Allen-Bradley

Motor Protection Circuit Breaker and Motor Circuit Protector Specifications

Bulletin Number 140M

Summary of Changes

This publication updates current rating information beginning on page 22.

Additional Resources

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

Resource	Description
Use of Motor Protection Circuit Breakers with Variable- Frequency Drives, publication 140M-AT002	Provides application information about using 140M devices with variable-frequency drives.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.ab.com	Provides declarations of conformity, certificates, and other certification details.

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

Notes:

Overview

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 two cULus Listings - as Manual, Self-Protected Combination Motor Controllers and as Manual Motor Controllers (with optional approvals for Motor Disconnect and Group Installation). Cat. No. 140M-D8V* can also be applied at the output of a variable frequency drive (VFD) in multi-motor applications.

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).

Standards Compliance and Certifications

Standards Compliance	Certifications
IEC/EN60947-1,-2,-4-1,-5-1	CE Marked
IEC/EN60204-1	CCC
CSA,C22.2 No.14	CSA Certified
UL508	cULus Listed (File No. E54612, NLRV(7); E205542, NKJH(7); E197878, DIVQ(7);)
	ATEX

				
	C-Frame	**D-Frame**	**F-Frame**	**CMN-Frame**
Max. Current I_e	32 A	32 A	45 A	90 A
Current Rating	0.1…32 A	1.6…32 A	6.3…45 A	16…90 A
Short Circuit Protection	✓	✓	✓	✓
Standard Magnetic T rip	✓	✓	✓	✓
High Magnetic Trip	✓	✓	✓	✓
Magnetic Only Trip (MCP)	✓	✓	✓	—
Overload Protection	✓	✓	✓	✓
Trip Class	10	10	10	10
Application at output of VFD (multi-motor)		✓ (140M-D8V)		
Standards Compliance:				
CSA22.2, No.14	✓	✓	✓	✓
UL508 (Group Installation)	✓ (see ratings)	✓ (see ratings)	✓ (see ratings)	✓ (see ratings)
UL508 Manual, Self Protected (Type E)	✓ (see ratings)	✓ (see ratings)	✓ (see ratings)	—
UL508 (Overload Protection)	✓	✓	✓	✓
IEC60947-1,-2	✓	✓	✓	✓
IEC60947-4-1	✓	✓	✓	—
CE	✓	✓	✓	✓
ATEX (IEC60079-14)	✓ (up to 25 A)	✓ (up to 25 A; except 140M-D8V)	—	—
CCC	✓ (up to 25 A)	✓ (up to 25 A)	✓	—
Accessories				
External Rotary Operator	✓	✓	✓	✓
Auxiliary Contacts	✓	✓	✓	✓
Trip Indication Contacts	✓	✓	✓	✓

Catalog Number Explanation

Examples given in this section are not intended to be used for product selection.

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 Breaker

b	
Frame/Rating	
Code	**Description**
C	32 A
D	32A
F	45A

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 I_n)
T	Adj Thermal/Fixed Mag (Fixed at 16...20 x I_n)
V	Adj Thermal/Fixed Mag application at output of VFD (multi-motor)

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		
Miscellaneous		
Code	**Description**	**Frame Size**
KN	Black Lockable Knob	C,D,F,CMN
KRY	Red/Yellow Lockable Knob	C,D,F,CMN
TE	Spacing Adapter for Self-Protected Starters (TypeE)	C,D,F
MT	STD BusBar Mount, Top	C,D,F,CMN

g			
Auxiliary Trip Contacts			
C, D, F Frames			
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	2N.O.	K	1 N.C. (SC+OL) + 1 N.C. (SC)
E	2N.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)

h			
UV and Shunt Trips			
C, D, F Frame			
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, 60Hz
		T	277V AC, 60 Hz
		N	380. . .400V AC, 50 Hz
		B	480V AC, 60Hz and 415V AC, 50 Hz
		VC	600V AC, 60Hz
		M	575V AC, 60Hz and 500V AC, 50 Hz

Application Diagrams

Group Installation with MPCBs

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

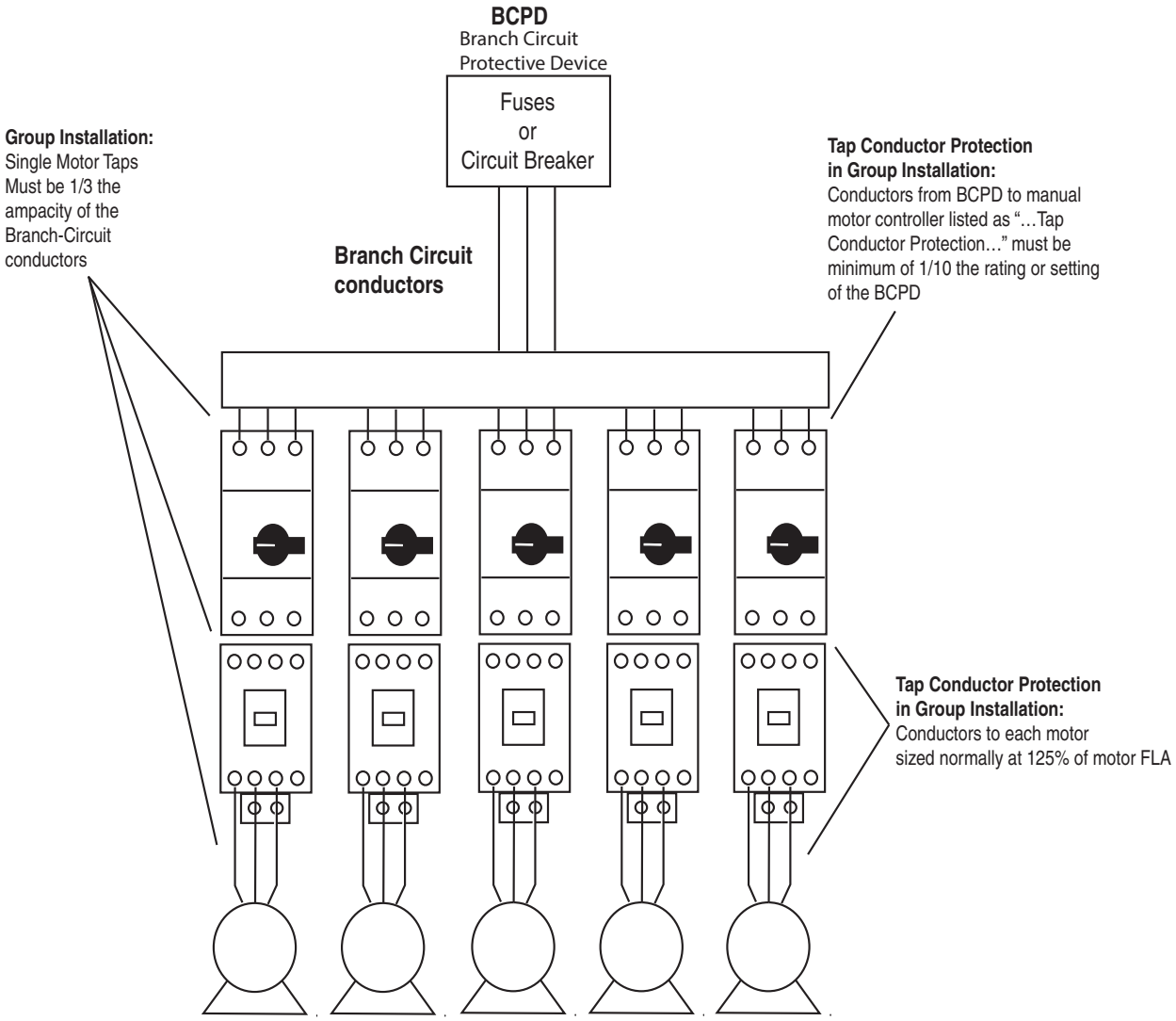
Group installation has been successfully used for many years in the U.S. and Canada. It allows "two or motors or one or more motors and other loads to be connected to the same branch-circuit…". The most restrictive part of the conditions specified for Group Installation is the requirement for the protection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

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

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

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

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

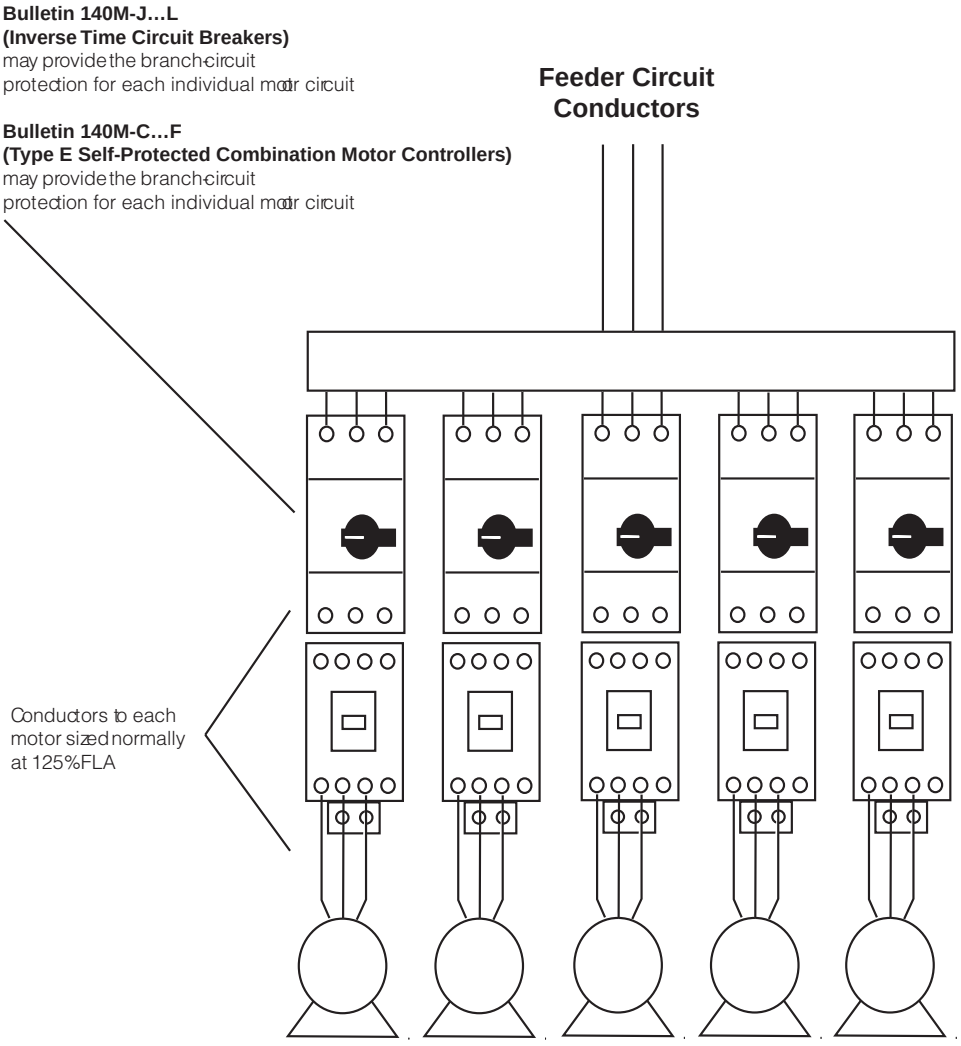


Multiple Motor Installation with MPCBs

Each Motor has an Individual Branch Circuit Protective Device

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

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



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 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 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.

