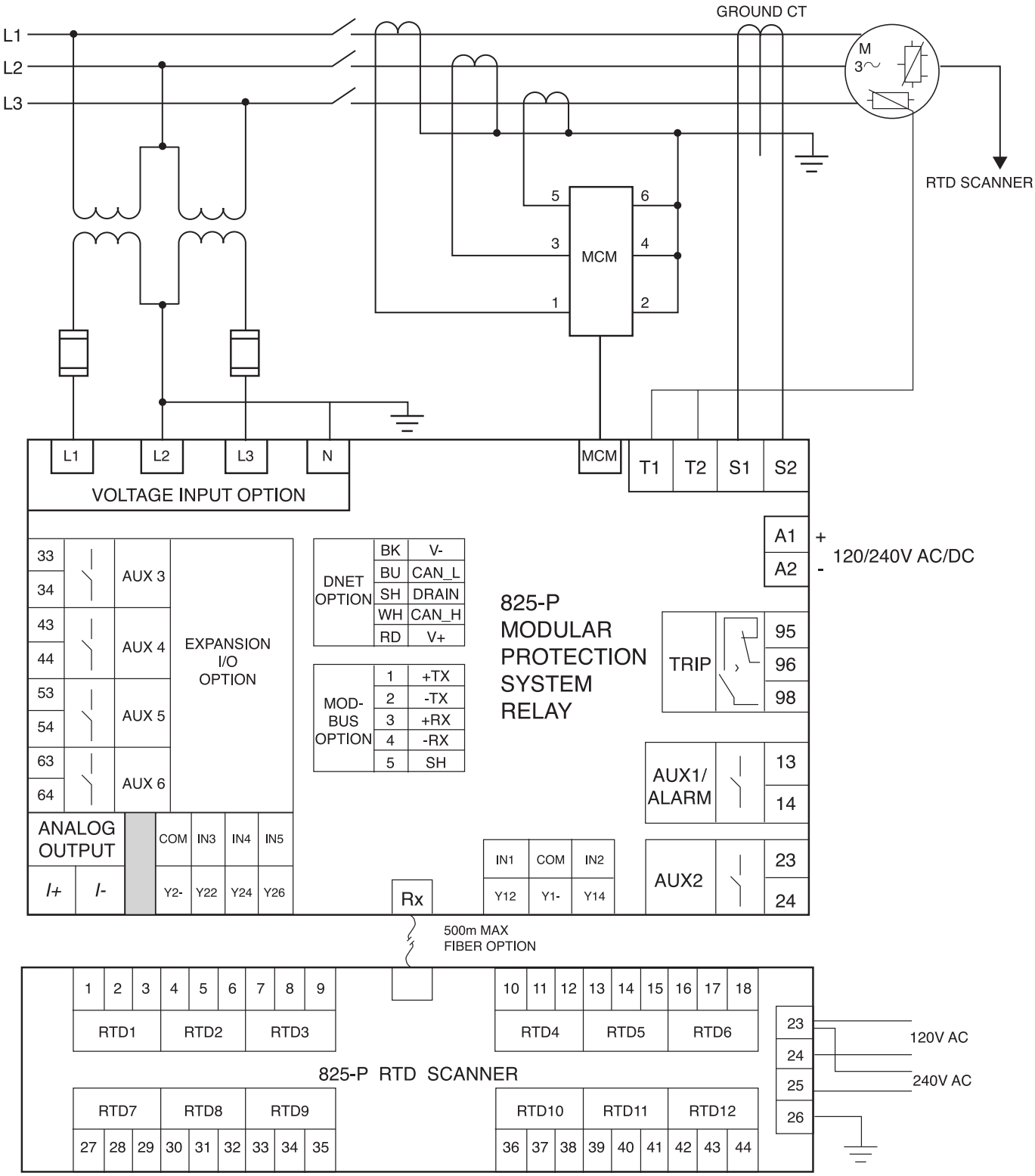
Supply		
Rated Supply Voltage U_s		110/240V AC
Operating Range		0.80…1.2 U_s
Rated Frequency		50/60 Hz ± 5 Hz
Max. Power Consumption		5VA
Rated Insulation Voltage U_i		300V AC
Rated Impulse Strength U_{imp}		4 kV
Pollution Degree		2
Environmental		
Ambient Temperature	Storage	-40…+85 °C (-40…+185 °F)
	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		± 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 mm² (#24…12 AWG)
Torque		0.4…0.6 N•m (3.5…5.3 lb•in.)
Degree of Protection		IP20

2

Trip Curves

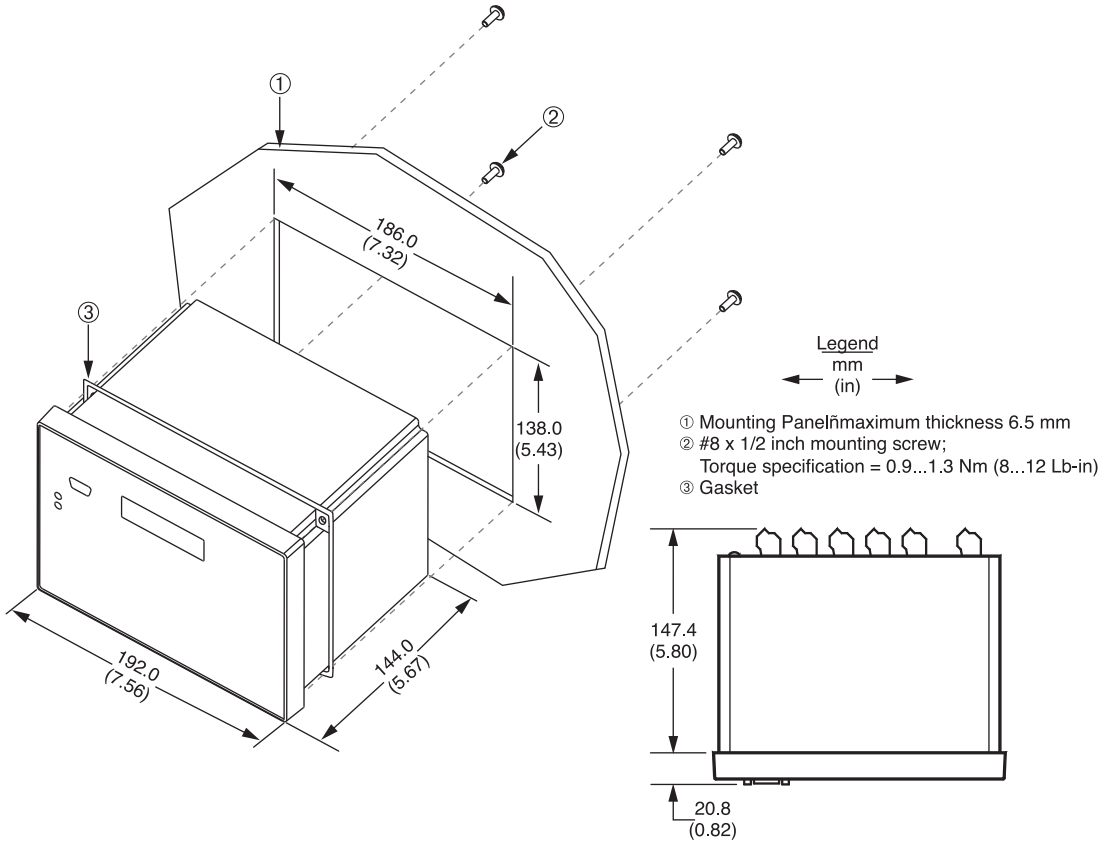


Wiring Schematic*

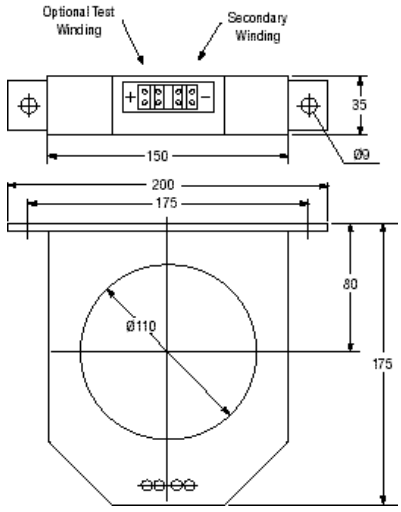


*Open Delta Voltage Connection

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



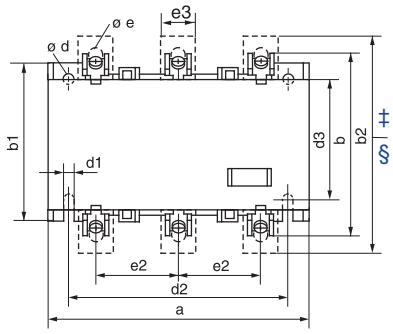
Core Balance Current Transformer

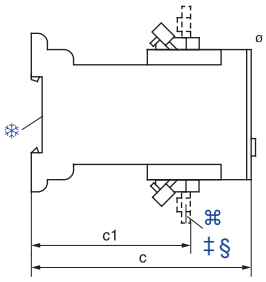


Cat. No. 825-CBCT

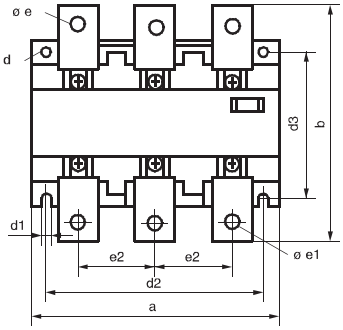
Dimensions are in millimeters. Dimensions are not intended to be used for manufacturing purposes.

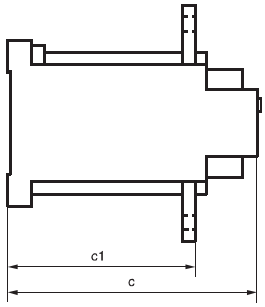
Bulletin 825-MCM Converter Module



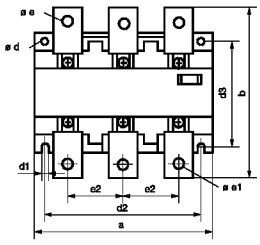


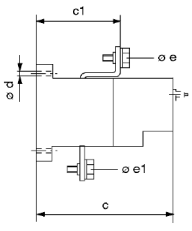
Cat. No. 825-MCM2...825-MCM180





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 mm²	—	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		

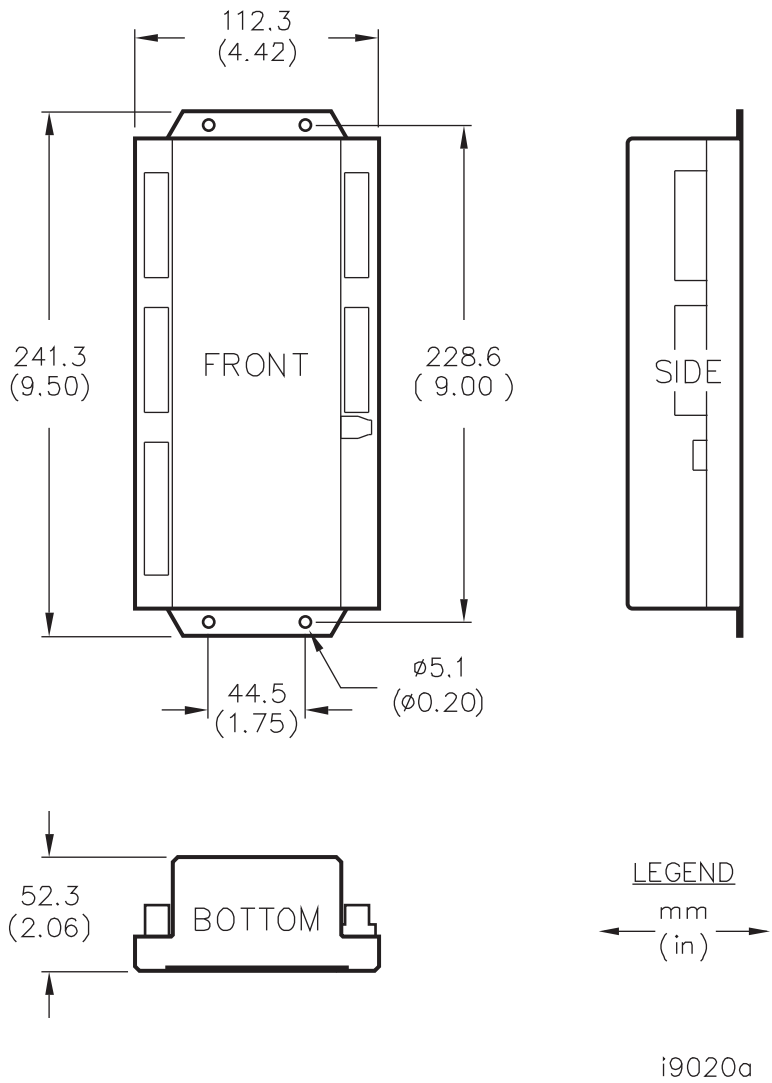
⌘ For snapping on to DIN Rail (EN 50 022-35 x 15 or 35 x 7.5).
❄ Cat. No. 825-MCM180; with bus bar or max. ø 19 mm aperture for looping the conductors.
‡ With Cat. No. 825-MVM.
§ Cat. No. 825-MVM2
♣ See below for bus bars for Cat. No. 825-MCM180.

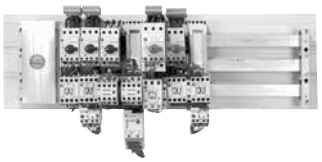
Bus Bars

Terminal Dimensions		
Cat. No.	Bottom	Top
825-MVM	M8	M8

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

RTD Scanner





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

Standards Compliance

UL 508
CSA 22.2 No. 14
EN 60947

Certifications

CE
cULus Recognized (File No. E 56639, Guide NMTR, NMTR8)

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
G	Standard busbar module with wires

b

Length	
Code	Description
S	Short (200 mm)
M	Medium (260 mm)

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

e

Bottom Hat Rail	
Code	Description
R	RA-specific rail
S	Standard rail
H	Rail carrier
Blank	No bottom rail

f

Current Rating	
Code	Description
Blank	0 A (no wires)
16	16 A
25	25 A
45	45 A
125	125 A

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

b

Length	
Code	Description
S	Short (200 mm)
M	Medium (260 mm)
L	Long (320 mm)

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

f

Current Rating	
Code	Description
25	25 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

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

a

Type	
Code	Description
S	ISO (isolation) busbar module with wires

b

Length	
Code	Description
S	Short (200 mm)
M	Medium (260 mm)

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

e

Bottom Hat Rail	
Code	Description
R	RA-specific rail
S	Standard plastic rail

f

Current Rating	
Code	Description
Blank	0 A (no wires)
25	25 A
45	45 A

141A – W S 45 R R P

a b c d e f

a

Type	
Code	Description
W	Panel mounting modules

b

Length	
Code	Description
S	Short (200 mm)
M	Medium (260 mm)
L	Long (333 mm)

c

Width	
Code	Description
45	45 mm
54	54 mm

d

Top (Middle) Hat Rail	
Code	Description
R	RA-specific plastic rail

e

Bottom Hat Rail	
Code	Description
R	RA-specific plastic rail

f

Terminal Location	
Code	Description
P	With PE terminal

141A – C U H 125 B

a b c d e

a

Type	
Code	Description
C	Busbar module for specific devices

b

Length	
Code	Description
U	Universal — 140U or 140M

c

Width	
Code	Description
H	Frame size H
J	Frame size J
L	Frame sizes K and L

d

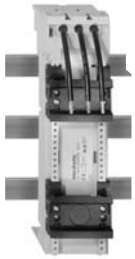
Current Rating	
Code	Description
125	125 A
250	250 A
600	600 A

e

Terminal Location	
Code	Description
Blank	Rear connecting studs (suitable for top or bottom)
T	Wires on top
B	Wires on bottom

ISO Busbar Modules

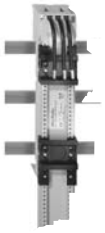
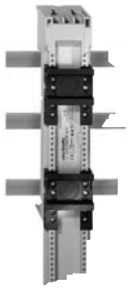
- 2-part construction
  - Device Adapter Plate (or DAP) (carrying the starter) snaps onto the base of the module
  - Base module remains on busbar when exchanging starters, providing isolation from live parts
- Test position with load circuit isolated
- Designed for use with control plug (order separately)
- 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	25	45	2R	1	**141A-SS45RR25**
			54			**141A-SS54RR25**
		45	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	25	45	1R+1S	1	**141A-SM45RS25**
			54			**141A-SM54RS25**
		45	54			**141A-SM54RS45**
			63			**141A-SM63RS45**
		Without electrical connections	45	1S	1	**141A-SM45S**
			54			**141A-SM54S**
			63			141A-SM63S

2

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 508

	Description	Rated Thermal Current I_{th} [A]	Width [mm]	Rails	Pkg. Qty.	Cat. No.
	**Standard Busbar Modules with Wires — Short Length** With wires for electrical connection, 200 mm tall Top Hat Rails: R = MCS-Specific top hat rail M = Metal top hat rail S = Standard top hat rail	16	45	2R	1	**141A-GS45RR16**
			54			**141A-GS54RR16**
		25	45			**141A-GS45RR25**
			54			**141A-GS54RR25**
		45	54			**141A-GS54RR45**
			63			**141A-GS63RR45**
		125 (For 140-CMN)	90	1M		**141A-GS90M125**
			180			**141A-GS180M125**
			270			141A-GS270M125
		125 (For 140M-H)	180	1M		141A-GS180M125H
			270			141A-GS270M125H
		Without electrical connections (e.g., for reversing starters)	45	1R		**141A-GS45R**
			54			**141A-GS54R**
			72	1S		141A-GS72S
			81			**141A-GS81S**
	**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	25	45	1R+1S	1	**141A-GM45RS25**
			54			141A-GM54RS25
		45	54			**141A-GM54RS45**
			63			**141A-GM63RS45**
		Without electrical connections (e.g., for reversing starters)	45	1S		**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	25	45	1S	1	**141A-FS45S25**
		63	54			**141A-FS54S63**
			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	25	45	2S		**141A-FM45SS25**
		63	54			**141A-FM54SS63**
			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 mm² (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 mm² (250 MCM) Universal mounting capability with sliding pocket nuts (M4)	250	110			**141A-FL110V250T**
	**Standard Busbar Module with Terminals on Bottom** 222 mm tall With box terminals on bottom for electrical connection Wire size 70 mm² (2/0 AWG) Universal mounting capability with sliding pocket nuts (M4)	200	108	—	1	**141A-FS108V200B**

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	1	**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		**141A-CUJ250**
		140U K-Frame 140U L-Frame 140M L-Frame (Top or bottom feed)	630	140		**141A-CUL600**

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
- Versions with integrated PE terminal for direct motor connection

	Description	Width [mm]	Rails	Pkg. Qty.	Cat. No.	Cat. No. (with PE Terminal)
	**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**	**141A-WS45RRP**
		54			**141A-WS54RR**	141A-WS54RRP
	**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**	141A-WM45RRP
		54			**141A-WM54RR**	141A-WM54RRP
	**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**	141A-WL45RRP
		54			141A-WL54RR	141A-WL54RRP

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 1600 mm length Tinned copper busbar❄	200	12 x 5		**141A-B125B**
		250‡	15 x 5		**141A-B155B**
		320	20 x 5		**141A-B205B**
		400‡	25 x 5		**141A-B255B**
		450	30 x 5		**141A-B305B**
		360	12 x 10		141A-B1210B
		520	20 x 10		**141A-B2010B**
		630	30 x 10		**141A-B3010B**
	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		**141A-B305N**
		360	12 x 10	6	**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

Busbar Components, Continued

	Description	Busbar [mm]	Pkg. Qty.	Cat. No.
	**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			**141A-TR1**
	**Busbar Support with terminals** 60 mm pole center spacing Terminals for electrical connections 16 mm² (#6 AWG) 3-pole	12…30 x 5 or 12…30 x 10	10	**141A-TR3F16**
	**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**

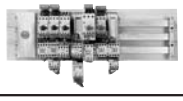
2

2

Busbar Components, Continued

	Description	Busbar [mm]	Pkg. Qty.	Cat. No.
	**Supply Module** 3-pole 6…50 mm² (10…1/0 AWG) 54 mm wide (meets feeder circuit spacings per UL 508A)	12…30 x 5 or 12…30 x 10	1	**141A-VN370**
	**Supply Module** 3-pole 35…120 mm² (2 AWG…250 MCM) 81 mm wide (meets feeder circuit spacings per UL 508A)			**141A-VN3120**
	**Supply Module** 3-pole 95…185 mm² (3/0 AWG…350 MCM) 135 mm wide			**141A-VN3185**
	Supply Module 3-pole for round conductors 150…300 mm² (300…600 MCM) 135 mm wide			**141A-VN3300R**
	Supply Module 3-pole for flat conductors up to 32 x 20 mm equivalent to 300 mm² (300…600 MCM) round conductor ampacity 135 mm wide			**141A-VN3300F**
	**Supply Module** 3-Pole (set of 3 terminals) for round conductors 120…300 mm² (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		1	**141A-VU3300R**
	Supply Module 3-Pole (set of 3 terminals) for flat conductors up to 32x20 mm equivalent to 300 mm² (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 mm² (#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 mm² (#12…2 AWG)	12…30 x 5		**141A-VS135**
		12…30 x 10		**141A-VS235**
	Single Terminals Single terminals for supplying busbars 16…70 mm² (#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 mm² (#6…250 MCM)	12…30 x 10		**141A-VS2120**
	**Profile Terminals** For double-T busbars To connect with flat busbars and flexible copper busbars	400…800 mm²	3	141A-VS54136F
		500…750 mm²	3	141A-VS55121F
		600…900 mm²	3	141A-VS56421F
		600…1200 mm²	3	141A-VS56436F
		800…1600 mm²	3	141A-VS58136F
		1000…2000 mm²	3	141A-VS510136F

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**
		Top/bottom shroud, 1100 mm	1	**141A-BKS**
	**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
	**Busbar Shroud Cover** 200 x 1100 mm Covers all 3 busbars	12…30 x 5 or 12…30 x 10	2	**141A-BCF1**
	Busbar Shroud Holder 2 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 — 48 mm deep	Double-T	1	141A-BST48
	76 mm deep		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**

Busbar Components, Continued

	Description				PQ	Cat. No.
	**Busbar Fuse Switch** 3-pole switch disconnector 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
	**Pilot Switch** Pilot switch for signaling ON/OFF position of lid For 140-NF0102, 140-NF1038 and 140-NFH1038 250V AC/5 A; 30V DC/4 A				1	141A-NFASNF
	**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.
PQ = Package Quantity

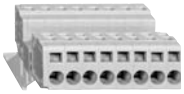
Busbar Components, Continued

	Description				PQ	Cat. No.
	**NH Fuse Switch Disconnector** 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	M8 70 mm²	160 A	1	**141A-NFD160**
		Size 1 243 x 184 mm	M10 120 mm²	250 A	1	141A-NFD250
		Size 2 288 x 210 mm	M10 240 mm²	400 A	1	141A-NFD400
		Size 3 300 x 256 mm	M12 240 mm²	630 A	1	141A-NFD630
	**Pilot Switch** For NH-fuse switch disconnectors Signaling ON/OFF position of lid 250V AC/5 A 30V DC/4 A	Size 00…3			1	141A-NFASNFD
	**Wedge Clamp Terminal** For NH-fuse switch disconnectors Connection accessories	Size 1 18 x 10 mm	70…150 mm²		1	141A-NFVF1150
		Size 2 21 x 15 mm	120…240 mm²		1	141A-NFVF2240
		Size 3 25 x 20 mm	150…300 mm²		1	141A-NFVF3300
	**Conversion Kit** For NH-fuse switch disconnector 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 disconnecor 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**

PQ = Package Quantity

2

Accessories

	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**
 ***Cat. No. 141A-AS9S***	**Spacer module — for 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	10	**141A-AS9S**
 ***Cat. No. 141A-AS9B***	**Spacer module — for Standard 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		**141A-AS9B**
	Spacer Module — for Mounting modules For spacing of load feeders by 9 mm e.g. for improved cooling. Including connection clips.	228		**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

Module Data

		Iso Modules		Standard Modules with Wire Connections				Standard Modules with Box Terminals			
		141A-S		141A-G				141A-F			
Rated current at 60 °C I_{th}*	[A]	25	45	16	25	45	125	25	63	200	250
stranded	[mm²] [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	[mm²] [AWG]	—	—	—	—	—	—	4 12	16 6	6…70 10…2/0	35…120 2…250 MCM
	[mm²] [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-VN3120	141A-VN3185	141A-VN3300R	141A-VN3300F	141A-VU3300R	141A-VU3300F
stranded	[mm²] [AWG]	1.5…16 16…6	6…50 10…1/0	35…120 2…250 MCM	95…185 No. 3/0…350 MCM	150…300 300…600 MCM	—	120…300 250…600 MCM	—
solid	[mm²] [AWG]	1.5…16 16…6	6…50 10…1/0	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	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	[mm²] [AWG]	6…70 10…2/0	10…150 8…300 MCM	16…300 4…600 MCM
solid	[mm²] [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	[mm²] [AWG]	2.5…16 14…6	4…35 12…2	16…70 6…2/0
solid	[mm²] [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

Short-Circuit Current Ratings (support spacing at 800 mm)

Cat. No.	Description	Max. Circuit Bkr. Cat. No.	C. B. Rating	SCCR 480V	SCCR 600V	Max. Class CC, J or T Fuse	SCCR 480V	Max. Class CC, J or T Fuse	SCCR 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		—	35kA	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		50 kA	25 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	50 kA	35kA	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	50 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-D26	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	50 kA	35kA	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	50 kA	25 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	47kA	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
141A-SS*45 141A-SM*45 141A-GS*45 141A-GM*45	Bus Bar Module	140M-F8E-C32	32A	65 kA	30 kA	—	—	—	—
		140M-F8E-C45	45 A	65 kA	18kA	—	—	—	—

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 ≤ 250 V DC-coil-voltage ≤ 120 V

Weight [g]

MCS Standard Busbar Module	[g]
141A-GS45RR25	302
141A-GS54RR25	347
141A-GS54RR45	358
141A-GS63RR45	379
141A-GS90M125	781
141A-GS180M125	1021
141A-GS270M125	1271
141A-GS45R	200
141A-GS54R	226
141A-GS72S	268
141A-GS81S	289
141A-GM45RS25	313
141A-GM54RS25	368
141A-GM54RS45	379
141A-GM63RS45	400
141A-GM45S	211
141A-GM54S	277
141A-GM63S	298
141A-FS45S25	272
141A-FS54S63	328
141A-FS63S63	349
141A-FS72S63	387
141A-FS81S63	408
141A-FM45SS25	293
141A-FM54SS63	349
141A-FM63SS63	370
141A-FM72SS63	408
141A-FM81SS63	429

MCS Iso Busbar Module	[g]
141A-SS45RR25	381
141A-SS54RR25	396
141A-SS54RR45	472
141A-SS63RR45	480
141A-SS45R	279
141A-SS54R	305
141A-SM45RS25	402
141A-SM54RS25	418
141A-SM54RS45	494
141A-SM63RS45	502
141A-SM45S	300
141A-SM54S	327
141A-SM63S	405

MCS Standard Busbar Module >100 A	[g]
141A-FS108V200T	1000
141A-FL110V250T	1200
141A-FS108V200B	1000

MCS Mounting Module	[g]
141A-WS45RR	163
141A-WS54RR	204
141A-WM45RR	189
141A-WM54RR	211
141A-WL45RR	211
141A-WL54RR	222
141A-WS45RRP	180
141A-WS54RRP	221
141A-WM45RRP	212
141A-WM54RRP	234
141A-WL45RRP	240
141A-WL54RRP	251

Busbar Components	[g]
141A-TR3	203
141A-TR4	256
141A-TR1	59
141A-TR3E	21
141A-TR4E	28
141A-TR3F16	285
141A-TU3	127
141A-T11	158
141A-T13	591
141A-T13E	20
141A-VN370	360
141A-VN3120	485
141A-VN3185	1140
141A-VN3300R	1540
141A-VN3300F	1619
141A-VU3300R	1550
141A-VU3300F	1325
141A-VS116	21
141A-VS216	23
141A-VS135	46
141A-VS235	47
141A-VS170	71
141A-VS270	74
141A-VS2120	109
141A-VS54136F	670
141A-VS55121F	705
141A-VS56421F	840
141A-VS56436F	859
141A-VS58136F	1011
141A-VS510136F	1137
141A-BK1	144
141A-VC3A	185
141A-VC3B	251
141A-VC3C	565
141A-VC3D	870
141A-VC5E	494
141A-VC5F	943
141A-VC5G	1461
141A-BCF1	750
141A-BCF1H	40
141A-BS5	87
141A-BS10	101

Busbar Components	[g]
141A-BCR	800
141A-BST48	700
141A-BST76	1050
141A-BCT1	380
141A-NF0102	759
141A-NF1038	760
141A-NFASNF	7
141A-NFAD	61
141A-NFAR	1
141A-NFJ100	3280
141A-NFJ200	4500
141A-NFJ400	6900
141A-NFD160	1300
141A-NFD250	3760
141A-NFD400	5500
141A-NFD630	7840
141A-NFASNFD	11
141A-NFVF1150	116
141A-NFVF2240	199
141A-NFVF3300	247
141A-NFAFR5	65
141A-NFAC00A	124
141A-NFAC1A	107
141A-NFAC2A	109
141A-NFAC3A	156
141A-BK180	395
141A-BK228	425
141A-BK250	440
141A-BKH	90
141A-BKC	420
141A-BKS	150

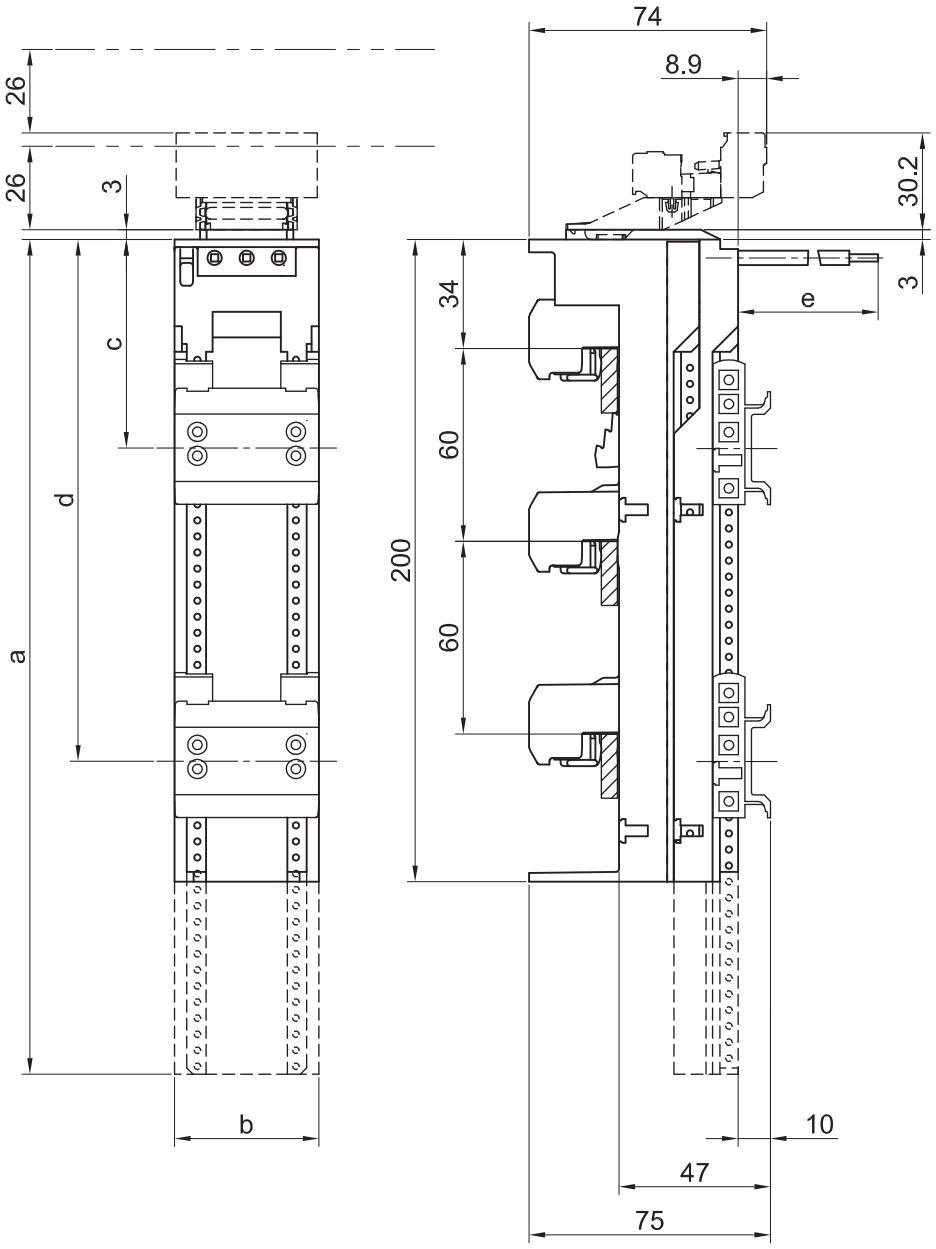
Accessories	[g]
141A-AHR45	15
141A-AHR54	16
141A-AHR63	16
141A-AHS72	17
141A-AHS81	18
141A-APC8	29
141A-APC10	35
141A-APC12	40
141A-APH	5
141A-AS9B	20
141A-AS9W	20
141A-AS9S	38
141A-AK	1
141A-AS	75

MCS Mounting System

Approximate Dimensions

Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

Cat. No. 141A-S…ISO Busbar Modules

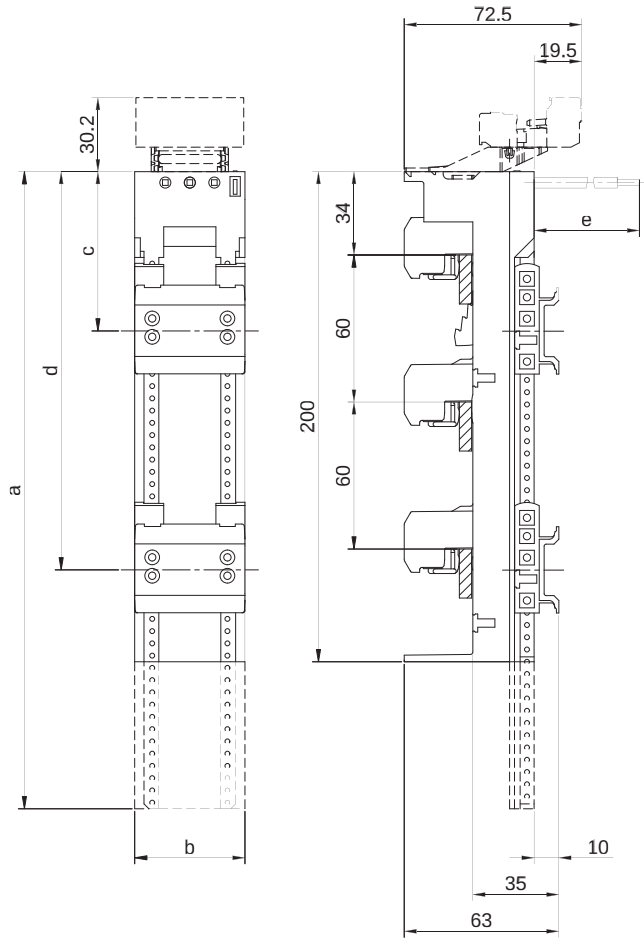


Cat. No.	A	B	C	D	E
141A-SS45RR25	200	45	65	162.5	73
141A-SS54RR25	200	54	65	162.5	73
141A-SS54RR45	200	54	65	170	95
141A-SS63RR45	200	63	65	170	95
141A-SS45R	200	45	—	162.5	—
141A-SS54R	200	54	—	170	—
141A-SM45RS25	260	45	65	170	73
141A-SM54RS25	260	54	65	170	73
141A-SM54RS45	260	54	65	170	95
141A-SM63RS45	260	63	65	170	95
141A-SM45S	260	45	—	170	—
141A-SM54S	260	54	—	170	—
141A-SM63S	260	63	—	170	—

NOTE:
1. FREE SPACE REQUIRED TO GET THE DEVICE ADAPTER PLATE IN PARKING POSITION.

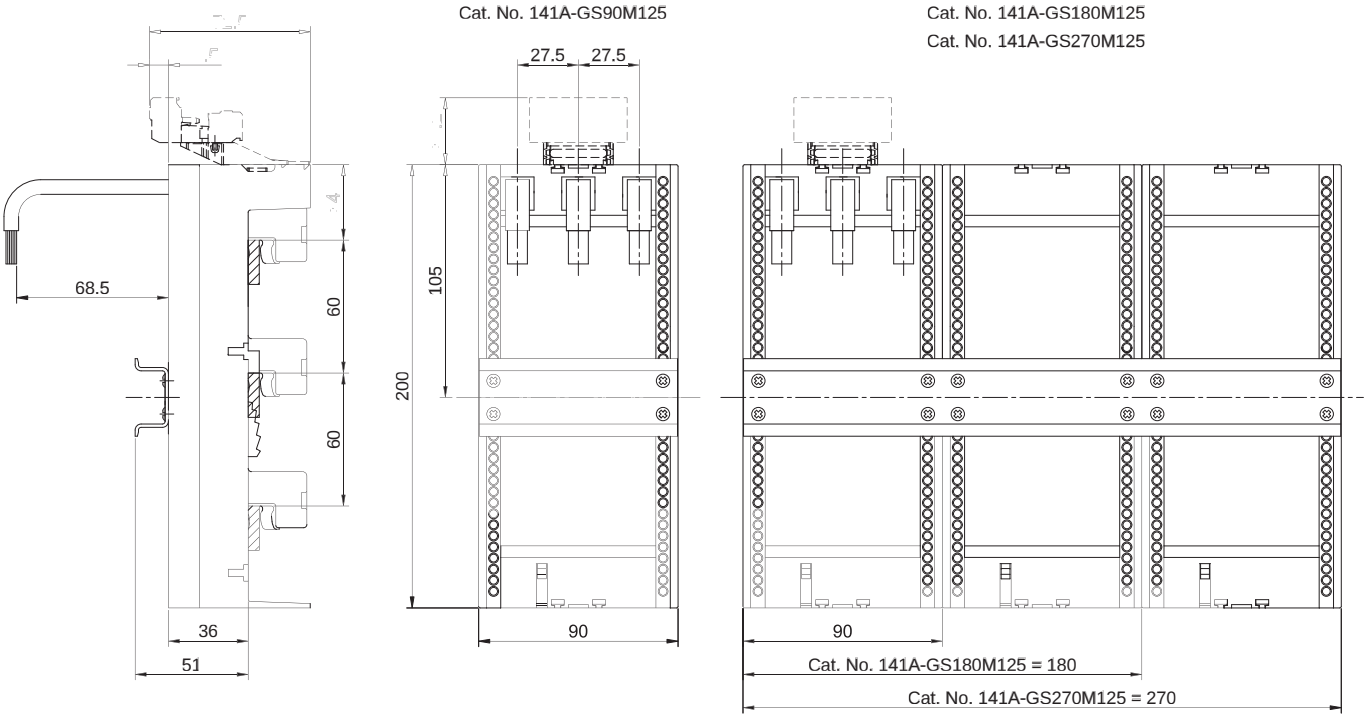
Dimensions are in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Cat. No. 141A-GS, Standard Busbar Modules with Wires



Cat. No.	PER DETAIL	A	B	C	D	E
141A-GS45RR16	A	200	45	65	162.5	73
141A-GS54RR16	A	200	54	65	162.5	73
141A-GS45RR25	A	200	45	65	162.5	73
141A-GS54RR25	A	200	54	65	162.5	73
141A-GS54RR45	A	200	54	65	170	95
141A-GS63RR45	A	200	63	65	170	95
141A-GS45R	A	200	45	—	162.5	—
141A-GS54R	A	200	54	—	170	—
141A-GS72S	A	200	72	105	—	—
141A-GS81S	A	200	81	105	—	—
141A-GM45RS25	A	260	45	65	170	73
141A-GM54RS25	A	260	54	65	170	73
141A-GM54RS45	A	260	54	65	170	95
141A-GM63RS45	A	260	63	65	170	95
141A-GM45S	A	260	45	—	170	—
141A-GM54S	A	260	54	—	170	—
141A-GM63S	A	260	63	—	170	—

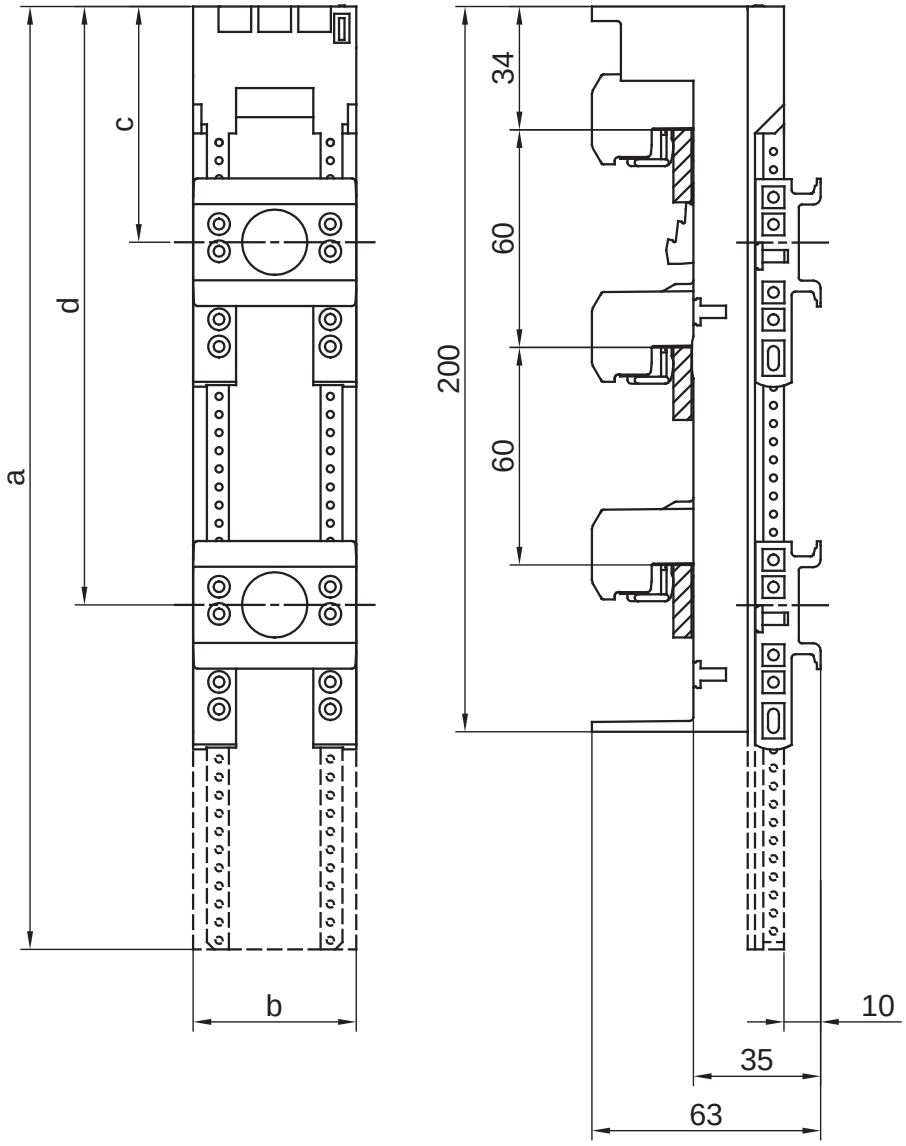
NOTE:
1. FREE SPACE REQUIRED TO PLUG/UNPLUG MODULE INTO THE BUSBARS.



2

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

Cat. No. 141A-F… Standard Busbar Modules with Terminals

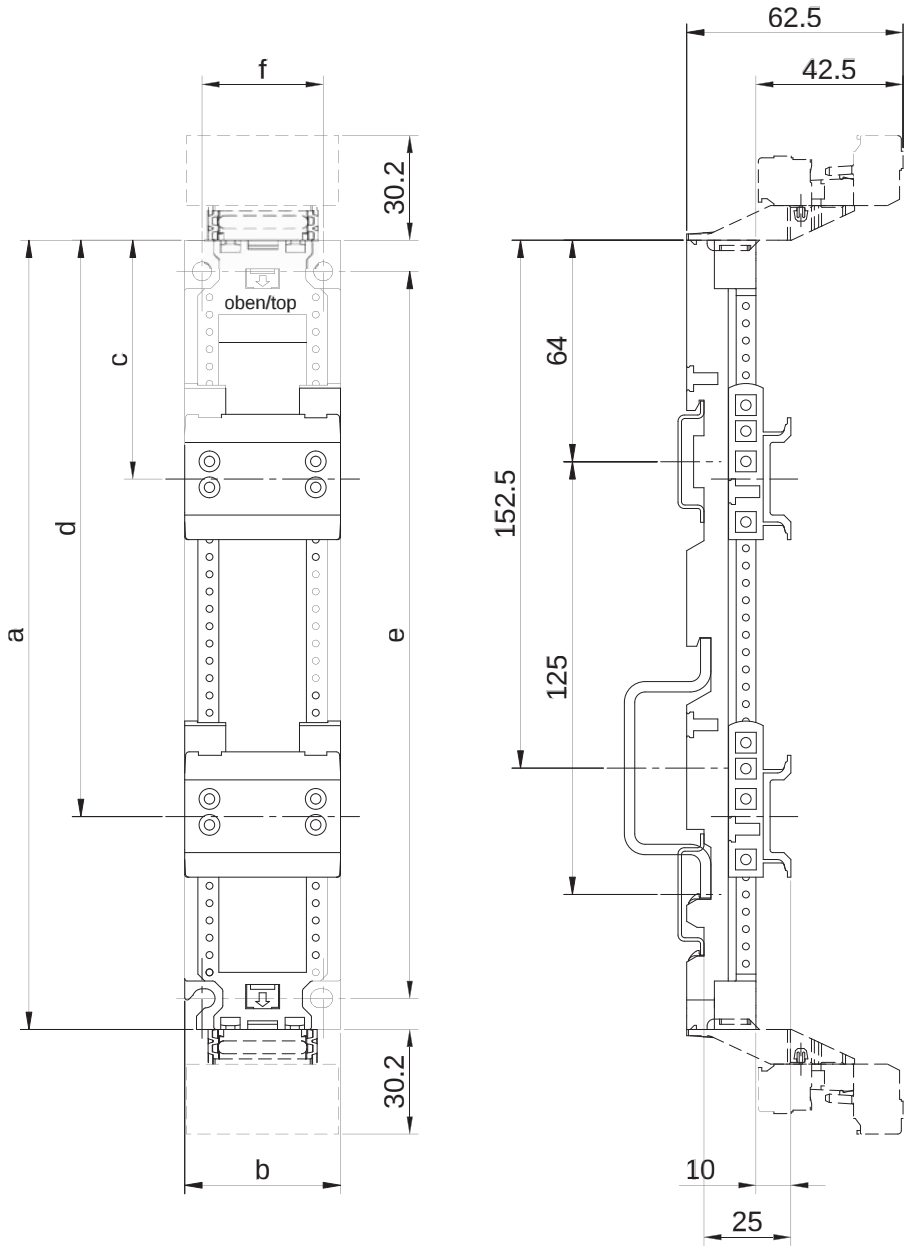


Cat. No.	A	B	C	D	WIRE SIZES	
					mm²	AWG
141A-FS45S25	200	45	65	—	6	#10
141A-FS54S63	200	54	65	—	16	#6
141A-FS63S63	200	63	65	—	16	#6
141A-FS72S63	200	72	65	—	16	#6
141A-FS81S63	200	81	65	—	16	#6
141A-FM45SS25	260	45	65	170	6	#10
141A-FM54SS63	260	54	65	170	16	#6
141A-FM63SS63	260	63	65	170	16	#6
141A-FM72SS63	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.

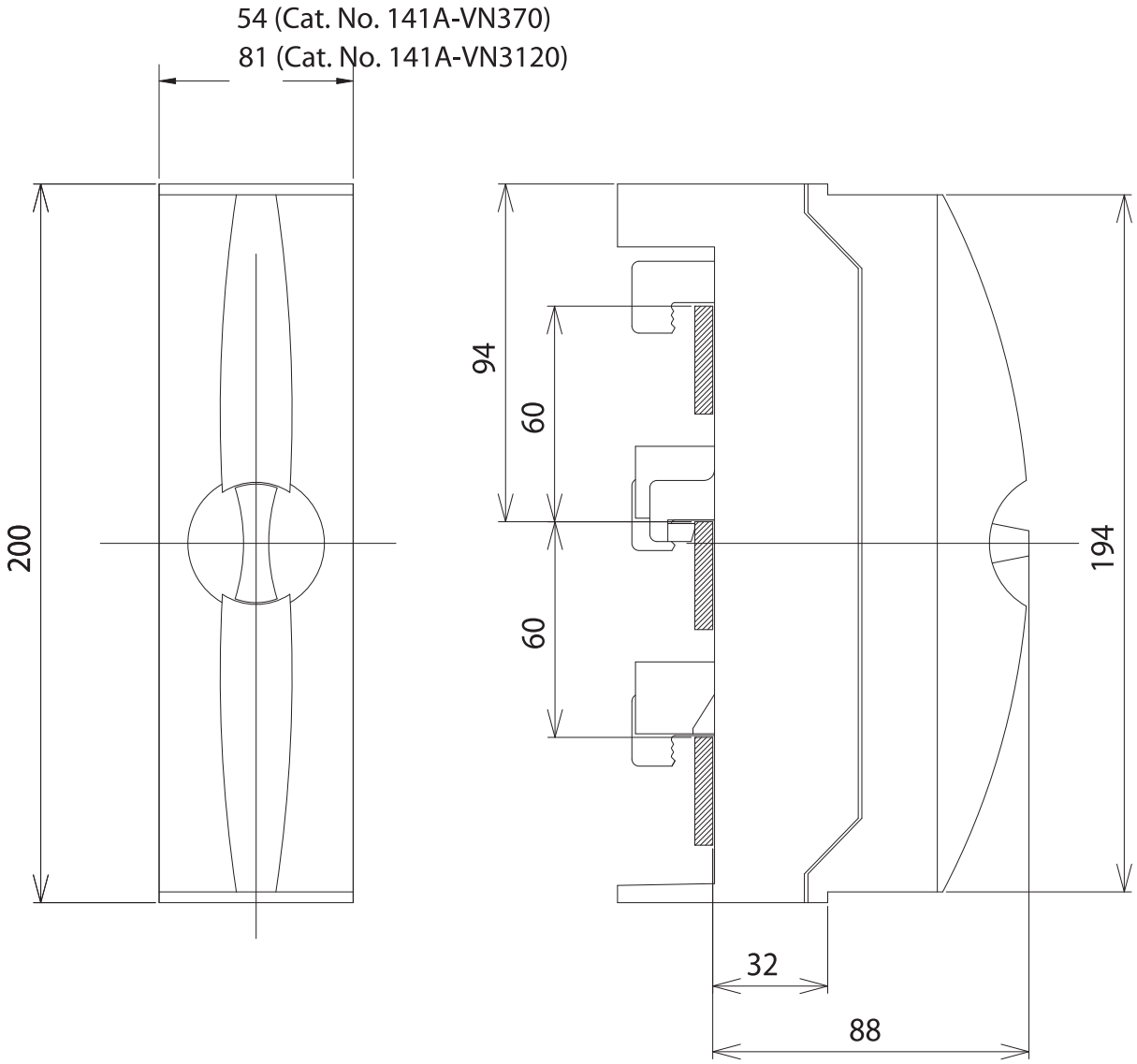
Cat. No. 141A-W… Panel Mount Modules



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

Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

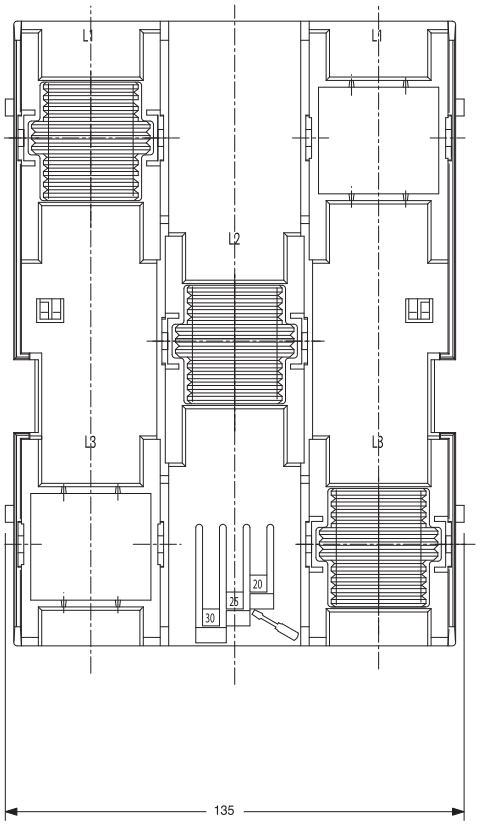
Supply Modules
Cat. Nos. 141A-VN370 and 141A-VN3120

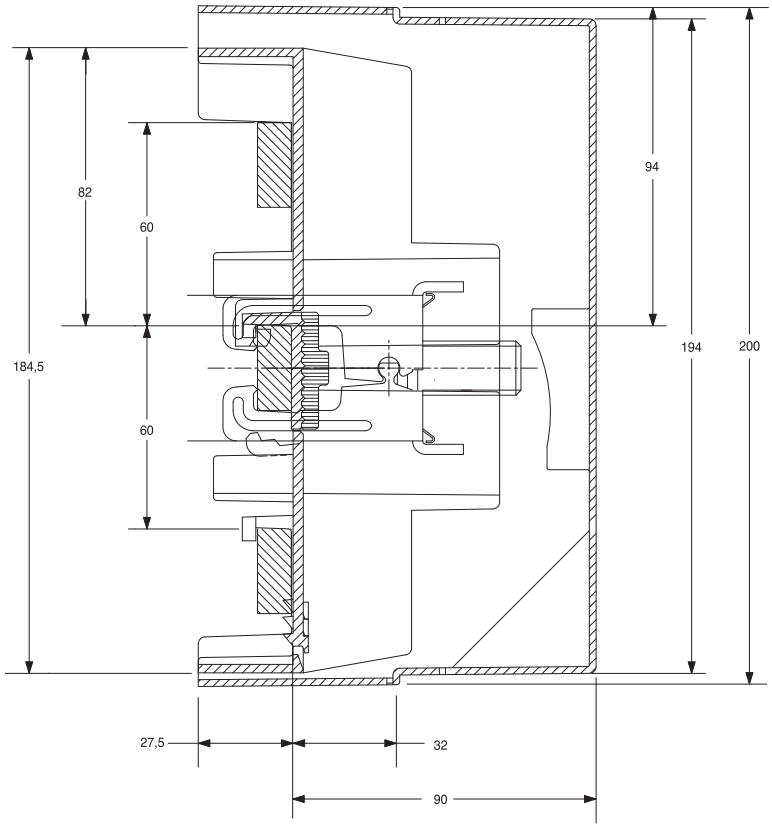


Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

Supply Modules, Continued

Cat. Nos. 141A-VN3185, -VN3300R, and -VN3300F

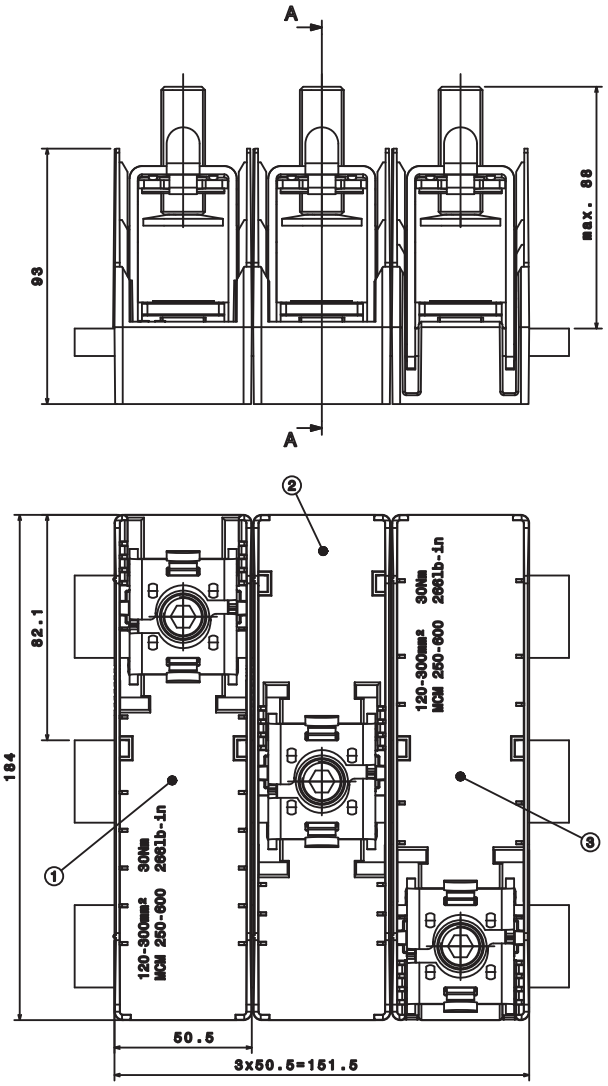


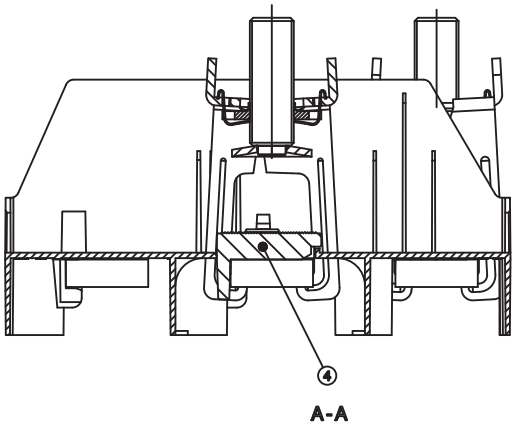


Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

Supply Modules, Continued

Cat. Nos. 141A-VU3300R and -VU3300F

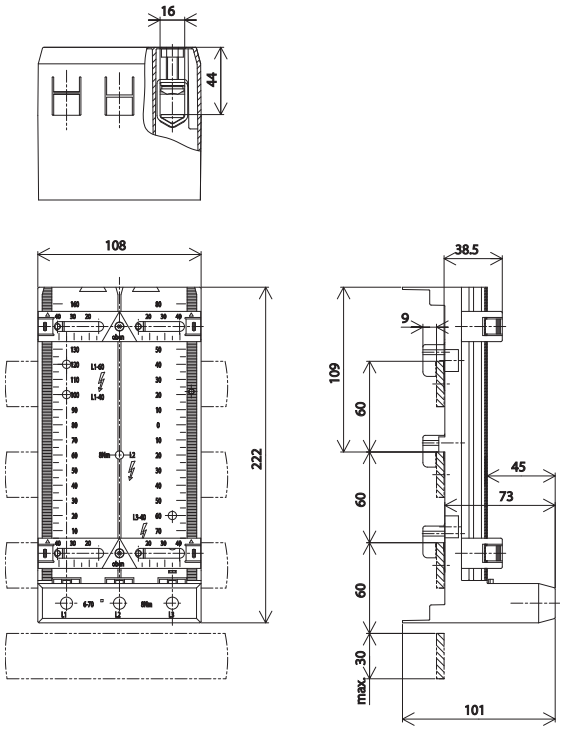




A-A

Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

Standard Busbar Modules — Universal Adapters



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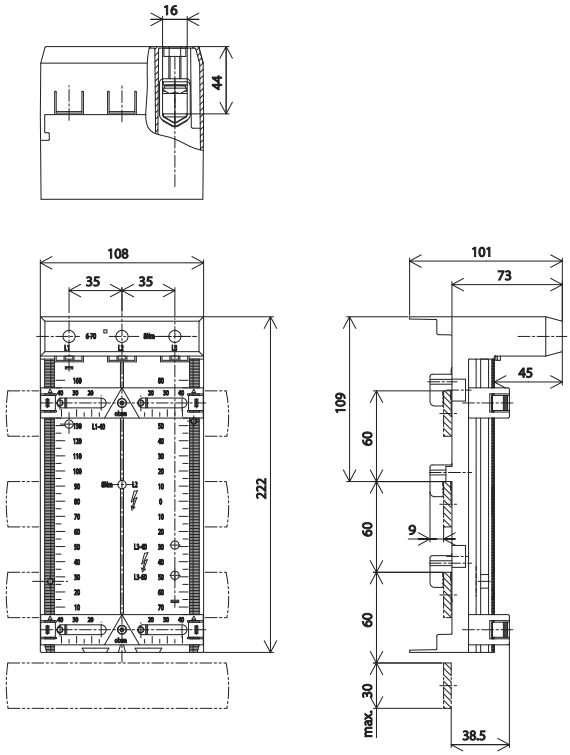
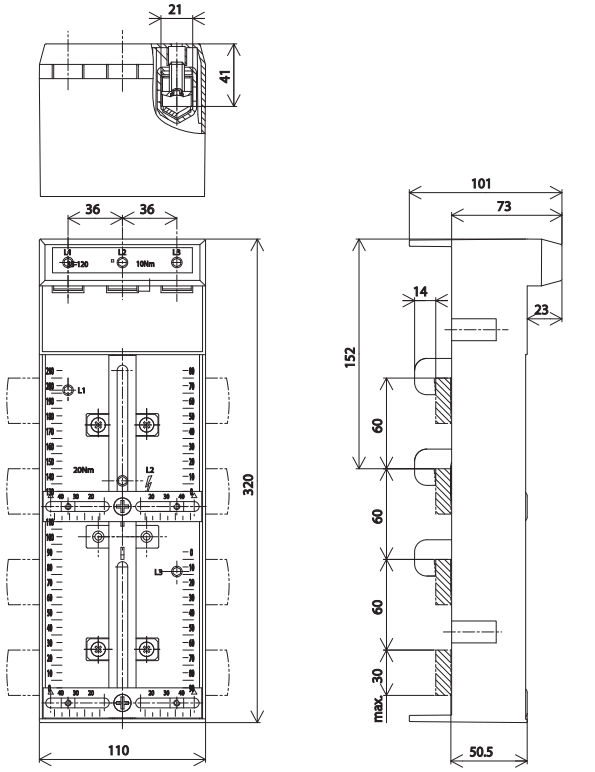


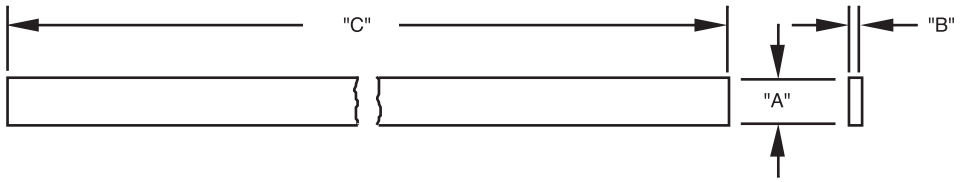
Cat. No. 141A-FS108V200T



Cat. No. 141A-FL110V250T

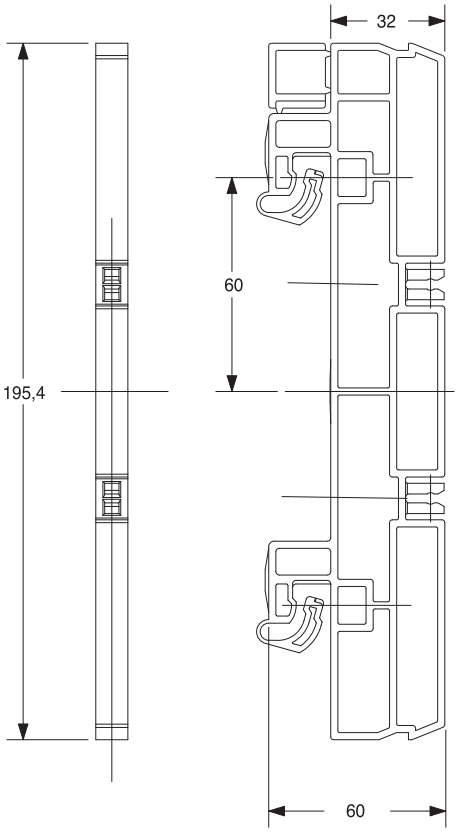
Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

Busbars

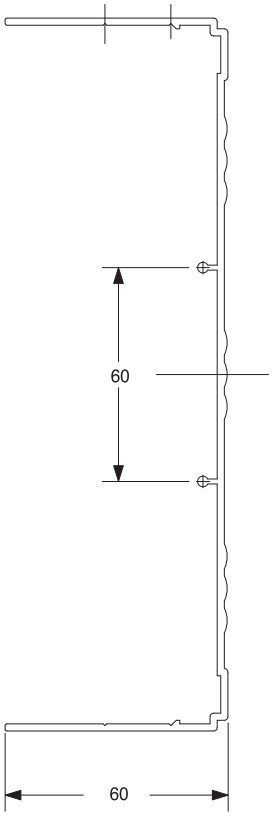


Cat. No.	A	B	C	Cat. No.	A	B	C
141A-B3010A	30	10	800	141A-B255B	25	5	1600
141A-B2010A	20	10	800	141A-B205B	20	5	1600
141A-B1210A	12	10	800	141A-B155B	15	5	1600
141A-B305A	30	5	800	141A-B125B	12	5	1600
141A-B255A	25	5	800	141A-B3010N	30	10	2400
141A-B205A	20	5	800	141A-B2010N	20	10	2400
141A-B155A	15	5	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-BCF1H

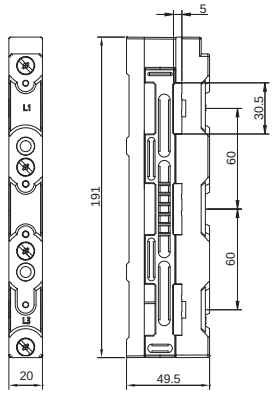


Cat. No. 141A-BCF1

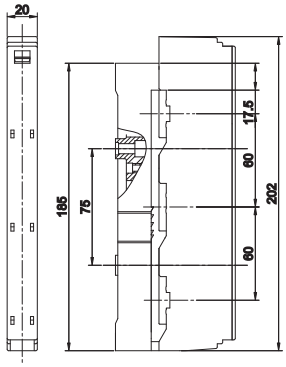
Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

Cat. No. 141A-TR…Busbar Supports and End Covers

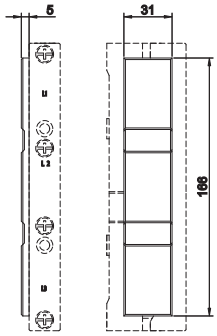
141A-TR3



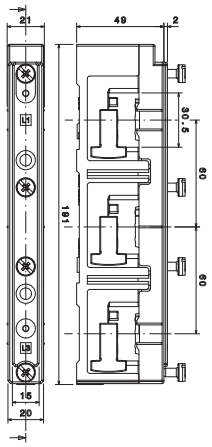
141A-TR3F16



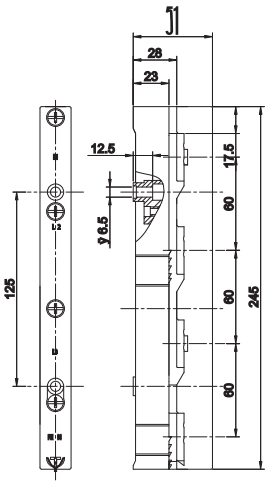
141A-TR3E



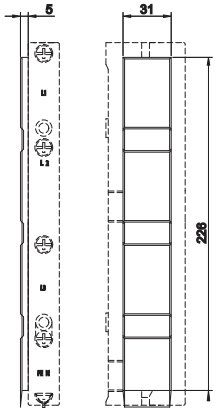
141A-TU3



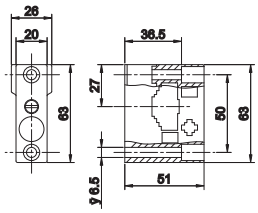
141A-TR4



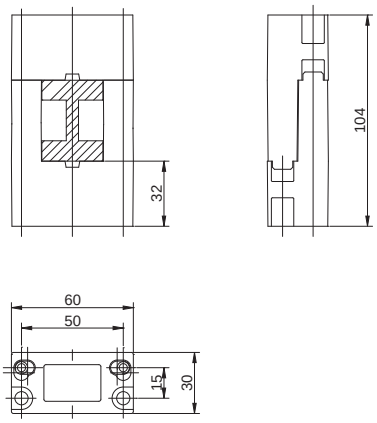
141A-TR4E



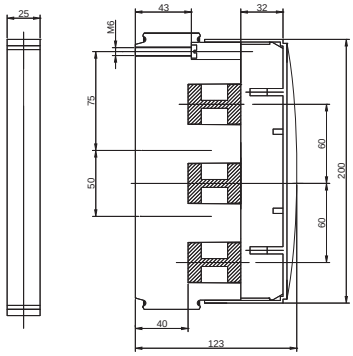
141A-TR1



141A-T11



141A-T13



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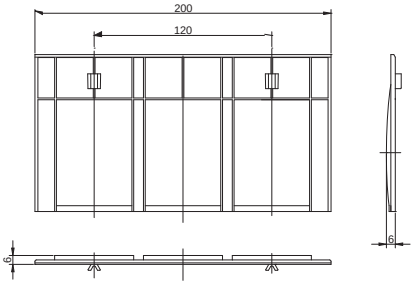
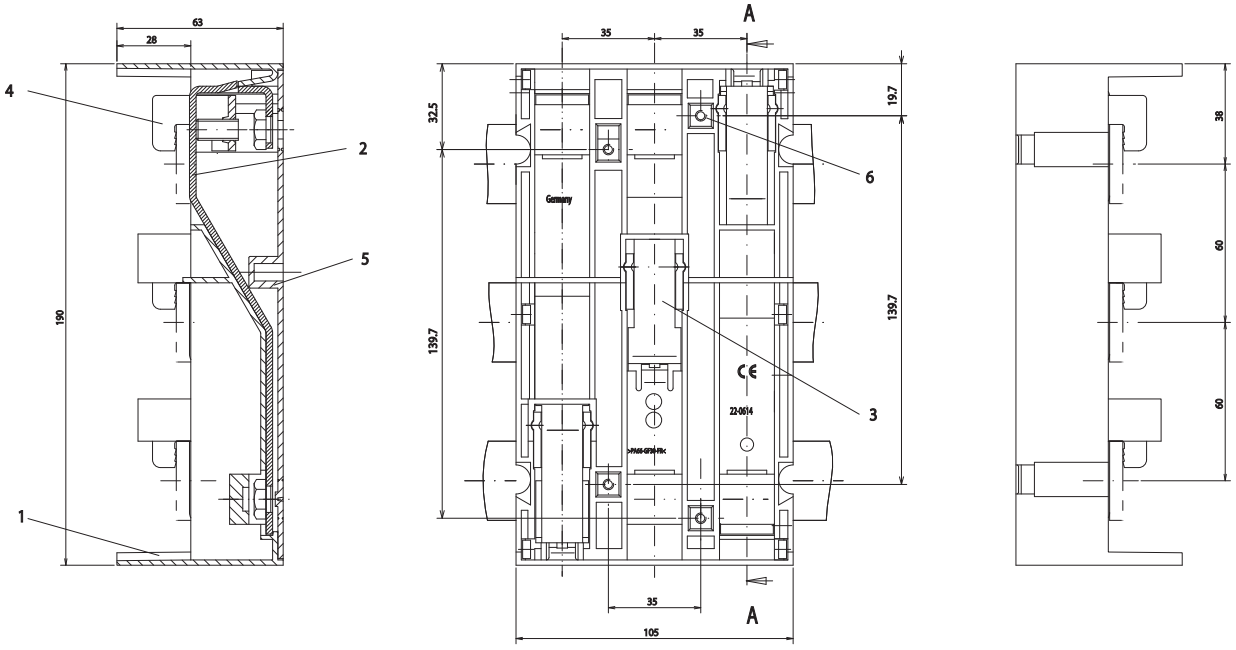
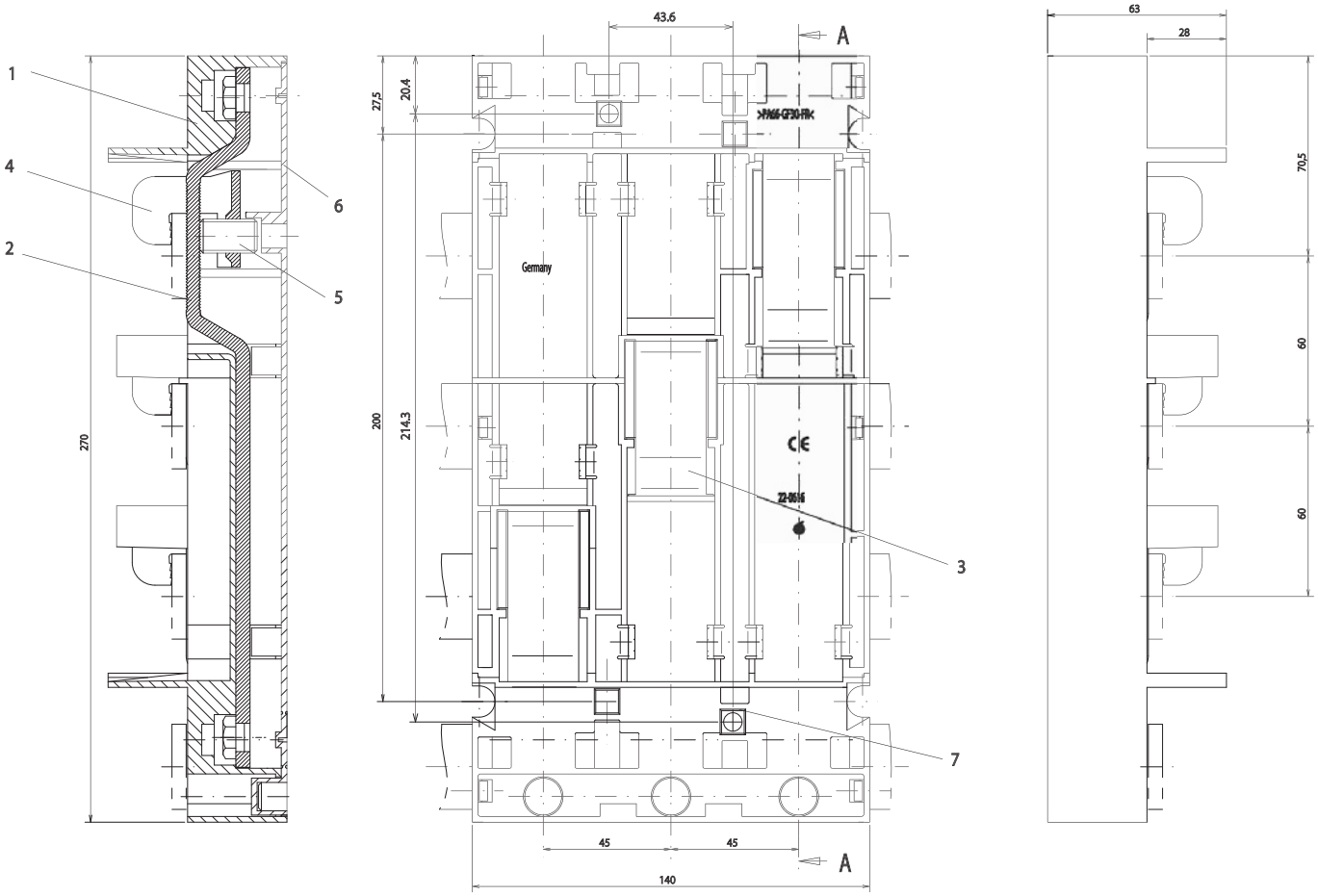


Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.