Overview

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).

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.

Standards Compliance and Certifications

Standards Compliance	Certifications
IEC/EN60947-1,-2,-4-1,-5-1	CE Marked
IEC/EN60204-1	CCC
CSA,C22.2 No.14	cULus Listed (File No. E54612, Guide No. NLRV, NLRV7)
UL508	

			
	C-Frame	**D-Frame**	**F-Frame**
Max. Current I_e	25 A	32A	45 A
Current Rating	0.16…2.5 A	2.5…32 A	25…45 A
Short Circuit Protection	✓	✓	✓
Standards Compliance:			
CSA22.2, No.14	✓	✓	✓
UL508 (Group Installation)	✓	✓	✓
IEC60947-2	✓	✓	✓
CE	✓	✓	✓
CCC	✓	✓ (up to 25 A)	✓
Accessories			
External Rotary Operator	✓	✓	✓
Auxiliary Contacts	✓	✓	✓
Trip Indication Contacts	✓	✓	✓

Catalog Number Explanation

Examples in this section are not intended to be used for product selection.

140M	–	C	2	N	–	A63	–	KN	–	CC	–	GJ
a		b	c	d		e		f		g		h

a	
Bulletin Number	
Code	**Description**
140M	Motor Circuit Protector

b	
Frame/Rating	
Code	**Description**
C	25 A
D	32A
F	45A

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

d	
Protection Type	
Code	**Description**
N	Fixed Mag only (13 x I_n)
P	Adj Mag only (<13 x I_n)
R	Adj Mag only (>13 x I_n)

e		
Current Range		
Code	**Description**	**Example**
A	A=0.10	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		
Miscellaneous		
Code	**Description**	**Frame Size**
KN	Black Lockable Knob	C,D,F,CMN
KRY	Red/Yellow Lockable Knob	C,D,F,CMN
TE	Spacing Adapter for Self-Protected Starters (Type E)	C,D,F
MT	STD BusBar Mount, Top	C,D,F,CMN

g			
Auxiliary Trip Contacts			
C, D, F Frames			
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	2N.O.	K	1 N.C. (SC+OL) + 1 N.C. (SC)
E	2N.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)

h			
UV and Shunt Trips			
C, D, F Frame			
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, 60Hz
		T	277V AC, 60 Hz
		N	380…400V AC, 50 Hz
		B	480V AC, 60Hz and 415V AC, 50 Hz
		VC	600V AC, 60Hz
		M	575V AC, 60Hz and 500V AC, 50 Hz

Application Diagrams

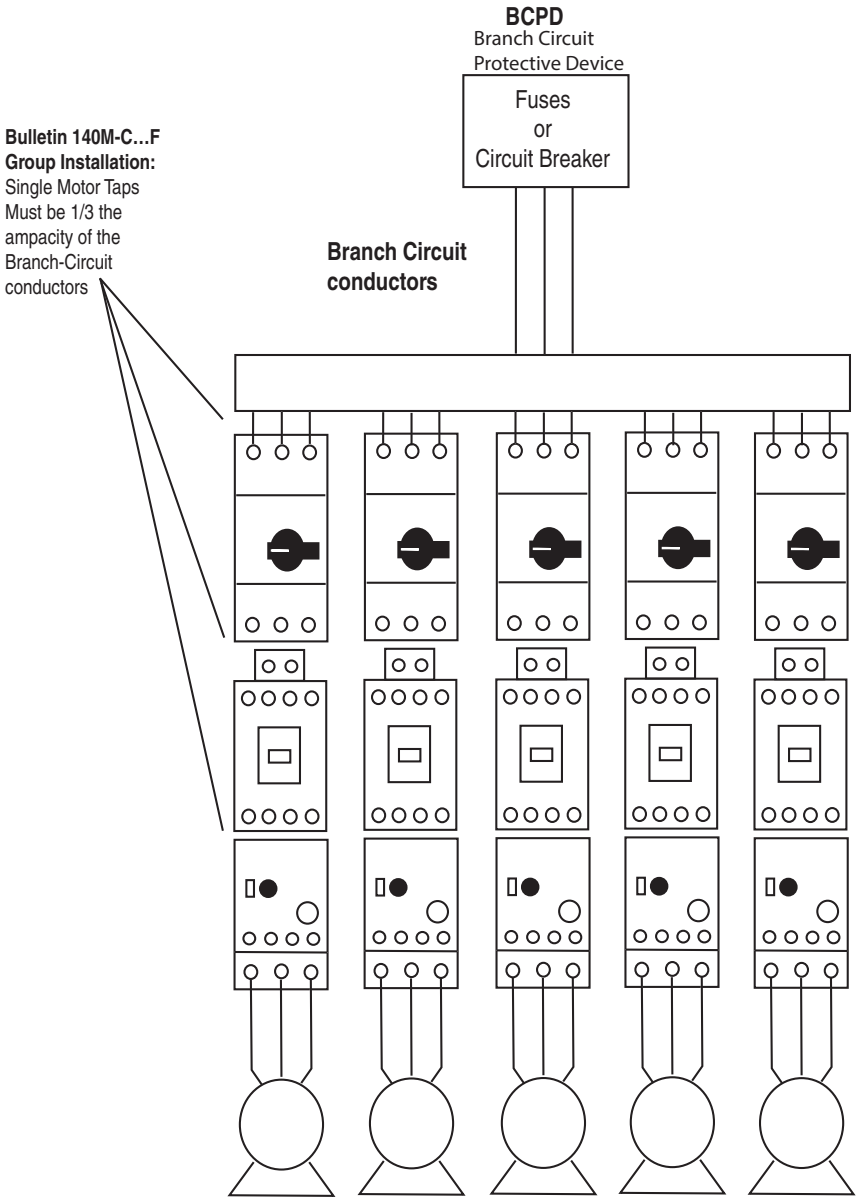
Group Installation with MCPs

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

Group installation has been successfully used for many years in the U.S. and Canada. It allows "two or motors or one or more motors and other loads to be connected to the same branch-circuit…". The most restrictive part of the conditions specified for Group Installation is the requirement for the protection of the conductors for each motor circuit.
Below is an example that illustrates installations involving multiple motors with a single BCPD protecting the entire "Group".

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

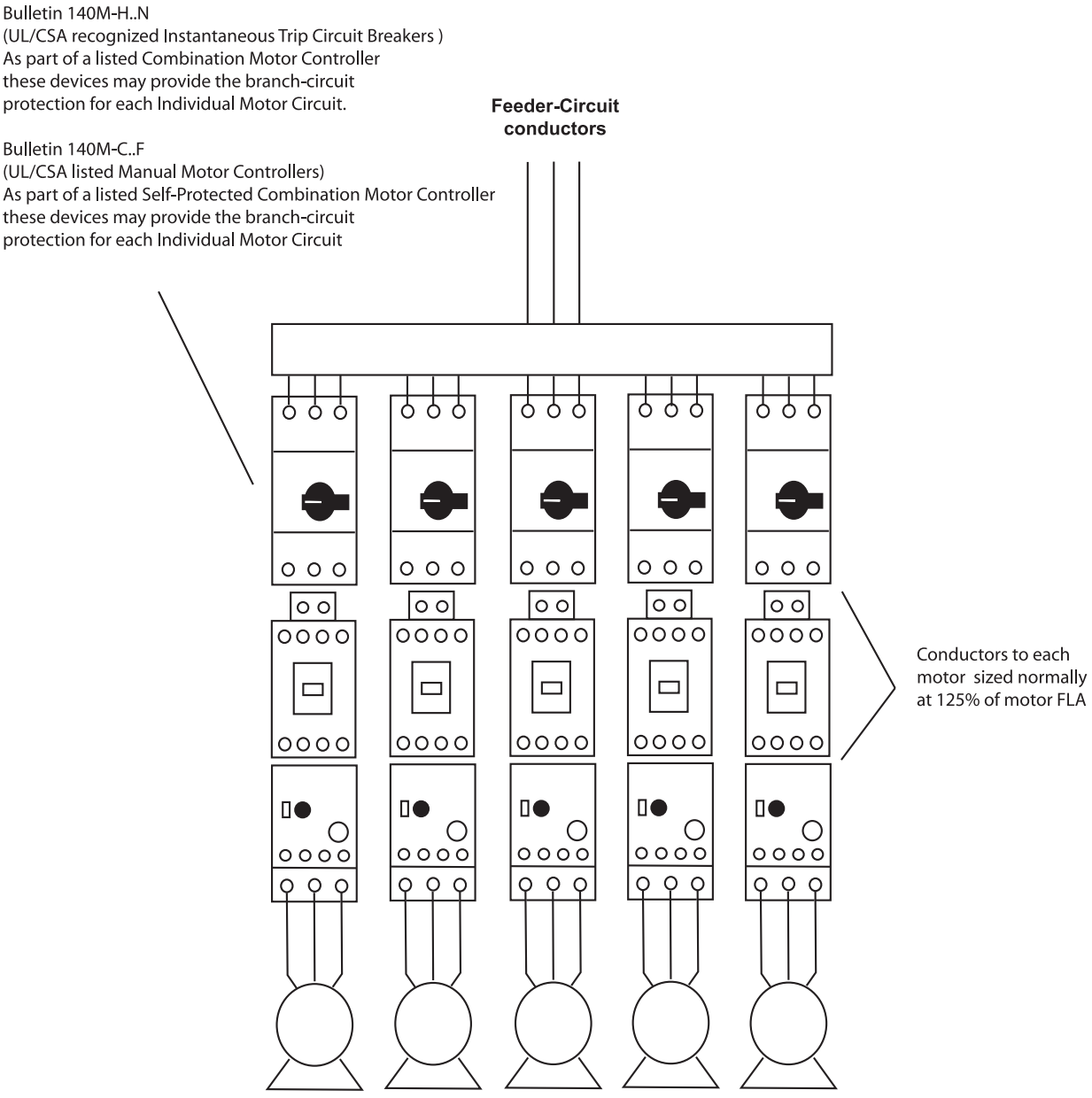
Conductors from the BCPD to each motor must be a minimum of 1/3 the ampacity of the Branch Circuit conductors.
Motor Circuit Protectors do not provide thermal protection, so a separate overload relay must be used.
Therefore, MCPs cannot be UL/CSA Listed for Tap Conductor Protection in Group Installations.



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).