Cat. No. 141A-CUJ250



Cat. No. 141A-CUL600

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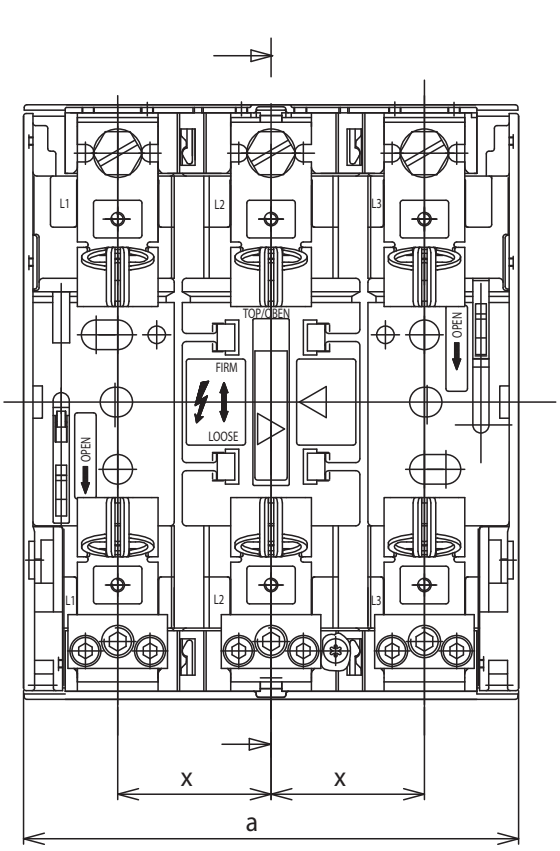
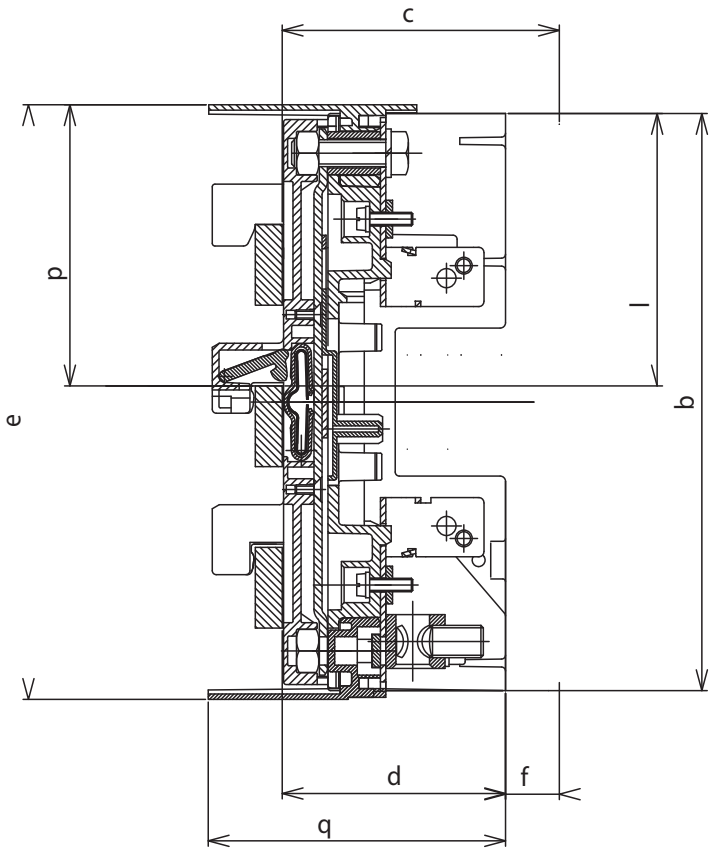
Preferred availability cat. nos. are printed in **bold**

Allen-Bradley

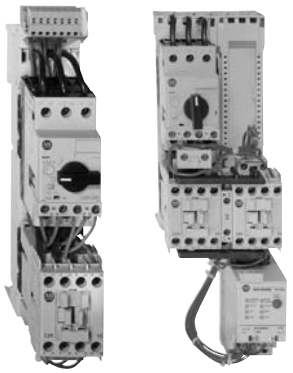
Dimensions are in millimeters. Dimensions are not intended for manufacturing purposes.

Cat. No. 141A-NFJ...





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



Bulletin 103S/107S and 103T/107T Combination Starters

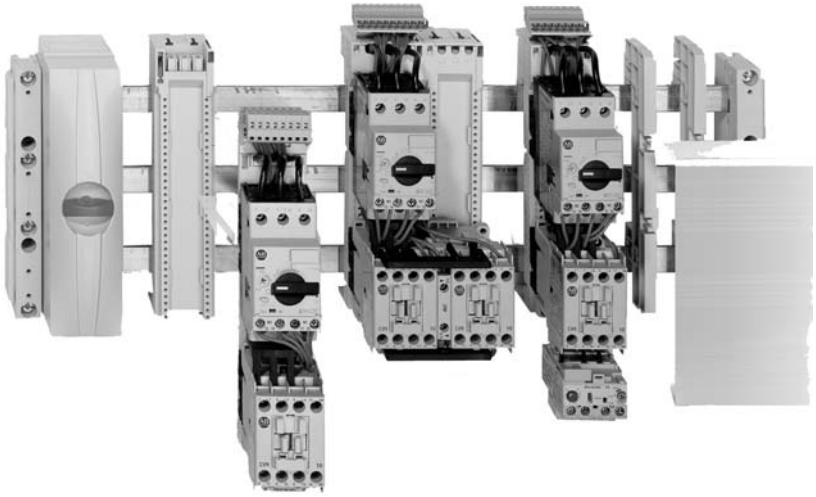
- Bulletin 103S/107S Combination Starters are 2-Component Starters
  - Bulletin 140M Motor Protection Circuit Breakers (MPCBs)
  - Bulletin 100-C/104-C Contactors
- Bulletin 103T/107T Combination Starters are 3-Component Starters
  - Bulletin 140M Motor Circuit Protectors (MCPs)
  - Bulletin 100-C/104-C 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 staters are referred to as 3-Component Starters.

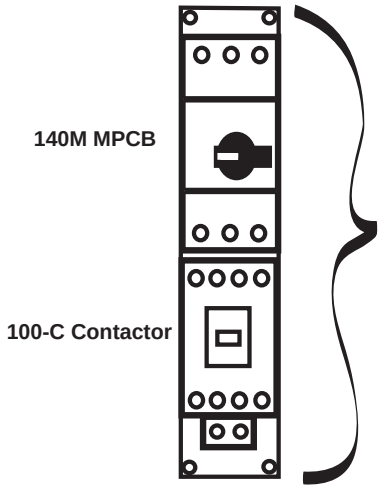
All of these combination starters may provide the branch-circuit, short-circuit protection, overload protection and magnetic control for each individual motor circuit. Additional short-circuit protection is not required for the protection of the individual motor circuits. Additionally, these starters 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.



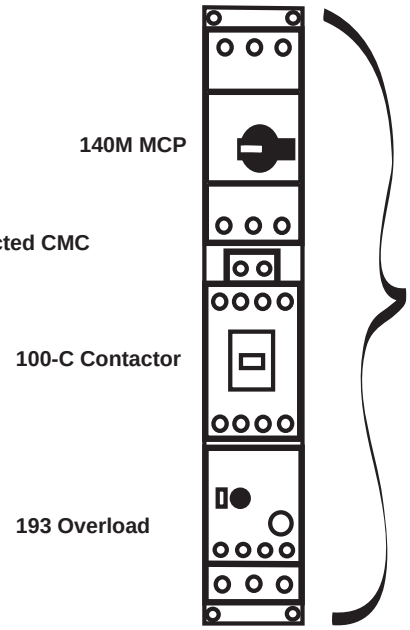
103S Starter
UL/CSA Approvals
* **Type F CMC**
* **Type E Self-Protected CMC**

IEC Approvals
* **Type 1**
* **Type 2**

Bulletin 103S

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.



103T Starter
UL/CSA Approvals
* **Type E Self-Protected CMC**

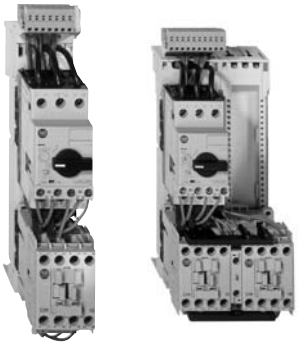
IEC Approvals
* **Type 1**
* **Type 2**

Bulletin 103T

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.

2



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.

Table of Contents

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 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 operations and an additional 4000 mechanical operations after a short circuit.

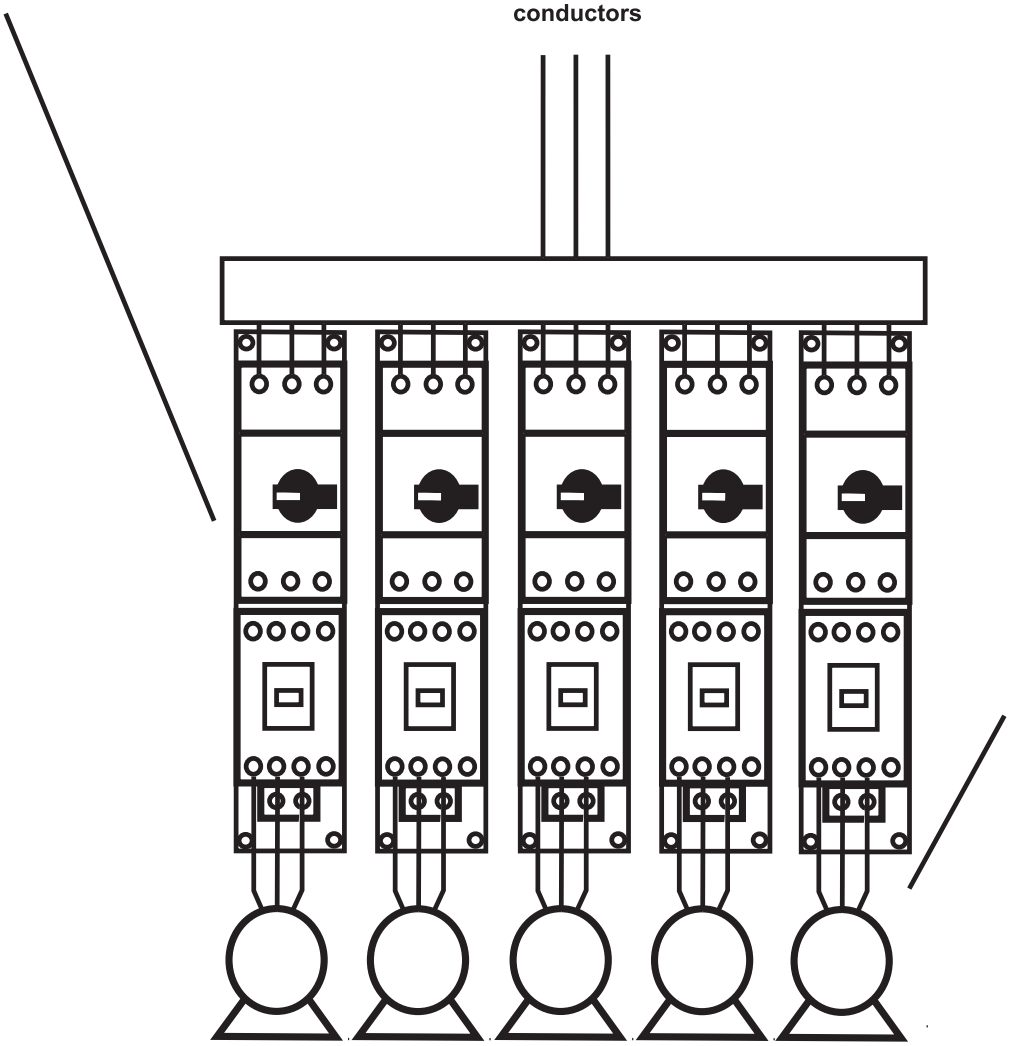
By definition, a **Type F** combination motor controller consists of a Type E manual self-protected combination motor controller and a magnetic or solid-state motor controller (such as a Bul. 100-C contactor or an SMC). As with a manual Type E self-protected combination motor controller, additional short-circuit 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 of either component to achieve weld-free performance and meet the additional life requirements.

Multiple Motor Installation with 103S Combination Starters

Bulletin103S Combination Starters provide Individual Branch Circuit Protection for each motor.
They consist of a 140M Motor Protection Circuit Breaker and a 100C 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

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.

103S – A T D 2 – C A16 C – KN

a b c d e f g h i

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	
Code	Code	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
B25	1.0...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.

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Bulletin 103S/107S Combination Starters

Product Selection and Coordination Ratings, 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	Max. Short-Circuit Current [kA]					
						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 Standard Bus Bar Modules											
0.10…0.16	—	—	—	—	450	65	47	65	47	103S-AT⊗2-CA16C	**107S-AT⊗3-CA16C**
0.16…0.25	—	—	—	—	450	65	47	65	47	103S-AT⊗2-CA25C	**107S-AT⊗3-CA25C**
0.25…0.40	—	—	—	—	450	65	47	65	47	103S-AT⊗2-CA40C	**107S-AT⊗3-CA40C**
0.40…0.63	—	—	—	—	450	65	47	65	47	103S-AT⊗2-CA63C	**107S-AT⊗3-CA63C**
0.63…1.00	—	—	1/2	3/4	450	65	47	65	47	103S-AT⊗2-CB10C	107S-AT⊗3-CB10C
1.00…1.60	—	—	1/2…1	3/4…1	450	65	47	65	47	103S-AT⊗2-CB16C	107S-AT⊗3-CB16C
1.60…2.50	1/2	1/2…3/4	3/4…1-1/2	1…2	450	65	30	65	10	103S-AT⊗2-CB25C	107S-AT⊗3-CB25C
2.50…4.00	1/2…1	3/4…1	1-1/2…3	2…3	450	65	30	50	—	103S-AT⊗2-CB40C	107S-AT⊗3-CB40C
4.00…6.30	1…1-1/2	1…2	3…5	5	450	65	30	50	—	**103S-AT⊗2-CB63C**	107S-AT⊗3-CB63C
6.30…9.00	1-1/2…2	2	5	7-1/2	450	65	30	50	—	103S-AT⊗2-CC10C	107S-AT⊗3-CC10C
6.30…10.0	1-1/2…3	2…3	5…7-1/2	7-1/2…10	450	65	30	50	—	**103S-BT⊗2-CC10C**	**107S-BT⊗3-CC10C**
10.0…12.0	3	3	7-1/2	10	450	30	30	—	—	**103S-BT⊗2-CC16C**	**107S-BT⊗3-CC16C**
10.0…16.0	3…5	5	7-1/2…10	10	450	30	30	—	—	**103S-CT⊗2-CC16C**	**107S-CT⊗3-CC16C**
10.0…16.0	3…5	5	7-1/2…10	10…15	450	30	30	—	—	**103S-DT⊗2-CC16C**	**107S-DT⊗3-CC16C**
14.5…20.0	5	5…7-1/2	15	15	450	30	30	—	—	103S-DT⊗2-CC20C	**107S-DT⊗3-CC20C**
18.0…23.0	5	7-1/2	15	15	450	30	30	—	—	**103S-DT⊗2-CC25C**	**107S-DT⊗3-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-AT⊗2-DB25C**	**107S-AT⊗3-DB25C**
1.60…2.50	1/2	1/2…3/4	3/4…1-1/2	1…2	450	65	30	65	30	103S-DT⊗2-DB25C	**107S-DT⊗3-DB25C**
2.50…4.00	1/2…1	3/4…1	1-1/2…3	2…3	450	65	30	65	—	**103S-AT⊗2-DB40C**	**107S-AT⊗3-DB40C**
2.50…4.00	1/2…1	3/4…1	1-1/2…3	2…3	450	65	30	65	30	103S-DT⊗2-DB40C	**107S-DT⊗3-DB40C**
4.00…6.30	1…1-1/2	1…2	3…5	5	450	65	30	65	—	103S-AT⊗2-DB63C	**107S-AT⊗3-DB63C**
4.00…6.30	1…1-1/2	1…2	3…5	5	450	65	30	65	30	**103S-ET⊗3-DB63C**	**107S-ET⊗3-DB63C**
6.30…9.00	1-1/2…2	2	5	7-1/2	450	65	30	65	—	**103S-AT⊗2-DC10C**	**107S-AT⊗3-DC10C**
6.30…10.0	1-1/2…3	2…3	5…7-1/2	7-1/2…10	450	65	30	65	—	**103S-BT⊗2-DC10C**	**107S-BT⊗3-DC10C**
6.30…10.0	1-1/2…3	2…3	5…7-1/2	7-1/2…10	450	65	30	65	—	**103S-CT⊗2-DC10C**	**107S-CT⊗3-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-ET⊗3-DC10C**	**107S-ET⊗3-DC10C**
10.0…12.0	3	3	7-1/2	10	450	65	30	65	—	**103S-BT⊗2-DC16C**	**107S-BT⊗3-DC16C**
10.0…16.0	3…5	5	7-1/2…10	10	450	65	30	65	—	**103S-CT⊗2-DC16C**	**107S-CT⊗3-DC16C**
10.0…16.0	3…5	5	7-1/2…10	10…15	450	65	30	65	—	103S-DT⊗2-DC16C	**107S-DT⊗3-DC16C**
10.0…16.0	3…5	5	7-1/2…10	10…15	450	65	30	65	30	**103S-ET⊗3-DC16C**	**107S-ET⊗3-DC16C**
14.5…20.0	5	5…7-1/2	15	15	450	65	30	65	—	**103S-DT⊗2-DC20C**	**107S-DT⊗3-DC20C**
14.5…20.0	5	5…7-1/2	15	20	450	65	30	65	—	**103S-ET⊗3-DC20C**	**107S-ET⊗3-DC20C**
18.0…23.0	5	7-1/2	15	15	450	65	30	65	—	**103S-DT⊗2-DC25C**	**107S-DT⊗3-DC25C**
18.0…25.0	7-1/2	7-1/2…10	15…20	20	450	65	30	65	—	**103S-ET⊗3-DC25C**	**107S-ET⊗3-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-ET⊗3-FC10C**	**107S-ET⊗3-FC10C**
10.0…16.0	3…5	5	7-1/2…10	10…15	600	65	30	65	30	**103S-ET⊗3-FC16C**	**107S-ET⊗3-FC16C**
14.5…20.0	5	5…7-1/2	15	15…20	600	65	30	65	30	**103S-ET⊗3-FC20C**	**107S-ET⊗3-FC20C**
18.0…25.0	7-1/2	7-1/2…10	15…20	20	600	65	30	65	30	**103S-ET⊗3-FC25C**	**107S-ET⊗3-FC25C**
18.0…25.0	7-1/2	7-1/2…10	15…20	20…25	600	65	30	65	30	**103S-GT⊗3-FC25C**	**107S-GT⊗3-FC25C**
23.0…30.0	7-1/2	10	20	25	600	65	30	65	30	**103S-ET⊗3-FC32C**	107S-ET⊗3-FC32C
23.0…32.0	7-1/2…10	10	20…25	30	600	65	30	65	30	**103S-FT⊗3-FC32C**	**107S-FT⊗3-FC32C**
23.0…32.0	7-1/2…10	10	20…25	30	600	65	30	65	30	**103S-GT⊗3-FC32C**	**107S-GT⊗3-FC32C**
23.0…32.0	7-1/2…10	10	20…25	30	600	65	30	65	30	**103S-HT⊗3-FC32C**	**107S-HT⊗3-FC32C**
32.0…37.0	10	10	25	30	600	65	18	65	10	**103S-FT⊗3-FC45C**	**107S-FT⊗3-FC45C**
32.0…43.0	10	15	30	30	600	65	18	65	10	**103S-GT⊗3-FC45C**	**107S-GT⊗3-FC45C**
32.0…45.0	10	15	30	30…40	600	65	18	65	10	**103S-HT⊗3-FC45C**	**107S-HT⊗3-FC45C**
32.0…45.0	10	15	30	30…40	600	65	18	65	10	**103S-JT⊗3-FC45C**	**107S-JT⊗3-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-HT⊗3-GC63C	**107S-HT⊗3-GC63C**
40.0…63.0	15…20	15…20	30…40	40…60	1000	42	18	42	18	**103S-JT⊗3-GC63C**	**107S-JT⊗3-GC63C**
40.0…63.0	15…20	15…20	30…40	40…60	1000	42	18	42	18	**103S-KT⊗3-GC63C**	**107S-KT⊗3-GC63C**
63.0…72.0	20	25	50	60	1000	35	10	35	10	**103S-JT⊗3-GC90C**	**107S-JT⊗3-GC90C**
63.0…85.0	25	30	50…60	60	1000	35	10	35	10	**103S-KT⊗3-GC90C**	**107S-KT⊗3-GC90C**

∗ Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current and service factor.

⊗Coil voltage code—see page 2-267

2

Product Selection and Coordination Ratings, 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]				Cat. No.	Cat. No.
						Type 1 Coordination		Type 2 Coordination			
	200V AC	230V AC	460V AC	575V AC		480V AC	600V AC	480V AC	600V AC		
C-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules											
0.10...0.16	—	—	—	—	450	65	47	65	47	**103S-AS⊗2-CA16C**	**107S-AS⊗3-CA16C**
0.16...0.25	—	—	—	—	450	65	47	65	47	**103S-AS⊗2-CA25C**	**107S-AS⊗3-CA25C**
0.25...0.40	—	—	—	—	450	65	47	65	47	**103S-AS⊗2-CA40C**	**107S-AS⊗3-CA40C**
0.40...0.63	—	—	—	—	450	65	47	65	47	**103S-AS⊗2-CA63C**	**107S-AS⊗3-CA63C**
0.63...1.00	—	—	1/2	3/4	450	65	47	65	47	**103S-AS⊗2-CB10C**	**107S-AS⊗3-CB10C**
1.00...1.60	—	—	1/2...1	3/4...1	450	65	47	65	47	**103S-AS⊗2-CB16C**	**107S-AS⊗3-CB16C**
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	65	10	**103S-AS⊗2-CB25C**	**107S-AS⊗3-CB25C**
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	50	—	**103S-AS⊗2-CB40C**	**107S-AS⊗3-CB40C**
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	50	—	**103S-AS⊗2-CB63C**	**107S-AS⊗3-CB63C**
6.30...9.00	1-1/2...2	2	5	7-1/2	450	65	30	50	—	**103S-AS⊗2-CC10C**	**107S-AS⊗3-CC10C**
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	50	—	**103S-BS⊗2-CC10C**	**107S-BS⊗3-CC10C**
10.0...12.0	3	3	7-1/2	10	450	30	30	—	—	**103S-BS⊗2-CC16C**	**107S-BS⊗3-CC16C**
10.0...16.0	3...5	5	7-1/2...10	10	450	30	30	—	—	**103S-CS⊗2-CC16C**	**107S-CS⊗3-CC16C**
10.0...16.0	3...5	5	7-1/2...10	10...15	450	30	30	—	—	**103S-DS⊗2-CC16C**	**107S-DS⊗3-CC16C**
14.5...20.0	5	5...7-1/2	15	15	450	30	30	—	—	**103S-DS⊗2-CC20C**	**107S-DS⊗3-CC20C**
18.0...23.0	5	7-1/2	15	15	450	30	30	—	—	103S-DS⊗2-CC25C	**107S-DS⊗3-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-AS⊗2-DB25C**	**107S-AS⊗3-DB25C**
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	65	30	**103S-DS⊗2-DB25C**	**107S-DS⊗3-DB25C**
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	65	—	**103S-AS⊗2-DB40C**	**107S-AS⊗3-DB40C**
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	65	30	**103S-DS⊗2-DB40C**	**107S-DS⊗3-DB40C**
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	65	—	**103S-AS⊗2-DB63C**	**107S-AS⊗3-DB63C**
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	65	30	**103S-ES⊗3-DB63C**	**107S-ES⊗3-DB63C**
6.30...9.00	1-1/2...2	2	5	7-1/2	450	65	30	65	—	**103S-AS⊗2-DC10C**	**107S-AS⊗3-DC10C**
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	65	—	**103S-BS⊗2-DC10C**	**107S-BS⊗3-DC10C**
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	65	—	**103S-CS⊗2-DC10C**	**107S-CS⊗3-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-ES⊗3-DC10C**	**107S-ES⊗3-DC10C**
10.0...12.0	3	3	7-1/2	10	450	65	30	65	—	**103S-BS⊗2-DC16C**	**107S-BS⊗3-DC16C**
10.0...16.0	3...5	5	7-1/2...10	10	450	65	30	65	—	**103S-CS⊗2-DC16C**	**107S-CS⊗3-DC16C**
10.0...16.0	3...5	5	7-1/2...10	10...15	450	65	30	65	—	**103S-DS⊗2-DC16C**	**107S-DS⊗3-DC16C**
10.0...16.0	3...5	5	7-1/2...10	10...15	450	65	30	65	30	**103S-ES⊗3-DC16C**	**107S-ES⊗3-DC16C**
14.5...20.0	5	5...7-1/2	15	15	450	65	30	65	—	**103S-DS⊗2-DC20C**	**107S-DS⊗3-DC20C**
14.5...20.0	5	5...7-1/2	15	20	450	65	30	65	—	**103S-ES⊗3-DC20C**	**107S-ES⊗3-DC20C**
18.0...23.0	5	7-1/2	15	15	450	65	30	65	—	**103S-DS⊗2-DC25C**	**107S-DS⊗3-DC25C**
18.0...25.0	7-1/2	7-1/2...10	15...20	20	450	65	30	65	—	**103S-ES⊗3-DC25C**	**107S-ES⊗3-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-ES⊗3-FC10C**	**107S-ES⊗3-FC10C**
10.0...16.0	3...5	5	7-1/2...10	10...15	600	65	30	65	30	**103S-ES⊗3-FC16C**	**107S-ES⊗3-FC16C**
14.5...20.0	5	5...7-1/2	15	15...20	600	65	30	65	30	**103S-ES⊗3-FC20C**	**107S-ES⊗3-FC20C**
18.0...25.0	7-1/2	7-1/2...10	15...20	20	600	65	30	65	30	**103S-ES⊗3-FC25C**	**107S-ES⊗3-FC25C**
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	600	65	30	65	30	**103S-GS⊗3-FC25C**	**107S-GS⊗3-FC25C**
23.0...30.0	7-1/2	10	20	25	600	65	30	65	30	**103S-ES⊗3-FC32C**	**107S-ES⊗3-FC32C**
23.0...32.0	7-1/2...10	10	20...25	30	600	65	30	65	30	**103S-FS⊗3-FC32C**	**107S-FS⊗3-FC32C**
23.0...32.0	7-1/2...10	10	20...25	30	600	65	30	65	30	**103S-GS⊗3-FC32C**	**107S-GS⊗3-FC32C**
32.0...37.0	10	10	25	30	600	65	18	65	10	**103S-FS⊗3-FC45C**	**107S-FS⊗3-FC45C**
32.0...43.0	10	15	30	30	600	65	18	65	10	**103S-GS⊗3-FC45C**	**107S-GS⊗3-FC45C**

∗ Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current and service factor.

⊗Coil voltage code—see page 2-267

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Product Selection and Coordination Ratings, 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]				Cat. No.	Cat. No.
						Type 1 Coordination		Type 2 Coordination			
	200V AC	230V AC	460V AC	575V AC		480V AC	600V AC	480V AC	600V AC		
C-Frame with 100-C/104-C Contactors on Panel Mounting Modules											
0.10...0.16	—	—	—	—	450	65	47	65	47	**103S-AW⊗2-CA16C**	**107S-AW⊗3-CA16C**
0.16...0.25	—	—	—	—	450	65	47	65	47	**103S-AW⊗2-CA25C**	**107S-AW⊗3-CA25C**
0.25...0.40	—	—	—	—	450	65	47	65	47	**103S-AW⊗2-CA40C**	**107S-AW⊗3-CA40C**
0.40...0.63	—	—	—	—	450	65	47	65	47	**103S-AW⊗2-CA63C**	**107S-AW⊗3-CA63C**
0.63...1.00	—	—	1/2	3/4	450	65	47	65	47	103S-AW⊗2-CB10C	**107S-AW⊗3-CB10C**
1.00...1.60	—	—	1/2...1	3/4...1	450	65	47	65	47	103S-AW⊗2-CB16C	107S-AW⊗3-CB16C
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	65	10	103S-AW⊗2-CB25C	107S-AW⊗3-CB25C
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	50	—	103S-AW⊗2-CB40C	107S-AW⊗3-CB40C
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	50	—	103S-AW⊗2-CB63C	**107S-AW⊗3-CB63C**
6.30...9.00	1-1/2...2	2	5	7-1/2	450	65	30	50	—	103S-AW⊗2-CC10C	**107S-AW⊗3-CC10C**
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	50	—	**103S-BW⊗2-CC10C**	**107S-BW⊗3-CC10C**
10.0...12.0	3	3	7-1/2	10	450	30	30	—	—	103S-BW⊗2-CC16C	**107S-BW⊗3-CC16C**
10.0...16.0	3...5	5	7-1/2...10	10	450	30	30	—	—	103S-CW⊗2-CC16C	**107S-CW⊗3-CC16C**
10.0...16.0	3...5	5	7-1/2...10	10...15	450	30	30	—	—	**103S-DW⊗2-CC16C**	**107S-DW⊗3-CC16C**
14.5...20.0	5	5...7-1/2	15	15	450	30	30	—	—	103S-DW⊗2-CC20C	**107S-DW⊗3-CC20C**
18.0...23.0	5	7-1/2	15	15	450	30	30	—	—	**103S-DW⊗2-CC25C**	**107S-DW⊗3-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-AW⊗2-DB25C	**107S-AW⊗3-DB25C**
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	450	65	30	65	30	**103S-DW⊗2-DB25C**	**107S-DW⊗3-DB25C**
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	65	—	**103S-AW⊗2-DB40C**	**107S-AW⊗3-DB40C**
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	450	65	30	65	30	**103S-DW⊗2-DB40C**	**107S-DW⊗3-DB40C**
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	65	—	103S-AW⊗2-DB63C	**107S-AW⊗3-DB63C**
4.00...6.30	1...1-1/2	1...2	3...5	5	450	65	30	65	30	**103S-EW⊗3-DB63C**	**107S-EW⊗3-DB63C**
6.30...9.00	1-1/2...2	2	5	7-1/2	450	65	30	65	—	**103S-AW⊗2-DC10C**	107S-AW⊗3-DC10C
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	65	—	**103S-BW⊗2-DC10C**	**107S-BW⊗3-DC10C**
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	450	65	30	65	—	103S-CW⊗2-DC10C	**107S-CW⊗3-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-EW⊗3-DC10C**	**107S-EW⊗3-DC10C**
10.0...12.0	3	3	7-1/2	10	450	65	30	65	—	**103S-BW⊗2-DC16C**	**107S-BW⊗3-DC16C**
10.0...16.0	3...5	5	7-1/2...10	10	450	65	30	65	—	103S-CW⊗2-DC16C	**107S-CW⊗3-DC16C**
10.0...16.0	3...5	5	7-1/2...10	10...15	450	65	30	65	—	103S-DW⊗2-DC16C	**107S-DW⊗3-DC16C**
10.0...16.0	3...5	5	7-1/2...10	10...15	450	65	30	65	30	**103S-EW⊗3-DC16C**	**107S-EW⊗3-DC16C**
14.5...20.0	5	5...7-1/2	15	15	450	65	30	65	—	103S-DW⊗2-DC20C	**107S-DW⊗3-DC20C**
14.5...20.0	5	5...7-1/2	15	20	450	65	30	65	—	**103S-EW⊗3-DC20C**	**107S-EW⊗3-DC20C**
18.0...23.0	5	7-1/2	15	15	450	65	30	65	—	**103S-DW⊗2-DC25C**	**107S-DW⊗3-DC25C**
18.0...25.0	7-1/2	7-1/2...10	15...20	20	450	65	30	65	—	**103S-EW⊗3-DC25C**	**107S-EW⊗3-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-EW⊗3-FC10C**	**107S-EW⊗3-FC10C**
10.0...16.0	3...5	5	7-1/2...10	10...15	600	65	30	65	30	**103S-EW⊗3-FC16C**	**107S-EW⊗3-FC16C**
14.5...20.0	5	5...7-1/2	15	15...20	600	65	30	65	30	**103S-EW⊗3-FC20C**	**107S-EW⊗3-FC20C**
18.0...25.0	7-1/2	7-1/2...10	15...20	20	600	65	30	65	30	**103S-EW⊗3-FC25C**	**107S-EW⊗3-FC25C**
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	600	65	30	65	30	**103S-GW⊗3-FC25C**	**107S-GW⊗3-FC25C**
23.0...30.0	7-1/2	10	20	25	600	65	30	65	30	**103S-EW⊗3-FC32C**	**107S-EW⊗3-FC32C**
23.0...32.0	7-1/2...10	10	20...25	30	600	65	30	65	30	**103S-FW⊗3-FC32C**	**107S-FW⊗3-FC32C**
23.0...32.0	7-1/2...10	10	20...25	30	600	65	30	65	30	**103S-GW⊗3-FC32C**	**107S-GW⊗3-FC32C**
32.0...37.0	10	10	25	30	600	65	18	65	10	**103S-FW⊗3-FC45C**	**107S-FW⊗3-FC45C**
32.0...43.0	10	15	30	30	600	65	18	65	10	**103S-GW⊗3-FC45C**	107S-GW⊗3-FC45C

∗ Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current and service factor.

⊗Coil voltage code—see page 2-267

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Product Selection and Coordination Ratings, UL/CSA as a UL508 Type F Combination Motor Controller

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]				Cat. No.	Cat. No.
					Type 1 Coordination		Type 2 Coordination			
	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 Standard Bus Bar Modules										
0.10...0.16	—	—	—	—	65	47	65	47	**103S-AT⊗2-CA16C-TE**	**107S-AT⊗3-CA16C-TE**
0.16...0.25	—	—	—	—	65	47	65	47	**103S-AT⊗2-CA25C-TE**	**107S-AT⊗3-CA25C-TE**
0.25...0.40	—	—	—	—	65	47	65	47	**103S-AT⊗2-CA40C-TE**	**107S-AT⊗3-CA40C-TE**
0.40...0.63	—	—	—	—	65	47	65	47	**103S-AT⊗2-CA63C-TE**	**107S-AT⊗3-CA63C-TE**
0.63...1.00	—	—	1/2	3/4	65	47	65	47	**103S-AT⊗2-CB10C-TE**	**107S-AT⊗3-CB10C-TE**
1.00...1.60	—	—	1/2...1	3/4...1	65	47	65	47	**103S-AT⊗2-CB16C-TE**	**107S-AT⊗3-CB16C-TE**
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	10	**103S-AT⊗2-CB25C-TE**	**107S-AT⊗3-CB25C-TE**
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	—	—	**103S-AT⊗2-CB40C-TE**	**107S-AT⊗3-CB40C-TE**
4.00...6.30	1...1-1/2	1...2	3...5	—	65	❖	—	❖	103S-AT⊗2-CB63C-TE	**107S-AT⊗3-CB63C-TE**
6.30...9.00	1-1/2...2	2	5	—	65	❖	—	❖	103S-AT⊗2-CC10C-TE	**107S-AT⊗3-CC10C-TE**
6.30...10.0	1-1/2...3	2...3	5...7-1/2	—	65	❖	50	❖	**103S-BT⊗2-CC10C-TE**	**107S-BT⊗3-CC10C-TE**
10.0...12.0	3	3	7-1/2	—	30	❖	—	❖	**103S-BT⊗2-CC16C-TE**	**107S-BT⊗3-CC16C-TE**
10.0...16.0	3...5	5	7-1/2...10	—	30	❖	—	❖	**103S-CT⊗2-CC16C-TE**	**107S-CT⊗3-CC16C-TE**
10.0...16.0	3...5	5	7-1/2...10	—	30	❖	—	❖	**103S-DT⊗2-CC16C-TE**	**107S-DT⊗3-CC16C-TE**
14.5...20.0	5	5...7-1/2	15	—	10	❖	—	❖	**103S-DT⊗2-CC20C-TE**	**107S-DT⊗3-CC20C-TE**
18.0...23.0	—	—	—	—	❖	❖	❖	❖	**103S-DT⊗2-CC25C-TE**	**107S-DT⊗3-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-AT⊗2-DB25C-TE**	**107S-AT⊗3-DB25C-TE**
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	30	**103S-DT⊗2-DB25C-TE**	**107S-DT⊗3-DB25C-TE**
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	65	—	**103S-AT⊗2-DB40C-TE**	**107S-AT⊗3-DB40C-TE**
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	65	30	**103S-DT⊗2-DB40C-TE**	**107S-DT⊗3-DB40C-TE**
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	65	—	**103S-AT⊗2-DB63C-TE**	**107S-AT⊗3-DB63C-TE**
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	65	30	**103S-ET⊗3-DB63C-TE**	**107S-ET⊗3-DB63C-TE**
6.30...9.00	1-1/2...2	2	5	7-1/2	65	30	65	—	**103S-AT⊗2-DC10C-TE**	**107S-AT⊗3-DC10C-TE**
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	—	**103S-BT⊗2-DC10C-TE**	**107S-BT⊗3-DC10C-TE**
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	—	**103S-CT⊗2-DC10C-TE**	**107S-CT⊗3-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-ET⊗3-DC10C-TE**	**107S-ET⊗3-DC10C-TE**
10.0...12.0	3	3	7-1/2	10	65	30	65	—	**103S-BT⊗2-DC16C-TE**	**107S-BT⊗3-DC16C-TE**
10.0...16.0	3...5	5	7-1/2...10	10	65	30	65	—	**103S-CT⊗2-DC16C-TE**	**107S-CT⊗3-DC16C-TE**
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	—	**103S-DT⊗2-DC16C-TE**	**107S-DT⊗3-DC16C-TE**
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	30	**103S-ET⊗3-DC16C-TE**	**107S-ET⊗3-DC16C-TE**
14.5...20.0	5	5...7-1/2	15	—	65	❖	65	❖	103S-DT⊗2-DC20C-TE	**107S-DT⊗3-DC20C-TE**
14.5...20.0	5	5...7-1/2	15	—	65	❖	65	❖	**103S-ET⊗3-DC20C-TE**	**107S-ET⊗3-DC20C-TE**
18.0...23.0	5	7-1/2	15	—	65	❖	65	❖	**103S-DT⊗2-DC25C-TE**	**107S-DT⊗3-DC25C-TE**
18.0...25.0	7-1/2	7-1/2...10	15...20	—	65	❖	65	❖	**103S-ET⊗3-DC25C-TE**	**107S-ET⊗3-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-ET⊗3-FC10C-TE**	**107S-ET⊗3-FC10C-TE**
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	30	**103S-ET⊗3-FC16C-TE**	**107S-ET⊗3-FC16C-TE**
14.5...20.0	5	5...7-1/2	15	15...20	65	30	65	30	**103S-ET⊗3-FC20C-TE**	**107S-ET⊗3-FC20C-TE**
18.0...25.0	7-1/2	7-1/2...10	15...20	20	65	30	65	30	**103S-ET⊗3-FC25C-TE**	**107S-ET⊗3-FC25C-TE**
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	65	30	65	30	**103S-GT⊗3-FC25C-TE**	**107S-GT⊗3-FC25C-TE**
23.0...30.0	7-1/2	10	20	25	65	30	65	30	103S-ET⊗3-FC32C-TE	**107S-ET⊗3-FC32C-TE**
23.0...32.0	7-1/2...10	10	20...25	30	65	30	65	30	**103S-FT⊗3-FC32C-TE**	**107S-FT⊗3-FC32C-TE**
23.0...32.0	7-1/2...10	10	20...25	30	65	30	65	30	**103S-GT⊗3-FC32C-TE**	**107S-GT⊗3-FC32C-TE**
23.0...32.0	7-1/2...10	10	20...25	30	65	30	65	30	**103S-HT⊗3-FC32C-TE**	**107S-HT⊗3-FC32C-TE**
32.0...37.0	10	10	25	—	65	❖	65	❖	103S-FT⊗3-FC45C-TE	**107S-FT⊗3-FC45C-TE**
32.0...43.0	10	15	30	—	65	❖	65	❖	**103S-GT⊗3-FC45C-TE**	**107S-GT⊗3-FC45C-TE**
32.0...45.0	10	15	30	—	65	❖	65	❖	**103S-HT⊗3-FC45C-TE**	**107S-HT⊗3-FC45C-TE**
32.0...45.0	10	15	30	—	65	❖	65	❖	**103S-JT⊗3-FC45C-TE**	**107S-JT⊗3-FC45C-TE**

✶ Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current and service factor.

❖ This starter is not valid for application at this horsepower and voltage.

⊗Coil voltage code—see page 2-267

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Product Selection and 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]				Cat. No.	Cat. No.
					Type 1 Coordination		Type 2 Coordination			
	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-AS⊗2-CA16C-TE**	**107S-AS⊗3-CA16C-TE**
0.16...0.25	—	—	—	—	65	47	65	47	**103S-AS⊗2-CA25C-TE**	**107S-AS⊗3-CA25C-TE**
0.25...0.40	—	—	—	—	65	47	65	47	**103S-AS⊗2-CA40C-TE**	**107S-AS⊗3-CA40C-TE**
0.40...0.63	—	—	—	—	65	47	65	47	**103S-AS⊗2-CA63C-TE**	**107S-AS⊗3-CA63C-TE**
0.63...1.00	—	—	1/2	3/4	65	47	65	47	**103S-AS⊗2-CB10C-TE**	**107S-AS⊗3-CB10C-TE**
1.00...1.60	—	—	1/2...1	3/4...1	65	47	65	47	**103S-AS⊗2-CB16C-TE**	**107S-AS⊗3-CB16C-TE**
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	10	**103S-AS⊗2-CB25C-TE**	**107S-AS⊗3-CB25C-TE**
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	—	—	**103S-AS⊗2-CB40C-TE**	**107S-AS⊗3-CB40C-TE**
4.00...6.30	1...1-1/2	1...2	3...5	—	65	❖	—	❖	**103S-AS⊗2-CB63C-TE**	**107S-AS⊗3-CB63C-TE**
6.30...9.00	1-1/2...2	2	5	—	65	❖	—	❖	**103S-AS⊗2-CC10C-TE**	**107S-AS⊗3-CC10C-TE**
6.30...10.0	1-1/2...3	2...3	5...7-1/2	—	65	❖	50	❖	**103S-BS⊗2-CC10C-TE**	**107S-BS⊗3-CC10C-TE**
10.0...12.0	3	3	7-1/2	—	30	❖	—	❖	**103S-BS⊗2-CC16C-TE**	**107S-BS⊗3-CC16C-TE**
10.0...16.0	3...5	5	7-1/2...10	—	30	❖	—	❖	**103S-CS⊗2-CC16C-TE**	**107S-CS⊗3-CC16C-TE**
10.0...16.0	3...5	5	7-1/2...10	—	30	❖	—	❖	**103S-DS⊗2-CC16C-TE**	**107S-DS⊗3-CC16C-TE**
14.5...20.0	5	5...7-1/2	15	—	10	❖	—	❖	**103S-DS⊗2-CC20C-TE**	**107S-DS⊗3-CC20C-TE**
18.0...23.0	—	—	—	—	❖	❖	❖	❖	**103S-DS⊗2-CC25C-TE**	**107S-DS⊗3-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-AS⊗2-DB25C-TE**	**107S-AS⊗3-DB25C-TE**
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	30	**103S-DS⊗2-DB25C-TE**	**107S-DS⊗3-DB25C-TE**
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	65	—	**103S-AS⊗2-DB40C-TE**	**107S-AS⊗3-DB40C-TE**
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	65	30	**103S-DS⊗2-DB40C-TE**	**107S-DS⊗3-DB40C-TE**
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	65	—	**103S-AS⊗2-DB63C-TE**	**107S-AS⊗3-DB63C-TE**
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	65	30	**103S-ES⊗3-DB63C-TE**	**107S-ES⊗3-DB63C-TE**
6.30...9.00	1-1/2...2	2	5	7-1/2	65	30	65	—	**103S-AS⊗2-DC10C-TE**	**107S-AS⊗3-DC10C-TE**
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	—	**103S-BS⊗2-DC10C-TE**	**107S-BS⊗3-DC10C-TE**
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	—	**103S-CS⊗2-DC10C-TE**	**107S-CS⊗3-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-ES⊗3-DC10C-TE**	**107S-ES⊗3-DC10C-TE**
10.0...12.0	3	3	7-1/2	10	65	30	65	—	**103S-BS⊗2-DC16C-TE**	**107S-BS⊗3-DC16C-TE**
10.0...16.0	3...5	5	7-1/2...10	10	65	30	65	—	**103S-CS⊗2-DC16C-TE**	**107S-CS⊗3-DC16C-TE**
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	—	**103S-DS⊗2-DC16C-TE**	**107S-DS⊗3-DC16C-TE**
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	30	**103S-ES⊗3-DC16C-TE**	**107S-ES⊗3-DC16C-TE**
14.5...20.0	5	5...7-1/2	15	—	65	❖	65	❖	**103S-DS⊗2-DC20C-TE**	**107S-DS⊗3-DC20C-TE**
14.5...20.0	5	5...7-1/2	15	—	65	❖	65	❖	**103S-ES⊗3-DC20C-TE**	**107S-ES⊗3-DC20C-TE**
18.0...23.0	5	7-1/2	15	—	65	❖	65	❖	**103S-DS⊗2-DC25C-TE**	**107S-DS⊗3-DC25C-TE**
18.0...25.0	7-1/2	7-1/2...10	15...20	—	65	❖	65	❖	**103S-ES⊗3-DC25C-TE**	**107S-ES⊗3-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-ES⊗3-FC10C-TE**	**107S-ES⊗3-FC10C-TE**
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	30	**103S-ES⊗3-FC16C-TE**	**107S-ES⊗3-FC16C-TE**
14.5...20.0	5	5...7-1/2	15	15...20	65	30	65	30	**103S-ES⊗3-FC20C-TE**	**107S-ES⊗3-FC20C-TE**
18.0...25.0	7-1/2	7-1/2...10	15...20	20	65	30	65	30	**103S-ES⊗3-FC25C-TE**	**107S-ES⊗3-FC25C-TE**
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	65	30	65	30	**103S-GS⊗3-FC25C-TE**	**107S-GS⊗3-FC25C-TE**
23.0...30.0	7-1/2	10	20	25	65	30	65	30	**103S-ES⊗3-FC32C-TE**	**107S-ES⊗3-FC32C-TE**
23.0...32.0	7-1/2...10	10	20...25	30	65	30	65	30	**103S-FS⊗3-FC32C-TE**	**107S-FS⊗3-FC32C-TE**
23.0...32.0	7-1/2...10	10	20...25	30	65	30	65	30	**103S-GS⊗3-FC32C-TE**	**107S-GS⊗3-FC32C-TE**
32.0...37.0	10	10	25	—	65	❖	65	❖	**103S-FS⊗3-FC45C-TE**	**107S-FS⊗3-FC45C-TE**
32.0...43.0	10	15	30	—	65	❖	65	❖	**103S-GS⊗3-FC45C-TE**	**107S-GS⊗3-FC45C-TE**

✶ Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current and service factor.

❖ This starter is not valid for application at this horsepower and voltage.

⊗Coil voltage code—see page 2-267

Product Selection and 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]				Cat. No.	Cat. No.
					Type 1 Coordination		Type 2 Coordination			
	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 Panel Mounting Modules										
0.10...0.16	—	—	—	—	65	47	65	47	**103S-AW⊗2-CA16C-TE**	**107S-AW⊗3-CA16C-TE**
0.16...0.25	—	—	—	—	65	47	65	47	**103S-AW⊗2-CA25C-TE**	**107S-AW⊗3-CA25C-TE**
0.25...0.40	—	—	—	—	65	47	65	47	**103S-AW⊗2-CA40C-TE**	**107S-AW⊗3-CA40C-TE**
0.40...0.63	—	—	—	—	65	47	65	47	**103S-AW⊗2-CA63C-TE**	**107S-AW⊗3-CA63C-TE**
0.63...1.00	—	—	1/2	3/4	65	47	65	47	**103S-AW⊗2-CB10C-TE**	**107S-AW⊗3-CB10C-TE**
1.00...1.60	—	—	1/2...1	3/4...1	65	47	65	47	**103S-AW⊗2-CB16C-TE**	**107S-AW⊗3-CB16C-TE**
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	10	**103S-AW⊗2-CB25C-TE**	**107S-AW⊗3-CB25C-TE**
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	—	—	**103S-AW⊗2-CB40C-TE**	**107S-AW⊗3-CB40C-TE**
4.00...6.30	1...1-1/2	1...2	3...5	—	65	❖	—	❖	**103S-AW⊗2-CB63C-TE**	**107S-AW⊗3-CB63C-TE**
6.30...9.00	1-1/2...2	2	5	—	65	❖	—	❖	**103S-AW⊗2-CC10C-TE**	**107S-AW⊗3-CC10C-TE**
6.30...10.0	1-1/2...3	2...3	5...7-1/2	—	65	❖	50	❖	**103S-BW⊗2-CC10C-TE**	**107S-BW⊗3-CC10C-TE**
10.0...12.0	3	3	7-1/2	—	30	❖	—	❖	**103S-BW⊗2-CC16C-TE**	**107S-BW⊗3-CC16C-TE**
10.0...16.0	3...5	5	7-1/2...10	—	30	❖	—	❖	**103S-CW⊗2-CC16C-TE**	**107S-CW⊗3-CC16C-TE**
10.0...16.0	3...5	5	7-1/2...10	—	30	❖	—	❖	**103S-DW⊗2-CC16C-TE**	**107S-DW⊗3-CC16C-TE**
14.5...20.0	5	5...7-1/2	15	—	10	❖	—	❖	**103S-DW⊗2-CC20C-TE**	**107S-DW⊗3-CC20C-TE**
18.0...23.0	—	—	—	—	❖	❖	❖	❖	**103S-DW⊗2-CC25C-TE**	**107S-DW⊗3-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-AW⊗2-DB25C-TE**	**107S-AW⊗3-DB25C-TE**
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	65	30	**103S-DW⊗2-DB25C-TE**	**107S-DW⊗3-DB25C-TE**
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	65	—	**103S-AW⊗2-DB40C-TE**	**107S-AW⊗3-DB40C-TE**
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	65	30	**103S-DW⊗2-DB40C-TE**	**107S-DW⊗3-DB40C-TE**
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	65	—	**103S-AW⊗2-DB63C-TE**	**107S-AW⊗3-DB63C-TE**
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	65	30	**103S-EW⊗3-DB63C-TE**	**107S-EW⊗3-DB63C-TE**
6.30...9.00	1-1/2...2	2	5	7-1/2	65	30	65	—	**103S-AW⊗2-DC10C-TE**	**107S-AW⊗3-DC10C-TE**
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	—	**103S-BW⊗2-DC10C-TE**	**107S-BW⊗3-DC10C-TE**
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	65	—	**103S-CW⊗2-DC10C-TE**	**107S-CW⊗3-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-EW⊗3-DC10C-TE**	**107S-EW⊗3-DC10C-TE**
10.0...12.0	3	3	7-1/2	10	65	30	65	—	**103S-BW⊗2-DC16C-TE**	**107S-BW⊗3-DC16C-TE**
10.0...16.0	3...5	5	7-1/2...10	10	65	30	65	—	**103S-CW⊗2-DC16C-TE**	**107S-CW⊗3-DC16C-TE**
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	—	**103S-DW⊗2-DC16C-TE**	**107S-DW⊗3-DC16C-TE**
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	30	**103S-EW⊗3-DC16C-TE**	**107S-EW⊗3-DC16C-TE**
14.5...20.0	5	5...7-1/2	15	—	65	❖	65	❖	**103S-DW⊗2-DC20C-TE**	**107S-DW⊗3-DC20C-TE**
14.5...20.0	5	5...7-1/2	15	—	65	❖	65	❖	**103S-EW⊗3-DC20C-TE**	**107S-EW⊗3-DC20C-TE**
18.0...23.0	5	7-1/2	15	—	65	❖	65	❖	**103S-DW⊗2-DC25C-TE**	**107S-DW⊗3-DC25C-TE**
18.0...25.0	7-1/2	7-1/2...10	15...20	—	65	❖	65	❖	**103S-EW⊗3-DC25C-TE**	**107S-EW⊗3-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-EW⊗3-FC10C-TE**	**107S-EW⊗3-FC10C-TE**
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	65	30	**103S-EW⊗3-FC16C-TE**	**107S-EW⊗3-FC16C-TE**
14.5...20.0	5	5...7-1/2	15	15...20	65	30	65	30	**103S-EW⊗3-FC20C-TE**	**107S-EW⊗3-FC20C-TE**
18.0...25.0	7-1/2	7-1/2...10	15...20	20	65	30	65	30	**103S-EW⊗3-FC25C-TE**	**107S-EW⊗3-FC25C-TE**
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	65	30	65	30	**103S-GW⊗3-FC25C-TE**	**107S-GW⊗3-FC25C-TE**
23.0...30.0	7-1/2	10	20	25	65	30	65	30	**103S-EW⊗3-FC32C-TE**	**107S-EW⊗3-FC32C-TE**
23.0...32.0	7-1/2...10	10	20...25	30	65	30	65	30	**103S-FW⊗3-FC32C-TE**	**107S-FW⊗3-FC32C-TE**
23.0...32.0	7-1/2...10	10	20...25	30	65	30	65	30	**103S-GW⊗3-FC32C-TE**	**107S-GW⊗3-FC32C-TE**
32.0...37.0	10	10	25	—	65	❖	65	❖	**103S-FW⊗3-FC45C-TE**	**107S-FW⊗3-FC45C-TE**
32.0...43.0	10	15	30	—	65	❖	65	❖	**103S-GW⊗3-FC45C-TE**	**107S-GW⊗3-FC45C-TE**

✶ Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current and service factor.
❖ This starter is not valid for application at this horsepower and voltage.
⊗Coil voltage code—see page 2-267

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)						DOL Starters	Reversing Starters
	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	Cat. No.	Cat. No.
C-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules								
0.10...0.16	—	—	—	—	65	47	**103S-AT⊗2-CA16C-TE**	**107S-AT⊗3-CA16C-TE**
0.16...0.25	—	—	—	—	65	47	**103S-AT⊗2-CA25C-TE**	**107S-AT⊗3-CA25C-TE**
0.25...0.40	—	—	—	—	65	47	**103S-AT⊗2-CA40C-TE**	**107S-AT⊗3-CA40C-TE**
0.40...0.63	—	—	—	—	65	47	**103S-AT⊗2-CA63C-TE**	**107S-AT⊗3-CA63C-TE**
0.63...1.00	—	—	1/2	3/4	65	47	**103S-AT⊗2-CB10C-TE**	**107S-AT⊗3-CB10C-TE**
1.00...1.60	—	—	1/2...1	3/4...1	65	47	**103S-AT⊗2-CB16C-TE**	**107S-AT⊗3-CB16C-TE**
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	—	65	❖	**103S-AT⊗2-CB25C-TE**	**107S-AT⊗3-CB25C-TE**
2.50...4.00	—	—	—	—	❖	❖	**103S-AT⊗2-CB40C-TE**	**107S-AT⊗3-CB40C-TE**
4.00...6.30	—	—	—	—	❖	❖	103S-AT⊗2-CB63C-TE	**107S-AT⊗3-CB63C-TE**
6.30...9.00	—	—	—	—	❖	❖	103S-AT⊗2-CC10C-TE	**107S-AT⊗3-CC10C-TE**
6.30...10.0	—	—	—	—	❖	❖	**103S-BT⊗2-CC10C-TE**	**107S-BT⊗3-CC10C-TE**
10.0...12.0	—	—	—	—	❖	❖	**103S-BT⊗2-CC16C-TE**	**107S-BT⊗3-CC16C-TE**
10.0...16.0	—	—	—	—	❖	❖	**103S-CT⊗2-CC16C-TE**	**107S-CT⊗3-CC16C-TE**
10.0...16.0	—	—	—	—	❖	❖	**103S-DT⊗2-CC16C-TE**	**107S-DT⊗3-CC16C-TE**
14.5...20.0	—	—	—	—	❖	❖	**103S-DT⊗2-CC20C-TE**	**107S-DT⊗3-CC20C-TE**
18.0...23.0	—	—	—	—	❖	❖	**103S-DT⊗2-CC25C-TE**	**107S-DT⊗3-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-AT⊗2-DB25C-TE**	**107S-AT⊗3-DB25C-TE**
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	**103S-DT⊗2-DB25C-TE**	**107S-DT⊗3-DB25C-TE**
2.50...4.00	—	—	—	—	❖	❖	**103S-AT⊗2-DB40C-TE**	**107S-AT⊗3-DB40C-TE**
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	**103S-DT⊗2-DB40C-TE**	**107S-DT⊗3-DB40C-TE**
4.00...6.30	—	—	—	—	❖	❖	**103S-AT⊗2-DB63C-TE**	**107S-AT⊗3-DB63C-TE**
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	**103S-ET⊗3-DB63C-TE**	**107S-ET⊗3-DB63C-TE**
6.30...9.00	—	—	—	—	❖	❖	**103S-AT⊗2-DC10C-TE**	**107S-AT⊗3-DC10C-TE**
6.30...10.0	—	—	—	—	❖	❖	**103S-BT⊗2-DC10C-TE**	**107S-BT⊗3-DC10C-TE**
6.30...10.0	—	—	—	—	❖	❖	**103S-CT⊗2-DC10C-TE**	**107S-CT⊗3-DC10C-TE**
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	**103S-ET⊗3-DC10C-TE**	**107S-ET⊗3-DC10C-TE**
10.0...12.0	—	—	—	—	❖	❖	**103S-BT⊗2-DC16C-TE**	**107S-BT⊗3-DC16C-TE**
10.0...16.0	—	—	—	—	❖	❖	**103S-CT⊗2-DC16C-TE**	**107S-CT⊗3-DC16C-TE**
10.0...16.0	—	—	—	—	❖	❖	**103S-DT⊗2-DC16C-TE**	**107S-DT⊗3-DC16C-TE**
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	**103S-ET⊗3-DC16C-TE**	**107S-ET⊗3-DC16C-TE**
14.5...20.0	—	—	—	—	❖	❖	103S-DT⊗2-DC20C-TE	**107S-DT⊗3-DC20C-TE**
14.5...20.0	5	5...7-1/2	15	—	65	❖	**103S-ET⊗3-DC20C-TE**	**107S-ET⊗3-DC20C-TE**
18.0...23.0	—	—	—	—	❖	❖	**103S-DT⊗2-DC25C-TE**	**107S-DT⊗3-DC25C-TE**
18.0...25.0	7-1/2	7-1/2...10	15...20	—	65	❖	**103S-ET⊗3-DC25C-TE**	**107S-ET⊗3-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-ET⊗3-FC10C-TE**	**107S-ET⊗3-FC10C-TE**
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	**103S-ET⊗3-FC16C-TE**	**107S-ET⊗3-FC16C-TE**
14.5...20.0	5	5...7-1/2	15	15...20	65	30	**103S-ET⊗3-FC20C-TE**	**107S-ET⊗3-FC20C-TE**
18.0...25.0	7-1/2	7-1/2...10	15...20	20	65	30	**103S-ET⊗3-FC25C-TE**	**107S-ET⊗3-FC25C-TE**
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	65	30	**103S-GT⊗3-FC25C-TE**	**107S-GT⊗3-FC25C-TE**
23.0...30.0	7-1/2	10	20	25	65	30	103S-ET⊗3-FC32C-TE	**107S-ET⊗3-FC32C-TE**
23.0...32.0	7-1/2...10	10	20...25	30	65	30	**103S-FT⊗3-FC32C-TE**	**107S-FT⊗3-FC32C-TE**
23.0...32.0	7-1/2...10	10	20...25	30	65	30	**103S-GT⊗3-FC32C-TE**	**107S-GT⊗3-FC32C-TE**
23.0...32.0	7-1/2...10	10	20...25	30	65	30	**103S-HT⊗3-FC32C-TE**	**107S-HT⊗3-FC32C-TE**
32.0...37.0	10	10	25	—	65	❖	103S-FT⊗3-FC45C-TE	**107S-FT⊗3-FC45C-TE**
32.0...43.0	10	15	30	—	65	❖	**103S-GT⊗3-FC45C-TE**	**107S-GT⊗3-FC45C-TE**
32.0...45.0	10	15	30	—	65	❖	**103S-HT⊗3-FC45C-TE**	**107S-HT⊗3-FC45C-TE**
32.0...45.0	10	15	30	—	65	❖	**103S-JT⊗3-FC45C-TE**	**107S-JT⊗3-FC45C-TE**

✶ Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current and service factor.
❖ This starter is not valid for application at this horsepower and voltage.
⊗Coil voltage code—see page 2-267

Product Selection and 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	Reversing Starters
	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	Cat. No.	Cat. No.
C-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules								
0.10...0.16	—	—	—	—	65	47	**103S-AS⊗2-CA16C-TE**	**107S-AS⊗3-CA16C-TE**
0.16...0.25	—	—	—	—	65	47	**103S-AS⊗2-CA25C-TE**	**107S-AS⊗3-CA25C-TE**
0.25...0.40	—	—	—	—	65	47	**103S-AS⊗2-CA40C-TE**	**107S-AS⊗3-CA40C-TE**
0.40...0.63	—	—	—	—	65	47	**103S-AS⊗2-CA63C-TE**	**107S-AS⊗3-CA63C-TE**
0.63...1.00	—	—	1/2	3/4	65	47	**103S-AS⊗2-CB10C-TE**	**107S-AS⊗3-CB10C-TE**
1.00...1.60	—	—	1/2...1	3/4...1	65	47	**103S-AS⊗2-CB16C-TE**	**107S-AS⊗3-CB16C-TE**
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	—	65	❖	**103S-AS⊗2-CB25C-TE**	**107S-AS⊗3-CB25C-TE**
2.50...4.00	—	—	—	—	❖	❖	**103S-AS⊗2-CB40C-TE**	**107S-AS⊗3-CB40C-TE**
4.00...6.30	—	—	—	—	❖	❖	**103S-AS⊗2-CB63C-TE**	**107S-AS⊗3-CB63C-TE**
6.30...9.00	—	—	—	—	❖	❖	**103S-AS⊗2-CC10C-TE**	**107S-AS⊗3-CC10C-TE**
6.30...10.0	—	—	—	—	❖	❖	**103S-BS⊗2-CC10C-TE**	**107S-BS⊗3-CC10C-TE**
10.0...12.0	—	—	—	—	❖	❖	**103S-BS⊗2-CC16C-TE**	**107S-BS⊗3-CC16C-TE**
10.0...16.0	—	—	—	—	❖	❖	**103S-CS⊗2-CC16C-TE**	**107S-CS⊗3-CC16C-TE**
10.0...16.0	—	—	—	—	❖	❖	**103S-DS⊗2-CC16C-TE**	**107S-DS⊗3-CC16C-TE**
14.5...20.0	—	—	—	—	❖	❖	**103S-DS⊗2-CC20C-TE**	**107S-DS⊗3-CC20C-TE**
18.0...23.0	—	—	—	—	❖	❖	**103S-DS⊗2-CC25C-TE**	**107S-DS⊗3-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-AS⊗2-DB25C-TE**	**107S-AS⊗3-DB25C-TE**
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	**103S-DS⊗2-DB25C-TE**	**107S-DS⊗3-DB25C-TE**
2.50...4.00	—	—	—	—	❖	❖	**103S-AS⊗2-DB40C-TE**	**107S-AS⊗3-DB40C-TE**
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	**103S-DS⊗2-DB40C-TE**	**107S-DS⊗3-DB40C-TE**
4.00...6.30	—	—	—	—	❖	❖	**103S-AS⊗2-DB63C-TE**	**107S-AS⊗3-DB63C-TE**
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	**103S-ES⊗3-DB63C-TE**	**107S-ES⊗3-DB63C-TE**
6.30...9.00	—	—	—	—	❖	❖	**103S-AS⊗2-DC10C-TE**	**107S-AS⊗3-DC10C-TE**
6.30...10.0	—	—	—	—	❖	❖	**103S-BS⊗2-DC10C-TE**	**107S-BS⊗3-DC10C-TE**
6.30...10.0	—	—	—	—	❖	❖	**103S-CS⊗2-DC10C-TE**	**107S-CS⊗3-DC10C-TE**
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	**103S-ES⊗3-DC10C-TE**	**107S-ES⊗3-DC10C-TE**
10.0...12.0	—	—	—	—	❖	❖	**103S-BS⊗2-DC16C-TE**	**107S-BS⊗3-DC16C-TE**
10.0...16.0	—	—	—	—	❖	❖	**103S-CS⊗2-DC16C-TE**	**107S-CS⊗3-DC16C-TE**
10.0...16.0	—	—	—	—	❖	❖	**103S-DS⊗2-DC16C-TE**	**107S-DS⊗3-DC16C-TE**
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	**103S-ES⊗3-DC16C-TE**	**107S-ES⊗3-DC16C-TE**
14.5...20.0	—	—	—	—	❖	❖	**103S-DS⊗2-DC20C-TE**	**107S-DS⊗3-DC20C-TE**
14.5...20.0	5	5...7-1/2	15	—	65	❖	**103S-ES⊗3-DC20C-TE**	**107S-ES⊗3-DC20C-TE**
18.0...23.0	—	—	—	—	❖	❖	**103S-DS⊗2-DC25C-TE**	**107S-DS⊗3-DC25C-TE**
18.0...25.0	7-1/2	7-1/2...10	15...20	—	65	❖	**103S-ES⊗3-DC25C-TE**	**107S-ES⊗3-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-ES⊗3-FC10C-TE**	**107S-ES⊗3-FC10C-TE**
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	**103S-ES⊗3-FC16C-TE**	**107S-ES⊗3-FC16C-TE**
14.5...20.0	5	5...7-1/2	15	15...20	65	30	**103S-ES⊗3-FC20C-TE**	**107S-ES⊗3-FC20C-TE**
18.0...25.0	7-1/2	7-1/2...10	15...20	20	65	30	**103S-ES⊗3-FC25C-TE**	**107S-ES⊗3-FC25C-TE**
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	65	30	**103S-GS⊗3-FC25C-TE**	**107S-GS⊗3-FC25C-TE**
23.0...30.0	7-1/2	10	20	25	65	30	**103S-ES⊗3-FC32C-TE**	**107S-ES⊗3-FC32C-TE**
23.0...32.0	7-1/2...10	10	20...25	30	65	30	**103S-FS⊗3-FC32C-TE**	**107S-FS⊗3-FC32C-TE**
23.0...32.0	7-1/2...10	10	20...25	30	65	30	**103S-GS⊗3-FC32C-TE**	**107S-GS⊗3-FC32C-TE**
32.0...37.0	10	10	25	—	65	❖	**103S-FS⊗3-FC45C-TE**	**107S-FS⊗3-FC45C-TE**
32.0...43.0	10	15	30	—	65	❖	**103S-GS⊗3-FC45C-TE**	**107S-GS⊗3-FC45C-TE**

✶ Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current and service factor.

❖ This starter is not valid for application at this horsepower and voltage.