Application Ratings

UL/CSA Listed Application Ratings, Motor Protection Circuit Breaker Only

Cat. No.	UL 508 — Manual Motor Controller							UL 508 Self-Protected (Type E) Combination Motor Controller	
	Max. Fuse or C.B. per NEC	Group Motor Installation		Motor Disconnect		Tap Conductor Protection			
		Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]	
		480V	600V	480V	600V	480Y/277V(1)	600Y/347V(1)	480Y/277V(1)	600Y/347V(1)
C-Frame									
140M-C2E-A16	450	65	47	65	47	65	47	65	47
140M-C2E-A25	450	65	47	65	47	65	47	65	47
140M-C2E-A40	450	65	47	65	47	65	47	65	47
140M-C2E-A63	450	65	47	65	47	65	47	65	47
140M-C2E-B10	450	65	47	65	47	65	47	65	47
140M-C2E-B16	450	65	47	65	47	65	47	65	47
140M-C2E-B25	450	65	30	65	30	65	30	65	30
140M-C2E-B40	450	65	25	65	25	65	25	65	25
140M-C2E-B63	450	65	30	65	30	65	—	65	—
140M-C2E-C10	450	65	30	65	30	65	—	65	—
140M-C2E-C16	450	30	30	30	30	30	—	30	—
140M-C2E-C20	450	30	30	10	10	10	—	10	—
140M-C2E-C25	450	25	10	10	5	—	—	—	—
140M-C2E-C29	450	25	5	10	—	—	—	—	—
140M-C2E-C32	450	25	5	10	—	—	—	—	—
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 (D8E)									
140M-D8E-B25	450	65	30	65	30	65	30	65	30
140M-D8E-B40	450	65	30	65	30	65	30	65	30
140M-D8E-B63	450	65	30	65	30	65	30	65	30
140M-D8E-C10	450	65	30	65	30	65	30	65	30
140M-D8E-C16	450	65	30	65	30	65	30	65	30
140M-D8E-C20	450	65	30	65	30	65	—	65	—
140M-D8E-C25	450	30	30	30	30	30	—	30	—
140M-D8E-C29	450	30	30	30	18	—	—	—	—
140M-D8E-C32	450	30	30	30	18	—	—	—	—

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

Cat. No.	UL 508 — Manual Motor Controller							UL 508 Self-Protected (Type E) Combination Motor Controller	
	Max. Fuse or C.B. per NEC	Group Motor Installation		Motor Disconnect		Tap Conductor Protection			
		Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]	
		480V	600V	480V	600V	480Y/277V(1)	600Y/347V(1)	480Y/277V(1)	600Y/347V(1)
D-Frame (D8V, D8T)									
140M-D8T-C16	450	65	30	65	30	65	30	65	30
140M-D8T-C20	450	30	30	30	30	30	—	30	—
140M-D8V-B16	450	65	—	65	—	65	—	65	—
140M-D8V-B25	450	65	—	65	—	65	—	65	—
140M-D8V-B40	450	65	—	65	—	65	—	65	—
140M-D8V-B63	450	65	—	65	—	65	—	65	—
140M-D8V-C10	450	65	—	65	—	65	—	65	—
140M-D8V-C16	450	65	—	65	—	65	—	65	—
140M-D8V-C20	450	65	—	65	—	65	—	65	—
140M-D8V-C25	450	30	—	30	—	30	—	30	—
140M-D8V-C29	450	30	—	30	—	—	—	—	—
140M-D8V-C32	450	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	—
140M-F8T-C25	600	65	30	65	30	65	30	65	30
140M-F8T-C32	600	65	18	65	18	65	18	65	18

(1) 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 Protector Only (Separate Overload Protection Required)

Cat. No.	UL 508 — Manual Motor Controller				
	Max. Fuse or C.B. per NEC	Group Motor Installation		Motor Disconnect	
		Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]	
		480V	600V	480V	600V
C-Frame					
140M-C2N-A16	450	65	47	65	47
140M-C2N-A25	450	65	47	65	47
140M-C2N-A40	450	65	47	65	47
140M-C2N-A63	450	65	47	65	47
140M-C2N-B10	450	65	47	65	47
140M-C2N-B16	450	65	47	65	47
140M-C2N-B25	450	65	30	65	30
D-Frame					
140M-D8N-B25	450	65	30	65	30
140M-D8N-B40	450	65	30	65	30
140M-D8N-B63	450	65	30	65	30
140M-D8N-C10	450	65	30	65	30
140M-D8N-C16	450	65	30	65	30
140M-D8N-C25	450	30	30	30	30
140M-D8N-C32	450	30	30	30	18
F-Frame					
140M-F8N-C25	600	65	30	65	30
140M-F8N-C32	600	65	30	65	30
140M-F8N-C45	600	65	18	65	18

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

Cat. No.	UL 508 — Manual Motor Controller						UL508 Type F Combination Motor Controller		
	Max. Fuse or C.B. per NEC	Minimum Contactor Size	Group Motor Installation		Motor Disconnect		Minimum Contactor Size	Max. Short Circuit Current [kA]	
			Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]			480Y/277V(1)	600Y/347V(1)
			480V	600V	480V	600V			
C-Frame									
140M-C2E-A16	450	100-K05	65	47	65	47	100-K05	65	47
140M-C2E-A25	450	100-K05	65	47	65	47	100-K05	65	47
140M-C2E-A40	450	100-K05	65	47	65	47	100-K05	65	47
140M-C2E-A63	450	100-K05	65	47	65	47	100-K05	65	47
140M-C2E-B10	450	100-K05	65	47	65	47	100-K05	65	47
140M-C2E-B16	450	100-K05	65	47	65	47	100-K05	65	47
140M-C2E-B25	450	100-K05	65	30	65	30	100-K05	65	30
140M-C2E-B40	450	100-K05	65	30	65	30	100-K05	65	30
140M-C2E-B63	450	100-K05	65	30	65	30	100-K05	65	—
140M-C2E-C10	450	100-K09	65	30	65	30	100-K09	65	—
140M-C2E-C16	450	100-K12	30	30	30	30	100-K12	30	—
D-Frame									
140M-D8E-B25	450	100-K05	65	30	65	30	100-K05	65	30
140M-D8E-B40	450	100-K05	65	30	65	30	100-K05	65	30
140M-D8E-B63	450	100-K05	65	30	65	30	100-K05	65	30
140M-D8E-C10	450	100-K09	65	30	65	30	100-K09	65	30
140M-D8E-C16	450	100-K12	65	30	65	30	100-K12	65	30

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

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

Cat. No.	UL 508 — Manual Motor Controller						UL508 Type F Combination Motor Controller			UL508 Type E Self-Protected Combination Motor Controller		
	Max. Fuse or C.B. per NEC	Minimum Contactor Size	Group Motor Installation		Motor Disconnect		Minimum Contactor Size	Max. Short Circuit Current [kA]		Minimum Contactor Size	Max. Short Circuit Current [kA]	
			Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]							
			480V	600V	480V	600V		480Y/ 277V(1)	600Y/ 347V(1)		480Y/ 277V(1)	600Y/ 347V(1)
C-Frame												
140M-C2E-A16	450	100-C09	65	47	65	47	100-C09	65	47	100-C09	65	47
140M-C2E-A25	450	100-C09	65	47	65	47	100-C09	65	47	100-C09	65	47
140M-C2E-A40	450	100-C09	65	47	65	47	100-C09	65	47	100-C09	65	47
140M-C2E-A63	450	100-C09	65	47	65	47	100-C09	65	47	100-C09	65	47
140M-C2E-B10	450	100-C09	65	47	65	47	100-C09	65	47	100-C09	65	47
140M-C2E-B16	450	100-C09	65	47	65	47	100-C09	65	47	100-C09	65	47
140M-C2E-B25	450	100-C09	65	30	65	30	100-C09	65	30	100-C09	65	30
140M-C2E-B40	450	100-C09	65	30	65	30	100-C09	65	30	—	65	25
140M-C2E-B63	450	100-C09	65	30	65	30	100-C09	65	—	—	65	—
140M-C2E-C10	450	100-C09	65	30	65	30	100-C09	65	—	—	65	—
140M-C2E-C16	450	100-C12	30	30	30	25	100-C12	30	—	—	30	—
140M-C2E-C20	450	100-C16	30	30	30	30	100-C23	10	—	—	10	—
140M-C2E-C25	450	100-C23	30	30	10	10	—	—	—	—	—	—
	450	100-C30	30	30	30	30	—	—	—	—	—	—
140M-C2E-C29	450	100-C30	10	5	10	5	—	—	—	—	—	—
140M-C2E-C32	450	100-C37	10	5	10	5	—	—	—	—	—	—
D-Frame												
140M-D8E-B25	450	100-C09	65	30	65	30	100-C09	65	30	100-C09	65	30
	—	—	—	—	—	—	—	—	—	100-C23	65	30
140M-D8E-B40	450	100-C09	65	30	65	30	100-C09	65	30	100-C23	65	30
140M-D8E-B63	450	100-C09	65	30	65	30	100-C09	65	30	100-C30	65	30
140M-D8E-C10	450	100-C09	65	30	65	30	100-C09	65	30	100-C30	65	30
140M-D8E-C16	450	100-C12	65	30	65	30	100-C12	65	30	100-C30	65	30
140M-D8E-C20	450	100-C23	65	30	65	30	100-C23	65	—	100-C30	65	—
140M-D8E-C25	450	100-C23	65	30	65	30	100-C23	30	—	100-C30	30	—
140M-D8E-C29	450	100-C30	65	10	65	10	—	—	—	—	—	—
140M-D8E-C32	450	100-C37	65	10	65	10	—	—	—	—	—	—
F-Frame												
140M-F8E-C10	600	100-C30	65	30	65	30	100-C30	65	30	100-C30	65	30
140M-F8E-C16	600	100-C30	65	30	65	30	100-C30	65	30	100-C30	65	30
140M-F8E-C20	600	100-C30	65	30	65	30	100-C30	65	30	100-C30	65	30
140M-F8E-C25	600	100-C30	65	30	65	30	100-C30	65	30	100-C30	65	30
140M-F8E-C32	600	100-C30	65	30	65	30	100-C30	65	30	100-C30	65	30
140M-F8E-C45	600	100-C37	65	18	65	18	100-C37	65	—	100-C37	65	—

(1) 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 (Separate Overload Protection Required)

Cat. No.	UL 508 — Manual Motor Controller						UL508 Type E Self-Protected Combination Motor Controller		
	Max. Fuse or C.B. per NEC	Minimum Contactor Size	Group Motor Installation		Motor Disconnect		Minimum Contactor Size	Max. Short Circuit Current [kA]	
			Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]				
			480V	600V	480V	600V		480Y/277V(1)	600Y/347V(1)
C-Frame									
140M-C2N-A16	450	100-C09	65	47	65	47	100-C09	65	47
140M-C2N-A25	450	100-C09	65	47	65	47	100-C09	65	47
140M-C2N-A40	450	100-C09	65	47	65	47	100-C09	65	47
140M-C2N-A63	450	100-C09	65	47	65	47	100-C09	65	47
140M-C2N-B10	450	100-C09	65	47	65	47	100-C09	65	47
140M-C2N-B16	450	100-C09	65	47	65	47	100-C09	65	47
140M-C2N-B25	450	100-C09	65	30	65	30	100-C09	65	—
D-Frame									
140M-D8N-B25	450	100-C09	65	30	65	30	100-C09	65	—
	—	—	—	—	—	—	100-C23	65	30
140M-D8N-B40	450	100-C09	65	30	65	30	100-C23	65	30
140M-D8N-B63	450	100-C09	65	30	65	30	100-C30	65	30
140M-D8N-C10	450	100-C09	65	30	65	30	100-C30	65	30
140M-D8N-C16	450	100-C12	65	30	65	30	100-C30	65	30
140M-D8N-C25	450	100-C23	30	30	30	30	100-C30	65	—
140M-D8N-C32	450	100-C37	65	10	65	10	—	—	
F-Frame									
140M-F8N-C25	600	100-C23	65	30	65	30	100-C30	65	30
140M-F8N-C32	600	100-C30	65	30	65	30	100-C30	65	30
140M-F8N-C45	600	100-C37	65	18	65	18	100-C37	65	—

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

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]	Minimum Contactor Size
Standard Motor Protection	High Inrush Motor Protection	Motor Circuit Protection	400V	
C-Frame				
140M-C2E-A16	—	140M-C2N-A16	100	100-C09
140M-C2E-A25	140M-C2T-A16	140M-C2N-A25	100	100-C09
140M-C2E-A40	140M-C2T-A25	140M-C2N-A40	100	100-C09
140M-C2E-A63	140M-C2T-A40	140M-C2N-A63	100	100-C09
140M-C2E-B10	140M-C2T-A63	140M-C2N-B10	100	100-C09
140M-C2E-B16	140M-C2T-B10	140M-C2N-B16	100	100-C09
140M-C2E-B25	140M-C2T-B16	140M-C2N-B25	50	100-C09
140M-C2E-B40	140M-C2T-B25	—	50	100-C09
140M-C2E-B63	140M-C2T-B40	—	50	100-C09
140M-C2E-C10	140M-C2T-B63	—	50	100-C09
140M-C2E-C16	140M-C2T-C10	—	50	100-C12(1)
140M-C2E-C20	140M-C2T-C16	—	50	100-C23
140M-C2E-C25	—	—	15	100-C30
140M-C2E-C29	—	—	15	100-C30
140M-C2E-C32	—	—	15	100-C37
D-Frame				
140M-D8E-B25	—	140M-D8N-B25	100	100-C09
140M-D8E-B40	—	140M-D8N-B40	100	100-C09
140M-D8E-B63	—	140M-D8N-B63	100	100-C09
140M-D8E-C10	—	140M-D8N-C10	65	100-C09
140M-D8E-C16	—	140M-D8N-C16	65	100-C12
140M-D8E-C20	140M-D8T-C16	—	65	100-C23
140M-D8E-C25	140M-D8T-C20	140M-D8N-C25	50	100-C23
140M-D8E-C29	—	—	65	100-C30
140M-D8E-C32	—	140M-D8N-C32	65	100-C37
F-Frame				
140M-F8E-C10	—	—	100	100-C09
140M-F8E-C16	—	—	100	100-C12
140M-F8E-C20	—	—	100	100-C23
140M-F8E-C25	—	140M-F8N-C25	100	100-C30
140M-F8E-C32	140M-F8T-C25	140M-F8N-C32	100	100-C30
140M-F8E-C45	140M-F8T-C32	140M-F8N-C45	100	100-C37

(1) Cat. No. 100-C16 contactors Type 1 only

Type 2 Coordination, 480V

Cat. No.			Max. Short-Circuit Current [kA]	Minimum Contactor Size
Standard Motor Protection	High Inrush Motor Protection	Motor Circuit Protection	480V	
C-Frame				
140M-C2E-A16	—	140M-C2N-A16	65	100-C09
140M-C2E-A25	140M-C2T-A16	140M-C2N-A25	65	100-C09
140M-C2E-A40	140M-C2T-A25	140M-C2N-A40	65	100-C09
140M-C2E-A63	140M-C2T-A40	140M-C2N-A63	65	100-C09
140M-C2E-B10	140M-C2T-A63	140M-C2N-B10	65	100-C09
140M-C2E-B16	140M-C2T-B10	140M-C2N-B16	65	100-C09
140M-C2E-B25	140M-C2T-B16	140M-C2N-B25	50	100-C16
140M-C2E-B40	140M-C2T-B25	—	50	100-C30
140M-C2E-B63	140M-C2T-B40	—	50	100-C30
140M-C2E-C10	140M-C2T-B63	—	50	100-C30
140M-C2E-C16	140M-C2T-C10	—	10	100-C30
140M-C2E-C20	140M-C2T-C16	—	10	100-C30
140M-C2E-C25	—	—	10	100-C30
140M-C2E-C29	—	—	10	100-C30
140M-C2E-C32	—	—	10	100-C37
D-Frame				
140M-D8E-B25	—	140M-D8N-B25	65	100-C09
140M-D8E-B40	—	140M-D8N-B40	65	100-C09
140M-D8E-B63	—	140M-D8N-B63	65	100-C09
140M-D8E-C10	—	140M-D8N-C10	65	100-C09
140M-D8E-C16	—	140M-D8N-C16	65	100-C12
140M-D8E-C20	140M-D8T-C16	—	65	100-C23
140M-D8E-C25	140M-D8T-C20	140M-D8N-C25	65	100-C23
140M-D8E-C29	—	—	65	100-C30
140M-D8E-C32	—	140M-D8N-C32	65	100-C37
F-Frame				
140M-F8E-C10	—	—	65	100-C09
140M-F8E-C16	—	—	65	100-C12
140M-F8E-C20	—	—	65	100-C23
140M-F8E-C25	—	140M-F8N-C25	65	100-C30
140M-F8E-C32	140M-F8T-C25	140M-F8N-C32	65	100-C30
140M-F8E-C45	140M-F8T-C32	140M-F8N-C45	65	100-C37

Type 2 Coordination, 600V

Cat. No.			Max. Short-Circuit Current [kA]	Minimum Contactor Size
Standard Motor Protection	High Inrush Motor Protection	Motor Circuit Protection	600V	
C-Frame				
140M-C2E-A16	—	140M-C2N-A16	47	100-C09
140M-C2E-A25	140M-C2T-A16	140M-C2N-A25	47	100-C09
140M-C2E-A40	140M-C2T-A25	140M-C2N-A40	47	100-C09
140M-C2E-A63	140M-C2T-A40	140M-C2N-A63	47	100-C09
140M-C2E-B10	140M-C2T-A63	140M-C2N-B10	47	100-C09
140M-C2E-B16	140M-C2T-B10	140M-C2N-B16	47	100-C09
140M-C2E-B25	140M-C2T-B16	140M-C2N-B25	10	100-C16
140M-C2E-B40	140M-C2T-B25	—	10	100-C16
140M-C2E-B63	140M-C2T-B40	—	5	100-C23
140M-C2E-C10	140M-C2T-B63	—	5	100-C30
140M-C2E-C16	140M-C2T-C10	—	5	100-C30
140M-C2E-C20	140M-C2T-C16	—	5	100-C30
140M-C2E-C25	—	—	5	100-C30
140M-C2E-C29	—	—	5	100-C30
140M-C2E-C32	—	—	5	100-C37
D-Frame				
140M-D8E-B25	—	140M-D8N-B25	30	100-C30
140M-D8E-B40	—	140M-D8N-B40	30	100-C30
140M-D8E-B63	—	140M-D8N-B63	30	100-C30
140M-D8E-C10	—	140M-D8N-C10	30	100-C30
140M-D8E-C16	—	140M-D8N-C16	30	100-C30
140M-D8E-C20	140M-D8T-C16	—	5	100-C30
140M-D8E-C25	140M-D8T-C20	140M-D8N-C25	5	100-C30
140M-D8E-C29	—	—	10	100-C30
140M-D8E-C32	—	140M-D8N-C32	10	100-C37
F-Frame				
140M-F8E-C10	—	—	30	100-C30
140M-F8E-C16	—	—	30	100-C30
140M-F8E-C20	—	—	30	100-C30
140M-F8E-C25	—	140M-F8N-C25	30	100-C30
140M-F8E-C32	140M-F8T-C25	140M-F8N-C32	30	100-C30
140M-F8E-C45	140M-F8T-C32	140M-F8N-C45	10	100-C37

Specifications

IEC Performance Data

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

⋆ No back-up fuse required.

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

⋆ No back-up fuse required.

		Cat. No. 140M-D8V-									
		B16	**B25**	**B40**	**B63**	**C10**	**C16**	**C20**	**C25**	**C29**	**C32**
Rated Operational Current, I_e	[A]	1.6	2.5	4	6.3	10	16	20	25	29	32
Magnetic Release Current	[A]	82	82	82	82	130	208	260	325	406	448
Switching of Standard Three-Phase Motors, AC-3											
230/240V	[kW]	0.25	0.37	0.75	1.5	2.2	4	5.5	5.5	7.5	7.5
400/415V	[kW]	0.55	0.75	1.5	2.2	4	7.5	10	11	13	15
500V	[kW]	0.75	1.1	2.2	3	6.3	10	11	15	18.5	20
Back-Up Fuses gG, gL, only if $I_{cc} \geq I_{cu}$											
230/240V	[A]	⋆	⋆	⋆	⋆	⋆	⋆	⋆	⋆	⋆	⋆
400/415V	[A]	⋆	⋆	⋆	⋆	⋆	⋆	100	100	125	125
440/460V	[A]	⋆	⋆	⋆	⋆	⋆	80	100	100	125	125
500V	[A]	⋆	⋆	⋆	⋆	⋆	80	80	80	100	100
Ultimate Short Circuit Breaking Capacity, I_{cu}											
230/240V	[kA]	65	65	65	65	65	65	65	65	65	65
400/415V	[kA]	65	65	65	65	65	65	65	65	50	50
440/460V	[kA]	65	65	65	65	50	50	50	50	25	25
500V	[kA]	65	65	65	65	50	50	50	50	25	25
Rated Service Short Circuit Breaking Capacity, I_{cs}											
230/240V	[kA]	65	65	65	65	65	65	65	65	50	50
400/415V	[kA]	65	65	65	65	65	50	25	25	25	25
440/460V	[kA]	65	65	65	65	50	50	25	25	20	20
500V	[kA]	65	65	65	65	50	50	25	25	20	20

		Cat.No.140M-C2N-						
		A16	**A25**	**A40**	**A63**	**B10**	**B16**	**B25**
Rated Operational Current, I_e	[A]	0.16	0.25	0.4	0.63	1	1.6	2.5
Magnetic Release Current	[A]	2.1	3.3	5.2	8.2	13	21	32
Switching of Standard Three-Phase Motors, AC-3								
230/240V	[kW]	—	—	0.06	0.09	0.18	0.25	0.37
400/415V	[kW]	0.02	0.04	0.09	0.18	0.25	0.55	0.75
500V	[kW]	0.06	0.09	0.12	0.18	0.37	0.75	1.1
690V	[kW]	0.06	0.09	0.18	0.25	0.55	1.1	1.8
Back-Up Fuses gG, gL, only if $I_{cc} \geq I_{cu}$								
230/240V	[A]	⋆	⋆	⋆	⋆	⋆	⋆	⋆
400/415V	[A]	⋆	⋆	⋆	⋆	⋆	⋆	⋆
440/460V	[A]	⋆	⋆	⋆	⋆	⋆	⋆	⋆
500V	[A]	⋆	⋆	⋆	⋆	⋆	⋆	⋆
690V	[A]	⋆	⋆	⋆	⋆	⋆	16	20
Ultimate Short Circuit Breaking Capacity, I_{cu}								
230/240V	[kA]	100	100	100	100	100	100	100
400/415V	[kA]	100	100	100	100	100	100	100
440/460V	[kA]	100	100	100	100	100	100	100
500V	[kA]	100	100	100	100	100	100	100
690V	[kA]	100	100	100	100	100	10	6
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	6

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

⋆ No back-up fuse required.