⊗Coil voltage code—see page 2-267

Product Selection and 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	Reversing Starters
	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	Cat. No.	Cat. No.
C-Frame with 100-C/104-C Contactors on Panel Mounting Modules								
0.10...0.16	—	—	—	—	65	47	**103S-AW⊗2-CA16C-TE**	**107S-AW⊗3-CA16C-TE**
0.16...0.25	—	—	—	—	65	47	**103S-AW⊗2-CA25C-TE**	**107S-AW⊗3-CA25C-TE**
0.25...0.40	—	—	—	—	65	47	**103S-AW⊗2-CA40C-TE**	**107S-AW⊗3-CA40C-TE**
0.40...0.63	—	—	—	—	65	47	**103S-AW⊗2-CA63C-TE**	**107S-AW⊗3-CA63C-TE**
0.63...1.00	—	—	1/2	3/4	65	47	**103S-AW⊗2-CB10C-TE**	**107S-AW⊗3-CB10C-TE**
1.00...1.60	—	—	1/2...1	3/4...1	65	47	**103S-AW⊗2-CB16C-TE**	**107S-AW⊗3-CB16C-TE**
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	—	65	❖	**103S-AW⊗2-CB25C-TE**	**107S-AW⊗3-CB25C-TE**
2.50...4.00	—	—	—	—	❖	❖	**103S-AW⊗2-CB40C-TE**	**107S-AW⊗3-CB40C-TE**
4.00...6.30	—	—	—	—	❖	❖	**103S-AW⊗2-CB63C-TE**	**107S-AW⊗3-CB63C-TE**
6.30...9.00	—	—	—	—	❖	❖	**103S-AW⊗2-CC10C-TE**	**107S-AW⊗3-CC10C-TE**
6.30...10.0	—	—	—	—	❖	❖	**103S-BW⊗2-CC10C-TE**	**107S-BW⊗3-CC10C-TE**
10.0...12.0	—	—	—	—	❖	❖	**103S-BW⊗2-CC16C-TE**	**107S-BW⊗3-CC16C-TE**
10.0...16.0	—	—	—	—	❖	❖	**103S-CW⊗2-CC16C-TE**	**107S-CW⊗3-CC16C-TE**
10.0...16.0	—	—	—	—	❖	❖	**103S-DW⊗2-CC16C-TE**	**107S-DW⊗3-CC16C-TE**
14.5...20.0	—	—	—	—	❖	❖	**103S-DW⊗2-CC20C-TE**	**107S-DW⊗3-CC20C-TE**
18.0...23.0	—	—	—	—	❖	❖	**103S-DW⊗2-CC25C-TE**	**107S-DW⊗3-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-AW⊗2-DB25C-TE**	**107S-AW⊗3-DB25C-TE**
1.60...2.50	1/2	1/2...3/4	3/4...1-1/2	1...2	65	30	**103S-DW⊗2-DB25C-TE**	**107S-DW⊗3-DB25C-TE**
2.50...4.00	—	—	—	—	❖	❖	**103S-AW⊗2-DB40C-TE**	**107S-AW⊗3-DB40C-TE**
2.50...4.00	1/2...1	3/4...1	1-1/2...3	2...3	65	30	**103S-DW⊗2-DB40C-TE**	**107S-DW⊗3-DB40C-TE**
4.00...6.30	—	—	—	—	❖	❖	**103S-AW⊗2-DB63C-TE**	**107S-AW⊗3-DB63C-TE**
4.00...6.30	1...1-1/2	1...2	3...5	5	65	30	**103S-EW⊗3-DB63C-TE**	**107S-EW⊗3-DB63C-TE**
6.30...9.00	—	—	—	—	❖	❖	**103S-AW⊗2-DC10C-TE**	**107S-AW⊗3-DC10C-TE**
6.30...10.0	—	—	—	—	❖	❖	**103S-BW⊗2-DC10C-TE**	**107S-BW⊗3-DC10C-TE**
6.30...10.0	—	—	—	—	❖	❖	**103S-CW⊗2-DC10C-TE**	**107S-CW⊗3-DC10C-TE**
6.30...10.0	1-1/2...3	2...3	5...7-1/2	7-1/2...10	65	30	**103S-EW⊗3-DC10C-TE**	**107S-EW⊗3-DC10C-TE**
10.0...12.0	—	—	—	—	❖	❖	**103S-BW⊗2-DC16C-TE**	**107S-BW⊗3-DC16C-TE**
10.0...16.0	—	—	—	—	❖	❖	**103S-CW⊗2-DC16C-TE**	**107S-CW⊗3-DC16C-TE**
10.0...16.0	—	—	—	—	❖	❖	**103S-DW⊗2-DC16C-TE**	**107S-DW⊗3-DC16C-TE**
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	**103S-EW⊗3-DC16C-TE**	**107S-EW⊗3-DC16C-TE**
14.5...20.0	—	—	—	—	❖	❖	**103S-DW⊗2-DC20C-TE**	**107S-DW⊗3-DC20C-TE**
14.5...20.0	5	5...7-1/2	15	—	65	❖	**103S-EW⊗3-DC20C-TE**	**107S-EW⊗3-DC20C-TE**
18.0...23.0	—	—	—	—	❖	❖	**103S-DW⊗2-DC25C-TE**	**107S-DW⊗3-DC25C-TE**
18.0...25.0	7-1/2	7-1/2...10	15...20	—	65	❖	**103S-EW⊗3-DC25C-TE**	**107S-EW⊗3-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-EW⊗3-FC10C-TE**	**107S-EW⊗3-FC10C-TE**
10.0...16.0	3...5	5	7-1/2...10	10...15	65	30	**103S-EW⊗3-FC16C-TE**	**107S-EW⊗3-FC16C-TE**
14.5...20.0	5	5...7-1/2	15	15...20	65	30	**103S-EW⊗3-FC20C-TE**	**107S-EW⊗3-FC20C-TE**
18.0...25.0	7-1/2	7-1/2...10	15...20	20	65	30	**103S-EW⊗3-FC25C-TE**	**107S-EW⊗3-FC25C-TE**
18.0...25.0	7-1/2	7-1/2...10	15...20	20...25	65	30	**103S-GW⊗3-FC25C-TE**	**107S-GW⊗3-FC25C-TE**
23.0...30.0	7-1/2	10	20	25	65	30	**103S-EW⊗3-FC32C-TE**	**107S-EW⊗3-FC32C-TE**
23.0...32.0	7-1/2...10	10	20...25	30	65	30	**103S-FW⊗3-FC32C-TE**	**107S-FW⊗3-FC32C-TE**
23.0...32.0	7-1/2...10	10	20...25	30	65	30	**103S-GW⊗3-FC32C-TE**	**107S-GW⊗3-FC32C-TE**
32.0...37.0	10	10	25	—	65	❖	**103S-FW⊗3-FC45C-TE**	**107S-FW⊗3-FC45C-TE**
32.0...43.0	10	15	30	—	65	❖	**103S-GW⊗3-FC45C-TE**	**107S-GW⊗3-FC45C-TE**

✶ Horsepower ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current and service factor.
❖ This starter is not valid for application at this horsepower and voltage.
⊗Coil voltage code—see page 2-267

Product Selection and 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	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.
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-AT⊗2-CA16C	**107S-AT⊗3-CA16C**
0.16...0.25	0.02	0.06	0.06	0.12	65	65	65	50	65	65	65	50	103S-AT⊗2-CA25C	**107S-AT⊗3-CA25C**
0.25...0.40	0.06	0.09	0.12	0.18	65	65	65	50	65	65	65	50	103S-AT⊗2-CA40C	**107S-AT⊗3-CA40C**
0.40...0.63	0.09	0.18	0.18	0.37	65	65	65	50	65	65	65	50	103S-AT⊗2-CA63C	**107S-AT⊗3-CA63C**
0.63...1.00	0.12	0.25	0.37	0.55	65	65	65	50	65	65	65	50	103S-AT⊗2-CB10C	107S-AT⊗3-CB10C
1.00...1.60	0.25	0.55	0.75	1.1	65	65	65	50	65	65	65	50	103S-AT⊗2-CB16C	107S-AT⊗3-CB16C
1.60...2.50	0.55	0.75	1.1	1.8	65	65	50	8	65	50	50	8	103S-AT⊗2-CB25C	107S-AT⊗3-CB25C
2.50...4.00	0.75	1.5	2.2	3	65	50	50	8	50	50	—	—	103S-AT⊗2-CB40C	107S-AT⊗3-CB40C
4.00...6.30	1.5	2.2	3	4	65	50	50	4	50	50	—	—	**103S-AT⊗2-CB63C**	107S-AT⊗3-CB63C
6.30...9.00	2.2	4	4	—	65	65	50	—	50	50	—	—	103S-AT⊗2-CC10C	107S-AT⊗3-CC10C
6.30...10.0	2.2	4	5.5	5.5	65	65	50	4	50	50	50	—	**103S-BT⊗2-CC10C**	**107S-BT⊗3-CC10C**
6.30...10.0	2.2	4	5.5	7.5	65	65	50	4	50	50	50	—	**103S-CT⊗2-CC10C**	**107S-CT⊗3-CC10C**
10.0...12.0	4	5.5	—	—	65	65	—	—	50	50	—	—	**103S-BT⊗2-CC16C**	**107S-BT⊗3-CC16C**
10.0...16.0	4	7.5	7.5	—	65	50	10	—	50	—	—	—	**103S-CT⊗2-CC16C**	**107S-CT⊗3-CC16C**
10.0...16.0	4	7.5	10	10	65	50	10	3	50	50	—	—	**103S-DT⊗2-CC16C**	**107S-DT⊗3-CC16C**
14.5...20.0	4	10	11	—	50	15	6	—	15	—	—	—	103S-DT⊗2-CC20C	**107S-DT⊗3-CC20C**
18.0...23.0	6.3	11	13	—	50	15	6	—	15	—	—	—	**103S-DT⊗2-CC25C**	**107S-DT⊗3-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-AT⊗2-DB25C**	**107S-AT⊗3-DB25C**
1.60...2.50	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	103S-DT⊗2-DB25C	**107S-DT⊗3-DB25C**
2.50...4.00	0.75	1.5	2.2	3	65	65	50	10	65	65	50	—	**103S-AT⊗2-DB40C**	**107S-AT⊗3-DB40C**
2.50...4.00	0.75	1.5	2.2	3	65	65	50	50	65	65	50	50	103S-DT⊗2-DB40C	**107S-DT⊗3-DB40C**
4.00...6.30	1.5	2.2	3	4	65	65	50	50	65	65	50	—	103S-AT⊗2-DB63C	**107S-AT⊗3-DB63C**
4.00...6.30	1.5	2.2	3	4	65	65	50	50	65	65	50	50	**103S-ET⊗3-DB63C**	**107S-ET⊗3-DB63C**
6.30...9.00	2.2	4	4	—	65	65	50	—	65	65	—	—	**103S-AT⊗2-DC10C**	**107S-AT⊗3-DC10C**
6.30...10.0	2.2	4	5.5	5.5	65	65	65	50	65	65	65	—	**103S-BT⊗2-DC10C**	**107S-BT⊗3-DC10C**
6.30...10.0	2.2	4	5.5	7.5	65	65	65	50	65	65	65	50	**103S-CT⊗2-DC10C**	**107S-CT⊗3-DC10C**
6.30...10.0	2.2	4	5.5	7.5	65	65	65	50	65	65	65	50	**103S-ET⊗3-DC10C**	**107S-ET⊗3-DC10C**
10.0...12.0	4	5.5	—	—	65	65	—	—	65	65	—	—	**103S-BT⊗2-DC16C**	**107S-BT⊗3-DC16C**
10.0...16.0	4	7.5	7.5	—	65	65	50	—	65	65	50	—	**103S-CT⊗2-DC16C**	**107S-CT⊗3-DC16C**
10.0...16.0	4	7.5	10	10	65	65	50	6	65	65	50	—	103S-DT⊗2-DC16C	**107S-DT⊗3-DC16C**
10.0...16.0	4	7.5	10	13	65	65	50	6	65	65	50	—	**103S-ET⊗3-DC16C**	**107S-ET⊗3-DC16C**
14.5...20.0	4	10	11	—	65	65	25	—	65	65	25	—	**103S-DT⊗2-DC20C**	**107S-DT⊗3-DC20C**
14.5...20.0	4	10	11	15	65	65	25	6	65	65	25	—	**103S-ET⊗3-DC20C**	**107S-ET⊗3-DC20C**
18.0...23.0	6.3	11	13	—	65	50	25	—	65	50	25	—	**103S-DT⊗2-DC25C**	**107S-DT⊗3-DC25C**
18.0...25.0	6.3	11	15	—	65	50	25	—	65	50	25	—	**103S-ET⊗3-DC25C**	**107S-ET⊗3-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-ET⊗3-FC10C**	**107S-ET⊗3-FC10C**
10.0...16.0	4	7.5	10	13	65	65	50	50	65	65	50	50	**103S-ET⊗3-FC16C**	**107S-ET⊗3-FC16C**
14.5...20.0	4	10	11	15	65	65	50	50	65	65	50	50	**103S-ET⊗3-FC20C**	**107S-ET⊗3-FC20C**
18.0...25.0	6.3	11	15	—	65	65	50	—	65	65	50	—	**103S-ET⊗3-FC25C**	**107S-ET⊗3-FC25C**
18.0...25.0	6.3	11	15	22	65	65	50	50	65	65	50	50	**103S-GT⊗3-FC25C**	**107S-GT⊗3-FC25C**
23.0...30.0	7.5	15	15	—	65	65	50	—	65	65	50	—	**103S-ET⊗3-FC32C**	107S-ET⊗3-FC32C
23.0...32.0	7.5	15	20	—	65	65	50	—	65	65	50	—	**103S-FT⊗3-FC32C**	**107S-FT⊗3-FC32C**
23.0...32.0	7.5	15	20	22	65	65	50	50	65	65	50	50	**103S-GT⊗3-FC32C**	**107S-GT⊗3-FC32C**
23.0...32.0	7.5	15	20	25	65	65	50	50	65	65	50	50	**103S-HT⊗3-FC32C**	**107S-HT⊗3-FC32C**
32.0...37.0	11	18.5	—	—	65	65	—	—	65	65	—	—	**103S-FT⊗3-FC45C**	**107S-FT⊗3-FC45C**
32.0...43.0	13	22	25	—	65	65	50	—	65	65	50	—	**103S-GT⊗3-FC45C**	**107S-GT⊗3-FC45C**
32.0...45.0	13	22	30	—	65	65	50	—	65	65	50	—	**103S-HT⊗3-FC45C**	**107S-HT⊗3-FC45C**
32.0...45.0	13	22	30	—	65	65	50	—	65	65	50	—	**103S-JT⊗3-FC45C**	**107S-JT⊗3-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-HT⊗3-GC63C	**107S-HT⊗3-GC63C**
40.0...63.0	18.5	32	40	—	65	65	50	—	65	65	30	—	**103S-JT⊗3-GC63C**	**107S-JT⊗3-GC63C**
40.0...63.0	18.5	32	40	45	65	65	50	8	65	65	30	—	**103S-KT⊗3-GC63C**	**107S-KT⊗3-GC63C**
63.0...72.0	22	40	45	—	65	65	50	—	65	65	15	—	**103S-JT⊗3-GC90C**	**107S-JT⊗3-GC90C**
63.0...85.0	25	45	50	—	65	65	50	—	65	65	15	—	**103S-KT⊗3-GC90C**	**107S-KT⊗3-GC90C**

* kW ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current and service factor.

⊗Coil voltage code—see page 2-267

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Preferred availability cat. nos. are printed in **bold**

Product Selection and Coordination Ratings, 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					
	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.
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-AS⊗2-CA16C**	**107S-AS⊗3-CA16C**
0.16...0.25	0.02	0.06	0.06	0.12	65	65	65	50	65	65	65	50	**103S-AS⊗2-CA25C**	**107S-AS⊗3-CA25C**
0.25...0.40	0.06	0.09	0.12	0.18	65	65	65	50	65	65	65	50	**103S-AS⊗2-CA40C**	**107S-AS⊗3-CA40C**
0.40...0.63	0.09	0.18	0.18	0.37	65	65	65	50	65	65	65	50	**103S-AS⊗2-CA63C**	**107S-AS⊗3-CA63C**
0.63...1.00	0.12	0.25	0.37	0.55	65	65	65	50	65	65	65	50	**103S-AS⊗2-CB10C**	**107S-AS⊗3-CB10C**
1.00...1.60	0.25	0.55	0.75	1.1	65	65	65	50	65	65	65	50	**103S-AS⊗2-CB16C**	**107S-AS⊗3-CB16C**
1.60...2.50	0.55	0.75	1.1	1.8	65	65	50	8	65	50	50	8	**103S-AS⊗2-CB25C**	**107S-AS⊗3-CB25C**
2.50...4.00	0.75	1.5	2.2	3	65	50	50	8	50	50	—	—	**103S-AS⊗2-CB40C**	**107S-AS⊗3-CB40C**
4.00...6.30	1.5	2.2	3	4	65	50	50	4	50	50	—	—	**103S-AS⊗2-CB63C**	**107S-AS⊗3-CB63C**
6.30...9.00	2.2	4	4	—	65	65	50	—	50	50	—	—	**103S-AS⊗2-CC10C**	**107S-AS⊗3-CC10C**
6.30...10.0	2.2	4	5.5	5.5	65	65	50	4	50	50	50	—	**103S-BS⊗2-CC10C**	**107S-BS⊗3-CC10C**
6.30...10.0	2.2	4	5.5	7.5	65	65	50	4	50	50	50	—	**103S-CS⊗2-CC10C**	**107S-CS⊗3-CC10C**
10.0...12.0	4	5.5	—	—	65	65	—	—	50	50	—	—	**103S-BS⊗2-CC16C**	**107S-BS⊗3-CC16C**
10.0...16.0	4	7.5	7.5	—	65	50	10	—	50	—	—	—	**103S-CS⊗2-CC16C**	**107S-CS⊗3-CC16C**
10.0...16.0	4	7.5	10	10	65	50	10	3	50	50	—	—	**103S-DS⊗2-CC16C**	**107S-DS⊗3-CC16C**
14.5...20.0	4	10	11	—	50	15	6	—	15	—	—	—	**103S-DS⊗2-CC20C**	**107S-DS⊗3-CC20C**
18.0...23.0	6.3	11	13	—	50	15	6	—	15	—	—	—	103S-DS⊗2-CC25C	**107S-DS⊗3-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-AS⊗2-DB25C**	**107S-AS⊗3-DB25C**
1.60...2.50	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	**103S-DS⊗2-DB25C**	**107S-DS⊗3-DB25C**
2.50...4.00	0.75	1.5	2.2	3	65	65	50	10	65	65	50	—	**103S-AS⊗2-DB40C**	**107S-AS⊗3-DB40C**
2.50...4.00	0.75	1.5	2.2	3	65	65	50	50	65	65	50	50	**103S-DS⊗2-DB40C**	**107S-DS⊗3-DB40C**
4.00...6.30	1.5	2.2	3	4	65	65	50	50	65	65	50	—	**103S-AS⊗2-DB63C**	**107S-AS⊗3-DB63C**
4.00...6.30	1.5	2.2	3	4	65	65	50	50	65	65	50	50	**103S-ES⊗3-DB63C**	**107S-ES⊗3-DB63C**
6.30...9.00	2.2	4	4	—	65	65	50	—	65	65	—	—	**103S-AS⊗2-DC10C**	**107S-AS⊗3-DC10C**
6.30...10.0	2.2	4	5.5	5.5	65	65	65	50	65	65	65	—	**103S-BS⊗2-DC10C**	**107S-BS⊗3-DC10C**
6.30...10.0	2.2	4	5.5	7.5	65	65	65	50	65	65	65	50	**103S-CS⊗2-DC10C**	**107S-CS⊗3-DC10C**
6.30...10.0	2.2	4	5.5	7.5	65	65	65	50	65	65	65	50	**103S-ES⊗3-DC10C**	**107S-ES⊗3-DC10C**
10.0...12.0	4	5.5	—	—	65	65	—	—	65	65	—	—	**103S-BS⊗2-DC16C**	**107S-BS⊗3-DC16C**
10.0...16.0	4	7.5	7.5	—	65	65	50	—	65	65	50	—	**103S-CS⊗2-DC16C**	**107S-CS⊗3-DC16C**
10.0...16.0	4	7.5	10	10	65	65	50	6	65	65	50	—	**103S-DS⊗2-DC16C**	**107S-DS⊗3-DC16C**
10.0...16.0	4	7.5	10	13	65	65	50	6	65	65	50	—	**103S-ES⊗3-DC16C**	**107S-ES⊗3-DC16C**
14.5...20.0	4	10	11	—	65	65	25	—	65	65	25	—	**103S-DS⊗2-DC20C**	**107S-DS⊗3-DC20C**
14.5...20.0	4	10	11	15	65	65	25	6	65	65	25	—	**103S-ES⊗3-DC20C**	**107S-ES⊗3-DC20C**
18.0...23.0	6.3	11	13	—	65	50	25	—	65	50	25	—	**103S-DS⊗2-DC25C**	**107S-DS⊗3-DC25C**
18.0...25.0	6.3	11	15	—	65	50	25	—	65	50	25	—	**103S-ES⊗3-DC25C**	**107S-ES⊗3-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-ES⊗3-FC10C**	**107S-ES⊗3-FC10C**
10.0...16.0	4	7.5	10	13	65	65	50	50	65	65	50	50	**103S-ES⊗3-FC16C**	**107S-ES⊗3-FC16C**
14.5...20.0	4	10	11	15	65	65	50	50	65	65	50	50	**103S-ES⊗3-FC20C**	**107S-ES⊗3-FC20C**
18.0...25.0	6.3	11	15	—	65	65	50	—	65	65	50	—	**103S-ES⊗3-FC25C**	**107S-ES⊗3-FC25C**
18.0...25.0	6.3	11	15	22	65	65	50	50	65	65	50	50	**103S-GS⊗3-FC25C**	**107S-GS⊗3-FC25C**
23.0...30.0	7.5	15	15	—	65	65	50	—	65	65	50	—	**103S-ES⊗3-FC32C**	**107S-ES⊗3-FC32C**
23.0...32.0	7.5	15	20	—	65	65	50	—	65	65	50	—	**103S-FS⊗3-FC32C**	**107S-FS⊗3-FC32C**
23.0...32.0	7.5	15	20	22	65	65	50	50	65	65	50	50	**103S-GS⊗3-FC32C**	**107S-GS⊗3-FC32C**
32.0...37.0	11	18.5	—	—	65	65	—	—	65	65	—	—	**103S-FS⊗3-FC45C**	**107S-FS⊗3-FC45C**
32.0...43.0	13	22	25	—	65	65	50	—	65	65	50	—	**103S-GS⊗3-FC45C**	**107S-GS⊗3-FC45C**

∗ kW ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current and service factor.

⊗Coil voltage code—see page 2-267

Product Selection and Coordination Ratings, 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					
	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.
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-AW⊗2-CA16C**	**107S-AW⊗3-CA16C**
0.16...0.25	0.02	0.06	0.06	0.12	100	100	65	50	65	65	65	50	**103S-AW⊗2-CA25C**	**107S-AW⊗3-CA25C**
0.25...0.40	0.06	0.09	0.12	0.18	100	100	65	50	65	65	65	50	**103S-AW⊗2-CA40C**	**107S-AW⊗3-CA40C**
0.40...0.63	0.09	0.18	0.18	0.37	100	100	65	50	65	65	65	50	**103S-AW⊗2-CA63C**	**107S-AW⊗3-CA63C**
0.63...1.00	0.12	0.25	0.37	0.55	100	100	65	50	65	65	65	50	103S-AW⊗2-CB10C	**107S-AW⊗3-CB10C**
1.00...1.60	0.25	0.55	0.75	1.1	100	100	65	50	65	65	65	50	103S-AW⊗2-CB16C	107S-AW⊗3-CB16C
1.60...2.50	0.55	0.75	1.1	1.8	100	65	50	8	65	50	50	8	103S-AW⊗2-CB25C	107S-AW⊗3-CB25C
2.50...4.00	0.75	1.5	2.2	3	100	50	50	8	50	50	—	—	103S-AW⊗2-CB40C	107S-AW⊗3-CB40C
4.00...6.30	1.5	2.2	3	4	100	50	50	4	50	50	—	—	103S-AW⊗2-CB63C	**107S-AW⊗3-CB63C**
6.30...9.00	2.2	4	4	—	100	65	50	—	50	50	—	—	103S-AW⊗2-CC10C	**107S-AW⊗3-CC10C**
6.30...10.0	2.2	4	5.5	5.5	100	65	50	4	50	50	50	—	**103S-BW⊗2-CC10C**	**107S-BW⊗3-CC10C**
6.30...10.0	2.2	4	5.5	7.5	100	65	50	4	50	50	50	—	**103S-CW⊗2-CC10C**	**107S-CW⊗3-CC10C**
10.0...12.0	4	5.5	—	—	100	65	—	—	50	50	—	—	103S-BW⊗2-CC16C	**107S-BW⊗3-CC16C**
10.0...16.0	4	7.5	7.5	—	100	50	10	—	50	—	—	—	103S-CW⊗2-CC16C	**107S-CW⊗3-CC16C**
10.0...16.0	4	7.5	10	10	100	50	10	3	50	50	—	—	**103S-DW⊗2-CC16C**	**107S-DW⊗3-CC16C**
14.5...20.0	4	10	11	—	50	15	6	—	15	—	—	—	103S-DW⊗2-CC20C	**107S-DW⊗3-CC20C**
18.0...23.0	6.3	11	13	—	50	15	6	—	15	—	—	—	**103S-DW⊗2-CC25C**	**107S-DW⊗3-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-AW⊗2-DB25C	**107S-AW⊗3-DB25C**
1.60...2.50	0.55	0.75	1.1	1.8	100	100	50	10	100	100	50	10	**103S-DW⊗2-DB25C**	**107S-DW⊗3-DB25C**
2.50...4.00	0.75	1.5	2.2	3	100	100	50	10	100	100	50	—	**103S-AW⊗2-DB40C**	**107S-AW⊗3-DB40C**
2.50...4.00	0.75	1.5	2.2	3	100	100	50	50	100	100	50	50	**103S-DW⊗2-DB40C**	**107S-DW⊗3-DB40C**
4.00...6.30	1.5	2.2	3	4	100	100	50	50	100	100	50	—	103S-AW⊗2-DB63C	**107S-AW⊗3-DB63C**
4.00...6.30	1.5	2.2	3	4	100	100	50	50	100	100	50	50	**103S-EW⊗3-DB63C**	**107S-EW⊗3-DB63C**
6.30...9.00	2.2	4	4	—	100	65	50	—	65	65	—	—	**103S-AW⊗2-DC10C**	107S-AW⊗3-DC10C
6.30...10.0	2.2	4	5.5	5.5	100	100	65	50	100	100	65	—	**103S-BW⊗2-DC10C**	**107S-BW⊗3-DC10C**
6.30...10.0	2.2	4	5.5	7.5	100	100	65	50	100	100	65	50	103S-CW⊗2-DC10C	**107S-CW⊗3-DC10C**
6.30...10.0	2.2	4	5.5	7.5	100	100	65	50	100	100	65	50	**103S-EW⊗3-DC10C**	**107S-EW⊗3-DC10C**
10.0...12.0	4	5.5	—	—	100	65	—	—	65	65	—	—	**103S-BW⊗2-DC16C**	**107S-BW⊗3-DC16C**
10.0...16.0	4	7.5	7.5	—	100	65	50	—	65	65	50	—	103S-CW⊗2-DC16C	**107S-CW⊗3-DC16C**
10.0...16.0	4	7.5	10	10	100	65	50	6	65	65	50	—	103S-DW⊗2-DC16C	**107S-DW⊗3-DC16C**
10.0...16.0	4	7.5	10	13	100	65	50	6	65	65	50	—	**103S-EW⊗3-DC16C**	**107S-EW⊗3-DC16C**
14.5...20.0	4	10	11	—	65	65	25	—	65	65	25	—	103S-DW⊗2-DC20C	**107S-DW⊗3-DC20C**
14.5...20.0	4	10	11	15	65	65	25	6	65	65	25	—	**103S-EW⊗3-DC20C**	**107S-EW⊗3-DC20C**
18.0...23.0	6.3	11	13	—	65	50	25	—	65	50	25	—	**103S-DW⊗2-DC25C**	**107S-DW⊗3-DC25C**
18.0...25.0	6.3	11	15	—	65	50	25	—	65	50	25	—	**103S-EW⊗3-DC25C**	**107S-EW⊗3-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-EW⊗3-FC10C**	**107S-EW⊗3-FC10C**
10.0...16.0	4	7.5	10	13	100	100	50	50	100	100	50	50	**103S-EW⊗3-FC16C**	**107S-EW⊗3-FC16C**
14.5...20.0	4	10	11	15	100	100	50	50	100	100	50	50	**103S-EW⊗3-FC20C**	**107S-EW⊗3-FC20C**
18.0...25.0	6.3	11	15	—	100	100	50	—	100	100	50	—	**103S-EW⊗3-FC25C**	**107S-EW⊗3-FC25C**
18.0...25.0	6.3	11	15	22	100	100	50	50	100	100	50	50	**103S-GW⊗3-FC25C**	**107S-GW⊗3-FC25C**
23.0...30.0	7.5	15	15	—	100	100	50	—	100	100	50	—	**103S-EW⊗3-FC32C**	**107S-EW⊗3-FC32C**
23.0...32.0	7.5	15	20	—	100	100	50	—	100	100	50	—	**103S-FW⊗3-FC32C**	**107S-FW⊗3-FC32C**
23.0...32.0	7.5	15	20	22	100	100	50	50	100	100	50	50	**107S-GW⊗3-FC32C**	**107S-GW⊗3-FC32C**
32.0...37.0	11	18.5	—	—	100	100	—	—	100	100	—	—	**103S-FW⊗3-FC45C**	**107S-FW⊗3-FC45C**
32.0...43.0	13	22	25	—	100	100	50	—	100	100	50	—	**103S-GW⊗3-FC45C**	107S-GW⊗3-FC45C

* kW ratings shown in the table are for reference. Final selection of the starter depends upon the actual motor full-load current and service factor.

⊗Coil voltage code—see page 2-267

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⊗ 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

2

2

103S Factory-Installed Options

Change option code ① to desired auxiliary contact: 103S-AWD①-CA16C

Contactor Auxiliaries without "-SP" Control Plug									
		ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
Option ①	Description	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									
		ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
Option ①	Description	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									
		ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
Option ②	Description	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									
		ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
Option ③	Description	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									
		ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
Option ①	Description	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									
		ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
Option ①	Description	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									
		ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
Option ②	Description	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									
		ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
Option ③	Description	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

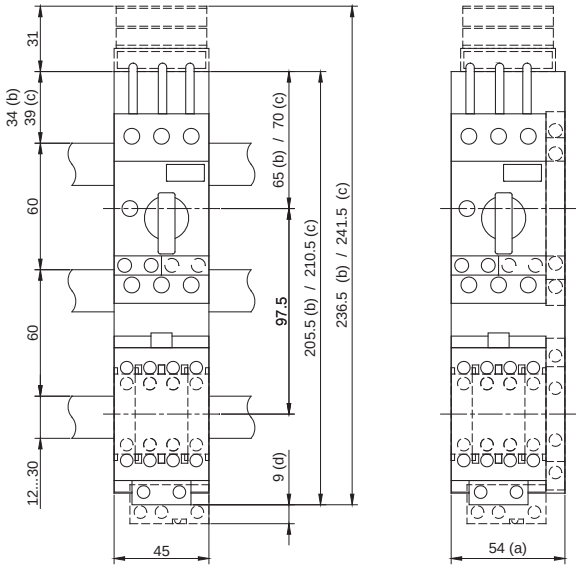
Modifications/Accessories	
Option ④	Description
JE	Electronic Interface
R	Surge Suppressor, RC
V	Surge Suppressor, Varistor
D	Surge Suppressor, Diode
KN	Lockable Knob, Black
KY	Lockable Knob, Red/Yellow
TE	Spacing Adapter for UL508 Type E
SP	Control Plug, Top Mount

Open Type Starters

Approximate Dimensions

Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.

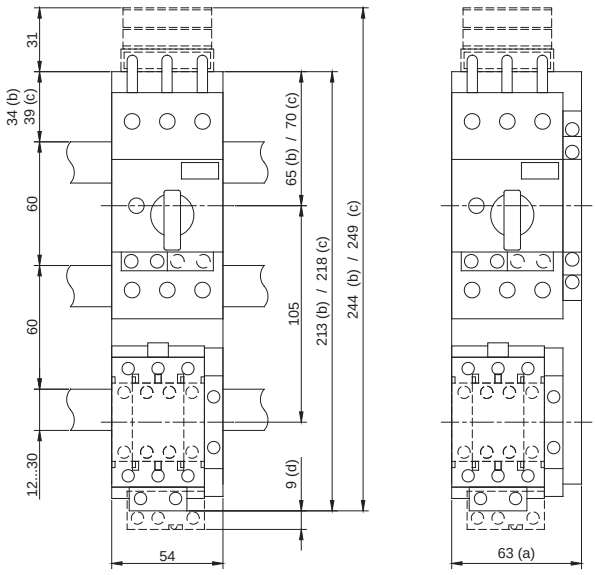
Standard and ISO Busbar Mount — Bulletin 103S Non-Reversing Starters



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

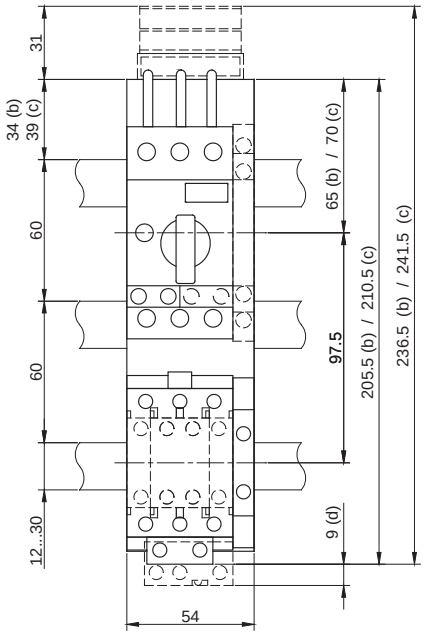
Bulletin 103S Busbar Mount



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

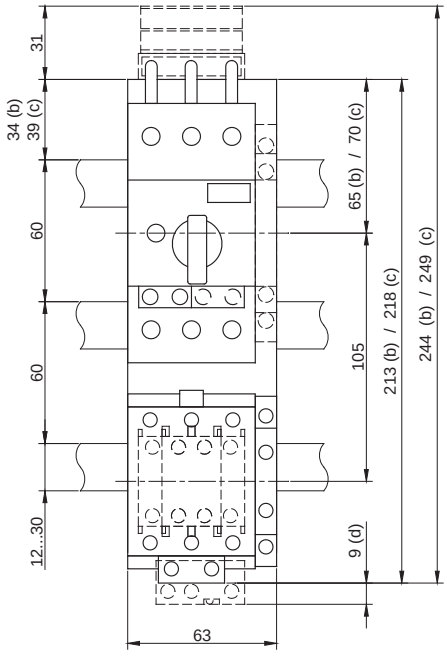
Bulletin 103S Busbar Mount



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



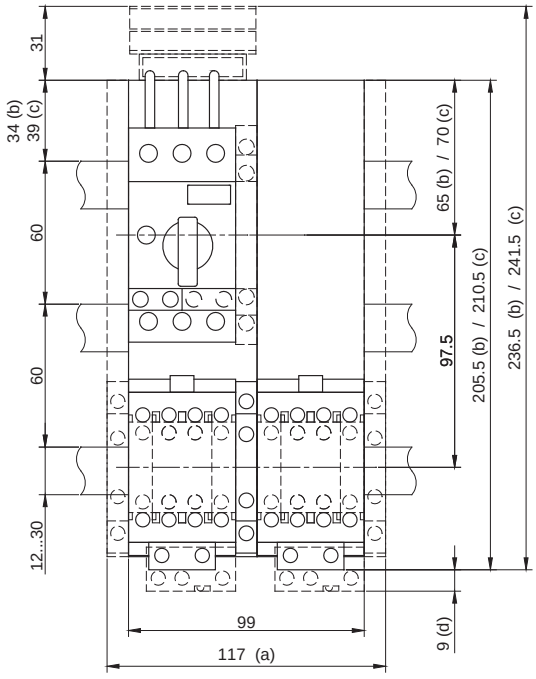
Circuit Breaker: 140M-F
Contactor: 100-C43
Reference Print: D20GMF

(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.

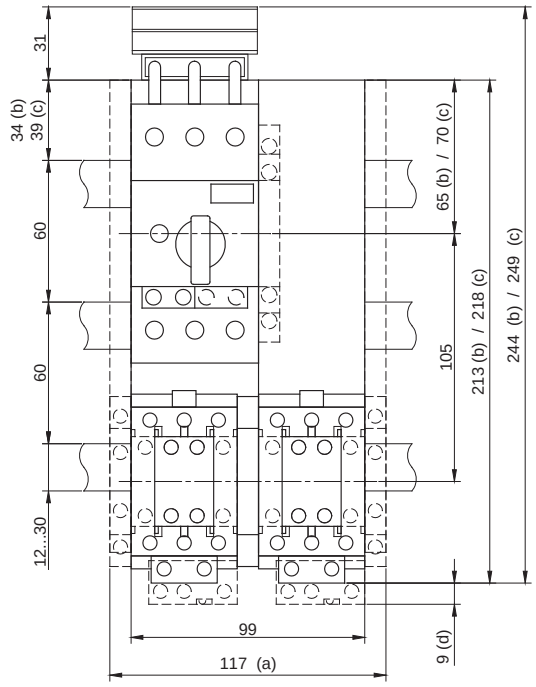
Standard and ISO Busbar Mount — Bulletin 107S Reversing Starters



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

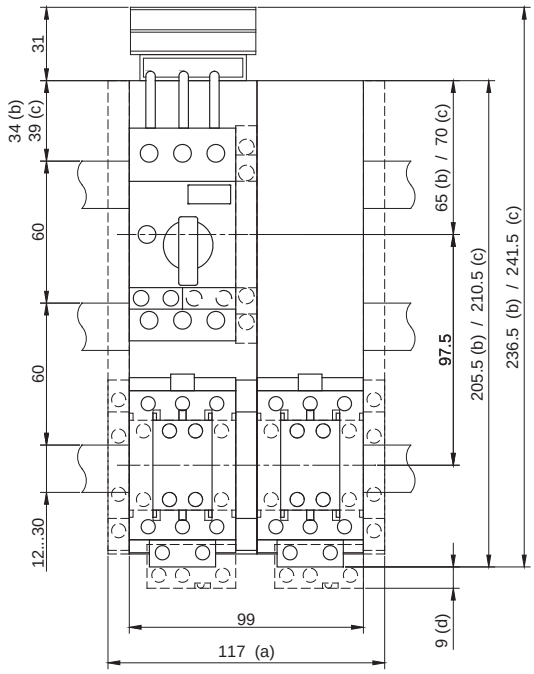
Bulletin 107S Busbar Mount



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

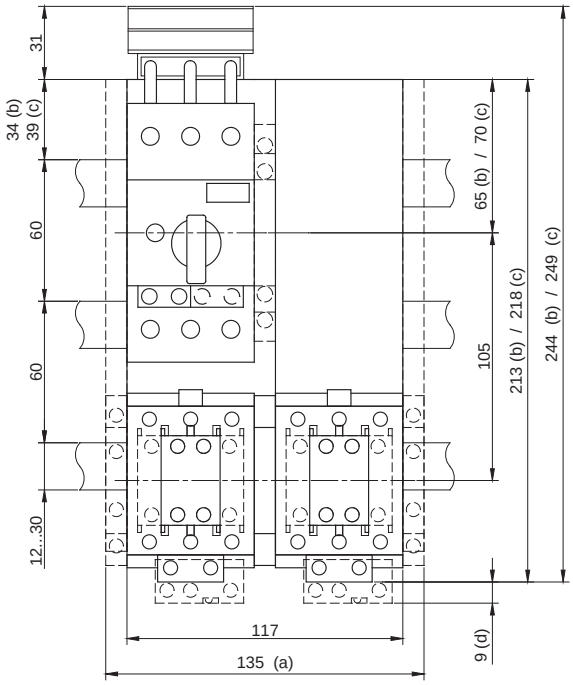
Bulletin 107S Busbar Mount



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

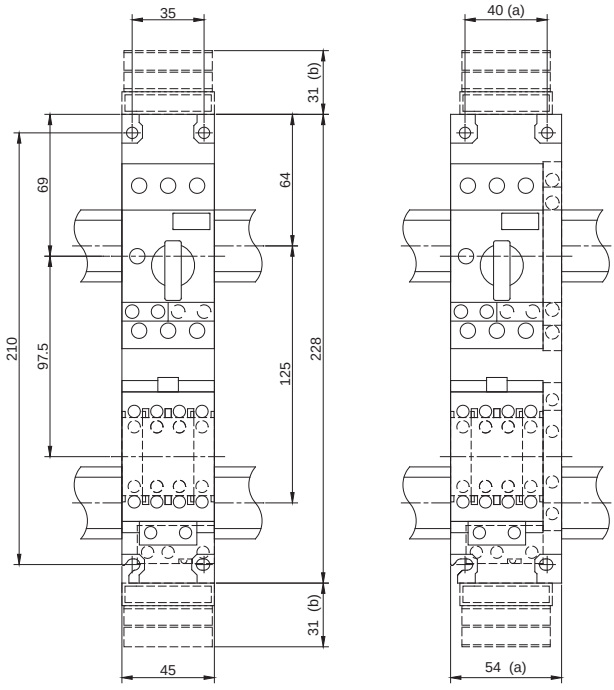
(a) With additional side-mount aux. contacts
(b) Standard busbar mount with control plug
(c) Iso busbar mount
(d) Electronic interface

Bulletin 107S Busbar Mount

2

Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.

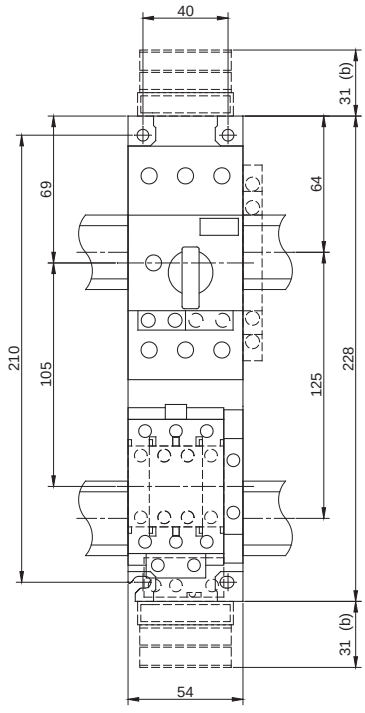
Panel Mount — Bulletin 103S Non-Reversing Starters



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

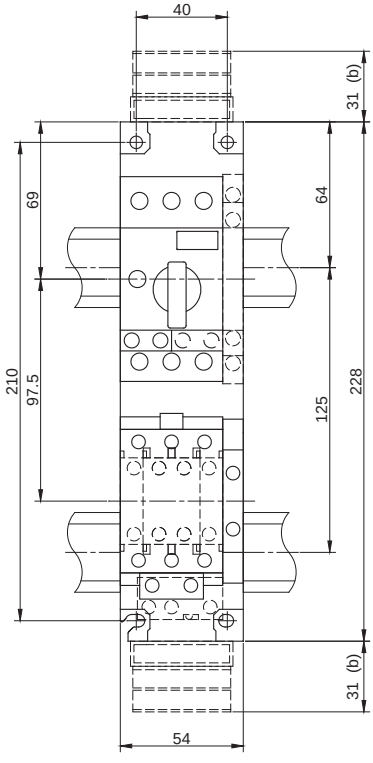
Bulletin 103S Panel Mount



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

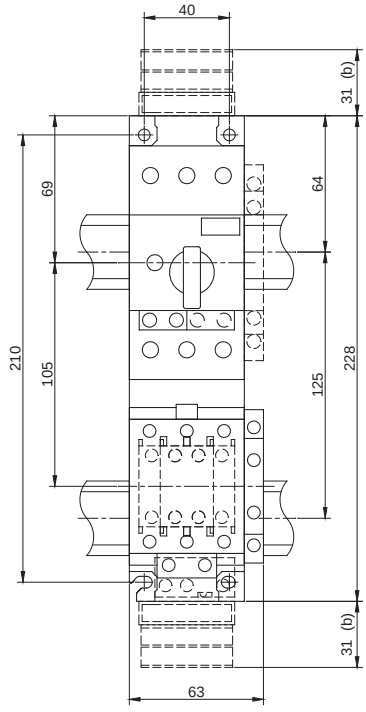
Bulletin 103S Panel Mount



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

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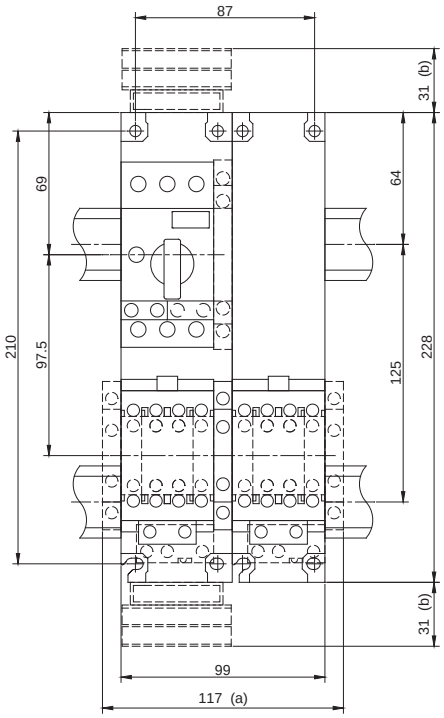
Preferred availability cat. nos. are printed in **bold**

Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.

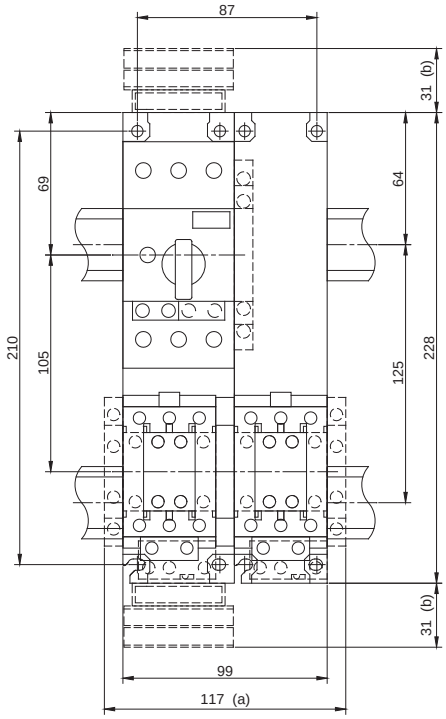
Panel Mount — Bulletin 107S Reversing Starters



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

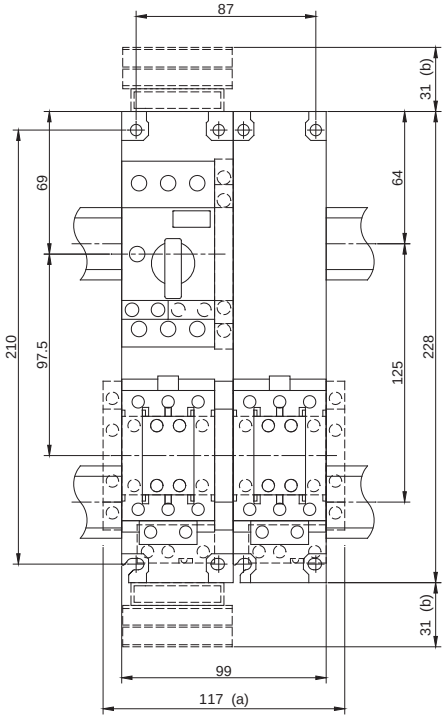
Bulletin 107S Panel Mount



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

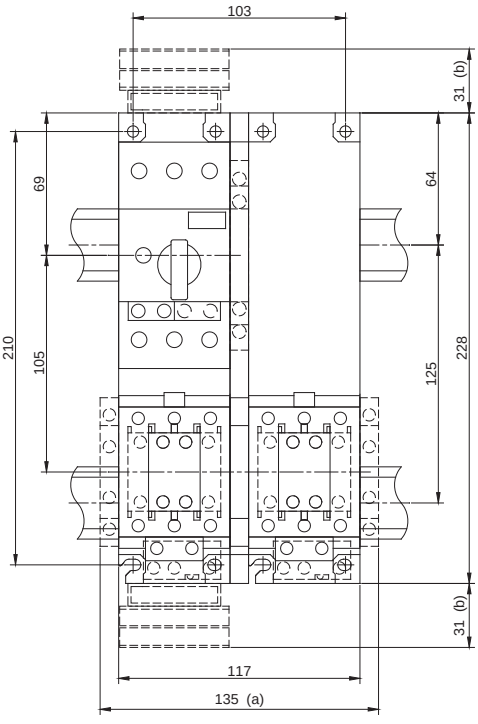
Bulletin 107S Panel Mount



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

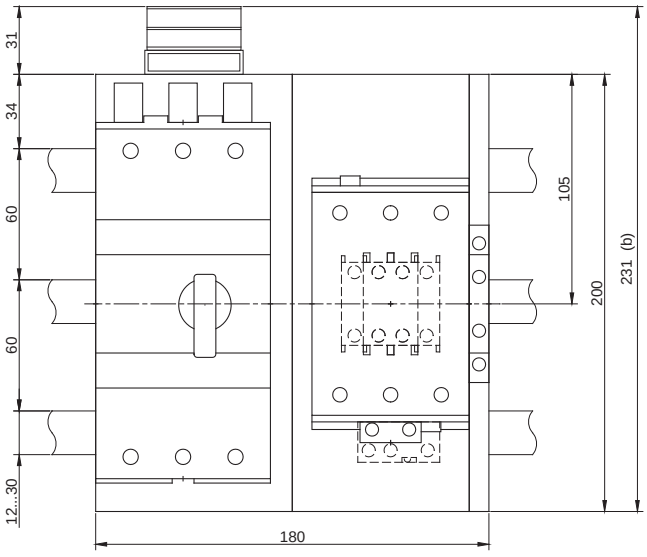
(a) With additional side-mount aux. contacts
(b) Control plug on top OR bottom side optional

Bulletin 107S Panel Mount

2

Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.

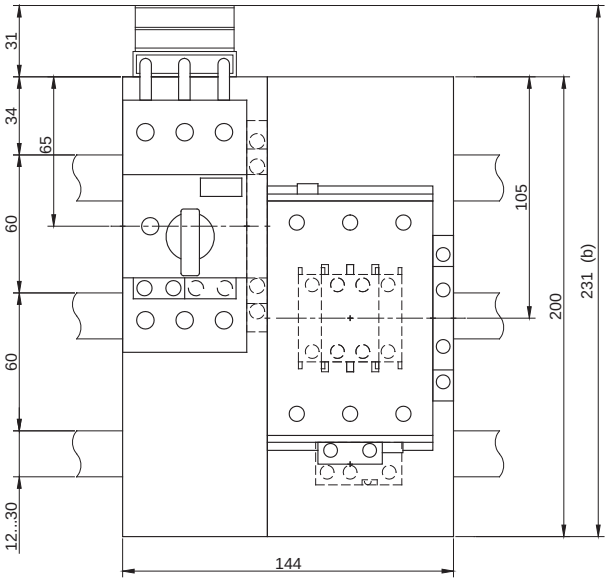
Standard Busbar Mount — Bulletin 103S Non-Reversing and Bulletin 107S Reversing Starters



Circuit Breaker: 140-CMN
Contactor: 100-C60...85
Reference Print: D30GCM

(b) Standard busbar mount with control plug

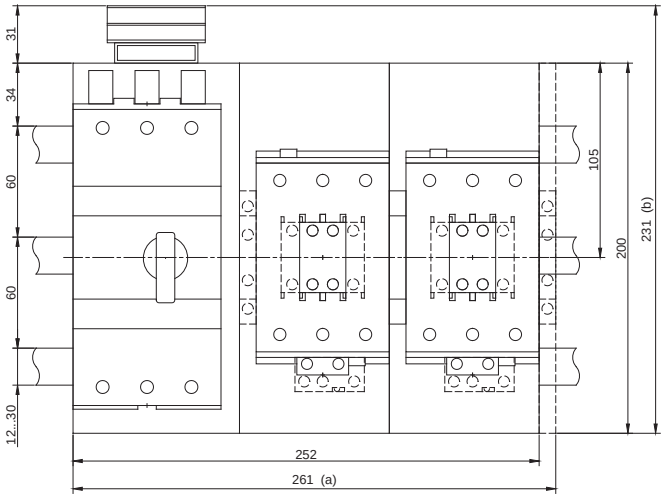
Bulletin 103S Busbar Mount



Circuit Breaker: 140M-F
Contactor: 100-C60...85
Reference Print: D30GMF

(b) Standard busbar mount with control plug

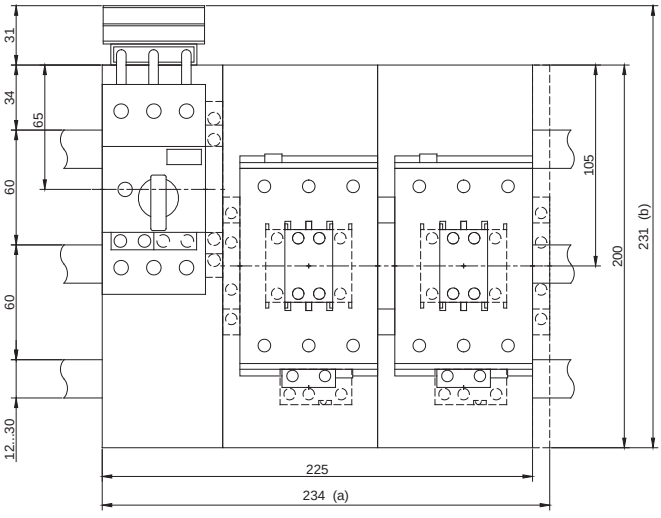
Bulletin 103S Busbar Mount



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

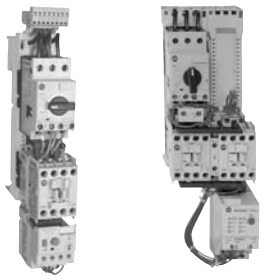
Bulletin 107S Busbar Mount



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.

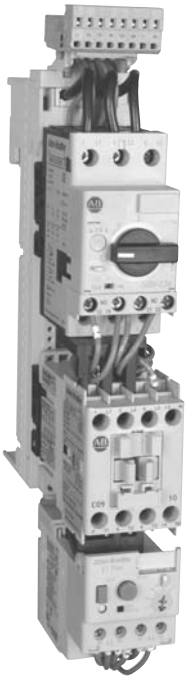
Table of Contents

Standards Compliance

UL 508
CSA 22.2, No. 14
IEC 60947 -2, -4

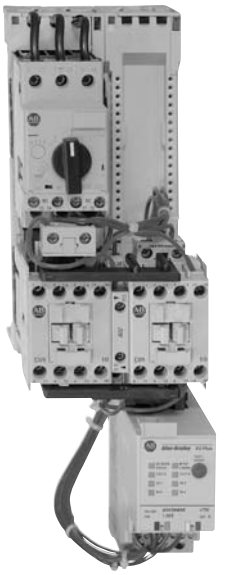
Certifications

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)

Open Type 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.

103T – A S D 2 – Q A16 C – C1P – TE

a b c d e f g h i j

a

Bulletin Number	
Code	**Description**
103T	DOL Starter with MCP
107T	Rev. Starter with MCP

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

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

d (cont'd)

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

e

Contactor Aux. Contacts	
Code	**Description**
2	1 N.O.
3	1 N.O. + 1 N.C.

f

Circuit Breaker Frame Size	
Code	**Description**
Q	C Frame
R	D Frame
T	F Frame
F3	Bul. 140F fuse holder

g

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

g (cont'd)

Bul. 140F Fuse Holder Type	
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.

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. 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

i

193-ED/EE O/L Relay	
Code	**Description**
D1	193-ED Cl.10, Man. Reset
E2	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
..G	18...90 A

i (cont'd)

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

j

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)

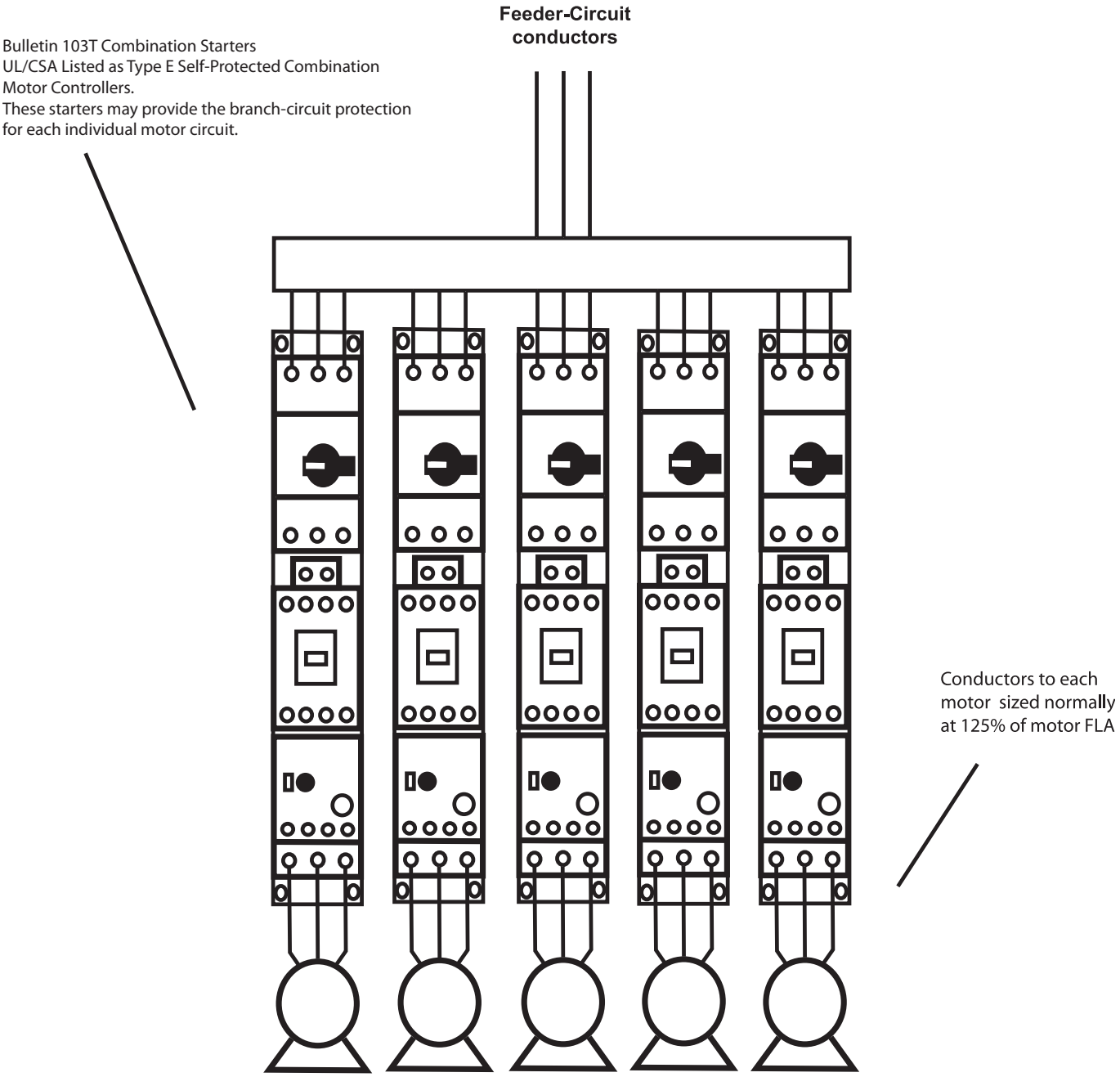
* Standard for Starters on ISO Adapters, no code required

Preferred availability cat. nos. are printed in **bold**

Multiple Motor Installation with 103T Combination Starters

Each Motor has an Individual Branch Circuit Protective Device (BCPD)

Bulletin103T 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.



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 provded 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 over sizing of 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.

Product Selection and 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	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]					
						Type 1 Coordination		Type 2 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 Standard Bus Bar Modules											
0.10...0.40	—	—	—	—	450	65	47	65	47	**103T-AT⊗2-QA40C-D1A**	**107T-AT⊗3-QA40C-D1A**
0.10...0.40	—	—	—	—	450	65	47	65	47	**103T-AT⊗2-QA40C-E1A**	**107T-AT⊗3-QA40C-E1A**
0.20...1.00	—	—	—	1/2	450	65	47	65	47	**103T-AT⊗2-QB10C-D1B**	**107T-AT⊗3-QB10C-D1B**
0.20...1.00	—	—	—	1/2	450	65	47	65	47	**103T-AT⊗2-QB10C-E1B**	**107T-AT⊗3-QB10C-E1B**
0.40...1.00	—	—	—	1/2	450	65	47	65	47	**103T-AT⊗2-QB10C-C1P**	—
0.40...1.00	—	—	—	1/2	450	65	47	65	47	**103T-AT⊗2-QB10C-C2P**	**107T-AT⊗3-QB10C-C2P**
0.4...2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	**103T-AT⊗2-QB25C-C1P**	—
0.4...2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	**103T-AT⊗2-QB25C-C2P**	**107T-AT⊗3-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-AT⊗2-QB25C-D1C**	**107T-AT⊗3-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-AT⊗2-QB25C-E1C**	**107T-AT⊗3-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-AT⊗2-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-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	—	—	1/2...1	1/2...1	450	65	30	65	—	**103T-AT⊗2-RB25C-C1P**	—
0.4...2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	**103T-AT⊗2-RB25C-C2P**	**107T-AT⊗3-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-AT⊗2-RB25C-D1C**	**107T-AT⊗3-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-AT⊗2-RB25C-E1C**	**107T-AT⊗3-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-AT⊗2-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-AT⊗2-RB25C-C2A**	**107T-AT⊗3-RB25C-C2A**
0.4...2.0	—	—	1/2...1	1/2...1	450	65	30	65	30	**103T-DT⊗2-RB25C-C1P**	—
0.4...2.0	—	—	1/2...1	1/2...1	450	65	30	65	30	**103T-DT⊗2-RB25C-C2P**	**107T-DT⊗3-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-DT⊗2-RB25C-D1C**	**107T-DT⊗3-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-DT⊗2-RB25C-E1C**	**107T-DT⊗3-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-DT⊗2-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-DT⊗2-RB25C-C2A**	**107T-DT⊗3-RB25C-C2A**
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	**103T-AT⊗2-RB40C-D1C**	**107T-AT⊗3-RB40C-D1C**
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	**103T-AT⊗2-RB40C-E1C**	**107T-AT⊗3-RB40C-E1C**
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	**103T-AT⊗2-RB40C-C1A**	—
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	**103T-AT⊗2-RB40C-C2A**	**107T-AT⊗3-RB40C-C2A**
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	**103T-DT⊗2-RB40C-D1C**	**107T-DT⊗3-RB40C-D1C**
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	**103T-DT⊗2-RB40C-E1C**	**107T-DT⊗3-RB40C-E1C**
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	**103T-DT⊗2-RB40C-C1A**	—
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	**103T-DT⊗2-RB40C-C2A**	**107T-DT⊗3-RB40C-C2A**
3.2...6.3	3/4...1-1/2	3/4...2	2...5	3...5	450	65	30	65	—	**103T-AT⊗2-RB63C-D1D**	**107T-AT⊗3-RB63C-D1D**
3.2...6.3	3/4...1-1/2	3/4...2	2...5	3...5	450	65	30	65	—	**103T-AT⊗2-RB63C-E1D**	**107T-AT⊗3-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-AT⊗2-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-AT⊗2-RB63C-C2B**	**107T-AT⊗3-RB63C-C2B**
3.2...10	3/4...3	3/4...3	2...7-1/2	3...10	450	65	30	65	—	**103T-BT⊗2-RC10C-D1D**	**107T-BT⊗3-RC10C-D1D**
3.2...10	3/4...3	3/4...3	2...7-1/2	3...10	450	65	30	65	—	**103T-BT⊗2-RC10C-E1D**	**107T-BT⊗3-RC10C-E1D**
3.0...10	3/4...3	3/4...3	1-1/2...7-1/2	3...10	450	65	30	65	—	**103T-BT⊗2-RC10C-C1B**	—
3.0...10	3/4...3	3/4...3	1-1/2...7-1/2	3...10	450	65	30	65	—	**103T-BT⊗2-RC10C-C2B**	**107T-BT⊗3-RC10C-C2B**
3.2...10	3/4...3	3/4...3	2...7-1/2	3...10	450	65	30	65	30	**103T-ET⊗3-RC10C-E1D**	**107T-ET⊗3-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-ET⊗3-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-ET⊗3-RC10C-C2B**	**107T-ET⊗3-RC10C-C2B**
3.2...16	3/4...5	3/4...5	2...10	3...10	450	65	30	65	—	**103T-CT⊗2-RC16C-D1D**	**107T-CT⊗3-RC16C-D1D**

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]					
						Type 1 Coordination		Type 2 Coordination	Type 2 Coordination		
	200V AC	230V AC	460V AC	575V AC		480V AC	600V AC	480V AC	600V AC	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	—	**103T-CT⊗2-RC16C-E1D**	**107T-CT⊗3-RC16C-E1D**
3.0...15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	—	**103T-CT⊗2-RC16C-C1B**	—
3.0...15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	—	**103T-CT⊗2-RC16C-C2B**	**107T-CT⊗3-RC16C-C2B**
3.2...16	3/4...5	3/4...5	2...10	3...10	450	65	30	65	30	**103T-ET⊗3-RC16C-E1D**	**107T-ET⊗3-RC16C-E1D**
3.0...15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	30	**103T-ET⊗3-RC16C-C1B**	—
3.0...15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	30	**103T-ET⊗3-RC16C-C2B**	**107T-ET⊗3-RC16C-C2B**
5.4...23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	30	50	—	**103T-DT⊗2-RC25C-D1E**	**107T-DT⊗3-RC25C-D1E**
5.4...23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	30	50	—	**103T-DT⊗2-RC25C-E1E**	**107T-DT⊗3-RC25C-E1E**
5.0...23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	30	50	—	**103T-DT⊗2-RC25C-C1C**	—
5.0...23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	30	50	—	**103T-DT⊗2-RC25C-C2C**	**107T-DT⊗3-RC25C-C2C**
5.4...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	450	65	30	65	—	**103T-ET⊗3-RC25C-E1E**	**107T-ET⊗3-RC25C-E1E**
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	450	65	30	65	—	**103T-ET⊗3-RC25C-C1C**	—
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	450	65	30	65	—	**103T-ET⊗3-RC25C-C2C**	**107T-ET⊗3-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-ET⊗3-TC25C-E1E**	**107T-ET⊗3-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-ET⊗3-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-ET⊗3-TC25C-C2C**	**107T-ET⊗3-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-ET⊗3-TC32C-E1F**	**107T-ET⊗3-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-ET⊗3-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-ET⊗3-TC32C-C2D**	**107T-ET⊗3-TC32C-C2D**
9.0...32	3...10	3...10	7-1/2...25	7-1/2...30	600	65	30	65	30	**103T-FT⊗3-TC32C-E1F**	**107T-FT⊗3-TC32C-E1F**
9.0...32	3...10	3...10	7-1/2...25	7-1/2...30	600	65	30	65	30	**103T-FT⊗3-TC32C-C1D**	—
9.0...32	3...10	3...10	7-1/2...25	7-1/2...30	600	65	30	65	30	**103T-FT⊗3-TC32C-C2D**	**107T-FT⊗3-TC32C-C2D**
9.0...37	3...10	3...10	7-1/2...25	7-1/2...30	600	65	18	65	—	**103T-FT⊗3-TC45C-E1F**	**107T-FT⊗3-TC45C-E1F**
9.0...37	3...10	3...10	7-1/2...25	7-1/2...30	600	65	18	65	—	**103T-FT⊗3-TC45C-C1D**	—
9.0...37	3...10	3...10	7-1/2...25	7-1/2...30	600	65	18	65	—	**103T-FT⊗3-TC45C-C2D**	**107T-FT⊗3-TC45C-C2D**
9.0...43	3...10	3...15	7-1/2...30	7-1/2...30	600	65	18	65	—	**103T-GT⊗3-TC45C-E1F**	**107T-GT⊗3-TC45C-E1F**
9.0...43	3...10	3...15	7-1/2...30	7-1/2...30	600	65	18	65	—	**103T-GT⊗3-TC45C-C1D**	—
9.0...43	3...10	3...15	7-1/2...30	7-1/2...30	600	65	18	65	—	**103T-GT⊗3-TC45C-C2D**	**107T-GT⊗3-TC45C-C2D**
18...45	7-1/2...10	7-1/2...15	15...30	20...40	600	65	18	65	—	**103T-HT⊗3-TC45C-E1G**	**107T-HT⊗3-TC45C-E1G**
9.0...45	3...10	3...15	7-1/2...30	7-1/2...40	600	65	18	65	—	**103T-HT⊗3-TC45C-C1D**	—
9.0...45	3...10	3...15	7-1/2...30	7-1/2...40	600	65	18	65	—	**103T-HT⊗3-TC45C-C2D**	**107T-HT⊗3-TC45C-C2D**

∗ 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.

⊗Coil voltage code—see page 2-295

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Product Selection and Coordination Ratings with Bulletin 193-EC, -ED, or EE Overload Relays—UL/CSA in Group Motor Installations, 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 C.B. per NEC	Max. Short-Circuit Current [kA]					
						Type 1 Coordination		Type 2 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 ISO Bus Bar Modules											
0.10...0.40	—	—	—	—	450	65	47	65	47	**103T-AS⊗2-QA40C-D1A**	**107T-AS⊗3-QA40C-D1A**
0.10...0.40	—	—	—	—	450	65	47	65	47	**103T-AS⊗2-QA40C-E1A**	**107T-AS⊗3-QA40C-E1A**
0.20...1.00	—	—	—	1/2	450	65	47	65	47	**103T-AS⊗2-QB10C-D1B**	**107T-AS⊗3-QB10C-D1B**
0.20...1.00	—	—	—	1/2	450	65	47	65	47	**103T-AS⊗2-QB10C-E1B**	**107T-AS⊗3-QB10C-E1B**
0.40...1.00	—	—	—	1/2	450	65	47	65	47	**103T-AS⊗2-QB10C-C1P**	—
0.40...1.00	—	—	—	1/2	450	65	47	65	47	**103T-AS⊗2-QB10C-C2P**	**107T-AS⊗3-QB10C-C2P**
0.4...2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	103T-AS⊗2-QB25C-C1P	—
0.4...2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	**103T-AS⊗2-QB25C-C2P**	107T-AS⊗3-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-AS⊗2-QB25C-D1C**	**107T-AS⊗3-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-AS⊗2-QB25C-E1C**	**107T-AS⊗3-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-AS⊗2-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-AS⊗2-QB25C-C2A**	**107T-AS⊗3-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-AS⊗2-RB25C-C1P**	—
0.4...2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	**103T-AS⊗2-RB25C-C2P**	**107T-AS⊗3-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-AS⊗2-RB25C-D1C**	**107T-AS⊗3-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-AS⊗2-RB25C-E1C**	**107T-AS⊗3-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-AS⊗2-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-AS⊗2-RB25C-C2A**	**107T-AS⊗3-RB25C-C2A**
0.4...2.0	—	—	1/2...1	1/2...1	450	65	30	65	30	**103T-DS⊗2-RB25C-C1P**	—
0.4...2.0	—	—	1/2...1	1/2...1	450	65	30	65	30	**103T-DS⊗2-RB25C-C2P**	**107T-DS⊗3-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-DS⊗2-RB25C-D1C**	**107T-DS⊗3-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-DS⊗2-RB25C-E1C**	**107T-DS⊗3-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-DS⊗2-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-DS⊗2-RB25C-C2A**	**107T-DS⊗3-RB25C-C2A**
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	**103T-AS⊗2-RB40C-D1C**	**107T-AS⊗3-RB40C-D1C**
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	**103T-AS⊗2-RB40C-E1C**	**107T-AS⊗3-RB40C-E1C**
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	**103T-AS⊗2-RB40C-C1A**	—
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	**103T-AS⊗2-RB40C-C2A**	**107T-AS⊗3-RB40C-C2A**
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	**103T-DS⊗2-RB40C-D1C**	**107T-DS⊗3-RB40C-D1C**
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	**103T-DS⊗2-RB40C-E1C**	**107T-DS⊗3-RB40C-E1C**
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	**103T-DS⊗2-RB40C-C1A**	—
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	**103T-DS⊗2-RB40C-C2A**	**107T-DS⊗3-RB40C-C2A**
3.2...6.3	3/4...1-1/2	3/4...2	2...5	3...5	450	65	30	65	—	**103T-AS⊗2-RB63C-D1D**	**107T-AS⊗3-RB63C-D1D**
3.2...6.3	3/4...1-1/2	3/4...2	2...5	3...5	450	65	30	65	—	**103T-AS⊗2-RB63C-E1D**	**107T-AS⊗3-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-AS⊗2-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-AS⊗2-RB63C-C2B**	**107T-AS⊗3-RB63C-C2B**
3.2...10	3/4...3	3/4...3	2...7-1/2	3...10	450	65	30	65	—	**103T-BS⊗2-RC10C-D1D**	**107T-BS⊗3-RC10C-D1D**
3.2...10	3/4...3	3/4...3	2...7-1/2	3...10	450	65	30	65	—	**103T-BS⊗2-RC10C-E1D**	**107T-BS⊗3-RC10C-E1D**
3.0...10	3/4...3	3/4...3	1-1/2...7-1/2	3...10	450	65	30	65	—	**103T-BS⊗2-RC10C-C1B**	—
3.0...10	3/4...3	3/4...3	1-1/2...7-1/2	3...10	450	65	30	65	—	**103T-BS⊗2-RC10C-C2B**	**107T-BS⊗3-RC10C-C2B**
3.2...10	3/4...3	3/4...3	2...7-1/2	3...10	450	65	30	65	30	**103T-ES⊗3-RC10C-E1D**	**107T-ES⊗3-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-ES⊗3-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-ES⊗3-RC10C-C2B**	**107T-ES⊗3-RC10C-C2B**
3.2...16	3/4...5	3/4...5	2...10	3...10	450	65	30	65	—	**103T-CS⊗2-RC16C-D1D**	**107T-CS⊗3-RC16C-D1D**
3.2...16	3/4...5	3/4...5	2...10	3...10	450	65	30	65	—	**103T-CS⊗2-RC16C-E1D**	**107T-CS⊗3-RC16C-E1D**
3.0...15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	—	**103T-CS⊗2-RC16C-C1B**	—
3.0...15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	—	**103T-CS⊗2-RC16C-C2B**	**107T-CS⊗3-RC16C-C2B**
3.2...16	3/4...5	3/4...5	2...10	3...10	450	65	30	65	30	**103T-ES⊗3-RC16C-E1D**	**107T-ES⊗3-RC16C-E1D**
3.0...15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	30	**103T-ES⊗3-RC16C-C1B**	—
3.0...15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	30	**103T-ES⊗3-RC16C-C2B**	**107T-ES⊗3-RC16C-C2B**
5.4...23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	—	50	—	**103T-DS⊗2-RC25C-D1E**	**107T-DS⊗3-RC25C-D1E**
5.4...23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	—	50	—	**103T-DS⊗2-RC25C-E1E**	**107T-DS⊗3-RC25C-E1E**
5.0...23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	—	50	—	103T-DS⊗2-RC25C-C1C	—
5.0...23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	—	50	—	**103T-DS⊗2-RC25C-C2C**	107T-DS⊗3-RC25C-C2C
5.4...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	450	65	30	65	—	**103T-ES⊗3-RC25C-E1E**	**107T-ES⊗3-RC25C-E1E**

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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 Motor Controller in Group Motor Installations∗				Max. Fuse or C.B. per NEC	Max. Short-Circuit Current [kA]					
						Type 1 Coordination		Type 2 Coordination	Type 2 Coordination		
	200V AC	230V AC	460V AC	575V AC		480V AC	600V AC	480V AC	600V AC	Cat. No.	Cat. No.
D-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules											
5.0…25	1-1/2…5	1-1/2…7-1/2	5…15	5…20	450	65	30	65	—	**103T-ES⊗3-RC25C-C1C**	—
5.0…25	1-1/2…5	1-1/2…7-1/2	5…15	5…20	450	65	30	65	—	**103T-ES⊗3-RC25C-C2C**	**107T-ES⊗3-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-ES⊗3-TC25C-E1E**	**107T-ES⊗3-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-ES⊗3-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-ES⊗3-TC25C-C2C**	**107T-ES⊗3-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-ES⊗3-TC32C-E1F**	**107T-ES⊗3-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-ES⊗3-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-ES⊗3-TC32C-C2D**	107T-ES⊗3-TC32C-C2D
9.0…32	3…10	3…10	7-1/2…25	7-1/2…30	600	65	30	65	30	**103T-FS⊗3-TC32C-E1F**	**107T-FS⊗3-TC32C-E1F**
9.0…32	3…10	3…10	7-1/2…25	7-1/2…30	600	65	30	65	30	**103T-FS⊗3-TC32C-C1D**	—
9.0…32	3…10	3…10	7-1/2…25	7-1/2…30	600	65	30	65	30	**103T-FS⊗3-TC32C-C2D**	**107T-FS⊗3-TC32C-C2D**
9.0…37	3…10	3…10	7-1/2…25	7-1/2…30	600	65	18	65	—	**103T-FS⊗3-TC45C-E1F**	**107T-FS⊗3-TC45C-E1F**
9.0…37	3…10	3…10	7-1/2…25	7-1/2…30	600	65	18	65	—	**103T-FS⊗3-TC45C-C1D**	—
9.0…37	3…10	3…10	7-1/2…25	7-1/2…30	600	65	18	65	—	**103T-FS⊗3-TC45C-C2D**	107T-FS⊗3-TC45C-C2D
9.0…43	3…10	3…15	7-1/2…30	7-1/2…30	600	65	18	65	—	**103T-GS⊗3-TC45C-E1F**	**107T-GS⊗3-TC45C-E1F**
9.0…43	3…10	3…15	7-1/2…30	7-1/2…30	600	65	18	65	—	**103T-GS⊗3-TC45C-C1D**	—
9.0…43	3…10	3…15	7-1/2…30	7-1/2…30	600	65	18	65	—	**103T-GS⊗3-TC45C-C2D**	**107T-GS⊗3-TC45C-C2D**

∗ 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.