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

⋆ No back-up fuse required.

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

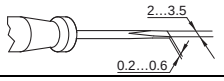
⋆ No back-up fuse required.
‡ Consult your local Rockwell Automation sales office or Allen-Bradley distributor.

General Data

Cat.No.		140M-C	140M-D	140M-F
Rated Insulation Voltage U_i				
IEC, SEV, VDE0660	[V]	690		
UL, CSA	[V]	600		
Rated Impulse Withstand Voltage U_{imp}				
Pollution degree		3		
Main circuits U_{imp}/Overvoltage Category		6kV/III		
Auxiliary circuits U_{imp}/Overvoltage Category		6kV/III		
Rated Frequency	[Hz]	50/60		
Utilization Category				
IEC60947-2 (Circuit breaker)		A		
IEC60947-4-1 (Motor starter)		AC-3		
Lifespan				
Mechanical	[operations]	100000		30000
Electrical (I_e max.)	[operations]	100000		30000
Switching Frequency	[operations/h]	max.25		

Cat.No.		140M-C	140M-D	140M-F
Ambient Temperature				
Storage	[°C]	-40…+80		
Operation	[°C]	-25…+60		
Climatic resistance				
Moisture change climate (600068-2-30)		23°C/83% relative humidity and 40°C/92% relative humidity, 56 cycles		
Dry heat (60086-2-2)		100°C, relative humidity <50%, 7 days		
Moisture heat (60068-2-3)		40°C, relative humidity 93%, 56 days		
Site Altitude	[m]	to 2000 N.N.		
Protection Class		140M-C; 140M-D : IP2X from all directions 140M-F : IP2X from front with front (upper) terminal wired		
Resistance to Shock, Transport (60068-2-27)		30 g,11ms,all axes		
Resistance to Vibration, Operation (60068-2-6)		5g		
Rated Thermal Current I_{th}				
up to 40°C ambient temperature	[A]	0.1…32	1.6…32 (1.0…32 for -D8V)	6.3…45
up to 60°C ambient temperature	[A]	0.1…32	1.6…32 (1.0…32 for -D8V)	6.3…45
Rated Supply Current I_e	[A]	0.1…32	1.6…32 (1.0…32 for -D8V)	6.3…45
Dependence on Temperature				
40°C	[A]	no reduction		
50°C	[A]	no reduction		
60°C	[A]	no reduction		
70°C	[A]	15% current reduction of the upper rated current I_e		
Overload Protection				
Characteristics		IEC 60947-4-1Motor protection (except Cat.Nos.140M-C2N,140M-D8N,140M-F8N)		
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		
Magnetic Release Release current(+/-20%)		fixed setting 13…14 x I_e max. (for 140M-C2E,140M-D8E,140M-F8E,140M-C2N,140M-D8N,140M-F8N) 16…21 x I_e max. (for 140M-C2T, 140M-D8T, 140M-F8T) I_e max. = maximum values of setting ranges fixed magnetic setting for 140M-D8V; see ratings		
Total Power Loss P_v				
Circuit Breaker at rated load operating temperature	[W]	6…11.5	6…11.6	9…16
Main Disconnect Switch Application		Yes, with accessories		
Application Conditions		For utilization outside North America, assemblies (of products) shall comply to the IEC61439-1 requirements		
		140M manual motor starters are intended for use in closed areas without hazardous operating conditions such as dust or explosive or corrosive gases. Enclosures of appropriate manner need to be in place to protect devices in such environments.		
Application Conditions (140M-D8V)		PWM frequency ≤ 4 kHz		
		VFD output frequency 0…400 Hz		

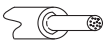
Cat.No.			140M-C…	140M-D…	140M-F…
Conformity to Standards			IEC60947-1;-2;-4-1; EN60947-1;-2;-4-1; UL508; CSA22.2, No.14		
Approvals			CE,UL,CSA		
Terminal Parts Type of terminals					
Screwdriver			PozidrivNo.2/BladeNo.3		PozidrivNo.2/BladeNo.3
	1.conductor	[mm^2]/[AWG]	1…6/No.16…10		2.5…25/No.14…4
	2.conductor	[mm^2]/[AWG]	1…4/No.16…10		2.5…25/No.14…4
	1.conductor	[mm^2]/[AWG]	1…6/No.16…10		2.5…25/No.14…4
	2.conductor	[mm^2]/[AWG]	1…6/No.16…10		2.5…25/No.14…4
	1.conductor	[mm^2]/[AWG]	1.5…6/No.16…8		16…25/No.14…4
	2.conductor	[mm^2]/[AWG]	1.5…6/No.16…8		16…25/No.14…4
	1.conductor	[mm^2]/[AWG]	1…6/No.16…10		2.5…10/No.14…8
	2.conductor	[mm^2]/[AWG]	1…6/No.16…10		2.5…10/No.14…8
Tightening torque		[N•m]/[lb•in]	2…2.5/18…22		3…3.5/27…30

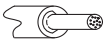
Cat.No.			140M-RC…
Terminal Parts Type of terminals			
Screwdriver			
	1.conductor	[mm^2]/[AWG]	0.5…2.5/—
	2.conductor	[mm^2]/[AWG]	0.5…2.5/—
	1.conductor	[mm^2]/[AWG]	0.5…2.5/No.18…12
	2.conductor	[mm^2]/[AWG]	0.5…2.5/No.18…12
	1.conductor	[mm^2]/[AWG]	1…4/No.16…12
	2.conductor	[mm^2]/[AWG]	1…4/No.16…12

Accessories for Bulletin 140M Motor Protection Circuit Breakers

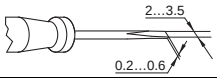
			Auxiliary Contact Blocks for Front Mounting Cat.No.140M-C-AFA…,140M-C-AFAR…			Auxiliary Contact Blocks for Right-Side Mounting Cat.No.140M-C-ASA…,140M-C-ASAR…				
Rated Thermal Current I_{th} at 40°C ambient temperature at 60°C ambient temperature		 [A] [A]	 5 4			 10 6				
Contact Class Coordination According to NEMA										
(UL/CSA Standards)		AC DC	B300 Q300			B600 Q600				
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			PozidrivNo.2/BladeNo.3							

			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…
	1.conductor	[mm^2]/[AWG]	0.5…1.5/18…14	0.5…2.5/18…14
	2.conductor	[mm^2]/[AWG]	0.75…1.5/18…14	0.75…2.5/18…14
	1.conductor	[mm^2]/[AWG]	0.75…1.5/18…14	0.75…2.5/18…14
	2.conductor	[mm^2]/[AWG]	0.75…1.5/18…14	0.75…2.5/18…14
	1.conductor	[mm^2]/[AWG]	0.75…1.5/18…14	0.75…2.5/18…14
	2.conductor	[mm^2]/[AWG]	0.75…1.5/18…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

			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 Drop-out			0.85…1.1 x U_s 0.7…0.35 x U_s	0.85…1.1 x U_s 0.7…0.35 x U_s	0.7…1.1 x U_s
Rated Control Voltage		min. max.	21V 50 Hz,24V 60 Hz 600V 50 Hz	21V 50 Hz,24V 60 Hz 600V 50 Hz	21V 50 Hz, 24V 60 Hz 600V 50 Hz
On-Time			100%	100%	AC: 100%; DC: max. 5 sec.
Coil Rating		Pull-in Hold	8.5VA, 8 W 4VA, 2 W	8.5VA, 8 W 4VA, 2 W	8.5VA, 8 W 4VA, 2 W
Terminal Parts Type of terminals					
Screwdriver			PozidrivNo.2/BladeNo.3		
	1.conductor	[mm^2]/[AWG]	0.5…2.5/No.18…14		
	2.conductor	[mm^2]/[AWG]	0.75…2.5/No.18…14		
	1.conductor	[mm^2]/[AWG]	0.75…2.5/No.18…14		
	2.conductor	[mm^2]/[AWG]	0.75…2.5/No.18…14		
	1.conductor	[mm^2]/[AWG]	0.75…2.5/No.18…14		
	2.conductor	[mm^2]/[AWG]	0.75…2.5/No.18…14		
Tightening torque		[N•m]/[lb•in]	1.2…1.5/10.6…13.3		

			Compact Busbar Feeder Terminal		Compact Busbar		Compact Busbar Feeder Block			
			140M-C-WTN 140M-C-WTEN	140M-F-WTE	140M-C-W…	140M-F-W…	140M-C-WBEL1,L2,L3	140M-C-WBET1,T2,T3	140M-F-WBEL1,L2,L3	140M-F-WBET1,T2,T3
Rated Thermal Current I_{th} at 60°C ambient temperature		[A]	64	120	64	120	64		IEC120/UL115	
	1.conductor	[mm^2]/[AWG]	2.5…25/14…4	—	—	—	4…25/10…4	for use with 140M-C-W	4…50/10…4	for use with 140M-F-W
	1.conductor	[mm^2]/[AWG]	2.5…25/14…4	4…50/12…1/0	—	—	4…25/10…4	for use with 140M-C-W	4…25/10…4	for use with 140M-F-W
	1.conductor	[mm^2]/[AWG]	2.5…25/14…4	2.5…50/12…1/0	—	—	2.5…25/14…4	for use with 140M-C-W	2.5…25/14…4	for use with 140M-F-W
Tightening torque		[N•m]/[lb•in]	3…3.5/27…31	5…6/45…54	—	—	3…3.5/27…31	2.5…3/23…27	5…6/45…54	

Accessories for Bulletin 140M Screwless

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

Weights

Description	Weight [g]	Cat.No.
Motor Protection Circuit Breakers	317	140MC-C2E-…
	373	140M-D8E-…
	782	140MC-F8E-…
	315	140M-C2N-…
	365	140M-D8N-…
	782	140M-F8N-…
	315	140M-C2T-…
	365	140M-D8T-…
	782	140M-F8T-…
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
Undervoltage Trip	108	140M-C-UX…
	110	140M-C-SN…
	116	140M-C-UC…

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

Cutoff Current

The Bulletin 140-M limits solid short-circuit current ICC (prospective short-circuit current). ID is the maximum cutoff 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.

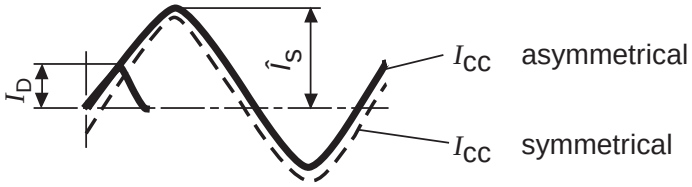


Figure 1 - Bulletin140M-C Circuit Breaker (Maximum Cutoff Current)

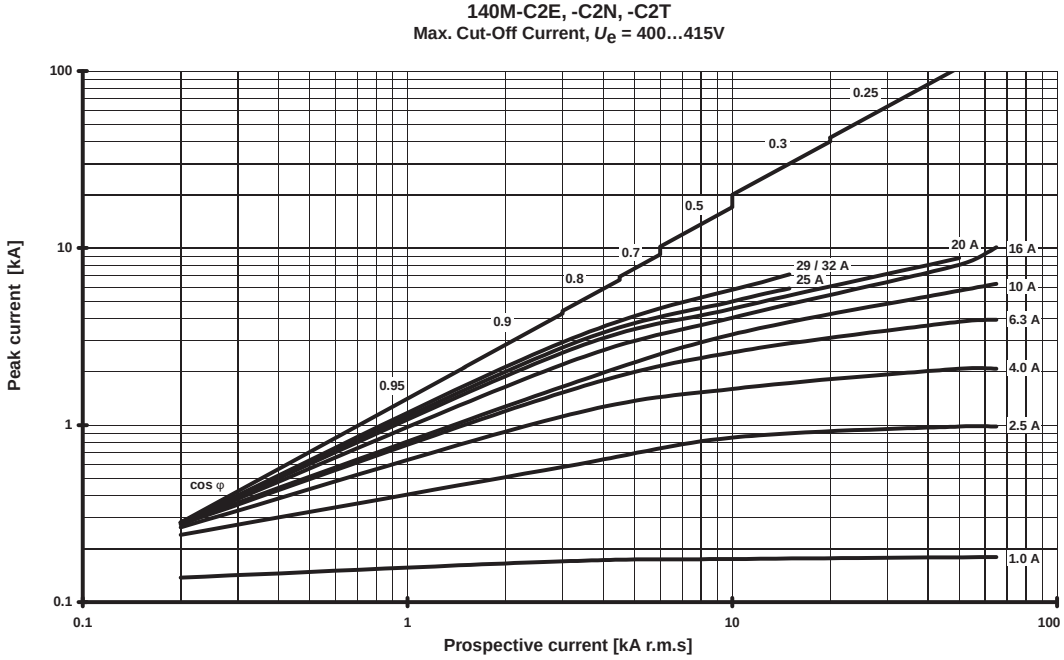


Figure 2 - Bulletin140M-D8E, -D8N, D8T Circuit Breaker (Maximum Cutoff Current)

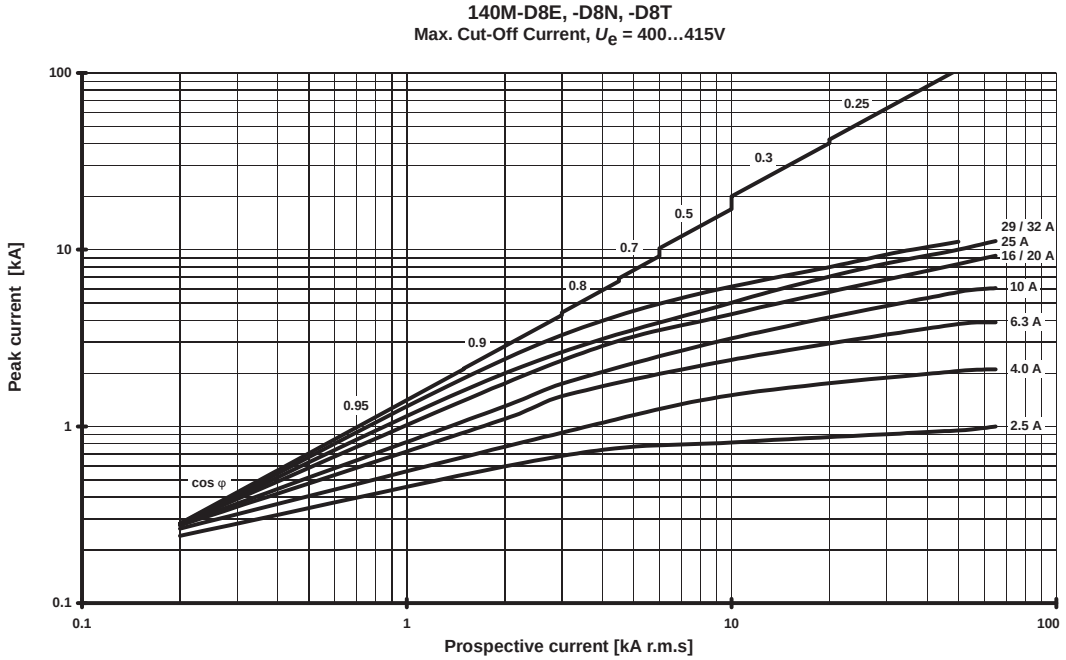


Figure 3 - Bulletin140M-D8V Circuit Breaker (Maximum Cutoff Current)

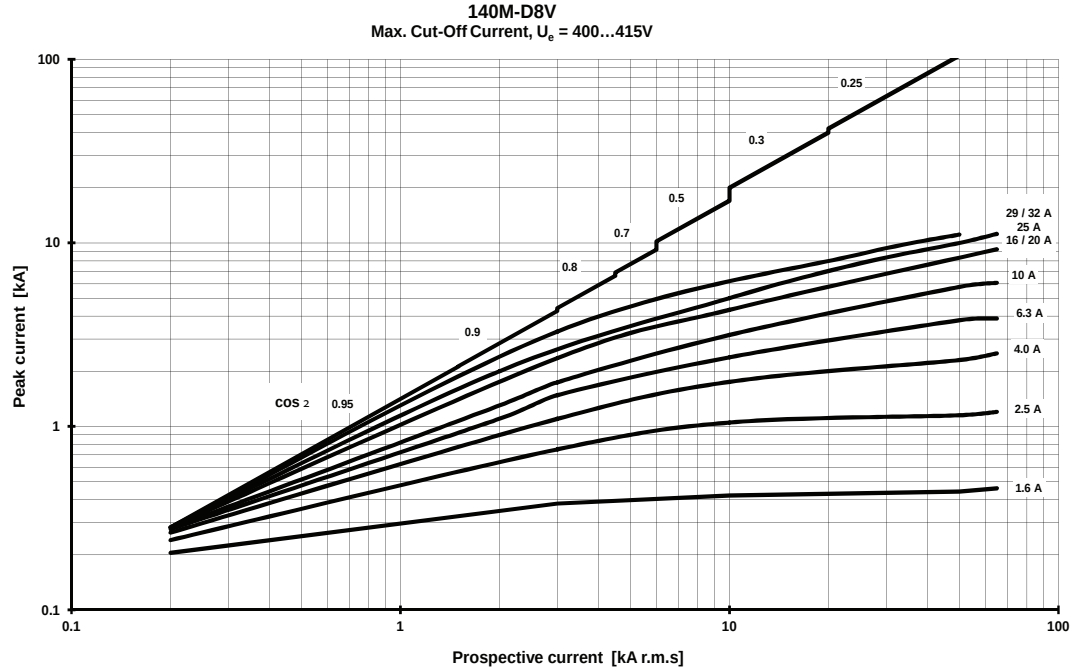


Figure 4 - Bulletin140M-F Circuit Breaker (Maximum Cutoff Current)

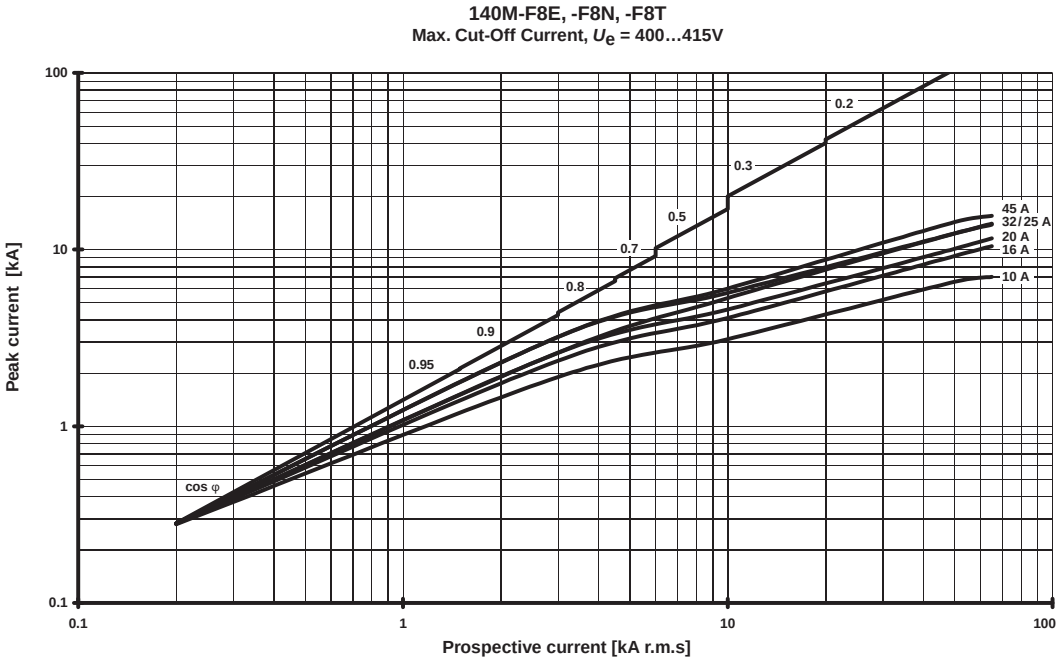


Figure 5 - Bulletin140M-C Circuit Breaker (Maximum Let-through Energy)

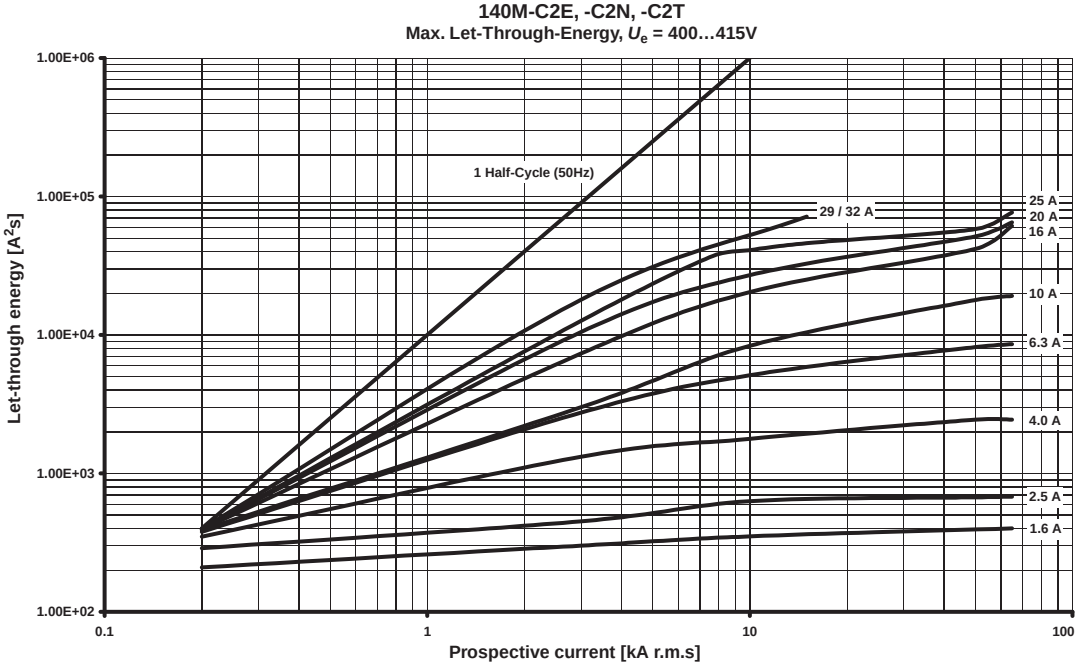


Figure 6 - Bulletin140M-D8E, -D8N, -D8T Circuit Breaker (Maximum Let-through Energy)