⊗Coil voltage code—see page 2-295

Product Selection and Coordination Ratings with Bulletin 193-EC, -ED, or EE Overload Relays—UL/CSA in Group Motor Installations, 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 C.B. per NEC	Max. Short-Circuit Current [kA]					
						Type 1 Coordination		Type 2 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...0.40	—	—	—	—	450	65	47	65	47	**103T-AW⊗2-QA40C-D1A**	**107T-AW⊗3-QA40C-D1A**
0.10...0.40	—	—	—	—	450	65	47	65	47	**103T-AW⊗2-QA40C-E1A**	**107T-AW⊗3-QA40C-E1A**
0.20...1.00	—	—	—	1/2	450	65	47	65	47	**103T-AW⊗2-QB10C-D1B**	**107T-AW⊗3-QB10C-D1B**
0.20...1.00	—	—	—	1/2	450	65	47	65	47	**103T-AW⊗2-QB10C-E1B**	**107T-AW⊗3-QB10C-E1B**
0.40...1.00	—	—	—	1/2	450	65	47	65	47	**103T-AW⊗2-QB10C-C1P**	—
0.40...1.00	—	—	—	1/2	450	65	47	65	47	**103T-AW⊗2-QB10C-C2P**	**107T-AW⊗3-QB10C-C2P**
0.4...2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	**103T-AW⊗2-QB25C-C1P**	—
0.4...2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	**103T-AW⊗2-QB25C-C2P**	**107T-AW⊗3-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-AW⊗2-QB25C-D1C**	**107T-AW⊗3-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-AW⊗2-QB25C-E1C	**107T-AW⊗3-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-AW⊗2-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-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	—	—	1/2...1	1/2...1	450	65	30	65	—	**103T-AW⊗2-RB25C-C1P**	—
0.4...2.0	—	—	1/2...1	1/2...1	450	65	30	65	—	**103T-AW⊗2-RB25C-C2P**	**107T-AW⊗3-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-AW⊗2-RB25C-D1C**	**107T-AW⊗3-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-AW⊗2-RB25C-E1C**	**107T-AW⊗3-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-AW⊗2-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-AW⊗2-RB25C-C2A**	**107T-AW⊗3-RB25C-C2A**
0.4...2.0	—	—	1/2...1	1/2...1	450	65	30	65	30	**103T-DW⊗2-RB25C-C1P**	—
0.4...2.0	—	—	1/2...1	1/2...1	450	65	30	65	30	**103T-DW⊗2-RB25C-C2P**	**107T-DW⊗3-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-DW⊗2-RB25C-D1C**	**107T-DW⊗3-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-DW⊗2-RB25C-E1C**	**107T-DW⊗3-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-DW⊗2-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-DW⊗2-RB25C-C2A**	**107T-DW⊗3-RB25C-C2A**
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	**103T-AW⊗2-RB40C-D1C**	**107T-AW⊗3-RB40C-D1C**
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	**103T-AW⊗2-RB40C-E1C**	**107T-AW⊗3-RB40C-E1C**
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	**103T-AW⊗2-RB40C-C1A**	—
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	—	**103T-AW⊗2-RB40C-C2A**	**107T-AW⊗3-RB40C-C2A**
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	**103T-DW⊗2-RB40C-D1C**	**107T-DW⊗3-RB40C-D1C**
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	**103T-DW⊗2-RB40C-E1C**	**107T-DW⊗3-RB40C-E1C**
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	**103T-DW⊗2-RB40C-C1A**	—
1.0...4.0	1/2...1	1/2...1	1/2...3	3/4...3	450	65	30	65	30	**103T-DW⊗2-RB40C-C2A**	**107T-DW⊗3-RB40C-C2A**
3.2...6.3	3/4...1-1/2	3/4...2	2...5	3...5	450	65	30	65	—	**103T-AW⊗2-RB63C-D1D**	**107T-AW⊗3-RB63C-D1D**
3.2...6.3	3/4...1-1/2	3/4...2	2...5	3...5	450	65	30	65	—	**103T-AW⊗2-RB63C-E1D**	**107T-AW⊗3-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-AW⊗2-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-AW⊗2-RB63C-C2B**	**107T-AW⊗3-RB63C-C2B**
3.2...10	3/4...3	3/4...3	2...7-1/2	3...10	450	65	30	65	—	**103T-BW⊗2-RC10C-D1D**	**107T-BW⊗3-RC10C-D1D**
3.2...10	3/4...3	3/4...3	2...7-1/2	3...10	450	65	30	65	—	**103T-BW⊗2-RC10C-E1D**	**107T-BW⊗3-RC10C-E1D**
3.0...10	3/4...3	3/4...3	1-1/2...7-1/2	3...10	450	65	30	65	—	**103T-BW⊗2-RC10C-C1B**	—
3.0...10	3/4...3	3/4...3	1-1/2...7-1/2	3...10	450	65	30	65	—	**103T-BW⊗2-RC10C-C2B**	**107T-BW⊗3-RC10C-C2B**
3.2...10	3/4...3	3/4...3	2...7-1/2	3...10	450	65	30	65	30	**103T-EW⊗3-RC10C-E1D**	**107T-EW⊗3-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-EW⊗3-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-EW⊗3-RC10C-C2B**	**107T-EW⊗3-RC10C-C2B**
3.2...16	3/4...5	3/4...5	2...10	3...10	450	65	30	65	—	**103T-CW⊗2-RC16C-D1D**	**107T-CW⊗3-RC16C-D1D**
3.2...16	3/4...5	3/4...5	2...10	3...10	450	65	30	65	—	**103T-CW⊗2-RC16C-E1D**	**107T-CW⊗3-RC16C-E1D**
3.0...15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	—	**103T-CW⊗2-RC16C-C1B**	—
3.0...15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	—	**103T-CW⊗2-RC16C-C2B**	**107T-CW⊗3-RC16C-C2B**
3.2...16	3/4...5	3/4...5	2...10	3...10	450	65	30	65	30	**103T-EW⊗3-RC16C-E1D**	**107T-EW⊗3-RC16C-E1D**
3.0...15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	30	**103T-EW⊗3-RC16C-C1B**	—
3.0...15	3/4...5	3/4...5	1-1/2...10	3...10	450	65	30	65	30	**103T-EW⊗3-RC16C-C2B**	**107T-EW⊗3-RC16C-C2B**
5.4...23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	—	50	—	**103T-DW⊗2-RC25C-D1E**	**107T-DW⊗3-RC25C-D1E**
5.4...23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	—	50	—	**103T-DW⊗2-RC25C-E1E**	**107T-DW⊗3-RC25C-E1E**
5.0...23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	—	50	—	**103T-DW⊗2-RC25C-C1C**	—
5.0...23	1-1/2...5	1-1/2...7-1/2	5...15	5...15	450	65	—	50	—	**103T-DW⊗2-RC25C-C2C**	**107T-DW⊗3-RC25C-C2C**
5.4...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	450	65	30	65	—	**103T-EW⊗3-RC25C-E1E**	**107T-EW⊗3-RC25C-E1E**
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	450	65	30	65	—	**103T-EW⊗3-RC25C-C1C**	—
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	450	65	30	65	—	**103T-EW⊗3-RC25C-C2C**	**107T-EW⊗3-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	Max. Short-Circuit Current [kA]					
						Type 1 Coordination		Type 2 Coordination	Type 2 Coordination		
	200V AC	230V AC	460V AC	575V AC		480V AC	600V AC	480V AC	600V AC	Cat. No.	Cat. No.
F-Frame with 100-C/104-C Contactors on Panel Mounting Modules											
5.4...25	1-1/2...7-1/2	1-1/2...10	5...20	5...20	600	65	30	65	30	**103T-EW⊗3-TC25C-E1E**	**107T-EW⊗3-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-EW⊗3-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-EW⊗3-TC25C-C2C**	**107T-EW⊗3-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-EW⊗3-TC32C-E1F**	**107T-EW⊗3-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-EW⊗3-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-EW⊗3-TC32C-C2D**	**107T-EW⊗3-TC32C-C2D**
9.0...32	3...10	3...10	7-1/2...25	7-1/2...30	600	65	30	65	30	**103T-FW⊗3-TC32C-E1F**	**107T-FW⊗3-TC32C-E1F**
9.0...32	3...10	3...10	7-1/2...25	7-1/2...30	600	65	30	65	30	**103T-FW⊗3-TC32C-C1D**	—
9.0...32	3...10	3...10	7-1/2...25	7-1/2...30	600	65	30	65	30	**103T-FW⊗3-TC32C-C2D**	**107T-FW⊗3-TC32C-C2D**
9.0...37	3...10	3...10	7-1/2...25	7-1/2...30	600	65	18	65	—	**103T-FW⊗3-TC45C-E1F**	**107T-FW⊗3-TC45C-E1F**
9.0...37	3...10	3...10	7-1/2...25	7-1/2...30	600	65	18	65	—	**103T-FW⊗3-TC45C-C1D**	—
9.0...37	3...10	3...10	7-1/2...25	7-1/2...30	600	65	18	65	—	**103T-FW⊗3-TC45C-C2D**	**107T-FW⊗3-TC45C-C2D**
9.0...43	3...10	3...15	7-1/2...30	7-1/2...30	600	65	18	65	—	103T-GW⊗3-TC45C-E1F	**107T-GW⊗3-TC45C-E1F**
9.0...43	3...10	3...15	7-1/2...30	7-1/2...30	600	65	18	65	—	**103T-GW⊗3-TC45C-C1D**	—
9.0...43	3...10	3...15	7-1/2...30	7-1/2...30	600	65	18	65	—	103T-GW⊗3-TC45C-C2D	**107T-GW⊗3-TC45C-C2D**

✶ 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.

⊗Coil voltage code—see page 2-295

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Product Selection and Coordination Ratings with Bulletin 193-EC, -ED, or EE Overload Relays— 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	Reversing Starters
	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	Cat. No.	Cat. No.
C-Frame with 100-C/104-C Contactors on Standard Bus Bar Modules								
0.10...0.40	—	—	—	—	65	47	**103T-AT⊗2-QA40C-D1A-TE**	**107T-AT⊗3-QA40C-D1A-TE**
0.10...0.40	—	—	—	—	65	47	**103T-AT⊗2-QA40C-E1A-TE**	**107T-AT⊗3-QA40C-E1A-TE**
0.20...1.00	—	—	—	1/2	65	47	**103T-AT⊗2-QB10C-D1B-TE**	**107T-AT⊗3-QB10C-D1B-TE**
0.20...1.00	—	—	—	1/2	65	47	**103T-AT⊗2-QB10C-E1B-TE**	**107T-AT⊗3-QB10C-E1B-TE**
0.40...1.00	—	—	—	1/2	65	47	**103T-AT⊗2-QB10C-C1P-TE**	—
0.40...1.00	—	—	—	1/2	65	47	**103T-AT⊗2-QB10C-C2P-TE**	**107T-AT⊗3-QB10C-C2P-TE**
0.4...2.0	—	—	1/2...3/4	—	65	❖	**103T-AT⊗2-QB25C-C1P-TE**	—
0.4...2.0	—	—	1/2...3/4	—	65	❖	**103T-AT⊗2-QB25C-C2P-TE**	**107T-AT⊗3-QB25C-C2P-TE**
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	**103T-AT⊗2-QB25C-D1C-TE**	**107T-AT⊗3-QB25C-D1C-TE**
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	**103T-AT⊗2-QB25C-E1C-TE**	**107T-AT⊗3-QB25C-E1C-TE**
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	**103T-AT⊗2-QB25C-C1A-TE**	—
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	**103T-AT⊗2-QB25C-C2A-TE**	**107T-AT⊗3-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-AT⊗2-RB25C-C1P-TE**	—
0.4...2.0	—	—	1/2...3/4	—	65	❖	**103T-AT⊗2-RB25C-C2P-TE**	**107T-AT⊗3-RB25C-C2P-TE**
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	**103T-AT⊗2-RB25C-D1C-TE**	**107T-AT⊗3-RB25C-D1C-TE**
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	**103T-AT⊗2-RB25C-E1C-TE**	**107T-AT⊗3-RB25C-E1C-TE**
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	**103T-AT⊗2-RB25C-C1A-TE**	—
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	**103T-AT⊗2-RB25C-C2A-TE**	**107T-AT⊗3-RB25C-C2A-TE**
0.4...2.0	—	—	1/2...3/4	1/2...1	65	30	**103T-DT⊗2-RB25C-C1P-TE**	—
0.4...2.0	—	—	1/2...3/4	1/2...1	65	30	**103T-DT⊗2-RB25C-C2P-TE**	**107T-DT⊗3-RB25C-C2P-TE**
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	**103T-DT⊗2-RB25C-D1C-TE**	**107T-DT⊗3-RB25C-D1C-TE**
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	**103T-DT⊗2-RB25C-E1C-TE**	**107T-DT⊗3-RB25C-E1C-TE**
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	**103T-DT⊗2-RB25C-C1A-TE**	—
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	**103T-DT⊗2-RB25C-C2A-TE**	**107T-DT⊗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-DT⊗2-RB40C-D1C-TE**	**107T-DT⊗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-DT⊗2-RB40C-E1C-TE**	**107T-DT⊗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-DT⊗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-DT⊗2-RB40C-C2A-TE**	**107T-DT⊗3-RB40C-C2A-TE**
3.2...10	3/4...2	3/4...3	2...5	3...7-1/2	65	30	**103T-ET⊗3-RC10C-E1D-TE**	**107T-ET⊗3-RC10C-E1D-TE**
3.0...10	3/4...2	3/4...3	1-1/2...5	3...7-1/2	65	30	**103T-ET⊗3-RC10C-C1B-TE**	—
3.0...10	3/4...2	3/4...3	1-1/2...5	3...7-1/2	65	30	**103T-ET⊗3-RC10C-C2B-TE**	**107T-ET⊗3-RC10C-C2B-TE**
3.2...16	3/4...3	3/4...5	2...10	3...10	65	30	**103T-ET⊗3-RC16C-E1D-TE**	**107T-ET⊗3-RC16C-E1D-TE**
3.0...15	3/4...3	3/4...5	2...10	3...10	65	30	**103T-ET⊗3-RC16C-C1B-TE**	—
3.0...15	3/4...3	3/4...5	2...10	3...10	65	30	**103T-ET⊗3-RC16C-C2B-TE**	**107T-ET⊗3-RC16C-C2B-TE**
5.4...25	1-1/2...5	1-1/2...7-1/2	5...15	—	65	❖	**103T-ET⊗3-RC25C-E1E-TE**	**107T-ET⊗3-RC25C-E1E-TE**
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	—	65	❖	**103T-ET⊗3-RC25C-C1C-TE**	—
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	—	65	❖	**103T-ET⊗3-RC25C-C2C-TE**	**107T-ET⊗3-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-ET⊗3-TC25C-E1E-TE**	**107T-ET⊗3-TC25C-E1E-TE**
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	65	30	**103T-ET⊗3-TC25C-C1C-TE**	—
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	65	30	**103T-ET⊗3-TC25C-C2C-TE**	**107T-ET⊗3-TC25C-C2C-TE**
9.0...30	3...7-1/2	3...10	7-1/2...20	7-1/2...20	65	30	**103T-ET⊗3-TC32C-E1F-TE**	**107T-ET⊗3-TC32C-E1F-TE**
9.0...30	3...7-1/2	3...10	7-1/2...20	7-1/2...20	65	30	**103T-ET⊗3-TC32C-C1D-TE**	—
9.0...30	3...7-1/2	3...10	7-1/2...20	7-1/2...20	65	30	**103T-ET⊗3-TC32C-C2D-TE**	**107T-ET⊗3-TC32C-C2D-TE**
9.0...32	3...7-1/2	3...10	7-1/2...20	7-1/2...25	65	30	**103T-FT⊗3-TC32C-E1F-TE**	**107T-ET⊗3-TC32C-E1F-TE**
9.0...32	3...7-1/2	3...10	7-1/2...20	7-1/2...25	65	30	**103T-FT⊗3-TC32C-C1D-TE**	—
9.0...32	3...7-1/2	3...10	7-1/2...20	7-1/2...25	65	30	**103T-FT⊗3-TC32C-C2D-TE**	**107T-ET⊗3-TC32C-C2D-TE**
9.0...37	3...10	3...10	7-1/2...25	—	65	❖	**103T-FT⊗3-TC45C-E1F-TE**	**107T-FT⊗3-TC45C-E1F-TE**
9.0...37	3...10	3...10	7-1/2...25	—	65	❖	**103T-FT⊗3-TC45C-C1D-TE**	—
9.0...37	3...10	3...10	7-1/2...25	—	65	❖	**103T-FT⊗3-TC45C-C2D-TE**	**107T-FT⊗3-TC45C-C2D-TE**
9.0...43	3...10	3...15	7-1/2...30	—	65	❖	**103T-GT⊗3-TC45C-E1F-TE**	**107T-GT⊗3-TC45C-E1F-TE**
9.0...43	3...10	3...15	7-1/2...30	—	65	❖	**103T-GT⊗3-TC45C-C1D-TE**	—
9.0...43	3...10	3...15	7-1/2...30	—	65	❖	**103T-GT⊗3-TC45C-C2D-TE**	**107T-GT⊗3-TC45C-C2D-TE**
18...45	7-1/2...10	7-1/2...15	15...30	—	65	❖	**103T-HT⊗3-TC45C-E1G-TE**	**107T-HT⊗3-TC45C-E1G-TE**
9.0...45	3...10	3...15	7-1/2...30	—	65	❖	**103T-HT⊗3-TC45C-C1D-TE**	—
9.0...45	3...10	3...15	7-1/2...30	—	65	❖	**103T-HT⊗3-TC45C-C2D-TE**	**107T-HT⊗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 and service factor.

❖ This starter is not valid for application at this horsepower and voltage.

⊗Coil voltage code—see page 2-295

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Product Selection and Coordination Ratings with Bulletin 193-EC, -ED, or EE Overload Relays— 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	Reversing Starters
	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	Cat. No.	Cat. No.
C-Frame with 100-C/104-C Contactors on ISO Bus Bar Modules								
0.10...0.40	—	—	—	—	65	47	**103T-AS⊗2-QA40C-D1A-TE**	**107T-AS⊗3-QA40C-D1A-TE**
0.10...0.40	—	—	—	—	65	47	**103T-AS⊗2-QA40C-E1A-TE**	**107T-AS⊗3-QA40C-E1A-TE**
0.20...1.00	—	—	—	1/2	65	47	**103T-AS⊗2-QB10C-D1B-TE**	**107T-AS⊗3-QB10C-D1B-TE**
0.20...1.00	—	—	—	1/2	65	47	**103T-AS⊗2-QB10C-E1B-TE**	**107T-AS⊗3-QB10C-E1B-TE**
0.40...1.00	—	—	—	1/2	65	47	**103T-AS⊗2-QB10C-C1P-TE**	—
0.40...1.00	—	—	—	1/2	65	47	**103T-AS⊗2-QB10C-C2P-TE**	**107T-AS⊗3-QB10C-C2P-TE**
0.4...2.0	—	—	1/2...3/4	—	65	❖	**103T-AS⊗2-QB25C-C1P-TE**	—
0.4...2.0	—	—	1/2...3/4	—	65	❖	**103T-AS⊗2-QB25C-C2P-TE**	**107T-AS⊗3-QB25C-C2P-TE**
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	**103T-AS⊗2-QB25C-D1C-TE**	**107T-AS⊗3-QB25C-D1C-TE**
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	**103T-AS⊗2-QB25C-E1C-TE**	**107T-AS⊗3-QB25C-E1C-TE**
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	**103T-AS⊗2-QB25C-C1A-TE**	—
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	**103T-AS⊗2-QB25C-C2A-TE**	**107T-AS⊗3-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-AS⊗2-RB25C-C1P-TE**	—
0.4...2.0	—	—	1/2...3/4	—	65	❖	**103T-AS⊗2-RB25C-C2P-TE**	**107T-AS⊗3-RB25C-C2P-TE**
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	**103T-AS⊗2-RB25C-D1C-TE**	**107T-AS⊗3-RB25C-D1C-TE**
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	**103T-AS⊗2-RB25C-E1C-TE**	**107T-AS⊗3-RB25C-E1C-TE**
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	**103T-AS⊗2-RB25C-C1A-TE**	—
1.0...2.5	1/2	1/2	1/2...1	—	65	❖	**103T-AS⊗2-RB25C-C2A-TE**	**107T-AS⊗3-RB25C-C2A-TE**
0.4...2.0	—	—	1/2...3/4	1/2...1	65	30	**103T-DS⊗2-RB25C-C1P-TE**	—
0.4...2.0	—	—	1/2...3/4	1/2...1	65	30	**103T-DS⊗2-RB25C-C2P-TE**	**107T-DS⊗3-RB25C-C2P-TE**
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	**103T-DS⊗2-RB25C-D1C-TE**	**107T-DS⊗3-RB25C-D1C-TE**
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	**103T-DS⊗2-RB25C-E1C-TE**	**107T-DS⊗3-RB25C-E1C-TE**
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	**103T-DS⊗2-RB25C-C1A-TE**	—
1.0...2.5	1/2	1/2	1/2...1	3/4...1-1/2	65	30	**103T-DS⊗2-RB25C-C2A-TE**	**107T-DS⊗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-DS⊗2-RB40C-D1C-TE**	**107T-DS⊗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-DS⊗2-RB40C-E1C-TE**	**107T-DS⊗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-DS⊗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-DS⊗2-RB40C-C2A-TE**	**107T-DS⊗3-RB40C-C2A-TE**
3.2...10	3/4...2	3/4...3	2...5	3...7-1/2	65	30	**103T-ES⊗3-RC10C-E1D-TE**	**107T-ES⊗3-RC10C-E1D-TE**
3.0...10	3/4...2	3/4...3	1-1/2...5	3...7-1/2	65	30	**103T-ES⊗3-RC10C-C1B-TE**	—
3.0...10	3/4...2	3/4...3	1-1/2...5	3...7-1/2	65	30	**103T-ES⊗3-RC10C-C2B-TE**	**107T-ES⊗3-RC10C-C2B-TE**
3.2...16	3/4...3	3/4...5	2...10	3...10	65	30	**103T-ES⊗3-RC16C-E1D-TE**	**107T-ES⊗3-RC16C-E1D-TE**
3.0...15	3/4...3	3/4...5	2...10	3...10	65	30	**103T-ES⊗3-RC16C-C1B-TE**	—
3.0...15	3/4...3	3/4...5	2...10	3...10	65	30	**103T-ES⊗3-RC16C-C2B-TE**	**107T-ES⊗3-RC16C-C2B-TE**
5.4...25	1-1/2...5	1-1/2...7-1/2	5...15	—	65	❖	**103T-ES⊗3-RC25C-E1E-TE**	**107T-ES⊗3-RC25C-E1E-TE**
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	—	65	❖	**103T-ES⊗3-RC25C-C1C-TE**	—
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	—	65	❖	**103T-ES⊗3-RC25C-C2C-TE**	**107T-ES⊗3-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-ES⊗3-TC25C-E1E-TE**	**107T-ES⊗3-TC25C-E1E-TE**
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	65	30	**103T-ES⊗3-TC25C-C1C-TE**	—
5.0...25	1-1/2...5	1-1/2...7-1/2	5...15	5...20	65	30	**103T-ES⊗3-TC25C-C2C-TE**	**107T-ES⊗3-TC25C-C2C-TE**
9.0...30	3...7-1/2	3...10	7-1/2...20	7-1/2...20	65	30	**103T-ES⊗3-TC32C-E1F-TE**	**107T-ES⊗3-TC32C-E1F-TE**
9.0...30	3...7-1/2	3...10	7-1/2...20	7-1/2...20	65	30	**103T-ES⊗3-TC32C-C1D-TE**	—
9.0...30	3...7-1/2	3...10	7-1/2...20	7-1/2...20	65	30	**103T-ES⊗3-TC32C-C2D-TE**	**107T-ES⊗3-TC32C-C2D-TE**
9.0...32	3...7-1/2	3...10	7-1/2...20	7-1/2...25	65	30	**103T-FS⊗3-TC32C-E1F-TE**	**107T-ES⊗3-TC32C-E1F-TE**
9.0...32	3...7-1/2	3...10	7-1/2...20	7-1/2...25	65	30	**103T-FS⊗3-TC32C-C1D-TE**	—
9.0...32	3...7-1/2	3...10	7-1/2...20	7-1/2...25	65	30	**103T-FS⊗3-TC32C-C2D-TE**	**107T-ES⊗3-TC32C-C2D-TE**
9.0...37	3...10	3...10	7-1/2...25	—	65	❖	**103T-FS⊗3-TC45C-E1F-TE**	**107T-FS⊗3-TC45C-E1F-TE**
9.0...37	3...10	3...10	7-1/2...25	—	65	❖	**103T-FS⊗3-TC45C-C1D-TE**	—
9.0...37	3...10	3...10	7-1/2...25	—	65	❖	**103T-FS⊗3-TC45C-C2D-TE**	**107T-FS⊗3-TC45C-C2D-TE**
9.0...43	3...10	3...15	7-1/2...30	—	65	❖	**103T-GS⊗3-TC45C-E1F-TE**	**107T-GS⊗3-TC45C-E1F-TE**
9.0...43	3...10	3...15	7-1/2...30	—	65	❖	**103T-GS⊗3-TC45C-C1D-TE**	—
9.0...43	3...10	3...15	7-1/2...30	—	65	❖	**103T-GS⊗3-TC45C-C2D-TE**	**107T-GS⊗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 and service factor.
❖ This starter is not valid for application at this horsepower and voltage.
⊗Coil voltage code—see page 2-295

Product Selection and Coordination Ratings with Bulletin 193-EC, -ED, or EE Overload Relays— 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	Reversing Starters
	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	Cat. No.	Cat. No.
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 and service factor.

❖ This starter is not valid for application at this horsepower and voltage.

⊗ Coil voltage code—see page 2-295

Product Selection and Coordination Ratings 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-AT⊗2-F3CC-D1A**	**107T-AT⊗3-F3CC-D1A**
0.10...0.50	—	—	—	—	3	100	3	100	**103T-AT⊗2-F3CC-E1A**	**107T-AT⊗3-F3CC-E1A**
0.20...1.00	—	—	—	1/2	6	100	6	100	**103T-AT⊗2-F3CC-D1B**	**107T-AT⊗3-F3CC-D1B**
0.20...1.00	—	—	—	1/2	6	100	6	100	**103T-AT⊗2-F3CC-E1B**	**107T-AT⊗3-F3CC-E1B**
0.40...1.00	—	—	—	1/2	6	100	6	100	**103T-AT⊗2-F3CC-C1P**	—
0.40...1.00	—	—	—	1/2	6	100	6	100	**103T-AT⊗2-F3CC-C2P**	**107T-AT⊗3-F3CC-C2P**
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	**103T-AT⊗2-F3CC-D1C**	**107T-AT⊗3-F3CC-D1C**
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	**103T-AT⊗2-F3CC-E1C**	**107T-AT⊗3-F3CC-E1C**
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	**103T-AT⊗2-F3CC-C1A**	—
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	**103T-AT⊗2-F3CC-C2A**	**107T-AT⊗3-F3CC-C2A**
3.2...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	**103T-AT⊗2-F3CC-D1D**	**107T-AT⊗3-F3CC-D1D**
3.2...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	**103T-AT⊗2-F3CC-E1D**	**107T-AT⊗3-F3CC-E1D**
3.0...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	**103T-AT⊗2-F3CC-C1B**	—
3.0...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	**103T-AT⊗2-F3CC-C2B**	**107T-AT⊗3-F3CC-C2B**
3.2...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	**103T-BT⊗2-F3CC-D1D**	**107T-BT⊗3-F3CC-D1D**
3.2...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	**103T-BT⊗2-F3CC-E1D**	**107T-BT⊗3-F3CC-E1D**
3.0...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	**103T-BT⊗2-F3CC-C1B**	—
3.0...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	**103T-BT⊗2-F3CC-C2B**	**107T-BT⊗3-F3CC-C2B**
3.2...16.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	**103T-CT⊗2-F3CC-D1D**	**107T-CT⊗3-F3CC-D1D**
3.2...16.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	**103T-CT⊗2-F3CC-E1D**	**107T-CT⊗3-F3CC-E1D**
3.0...15.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	**103T-CT⊗2-F3CC-C1B**	—
3.0...15.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	**103T-CT⊗2-F3CC-C2B**	**107T-CT⊗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-DT⊗2-F3CC-D1E**	**107T-DT⊗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-DT⊗2-F3CC-E1E**	**107T-DT⊗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-DT⊗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-DT⊗2-F3CC-C2C**	**107T-DT⊗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 and service factor.

⊗Coil voltage code—see page 2-295

Product Selection and Coordination Ratings with Bulletin 193-EC, -ED, or EE Overload Relays—UL/CSA as a Fused Motor Controller, Continued

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 ISO Bus Bar Modules										
0.10...0.50	—	—	—	—	3	100	3	100	**103T-AS⊗2-F3CC-D1A**	**107T-AS⊗3-F3CC-D1A**
0.10...0.50	—	—	—	—	3	100	3	100	**103T-AS⊗2-F3CC-E1A**	**107T-AS⊗3-F3CC-E1A**
0.20...1.00	—	—	—	1/2	6	100	6	100	**103T-AS⊗2-F3CC-D1B**	**107T-AS⊗3-F3CC-D1B**
0.20...1.00	—	—	—	1/2	6	100	6	100	**103T-AS⊗2-F3CC-E1B**	**107T-AS⊗3-F3CC-E1B**
0.40...1.00	—	—	—	1/2	6	100	6	100	**103T-AS⊗2-F3CC-C1P**	—
0.40...1.00	—	—	—	1/2	6	100	6	100	**103T-AS⊗2-F3CC-C2P**	**107T-AS⊗3-F3CC-C2P**
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	**103T-AS⊗2-F3CC-D1C**	**107T-AS⊗3-F3CC-D1C**
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	**103T-AS⊗2-F3CC-E1C**	**107T-AS⊗3-F3CC-E1C**
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	**103T-AS⊗2-F3CC-C1A**	—
1.0...5.0	1/2...1	1/2...1	1/2...3	1/2...3	20	100	15	100	**103T-AS⊗2-F3CC-C2A**	**107T-AS⊗3-F3CC-C2A**
3.2...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	**103T-AS⊗2-F3CC-D1D**	**107T-AS⊗3-F3CC-D1D**
3.2...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	**103T-AS⊗2-F3CC-E1D**	**107T-AS⊗3-F3CC-E1D**
3.0...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	**103T-AS⊗2-F3CC-C1B**	—
3.0...9.0	3/4...2	3/4...2	2...5	3...7-1/2	20	100	15	100	**103T-AS⊗2-F3CC-C2B**	**107T-AS⊗3-F3CC-C2B**
3.2...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	**103T-BS⊗2-F3CC-D1D**	**107T-BS⊗3-F3CC-D1D**
3.2...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	**103T-BS⊗2-F3CC-E1D**	**107T-BS⊗3-F3CC-E1D**
3.0...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	**103T-BS⊗2-F3CC-C1B**	—
3.0...12.0	3/4...3	3/4...3	2...7-1/2	3...10	20	100	20	100	**103T-BS⊗2-F3CC-C2B**	**107T-BS⊗3-F3CC-C2B**
3.2...16.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	**103T-CS⊗2-F3CC-D1D**	**107T-CS⊗3-F3CC-D1D**
3.2...16.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	**103T-CS⊗2-F3CC-E1D**	**107T-CS⊗3-F3CC-E1D**
3.0...15.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	**103T-CS⊗2-F3CC-C1B**	—
3.0...15.0	3/4...3	3/4...5	2...10	3...15	30	100	30	100	**103T-CS⊗2-F3CC-C2B**	**107T-CS⊗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-DS⊗2-F3CC-D1E**	**107T-DS⊗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-DS⊗2-F3CC-E1E**	**107T-DS⊗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-DS⊗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-DS⊗2-F3CC-C2C**	**107T-DS⊗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 and service factor.

⊗Coil voltage code—see page 2-295

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Product Selection and Coordination Ratings—UL/CSA as a Fused Motor Controller, Continued

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 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 and service factor.

⊗Coil voltage code—see page 2-295

Product Selection and 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	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.
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**

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**	
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 and service factor.

⊗Coil voltage code—see page 2-295

Product Selection and Coordination Ratings, 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					
	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.
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-AS⊗2-QA40C-D1A**	**107T-AS⊗3-QA40C-D1A**
0.10...0.40	0.06	0.09	0.12	0.18	65	65	65	50	65	65	50	50	**103T-AS⊗2-QA40C-E1A**	**107T-AS⊗3-QA40C-E1A**
0.20...1.00	0.12	0.25	0.37	0.55	65	65	65	50	65	65	50	50	**103T-AS⊗2-QB10C-D1B**	**107T-AS⊗3-QB10C-D1B**
0.20...1.00	0.12	0.25	0.37	0.55	65	65	65	50	65	65	50	50	**103T-AS⊗2-QB10C-E1B**	**107T-AS⊗3-QB10C-E1B**
0.40...1.00	0.12	0.25	0.37	0.55	65	65	65	50	65	65	50	50	**103T-AS⊗2-QB10C-C1P**	—
0.40...1.00	0.12	0.25	0.37	0.55	65	65	65	50	65	65	50	50	**103T-AS⊗2-QB10C-C2P**	**107T-AS⊗3-QB10C-C2P**
0.4 ... 2.0	0.37	0.75	0.75	1.1	65	65	50	8	65	50	50	8	**103T-AS⊗2-QB25C-C1P**	—
0.4 ... 2.0	0.37	0.75	0.75	1.1	65	65	50	8	65	50	50	8	**103T-AS⊗2-QB25C-C2P**	**107T-AS⊗3-QB25C-C2P**
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	8	65	50	50	8	**103T-AS⊗2-QB25C-D1C**	**107T-AS⊗3-QB25C-D1C**
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	8	65	50	50	8	**103T-AS⊗2-QB25C-E1C**	**107T-AS⊗3-QB25C-E1C**
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	8	65	50	50	8	**103T-AS⊗2-QB25C-C1A**	—
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	8	65	50	50	8	**103T-AS⊗2-QB25C-C2A**	**107T-AS⊗3-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-AS⊗2-RB25C-C1P**	—
0.4 ... 2.0	0.37	0.75	0.75	1.1	65	65	50	10	65	65	50	10	**103T-AS⊗2-RB25C-C2P**	**107T-AS⊗3-RB25C-C2P**
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	**103T-AS⊗2-RB25C-D1C**	**107T-AS⊗3-RB25C-D1C**
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	**103T-AS⊗2-RB25C-E1C**	**107T-AS⊗3-RB25C-E1C**
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	**103T-AS⊗2-RB25C-C1A**	—
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	**103T-AS⊗2-RB25C-C2A**	**107T-AS⊗3-RB25C-C2A**
0.4 ... 2.0	0.37	0.75	0.75	1.1	65	65	50	10	65	65	50	10	**103T-DS⊗2-RB25C-C1P**	—
0.4 ... 2.0	0.37	0.75	0.75	1.1	65	65	50	10	65	65	50	10	**103T-DS⊗2-RB25C-C2P**	**107T-DS⊗3-RB25C-C2P**
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	**103T-DS⊗2-RB25C-D1C**	**107T-DS⊗3-RB25C-D1C**
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	**103T-DS⊗2-RB25C-E1C**	**107T-DS⊗3-RB25C-E1C**
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	**103T-DS⊗2-RB25C-C1A**	—
1.0 ... 2.5	0.55	0.75	1.1	1.8	65	65	50	10	65	65	50	10	**103T-DS⊗2-RB25C-C2A**	**107T-DS⊗3-RB25C-C2A**
1.0 ... 4.0	0.75	1.5	2.2	3	65	50	50	10	65	65	50	—	**103T-AS⊗2-RB40C-D1C**	**107T-AS⊗3-RB40C-D1C**
1.0 ... 4.0	0.75	1.5	2.2	3	65	50	50	10	65	65	50	—	**103T-AS⊗2-RB40C-E1C**	**107T-AS⊗3-RB40C-E1C**
1.0 ... 4.0	0.75	1.5	2.2	3	65	50	50	10	65	65	50	—	**103T-AS⊗2-RB40C-C1A**	—
1.0 ... 4.0	0.75	1.5	2.2	3	65	50	50	10	65	65	50	—	**103T-AS⊗2-RB40C-C2A**	**107T-AS⊗3-RB40C-C2A**
1.0 ... 4.0	0.75	1.5	2.2	3	65	50	50	50	65	65	50	50	**103T-DS⊗2-RB40C-D1C**	**107T-DS⊗3-RB40C-D1C**
1.0 ... 4.0	0.75	1.5	2.2	3	65	50	50	50	65	65	50	50	**103T-DS⊗2-RB40C-E1C**	**107T-DS⊗3-RB40C-E1C**
1.0 ... 4.0	0.75	1.5	2.2	3	65	50	50	50	65	65	50	50	**103T-DS⊗2-RB40C-C1A**	—
1.0 ... 4.0	0.75	1.5	2.2	3	65	50	50	50	65	65	50	50	**103T-DS⊗2-RB40C-C2A**	**107T-DS⊗3-RB40C-C2A**
3.2 ... 6.3	1.5	2.2	3	4	65	65	50	50	65	65	50	—	**103T-AS⊗2-RB63C-D1D**	**107T-AS⊗3-RB63C-D1D**
3.2 ... 6.3	1.5	2.2	3	4	65	65	50	50	65	65	50	—	**103T-AS⊗2-RB63C-E1D**	**107T-AS⊗3-RB63C-E1D**
3.0 ... 6.3	1.5	2.2	3	4	65	65	50	50	65	65	50	—	**103T-AS⊗2-RB63C-C1B**	—
3.0 ... 6.3	1.5	2.2	3	4	65	65	50	50	65	65	50	—	**103T-AS⊗2-RB63C-C2B**	**107T-AS⊗3-RB63C-C2B**
3.2 ... 10	2.2	4	5.5	5.5	65	65	65	50	65	65	65	—	**103T-BS⊗2-RC10C-D1D**	**107T-BS⊗3-RC10C-D1D**
3.2 ... 10	2.2	4	5.5	5.5	65	65	65	50	65	65	65	—	**103T-BS⊗2-RC10C-E1D**	**107T-BS⊗3-RC10C-E1D**
3.0 ... 10	2.2	4	5.5	5.5	65	65	65	50	65	65	65	—	**103T-BS⊗2-RC10C-C1B**	—
3.0 ... 10	2.2	4	5.5	5.5	65	65	65	50	65	65	65	—	**103T-BS⊗2-RC10C-C2B**	**107T-BS⊗3-RC10C-C2B**
3.2 ... 10	2.2	4	5.5	7.5	65	65	65	50	65	65	65	50	**103T-ES⊗3-RC10C-E1D**	**107T-ES⊗3-RC10C-E1D**
3.0 ... 10	2.2	4	5.5	7.5	65	65	65	50	65	65	65	50	**103T-ES⊗3-RC10C-C1B**	—
3.0 ... 10	2.2	4	5.5	7.5	65	65	65	50	65	65	65	50	**103T-ES⊗3-RC10C-C2B**	**107T-ES⊗3-RC10C-C2B**
3.2 ... 16	4	7.5	7.5	—	65	65	50	—	65	65	50	—	**103T-CS⊗2-RC16C-D1D**	**107T-CS⊗3-RC16C-D1D**
3.2 ... 16	4	7.5	7.5	—	65	65	50	—	65	65	50	—	**103T-CS⊗2-RC16C-E1D**	**107T-CS⊗3-RC16C-E1D**
3.0 ... 15	4	7.5	7.5	—	65	65	50	—	65	65	50	—	**103T-CS⊗2-RC16C-C1B**	—
3.0 ... 15	4	7.5	7.5	—	65	65	50	—	65	65	50	—	**103T-CS⊗2-RC16C-C2B**	**107T-CS⊗3-RC16C-C2B**
3.2 ... 16	4	7.5	10	13	65	65	50	6	65	65	50	—	**103T-ES⊗3-RC16C-E1D**	**107T-ES⊗3-RC16C-E1D**
3.0 ... 15	4	7.5	10	13	65	65	50	6	65	65	50	—	**103T-ES⊗3-RC16C-C1B**	—
3.0 ... 15	4	7.5	10	13	65	65	50	6	65	65	50	—	**103T-ES⊗3-RC16C-C2B**	**107T-ES⊗3-RC16C-C2B**
5.4 ... 23	6.3	11	13	—	65	50	25	—	65	50	25	—	**103T-DS⊗2-RC25C-D1E**	**107T-DS⊗3-RC25C-D1E**
5.4 ... 23	6.3	11	13	—	65	50	25	—	65	50	25	—	**103T-DS⊗2-RC25C-E1E**	**107T-DS⊗3-RC25C-E1E**
5.0 ... 23	6.3	11	13	—	65	50	25	—	65	50	25	—	**103T-DS⊗2-RC25C-C1C**	—
5.0 ... 23	6.3	11	13	—	65	50	25	—	65	50	25	—	**103T-DS⊗2-RC25C-C2C**	**107T-DS⊗3-RC25C-C2C**
5.4 ... 25	6.3	11	15	—	65	50	25	—	65	50	25	—	**103T-ES⊗3-RC25C-E1E**	**107T-ES⊗3-RC25C-E1E**
5.0 ... 25	6.3	11	15	—	65	50	25	—	65	50	25	—	**103T-ES⊗3-RC25C-C1C**	—
5.0 ... 25	6.3	11	15	—	65	50	25	—	65	50	25	—	**103T-ES⊗3-RC25C-C2C**	**107T-ES⊗3-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					
	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 ISO Bus Bar Modules														
5.4 ... 25	6.3	11	15	—	65	65	50	—	65	65	50	—	**103T-ES⊗3-TC25C-E1E**	**107T-ES⊗3-TC25C-E1E**
5.0 ... 25	6.3	11	15	—	65	65	50	—	65	65	50	—	**103T-ES⊗3-TC25C-C1C**	—
5.0 ... 25	6.3	11	15	—	65	65	50	—	65	65	50	—	**103T-ES⊗3-TC25C-C2C**	**107T-ES⊗3-TC25C-C2C**
5.4 ... 25	6.3	11	15	18.5	65	65	50	50	65	65	50	50	**103T-FS⊗3-TC25C-E1E**	**107T-FS⊗3-TC25C-E1E**
5.0 ... 25	6.3	11	15	18.5	65	65	50	50	65	65	50	50	**103T-FS⊗3-TC25C-C1C**	—
5.0 ... 25	6.3	11	15	18.5	65	65	50	50	65	65	50	50	**103T-FS⊗3-TC25C-C2C**	**107T-FS⊗3-TC25C-C2C**
9.0 ... 30	7.5	15	15	—	65	65	50	—	65	65	50	—	**103T-ES⊗3-TC32C-E1F**	**107T-ES⊗3-TC32C-E1F**
9.0 ... 30	7.5	15	15	—	65	65	50	—	65	65	50	—	**103T-ES⊗3-TC32C-C1D**	—
9.0 ... 30	7.5	15	15	—	65	65	50	—	65	65	50	—	**103T-ES⊗3-TC32C-C2D**	**107T-ES⊗3-TC32C-C2D**
9.0 ... 32	7.5	15	20	—	65	65	50	—	65	65	50	—	**103T-FS⊗3-TC32C-E1F**	**107T-FS⊗3-TC32C-E1F**
9.0 ... 32	7.5	15	20	—	65	65	50	—	65	65	50	—	**103T-FS⊗3-TC32C-C1D**	—
9.0 ... 32	7.5	15	20	—	65	65	50	—	65	65	50	—	**103T-FS⊗3-TC32C-C2D**	**107T-FS⊗3-TC32C-C2D**
9.0 ... 32	7.5	15	20	22	65	65	50	50	65	65	50	50	**103T-GS⊗3-TC32C-E1F**	**107T-GS⊗3-TC32C-E1F**
9.0 ... 32	7.5	15	20	22	65	65	50	50	65	65	50	50	**103T-GS⊗3-TC32C-C1D**	—
9.0 ... 32	7.5	15	20	22	65	65	50	50	65	65	50	50	**103T-GS⊗3-TC32C-C2D**	**107T-GS⊗3-TC32C-C2D**
9.0 ... 37	11	18.5	—	—	65	65	—	—	65	65	—	—	**103T-FS⊗3-TC45C-E1F**	**107T-FS⊗3-TC45C-E1F**
9.0 ... 37	11	18.5	—	—	65	65	—	—	65	65	—	—	**103T-FS⊗3-TC45C-C1D**	—
9.0 ... 37	11	18.5	—	—	65	65	—	—	65	65	—	—	**103T-FS⊗3-TC45C-C2D**	**107T-FS⊗3-TC45C-C2D**
9.0 ... 43	13	22	25	—	65	65	50	—	65	65	50	—	**103T-GS⊗3-TC45C-E1F**	**107T-GS⊗3-TC45C-E1F**
9.0 ... 43	13	22	25	—	65	65	50	—	65	65	50	—	**103T-GS⊗3-TC45C-C1D**	—
9.0 ... 43	13	22	25	—	65	65	50	—	65	65	50	—	**103T-GS⊗3-TC45C-C2D**	**107T-GS⊗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 and service factor.

⊗Coil voltage code—see page 2-295

Product Selection and Coordination Ratings, 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					
	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.
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	50	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	50	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	50	100	100	50	50	**103T-DW⊗2-RB40C-C1A**	—
1.0 ... 4.0	0.75	1.5	2.2	3	100	100	50	50	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	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 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 and service factor.

⊗ 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									
		ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
Option ①	Description	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									
		ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
Option ①	Description	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									
		ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
Option ②	Description	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									
		ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
Option ③	Description	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									
		ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
Option ①	Description	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									
		ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
Option ①	Description	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									
		ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
Option ②	Description	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									
		ISO Busbar Mount			Standard Busbar Mount			Panel Mount	
Option ③	Description	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.

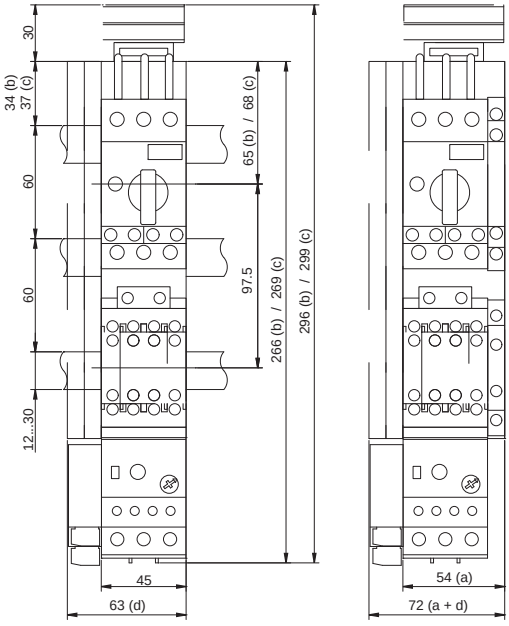
Add option code ④ to desired auxiliary contact: 107T-AWD2-CA16C-④

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

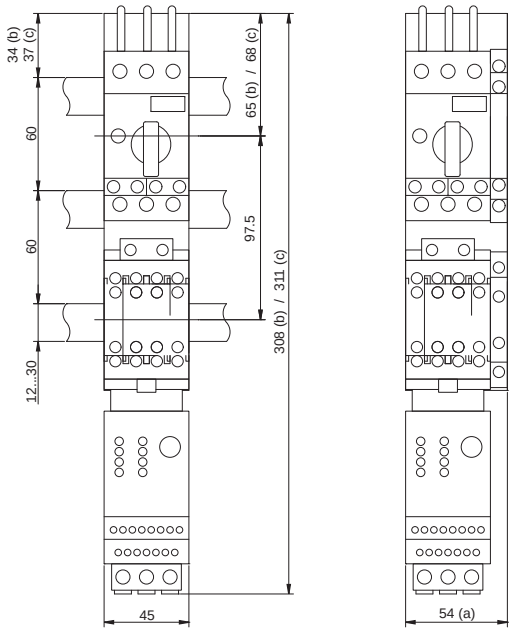
Open Type Starters

Approximate Dimensions

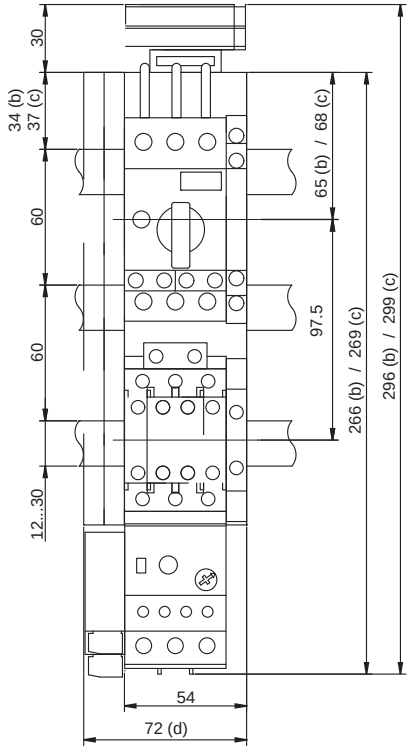
Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.



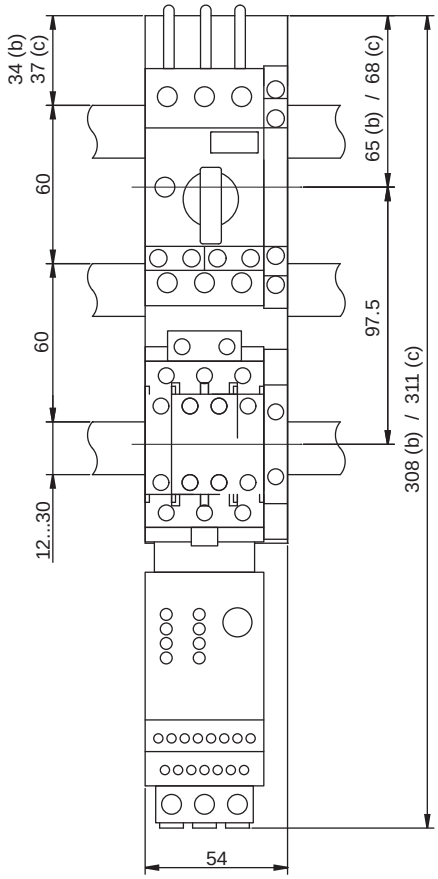
Circuit Breaker:	140M-C / -D	(a) With additional side-mount aux. or trip contact(s)
Contactor:	100-C09...23	(b) Standard busbar adapter with control plug
Motor Protection Relay:	193-ED / -EE	(c) Iso busbar adapter with control plug
		(d) With 193-E* side-mount module



Circuit Breaker:	140M-C / -D	(a) With additional side-mount aux. or trip contact(s)
Contactor:	100-C09...23	(b) Standard busbar adapter
Motor Protection Relay:	193-EC...	(c) Iso busbar adapter

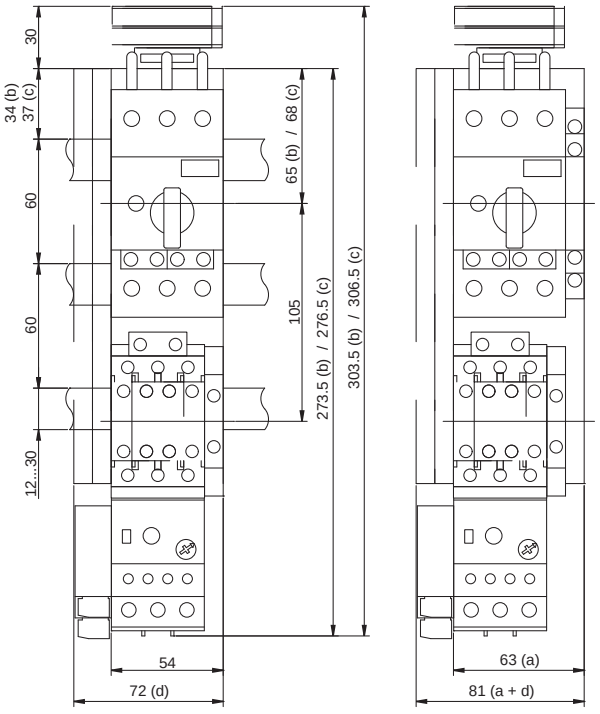


Circuit Breaker:	140M-D	(b) Standard busbar adapter with control plug
Contactor:	100-C30...37	(c) Iso busbar adapter with control plug
Motor Protection Relay:	193-EE	(d) With 193-E* side-mount module

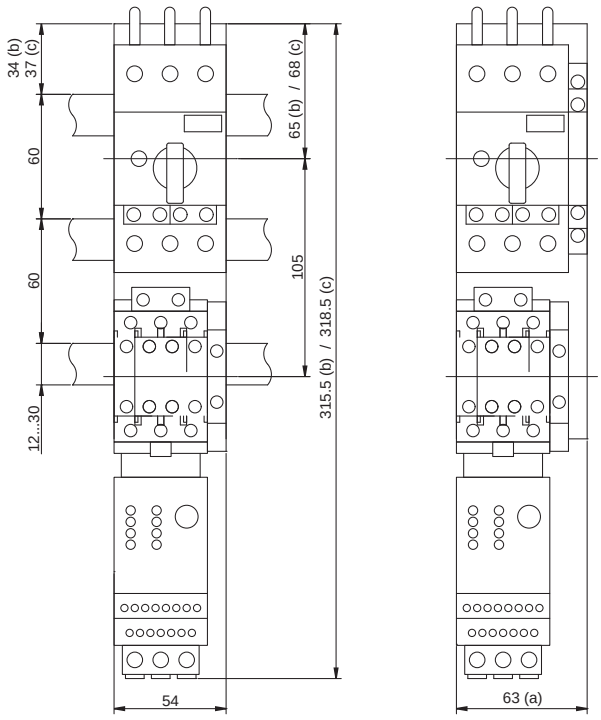


Circuit Breaker:	140M-D	(b) Standard busbar adapter
Contactor:	100-C30...37	(c) Iso busbar adapter
Motor Protection Relay:	193-EC...	

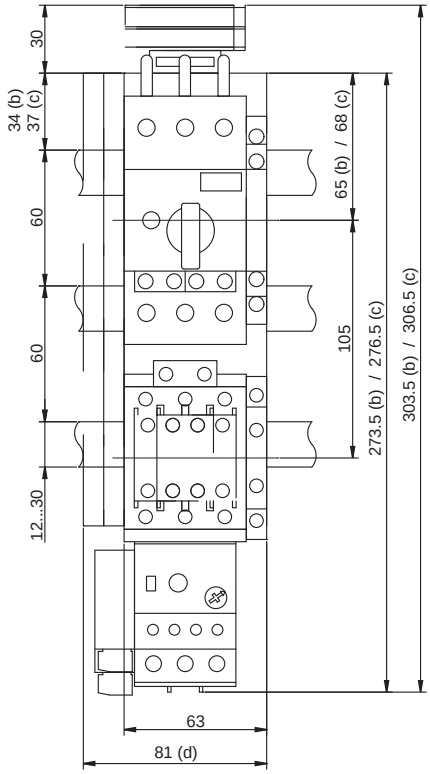
Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.



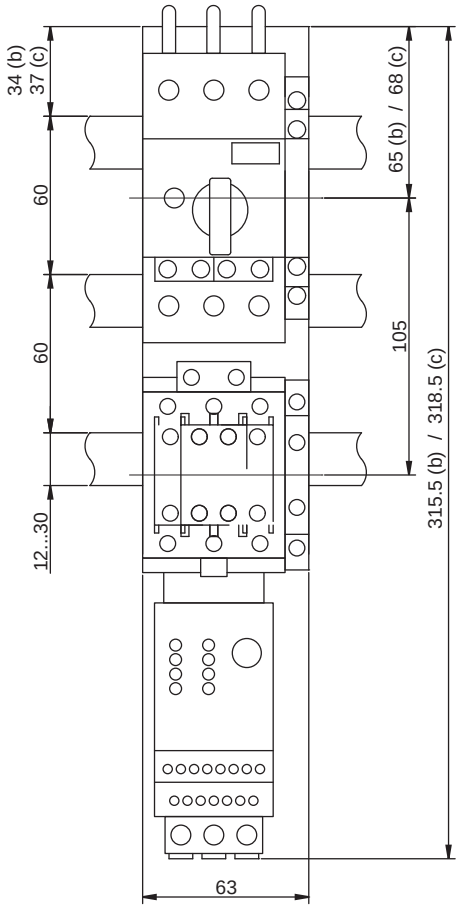
Circuit Breaker:	140M-F	(a) With additional side-mount aux. or trip contact
Contactor:	100-C30...37	(b) Standard busbar adapter with control plug
Motor Protection Relay:	193-EE	(c) Iso busbar adapter with control plug
		(d) With 193-E* side-mount module



Circuit Breaker:	140M-F	(a) With additional side-mount aux. or trip contact
Contactor:	100-C30...37	(b) Standard busbar adapter
Motor Protection Relay:	193.EC...	(c) Iso busbar adapter



Circuit Breaker:	140M-F	(b) Standard busbar adapter with control plug
Contactor:	100-C43	(c) Iso busbar adapter with control plug
Motor Protection Relay:	193-EE	(d) With 193-E* side-mount module

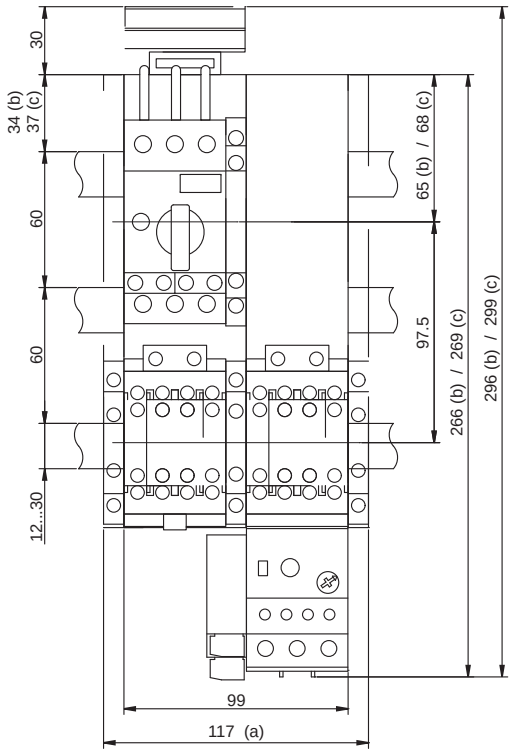


Circuit Breaker:	140M-F	(b) Standard busbar adapter
Contactor:	100-C43	(c) Iso busbar adapter
Motor Protection Relay:	193-EC...	

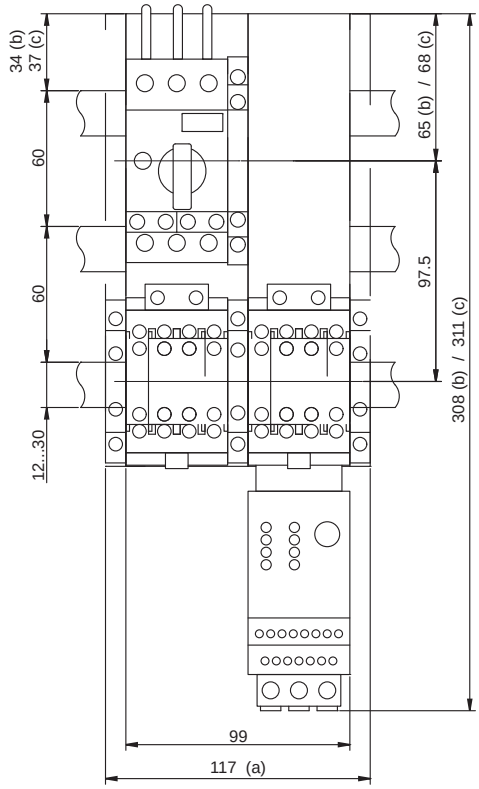
Open Type Starters

Approximate Dimensions, Continued

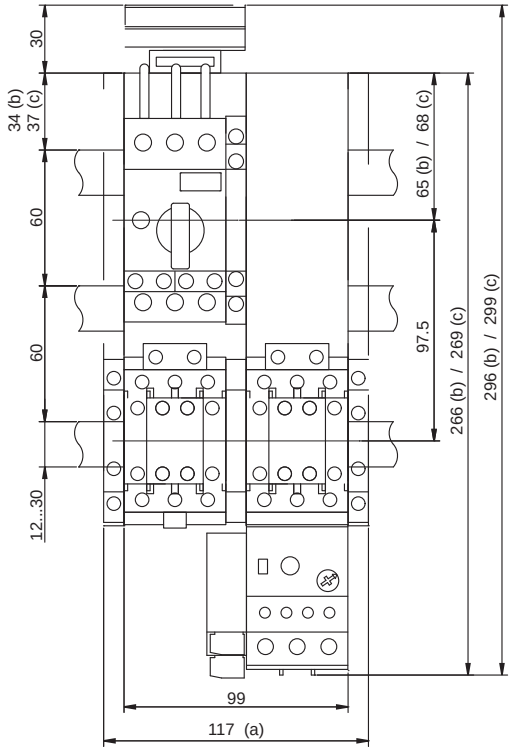
Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.



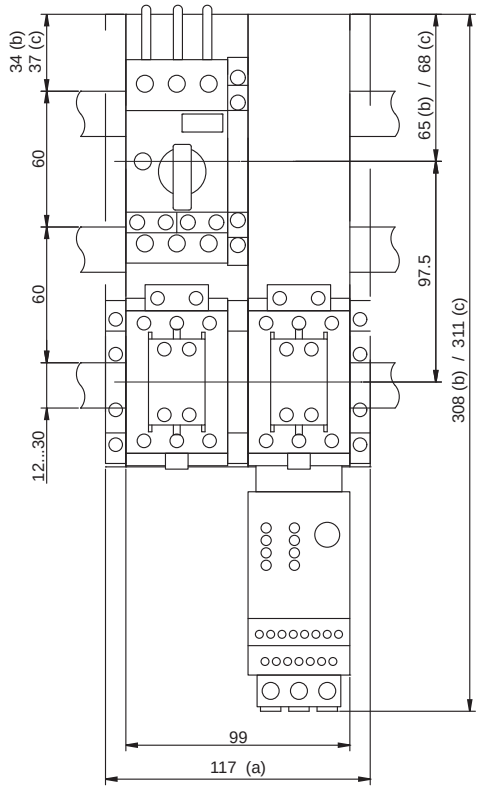
Circuit Breaker:	140M-C / -D	(a) With additional side-mount aux. contacts
Contactors:	100-C09...23	(b) Standard busbar adapter with control plug
Motor Protection Relay:	193-ED / -EE	(c) Iso busbar adapter with control plug



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

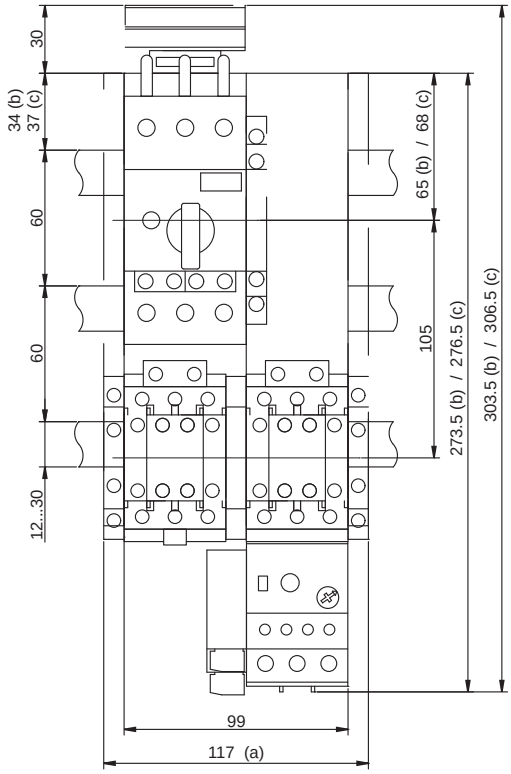


Circuit Breaker:	140M-D	(a) With additional side-mount aux. contacts
Contactors:	100-C30...37	(b) Standard busbar adapter with control plug
Motor Protection Relay:	193-EE	(c) Iso busbar adapter with control plug



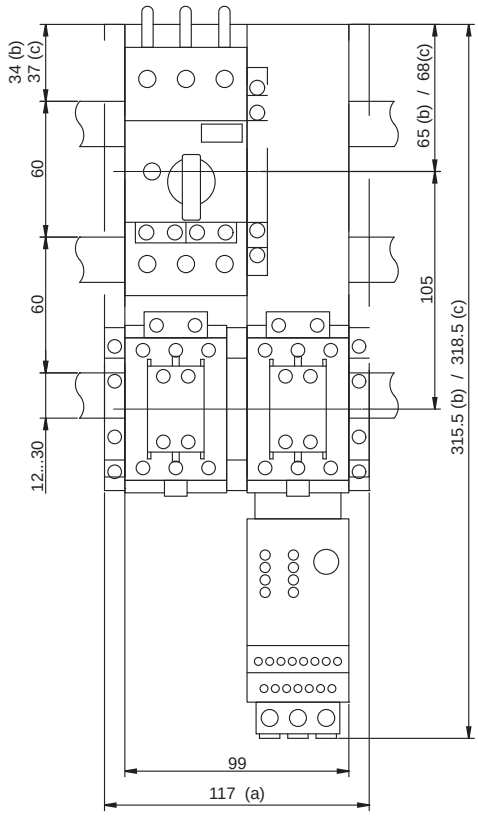
Circuit Breaker:	140M-D	(a) With additional side-mount aux. contacts
Contactors:	100-C30...37	(b) Standard busbar adapter
Motor Protection Relay:	193-EC...	(c) Iso busbar adapter

Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.



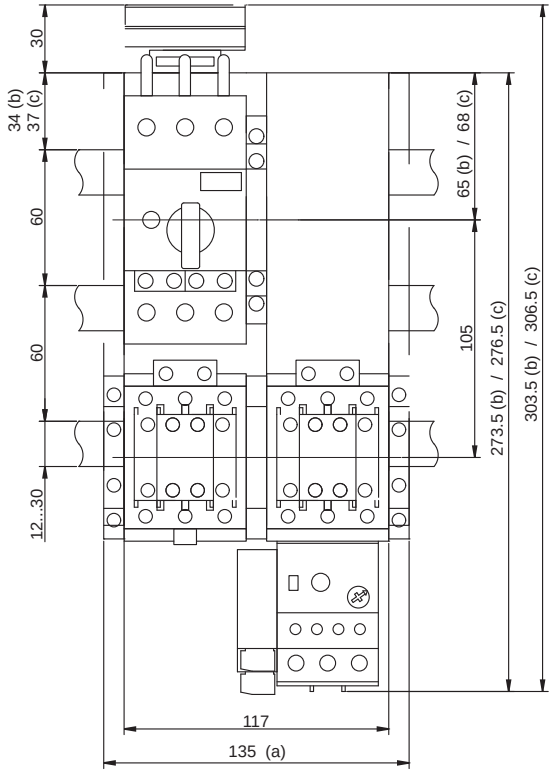
Circuit Breaker: 140M-F
Contactors: 100-C30...37
Motor Protection Relay: 193-EE

(a) With additional side-mount aux. contacts
(b) Standard busbar adapter with control plug
(c) Iso busbar adapter with control plug



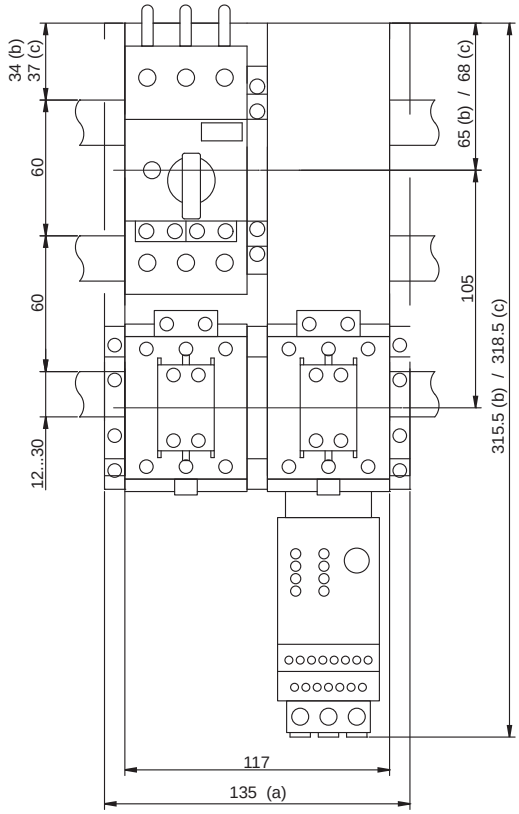
Circuit Breaker: 140M-F
Contactors: 100-C30...37
Motor Protection Relay: 193-EC...

(a) With additional side-mount aux. contacts
(b) Standard busbar adapter
(c) Iso busbar adapter



Circuit Breaker: 140M-F
Contactors: 100-C43
Motor Protection Relay: 193-EE

(a) With additional side-mount aux. contacts
(b) Standard busbar adapter with control plug
(c) Iso busbar adapter with control plug



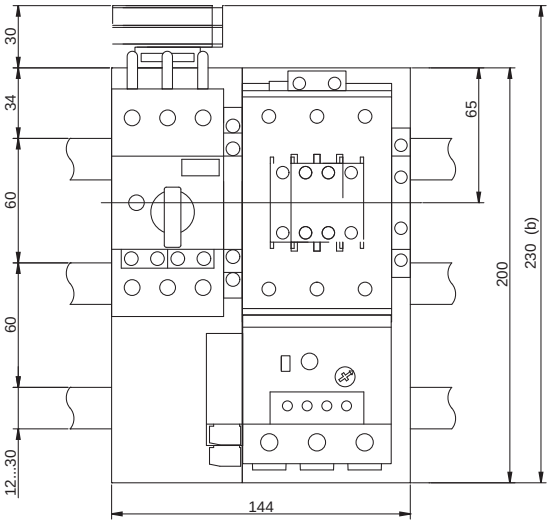
Circuit Breaker: 140M-F
Contactors: 100-C43
Motor Protection Relay: 193-EC...

(a) With additional side-mount aux. contacts
(b) Standard busbar adapter
(c) Iso busbar adapter

Open Type Starters

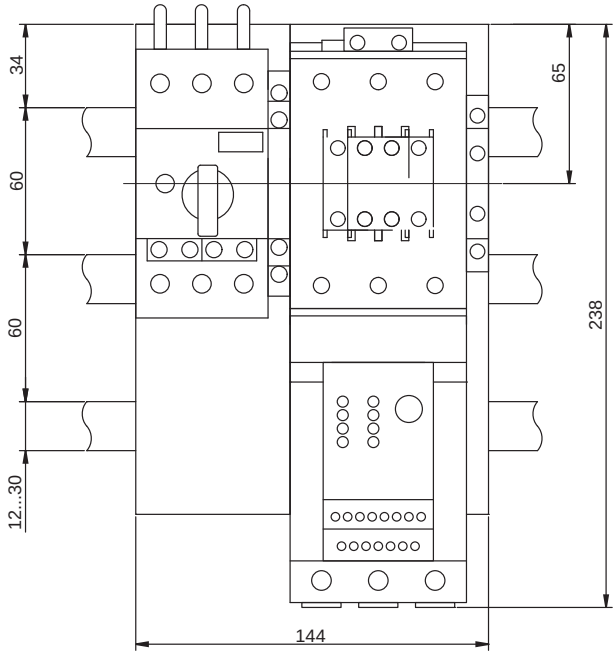
Approximate Dimensions, Continued

Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.

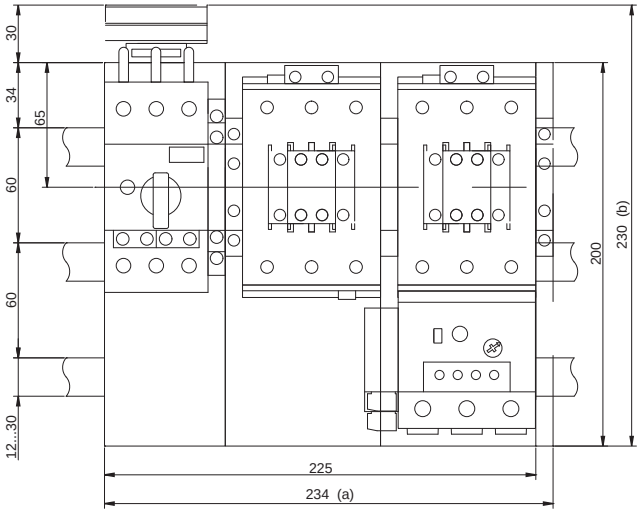


Circuit Breaker: 140M-F
Contactor: 100-C60...85
Motor Protection Relay: 193-EE

(b) Standard busbar adapter with control plug

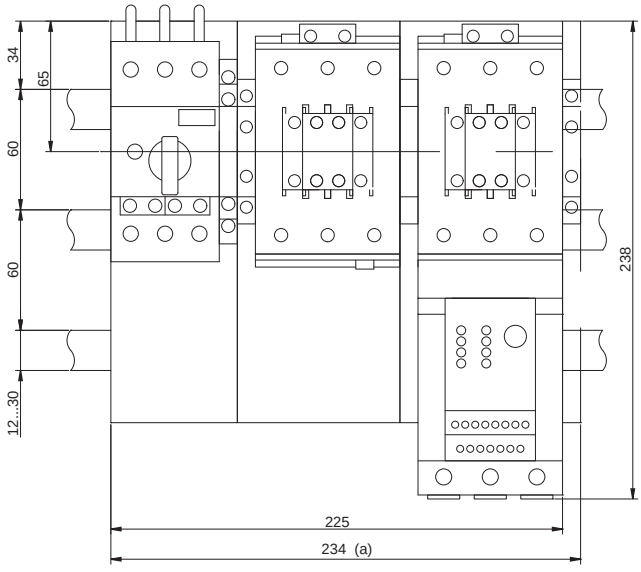


Circuit Breaker: 140M-F
Contactor: 100-C60...85
Motor Protection Relay: 193-EC...