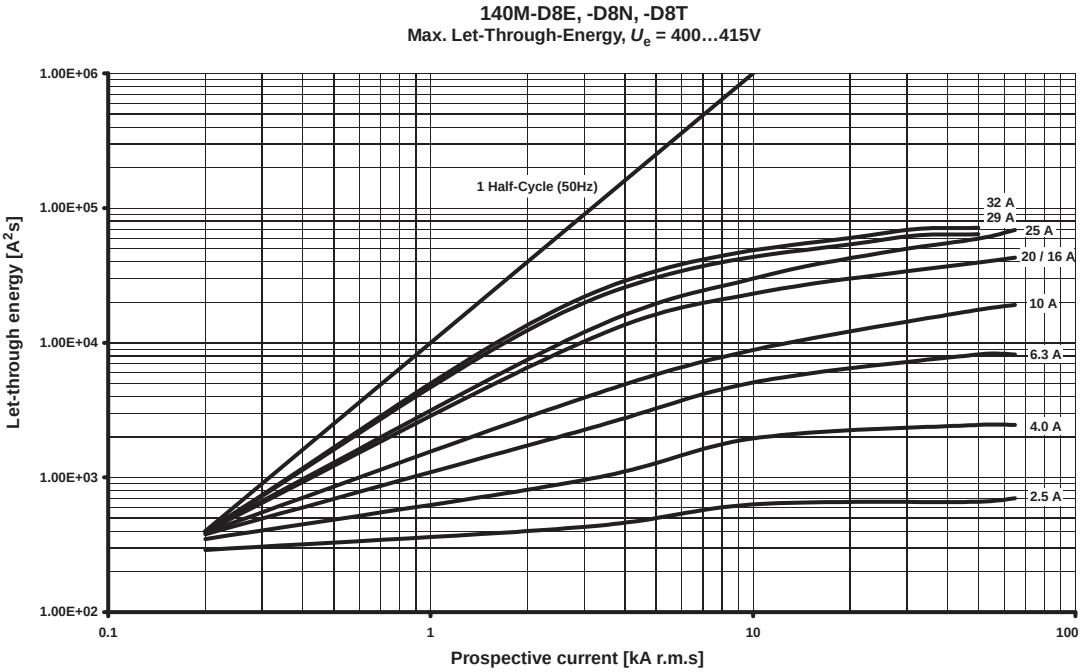


Figure 7 - Bulletin140M-D8V Circuit Breaker (Maximum Let-through Energy)

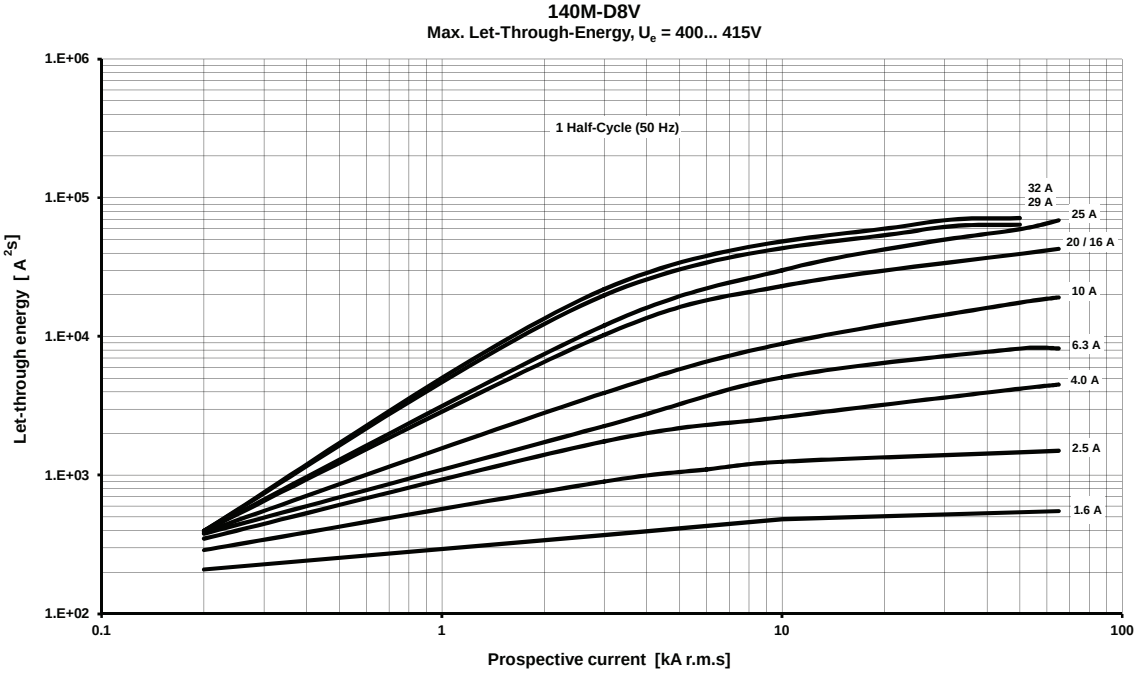
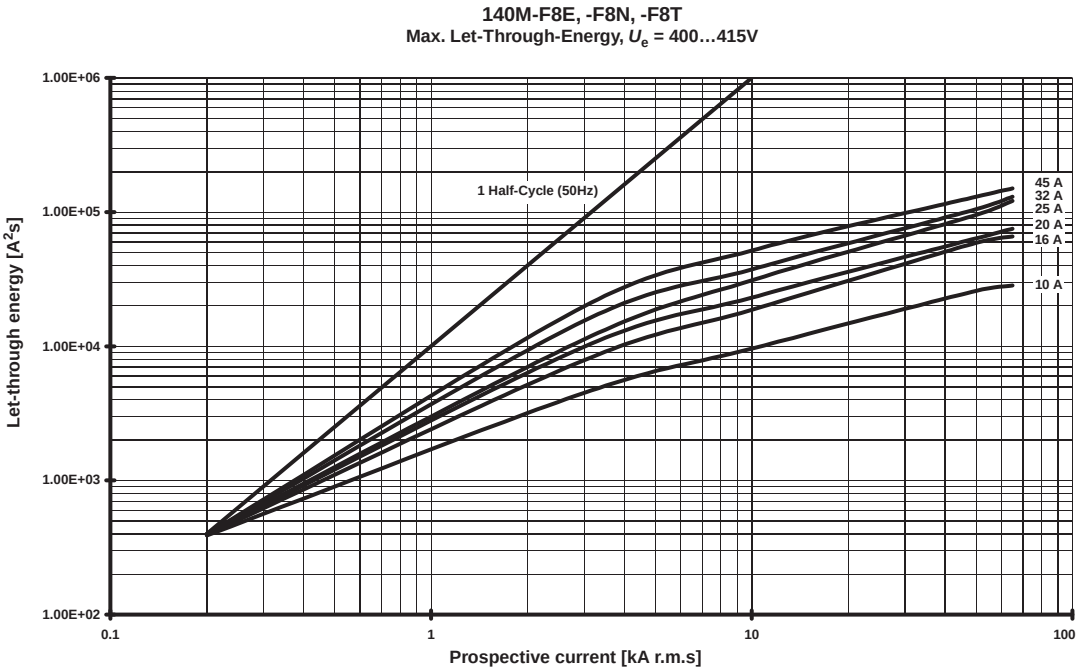
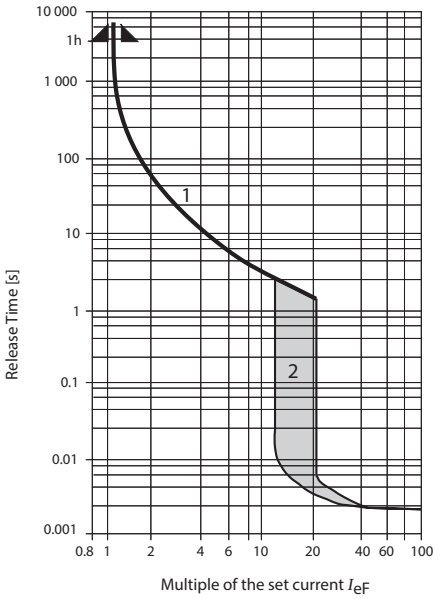


Figure 8 - Bulletin140M-F Circuit Breaker (Maximum Let-through Energy)



Time-Current Characteristic

Figure 9 - Motor Protection Circuit Breakers Time-Current Characteristic



140M-C, -D, -F Motor Protection Circuit Breakers (for 140M-D8V, see ratings)

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.