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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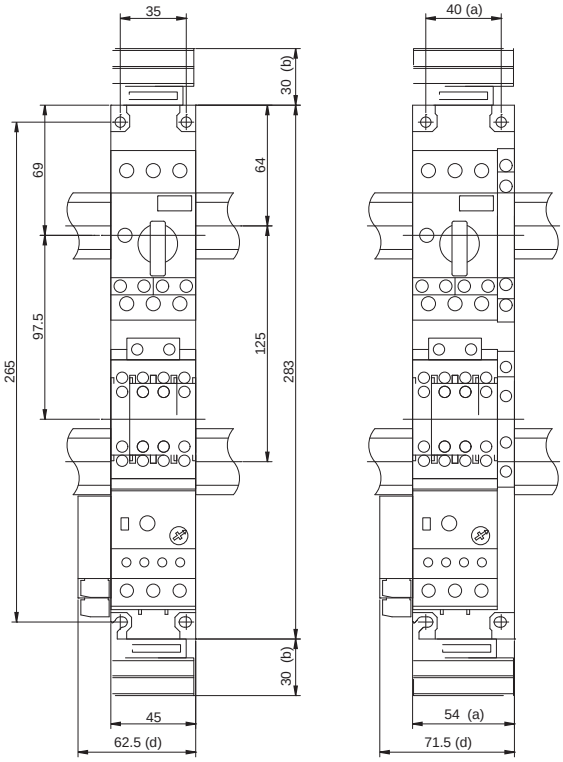
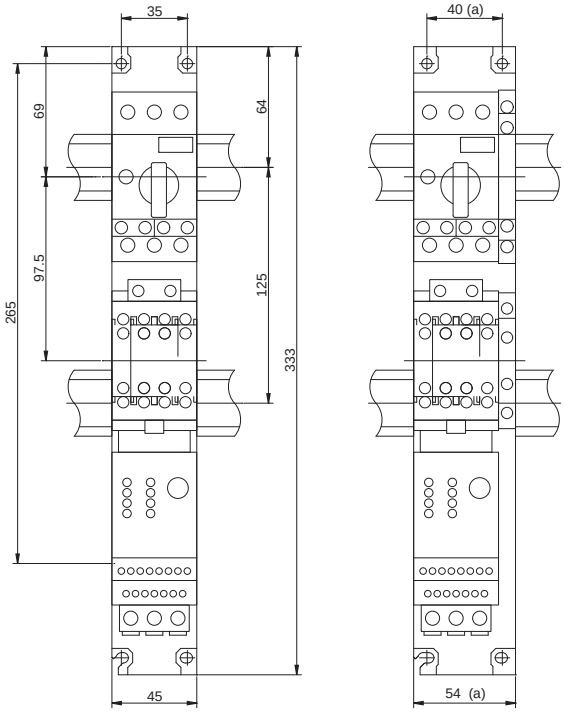
Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.



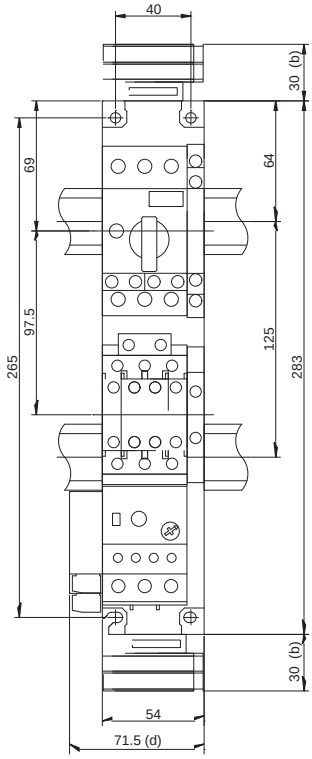
Circuit Breaker: 140M-C / -D
Contactors: 100-C09...23
Motor Protection Relay: 193-ED / -EE

(a) With additional side-mount aux. or trip contact(s)
(b) Control plug on top OR bottom side optional
(d) With 193-E* side-mount module



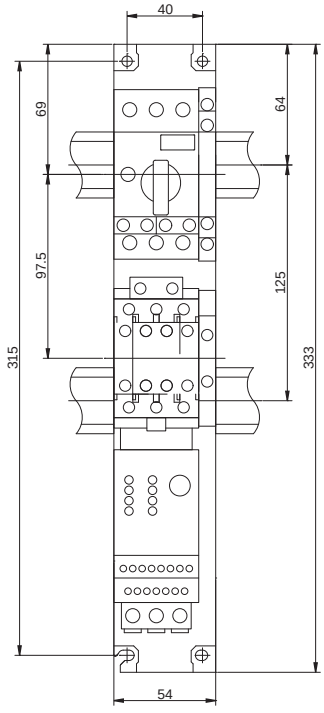
Circuit Breaker: 140M-C / -D
Contactors: 100-C09...23
Motor Protection Relay: 193-EC...

(a) With additional side-mount aux. or trip contact(s)



Circuit Breaker: 140M-D
Contactor: 100-C30...37
Motor Protection Relay: 193-EE

(b) Control plug on top OR bottom side optional
(d) With 193-E* side-mount module

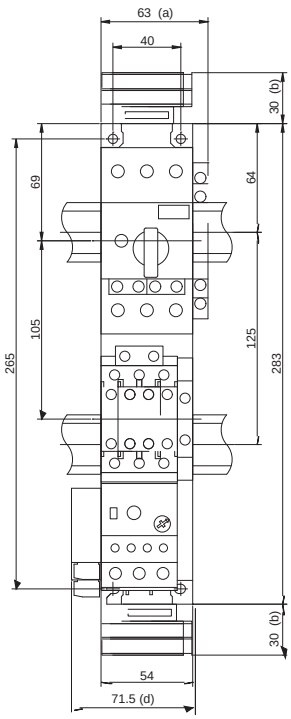


Circuit Breaker: 140M-D
Contactor: 100-C30...37
Motor Protection Relay: 193.EC...

Open Type Starters

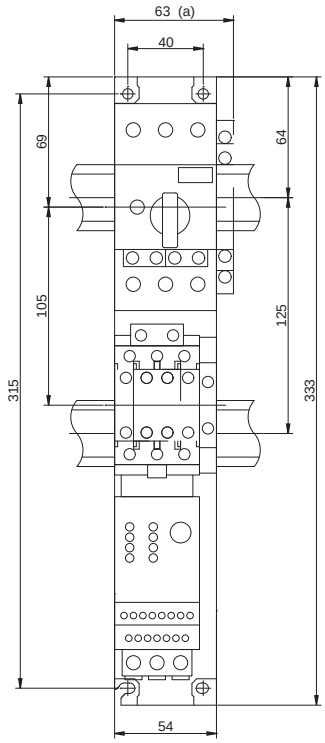
Approximate Dimensions, Continued

Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.



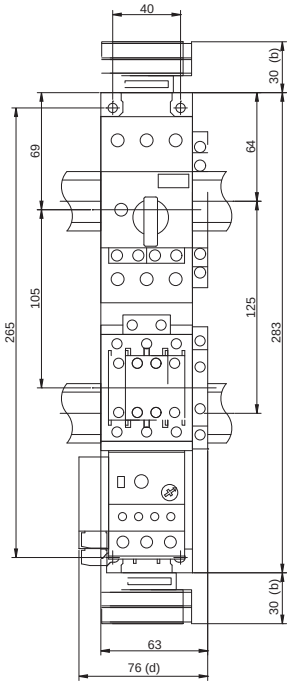
Circuit Breaker: 140M-F
Contactor: 100-C30...37
Motor Protection Relay: 193-EE

(a) With additional side-mount aux. or trip contact
(b) Control plug on top OR bottom side optional
(d) With 193-E* side-mount module



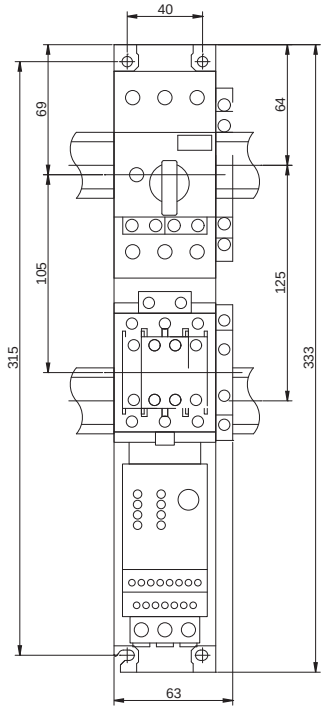
Circuit Breaker: 140M-F
Contactor: 100-C30...37
Motor Protection Relay: 193.EC...

(a) With additional side-mount aux. or trip contact



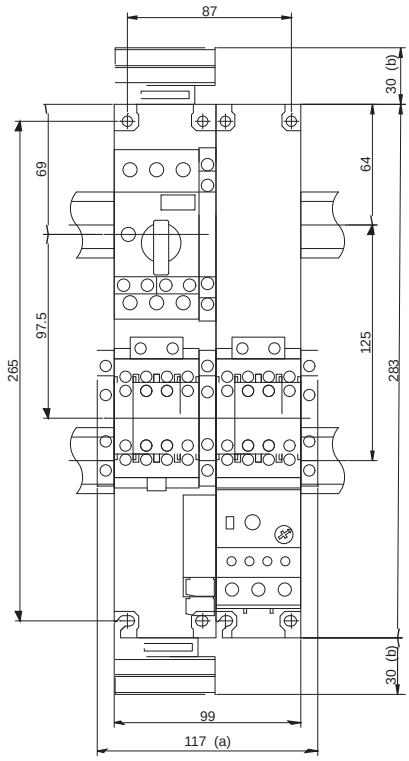
Circuit Breaker: 140M-F
Contactor: 100-C43
Motor Protection Relay: 193-EE

(b) Control plug on top OR bottom side optional
(d) With 193-E* side-mount module



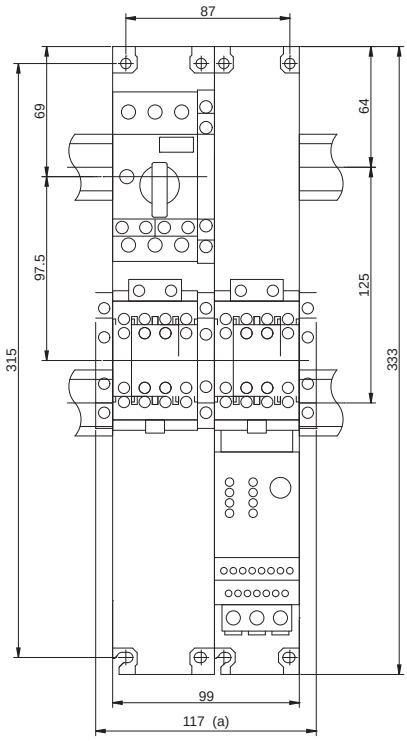
Circuit Breaker: 140M-F
Contactor: 100-C43
Motor Protection Relay: 193-EC...

Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.



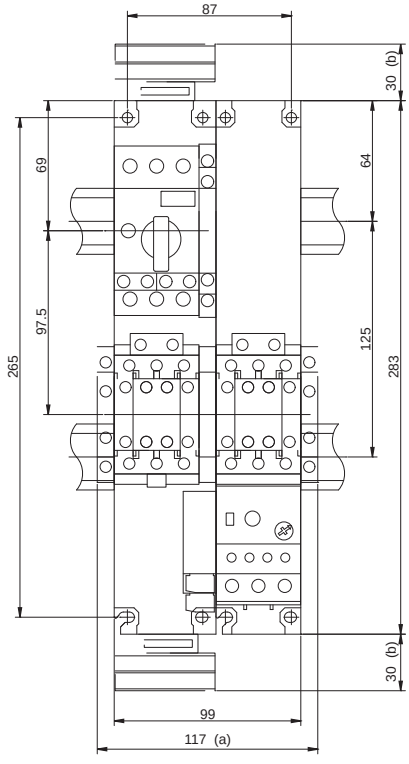
Circuit Breaker: 140M-C / -D
Contactors: 100-C09...23
Motor Protection Relay: 193-ED / -EE

(a) With additional side-mount aux. contacts
(b) Control plug on top OR bottom side optional



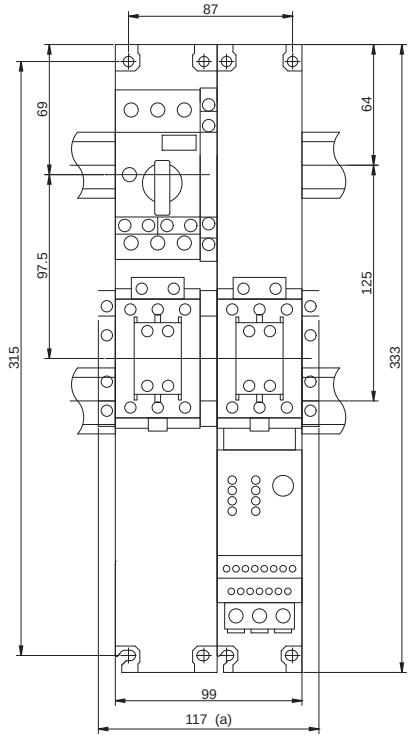
Circuit Breaker: 140M-C / -D
Contactors: 100-C09...23
Motor Protection Relay: 193-EC...

(a) With additional side-mount aux. contacts



Circuit Breaker: 140M-D
Contactors: 100-C30...37
Motor Protection Relay: 193-EE

(a) With additional side-mount aux. contacts
(b) Control plug on top OR bottom side optional



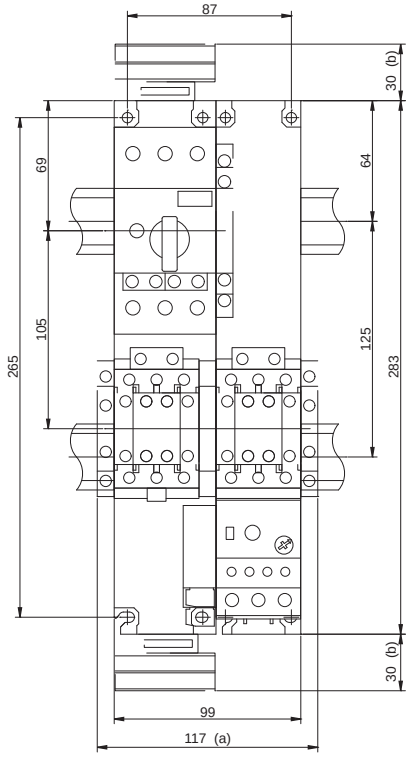
Circuit Breaker: 140M-D
Contactors: 100-C30...37
Motor Protection Relay: 193-EC...

(a) With additional side-mount aux. contacts

Open Type Starters

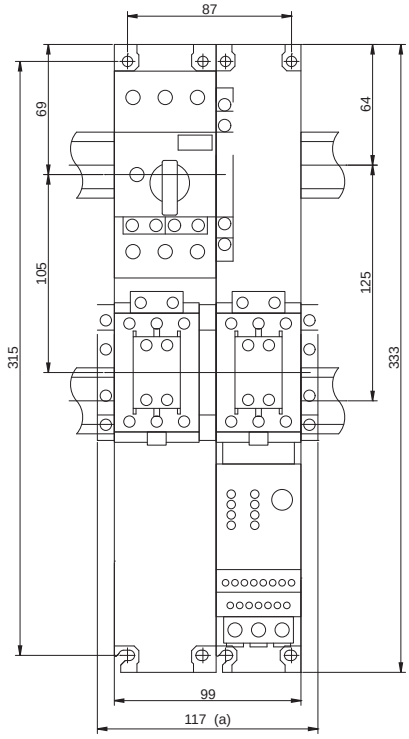
Approximate Dimensions, Continued

Dimensions are shown in millimeters. Dimensions are not intended for manufacturing purposes.



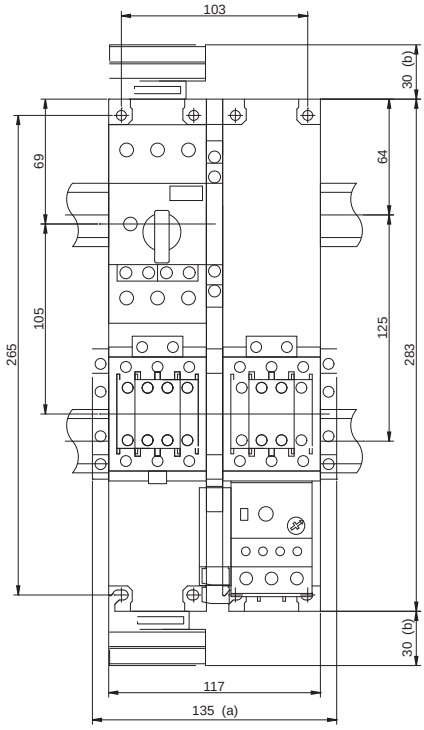
Circuit Breaker: 140M-F
Contactors: 100-C30...37
Motor Protection Relay: 193-EE

(a) With additional side-mount aux. contacts
(b) Control plug on top OR bottom side optional



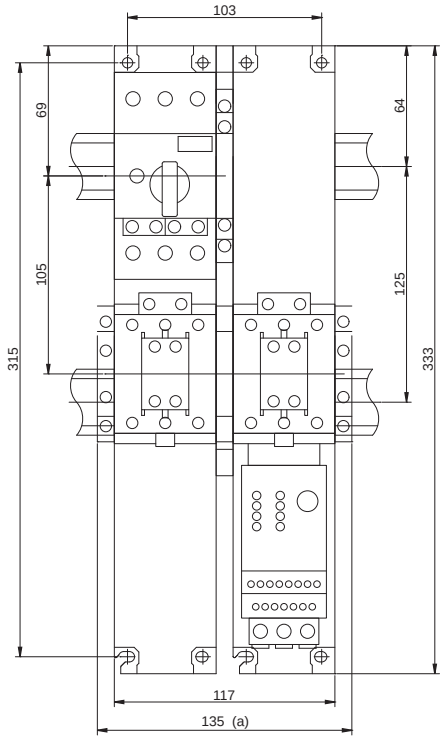
Circuit Breaker: 140M-F
Contactors: 100-C30...37
Motor Protection Relay: 193-EC...

(a) With additional side-mount aux. contacts



Circuit Breaker: 140M-F
Contactors: 100-C43
Motor Protection Relay: 193-EE

(a) With additional side-mount aux. contacts
(b) Control plug on top OR bottom side optional



Circuit Breaker: 140M-F
Contactors: 100-C43
Motor Protection Relay: 193-EC...

(a) With additional side-mount aux. contacts

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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

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

2

							
	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							
CE	✓	✓	✓	✓	✓	✓	✓
IEC 60947	✓	✓	✓	✓	✓	✓	✓
Type 2 Coordination	See pages 2-314 and page 2-320						
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.

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
B25	1.0...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.

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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

a

Bulletin Number	
Starter Type	
Code	Description
190S	DOL Starter with MPCB
191S	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

c

Style	
Code	Description
N	Open Style — Screw mount (4), 35 mm top hat rail mount (2) or 75 mm top hat rail mount (1)

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 — 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

e

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)

f

Circuit Breaker Frame Size	
Code	Description
C	C Frame
D	D Frame
F	F 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
B25	1.0...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

h

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

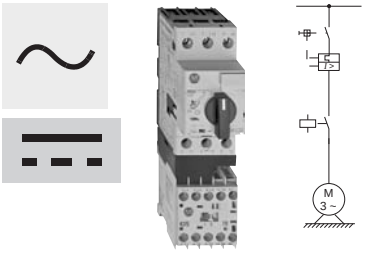
i

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.

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



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.

Product Selection and Coordination Ratings — 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-KMN⊗2-CA16X	191E-KMN⊗1-CA16X
0.16…0.25	—	—	—	—	450	65	47	65	—	190E-KMN⊗2-CA25X	191E-KMN⊗1-CA25X
0.25…0.40	—	—	—	—	450	65	47	65	—	190E-KMN⊗2-CA40X	191E-KMN⊗1-CA40X
0.40…0.63	—	—	—	—	450	65	47	65	—	190E-KMN⊗2-CA63X	191E-KMN⊗1-CA63X
0.63…1.00	—	—	—	1/2	450	65	47	65	—	190E-KMN⊗2-CB10X	191E-KMN⊗1-CB10X
1.00…1.60	—	—	1/2	3/4	450	65	47	65	—	190E-KMN⊗2-CB16X	191E-KMN⊗1-CB16X
1.60…2.50	1/2	1/2	1/2…1	1...1-1/2	450	65	30	—	—	190E-KMN⊗2-CB25X	191E-KMN⊗1-CB25X
2.50…4.00	1/2…3/4	3/4	3/4…2	2…3	450	65	30	—	—	190E-KMN⊗2-CB40X	191E-KMN⊗1-CB40X
4.00…6.30	1	1...1-1/2	1-1/2…3	5	450	65	30	—	—	190E-KNN⊗2-CB63X	191E-KNN⊗1-CB63X
6.30…8.50	1-1/2…2	2	5	5	450	65	30	—	—	190E-KNN⊗2-CC10X	191E-KNN⊗1-CC10X
6.30…10.0	1-1/2…2	2...3	5	7-1/2	450	65	30	—	—	190E-KPN⊗2-CC10X	191E-KPN⊗1-CC10X
10.0…11.0	3	3	7-1/2	7-1/2	450	30	30	—	—	190E-KPN⊗2-CC16X	191E-KPN⊗1-CC16X
C-Frame with 100-C/104-C Contactors											
0.10…0.16	—	—	—	—	450	65	47	65	47	190E-AN⊗2-CA16X	**191E-AN⊗3-CA16X**
0.16…0.25	—	—	—	—	450	65	47	65	47	**190E-AN⊗2-CA25X**	**191E-AN⊗3-CA25X**
0.25…0.40	—	—	—	—	450	65	47	65	47	190E-AN⊗2-CA40X	**191E-AN⊗3-CA40X**
0.40…0.63	—	—	—	—	450	65	47	65	47	190E-AN⊗2-CA63X	**191E-AN⊗3-CA63X**
0.63…1.00	—	—	1/2	3/4	450	65	47	65	47	190E-AN⊗2-CB10X	**191E-AN⊗3-CB10X**
1.00…1.60	—	—	1/2…1	3/4...1	450	65	47	65	47	190E-AN⊗2-CB16X	**191E-AN⊗3-CB16X**
1.60…2.50	1/2	1/2...3/4	3/4…1-1/2	1…2	450	65	30	65	10	190E-AN⊗2-CB25X	**191E-AN⊗3-CB25X**
2.50…4.00	1/2…1	3/4...1	1-1/2…3	2…3	450	65	30	50	—	190E-AN⊗2-CB40X	**191E-AN⊗3-CB40X**
4.00…6.30	1...1-1/2	1…2	3...5	5	450	65	30	50	—	190E-AN⊗2-CB63X	**191E-AN⊗3-CB63X**
6.30…9.00	1-1/2…2	2	5	7-1/2	450	65	30	50	—	190E-AN⊗2-CC10X	**191E-AN⊗3-CC10X**
6.30…10.0	1-1/2…3	2...3	5...7-1/2	7-1/2...10	450	65	30	50	—	190E-BN⊗2-CC10X	**191E-BN⊗3-CC10X**
10.0…12.0	3	3	7-1/2	10	450	30	30	30	—	190E-BN⊗2-CC16X	**191E-BN⊗3-CC16X**
10.0…16.0	3...5	5	7-1/2…10	10...15	450	30	30	30	—	190E-DN⊗2-CC16X	**191E-DN⊗3-CC16X**
14.5…20.0	5	5...7-1/2	15	15	450	30	30	30	—	190E-DN⊗2-CC20X	**191E-DN⊗3-CC20X**
18.0…23.0	5	7-1/2	15	15	450	30	30	30	—	190E-DN⊗2-CC25X	**191E-DN⊗3-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-AN⊗2-DB25X	**191E-AN⊗3-DB25X**
1.60…2.50	1/2	1/2...3/4	3/4…1-1/2	1…2	450	65	30	65	30	**190E-DN⊗2-DB25X**	**191E-DN⊗3-DB25X**
2.50…4.00	1/2…1	3/4...1	1-1/2…3	2…3	450	65	30	65	—	190E-AN⊗2-DB40X	**191E-AN⊗3-DB40X**
2.50…4.00	1/2…1	3/4...1	1-1/2…3	2…3	450	65	30	65	30	**190E-DN⊗2-DB40X**	**191E-DN⊗3-DB40X**
4.00…6.30	1…1-1/2	1…2	3…5	5	450	65	30	65	—	190E-AN⊗2-DB63X	**191E-AN⊗3-DB63X**
6.30…9.00	1-1/2…2	2	5	7-1/2	450	65	30	65	—	190E-AN⊗2-DC10X	**191E-AN⊗3-DC10X**
6.30…10.0	1-1/2…3	2...3	5…7-1/2	7-1/2…10	450	65	30	65	—	**190E-BN⊗2-DC10X**	**191E-BN⊗3-DC10X**
6.30…10.0	1-1/2…3	2...3	5…7-1/2	7-1/2…10	450	65	30	65	—	**190E-CN⊗2-DC10X**	**191E-CN⊗3-DC10X**
10.0…12.0	3	3	7-1/2	10	450	65	30	65	—	**190E-BN⊗2-DC16X**	**191E-BN⊗3-DC16X**
10.0…16.0	3…5	5	7-1/2…10	10	450	65	30	65	—	190E-CN⊗2-DC16X	**191E-CN⊗3-DC16X**
10.0…16.0	3…5	5	7-1/2…10	10…15	450	65	30	65	—	**190E-DN⊗2-DC16X**	**191E-DN⊗3-DC16X**
14.5…20.0	5	5...7-1/2	15	15	450	65	30	65	—	**190E-DN⊗2-DC20X**	**191E-DN⊗3-DC20X**
18.0…23.0	5	7-1/2	15	15	450	65	30	65	—	190E-DN⊗2-DC25X	**191E-DN⊗3-DC25X**

♣ 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.

⊗Coil voltage code—see page 2-315

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Product Selection and 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	Reversing Starter
	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	Cat. No.	Cat. No.
C-Frame with Bulletin 100-K/104-K Mini Contactors										
0.10…0.16	—	—	—	—	65	47	—	—	190E-KMN⊗2-CA16X-TE	191E-KMN⊗1-CA16X-TE
0.16…0.25	—	—	—	—	65	47	—	—	190E-KMN⊗2-CA25X-TE	191E-KMN⊗1-CA25X-TE
0.25…0.40	—	—	—	—	65	47	—	—	190E-KMN⊗2-CA40X-TE	191E-KMN⊗1-CA40X-TE
0.40…0.63	—	—	—	—	65	47	—	—	190E-KMN⊗2-CA63X-TE	191E-KMN⊗1-CA63X-TE
0.63…1.00	—	—	—	1/2	65	47	—	—	190E-KMN⊗2-CB10X-TE	191E-KMN⊗1-CB10X-TE
1.00…1.60	—	—	1/2	3/4	65	47	—	—	190E-KMN⊗2-CB16X-TE	191E-KMN⊗1-CB16X-TE
1.60…2.50	1/2	1/2	1/2…1	3/4...1-1/2	65	30	—	—	190E-KMN⊗2-CB25X-TE	191E-KMN⊗1-CB25X-TE
2.50…4.00	1/2…3/4	3/4	3/4…2	2…3	65	30	—	—	190E-KMN⊗2-CB40X-TE	191E-KMN⊗1-CB40X-TE
4.00…6.30	1	1...1-1/2	1-1/2…3	—	65	❖	—	❖	190E-KNN⊗2-CB63X-TE	191E-KNN⊗1-CB63X-TE
6.30…8.50	1-1/2…2	2	5	—	65	❖	—	❖	190E-KNN⊗2-CC10X-TE	191E-KNN⊗1-CC10X-TE
6.30…10.0	1-1/2…2	2...3	5	—	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 and service factor.

❖ This starter is not valid for application at this horsepower and voltage.

⊗Coil voltage code—see page 2-315

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 Ratings (60 Hz) Hp Ratings as a UL508 Self-Protected Type E Combination Motor Controller♣				Max. Short-Circuit Current [kA]		DOL Starter	Reversing Starter
	200V	230V	460V	575V	480Y/277V	600Y/347V	Cat. No.	Cat. No.
C-Frame with Bulletin 100-K/104-K Mini Contactors								
0.10…0.16	—	—	—	—	❖	❖	190E-KMN⊗2-CA16X-TE	191E-KMN⊗1-CA16X-TE
0.16…0.25	—	—	—	—	❖	❖	190E-KMN⊗2-CA25X-TE	191E-KMN⊗1-CA25X-TE
0.25…0.40	—	—	—	—	❖	❖	190E-KMN⊗2-CA40X-TE	191E-KMN⊗1-CA40X-TE
0.40…0.63	—	—	—	—	❖	❖	190E-KMN⊗2-CA63X-TE	191E-KMN⊗1-CA63X-TE
0.63…1.00	—	—	—	—	❖	❖	190E-KMN⊗2-CB10X-TE	191E-KMN⊗1-CB10X-TE
1.00…1.60	—	—	—	—	❖	❖	190E-KMN⊗2-CB16X-TE	191E-KMN⊗1-CB16X-TE
1.60…2.50	—	—	—	—	❖	❖	190E-KMN⊗2-CB25X-TE	191E-KMN⊗1-CB25X-TE
2.50…4.00	—	—	—	—	❖	❖	190E-KMN⊗2-CB40X-TE	191E-KMN⊗1-CB40X-TE
4.00…6.30	—	—	—	—	❖	❖	190E-KNN⊗2-CB63X-TE	191E-KNN⊗1-CB63X-TE
6.30…8.50	—	—	—	—	❖	❖	190E-KNN⊗2-CC10X-TE	191E-KNN⊗1-CC10X-TE
6.30…10.0	—	—	—	—	❖	❖	190E-KPN⊗2-CC10X-TE	191E-KPN⊗1-CC10X-TE
10.0…11.0	—	—	—	—	❖	❖	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	**190E-AN⊗2-CA16X-TE**	**191E-AN⊗3-CA16X-TE**
0.16…0.25	—	—	—	—	65	47	**190E-AN⊗2-CA25X-TE**	**191E-AN⊗3-CA25X-TE**
0.25…0.40	—	—	—	—	65	47	**190E-AN⊗2-CA40X-TE**	**191E-AN⊗3-CA40X-TE**
0.40…0.63	—	—	—	—	65	47	**190E-AN⊗2-CA63X-TE**	**191E-AN⊗3-CA63X-TE**
0.63…1.00	—	—	1/2	3/4	65	47	**190E-AN⊗2-CB10X-TE**	**191E-AN⊗3-CB10X-TE**
1.00…1.60	—	—	1/2…1	3/4...1	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	—	65	❖	**190E-AN⊗2-CB25X-TE**	**191E-AN⊗3-CB25X-TE**
2.50…4.00	—	—	—	—	❖	❖	**190E-AN⊗2-CB40X-TE**	**191E-AN⊗3-CB40X-TE**
4.00…6.30	—	—	—	—	❖	❖	**190E-AN⊗2-CB63X-TE**	**191E-AN⊗3-CB63X-TE**
6.30…9.00	—	—	—	—	❖	❖	**190E-AN⊗2-CC10X-TE**	**191E-AN⊗3-CC10X-TE**
6.30…10.0	—	—	—	—	❖	❖	**190E-BN⊗2-CC10X-TE**	**191E-BN⊗3-CC10X-TE**
10.0…12.0	—	—	—	—	❖	❖	**190E-BN⊗2-CC16X-TE**	**191E-BN⊗3-CC16X-TE**
10.0…16.0	—	—	—	—	❖	❖	**190E-CN⊗2-CC16X-TE**	**191E-CN⊗3-CC16X-TE**
10.0…16.0	—	—	—	—	❖	❖	**190E-DN⊗2-CC16X-TE**	**191E-DN⊗3-CC16X-TE**
14.5…20.0	—	—	—	—	❖	❖	**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	—	65	❖	**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	**190E-DN⊗2-DB25X-TE**	**191E-DN⊗3-DB25X-TE**
2.50…4.00	—	—	—	—	❖	❖	**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	**190E-DN⊗2-DB40X-TE**	**191E-DN⊗3-DB40X-TE**
4.00…6.30	—	—	—	—	❖	❖	**190E-AN⊗2-DB63X-TE**	**191E-AN⊗3-DB63X-TE**
6.30…9.00	—	—	—	—	❖	❖	**190E-AN⊗2-DC10X-TE**	**191E-AN⊗3-DC10X-TE**
6.30…10.0	—	—	—	—	❖	❖	**190E-BN⊗2-DC10X-TE**	**191E-BN⊗3-DC10X-TE**
6.30…10.0	—	—	—	—	❖	❖	**190E-CN⊗2-DC10X-TE**	**191E-CN⊗3-DC10X-TE**
10.0…12.0	—	—	—	—	❖	❖	**190E-BN⊗2-DC16X-TE**	**191E-BN⊗3-DC16X-TE**
10.0…16.0	—	—	—	—	❖	❖	**190E-CN⊗2-DC16X-TE**	**191E-CN⊗3-DC16X-TE**
10.0…16.0	—	—	—	—	❖	❖	**190E-DN⊗2-DC16X-TE**	**191E-DN⊗3-DC16X-TE**
14.5…20.0	—	—	—	—	❖	❖	**190E-DN⊗2-DC20X-TE**	**191E-DN⊗3-DC20X-TE**
18.0…23.0	—	—	—	—	❖	❖	**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 and service factor.

❖ This starter is not valid for application at this horsepower and voltage.

⊗Coil voltage code—see page 2-315

2

Product Selection and 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. kW, 50 Hz♣				Max. Short-Circuit Current [kA] Type 1 Coordination				Max. Short-Circuit Current [kA] Type 2 Coordination				DOL Starter	Reversing Starter
	230V	400V	500V	690V	230V	400V	500V	690V	230V	400V	500V	690V	Cat. No.	Cat. No.
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 and service factor.

⊗Coil voltage code—see page 2-315

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

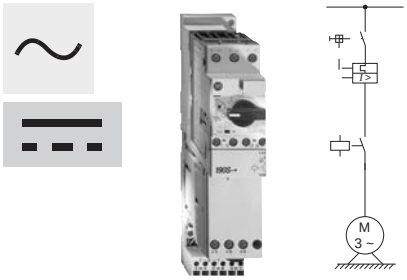
Voltage [V]	12	24	32	36	42	48	100	100... 110	110	120	127	200	200... 220	200... 230	208	208... 240
50 Hz	R	**K**	V	W	X	Y	KP	—	**D**	P	S	KG	—	—	—	—
60 Hz	Q	**J**	—	V	—	X	—	KP	—	**D**	—	—	KG	—	**H**	L
50/60 Hz	—	**KJ**	—	—	—	KY	KP	—	KD	—	—	KG	—	KL	—	—

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 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



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 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.

Note: Verify that the motor protection circuit breaker can be set to the rated motor current.

Product Selection and Coordination Ratings — UL/CSA in Group Motor Installations

Motor Current Adjustment Range [A]	UL/CSA Hp Ratings (60 Hz) Hp Ratings as a UL508 Motor Controller in Group Motor Installations♣ 200V	230V	460V	575V	Max. Fuse or Circuit Breaker per NEC [A]	Max. Short-Circuit Current [kA] Type 1 Coordination 480V	600V	Type 2 Coordination 480V	600V	DOL Starter Cat. No.	Reversing Starter (AC coils only) Cat. No.
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 and service factor.

⊗Coil voltage code—see page 2-321

2

Product Selection and 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	Reversing Starter
	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	Cat. No.	Cat. No.
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 and service factor.

❖ This starter is not valid for application at this horsepower and voltage.

⊗Coil voltage code—see page 2-321

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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 Ratings (60 Hz) Hp Ratings as a UL508 Self-Protected Type E Combination Motor Controller♣ 200V	230V	460V	575V	Max. Short-Circuit Current [kA] 480Y/277V	600Y/347V	DOL Starter Cat. No.	Reversing Starter Cat. No.
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 and service factor.

❖ This starter is not valid for application at this horsepower and voltage.

⊗Coil voltage code—see page 2-321

2

Product Selection and 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. kW, 50 Hz♣				Max. Short-Circuit Current [kA] Type 1 Coordination				Type 2 Coordination				DOL Starter	Reversing Starter
	230V	400V	500V	690V	230V	400V	500V	690V	230V	400V	500V	690V	Cat. No.	Cat. No.
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 and service factor.

⊗Coil voltage code—see page 2-321

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	—	—	—	—
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	DC	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.

2

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-CA16**X**

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	Avaiable
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**

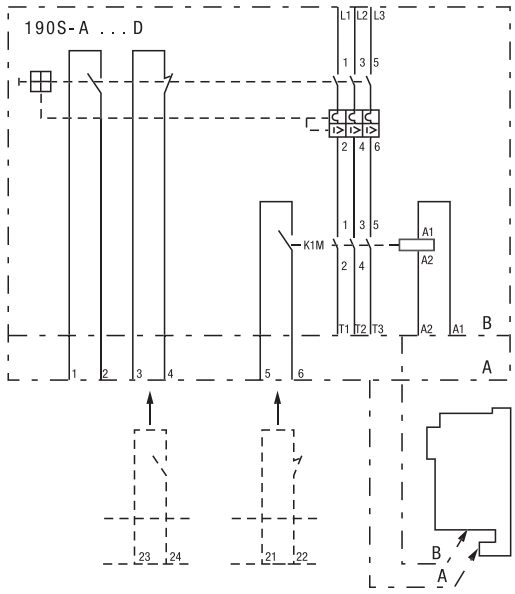
Modifications, Accessories		190E	191E	190S	191S
JE ‡	Electronic Interfaces (100-C)	Available	Available	Available	Available
R ‡	Surge Suppressor RC (100-C)	Available	Available	Available	Available
V ‡	Surge Suppressor Varistor (100-C)	Available	Available	Available	Available
D ‡	Surge Suppressor Diode (100-C)	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).

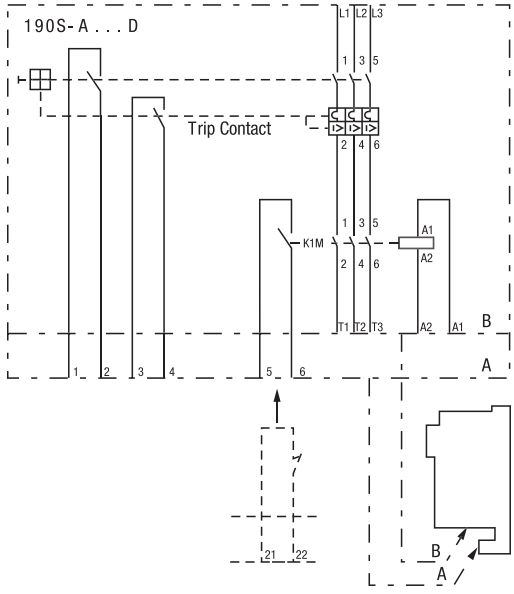
§ Not available on 190E/191E Eco starters with 100-K/104-K mini contactors.

Wiring Diagrams

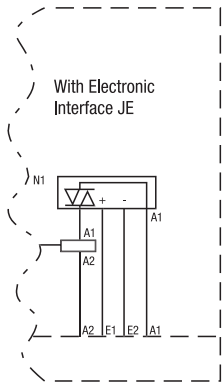
IEC Wiring Diagram Cat. No. 190S-A…D



190S-___2-____ C

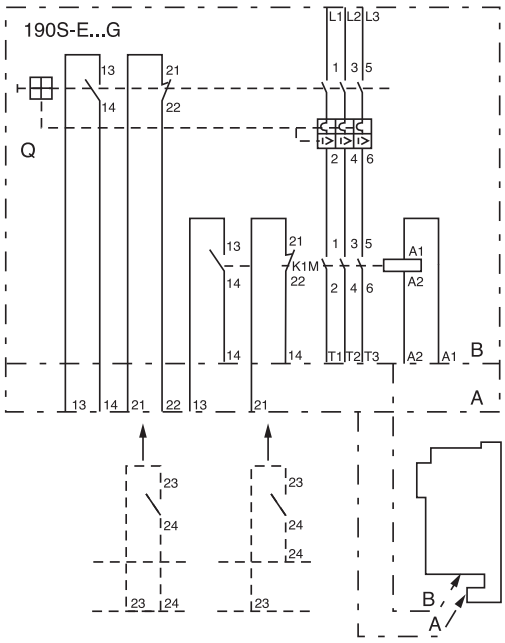


190S-___2-____ S

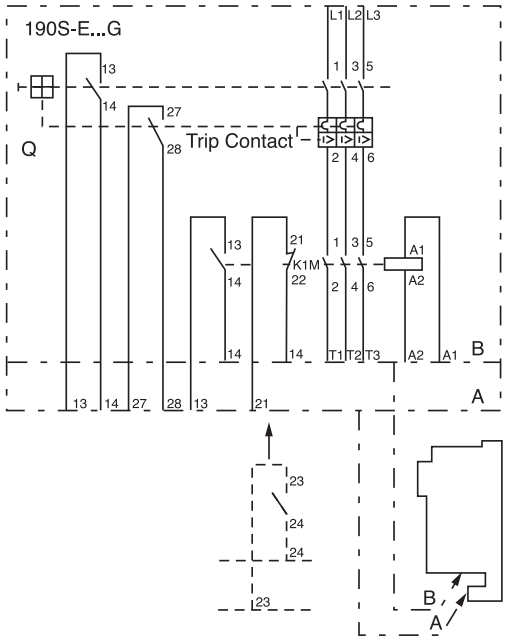


- JE Option

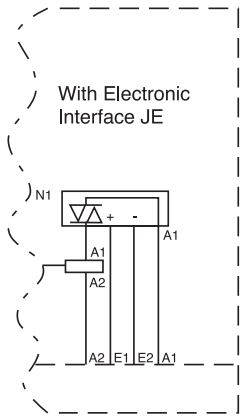
IEC Wiring Diagram Cat. No. 190S-E…G



190S-___2-____ C



190S-___2-____ S



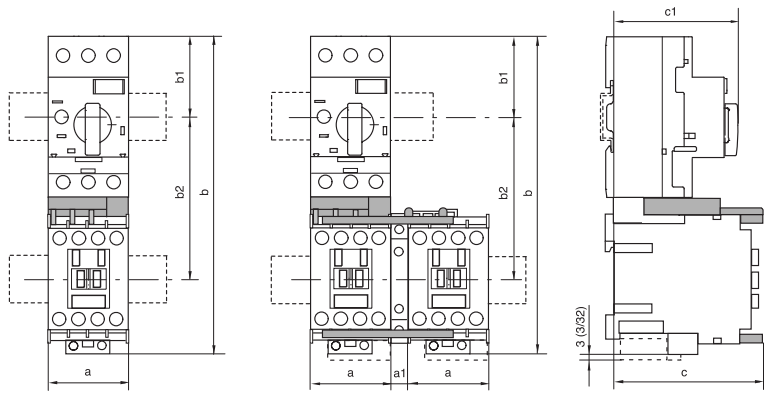
- JE Option

Eco and Compact Combination Starters

Approximate Dimensions

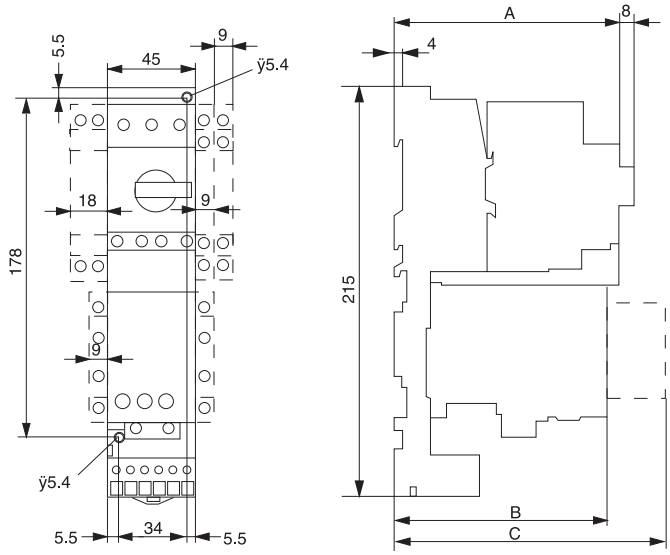
Dimensions are shown in millimeters. Dimensions are not intended to be used for manufacturing purposes.

190E/191E



Cat. No.	a	a1	b	b1	b2	c	c1
190E Eco Starters							
190E-KMN…190E-KPN	45 (1-25/32)	0	171 (6-3/4)	45 (1-25/32)	—	49 (1-15/16)	70 (2-49/64)
190E-AN…190E-DN			178 (7)			83.5 (3-19/64)	
191E Reversing Eco Starters							
191E-KMN…191E-KPN	45 (1-25/32)	0	164 (6-15/32)	45 (1-25/32)	—	49 (1-15/16)	70 (2-49/64)
191E-AN…191E-DN		9 (23/64)	178 (7)			83.5 (3-19/64)	

190S-A…D



		A [mm]	B [mm]
190S-AN, -ANEJ	140M-C	112	107
190S-BN, -BNEJ			
190S-CN, -CNEJ	140M-D	122	
190S-DN, -DNEJ			
190S-ANZ, -ANDJ	140M-C	134.5	132.5
190S-BNZ, -BNDJ			
190S-CNZ, -CNDJ	140M-D	144.5	
190S-DNZ, -DNDJ	140M-C	157	150
	140M-D	167	

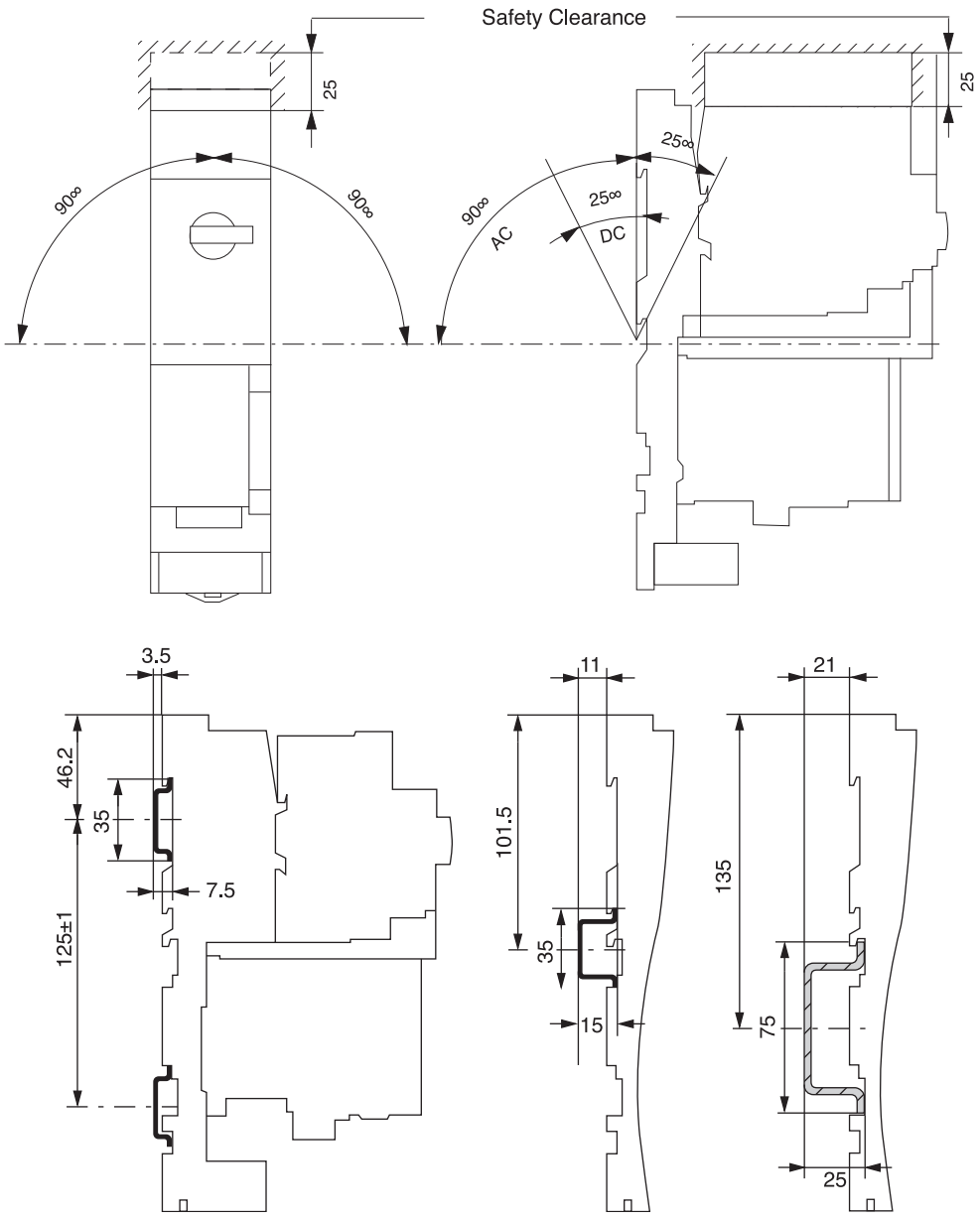
	C [mm]
100-FA, 100-FC 100-FPT 100-FL	138 157 160
100-FA, 100-FC	163.5
100-FA, 100-FC	181

Visit our website: www.ab.com/catalogs

Preferred availability cat. nos. are printed in **bold**

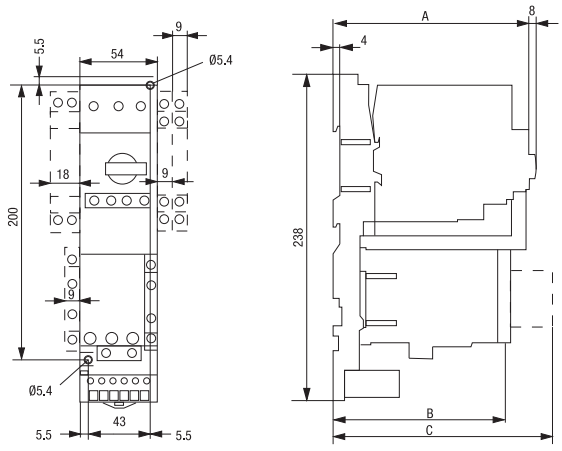
Dimensions are shown in millimeters. Dimensions are not intended to be used for manufacturing purposes.

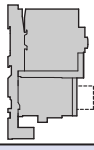
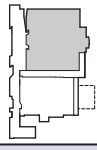
190S-A...D

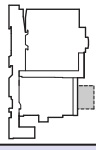


Dimensions are shown in millimeters. Dimensions are not intended to be used for manufacturing purposes.

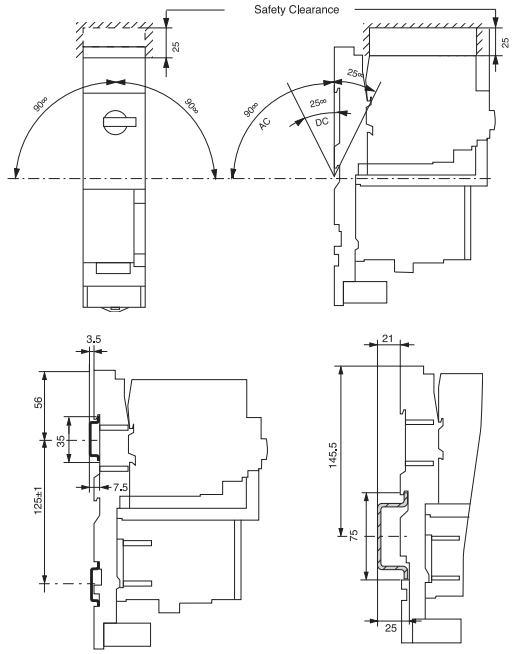
190S-E and 190S-F Approximate Dimensions

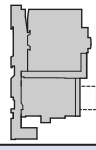
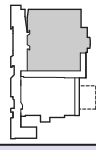


		A [mm]	B [mm]
190S-EN, -ENEJ	140M-F	135	124
190S-FN, -FNEJ			
190S-ENZ, -ENDJ		179	168
190S-FNZ, -FNDJ			

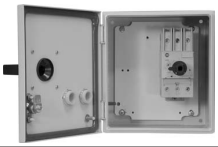
	C [mm]
100-FB 100-FPT 100-FL	154.5 173.5 176.5
100-FB	198.5

190S-G Approximate Dimensions



		A [mm]	B [mm]
190S-GN	140M-F	135	118.5
190S-GNZ, -GNDJ		179	162.5

	C [mm]
100-FB 100-FPT 100-FL	157 176 179
100-FB	201

					
	103H/107H	**140M**	**105-C**	**106-C**	**109-C**
Starter Type	Reversing (103H)/ non-reversing (107H)	Motor protection circuit breaker only	Reversing	Reversing combination	Non-reversing
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	85 A	85 A	85 A
Enclosure Material	Metal	Metal	Metal	Standard	Molded plastic or metal
Enclosure Type	IP66 (Type 3/4/12)	IP66 (Type 3/4/12)	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)—metal IP66 (Type 4/4X/12)—plastic
Product Selection	**page 2-329**	**page 2-331**	**page 2-336**	**page 2-337**	**page 2-339**

				
	112-C	**113-C**	**120E-C**	**132/133-C**
Starter Type	Non-reversing combination	Non-reversing combination	Multi-speed	Pump control panel
AC Coils	✓	✓	✓	✓
DC Coils	—	—	—	—
UL/CSA	✓	✓	✓	UL only
IEC/CE	✓	✓	✓	—
Components				
Motor Circuit Protector	—	✓	—	—
100-C Contactor	✓	✓	✓	✓
193 Overload Relay	✓	✓	✓	✓
194R Disconnect	✓	—	—	✓
Max. Current*	72 A	72 A	85 A	72 A
Enclosure Material	Metal	Metal	Metal	Molded plastic or 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)	IP32 (Type 3R)
Product Selection	**page 2-340**	**page 2-341**	**page 2-342**	**page 2-343**

* For IEC enclosed starter solutions from 95…860 A, contact your local Rockwell Automation sales office or Allen-Bradley distributor.

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

Table of Contents

Standards Compliance

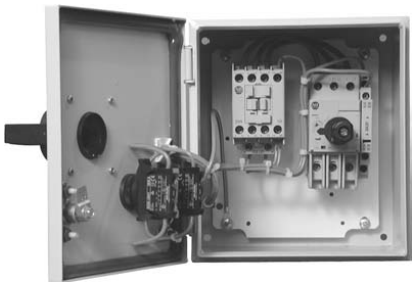
UL 508
CSA 22.2 No. 14

Certifications

cULus Listed (File No. E 125316, Guide NKJH, NKJH7)

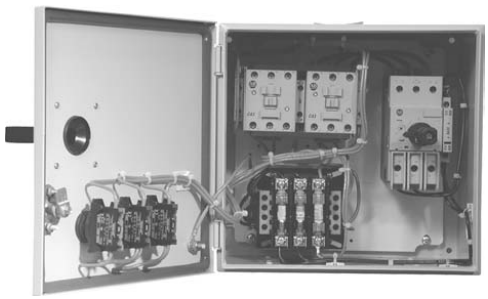
Product Selection

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.

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-AF✪⊗2-CA16X**	A	**107H-AF✪⊗3-CA16X**	B
0.16…0.25	—	—	—	—	65	47	65	47	**103H-AF✪⊗2-CA25X**	A	**107H-AF✪⊗3-CA25X**	B
0.25…0.40	—	—	—	—	65	47	65	47	**103H-AF✪⊗2-CA40X**	A	**107H-AF✪⊗3-CA40X**	B
0.40…0.63	—	—	—	—	65	47	65	47	**103H-AF✪⊗2-CA63X**	A	**107H-AF✪⊗3-CA63X**	B
0.63…1.00	—	—	1/2	3/4	65	47	65	47	**103H-AF✪⊗2-CB10X**	A	**107H-AF✪⊗3-CB10X**	B
1.00…1.60	—	—	1/2…1	3/4...1	65	47	65	47	103H-AF✪⊗2-CB16X	A	**107H-AF✪⊗3-CB16X**	B
1.60…2.50	1/2	1/2...3/4	3/4… 1-1/2	1…2	65	30	65	10	103H-AF✪⊗2-DB25X	A	107H-AF✪⊗3-DB25X	B
2.50…4.00	1/2…1	3/4...1	1-1/2… 3	2…3	65	30	65	—	103H-AF✪⊗2-DB40X	A	**107H-AF✪⊗3-DB40X**	B
2.50…4.00	1/2…1	3/4...1	1-1/2… 3	2…3	65	30	65	30	**103H-DF✪⊗2-DB40X**	A	**107H-DF✪⊗3-DB40X**	B
4.00…6.30	1… 1-1/2	1…2	3…5	5	65	30	65	—	103H-AF✪⊗2-DB63X	A	**107H-AF✪⊗3-DB63X**	B
4.00…6.30	1… 1-1/2	1…2	3…5	5	65	30	65	30	**103H-EF✪⊗2-DB63X**	C	**107H-EF✪⊗3-DB63X**	C
6.30…10.0	1-1/2… 3	2...3	5… 7-1/2	7-1/2… 10	65	30	65	—	103H-BF✪⊗2-DC10X	A	**107H-BF✪⊗3-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-EF✪⊗2-DC10X**	C	**107H-EF✪⊗3-DC10X**	C
10.0…16.0	3…5	5	7-1/2… 10	10…15	65	30	65	—	103H-CF✪⊗2-DC16X	A	**107H-CF✪⊗3-DC16X**	B
10.0…16.0	3…5	5	7-1/2… 10	10…15	65	30	65	30	**103H-EF✪⊗2-DC16X**	C	**107H-EF✪⊗3-DC16X**	C
14.5…20.0	5	5	10	—	65	❖	65	❖	103H-DF✪⊗2-DC20X	A	**107H-DF✪⊗3-DC20X**	B
18.0…23.0	5	7-1/2	15	—	65	❖	65	❖	**103H-DF✪⊗2-DC25X**	A	**107H-DF✪⊗3-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-EF✪⊗2-FC10X**	C	**107H-EF✪⊗3-FC10X**	C
10.0…16.0	3…5	5	7-1/2… 10	10…15	65	30	65	10	**103H-EF✪⊗2-FC16X**	C	**107H-EF✪⊗3-FC16X**	C
14.5…20.0	5	5… 7-1/2	15	15…20	65	30	65	10	**103H-EF✪⊗2-FC20X**	C	**107H-EF✪⊗3-FC20X**	C
18.0…25.0	7-1/2	7-1/2... 10	15...20	20	65	30	65	10	**103H-EF✪⊗2-FC25X**	C	**107H-EF✪⊗3-FC25X**	C
23.0…32.0	7-1/2... 10	10	20...25	30	65	30	65	10	**103H-FF✪⊗2-FC32X**	C	**107H-FF✪⊗3-FC32X**	C
32.0…43.0	10	15	30	—	65	❖	65	❖	**107H-GF✪⊗3-FC45X**	C	**107H-GF✪⊗3-FC45X**	C

✪ Line Voltage Codes — see page 2-332
⊗ Coil Voltage Codes — see page 2-332
✶ 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.
❖ This starter is not valid for application at this horsepower and voltage.

2

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-AF✪⊗2-CA16X**	A	**107H-AF✪⊗3-CA16X**	B
0.16…0.25	—	—	—	—	65	47	**103H-AF✪⊗2-CA25X**	A	**107H-AF✪⊗3-CA25X**	B
0.25…0.40	—	—	—	—	65	47	**103H-AF✪⊗2-CA40X**	A	**107H-AF✪⊗3-CA40X**	B
0.40…0.63	—	—	—	—	65	47	**103H-AF✪⊗2-CA63X**	A	**107H-AF✪⊗3-CA63X**	B
0.63…1.00	—	—	1/2	3/4	65	47	**103H-AF✪⊗2-CB10X**	A	**107H-AF✪⊗3-CB10X**	B
1.00…1.60	—	—	1/2…1	3/4...1	65	47	103H-AF✪⊗2-CB16X	A	**107H-AF✪⊗3-CB16X**	B
1.60…2.50	1/2	1/2...3/4	3/4…1-1/2	—	65	❖	103H-AF✪⊗2-DB25X	A	107H-AF✪⊗3-DB25X	B
1.60…2.50	1/2	1/2...3/4	3/4…1-1/2	1…2	65	30	**103H-DF✪⊗2-DB25X**	A	**107H-DF✪⊗3-DB25X**	B
2.50…4.00	—	—	—	—	❖	❖	103H-AF✪⊗2-DB40X	A	**107H-AF✪⊗3-DB40X**	B
2.50…4.00	1/2…1	3/4...1	1-1/2…3	2…3	65	30	**103H-DF✪⊗2-DB40X**	A	**107H-DF✪⊗3-DB40X**	B
4.00…6.30	—	—	—	—	❖	❖	103H-AF✪⊗2-DB63X	A	**107H-AF✪⊗3-DB63X**	B
4.00…6.30	1…1-1/2	1…2	3…5	5	65	30	**103H-EF✪⊗2-DB63X**	C	**107H-EF✪⊗3-DB63X**	C
6.30…10.0	—	—	—	—	❖	❖	103H-BF✪⊗2-DC10X	A	**107H-BF✪⊗3-DC10X**	B
6.30…10.0	1-1/2…3	2...3	5…7-1/2	7-1/2…10	65	30	**103H-EF✪⊗2-DC10X**	C	**107H-EF✪⊗3-DC10X**	C
10.0…16.0	—	—	—	—	❖	❖	103H-CF✪⊗2-DC16X	A	**107H-CF✪⊗3-DC16X**	B
10.0…16.0	3…5	5	7-1/2…10	10…15	65	30	**103H-EF✪⊗2-DC16X**	C	**107H-EF✪⊗3-DC16X**	C
14.5…20.0	—	—	—	—	❖	❖	103H-DF✪⊗2-DC20X	A	**107H-DF✪⊗3-DC20X**	B
14.5…20.0	5	5	10	—	65	❖	**103H-EF✪⊗2-DC20X**	C	**107H-EF✪⊗3-DC20X**	C
18.0…23.0	—	—	—	—	❖	❖	**103H-DF✪⊗2-DC25X**	A	**107H-DF✪⊗3-DC25X**	B
18.0…23.0	5	7-1/2	15	—	65	❖	**103H-EF✪⊗2-DC25X**	C	**107H-EF✪⊗3-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-EF✪⊗2-FC10X**	C	**107H-EF✪⊗3-FC10X**	C
10.0…16.0	3…5	5	7-1/2…10	10…15	65	30	**103H-EF✪⊗2-FC16X**	C	**107H-EF✪⊗3-FC16X**	C
14.5…20.0	5	5…7-1/2	15	15…20	65	30	**103H-EF✪⊗2-FC20X**	C	**107H-EF✪⊗3-FC20X**	C
18.0…25.0	7-1/2	7-1/2...10	15...20	20	65	30	**103H-EF✪⊗2-FC25X**	C	**107H-EF✪⊗3-FC25X**	C
23.0…32.0	7-1/2...10	10	20...25	30	65	30	**103H-FF✪⊗2-FC32X**	C	**107H-FF✪⊗3-FC32X**	C
32.0…43.0	10	15	30	—	65	❖	**103H-GF✪⊗2-FC45X**	C	**107H-GF✪⊗3-FC45X**	C

✪ Line Voltage Codes — see page 2-332
⊗ Coil Voltage Codes — see page 2-332
✶ 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.
❖ This starter is not valid for application at this horsepower and voltage.

Enclosed Motor Protectors

- Self-protected UL Type E manual combination motor controller
- 65 kA at 480V
- 30 kA at 600V
- AC control

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

2

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-CA16**X-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)
4RW	Pilot Light (red—FOR, White — REV)
6P❄‡	Control Transformer‡ (not available with enclosure size A)
KY	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 contacy option "A20" is required when seelcting this control transformer.

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

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

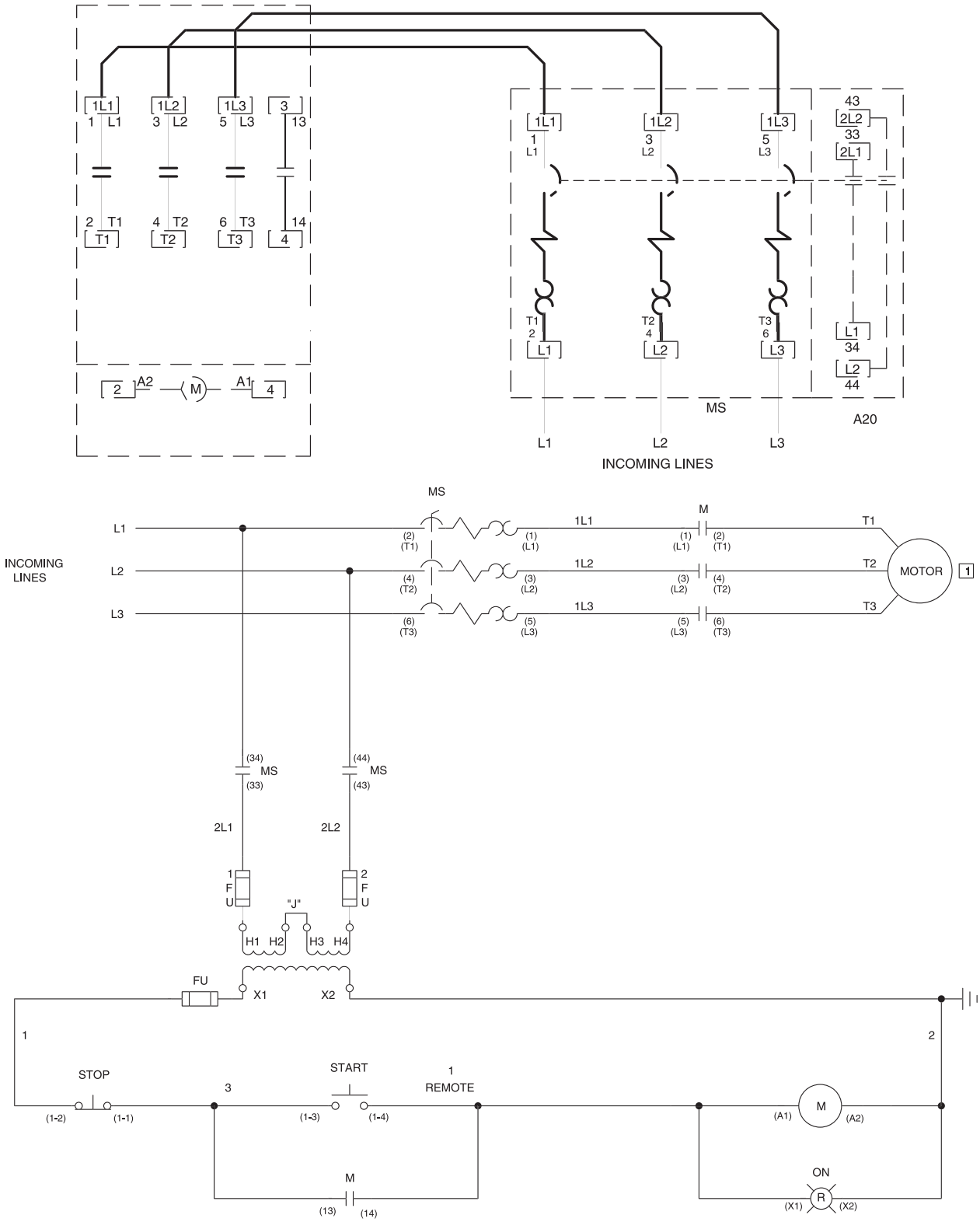
The Cat. No. as listed is incomplete. Select a coil voltage code from the table below to complete the Cat. No.
Example: 120V 60 Hz: **Cat. No. 103H-AFH⊗-CA16X** becomes **Cat. No. 103H-AFHD2-CA16X.**

Standard Coil Voltages [V]	24	110	120	208	220…230	240…260	277	380…400	415	480	600
50 Hz	K	C	—	—	F	—	—	N	B	—	—
60 Hz	J	—	D	H	—	A	T	—	—	B	UB

Visit our website: www.ab.com/catalogs
Preferred availability cat. nos. are printed in **bold**

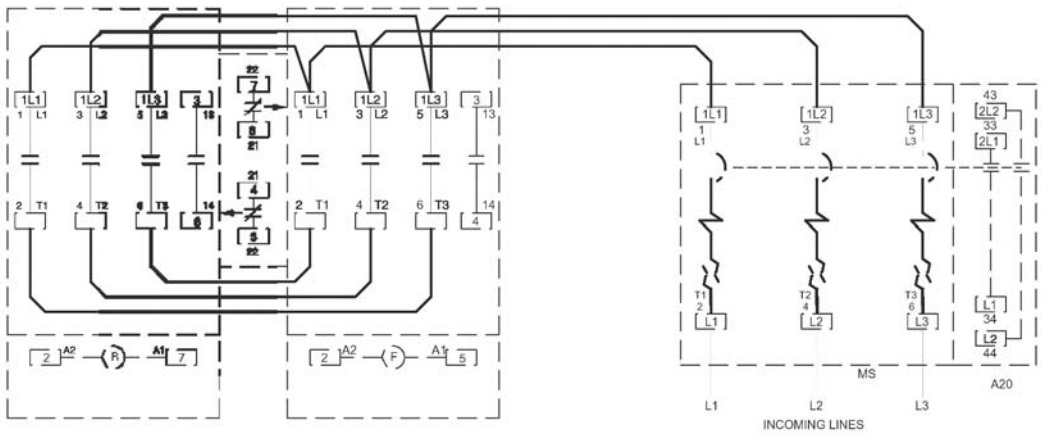
2

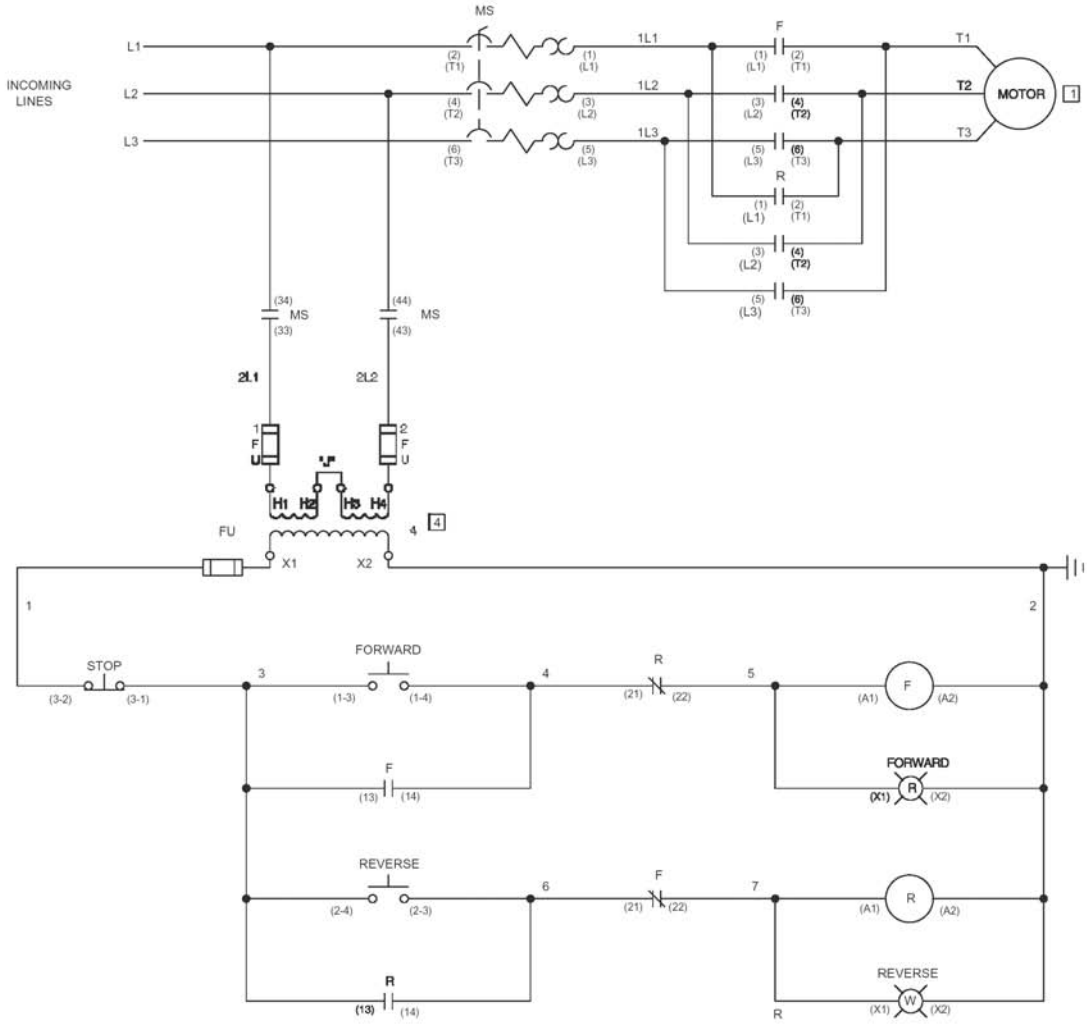
Cat. No. 103H-AFBD2-DB40X-1-4R-6P



2

Cat. No. 107H-AFBD3-CA16X-1M-4RW-6P





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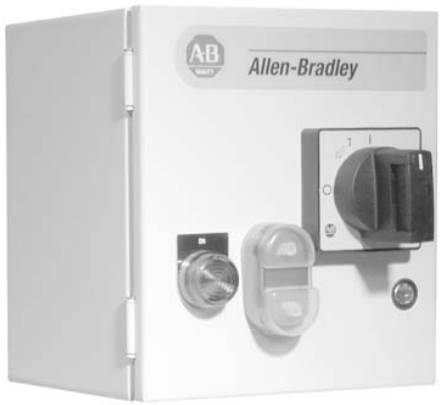
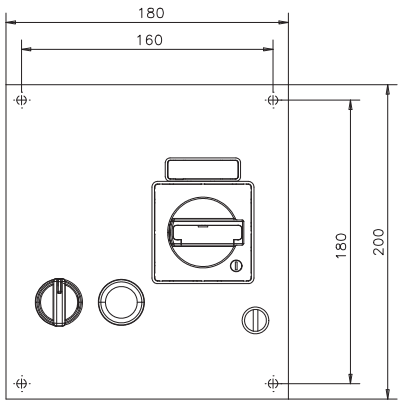
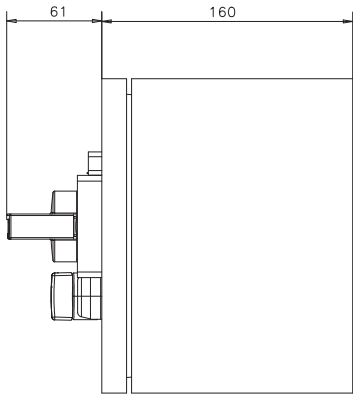
Allen-Bradley

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

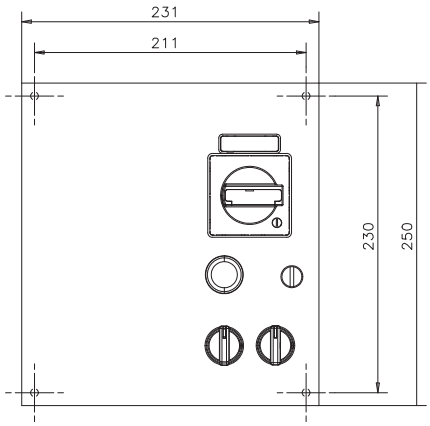
Enclosure Style A

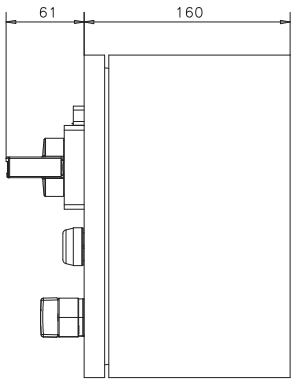




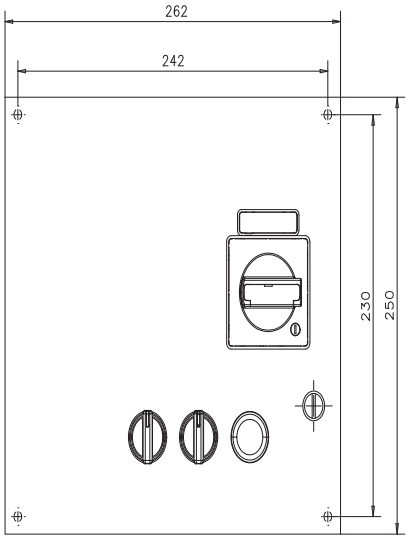


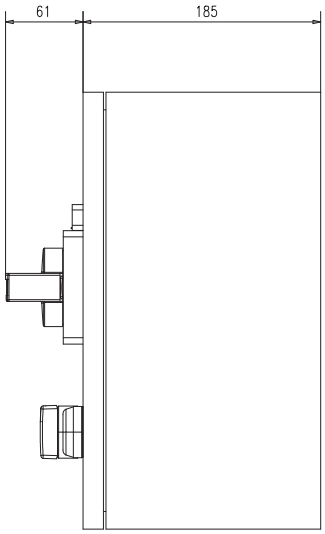
Enclosure Style B





Enclosure Style C





Cat. No. 105-C09ABA1F-1-6P Type 1 Metal Enclosure with Lift-off Cover

Bulletin 105 IEC Reversing Starters

- 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.

Table of Contents

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

AC-Operated

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							
	3Ø	1Ø ✶		3Ø					
Max I_e [A]	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 2-169 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 2-348), 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.

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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Standards Compliance

EN/IEC 60947-4-1
VDE 0660
CSA C22.2 No. 14
UL 508

Certifications

cULus Listed (File E3125, Guide NLDX, NLDX7)

2

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

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)
Max I_e [A]	kW 3Ø 380…415V	Hp 3Ø 200V	Hp 3Ø 230V	Hp 3Ø 460V	Hp 3Ø 575V	Fuse Clip Rating Amperes/UL Class	Cat. No.	Cat. No.
9	4	2	2	5	7-1/2	30 A/Class CC	106-C09AÄ✪	**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-C30FÄ✪
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 2-169 to complete the Cat. No.

∗ When selecting a factory-installed control circuit transformer (**see** Modifications page 2-348), 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.

IEC Non-Reversing Starters

Overview/Catalog Number Explanation

Cat. No. 109-C09ABA1F-1-4R-6P IP42 (Type 1) Metal Enclosure with Lift-off Cover

Cat. No. 109-CAKD2-E1A-7 Molded Plastic Enclosure

Bulletin 109 IEC Non-Reversing Starters

- Impact-resistant molded enclosures (9…23 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)

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.

IEC Non-Reversing Starters in Plastic Enclosures

109	–	CA	K	D	2	–	E1P	–	4G	–	7
a		*b*	*c*	*d*	*e*		*f*		*g*		*g*

a

Bulletin No.	
Code	Description
109	IEC Non-reversing starter

b

Contactor Size	
Code	Description
CA	100-C09
CB	100-C12
CC	100-C16
CD	100-C23

c

Enclosure	
Code	Description
K	Plastic Encl. PC, IP66, Type 12K/4/4X

d

Coil Voltage Code — AC Voltage	
Code	Description
Q	12V, 60 Hz
R	12V, 50 Hz
J	24V, 60 Hz
K	24V, 50 Hz
KJ	24V, 50/60 Hz
V	32V, 50 Hz / 36V, 60 Hz
W	36V, 50 Hz
X	42V, 50 Hz / 48V, 60 Hz
Y	48V, 50 Hz
KY	48V, 50/60 Hz
KP	100V, 50 Hz / 100...110V, 60 Hz
D	110V, 50 Hz / 120V, 60 Hz
KD	110V, 50/60 Hz
P	120V, 50 Hz
S	127V, 50 Hz
KG	200V, 50 Hz / 200…220V, 60 Hz
KL	200…230V, 50/60 Hz
L	208...240V, 60 Hz
F	220...230V, 50 Hz
KF	230V, 50/60 Hz
A	240V, 60 Hz
T	240V, 50 Hz / 277V, 60 Hz
E	380V, 60 Hz
N	380...400V, 50 Hz / 440V, 60 Hz
KN	400V, 50/60 Hz
G	400...415V, 50 Hz
KB	440V, 50/60 Hz
B	440V, 50 Hz / 480V, 60 Hz
M	500V, 50 Hz
C	550V, 50/60 Hz0V, 60 Hz

e

Auxiliary Contacts	
Code	Description
0	N.O. Aux.Contact used in Start/Stop Circuit
2	N.O. for Customer Use with Reset Option only

f

Overload Relay	
193-ED/ -EE 3-phase Electronic Overload Relay	
Code	Description
D1_	Cl.10, Man. Reset (add additional code suffix below)
E1_	Aut./Man.Reset, Adj. Class (add additional code suffix below)
Adj. Range/Contactor Size	
Code	Description
_A	0.1…0.5 A, 100-C09…C23
_B	0.2…1.0 A, 100-C09…C23
_C	1.0…5.0 A, 100-C09…C23
_D	3.2…16 A, 100-C09…C23
_E	5.4…27 A, 100-C16…C23
193-EE Single-phase Electron. Overload Relay	
Code	Description
E1P	1.0...5.0 A, 100-C09…C23
E1R	3.2...16 A, 100-C09…C23
E1S	5.4…27 A, 100-C16…C23

g

Modifications and Accessories	
Code	Description
R	Surge Suppressor RC
V	Surge Suppressor Varistor
2	Push Buttons, START/raised STOP (green/red)
7	Push Button, RESET (blue)
MC	With Pushbutton Latch for Maintained Control
Pilot Lights IP66, Type 4/4X/12K	
Code	Description
4G	Pilot Light "RUN", Green
4R	Pilot Light "RUN", Red
4Y	Pilot Light "Failure", Yellow

Visit our website: www.ab.com/catalogs
Preferred availability cat. nos. are printed in **bold**

Product Selection — AC-Operated Starters
Enclosed Type — Molded Plastic

Ratings (AC3, AC4)								IP66 (Type 4, 4X, 12) Watertight, Dusttight Corrosion Resistant Molded Plastic Enclosure	
Max I_e [A]	kW 3Ø 380V/415V	Hp 1Ø 115V	Hp 1Ø 230V	Hp 3Ø 200V	Hp 3Ø 230V	Hp 3Ø 460V	Hp 3Ø 575V	With integral Start/Stop Push Butotn Cat. No.∗	With integral Reset Push Butotn Cat. No.∗
9	4	1/2	1-1/2	2	2	5	7-1/2	109-CAK⊗0-✪-2	109-CAK⊗0-✪-7
12	5-1/2	1/2	2	3	3	7-1/2	10	109-CBK⊗0-✪-2	109-CBK⊗0-✪-7
16	7-1/2	1	3	5	5	10	15	**109-CCK⊗0-✪-2**	**109-CCK⊗0-✪-7**
23	11	2	3	5	7-1/2	15	15	**109-CDK⊗0-✪-2**	**109-CDK⊗0-✪-7**

∗ N.O. auxiliary contact is used as holding contact with the START/STOP option.
N.O. auxiliary contact is available for customer use with RESET option.

Enclosed Type — Sheet Metal

Ratings (AC3, AC4)								IP42 (Type 1) General Purpose Sheet Metal Enclosure (Liftoff Cover)	IP66 (Type 3, 4, 12) Watertight, Dusttight Sheet Metal Enclosure (Hinged Cover)
Max I_e [A]	kW 3Ø 380V/415V	Hp 1Ø 115V	Hp 1Ø 230V	Hp 3Ø 200V	Hp 3Ø 230V	Hp 3Ø 460V	Hp 3Ø 575V	Cat. No.	Cat. No.
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 2-169 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 Modifications page 2-348), 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-C09FBJ✪-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 Fused Combination Starters

Overview/Product Selection

Cat. No. 112-C09FBA1F-1-7 IP66 (Type 3,4,12) Metal Enclosure with Hinged Cover

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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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

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)
Max I_e [A]	Hp 3Ø 200V	Hp 3Ø 230V	Hp 3Ø 460V	Hp 3Ø 575V	Fuse Clip Rating Amperes/ UL Class	Cat. No.	Cat. No.
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

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)
Max I_e [A]	Hp 3Ø 200V	Hp 3Ø 230V	Hp 3Ø 460V	Hp 3Ø 575V	Cat. No.	Cat. No.
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	60 Hz	AD	AD	CD	CD

✪ Overload Relay Code

The Cat. No. as listed is incomplete. Select an overload relay code from page 2-169 to complete the Cat. No.

∗ When selecting a factory-installed control circuit transformer (see Modifications page 2-348), 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.

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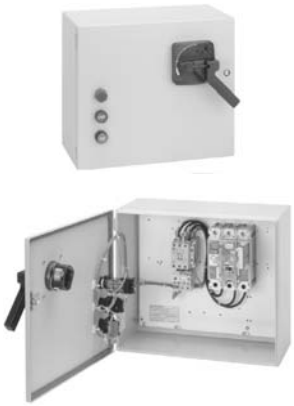
Preferred availability cat. nos. are printed in **bold**



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.

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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

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)
Max I_e [A]	Hp∗ 3Ø 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**
	—	—	20	15…20	**113-C30A⊗✪-43**	**113-C30F⊗✪-43**
	—	—	—	25	**113-C30A⊗✪-44**	**113-C30F⊗✪-44**
43	7-1/2…10	10	—	—	**113-C43A⊗✪-41**	**113-C43F⊗✪-41**
	—	15	—	—	**113-C43A⊗✪-42**	**113-C43F⊗✪-42**
	—	—	20…25	—	**113-C43A⊗✪-44**	**113-C43F⊗✪-44**
	—	—	30	25…30	**113-C43A⊗✪-45**	**113-C43F⊗✪-45**
60	15	—	—	—	**113-C60A⊗✪-42**	**113-C60F⊗✪-42**
	—	15…20	—	—	**113-C60A⊗✪-43**	**113-C60F⊗✪-43**
	—	—	40	40	**113-C60A⊗✪-46**	**113-C60F⊗✪-46**
72	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 2-169 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 2-348), 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.

Cat. No. 120E-C09FDA1FA1D-3-4RW-7
IP66 (Type 3,4,12)
Metal Enclosure with Hinged Cover

Bulletin 120E IEC Multi-Speed Starters

- Compact design
- Selection of enclosures
  IP42 (Type 1) and
  IP66 (Type 3/4/12)
- Bimetallic Class 10 overload relays
- Solid-state overload relays

Bulletin 120E multi-speed starters are designed to control "two-speed, separate-winding" AC squirrel-cage induction motors. These starters are available for constant torque, variable torque, or constant horsepower three-phase motors. Multi-speed motors are commonly used on machine tools, fans, blowers, pumps, conveyors and many other types of equipment.

Bulletin 120E multi-speed motor starters use Bulletin 100 contactors and Bulletin 193 bimetallic (Class 10) or solid-state overload relays. A normally open auxiliary contact is also included on each contactor. A wide variety of factory- and field-installed options are available.

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cULus Listed (File E3125, Guide NLDX, NLDX7)

Your order must include: Cat. No. of the starter selected, coil voltage code, and, if required, factory-installed modifications suffix code and/or Cat. No. of any accessories.

Product Selection

Enclosed Type — AC Operated

2-Speed Separate Winding, Constant or Variable Torque (Constant Horsepower—Consult your local Rockwell Automation sales office or Allen-Bradley distributor)

Ratings (AC3, AC4)								IP42 (Type 1) General Purpose Sheet Metal Enclosure (Lift-off Cover through 120E-C72)	IP66 (Type 3/4/12) Watertight, Dusttight Sheet Metal Enclosure (Hinged Cover)
Max I_e [A]	kW	Hp							
	3Ø	1Ø∗		3Ø					
	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	**120E-C09A⊗✪✪**	**120E-C09F⊗✪✪**
12	5-1/2	1/2	2	3	3	7-1/2	10	**120E-C12A⊗✪✪**	**120E-C12F⊗✪✪**
16	7-1/2	1	3	5	5	10	15	**120E-C16A⊗✪✪**	**120E-C16F⊗✪✪**
23	11	2	3	5	7-1/2	15	15	**120E-C23A⊗✪✪**	**120E-C23F⊗✪✪**
30	15	2	5	7-1/2	10	20	25	**120E-C30A⊗✪✪**	**120E-C30F⊗✪✪**
37	18-1/2	3	5	10	10	25	30	**120E-C37A⊗✪✪**	**120E-C37F⊗✪✪**
43	22	3	7-1/2	10	15	30	30	**120E-C43A⊗✪✪**	**120E-C43F⊗✪✪**
60	30	5	10	15	20	40	50	**120E-C60A⊗✪✪**	**120E-C60F⊗✪✪**
72	37	5	10	20	25	50	60	**120E-C72A⊗✪✪**	**120E-C72F⊗✪✪**
85	45	7-1/2	15	25	30	60	60	**120E-C85A⊗✪✪**	**120E-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. 120E-C09A⊗✪✪✪** becomes **Cat. No. 120E-C09AB✪✪**.

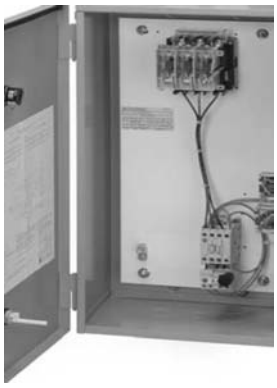
AC Voltage [V]		24	48	110	120	208	208…240	220	240	277	380…400	400…415	440	480	500	600
Common Control❄ Coil Voltage Code	50 Hz	—	—	—	—	—	—	A	T	—	N	G	B	—	M	—
	60 Hz	—	—	—	—	H	L	—	A	—	—	—	N	B	—	C
Separate Control (without transformer) Coil Voltage Code	50 Hz	K	Y	D	—	—	—	—	—	—	—	—	—	—	—	—
	60 Hz	J	X	—	D	—	—	—	—	T	—	—	—	—	—	—

✪ Overload Relay Code

The Cat. No. as listed is incomplete. Select two overload relay codes from page 2-169 to complete the Cat. No. The first code will denote the high speed overload relay, and the second code will denote the low speed overload relay.

∗ 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 2-348), 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. 120E-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. 12E-C09FBJ✪✪-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.



Cat. No. 132-C09MBA1F

Bulletins 132 and 133 IEC Pump Control Panel Starters

- IP32 (Type 3R)
- Bimetallic Class 10 overload relays
- Solid-state overload relays
- Enclosure with extra panel space for mounting accessory devices
- Factory-installed disconnect switch or circuit breaker
- Handle with defeater mechanism
- Service entrance rated

Bulletin 132 and 133 pump control panels are specifically designed for irrigation and similar outdoor pumping applications.
The Bulletin 132 pump control panel includes a Bulletin 194R IEC fusible rotary disconnect switch, a Bulletin 100 IEC contactor, a Bulletin 193 bimetallic overload relay or solid-state overload relays, a HAND-OFF-AUTO selector switch, and a START button. All starters include a normally open auxiliary contact as standard. The Bulletin 133 pump control panels are supplied with a motor circuit protector instead of a fusible disconnect switch. IEC pump control panels include an IP32 (Type 3R) weather-resistant enclosure with a rugged, outdoor finish and brackets for pole or cross-bar mounting. Conduit knockouts are located at the bottom of the enclosure. Padlock provisions are furnished on the door latches and the handle (both the ON and OFF positions).

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Standards Compliance

UL 508

Certifications

cULus Listed (File No. E 125316, Guide NKJH, NKJH7)

2

Your order must include: Cat. No. of the pump control panel, 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

Ratings (AC3, AC4)						Fuse Clip Rating Amperes/UL Class	IP32 (Type 3R) Sleet Resistant, Outdoor Sheet Metal Enclosure (Hinged Cover)
Max. I_e [A]	kW 3Ø 380/415V	Hp 3Ø 200V	230V	460V	575V		Cat. No.
9	4	2	2	5	7-1/2	30 A/Class CC	**132-C09M⊗✪**
12	5-1/2	3	3	7-1/2	10	30 A/Class J	**132-C12M⊗✪**
23	11	5	7-1/2	15	15	30 A/Class J	**132-C23M⊗✪**
30	15	7-1/2	10	20	25	60 A/Class J	**132-C30M⊗✪**
43	22	10	15	30	30	60 A/Class J	**132-C43M⊗✪**
60	30	15	20	40	50	100 A/Class J	**132-C60M⊗✪**
72	37	20	25	50	60	100 A/Class J	**132-C72M⊗✪**

⊗ Coil Voltage Code—see page 2-344
✪ Overload Relay Code—see page 2-344

Circuit Breaker Type

Max. I_e [A]	Ratings (AC3, AC4) Hp∗ 3Ø 200V	230V	460V	575V	IP32 (Type 3R) Sleet Resistant, Outdoor Sheet Metal Enclosure (Hinged Cover) Cat. No.
30	1/2	1/2	—	—	**133-C30M⊗✪-33**
	3/4…1	3/4…1	1/2…1	—	**133-C30M⊗✪-35**
	—	—	—	1/2…1-1/2	**133-C30M⊗✪-36**
	1-1/2…3	1-1/2…3	1-1/2…3	2…3	**133-C30M⊗✪-38**
	5	—	—	—	**133-C30M⊗✪-39**
	7-1/2	5…7-1/2	5…7-1/2	—	**133-C30M⊗✪-40**
	—	10	—	5…10	**133-C30M⊗✪-41**
	—	—	10	—	**133-C30M⊗✪-42**
	—	—	20	15…20	**133-C30M⊗✪-43**
	—	—	—	25	**133-C30M⊗✪-44**
43	7-1/2…10	10	—	—	**133-C43M⊗✪-41**
	—	15	—	—	**133-C43M⊗✪-42**
	—	—	20…25	—	**133-C43M⊗✪-44**
	—	—	30	25…30	**133-C43M⊗✪-45**
60	15	—	—	—	**133-C60M⊗✪-42**
	—	15…20	—	—	**133-C60M⊗✪-43**
	—	—	40	40	**133-C60M⊗✪-46**
72	15…20	—	—	—	**133-C72M⊗✪-43**
	—	20…25	—	—	**133-C72M⊗✪-44**
	—	—	40…50	—	**133-C72M⊗✪-47**
	—	—	—	40…60	**133-C72M⊗✪-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. 132-C12M⊗✪** becomes **Cat. No. 132-C12MB✪**

Voltage [V]		208	230…240	460…480	575…600
Common Control❄ Coil Voltage Suffix Code	60 Hz	H	A	B	C
120V Separate Control (without transformer) Coil Voltage Suffix Code		AD	AD	CD	CD

✪ Overload Relay Code

The Cat. No. as listed is incomplete. Select an overload relay code from page 2-169 to complete the Cat. No.

∗ For horsepower ratings less than those shown, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

❄ When selecting a factory-installed control circuit transformer (see Modifications page 2-348), 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. 132-C09MB✪-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. 132-C09MBJ✪-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.

For Bulletins 105, 106, 109, 112, 113, 120E, 132, and 133

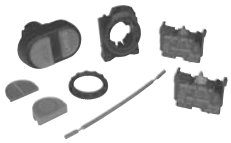
	Description		For Use With	Enclosure Type	Cat. No.
	**Red "ON" Pilot Light**∗ Transformer Type	120V	All	Metal Lift-off and Metal Hinged	❄ 198-PL21R
		208V			❄ 198-PL25R
		240V			❄ 198-PL22R
	**Dual "ON" Pilot Light**∗ Forward — Red Reverse — White	120V	105, 106	Metal Hinged	198-PL21RW
		240V			198-PL22RW
	**Pilot Device Mounting Bracket** (required when mounting pilot devices in metal lift-off enclosures)		105, 109, 120E	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**
	**Fuse Cover for Disconnect Switch**		106,112,132-C09…C23	Metal Hinged	**194R-FCA2**
			106,112,132-C30…C43		**194R-FCJ60**
			106,112,132-C60…C72		§ **194R-FCC1**
	**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 10-111 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.

Accessories — Field Installed

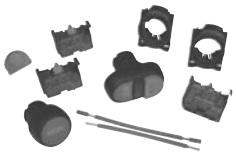
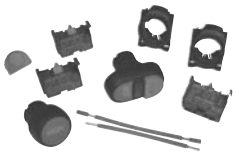
Accessories, Continued

For Bulletins 105, 106, 109, 112, 113, 120E, 132, and 133

	Description	For Use With	Enclosure Type		Cat. No.
	**"HAND-OFF-AUTO" Selector Switch** 3-Position Maintained, Includes Legend Plate	All	Metal Lift-off and Metal Hinged	✶	198-MT1
	"FORWARD-OFF-REVERSE" Selector Switch 3-Position Maintained	105, 106	Metal Lift-off and Metal Hinged	✶	198-MT2
	**"START-STOP" Push Button** Flush green "I/START" Extended red "O/STOP"	105, 109, 120E	Metal Lift-off	✶	198-MS3
	**"START" Push Button** Flush green "START"	All	Metal Hinged		198-MS13
	**"ON-OFF" Push Button**	105, 109, 120E	Metal Lift-off		198-MS6
	**"FORWARD, REVERSE-STOP" Push Button**	105	Metal Lift-off	✶	198-MS7

✶ Requires mounting bracket Cat. No. 198-BR1 when using metal lift-off enclosures.

For Bulletins 105, 106, 109, 112, 113, 120E, 132, and 133

	Description	For Use With	Enclosure Type	Cat. No.	
	**"HIGH, LOW-STOP" Push Button**	120E	Metal Lift-off	*	198-MS8
	**"FAST, SLOW-STOP" Push Button**	120E	Metal Lift-off	*	198-MS9
	**"STOP" Push Button** Extended red "STOP"	All	Metal Hinged		198-MS14
	**"ON" Push Button** Flush green "ON"	All	Metal Hinged		198-MS15
	**"OFF" Push Button** Extended red "OFF"	All	Metal Hinged		198-MS16
	**"FORWARD, REVERSE-STOP" Push Buttons**	105, 106	Metal Hinged		198-MS17
	**"HIGH, LOW-STOP" Push Buttons**	120E	Metal Hinged		198-MS18
	**"RESET" Push Button**	All	Metal Hinged		198-MR6
	**"RESET" Push Button**	105, 109, 120E	Metal Lift-off		**198-MR3**

* Requires mounting bracket **Cat. No. 198-BR1** when using metal lift-off enclosures.

Accessories — Factory Installed

Modifications

Full Voltage Non-Reversing Starters and Lighting Contactors (Bulletins 109, 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/ CA	C12/ CB	C16/ CC	100L- C20	C23/ CD	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 240Vor less. If applicable, seelct 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, 133)

Description of Modification	Suffix Code	Enclosure Design	C09	C12	C16	C23	C30	C37	C43	C60	C72	C85
START-STOP Push Button (113 Only)	1	ALL	NA	NA	NA	NA	A	NA	A	A	A	NA
HAND-OFF-AUTO (113 Only)	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
∗ Transformer Type.
❄ When ordering in Canada, use suffix 6. Primary fusing is not required by the Canadian Electrical Code.

Full Voltage Reversing and Multi-Speed Starters (Bulletins 105, 120E)

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
HIGH-LOW-STOP Push Buttons (120E 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
HIGH-OFF-LOW Selector Switch (120E 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
Red HIGH/White LOW Pilot Lights∗ (120E 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
2 External Resets (120E 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

Reversing and Non-Reversing Fusible Combination Starters (Bulletins 106, 112, 132)

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∗	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 and 132 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 and 132 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

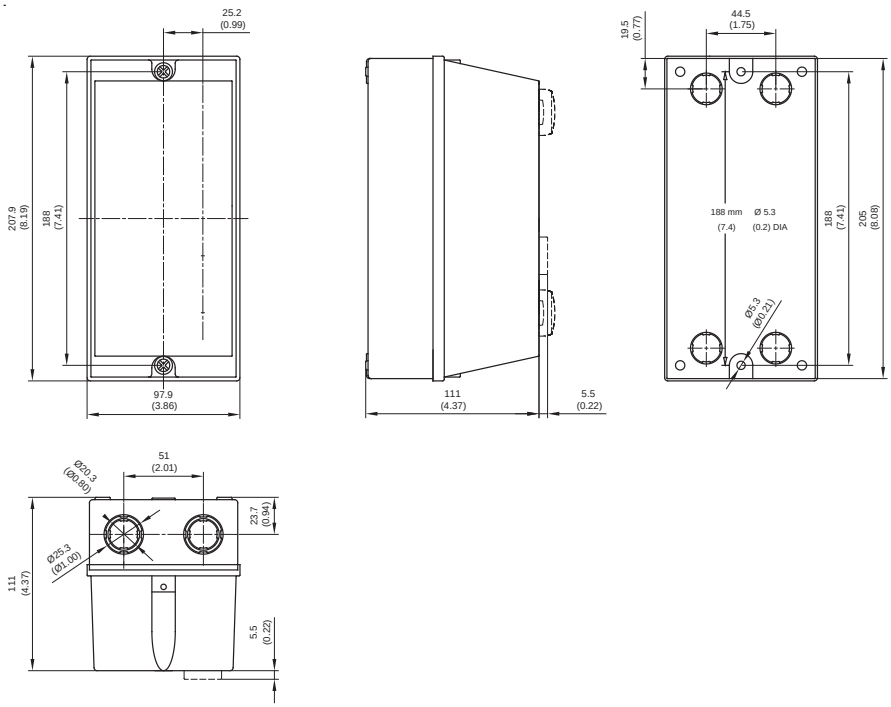
A=Available Option
NA=Not Available
∗ Transformer Type.
❄ When ordering in Canada, use suffix 6. Primary fusing is not required by the Canadian Electrical Code.

Accessories — Field Installed

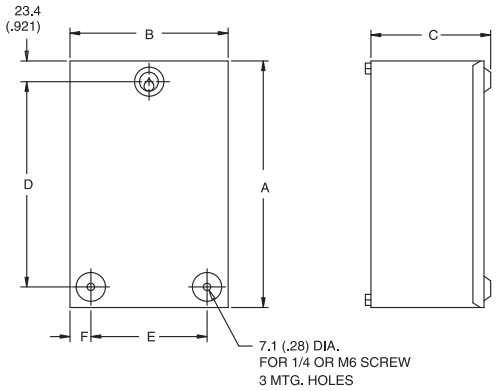
Approximate Dimensions

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

Bulletin 109 Plastic Lift-Off Enclosure



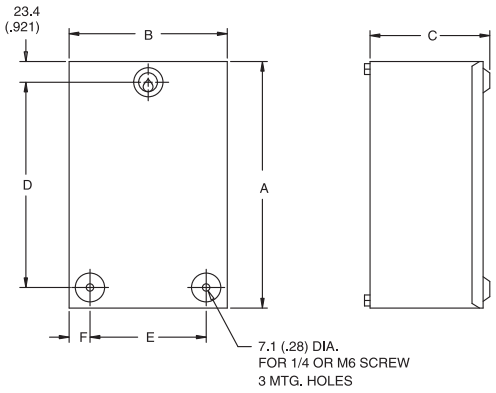
Bulletin 109 Metal Lift-Off Enclosures Type 1 (IP42)



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	220 (8-21/32)	140 (5-33/64)	152 (5-31/32)	175 (6-57/64)	95 (3-3/4)	22.5 (57/64)
C30…C43	290 (11-27/64)	188 (7-23/64)	152 (5-31/32)	245 (9-41/32)	140 (5-33/64)	24 (15/16)
C60…C72	305 (12)	178 (7)	203 (8)	270 (10-5/8)	140 (5-33/64)	24 (15/16)
C85	585 (23-1/32)	257 (10-7/64)	203 (8)	540 (21-17/64)	210 (8-17/64)	23.5 (59/64)
IP42 (Type 1) General Purpose Metal Lift-Off Enclosure for Bulletin 109 (With Transformer)						
C09…C23	305 (12)	178 (7)	203 (8)	245 (9-41/64)	140 (5-33/64)	24 (15/16)
C30…C43	290 (11-27/64)	270 (10-5/8)	152 (5-31/32)	245 (9-41/64)	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	585 (23-1/32)	257 (10-7/64)	203 (8)	540 (21-17/64)	210 (8-17/64)	23.5 (59/64)

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

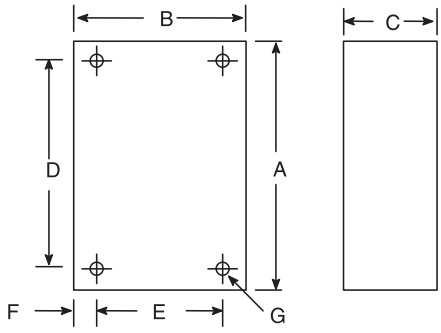
Bulletins 105 and 120E Metal Lift-Off Enclosures Type 1 (IP42)



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)



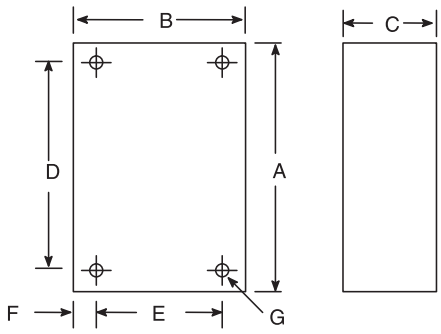
Contactor Size	A Height	B Width	C Depth	D	E	F	G (dia)
IP42 (Type 1) General Purpose Metal Hinged Enclosure for Bulletin 106 (With and Without Transformer)							
C30…C43	350 (13-25/32)	400 (15-3/4)	210 (8-9/32)	315 (12-13/32)	178 (7)	111 (4-3/8)	5.5 (7/32)
C60…C72	610 (24)	406 (16)	230 (9-1/06)	572 (22-1/2)	368 (14-1/2)	19 (3/4)	11 (7/16)
IP42 (Type 1) General Purpose Metal Hinged Enclosure for Bulletin 112 (With and Without Transformer)							
C09…C23	350 (13-25/32)	200 (7-7/8)	210 (8-9/32)	315 (12-13/32)	76 (3)	64 (2-1/2)	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 (9-1/06)	572 (22-1/2)	368 (14-1/2)	19 (3/4)	11 (7/16)
IP42 (Type 1) General Purpose Metal Hinged Enclosure for Bulletin 113 (With and Without Transformer)							
C30…C72	610 (24)	406 (16)	230 (9-1/06)	572 (22-1/2)	368 (14-1/2)	19 (3/4)	11 (7/16)

Accessories — Field Installed

Approximate Dimensions, Continued

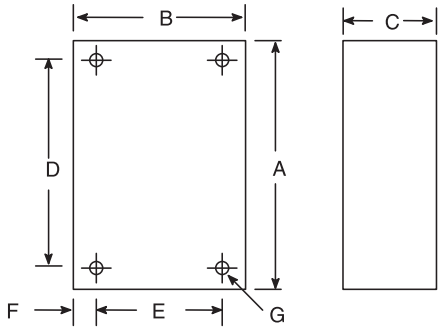
Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

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)

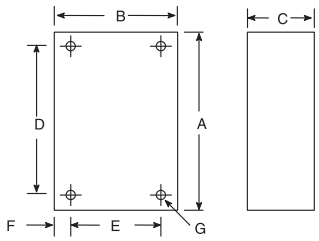
Bulletins 105 and 120E Metal Hinged Enclosures Type 3/4/12 (IP66)



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 (9-1/06)	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 (9-1/06)	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)

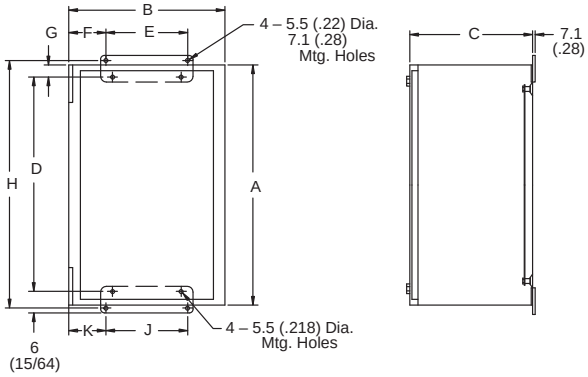
Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Bulletins 106, 112 and 113 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 106 (With and Without Transformer)							
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 (9-1/06)	572 (22-1/2)	368 (14-1/2)	19 (3/4)	11 (7/16)
IP42 (Type 1) General Purpose Metal Hinged Enclosure for Bulletin 112 (With and Without Transformer)							
C09…C23	350 (13-25/32)	200 (7-7/8)	210 (8-9/32)	315 (12-13/32)	76 (3)	64 (2-1/2)	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 (9-1/06)	572 (22-1/2)	368 (14-1/2)	19 (3/4)	11 (7/16)
IP42 (Type 1) General Purpose Metal Hinged Enclosure for Bulletin 113 (With and Without Transformer)							
C30…C72	610 (24)	406 (16)	230 (9-1/06)	572 (22-1/2)	368 (14-1/2)	19 (3/4)	11 (7/16)

Bulletins 132 and 133 Metal Hinged Enclosures with Extra Space Type 3R (IP32)



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

IP42 (Type 1) — General Purpose Molded Plastic Lift-off Enclosure

Bulletin No.						Enclosure Cat. No.	Mounting Plate Cat. No.
105	106	109	112	113	120E		
—	—	C09…C23	—	—	—	**198E-AAC845**	—

IP66 (Type 4, 4X, 12) — Raintight, Dusttight, Corrosion-Resistant Molded Plastic Enclosure

Bulletin No.						Enclosure Cat. No.	Mounting Plate Cat. No.
105	106	109	112	113	120E		
—	—	C09…C23	—	—	—	**198E-AKC845**	—

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 4, 4X, 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§	—	C30…C43§	—	—	C09…C23§	198E-DF12126	198E-P1212
C09…C23‡					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

			
	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, CSA ratings "suitable as at-motor disconnect"	• UL, CSA ratings "suitable as at-motor disconnect"	• UL 98 ratings "suitable as service entrance disconnecting means" • UL 508, CSA ratings "suitable as at-motor disconnect"
Functionality	• 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)	• 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.	• 3- or 4-pole fusible or non-fusible disconenct 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	• Handle colors in grey/black and red/yellow and padlockable versions • Legend plates available in 0-I international markings and text styles	• 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	• 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	• Open switch (large frame Bul. 194E — open style only) • Enclosed: IP66 thermoplastic enclosure or UL/CSA rated enclosure	• Open switch	• 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]	• 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)	• 1 million	• 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	• Switch bodies: IP2	• Switch bodies: IP2	• Switch bodies: IP2 • Fuse carriers: IP30
Optional Accessories	• IP66 handles • Multi-length shafts and shaft extension kits • Terminal covers	• IP66 handles • Multi-length shafts and shaft extension kits • Terminal covers	• IP66 handles • Multi-length shafts • Auxiliary contacts • Terminal covers • NFPA 79 internal handle
Standards/Certifications	• UL 508 • CSA C22.2, No. 14 • IEC 60947-3 Low Voltage Switchgear and Controlgear part 3 • CE	• UL 508 • CSA C22.2, No. 14 • IEC 60947-3 Low Voltage Switchgear and Controlgear part 3 • CE	• UL 98, UL 508 • CSA C22.2, No. 14 • IEC 60947-3 Low Voltage Switchgear and Controlgear part 3 • CE
Product Selection	**Page 2-357**	**Page 2-387**	**Page 2-407**

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)

Table of Contents

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

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 2-358)

3-Pole Base Mount

3-Pole Front Mount

6-Pole Base Mount

6-Pole Front Mount

194E – A 32 –1753
a b c

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 2-358)

Function Switching Angle	Contact Target Configuration X = Contact Closed O = Contact Open			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)	
		Handle Position					Base-Mounted	Front-Mounted
	No. of Circuits	OFF/0	ON/1				Cat. No.	Cat. No.
ON 1 / OFF 0 / 90°	1 2 3	O O O	X X X	16	7.5	7.5	**194E-A16-1753**	**194E-E16-1753**
				25	11	10	**194E-A25-1753**	**194E-E25-1753**
				32	15	15	**194E-A32-1753**	**194E-E32-1753**
				40	18.5	20	**194E-A40-1753**	**194E-E40-1753**
				63	22	25	**194E-A63-1753**	**194E-E63-1753**
				80	37	40	**194E-A80-1753**	**194E-E80-1753**
				100	45	50	**194E-A100-1753**	**194E-E100-1753**

Frequently Ordered* OFF-ON 6-Pole Switch (includes operating shaft) (Handles listed on page 2-358)

Function Switching Angle	Contact Target Configuration X = Contact Closed O = Contact Open			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)	
		Handle Position					Base-Mounted	Front-Mounted
	No. of Circuits	OFF/0	ON/1				Cat. No.	Cat. No.
ON 1 / OFF 0 / 90°	1 2 3 4 5 6	O O O O O O	X X X X X X	16	7.5	7.5	**194E-A16-1756**	**194E-E16-1756**
				25	11	10	**194E-A25-1756**	**194E-E25-1756**
				32	15	15	**194E-A32-1756**	**194E-E32-1756**
				40	18.5	20	**194E-A40-1756**	**194E-E40-1756**
				63	22	25	**194E-A63-1756**	**194E-E63-1756**
				80	37	40	**194E-A80-1756**	**194E-E80-1756**
				100	45	50	**194E-A100-1756**	**194E-E100-1756**

* See Catalog No. Explanation for more load size and change-over switch options.

2

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)*	 *Type S (IP66, UL Type 3/3R/12)*

Cat. No. 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 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

c

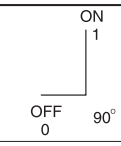
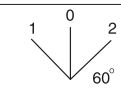
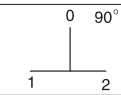
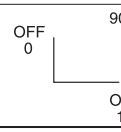
Code	Legend Plate Type	Color
A	Square	Grey/Black
I	Square	Red/Yellow
E	Square/Lockable	Grey/Black
L	Square/Lockable	Red/Yellow
G	Disc/Lockable (up to 3 locks)	Grey/Black
N	Disc/Lockable (up to 3 locks)	Red/Yellow
S	Large Square with extra legend area	Grey/Black

∗ 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- 16A Type G and N handles as Cat. No. 194**E**-HE4N-175 or 194**E**-HE4G-175

‡ Use Type G and N with ON-OFF function only (selection "d", code -175)

d

Code	Description	Legend Marking
175	O-I	
175I	OFF-ON	
350	1-0-2 (Reversing)	
375	0-1-2 (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 2-357)

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 mm x 48 mm (1-57/64 in. x 1-57/64 in.)	194E-16…63 A 194L-E12…40 A, -1753 194L-A12…40 A, -1753	0-1	**194L-HE4E-175**
					OFF-ON	**194L-HE4E-175I**
L		Red/Yellow	48 mm x 48 mm (1-57/64 in. x 1-57/64 in.)	194E-16…63 A 194L-E12…40 A, -1753 194L-A12…40 A, -1753	0-1	**194L-HE4L-175**
					OFF-ON	**194L-HE4L-175I**
G	IP66 (UL Type 3/3R/12)	Black/Grey	54 mm x 54 mm (2-1/8 in. x 2-1/8 in.)	194E-16 A	0-1 OFF-ON	**194E-HE4G-175**
			67 mm x 67 mm (2-41/64 in. 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 mm x 88 mm (3-15/32 in. x 3-15/32 in.)	194E-40…100 A	0-1 OFF-ON	**194L-HE8G-175**
N		Red/Yellow	54 mm x 54 mm (2-1/8 in. x 2-1/8 in.)	194E-16 A	0-1 OFF-ON	**194E-HE4N-175**
			67 mm x 67 mm (2-41/64 in. 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 mm x 88 mm (3-15/32 in. 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 mm x 48 mm (1-57/64 in. x 1-57/64 in.)	194L-E12…40 A, -1753	0-1	**194L-HC4L-175**
					OFF-ON	**194L-HC4L-175I**

Visit our website: www.ab.com/catalogs

Preferred availability cat. nos. are printed in **bold**

Bulletin 194E Open and Enclosed Switch Kits

Cat. No. Explanation

194E – Y 32 – 1753 – 6N

a b c d

a

Code	Installation Type
A	Base/DIN Mounting, open type switch
E	Front/Door Mounting, open type switch
Y	Enclosed Base Mounting Switch With Handle (Uses IP66 ABS thermoplastic enclosure)

b

Code	Load Size
16	16 A∗
25	25 A
32	32 A
40	40 A
63	63 A
80	80 A
100	100 A

c

Code	Configuration
1753	3-Pole OFF/ON (90°)
1756	6-Pole OFF/ON (90°)

d

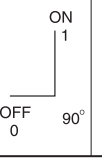
Code	Handle Style
4N	194E-HE4N-175 (use with 16 A Switch)
4G	194E-HE4G-175 (use with 16 A Switch)
4A	194L-HE4A-175 (use with 16…100 A Switch)
6N	194L-HE6N-175 (use with 25…100 A Switch)
6G	194L-HE6G-175 (use with 25…100 A Switch)
6A	194L-HE6A-175 (use with 25…100 A Switch)

∗ 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)

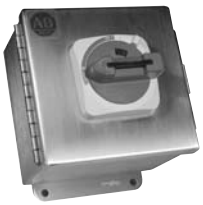
	Function Switching Angle	No. of Circuits	Contact Target OFF/0	Contact Target ON/1	Handle Color	Legend Plate Marking	Lockable (One Padlock)	Rated Current [A]	AC23A Rated Power [kW] at 690V AC	Hp @ 480V AC 60 Hz, 3 Ø	Cat. No.
		1 2 3	O O O	X X X	Red/Yellow	0-1	Yes	25	11	—	**194E-A25-1753-R**
					Black/Grey	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.
 *Uses Base-Mounted Switches*	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**

2

Bulletin 194E Enclosed Disconnect Load Switches with 194R Handles (with Defeater, suitable for 3 padlocks)

194E-FA Painted Steel Enclosure UL Type 3/4/12, IP66	194E-CA Stainless Steel Enclosure UL Type 4/4X, IP66	194E-KA Non-Metallic Enclosure UL Type 3/4/4X, IP66	194E-AA Metallic Enclosure UL Type 1, IP54	194E-GA Painted Steel Enclosure UL Type 3/4/12, IP66	194E-DA Stainless Steel Enclosure UL Type 4/4X, IP66
					

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 6-73. 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-FA40**EX.
‡ GA and DA type enclosures: use with 3-pole 16…32 A switches only.
§ Special order; allow for longer delivery time.

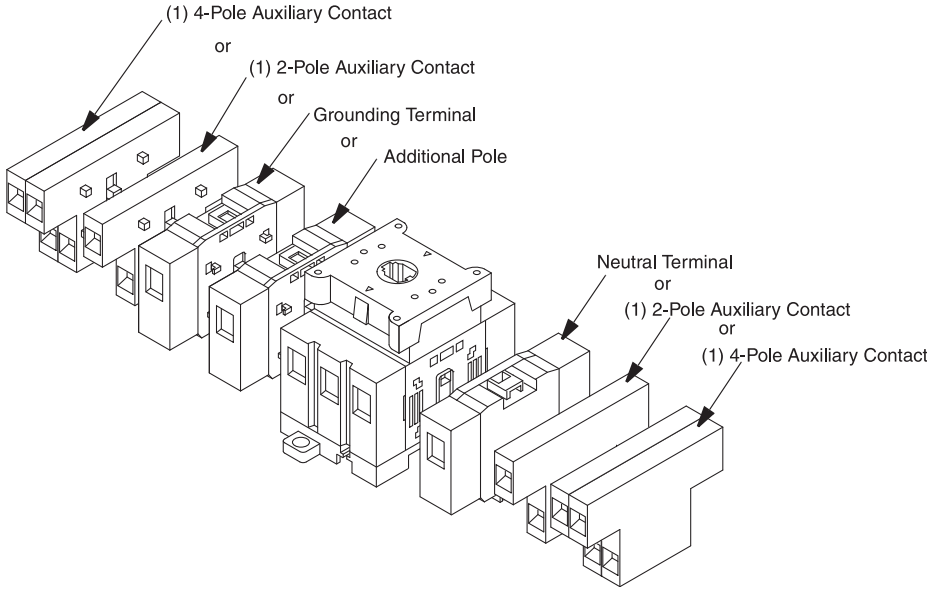
Frequently Ordered Bulletin 194E Enclosed Switches with Bulletin 194R Handle

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
	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
	25	C1	Black	194E-KA20
			Red/Yellow	194E-KA20E

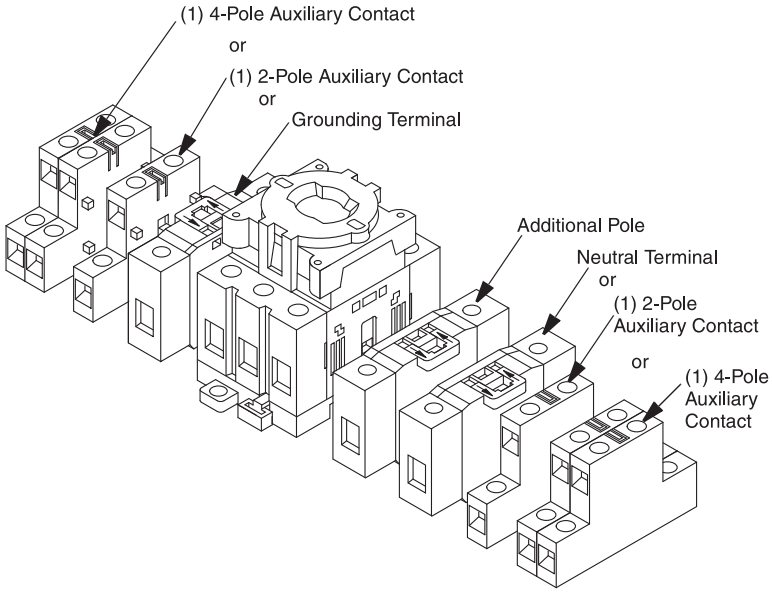
∗ Modifications: Up to two suffix codes may be added to an enclosed disconnect load switch. See Guidelines, page 2-361. If only one accessory is chosen, it is mounted on the left side of the switch.

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 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 permissable.
- For the 194E 80 and 100 A switches, any combination of auxiliary contacts, 4th pole, ground terminal, neutral terminal, and -PD10 is permissable.

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**

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**

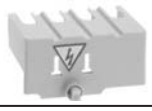
* A maximum of two side-mount accessories may be added to a 194E switch (one on each side).

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**

ABS Thermoplastic Enclosure — IP66, For High-Impact Applications (grounding screw included)	No. of Poles	For Use With	Cat. No.
	3…4	194EA-25/32	**194L-G3572**
	3…4	194EA-40/63	**194E-G3663**
	6	194EA-25/32	
	6	194EA-40/63	**194E-G3665**
	3…4	194EA-80/100	

Noryl Thermoplastic Enclosures — IP66, For Corrosion-Prone Applications (grounding screw included)	No. of Poles	For Use With	Cat. No.
	3…4	194EA-25/32	**194L-G3576**
	6	194EA-25/32	**194E-G3664**
	3…4	194EA-40/63	
	6	194EA-40/63	**194E-G3666**
	3…4	194EA-80/100	

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**
		194E-80/100	**194E-80-C3**
	4	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).

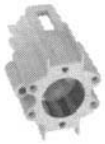
Operating Shafts

	Length	Construction	Pkg. Qty.	Cat. No.
 *Standard Shaft (for front-mount switches)*	34 mm (1-11/32 in.)	Plastic	5	**194L-G3380**
		Metal	5	**194E-G3688**
 *Interlock Shaft (for base-mount switches)*	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	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)
63	plastic shaft (Cat. No. 194L-G3380)	plastic shaft (Cat. No. 194L-G2830)	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)

Shaft Extension Kits

	Length	For Use With	Pkg. Qty.	Cat. No.
 *Shaft Extension*	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

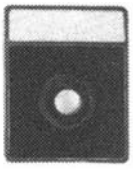
		For Use With	Pkg. Qty.	Cat. No.
	Metal shaft adaptor kits — for use with 194R Type 4/4X handles kit includes bezel adapter and 194R-R1 operating shaft. Operating handle (Cat. No. 194R-HS4) must be ordered separately.	194E-A…	1	**194E-G3675**
	Metal Shaft Extension For modification of Cat. No. 194L-G3393/ 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)

	Description		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		**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.
	Locking Ring Wrench For 22.5 mm Mounting Hole Style Handles (For use with front-mounted switches)	1	**800E-AW2**
	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**

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
 *Standard Black Control Knob*	 *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.)		**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 mm x 62 mm (1-57/64 in. x 2-7/16 in.)	10	**194L-G3196**
		Rectangular front frame with blank nameplate L = 64 mm x 78 mm (2-33/64 in. 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**
				HAUPSCHALTER	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 mm x 84 mm 11/16 in. 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			
	194L-A20(25)	1/2	194L-G3194			
(95 x 150 x 86 mm)	194L-A20(25)	3/4	Standard			
194L-G3573	194L-A12(16)	5/6	194L-G3195			
194L-G3577	194L-A12(16)	7/8	194L-G3194			
	194L-A12(16)	9/10	Standard	—	—	—
	194L-A20(25)	5/6	194L-G3194			
(95 x 150 x 111 mm)	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	
				X					X
(95 x 150 x 86 mm)								X	X
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

2

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	600
Rated isolation voltage (U_i): IEC/UL, CSA			[V]	690/600	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	8
Test voltage, (U_i) 1 minute			[kV]	2.5	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	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 **AC-21A** Switching of resistive loads with slight overload			[A]	16	25	32	40	63	80	100	10
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	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	15	3	3	
		440V	[A]	0.5	0.5	0.5	0.6	0.6	0.7	0.7	
DC-21A For resistive loads, T ≤ 1 ms, U_e max = 660V	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	
		600V	[A]	0.6	0.6	0.6	0.8	0.8	1	1	
	3 poles in series	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 For inductive loads, T ≤ 15 ms	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 2-356.
❄ Suitable also for SEV 500.

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	
Single-phase (2 poles)	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	
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			A4	A6	A7	A9	2xA2
rigid wire	1/2 conductor	AWG	(1)16…10/(2)16…12	(1)14…8/(2)14…10	(1)12…4/(2)12…8	(1)10…1/(2)10…4	18…14
		mm^2	(1)1…10/(2)1…4	(1)1.5…16/(2)1.5…6	(1)2.5…25/(2)2.5…16	(1)4…50/(2)4…25	0.75…2.5
fine strands	1/2 conductor	AWG	(1)16…8/(2)16…12	(1)14…8/(2)14…10	(1)12…4/(2)12…8	(1)10…1/(2)10…6	18…14
		mm^2	(1)1.5…6/(2)1.5…4	(1)1.5…10/(2)1…6	(1)2.5…16/(2)2.5…10	(1)4…35/(2)4…16	0.5…2.5

Environmental Data

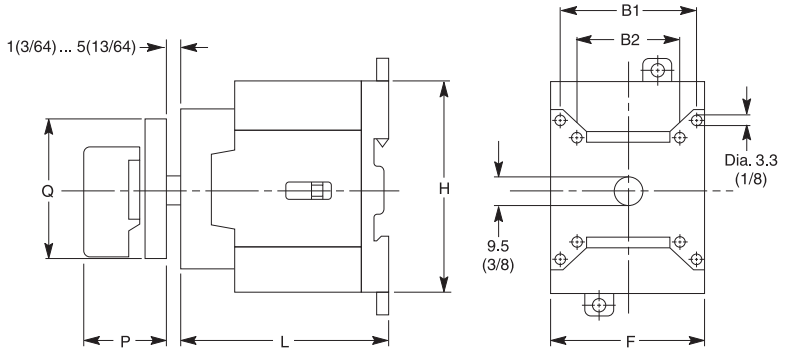
Storage	–40…+80 °C (–40…+176 °F)
Operation	–25…+60 °C (–13…+140 °F)

IEC Load Switches

Approximate Dimensions

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

Front Installation Cat. No. 194E-E...

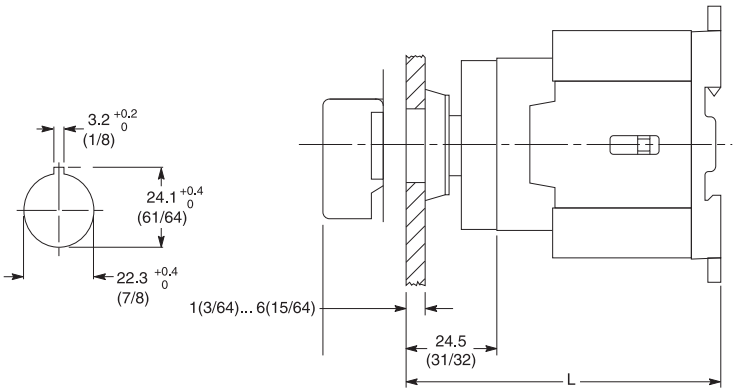


Handles		
Cat. No.	P	Q
194L-HE4A	28 (1-7/64)	48 x 48 (1-57/64 x 1-57/64)
194L-HE4I	28 (1-7/64)	48 x 48 (1-57/64 x 1-57/64)
194L-HE4S	28 (1-7/64)	48 x 62 (1-57/64 x 2-7/16)
194E-HE4N	34 (1-11/32)	54 x 54 (2-1/8 x 2-1/8)
194E-HE4G	34 (1-11/32)	54 x 54 (2-1/8 x 2-1/8)
194L-HE6A	28 (1-7/64)	64 x 64 (2-33/64 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)

Switch Body						
Use with Cat. No.	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.

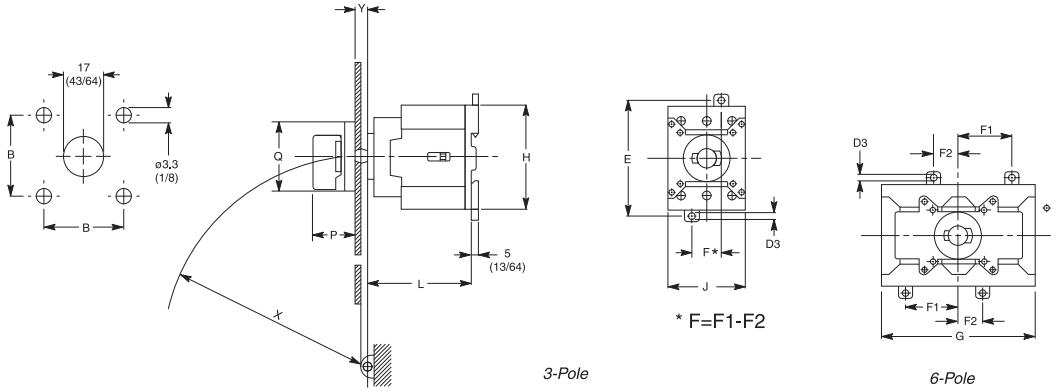
Cat. No. 194E-E Switch Body with Cat. No. 194L-HC4A Handle for 22.5 mm Hole Mounting Style



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)

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

Base Mounting Cat. No. 194E-A...



3-Pole *6-Pole*

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 ≥	Y max.	X ≥
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)

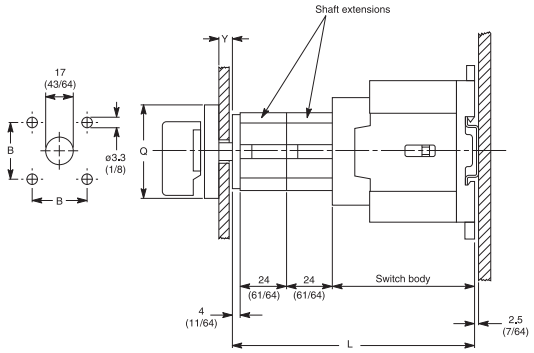
Switch Body

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.

Base Mounting Cat. No. 194E-A...

Cat. No. 194E-A... Switch Body with Cat. No. 194L-G2853 Shaft Extension



Switch Body				
	Cat. No.			
L ∗	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 6-pole switches, add 1 in. to the "L" dimension.

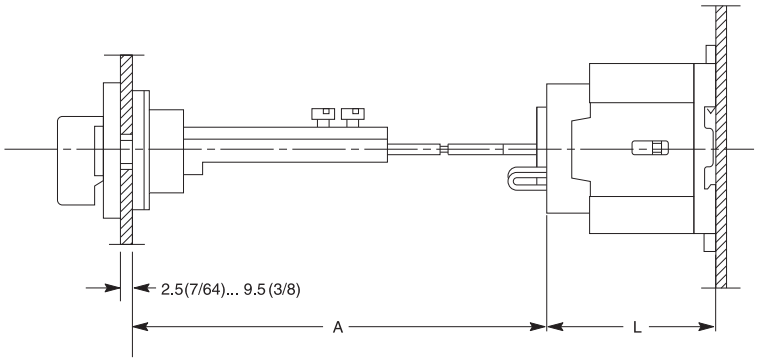
Shaft	Y
194L-G2830	2.5...9.5 (7/64...3/8)
194L-G3194	9...18 (23/64...23/32)
194L-G3195	14...23 (9/16)...(29/32)

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)

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



Cat. No.	A
194L-G3393	110...235 (4-11/32...9-1/4)
194L-G3394	230...350 (9-1/16...13-25/32)

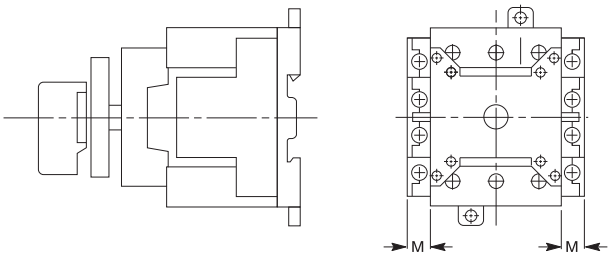
Cat. No.	L*
194E-A16	51 (2)
194E-A25/32	60 (2-3/8)
194E-A40/63	74 (2-59/64)
194E-A80/100	90 (3-35/64)

* For 6-pole switches, add 1 in. to the "L" dimension.

Base and Front Installation

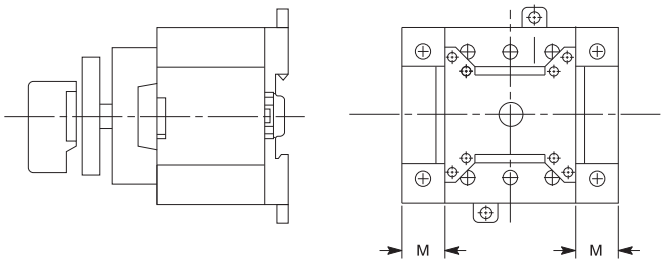
Cat. No. 194E... with Auxiliary Contact Block Installed

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

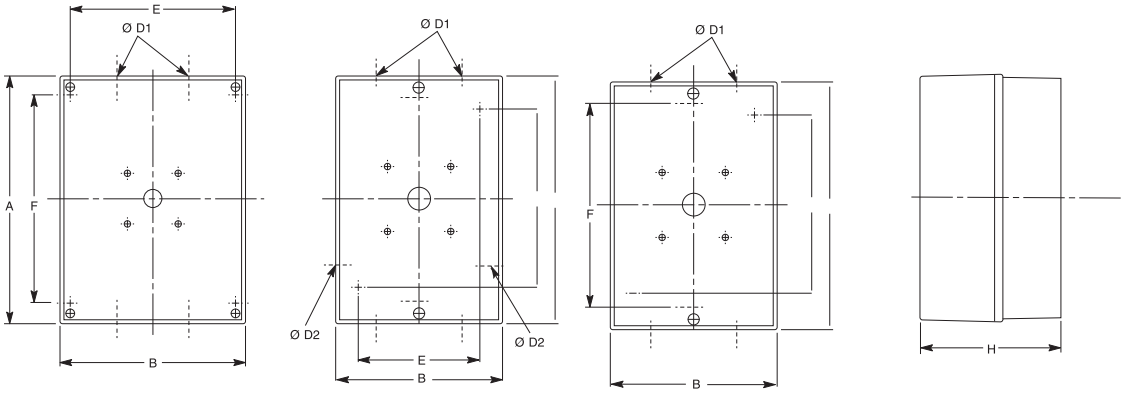
Cat. No.	M
194E-16	12.5 (31/64)
194E-25/32	14 (9/16)
194E-40/63	17.5 (11/16)
194E-80/100	22 (7/8)



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

Base Mounting Cat. No. 194E-A...

Thermoplastic Enclosures



Cat. No. 194L-3665 | Cat. No. 194L-3572 | Cat. No. 194L-3563 | Enclosure Base View

Complete Switches		Enclosures		Height A	Width B	Knockouts❄ ØD1		Mounting Holes‡ E	Mounting Holes‡ F	Depth H
Cat. No.	Poles	ABS Cat. No.	Noryl Cat. No.							
194E-Y16	3 and 4	∗	∗	118 (4-21/32)	66 (2-19/32)	M16/M20 16/20 mm	PG11/PG16 18.5/22.5 mm	50 (1-31/32)	105 (4-9/65)	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 (4-11/16)	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 (4-11/16)	120 (4-47/64)

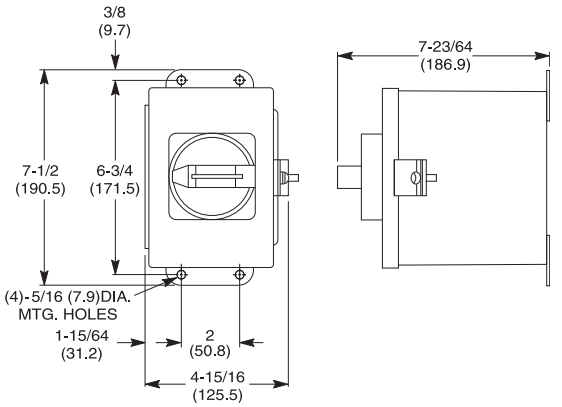
∗ Empty enclosures not available for purchase.
❄ Cat. No. 194E-A16 units have 1 knockout on each end. all others have 2 knockouts on each end. A letter "M" in the catalog number indicates metric knockouts; the unit is otherwise supplied with PG knockouts.
‡ All mounting holes have a 4.2 mm (5/32 in.) 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)

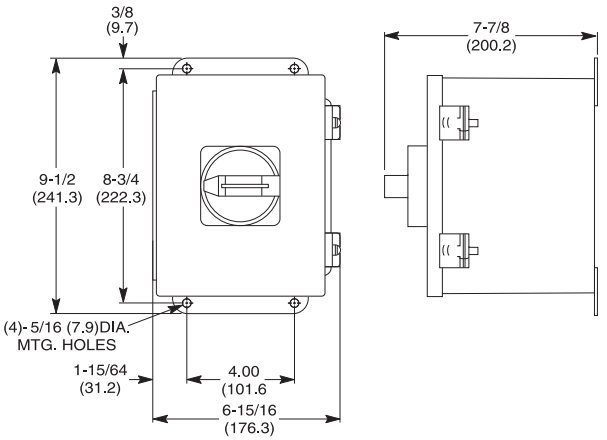
∗ When more than 4 modules are used, attach the first one to the switch body using the screws supplied with the extension (Cat. No. 194L-G2853).

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

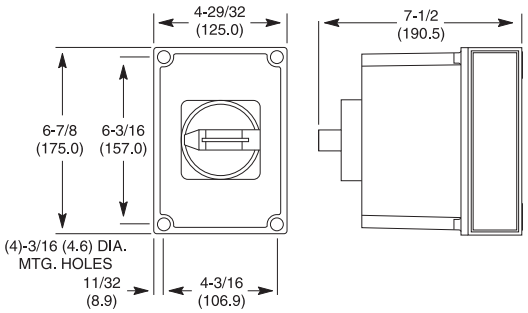
194E Enclosed Switches with 194R Handles



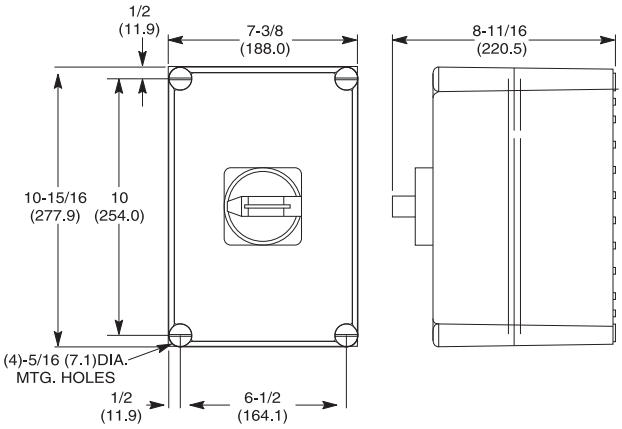
Cat. Nos. 194E-CA16...63, 194E-FA16...63, 194E-AA16...63



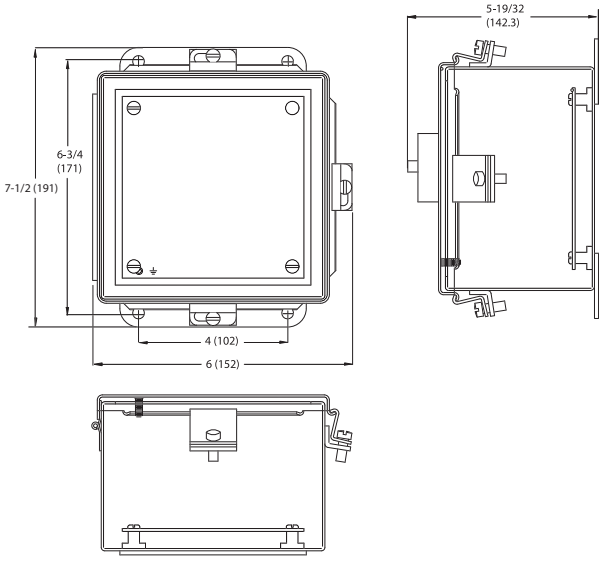
Cat. Nos. 194E-CA80...00, 194E-FA80...00, 194E-AA80...00
Cat. Nos. 194E-CA40X...63X, 194E-FA40X...63X, 194E-AA40X...63X



Cat. No. 194E-KA16...63



Cat. No. 194E-KA80...00



Cat. No. 194E-DA16...32, 194E-GA16...32

Bulletin 194E IEC Load Switches

- 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
- OFF-ON Configurations
- Box Lug and Bolt-on Terminals Available
- Switches Include Operating Shaft
- Suitable as Motor Disconnect

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.
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.

Table of Contents

Standards Compliance

IEC 207
IEC 60947-1
IEC 60947-3 Low-voltage switchgear and control gear part 3
UL 508
CSA C22.2, No. 14

Certifications

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

Bulletin 194E Switches — 125…315 A

OFF-ON Switch — with Box Lugs (UL Listed)		OFF-ON Switch — with Bolt-on Wiring (UR Recognized))	
 *3-pole Base Mounted*	 *3-pole Front Mounted*	 *3-pole Base Mounted*	 *3-pole Front Mounted*
 *4-pole Base Mounted*	 *4-pole Front Mounted*	 *4-pole Base Mounted*	 *4-pole Front Mounted*

Cat. No. 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	Circuit Diagram Ref. No.
1753	OFF-ON	3-Pole, 2-position (90 degrees)	1753
1754	OFF-ON	4-Pole, 2-position (90 degrees)	1754

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.

Visit our website: www.ab.com/catalogs
Preferred availability cat. nos. are printed in **bold**

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 mm x 88 mm 3-15/32 in. x 3-15/32 in.	194E-125…315 A		**194E-HE8A-175**
			130 mm x 130 mm 5-1/8 in. x 5-1/8 in.			**194E-HE13A-175**
 *Type I*		Red/Yellow	88 mm x 88 mm 3-15/32 in. x 3-15/32 in.			**194E-HE8I-175**
			130 mm x 130 mm 5-1/8 in. x 5-1/8 in.			**194E-HE13I-175**
 *Type G*		Black/Grey	90 mm x 90 mm 3-35/64 in. x 3-35/64 in.	194E-125…315 A		**194E-HE8G-175**
			135 mm x 135 mm 5-5/16 in. x 5-5/16 in.			**194E-HE13G-175**
 *Type N*		Red/Yellow	90 mm x 90 mm 3-35/64 in. x 3-35/64 in.			**194E-HE8N-175**
			135 mm x 135 mm 5-5/16 in. 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 mm x 84 mm 11/16 in. 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
	Red/Yellow			EMERGENCY OFF		194L-G3515H

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 / AC-21A	Non-inductive or slightly induc. load / 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
AC-23A (cos ϕ 0.45)		400V	[A]	750	850	1380	1650
		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-20A) 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≤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≤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≤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

* When provided with terminal covers.

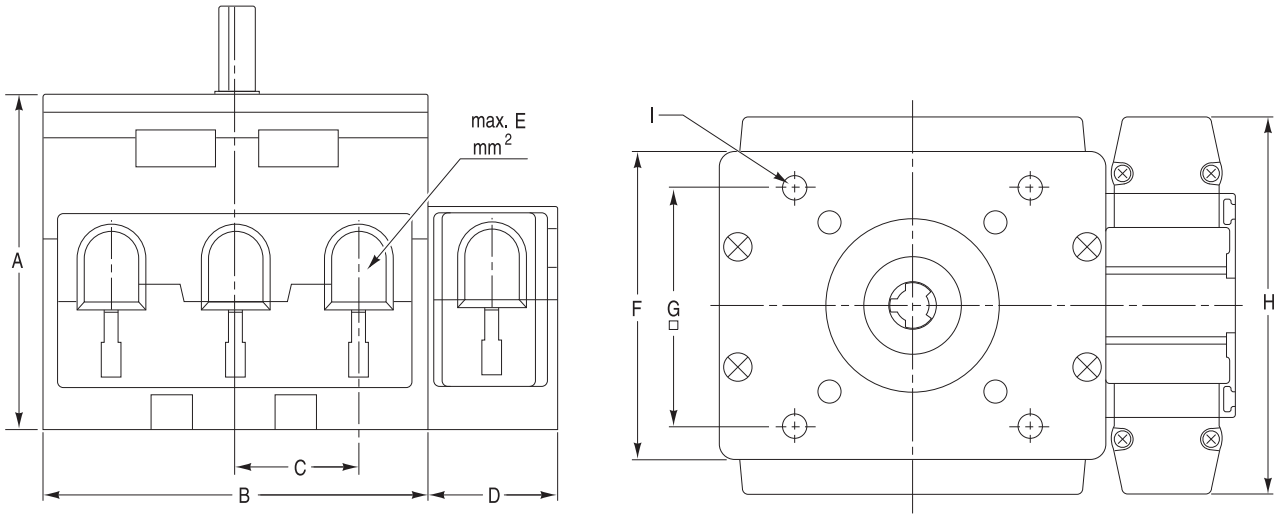
Certifications

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

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

Front-Installation Box Lugs, 3- and 4-Pole

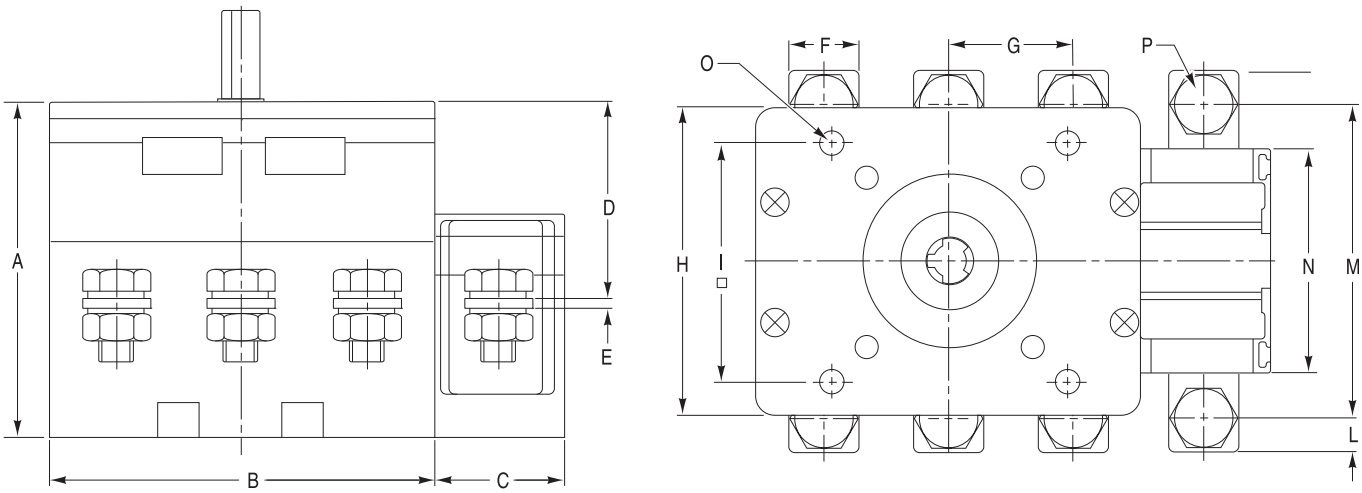


Switch Body 194E-E

[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.

Front-Installation Bolt-on Terminals, 3- and 4-Pole



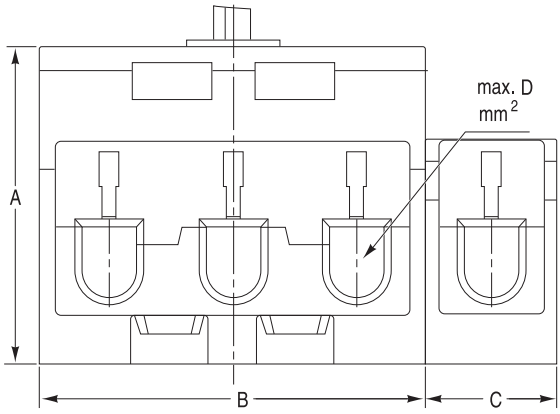
Switch Body 194E-F

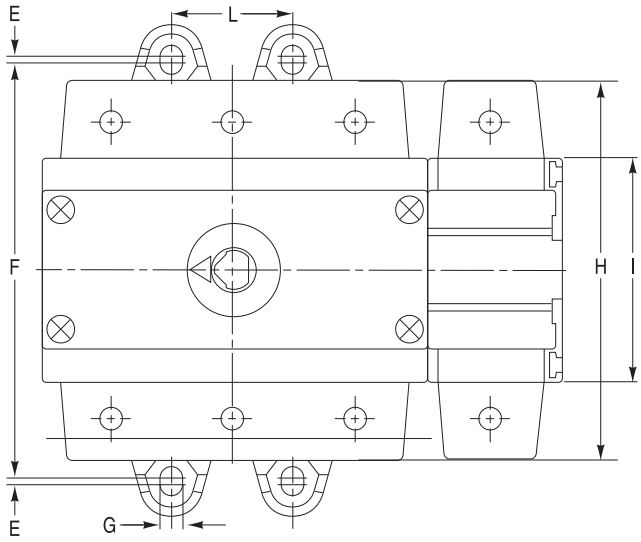
[A]	A	B	C	D	E	F	G	H	I	L	M	N	O∗	P❄
125	91 (3-19/32)	112 (4-3/32)	38 (1-1/2)	65.5 (2-9/16)	3 (1/8)	2 (3/32)	36 (1-13/32)	88 (3-7/16)	68 (2-11/16)	10 (13/32)	90 (3-17/32)	64 (2-17/32)	M5∗	M10❄
160	91 (3-19/32)	112 (4-3/32)	38 (1-1/2)	65.5 (2-9/16)	3 (1/8)	2 (3/32)	36 (1-13/32)	88 (3-7/16)	68 (2-11/16)	10 (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.

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

Base-Mounting Box Lugs, 3- and 4-Pole

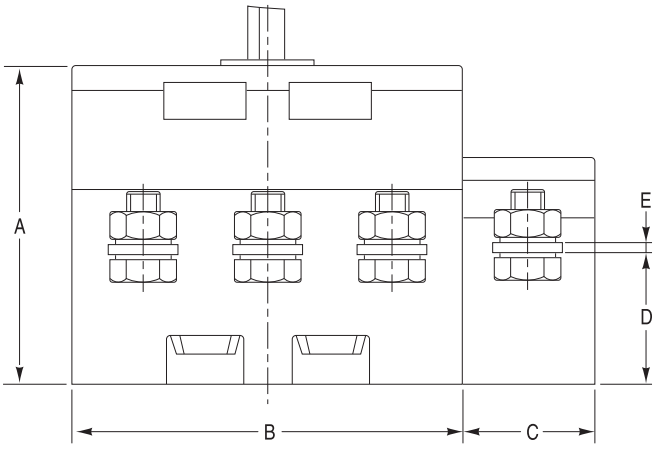


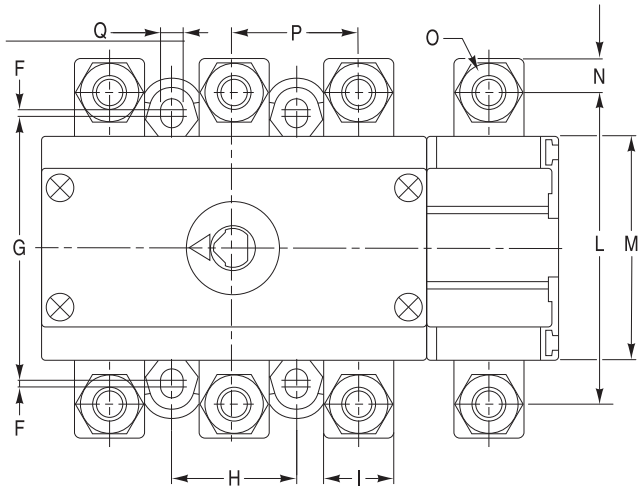


Switch Body 194E-A

[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)

Base-Mounting Bolt-on Terminals, 3- and 4-Pole



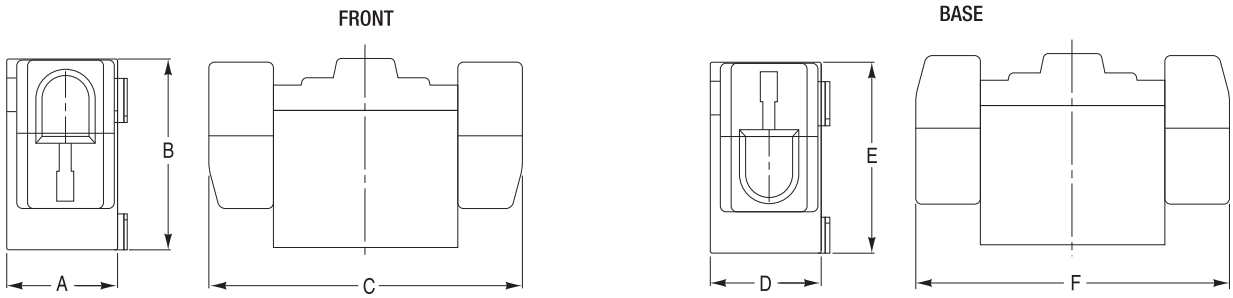


Switch Body 194E-B

[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)

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

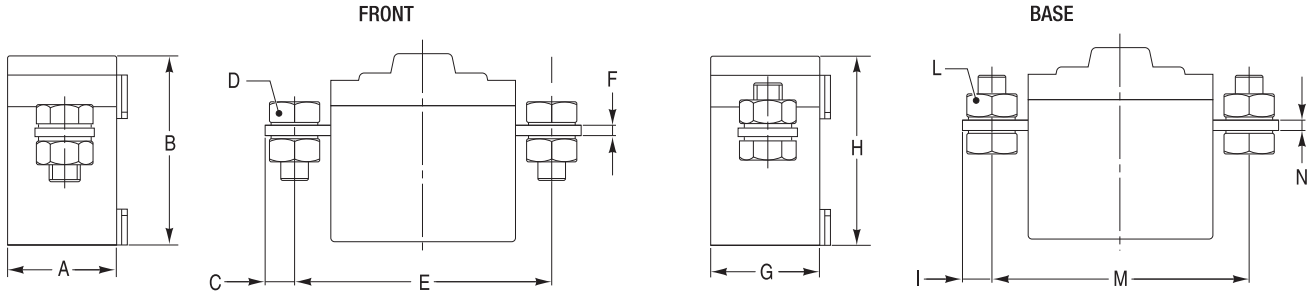
Box Ground and Neutral Terminal



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)

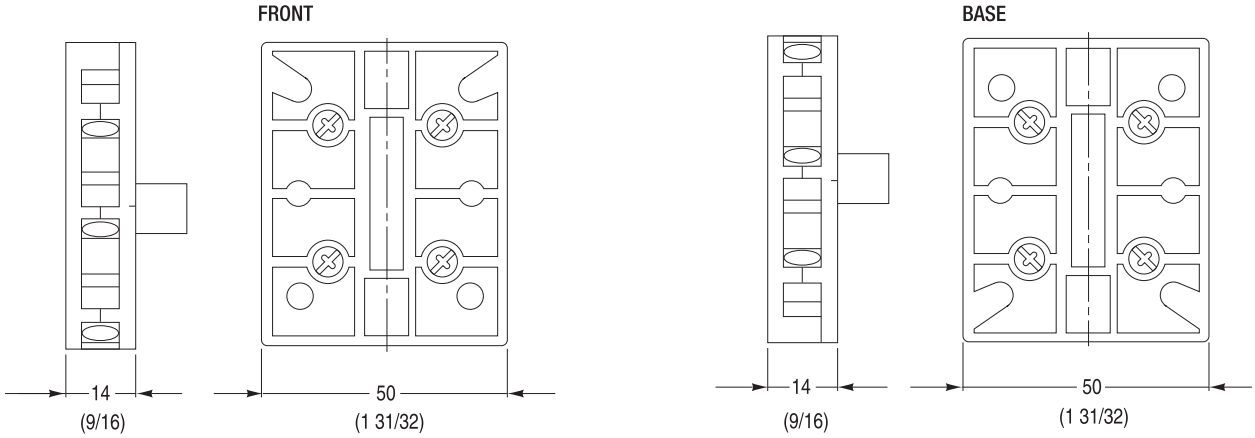
Bolt Ground and Neutral Terminal



Switch Body 194E-F

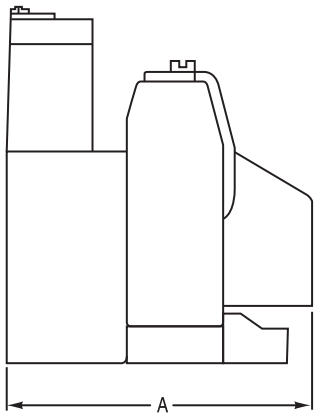
[A]	A	B	C	D	E	F	G	H	I	L	M	N
125	37.8 (1-1/2)	64 (2-17/32)	10 (13/32)	M10 (13/32)	90 (3-17/32)	3 (1/8)	37.8 (1-1/2)	64 (2-17/32)	10 (13/32)	M10 (13/32)	90 (3-17/32)	3 (1/8)
160	37.8 (1-1/2)	64 (2-17/32)	10 (13/32)	M10 (13/32)	90 (3-17/32)	3 (1/8)	37.8 (1-1/2)	64 (2-17/32)	10 (13/32)	M10 (13/32)	90 (3-17/32)	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

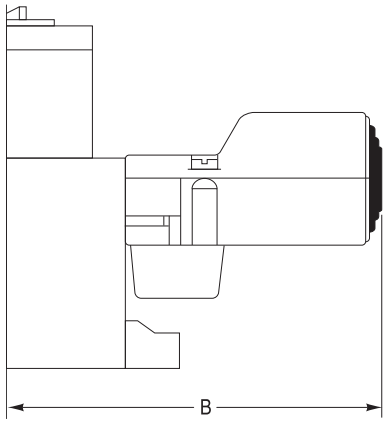


Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Terminal Cover

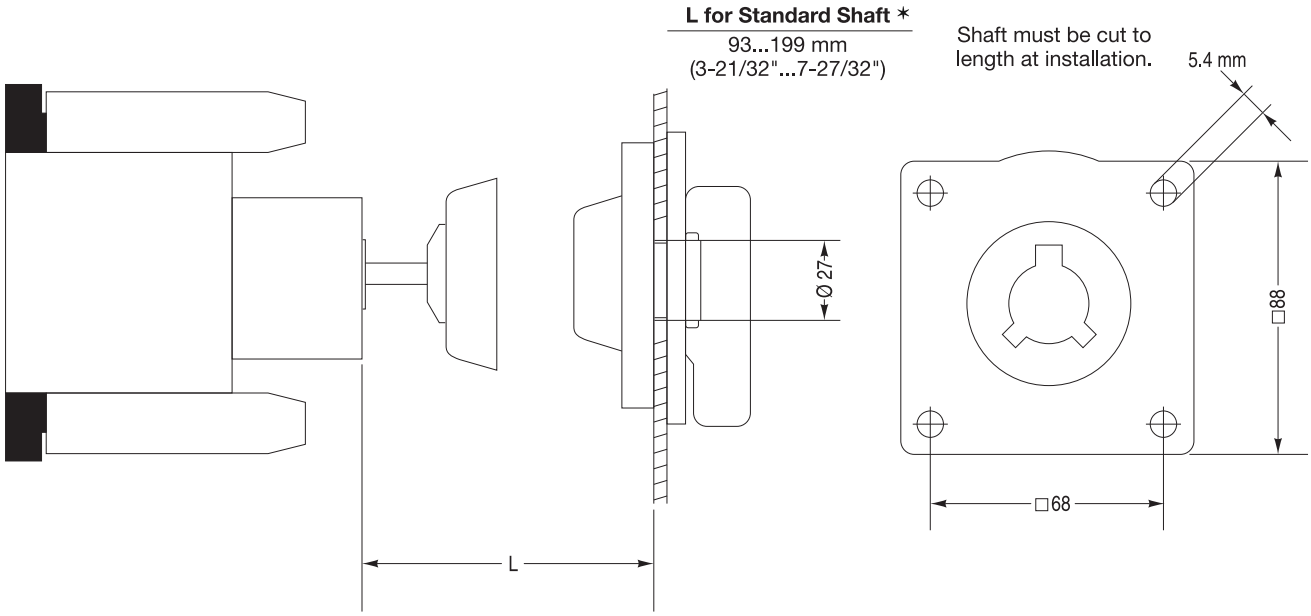


Switch Body 194E-F



[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)

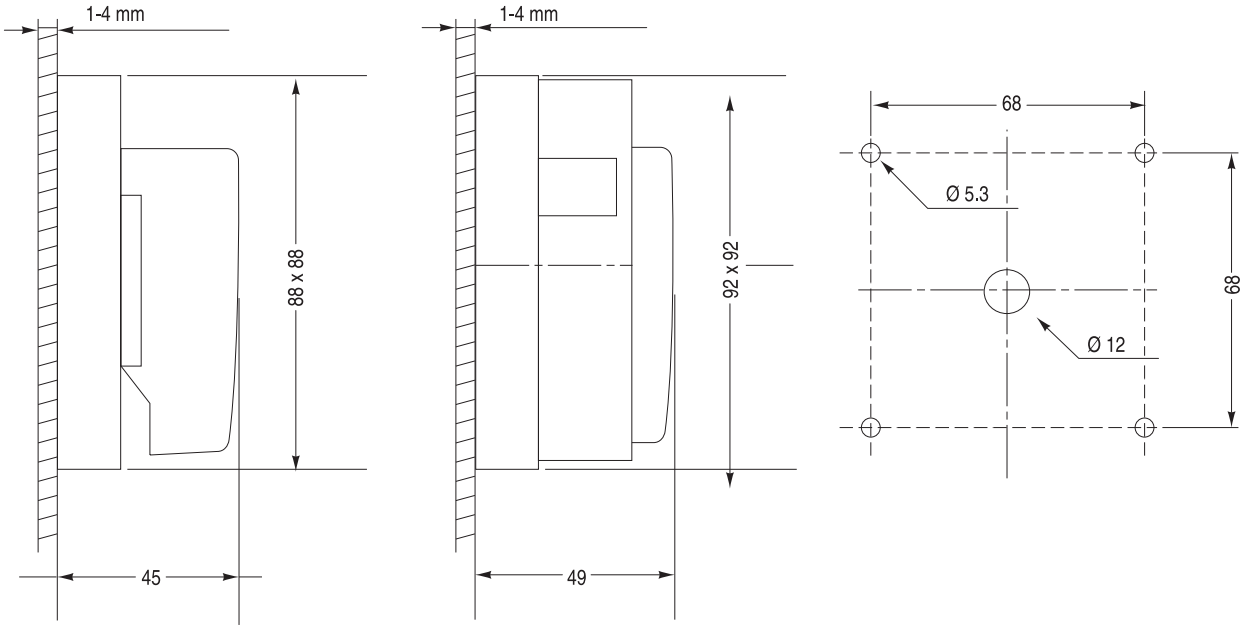
Door Clutches



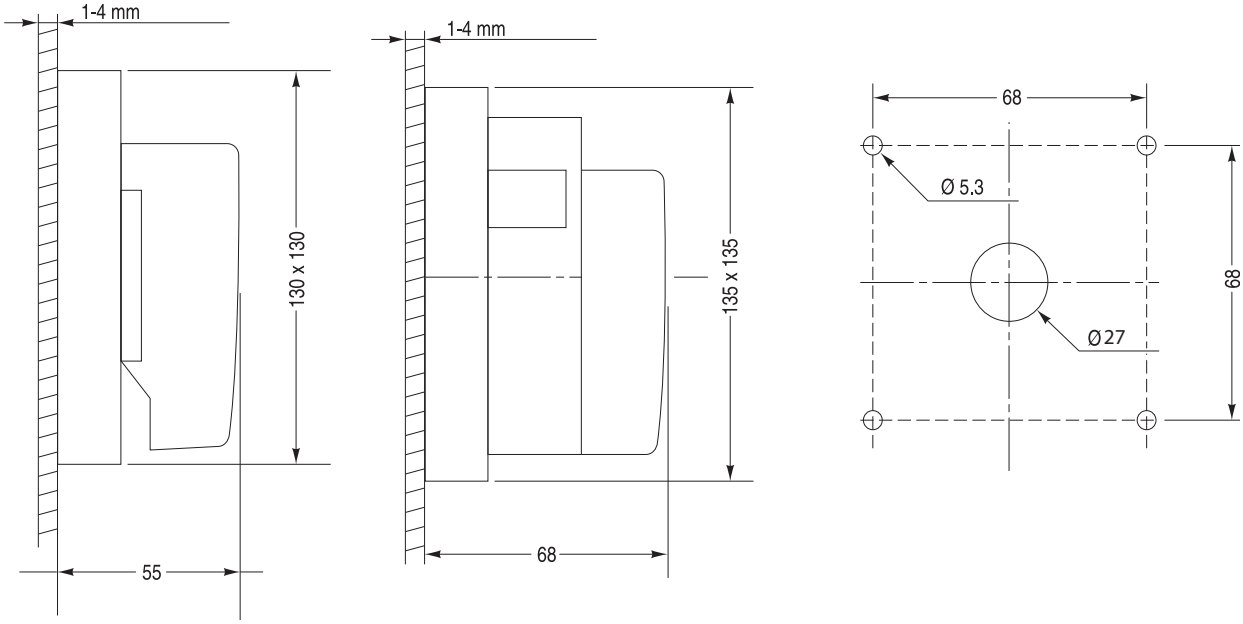
* Use Cat. No. 194E-AB40 shaft extension accessory to extend beyond the standard shaft length.

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

Handles (Type 194E-HE-8A-8I-8G-8N)



Handles (Type 194E-HE-13A-13I-13G-13N)

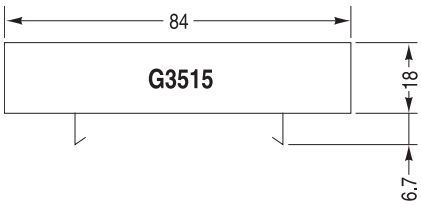


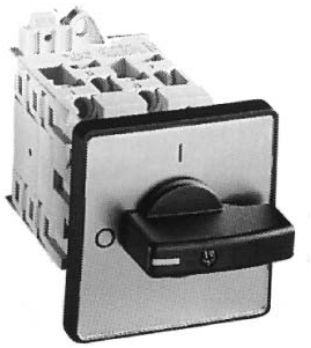
Type A and I

Type G and N

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

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 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.

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.

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.

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

2

Cat. No. 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

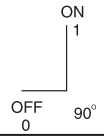
Code	Function	Configuration	Use with Switch Style∗❄:	Circuit Diagram Ref. No.
150	On/Off	2-Position (60 degrees)	194L-E, 12…40 A, 1…6 poles	1501…1506
175		2-Position (90 degrees)	194L-E or 194L-A, 12…40 A, 1…6 poles	1751…1756
178		2-Position (90 degrees-inverted)	194L-E or 194L-A, 12…40 A, 1…4 poles	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)		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)		4281
450		1-2-3 (60 degrees)	194L-E, 12…40 A, 1…3 poles	4501…4503
451		1-2-3-4 (60 degrees)		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)		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)		5011…5013
525		0-1-2 (45 degrees)		5251…5253
526		0-1-2-3 (45 degrees)	194L-E or 194L-A, 12…40 A, 1 pole 194L-E, 12…40 A, 2…3 poles	5261…5263
527		0-1-2-3-4 (45 degrees)		5271…5273
528		0-1-2-3-4-5 (45 degrees)		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)		5511…5513
552		0-1-2-3-4 (60 degrees)		5521…5523
553		0-1-2-3-4-5 (60 degrees)		5531…5533
725	Star-Delta (Wye-Delta)	0-Y-Δ (45/90 degrees)	194L-E or 194L-A, 12…40 A, 3 poles	7253
732		0-Y-Δ (45/90 degrees)		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)		8271
875	Ammeter	0-1-2-3 (90 degrees)		8751
876		0-1-2-3-4 (90 degrees)		8761
877		0-1 (90 degrees inverted)		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 as standard. Some configurations are custom orders with longer delivery times.
❄ When choosing front mount style 194L-E for 32 A or 40 A, use the 194L-C code.

Frequently Ordered 194L Switches — Base/Front-Mounted Switches
(Switch Handles listed on page 2-389)

ON-OFF Switch Body (Includes Shaft) 	No. of Poles	Contact Target Configuration X = Contact Closed O = Contact Open: No. of Circuits	Control Knob Position: OFF/0 	Control Knob Position: ON/1 	Rated Current [A]	Mounting Type	Cat. No.
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**
						Front/Door	**194L-E12-1752**
					16	Front/Door	**194L-E16-1752**
					20	Base/DIN	**194L-A20-1752**
						Front/Door	**194L-E20-1752**
					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**
						Front/Door	**194L-E12-1753**
					16	Base/DIN	**194L-A16-1753**
						Front/Door	**194L-E16-1753**
					20	Base/DIN	**194L-A20-1753**
						Front/Door	**194L-E20-1753**
					25	Base/DIN	**194L-A25-1753**
						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	Contact Target Configuration X = Contact Closed O = Contact Open: No. of Circuits	Control Knob Position: 1 	Control Knob Position: 0 	Control Knob Position: 2 	Rated Current [A]	Mounting Type	Cat. No.
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**

Visit our website: www.ab.com/catalogs

Preferred availability cat. nos. are printed in **bold**

Allen-Bradley

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*	 *Type S*

Cat. No. 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.)	194L-A12…40 A 194L-E12…40 A
	G, N∗	67 mm x 67 mm (2-41/64 in. x 2-41/64 in.)	
	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

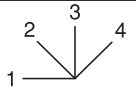
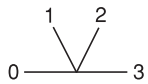
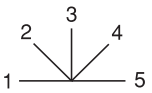
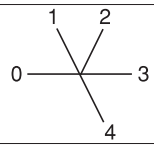
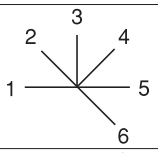
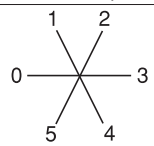
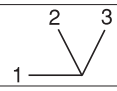
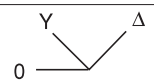
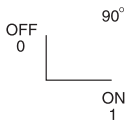
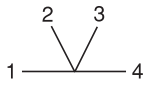
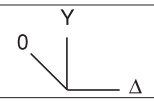
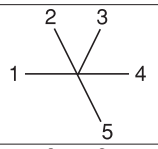
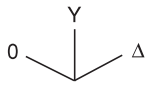
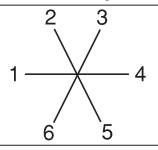
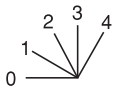
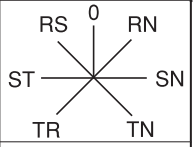
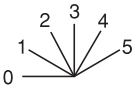
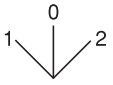
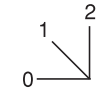
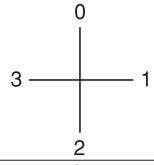
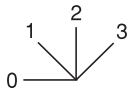
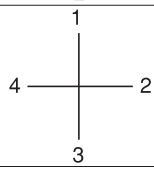
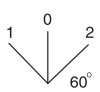
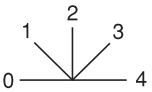
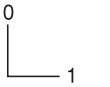
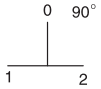
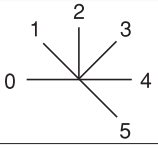
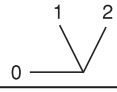
Code	Legend Plate Type	Color
A	Square	Grey/Black
I	Square	Red/Yellow
E	Square/Lockable	Grey/Black
L	Square/Lockable	Red/Yellow
G	Disc/Lockable (up to 3 locks)	Grey/Black
N	Disc/Lockable (up to 3 locks)	Red/Yellow
S	Large Square with extra legend area	Grey/Black

d

See Table on the next page.

2

d

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)				

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Frequently Ordered 194L Handles — Base/Front-Mounted Switch Handles (Switch Body listed on page 2-387)

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 mm x 48 mm (1-57/64 in. x 1-57/64 in.)	194E-16…63 A 194L-E12…40 A, -1753 194L-A12…40 A, -1753	0-1	**194L-HE4E-175**
					OFF-ON	**194L-HE4E-175I**
L		Red/Yellow	48 mm x 48 mm (1-57/64 in. x 1-57/64 in.)	194E-16…63 A 194L-E12…40 A, -1753 194L-A12…40 A, -1753	0-1	**194L-HE4L-175**
					OFF-ON	**194L-HE4L-175I**
G	IP66 (UL Type 3/3R/12)	Black/Grey	67 mm x 67 mm (2-41/64 in. 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**
N		Red/Yellow	67 mm x 67 mm (2-41/64 in. 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**
L	IP66 (UL Type 3/3R/12)	Red/Yellow	48 mm x 48 mm (1-57/64 in. x 1-57/64 in.)	194L-E12…40 A, -1753	0-1	**194L-HC4L-175**
					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**

2

Custom Motor-Rated Cam Switches

Switch Specifications for Special Versions of Bulletin 194L Switches

Bulletin 194L switches are offered in 12, 16, 20, or 25 A load sizes. Switches may be configured for up to 16 inductive load 32 and 40 A rated circuits. Handle operation may be specified for up to 12 positions, with 30, 60, 45 or 90 degrees of positional rotation. Maintained and some spring return functions may be specified. Custom legend markings are also available.

Key Features

- Motor rated/HP rated to switch inductive loads
- Same appearance as standard 194L devices
- Suitable as Motor Disconnect
- Suitable for Across-the-Line motor starting applications
- Gold flashed contacts for Auxiliary load switching
- UL Listed, CSA Certified, CE compliant
- Lockout/Tagout compliant (when using lockable handles)
- Mounts to many competitive panel drilling patterns

Instructions to receive your price and availability quotation

- Complete the following layout form.
- Fill in distributor name, date, telephone/fax, quantity required and end user name. To locate your nearest Allen-Bradley distributor, go to www.ab.com.
- Select all the following options:
  Switch load size and mounting style
  Target table, # positions, spring returned/maintained operation
  Handle type
  Special wiring & terminal markings (optional)
- In the U.S. and Canada, send the completed Custom Switch form to your local Allen-Bradley distributor

If you are outside the US or Canada, or if you have technical questions about filling out this form, please call our Technical Response Center at 440-646-5800 and select the "Allen-Bradley Industrial Controls" option.

Special Switches

Switching specification for special versions of 194-L switches (sample for copy)

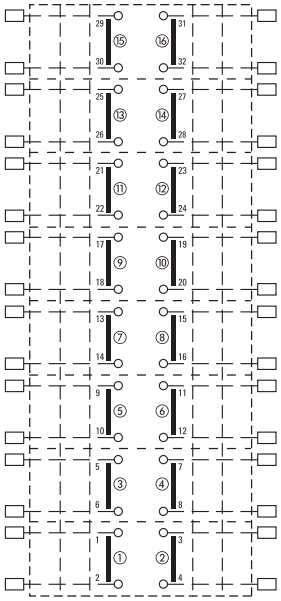
Distributor	Location	Date
Quantity	Phone No.	Fax No.
End User Name		

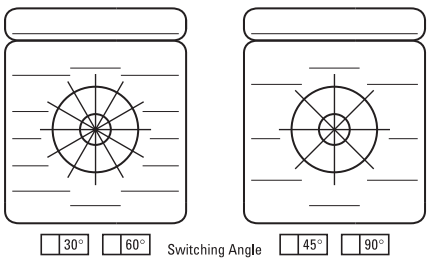
Switch Load Size & Mounting (choose 1)

194L-A12	194L-A16	194L-A20	194L-A25	**Base Mount Switching (8 Circuit Max.)**
194L-E12	194L-E16	194L-E20	194L-E25	**Door Mount Switching (16 Circuit Max.)**

Switch Level	Circuit No.	Terminal Markings	Target Table											
8	16	31-32												
	15	29-30												
7	14	27-28												
	13	25-26												
6	12	23-24												
	11	21-22												
5	10	19-20												
	9	17-18												
4	8	15-16												
	7	13-14												
3	6	11-12												
	5	9-10												
2	4	7-8												
	3	5-6												
1	2	3-4												
	1	1-2												
Position #/ Function **X** Contact Closed Spring Return **X-X** Contact Closed in several positions														

Special Wiring or Terminal Markings

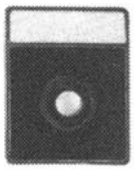
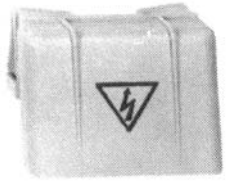




Handle and Legend Selection

Handle Type: 194L-H__ __ __ (See page 2-389 for handle styles.)
Quantity: _____
Note: _____

Accessories

	Description	Pkg. Qty.	Cat. No.
  ***Standard Black Control Knob*** ***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 mm x 62 mm (1-57/64 in. x 2-7/16 in.)	10	**194L-G3196**
	Rectangular front frame with blank nameplate L = 64 mm x 78 mm (2-33/64 in. x 3-5/64 in.)	10	**194L-G3197**
 ***Control Knob, With Locking Facility***	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**
	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**
	Locking Ring Wrench For 22.5 mm Mounting Hole Style Handles (For use with front-mounted switches)	1	**800E-AW2**
	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**

IEC Control and Load Switches

Accessories, Continued

	Use With Switch	Number of Contacts❄	ABS Cat. No.	Required Shaft Cat. No.	Noryl Material Cat. No.	Required Shaft Cat. No.
 *Use With Size 6 Handles*	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**

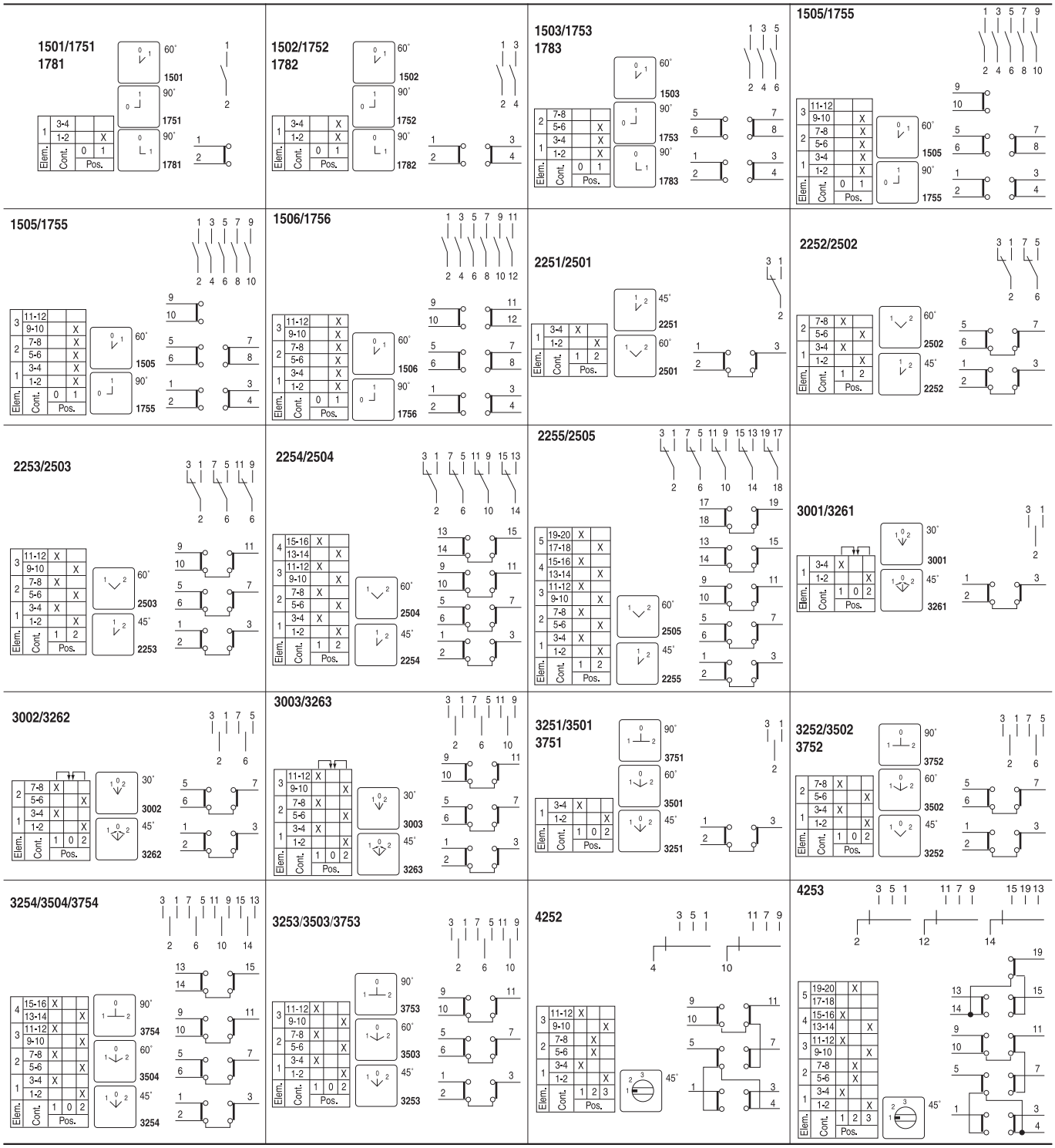
✶ Covers must be drilled for operating handle by user. Does not include earth/ground — neutral terminal.
❄ Refer to the switching diagrams that follow to determine the number of switch contacts.

	Description	Pkg. Qty.	Cat. No.
	Metal Shaft Extension with Padlock Provision ON Switch in OFF Position L = 110 mm…235 mm (4-21/64 in.…9-1/4 in.)	1	**194L-G3393**
	Metal Shaft Extension with Padlock Provision ON Switch in OFF Position L = 230 mm…350 mm (9-3/64 in.…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.

Contact target tables: X = Contact Closed
[Blank] = Contact Open

Circuit Diagram Nos. 1501…4253

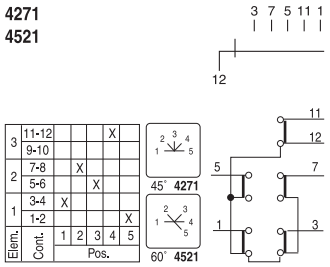


IEC Control and Load Switches

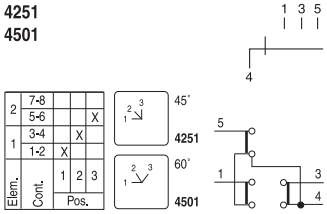
Switching Diagrams, Continued

Circuit Diagram Nos. 4271…5531

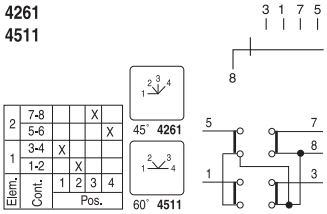
4271
4521



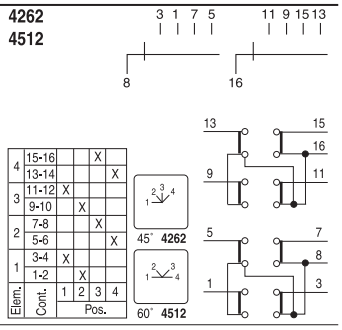
4251
4501



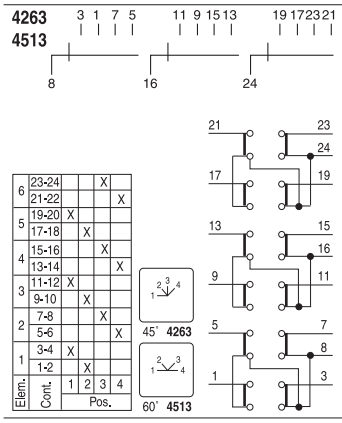
4261
4511



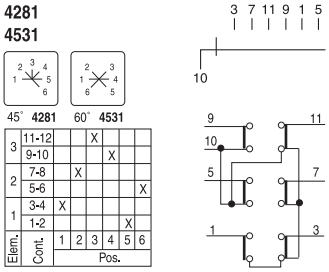
4262
4512



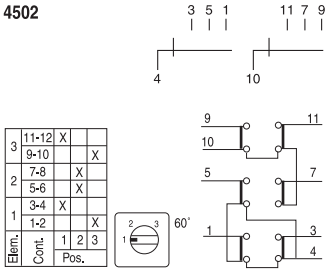
4263
4513



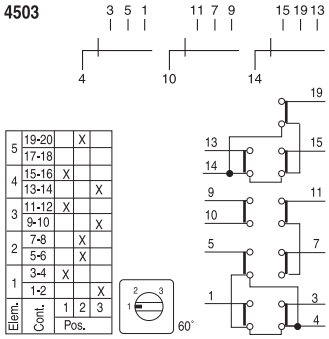
4281
4531



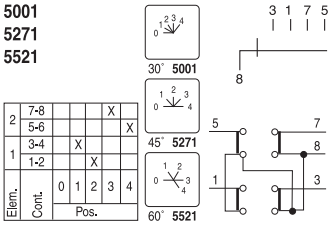
4502



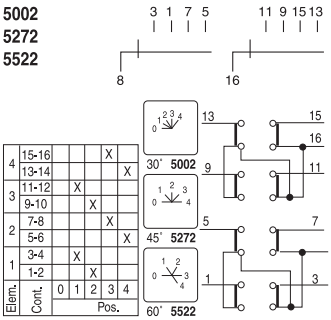
4503



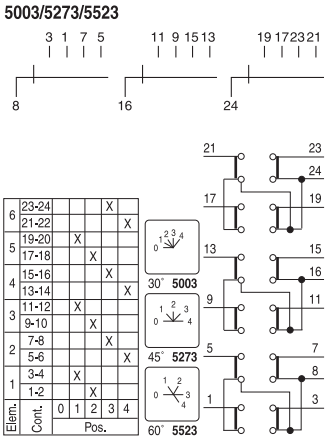
5001
5271
5521



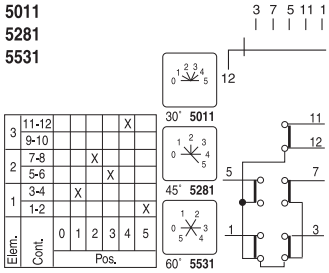
5002
5272
5522



5003/5273/5523



5011
5281
5531



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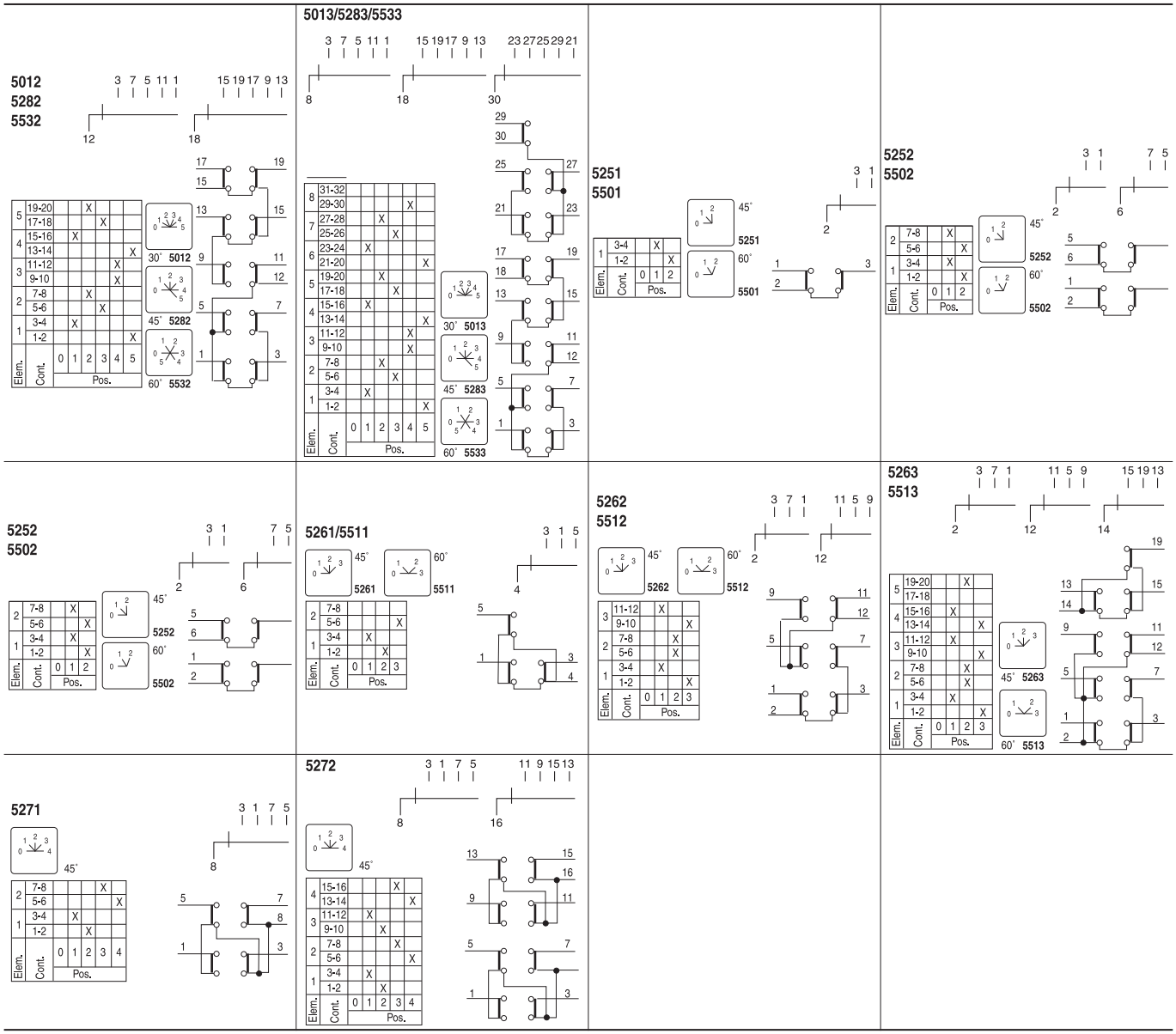
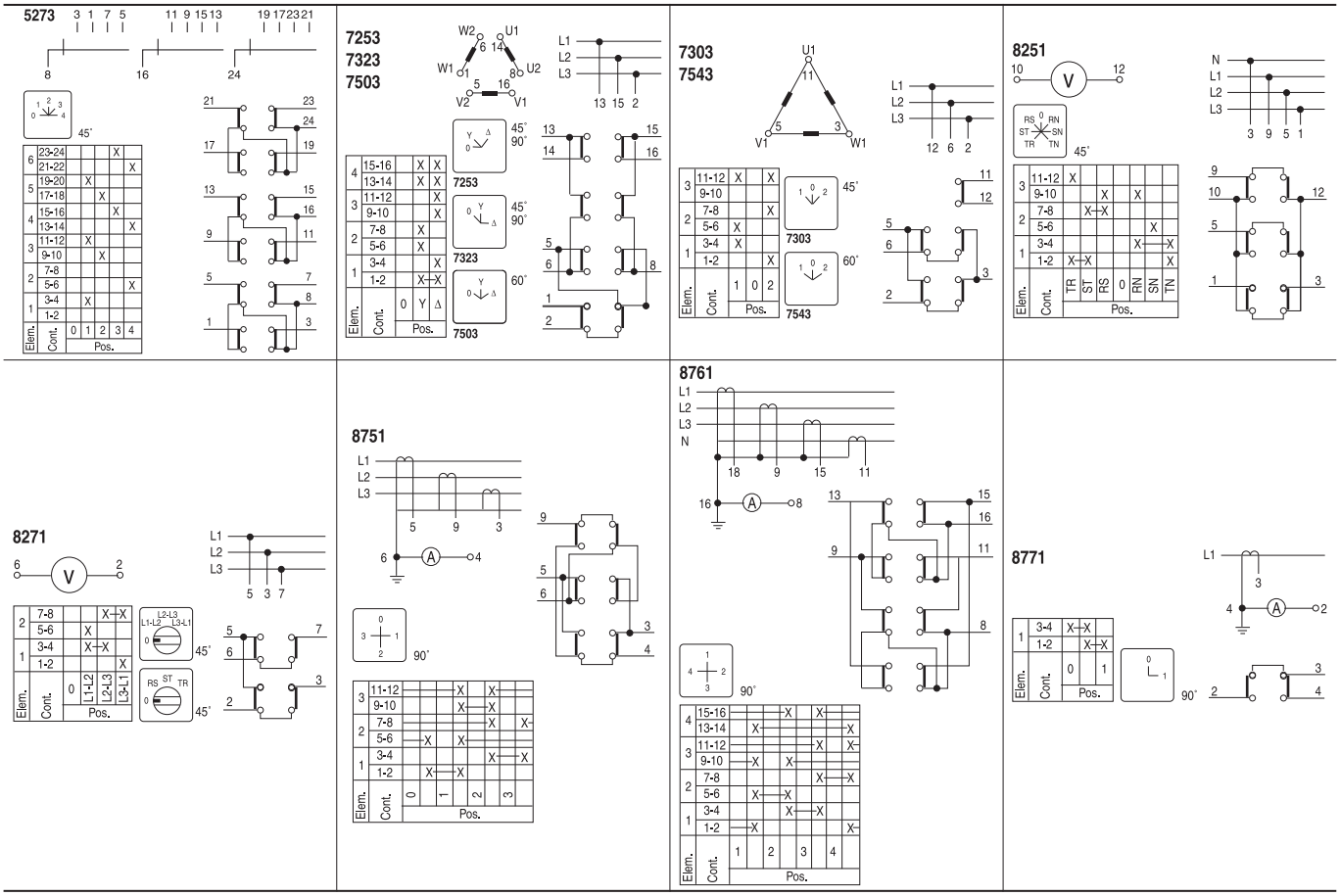
Circuit Diagram Nos. 5012...5272



Circuit Diagram Nos. 5273...8771



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Allen-Bradley

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	690
Isolating conditions acc. to VDE fulfilled up to rated impulse voltage *U*imp										[kV]	6	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 Rated current I_e		Contacts in series														
	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 ≤ 1ms	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
Rated voltage [V]		48				3				[kW]	0.30	0.37	0.50	0.75	—	—
DC-23A, DC-3, DC-5		60				2				[kW]	0.25	0.30	0.37	0.50	1.00	1.00
For inductive loads, T ≤1 ms		60				4				[kW]	0.37	0.50	0.75	1.00	—	—
		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 2-386.

❄ 32 and 40 A data for one contact in series.

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]	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	—	—
DC-23A, DC-3, DC-5		50.4	2	[A]	21.0	25.0	30.8	41.6	41.6	41.6
For inductive loads, T ≤ 7.5 ms		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 0.45 [cos j]	[A]	72	96	128	176	296	296
			at 380V 0.45 [cos j]	[A]	72	96	128	176	280	336
			at 660V 0.45[cos j]	[A]	53	72	86	112	196	196
Rated power P_e*		IEC-947								
AC-2	Slip-ring motors: starting, reversing and electric braking; star/delta starting	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 page 2-386.

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 3Ø 3-pole	220…240V 380…440V 500V 660V	[kW] [kW] [kW] [kW]	2.2 4 5.5 5.5	3 5.5 7.5 7.5	4.5 7.5 10 8	5.5 11 13 11	11 18.5 — 22	11 22 — 22
		1Ø 2-pole	110V 220…240V 380…440V	[kW] [kW] [kW]	0.75 1.3 2.2	1.1 2.2 3.7	1.2 2.5 4.5	1.6 3.2 5.5	— 5.5 11	— 5.5 11
Short-circuit ratings										
	Rated short-time current (1s)			[kA_{rms}]	0.48	0.48	0.6	0.75	0.8	0.8
	Strongest series fuse, not in enclosure	(gL characteristic)		[A]	20∗	20∗	20∗	25∗	35	40
	Conditional rated short-circuit			[kA]	6	6	5	5	5	5
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 General Use	Contact class Non-inductive or slightly inductive load❄		[A]	A600 12	A600 16	— 20	— 25	— 32	— 40
Rated power P_e‡		UL (CSA)			(FLA)	(FLA)	(FLA)	(FLA)		
Standard motor DOL rating (similar to AC-3)		3Ø 3-pole	120V 240V 480V 600V	[Hp] [Hp] [Hp] [Hp]	1 (7.2) 2 (6.8) 5 (7.6) 5 (6.1)	1.5 (12) 3 (9.6) 7.5 (11) 7.5 (9)	2 (13.6) 4 (12.4) 8 (11.6) 10 (11)	3 (19.2) 6 (18) 12 (17) 15 (17)	5 (30.4) 7.5 (22) 20 (27) 20 (22)	5 (30.4) 10 (28) 25 (34) 25 (27)
		1Ø 2-pole	120V 240V 480V 600V	[Hp] [Hp] [Hp] [Hp]	0.5 (9.8) 1 (8.0) 2 (6.0) 3 (6.8)	.75 (13.8) 1.5 (10.0) 3 (8.5) 3 (6.8)	1 (16) 2 (12) 4 (11.2) 5 (11.2)	1.5 (20) 3 (17) 6 (17) 7.5 (16)	2 (24) 5 (28) 7.5 (21) 10 (20)	2 (24) 5 (28) 10 (26) 15 (27)
Heavy motor load, reversing Rating (similar to AC-4) Max. back-up fuse		3Ø 3-pole (gG characteristic)	120V 240V	[Hp] [Hp] [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 [mm^2]	(2)18…12 (2)1…2.5	(2)16…10 (2)1.5…6	(2)12…8 (2)4…10
	fine strands	AWG [mm^2]	(2)18…12 (2)1…2.5	(2)16…10 (2)1.5…4	(2)14…10 (2)2.5…6

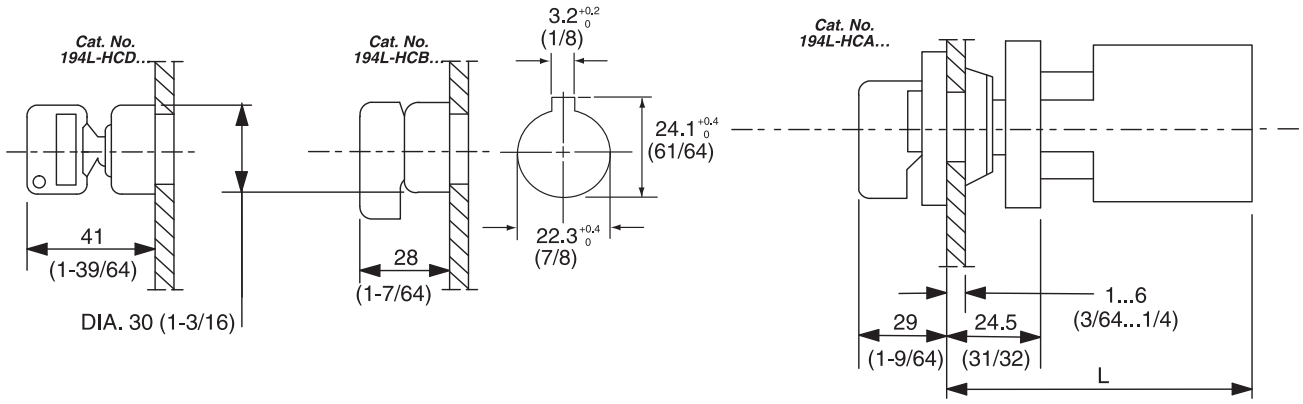
Environmental Data

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 page 2-386.

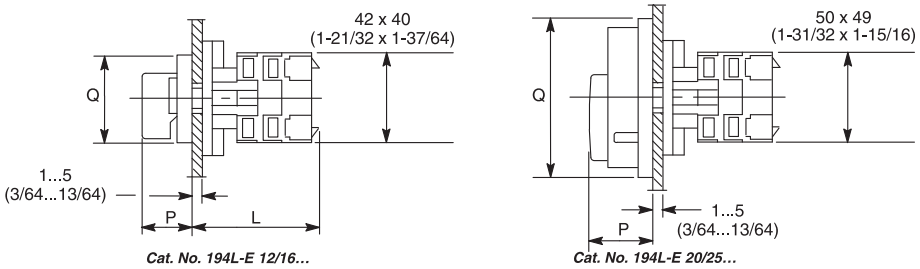
Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

***Cat. No. 194L-E**... for Central Fixing (**194L-HC**...)*

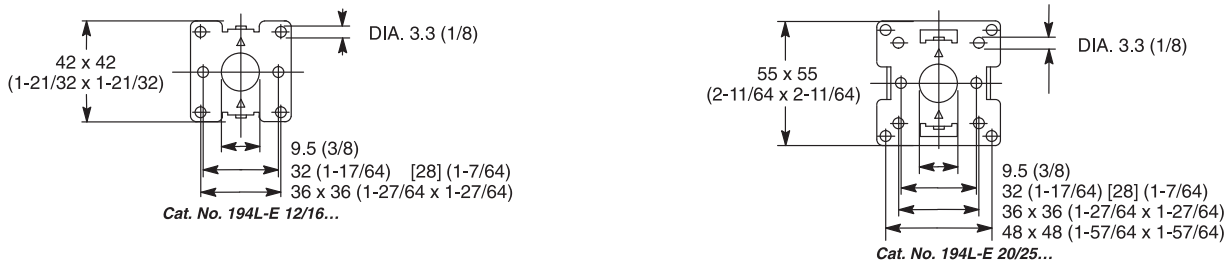


Cat. No.	L				
	No. of Contacts				
	1...2	3...4	5...6	7...8	9...10
194L-E12/16...	67.5 (2-21/32)	77.5 (3-3/64)	87.5 (3-7/16)	97.5 (3-27/32)	107.5 (4-15/64)
194L-E20/25...	69 (2-23/32)	81.5 (3-7/32)	94 (3-45/64)	106.5 (4-3/16)	119 (4-11/16)
194L-E32/40...	86 (3-25/64)	103.5 (4-5/64)	121 (4-49/64)	138.5 (5-29/64)	156 (6-9/64)

Cat. No. 194L... for Front (Door) Installation



Mounting Dimensions



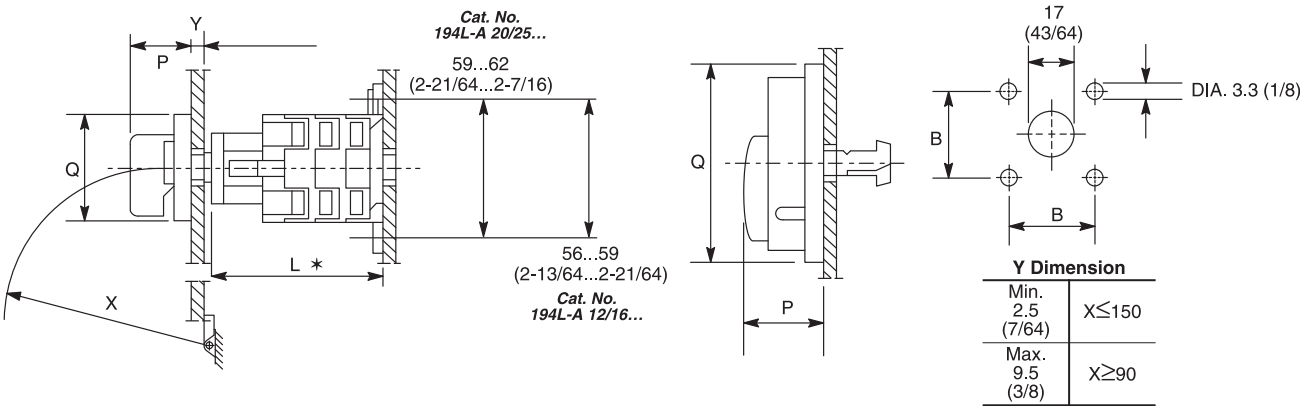
Cat. No.	L				
	No. of Contacts				
	1...2	3...4	5...6	7...8	9...10
194L-E12/16...	44 (1-47/64)	54 (2-1/8)	64 (2-33/64)	74 (2-29/32)	84 (3-5/16)
194L-E20/25...	44.5 (1-3/4)	57 (2-1/4)	69.5 (2-3/4)	82 (3-15/64)	94.5 (3-23/32)
194L-E32/40...	43 (1-11/16)	58.5 (2-5/16)	76 (2-63/64)	93.5 (3-11/16)	111 (4-3/8)

Control Knob

Cat. No.	P	Q
194L-HE4A...	28 (1-7/64)	48 (1-57/64) x 48 (1-57/64)
194L-HE4I...		
194L-HE4S...		48 (1-57/64) x 62 (2-7/16)
194L-HE6A...		64 (2-33/64) x 64 (2-33/64)
194L-HE6I...		
194L-HE6S...		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)	

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

***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-HE4I...			
194L-HE4S...			48 (1-57/64) x 62 (2-7/16)
194L-HE6A...		48 (1-57/64)	64 (2-33/64) x 64 (2-33/64)
194L-HE6I...			
194L-HE6S...			64 (2-33/64) x 78 (3-5/64)
194L-HE6N...	34 (1-11/32)		67 (2-41/64) x 67 (2-41/64)
194L-HE6G...			

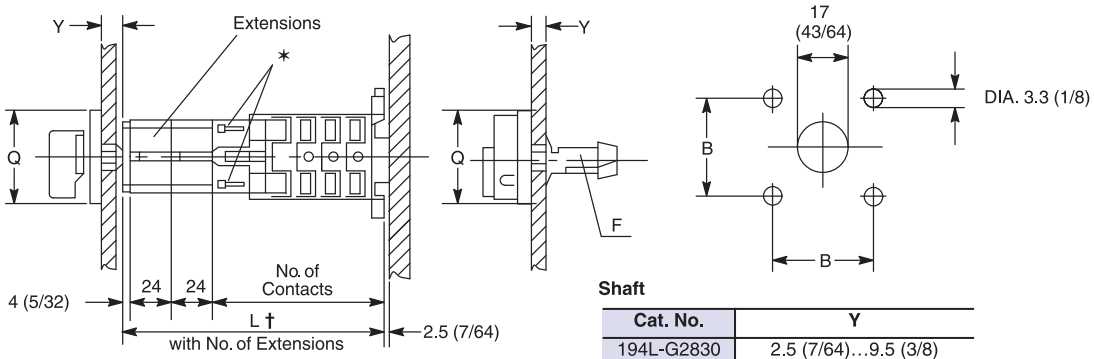
✶ With DIN 46 277 (35) Rail + 2.5 mm (7/64)

IEC Control and Load Switches

Approximate Dimensions, Continued

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



Shaft

Cat. No.	Y
194L-G2830 194L-G3194 194L-G3195	2.5 (7/64)...9.5 (3/8) 9 (23/64)...18 (23/32) 14 (35/64)...23 (29/32)

	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											
No. of Extensions	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)

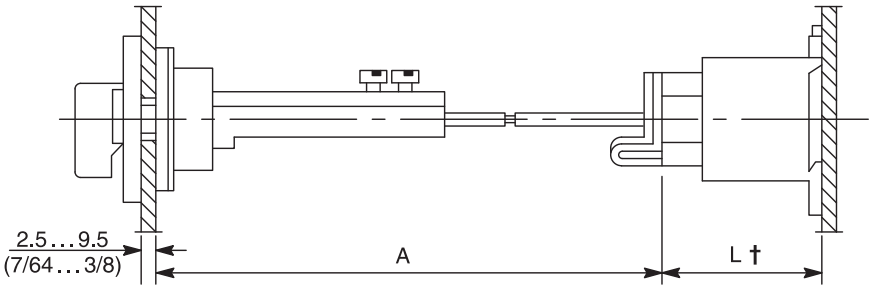
Control Knob

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...	67 (2-41/64) x 67 (2-41/64)	
194L-HE6G...		

* 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.

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)

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.

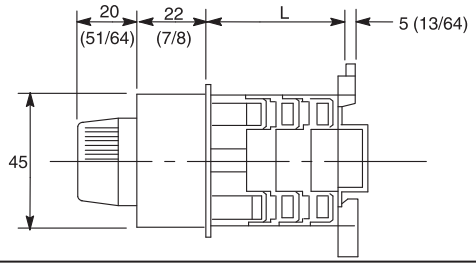
No. of Extension Modules	Required End Shaft	Enclosure Mounting Depth‡ Cat. No. 194L-A12/16...	Cat. No. 194L-A20/25...
0	44 (1-47/64) §	71.5...77.5 (2-13/16...3-1/16)	75...80.5 (2-61/64...3-11/64)
	52 (2-3/64)	77...87 (3-1/32...3-27/64)	80...90 (3-5/32...3-35/64)
	57 (2-1/4)	82...92 (3-15/64...3-5/8)	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.

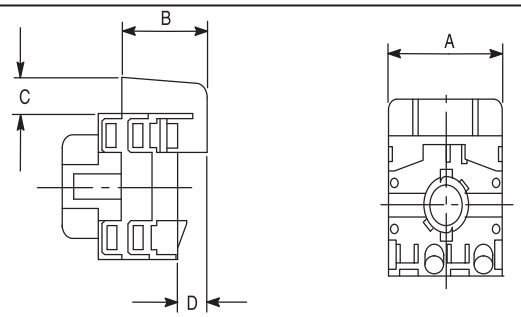
Cat. No. 194L-A... With Cat. No. 194L-HE4P-...

Installation on DIN 46277 (35) Rails + 2.5 mm (7/64)



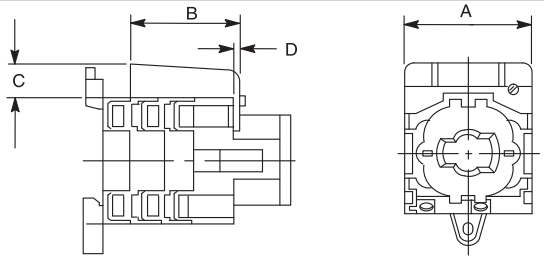
Cat. No.	L			
	No. of Contacts			
	1...2	3...4	5...6	7...8
194L-A12/16...	35 (1-3/8)	45 (1-49/64)	55 (2-11/64)	65 (2-9/16)
194L-A20/25...	33.5 (1-21/64)	48 (1-57/64)	60.5 (2-3/8)	73 (2-7/8)
194L-A32/40...	43 (1-11/16)	61 (2-13/32)	79 (3-7/64)	97 (3-53/64)

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)

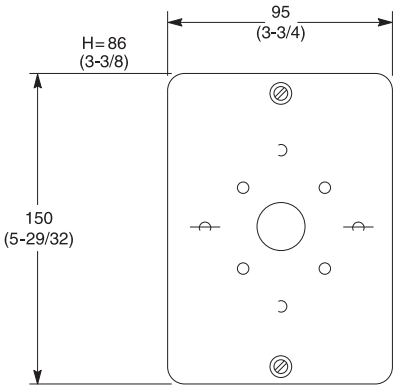
Cat. No. 194L-A... With Terminal Cover



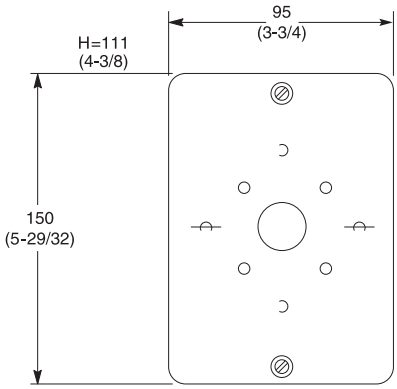
Cat. No.	A	B	C	D
194L-A12/16...	40 (1-37/64)	42.5 (1-43/64)	12 (15/32)	2.5 (7/64)
194L-A20/25...	49 (1-15/16)	37.5 (1-31/64)	12 (15/32)	2.5 (7/64)
194L-A32/40...	63.5 (2-1/2)	49 (1-53/64)	12 (15/32)	2 (5/64)

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

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

Cat. No. Explanation

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

✶ See page 2-420 for dimensional reference data.
❄ Non-fused disconnect switches must use separately installed fuses for upstream short-circuit protection

c

No. of Poles	
Code	Description
1753	3-pole switch

d

Fuse Indication	
Code	Configuration
Blank	No fuse status indication
S	Fuse status indication

Limit of 6 total auxiliary contact blocks total for test and standard positions.
Fourth pole, additional auxiliary contacts and handle options available in accessory section.

UL/CSA Fused Disconnect Switches

Cat. No. 194R-J30-1753

Rated Current [A]	Maximum Hp Ratings ✶							Fuse	Dim. Ref.	Cat. No.
	1Ø (60 Hz)		3Ø (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

194R-N30-1753

Fuse Description	Rated Current✶ [A]	Non-Fused Maximum Hp Ratings							Dim. Ref.	Cat. No.
		1Ø (60 Hz)		3Ø (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

194R-F32-1753

194R-F63-1753

BS88 Fused Disconnect Switches

Load Rating I_e [A]	Ratings (AC23) With Fuse Links 3Ø Maximum kW (50 Hz) 200/230V	380/400/415V	660/690V	Fuse	Dim. Ref.	Cat. No.
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) With Fuse Links 3Ø Maximum kW (50 Hz) 200/230V	380/400/415V	660/690V	Fuse	Dim. Ref.	Cat. No.
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) With Fuse Links 3Ø Maximum kW (50 Hz) 200/230V	380/400/415V	660/690V	Fuse	Dim. Ref.	Cat. No.
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∗ 1Ø (60 Hz) 120V	1Ø (60 Hz) 240V	3Ø (60 Hz) 240V	3Ø (60 Hz) 480V	3Ø (60 Hz) 600V	DC 125V	DC 250V	Fuse	Dim. Ref.	Cat. No.
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) With Fuse Links 3Ø Maximum kW (50 Hz) 200/230V	380/400/415V	660/690V	Fuse	Dim. Ref.	Cat. No.
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) With Fuse Links 3Ø Maximum kW (50 Hz) 200/230V	380/400/415V	660/690V	Fuse	Dim. Ref.	Cat. No.
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) With Fuse Links 3Ø Maximum kW (50 Hz) 200/230V	380/400/415V	660/690V	Fuse	Dim. Ref.	Cat. No.
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

Operating Handles (Accepts 3 Padlocks)

	For Use With	Description	Color	Degree of Protection	Cat. No.
	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 test mode **with** defeater	Black	(Type 1) IP42	**194R-HS1**
				(Type 3R, 3, 12, 4, 4X) IP66	**194R-HS4**
			Red/Yellow	(Type 1) IP42	**194R-HS1E**
				(Type 3R, 3, 12, 4, 4X) IP66	**194R-HS4E**
		Standard handle **without** defeater	Black	(Type 1) IP42	**194R-HS1-N2**
				(Type 3R, 3, 12, 4, 4X) IP66	**194R-HS4-N2**
			Red/Yellow	(Type 1) IP42	**194R-HS1E-N2**
				(Type 3R, 3, 12, 4, 4X) IP66	**194R-HS4E-N2**

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)	

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 set screw, 1 shaft clip, and 2 #8 M4 screws	A1, A2	**194R-30-HDWR**
	4	1 set screw, 1 shaft clip, and 4 #8 M4 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 (3 terminals)**	A1, A2	2	2	**194R-30-C3**
	60 A Terminal Shield (3 terminal)	B1, B2	2	2	**194R-60-C3**
	**30 A Terminal Shield (1 terminal)**	A1, A2	2	2	**194R-30-C1**
	60 A Terminal Shield (1 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**

Replacement Fuse Carriers

	Description	Pkg. Quantity	Cat. No.❄
 *194R-J30-FC*	**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**
 194R-J30-FCS	**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.
 Cat. No. 800F-X10	**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.

Fused Disconnect Switches For UL Class Fuses and CSA HRCI-J

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 DC	(V) (V)	600 250		600 250		600 250	
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, 3Ø 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, 1Ø 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 Switch with Terminal Shield & Fuse Carriers		 IP20 IP20	 IP20 IP20
Mechanical Endurance‡	Operations	10 000	10 000
Operating Torque (Maximum)	N•m lb•in.	2 12	3.5 35
Terminal Capacity Power Terminals	mm^2 AWG	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
Maximum Number of Auxiliary Circuits		6	6
Approximate Weight	kg. lbs.	0.92 2.03	1.32 2.9
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) 197 (7-3/4) 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.

Non-Fused Disconnect Switches For CSA and UL Class Applications§

Electrical Ratings						
Cat. No.			194R-N30-1753		194R-N60-1753	
Maximum Fuse Cartridge Size			30♣		60♣	
Maximum Voltage	AC DC	[V] [V]	600 250		600 250	
Ampere Rating		[A]	30		60	
Maximum Short Circuit Prospective Fault Current		[kA]	200		200	
Fuse Operating Characteristics➢			Time Delay	Non-Time Delay	Time Delay	Non-Time Delay
Maximum Hp, 3Ø AC	200V, 60 Hz 240V, 60 Hz 480V, 60 Hz 600V, 60 Hz	[Hp] [Hp] [Hp] [Hp]	7.5 7.5 15 20	3 3 5 7.5	15 15 30 50	7.5 7.5 15 15
Maximum Hp, 1Ø AC	120V, 60 Hz 240V, 60 Hz	[Hp] [Hp]	2 3	0.5 1.5	3 10	1.5 3
Maximum Hp, DC	125V DC 250V DC	[Hp] [Hp]	3 5	2 5	5 10	5 10
Power Lost		[W]	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.

Mechanical Data				
Cat. No.			194R-N30-1753	194R-N60-1753
Degree of Protection (per IEC 60947-3) Switch Only Switch with Terminal Shield & Fuse Carriers			IP20 IP20	IP20 IP20
Mechanical Endurance‡		Operations	10 000	10 000
Operating Torque (Maximum)		N•m lb•in.	2 12	3.5 35
Terminal Capacity Power Terminals		mm^2 AWG	2.5…10 #14…#8	2.5…25 #14…#4
Auxiliary Contact Terminals		mm^2 AWG	2.5…10 #14…#8	2.5…25 #14…#4
Maximum Number of Auxiliary Circuits			6	6
Approximate Weight		kg lbs.	0.81 1.78	1.14 2.52
Minimum Enclosure Size Approximate dimensions in millimeters (inches)		Height Width Depth	248 (9-3/4) 171 (6-3/4) 111 (4-3/8)	248 (9-3/4) 197 (7-3/4) 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 A…63 A Range

Environmental Data	
Ambient Temperature	
Open .....°C (°F) Enclosed .....°C (°F) Storage .....°C (°F)	–2…+55 (–4…+131) –20…+40 (–4…+104) –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

Electrical Ratings				
Cat. No.			194R-H30-1753	194R-H60-1753
CSA Fuse Type			HRCII-C	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, 3Ø 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, 1Ø AC				
	120V, 60 Hz	[Hp]	2	3
	240V, 60 Hz	[Hp]	3	10

Mechanical Data			
Cat. No.		194R-H30-1753	194R-H60-1753
Degree of Protection (per IEC 60947-3) Switch Only Switch with Terminal Shield & Fuse Carriers		IP 20 IP 20	IP 20 IP 20
Mechanical Endurance∗	Operations	10 000	10 000
Operating Torque (Maximum)	N•m lb•in.	2 12	3.5 35
Terminal Capacity			
Power Terminals	mm^2 AWG	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
Maximum Number of Auxiliary Circuits		6	6
Approximate Weight	kg lbs.	1.18 2.60	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) 197 (7-3/4) 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 2-435…2-439.

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_e)		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_e)						
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 3Ø						
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 Switch with Terminal Shield & Fuse Carriers		 IP20 IP20	 IP20 IP20	 IP20 IP20
Mechanical Endurance Operations ‡		10 000	10 000	10 000
Operating Torque (Maximum)	N•m lb•in.	2 12	2 12	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 (See dimension drawings.)		A1	A1	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.

Fused Disconnect Switches For DIN Fuses

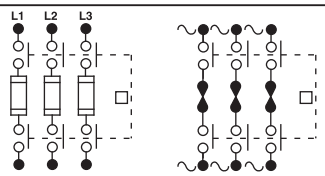
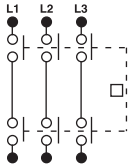
Electrical Ratings			
Cat No.		194R-D32-1753	194R-D63-1753
Fuse Type	DIN Dimension	00	0, 00
Rated Insulation Voltage (U_i)	(V)	1000	1000
Rated Conditional Short-Circuit Current (r.m.s.) at 415V	(kA)	100	100
Rated Operational Current AC-22A (I_e)		Fuse Links	Fuse Links
200/230V 50 Hz	(A)	32	63
380/400/415V 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 3Ø			
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

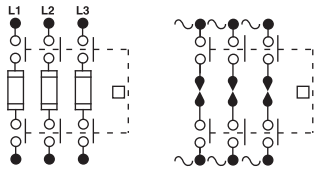
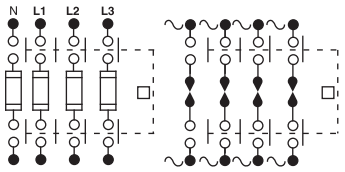
Mechanical Data			
Cat. No.		194R-D32-1753	194R-D63-1753
Degree of Protection (per IEC 60947-3) Switch Only Switch with Terminal Shield & Fuse Carriers		 IP20 IP20	 IP20 IP20
Mechanical Endurance❄	Operations	10 000	8 000
Operating Torque (Maximum)	N•m lb•in.	2 35	3.5 35
Terminal Capacity Power Terminals	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 Approximate dimensions in millimeters (inches)	Height Width Depth	248 (9-3/4) 197 (7-3/4) 148 (5-13/16)	248 (9-3/4) 197 (7-3/4) 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.

Wiring Schematic

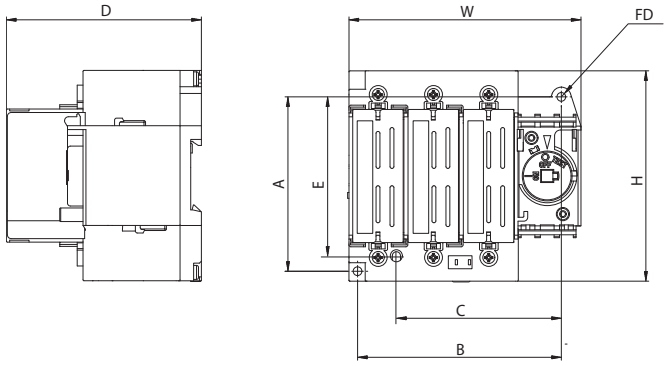
UL LISTED, CSA CERTIFIED	DIMENSION REFERENCE	CIRCUIT
Cat. No.		
194R-C30-1753	A1	
194R-J30-1753	A1	
194R-J60-1753	B1	
194R-H30-1753	B1	
194R-H60-1753	B1	
194R-N30-1753	A2	
194R-N60-1753	B2	

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	

2

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

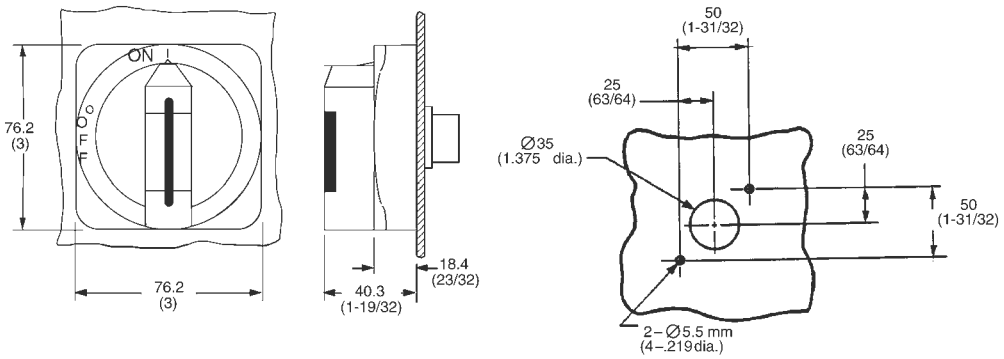
Disconnect Switch Dimension References A1, A2, B1 and B2 (30 A and 60 A)



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.

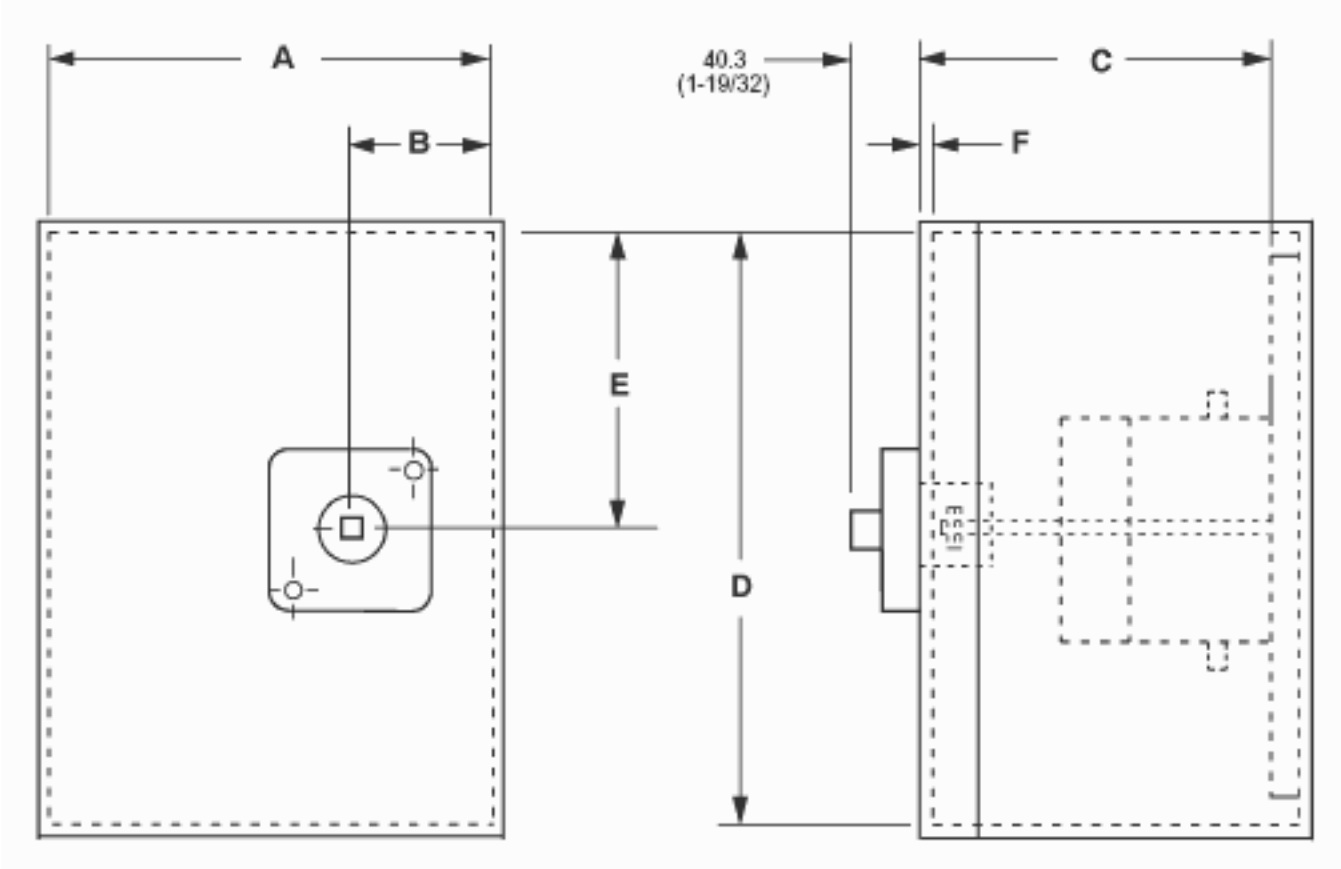
Operating Handles — Cat. No. 194R-HS.../HST



Visit our website: www.ab.com/catalogs
Preferred availability cat. nos. are printed in **bold**

Disconnect Switch Dim. Ref.: A1, A2, B1, B2 (30 A and 60 A) Enclosure and Operating Handle

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

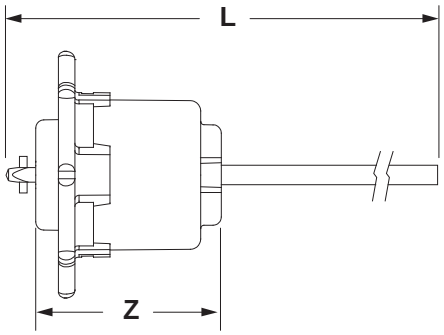


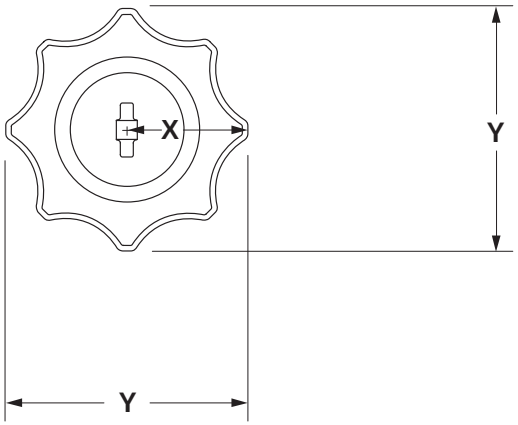
Enclosure Installation Dimensions

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)

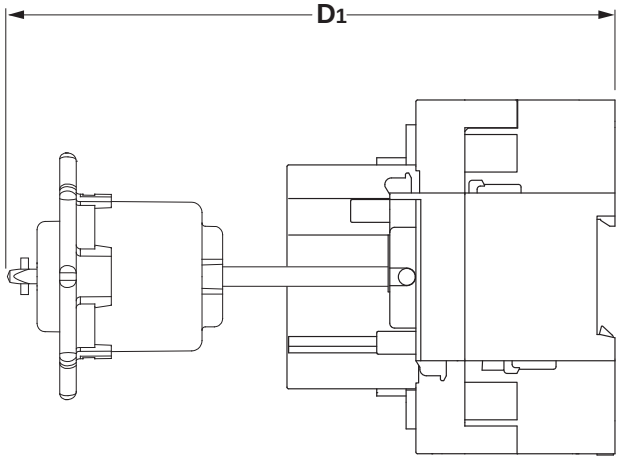
Universal Internal Handle Dimensions

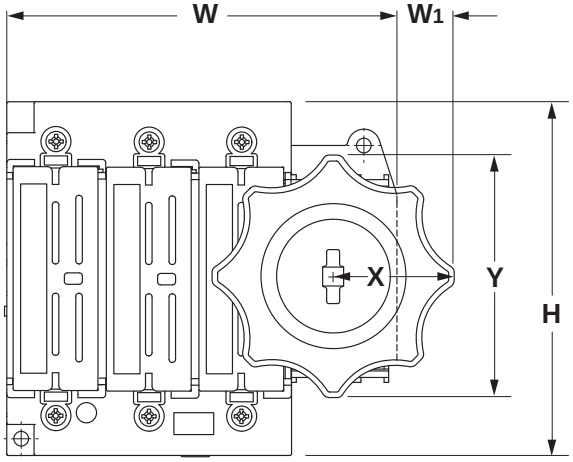
Dimensions in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.





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)

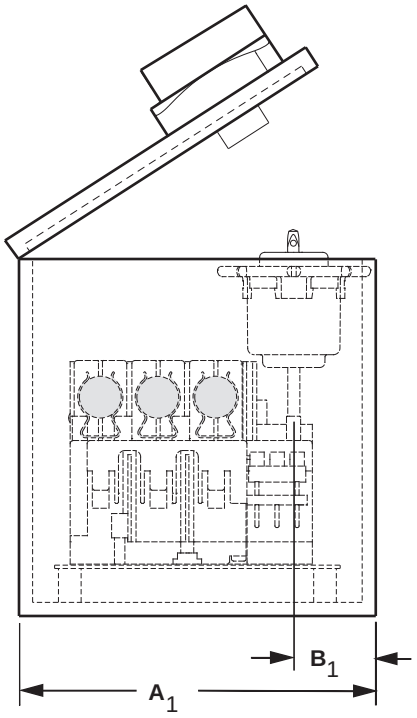


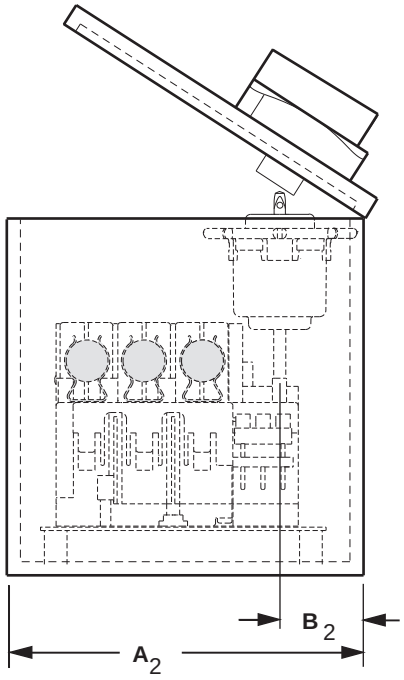


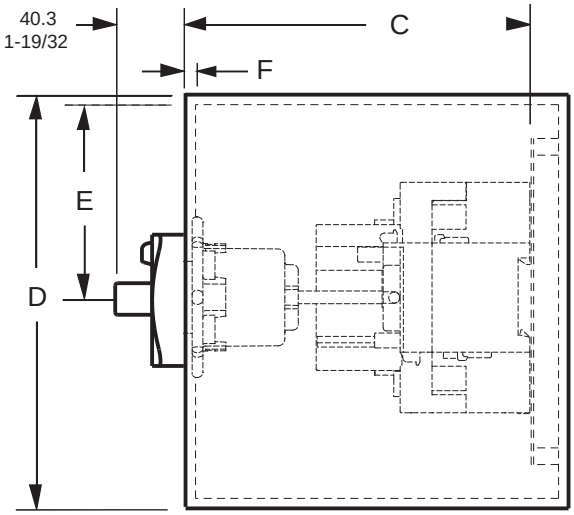
Catalog No.	Dim. Ref.		H	W	W_1	$D_{1(min)}$	X	Y
194R-B20-* 194R-F25-* 194R-B32-* 194R-F32-* 194R-C30-* 194R-J30-*	A1	mm (in.)	108 (4-1/4)	120 (4-3/4)	19 (3/4)	184 (7-1/4)	38 (1-1/2)	76 (3)
194R-N30-*	A2	mm (in.)	108 (4-1/4)	120 (4-3/4)	19 (3/4)	160 (6-5/16)	38 (1-1/2)	76 (3)
194R-B63-* 194R-H30-* 194R-D32-* 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)

Enclosure Installation Dimensions

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







ENCLOSURE INSTALLATION DIMENSIONS

CAT.	DIM. REF.		A_{112} MINIMUM	A_2 MINIMUM	B MINIMUM	B MINIMUM	C MINIMUM	C MAXIMUM	D MINIMUM	E MINIMUM	F MINIMUM	F 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.

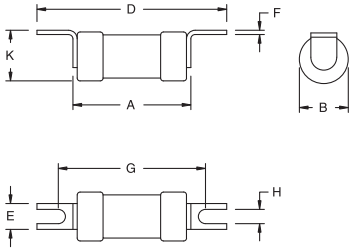
Fuse Description

With Bulletin 194R Fused Disconnect Switches

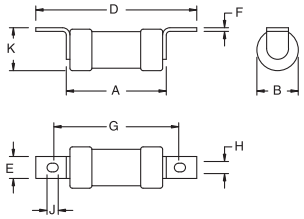
Bulletin 194R Fused Disconnect Switches have been designed to accept a variety of fuses for worldwide application flexibility. Following is a brief summary of typical fuse specifications, where the fuses are typically used, and which Bulletin 194R disconnect switches will accommodate each fuse type. 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.

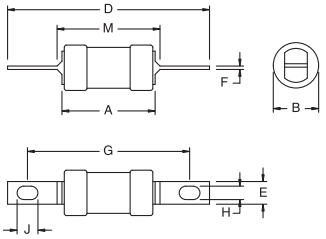
- IEC fuse type: Fuse-link for bolted connection
- Voltage rating: 660/690V AC
- Interrupting rating: 80 kA
- Standard cartridge sizes: A1, A2, A3, A4, B1, B2, B3, B4
- Typical ampere ratings: 2…400 A
- Construction: Blade type for bolted connection
- Can be installed on Bulletin 194R disconnect switch **Cat. Nos: 194RNA100P3, NA200P3, NA300P3, NA380P3, NA400P3, NB200P3, NB300P3**
- Where used: United Kingdom, Australia, New Zealand, Asia



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/	8.70 (11/32)	10.30 (13/32)	34.90 (1-3/8)

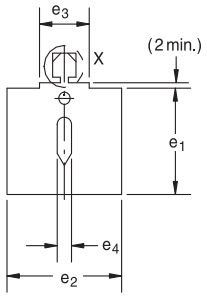
Dim. Ref.	Ampere Range [A]	A	B	D	E	F	G	H	J	M
B1	2…20	70.00 (2-3/4)	34.90 (1-3/8)	136.50 (5-3/8)	19.10 (3/4)	3.20 (1/8)	111.00 (4-3/8)	8.70 (11/32)	11.90 (15/32)	79.40 (3-1/8)
B2	125…200	77.00 (3-1/32)	41.30 (1-5/8)	136.50 (5-3/8)	19.10 (3/4)	3.20 (1/8)	111.00 (4-3/8)	8.70 (11/32)	11.90 (15/32)	79.40 (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)

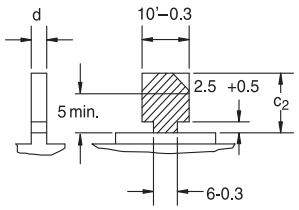
2

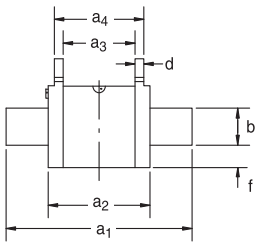
DIN Fuses (100 A shown)

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

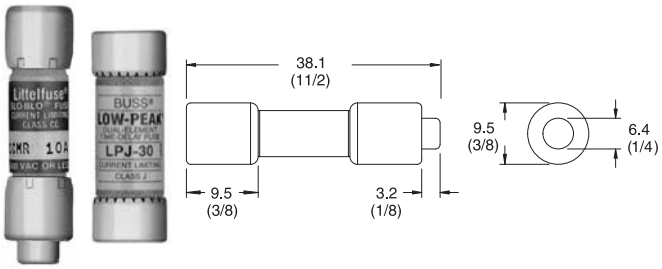
With Bulletin 194R Fused Disconnect Switches, Continued

CSA HRCI and UL Class Fuses (10 A shown)

CSA HRCI and UL Class Fuses (10 A shown)

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

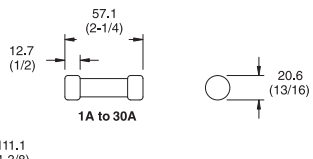
- UL fuse type: Class CC
- CSA fuse type: HRCI-MISC
- Voltage rating: 600V AC
- Interrupting rating: 200 000 A
- Standard cartridge sizes: 30 A
- Typical ampere ratings: 1…30 A
- Construction: Ferrule type
- Can be installed on Bulletin 194R disconnect switch **Cat. No: 194R-NC030P3**
- Where used: North America

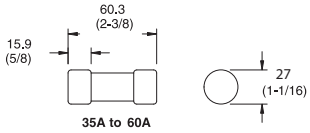


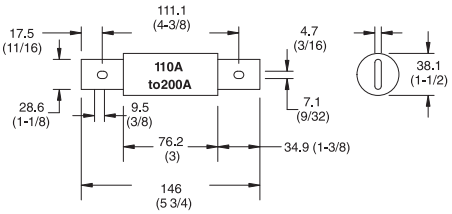
CSA HRCI and UL Class Fuses (30 A shown)

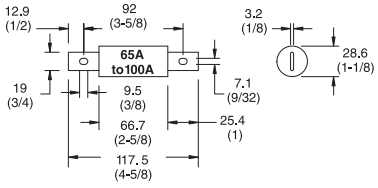
Dimensions in millimeters (inches).
Dimensions are not intended to be used for manufacturing purposes.

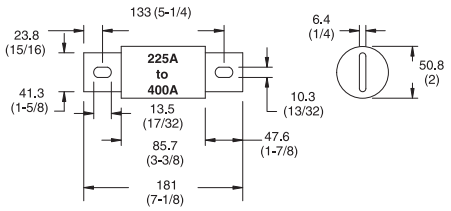
- CSA fuse type: HRCI-J
- UL fuse type: Class J
- Voltage rating: 600V AC
- Interrupting rating: 200 000 A
- Standard cartridge sizes: 30, 60, 100, 200, and 400 A
- Typical ampere ratings: 1…600 A; Blade type for bolted connection
- Can be installed on Bulletin 194R disconnect switch **Cat. Nos: 194R-NJ030P3, NJ060P3, NJ100P3, NJ200P3, NJ400P3**
- Where used: North America







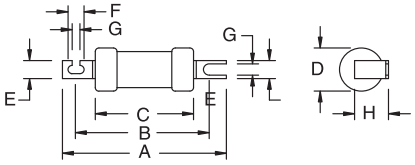




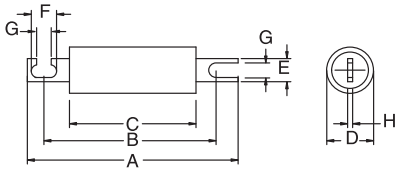
CSA HRCII Fuses (100 A shown)

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

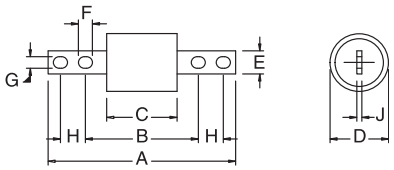
- CSA fuse type: HRCII-C
- Voltage rating: 600V AC
- Interrupting rating: 200 000 A
- Standard cartridge sizes: 30, 60, 100, 200, and 400 A
- Typical ampere ratings: 1…400 A
- Construction: Blade type for bolted connection
- Can be installed on Bulletin 194R disconnect switch **Cat. Nos: 194R-NA200P3, NA300P3, NH100P3, NH200P3, NH400P3**
- Where used: Canada



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)

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)

Table of Contents

Standards Compliance

IEC 60947-4-1/EN60947-3
BS EN60947-3
VDE 0660
CSA 22.2 No. 4
NEMA KS-1
UL 98

Certifications

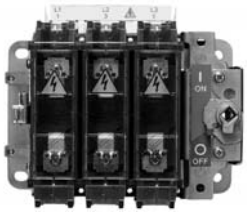
UL Listed (File No. E 47426, Guide WHTY)
CSA Certified (File No. LR1234)
CE
ASTA Certified
LOVAG Certified

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 ∗ 1Ø (60 Hz) 115V	1Ø (60 Hz) 230V	3Ø (60 Hz) 200V	3Ø (60 Hz) 230V	3Ø (60 Hz) 460V	3Ø (60 Hz) 575V	DC 125V	DC 250V	Fuse	Dim. Ref.	Cat. No.∗
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	7-1/2	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

Non-Fused											
Fuse Description	Rated Current [A]	Maximum Hp Ratings								Dim. Ref.	Cat. No.
		1Ø (60 Hz)		3Ø (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)											
With Fuse Links					With Shorting Links						
	3Ø Maximum kW (50 Hz)					3Ø Maximum kW (50 Hz)					
Load Rating I_e [A]	200/ 230V	380/ 400/ 415V	500V	660/ 690V	Load Rating I_e [A]	200/ 230V	380/ 400/ 415V	500V	660/ 690V	Fuse	Dim. Ref.	Cat. No.
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 3Ø Maximum kW (50 Hz) 200/230V	380/400/415V	500V	660/690V	Fuse	Dim. Ref.	Cat. No.
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**
		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

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✶ 3Ø (60 Hz) 200V	230V	460V	575V	Disconnect Switch❄ Fuse	Dim. Ref.	Operating Shaft Type	Operating Handle Degree of Protection	Handle Color	Cat. No.
100	25	30	60	75	None	C1	Standard Length	!P66 (Type 3, 3R, 4, 4X, 12)	Black/Grey	194R-NN100P34R3
									Red/Yellow	194R-NN100P34ER3
	25	30	60	75	100 A Class J	C1			Black/Grey	**194R-NJ100P34R3**
									Red/Yellow	**194R-NJ100P34ER3**
200	50	60	125	150	None	D1			Black/Grey	194R-NN200P34R3
									Red/Yellow	194R-NN200P34ER3
	50	60	125	150	200 A Class J	D1			Black/Grey	194R-NJ200P34R3
									Red/Yellow	**194R-NJ200P34ER3**
400	100	125	250	300	None	F1			Black/Grey	194R-NN400P34R5
									Red/Yellow	194R-NN400P34ER5
	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

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
	1Ø (60Hz)		3Ø (60Hz)								
	115V	230V	200V	230V	460V	575V			Cat. No.∗	Cat. No.∗	Cat. No.∗
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

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**

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 (Cat. No. 194R-NH100P3 only)	#8…1/0 AWG 10 mm²…50 mm²	3	**199-LE1**
D1 (Cat. No. 194R-NJ200P3, -NN200P3, -NA400P3) D2	#6…250 MCM AWG 16 mm²…120 mm²		**199-LF1**
E1, E2, F1	#4…500 MCM AWG 25 mm²…240 mm²		**199-LG1**
F1	Two 1/0…350 MCM AWG Two 50 mm²…150 mm²		**199-LH1**

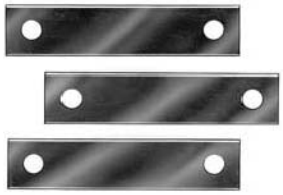
Auxiliary Contacts∗

Cat. No. 195-GA10

Disconnect Switch Dim Ref.	Description	No. of Auxiliary Contacts	Cat. No.
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	Two-pole N.O. auxiliary contact for disconnect switch 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 2-439 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	

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_e)		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_e)									
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 3Ø									
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) Switch Only Switch with Terminal Shield & Fuse Cover(s)		 IP00 IP20	 IP00 IP20	 IP00 IP20	 IP00 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.	4.03 8.88	6.16 13.59	9.30 20.50	23.83 30.50
Minimum Enclosure Size Approximate dimensions in millimeters (inches)	Height Width Depth	330 (13) 301 (11-27/32) 162 (6-3/8)	560 (22) 344 (13-17/32) 178 (7)	610 (24) 394 (15-33/64) 227 (8-15/16)	762 (30) 424 (16-45/64) 243 (9-9/16)
Switch Dimension Reference (See dimension drawings on pages 2-441 and 2-443…2-444.)		C1	D1	E1	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 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 3Ø					
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 Switch with Terminal Shield & Fuse Cover(s)		IP00 IP20	IP00 IP20	IP00 IP20	IP00 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 Approximate dimensions in millimeters (inches)	Height Width Depth	330 (13) 301 (11-27/32) 168 (6-5/8)	560 (22) 344 (13-17/32) 183 (7-7/32)	712 (28) 394 (15-33/64) 227 (8-15/16)	762 (30) 424 (16-45/64) 243 (9-9/16)
Switch Dimension Reference (See dimension drawings on pages 2-441 and 2-443…2-444.)		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	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, 3Ø 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, 1Ø 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 Switch with Terminal Shield & Fuse Cover(s)		 IP00 IP20	 IP00 IP20	 IP00 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 AWG	10…50 #8…#1/0	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
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 Width Depth	384 (15-1/8) 344 (13-17/32) 178 (7)	610 (24) 394 (15-33/64) 227 (8-15/16)	762 (30) 424 (16-45/64) 243 (9-9/16)
Switch Dimension Reference (See dimension drawings on 2-441, 2-442, and 2-443.)		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.

IEC Fused and Non-Fused Disconnects

Specifications, Continued

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 DC	[V] [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	Non-Time Delay
Maximum Hp, 3Ø 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, 1Ø AC								
	115V 60 Hz	[Hp]	7.5	—	—	—	—	—
	230V 60 Hz	[Hp]	15	7.5	25	15	50	25
Maximum Hp, DC								
	125V DC	[Hp]	—	—	—	—	—	—
	250V DC	[Hp]	20	20	40	40	50	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.

Fused Disconnect Switches For CSA HRCI-J and UL Class Fuses∗, Continued

Mechanical Data				
Cat. No.		194R-NJ100P3	194R-NJ200P3	194R-NJ400P3
Degree of Protection (per IEC 947) Switch Only Switch with Terminal Shield & Fuse Cover(s)		IP00 IP20	IP00 IP20	IP00 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 Power Terminals	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 Approximate dimensions in millimeters (inches)	Height Width Depth	330 (13) 301 (11-27/32) 162 (6-3/8)	560 (22) 344 (13-17/32) 178 (7)	762 (30) 424 (16-45/64) 243 (9-9/16)
Switch Dimension Reference (See dimension drawings on 2-441, 2-443 and 2-443.)		C1	D1	F1

∗ 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 DC	[V] [V]	600 250		600 250		600 250	
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	Non-Time Delay
Maximum Hp, 3Ø AC	200V 60 Hz 230V 60 Hz 460V 60 Hz 575V 60 Hz	[Hp] [Hp] [Hp] [Hp]	25 30 60 75	15 15 25 30	50 60 125 150	25 25 50 60	100 125 250 300	50 50 100 125
Maximum Hp, 1Ø AC	115V 60 Hz 230V 60 Hz	[Hp] [Hp]	— 15	— 15	— 25	— 15	— 50	— 25
Maximum Hp, DC	125V DC 250V DC	[Hp] [Hp]	— 20	— 20	— 40	— 40	— 50	— 50
Power Lost		[W]	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.

Non-Fused Disconnect Switches For CSA and UL Class Applications∗, Continued

Mechanical Data					
Cat. No.		194R-NN100P3	194R-NN200P3	194R-NN400P3
Degree of Protection (per IEC 947) Switch Only Switch with Terminal Shield & Fuse Cover(s)		IP00 IP20	IP00 IP20	IP00 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 Power Terminals	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.	4.31 9.50	6.56 14.47	14.97 33.00
Minimum Enclosure Size Approximate dimensions in millimeters (inches)	Height Width Depth	330 (13) 301 (11-27/32) 162 (6-3/8)	560 (22) 344 (13-17/32) 178 (7)	762 (30) 424 (16-45/64) 243 (9-9/16)
Switch Dimension Reference (See dimension drawings on 2-441, 2-443 and 2-443.)		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

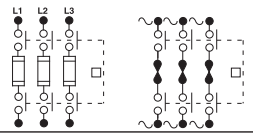
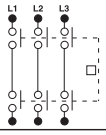
Environmental Data	
Ambient Temperature	
Open Enclosed Storage	–2…+55 °C (–4…+131 °F) –20…+40 °C (–4…+104 °F) –40…+65 °C (–40…+149 °F)
Altitude (per IEC 947-1)	2,000
Relative Humidity (per IEC 947-1)	90% @ +20 °C (+68 °F) 50% @ +40 °C (+104 °F)

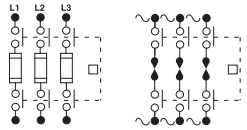
Auxiliary Contact Ratings for Cat. No. 195-GA

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

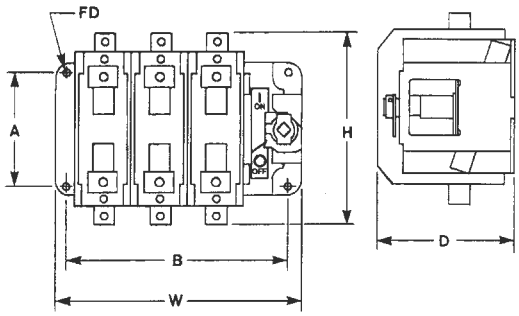
Hardware Kits (Includes switch/fuse mounting hardware and operating rod cotter pin)

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

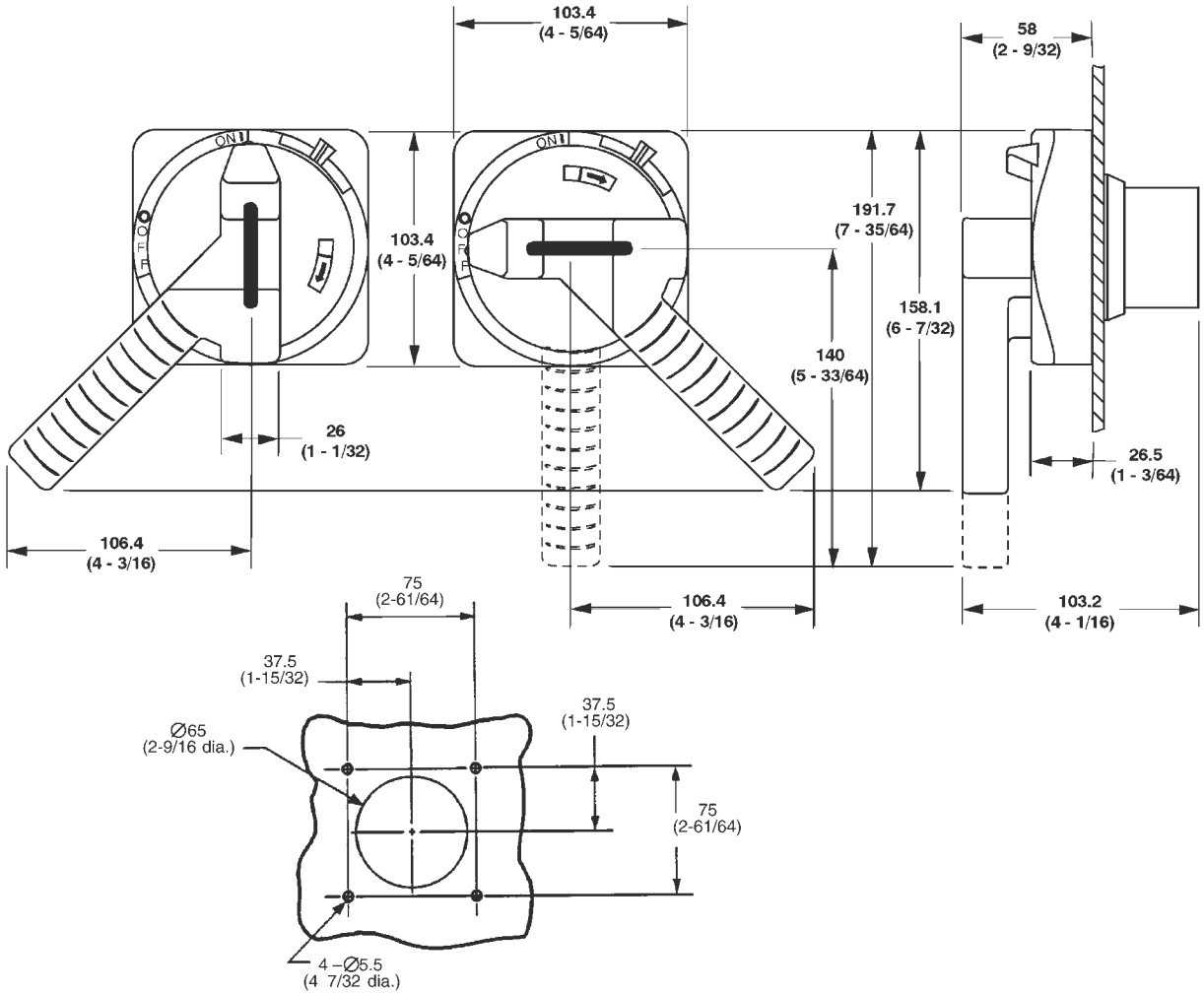
Disconnect Switch Dimension References C1, C2, D1, D2, E1, E2 and F1 (100, 200, and 400 A)

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



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)

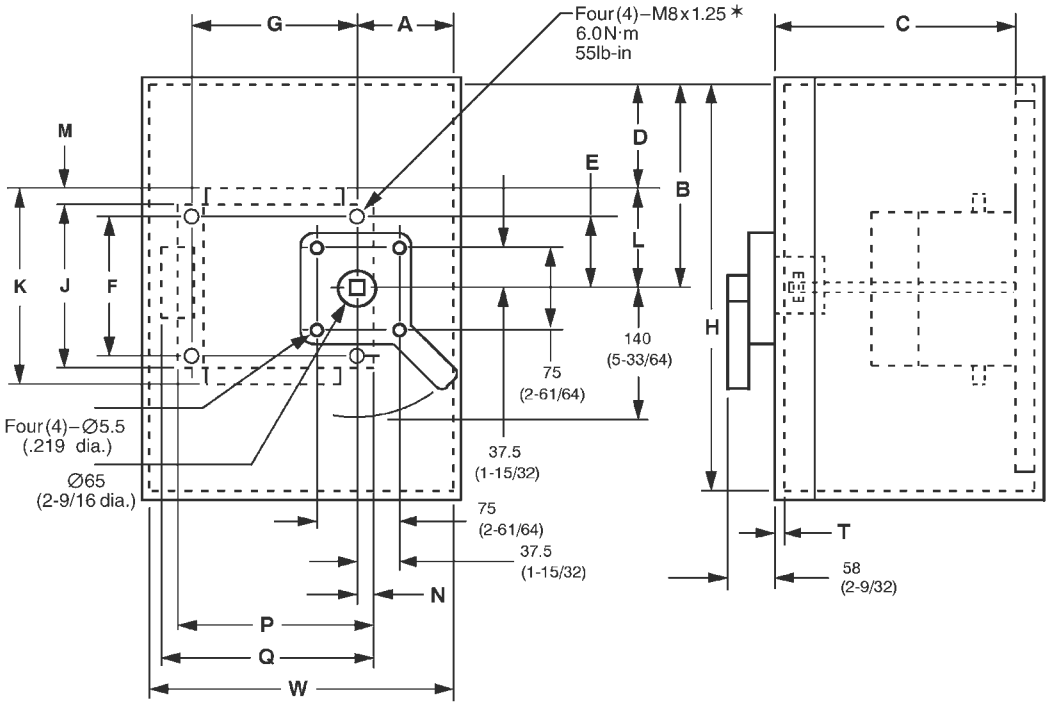
Operating Handles — Cat. No. 194R-HM…/190-HM



2

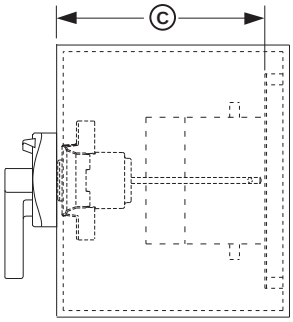
Disconnect Switch Dim. Ref.: C1, C2, D1, D2 (100 A and 200 A)

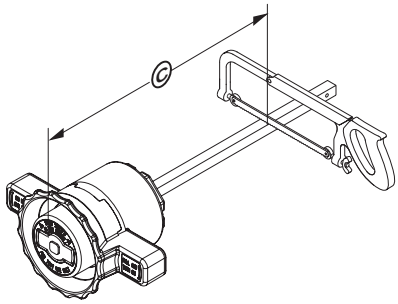
Dimensions in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.



✶The switch is capable of accepting four (4)Ø 6.4 (1/4 dia.) screws for mounting.

NFPA 79 Operating Handles/Shafts Cat. Nos. 194R-NHR...





Disconnect			Ⓒ
194R-NH100__ **194R-NJ100__** **194R-NN100__**	**194R-NJ200__** **194R-NN200__** **194R-NA400__**	**194R-NA380__** **194R-ND072__** **194R-ND138__**	**≥ 216 mm 8.5 in**
194R-NB200__ **194R-NB300__** **194R-ND250__**	**194R-ND300__** **194R-NH200__** **194R-NH400__**	**194R-NJ400__** **194R-NN400__**	**≥ 305 mm 12.0 in**

Enclosure Installation Dimensions

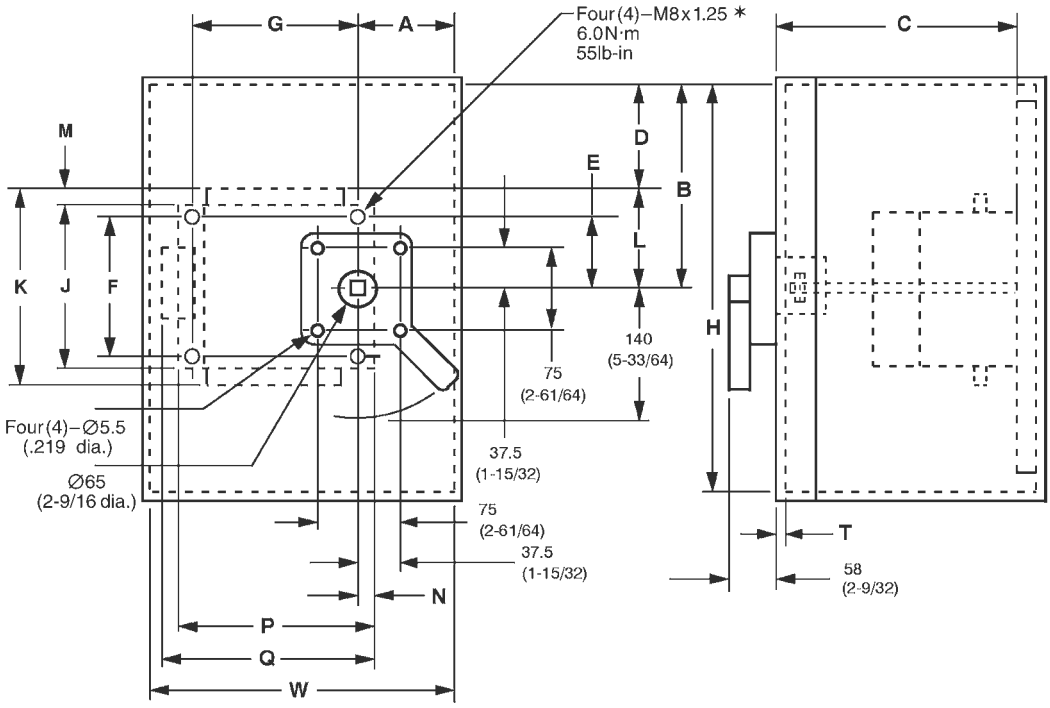
Dimension Reference	A	B	C		H	T		W	
								Minimum	
	Minimum	Minimum	Minimum	Maximum	Minimum	Minimum	Maximum	Single Pole Aux. Cont.	Two Pole Aux. Cont.
C1	108 (4-1/4)	162 (6-3/8)	162 (6-3/8)	457 (18)	330 (13)	1.6 (1/16)	4.8 (3/16)	301 (11-27/32)	313 (12-5/16)
C2	108 (4-1/4)	162 (6-3/8)	168 (6-5/8)	457 (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)

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)Ø 7.9 (5/16 dia.) screws for mounting.

Enclosure Installation Dimensions

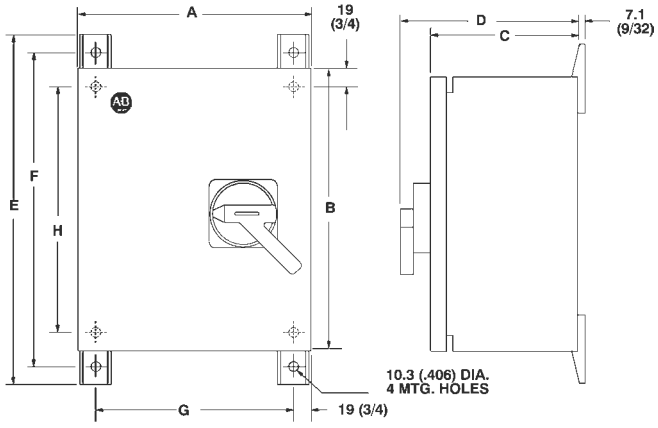
Dimension Reference	A	B	C		H	T		W	
								Minimum	
	Minimum	Minimum	Minimum	Maximum	Minimum	Minimum	Maximum	Single Pole Aux. Cont.	Two Pole Aux. Cont.
E1	108 (4-1/4)	305 (12)	227 (8-15/16)	610 (24)	610 (24)	1.6 (1/16)	4.8 (3/16)	394 (15-33/64)	406 (16)
E2	108 (4-1/4)	356 (14)	227 (8-15/16)	610 (24)	712 (28)	1.6 (1/16)	4.8 (3/16)	394 (15-33/64)	406 (16)
F1	108 (4-1/4)	381 (15)	243 (9-9/16)	610 (24)	762 (30)	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)

IP66 (Type 3/4/12) Watertight, Dusttight Sheet Metal Enclosure

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

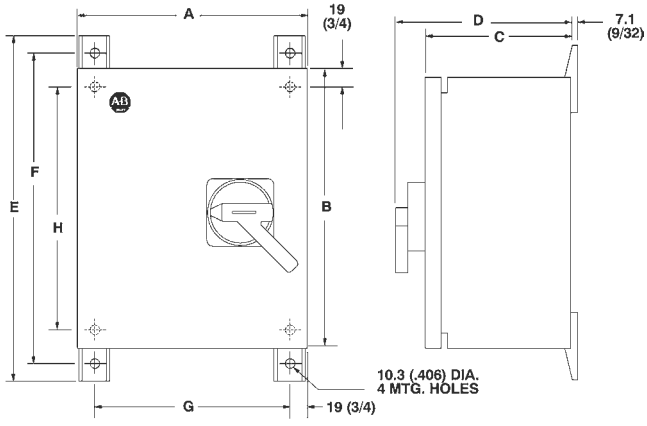


External Mounting Feet Optional Cat. No. 198-F3

[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)

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

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

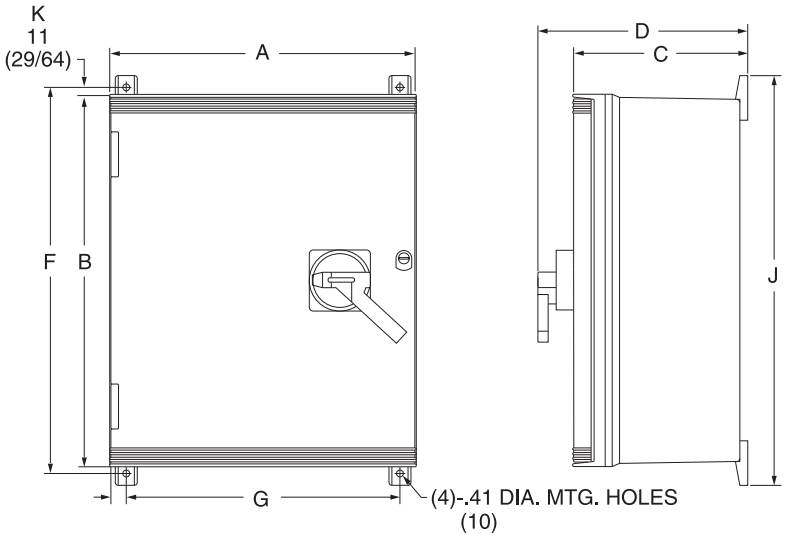


External Mounting Feet Optional Cat. No. 198-F3

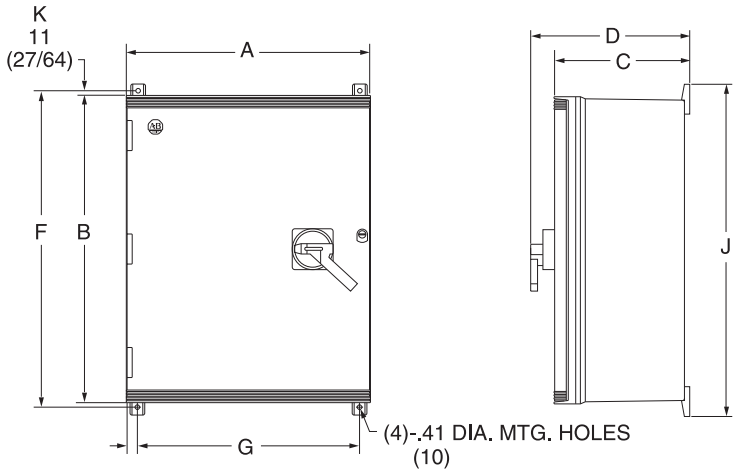
[A]	Type	Dim. Ref.	A	A1	B	C	D	E	F	G	H
100	Non-Fused & Fused	C1	508 (20)	—	406 (16)	224 (8-51/64)	282 (11-7/64)	484 (19-5/64)	444 (17-1/2)	470 (18-1/2)	368 (14-1/2)
200	Non-Fused & Fused	D1	406 (16)	—	610 (24)	224 (8-51/64)	282 (11-5/64)	484 (19-5/64)	444 (17-1/2)	572 (22-1/2)	368 (14-1/2)
400	Non-Fused & Fused	F1	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)

IP66 (Type 3/4/4X/12) Corrosion Resistant, Non-Metallic Enclosure

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



Cat. No. 194R-K_200P3 200 A Switch



Cat. No. 194R-K_400P3 400 A Switch

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)

2

Bulletin 194RS Preassembled Side-Mount Disconnect Switch

Bulletin 194RS NFPA 79 Compliant IEC Fused and Non-Fused Disconnects, Side-Mounted Style

- 30/60 A sizes
- Open switches
- Fused switch versions:
  – UL Class J, UL Class CC
- Non-fused switches
- Operating handle ingress ratings:
  – IP66 (Type 3R, 3, 12, 4, 4X)
- Pre-assembled, side-mounting bracketed disconnect interlock
- Padlockable handle

The Bulletin 194RS side-mount handle provides NFPA 79 compliancy with a bracketed switch and interlock system that is another Allen-Bradley exclusive. The 194R rotary handle is mounted to the side of the enclosure and attaches to the 194R bracketed 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.

Table of Contents

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 Pre-Assembled Side-Mount Handle Mechanism with Disconnect Switch

UL 98
CSA 22.2 No. 4

Standards Compliance for Enclosed Pre-Assembled 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
ASTA Certified
LOVAG Certified

Certifications for Pre-Assembled Side-Mount Handle Mechanism with Disconnect Switch

UL Listed (File No. E47426, Guide WHTY)
CSA Certified (File No. LR1234)

Certifications for Enclosed Pre-Assembled Side-Mount Handle Mechanism with Disconnect Switch

UL Listed (File No. E 227497, Guide WIAX)
CSA Certified (File No. LR1234)

Cat. No. Explanation

194RS	–	N	J	060	4E
		a	*b*	*c*	*d*	*f*

a

Code	Description
194RS	Side-Mounted Disconnect Switch with interlock

b

Code	Enclosure Type
N	Open

c

Code	Fuse Type
C	CC Fuse (30 A)
J	J Fuse (30…400 A)
N	Non-Fused

d

Code	Load Size (Class CC, J, Non-Fused)
030	30 A
060	60 A

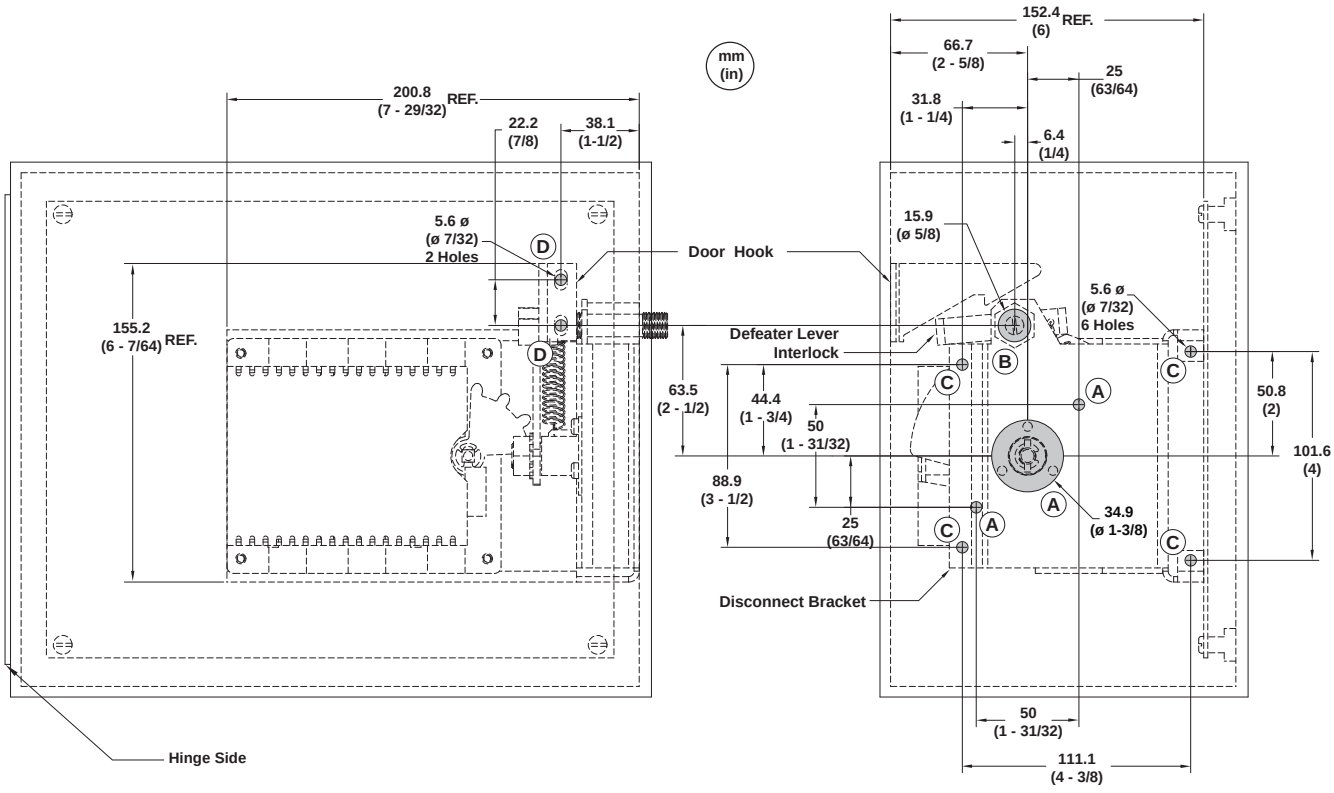
e ∗

Code	Handle Type
4	Type 4/4X Black
4E	Type 4/4X, Red/Yellow

∗ Side-mounted mechanism assembly and component gaskets meet UL Type 1/12 enclosure ratings at this time, even though handle meets UL 4/4X.

Visit our website: www.ab.com/catalogs
Preferred availability cat. nos. are printed in **bold**

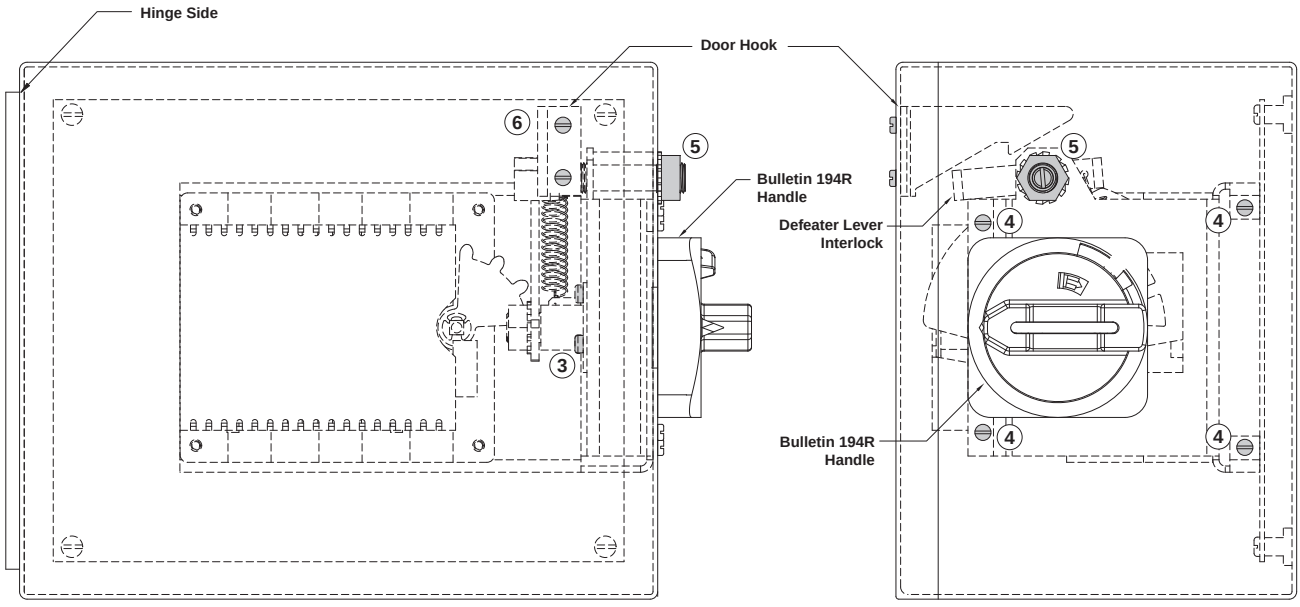
Dimensions in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.



FRONT VIEW

RIGHT SIDE VIEW

NOTE: 1) All dimensions reference inside wall.
2) Assembly and component gaskets meet UL Type 1/12 enclosure ratings.



FRONT VIEW

RIGHT SIDE VIEW

IEC Fused and Non-Fused Disconnects

Overview/Catalog Number Explanation

Bulletin 194RC NFPA 79 Compliant IEC Fused and Non-Fused Disconnects with Cable-Operated Handle for Flange-Style Enclosures

- 30 A size
- Open switches
- Fused switch versions:
  - – UL Class J, UL Class CC
- Non-fused switches
- Uses Bulletin 1494F handles
  - – IP66 (Type 3R, 3, 12, 4, 4X)
- Pre-assembled cable-operated disconnect with interlock
- Padlockable handle mounts to flange-styled enclosures
- Cable options available in 3…10 ft. lengths
- NFPA 2002 Compliant

Table of Contents

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 194RC cable-operated disconnect with interlock is another Rockwell Automation Allen-Bradley exclusive, providing a fully compliant solution to the 2002 changes in the National Fire Protection Association 79 (NFPA 79).

The new 194RC combines the small size of the 194R IEC disconnect with the flexibility of a cable-operated mechanism to provide an NFPA 79 IEC solution for flange style enclosures. The 194RC bracketed mechanism for 194R 30 A devices attaches to the current 194R disconnect switch base and operates the ON-OFF action via cable to a standard 1494F handle.

The 194RC handle/interlock mechanism provides the 'no-tools' operation and the secondary interlock as required by NFPA 79 2002 changes. The 194RC 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 is available in 3 different styles: plastic, stainless steel, or painted metal.

Cat. No. Explanation

194RC	–	N	J	030	P	4
a		*b*	*c*	*d*	*e*	*f*

a

Bulletin Number	
Code	Description
194RC	Cable-Operated Disconnect Switch with handle

b

Enclosure Type	
Code	Description
N	Open

c

Fuse Type	
Code	Description
C	CC Fuse (30 A)
J	J Fuse (30 A or 60 A)*
N	Non-Fused

d

Load Size	
Code	Description (Class CC, J, Non-Fused)
030	30 A
060	60 A

e

Handle Type	
Code	Description
P	Type 4/4X Black Plastic
M	Type 12 Metal
S	Type 4/4X Stainless Steel

f

Cable Length	
Code	Description
3	3 ft.
4	4 ft.
6	6 ft.
10	10 ft.

* 194RC 60 A version is under development at this time.

Visit our website: www.ab.com/catalogs
Preferred availability cat. nos. are printed in **bold**

Bulletin 194RC Installation

1. Install disconnect switch with four #10-32 screws (see ***Figure 1***).

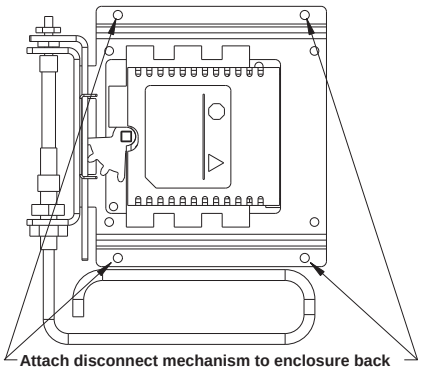


Figure 1 *Attaching Disconnect to Enclosure Back Panel*

2. Install handle to enclosure by placing the outer handle mechanism with the attached gasket over the enclosure cutout. Insert the top mounting screw with lockwasher through the enclosure and thread it into the outer handle mechanism for a few turns but not all the way (see ***Figure 2***).
3. Slide the toggle mechanism assembly over the top handle mounting screw. Insert the bottom handle mounting screw and lockwasher through the toggle mechanism assembly, through the enclosure and into the handle. Tighten both mounting screws to specified torque (see ***Figure 2***).
4. Assemble adapter link to actuator link. Tighten to specified torque (see ***Figure 3***).
5. Align adapter link with the bell crank. Attach bell crank to adapter link with shoulder bolt and nut. Tighten to specified torque (see ***Figure 4***).
6. Mount door hasp to handle using the two screws provided with the handle (see ***Figure 2***).
7. Operate handle mechanism to ensure functionality. To operate either close door or defeat door interlock.
8. If minor adjustments are necessary, refer to adjustment checklist (page 2-450).
9. Install appropriate door hardware (supplied).

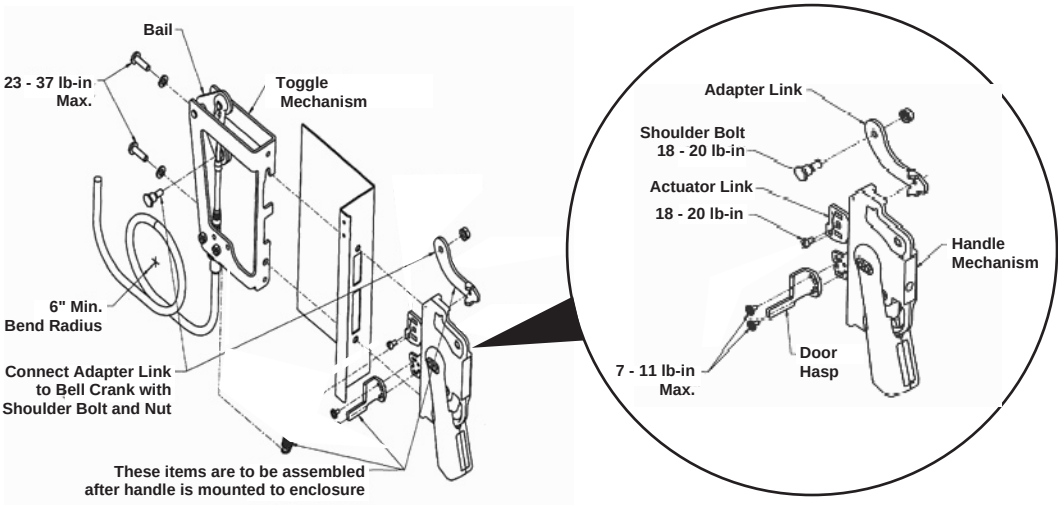


Figure 2 *Securing Toggle Mechanism and Handle to Flange*

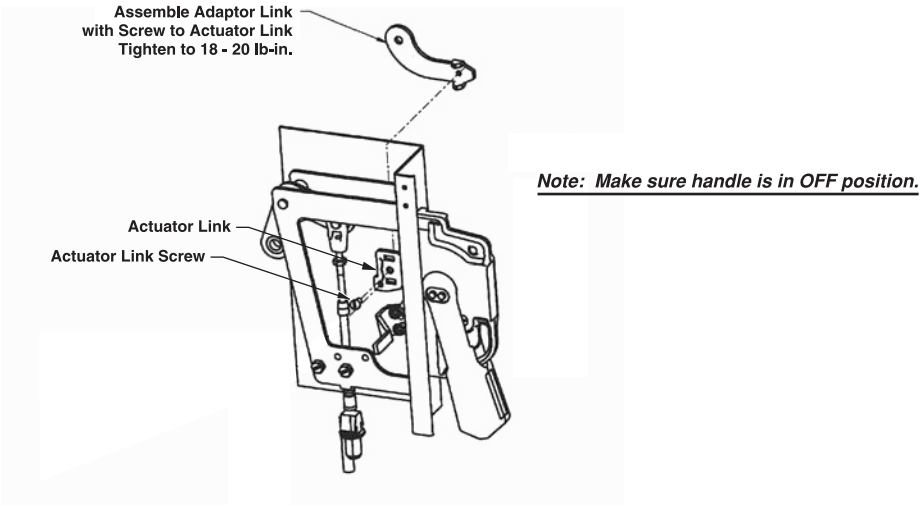


Figure 3 *Assembly of Adapter Link to Actuator Link*

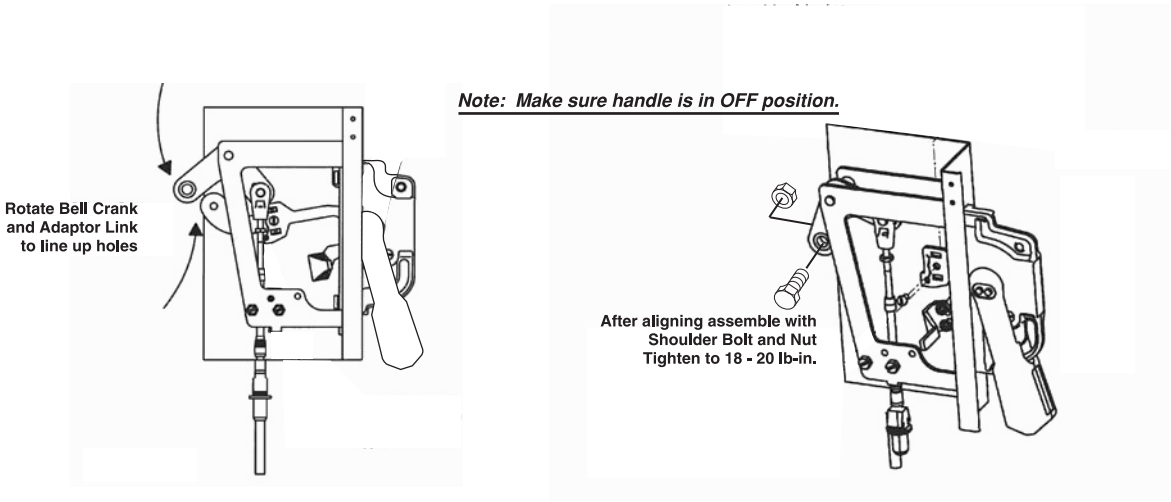


Figure 4 *Assembly of Adapter Link to Bell Crank Using Shoulder Bolt*

ATTENTION

Before any installation or maintenance is performed, make sure that the disconnect switch is not energized.

Adjustment Checklist

Situation:
Handle and Cable Operated Mechanism turns **ON**, but disconnect switch does not transition to **ON**.

Adjustment:
Loosen the lifting washer/nut while tightening the washer/lockwasher/nut, two or three turns should be sufficient (see ***Figure 5***).

➲ **NOTICE**
Check the OFF position of the actuator mechanism, that the lifting nut and sleeve of cable do not come into contact with the bulkhead connector (***Figure 5***). If they do, move the bulkhead connectors accordingly.

Situation:
Handle and Cable Operated Mechanism turns **OFF**, but disconnect switch does not transition to **OFF**.

Adjustment:
For the Cable Operated Disconnect Mechanism, loosen the washer/lockwasher/nut until the Disconnect Switch turns **OFF** with positive action. Tighten both nuts and recheck for **ON** and **OFF** positions (***Figure 5***).

NOTICE
Be certain after adjustment to have a minimum of 1 thread past the washer/lockwasher/nut assembly (***Figure 5***). If any other adjustment problems should arise, contact your local Allen-Bradley representative.

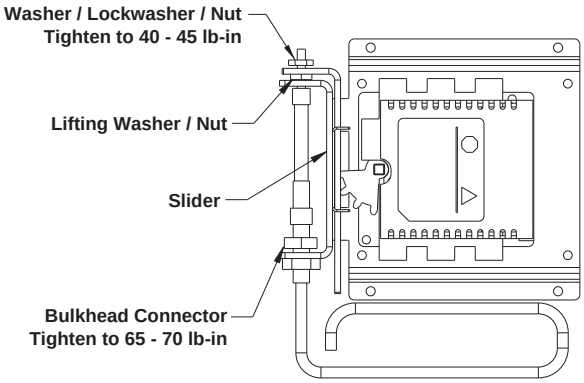
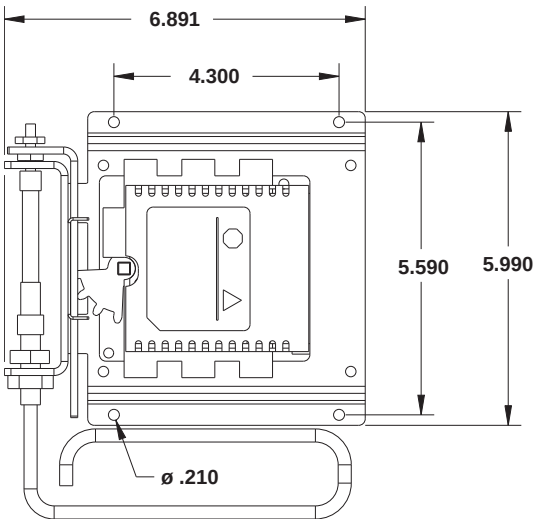


Figure 5 *Cable Operated Disconnect Mechanism*

Dimensions

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



2

Installation Instructions for Door Interlock

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

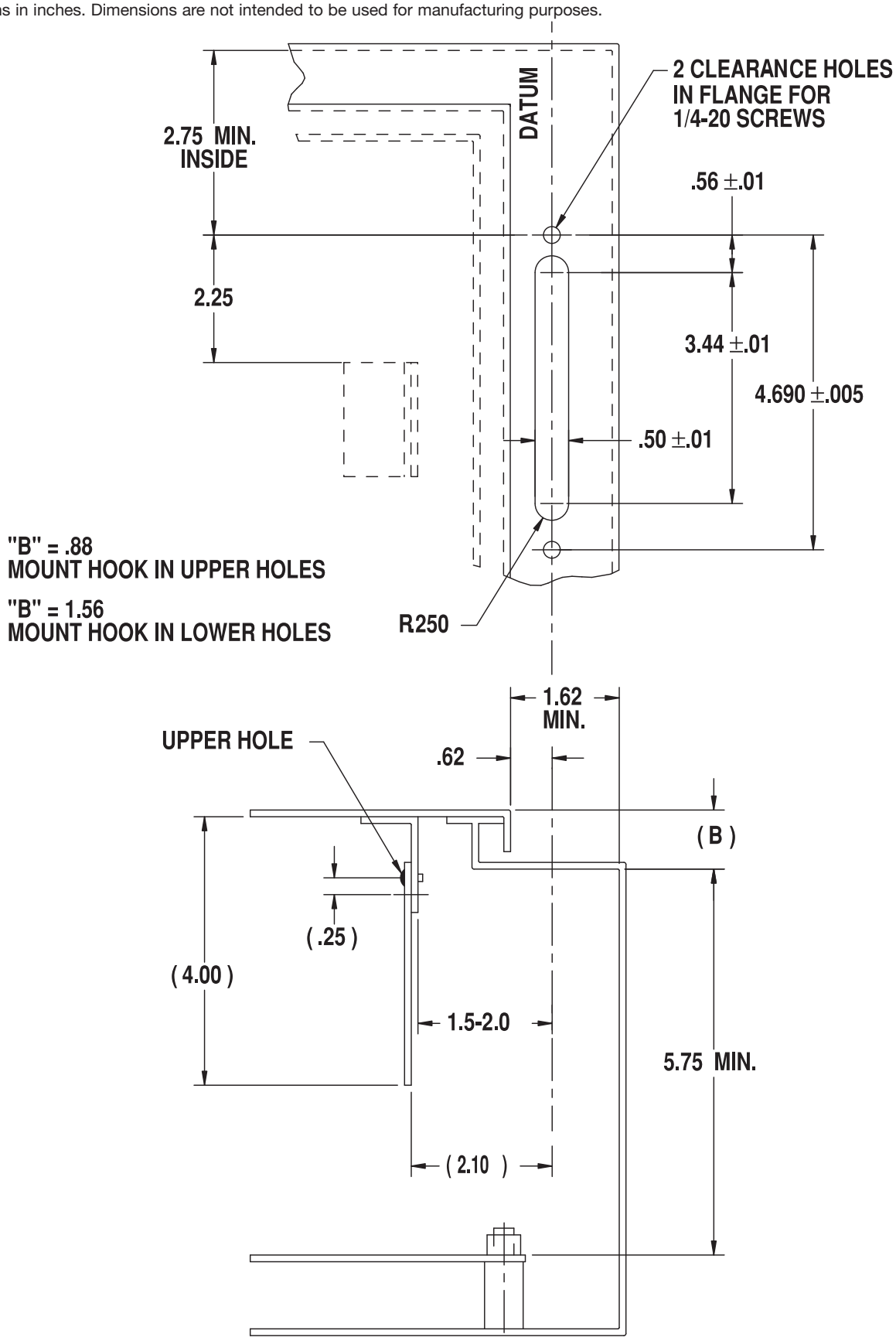


Figure 6 *Flange Drilling Plan for Handle and Interlock Blade Mounting Dimensions*

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

Standards Compliance

IEC 60947-3
CSA 22.2 No. 5
UL 489

Certifications

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

2

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)	**194R-R1**
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 2-428.

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**