Magnetic Release Trip Current

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

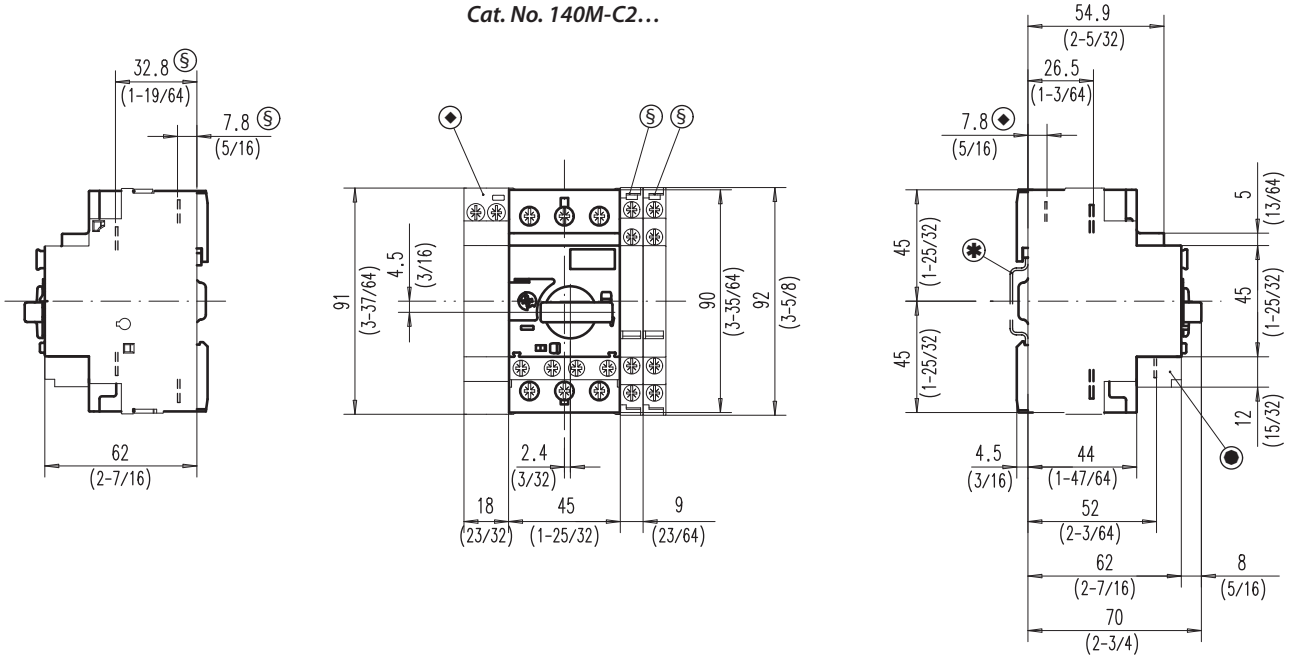
Current Setting I_eF

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

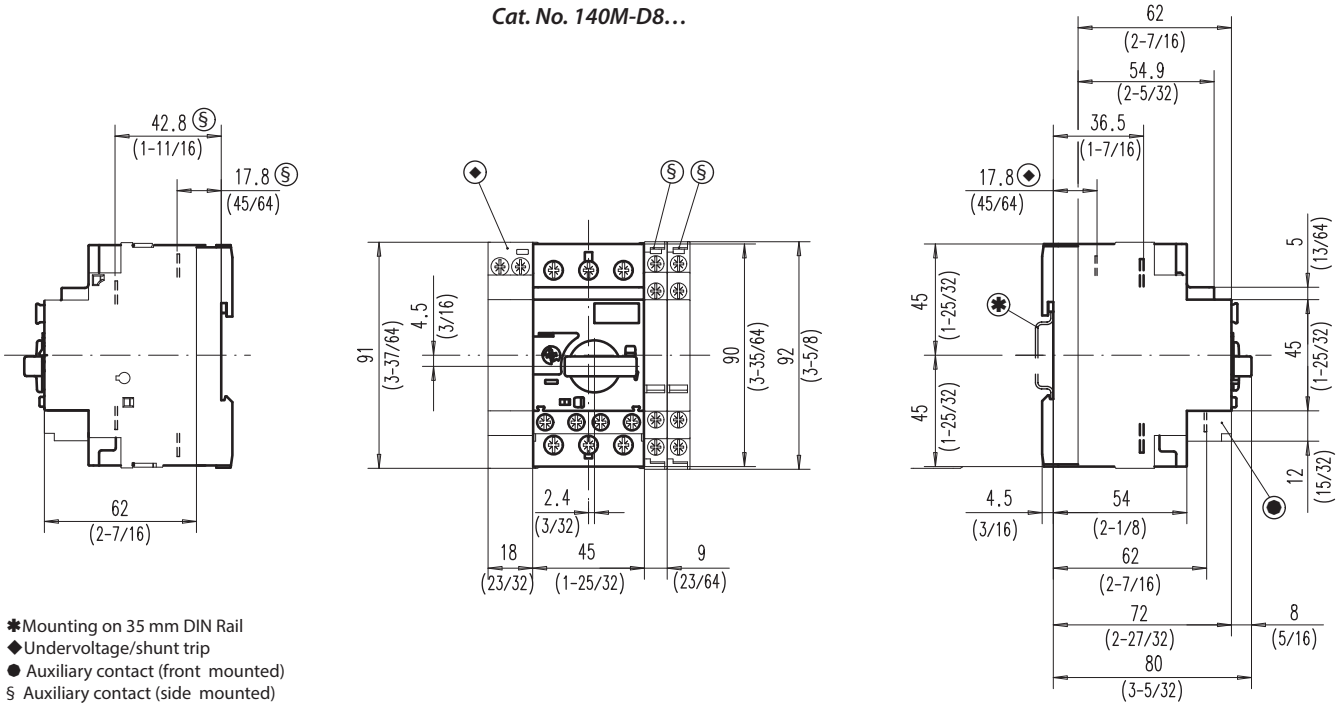
Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Figure 10 - Cat. No. 140M-C, -D

Cat. No. 140M-C2…

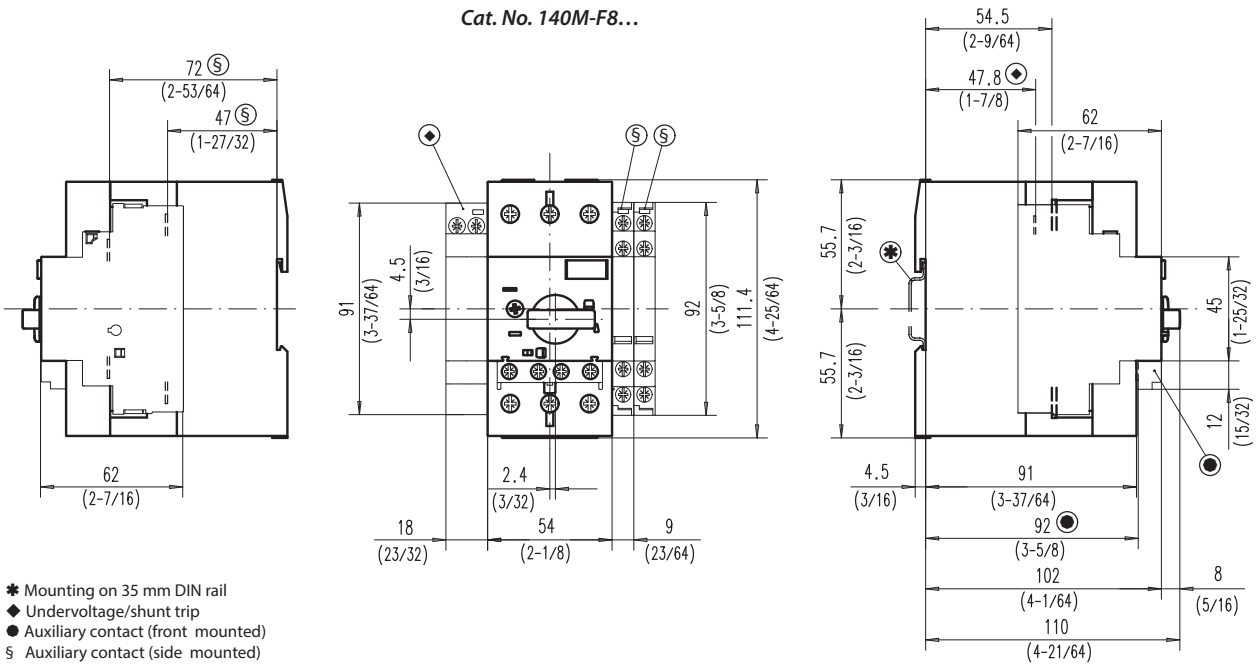


Cat. No. 140M-D8…



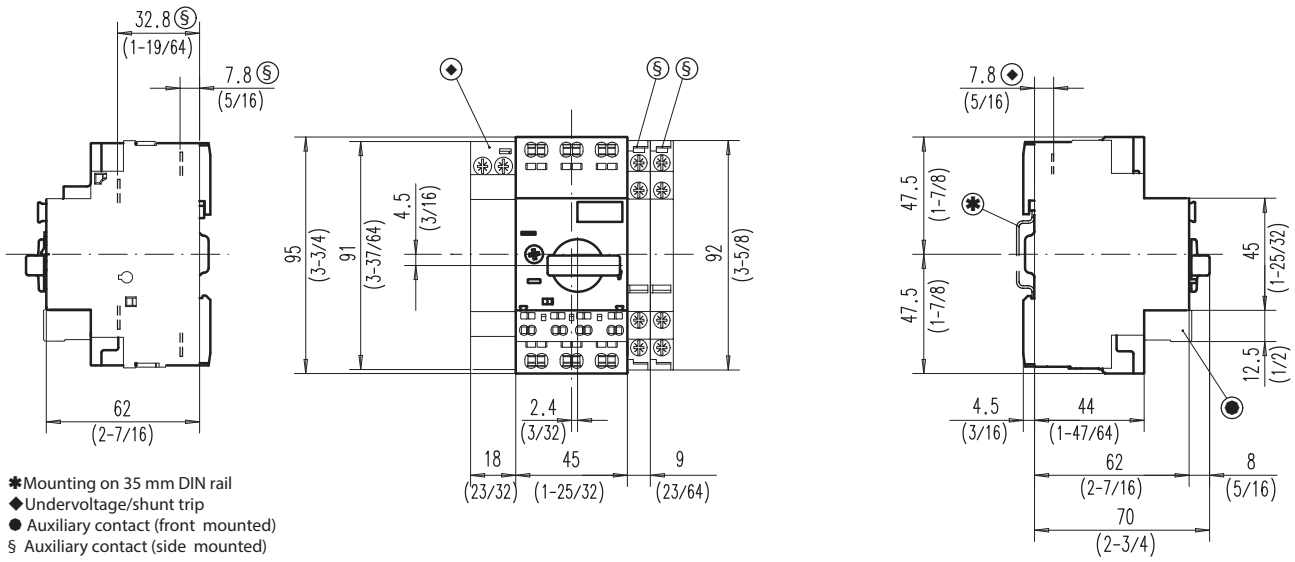
✱Mounting on 35 mm DIN Rail
◆Undervoltage/shunt trip
● Auxiliary contact (front mounted)
§ Auxiliary contact (side mounted)

Figure 11 - Cat. No. 140M-F



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

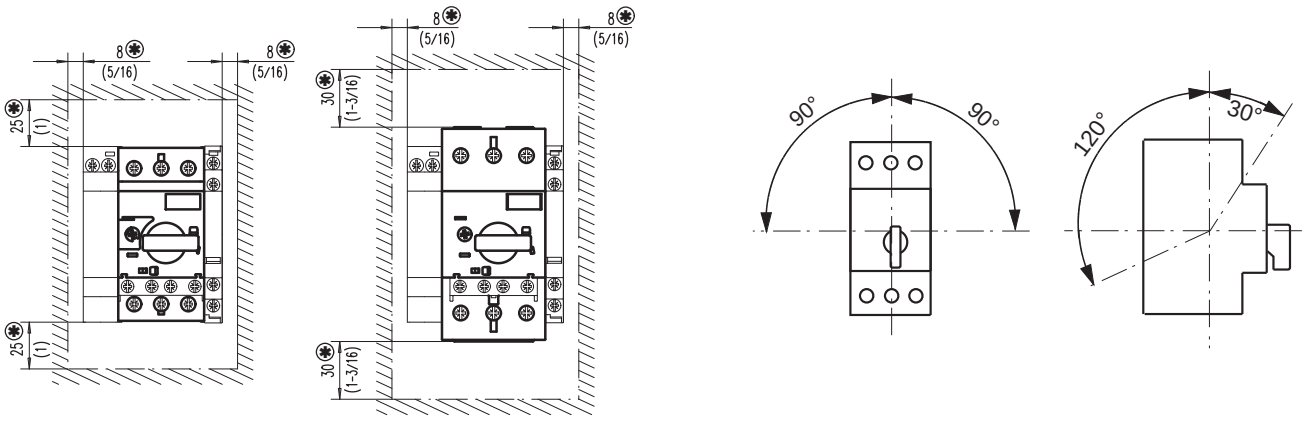
Figure 12 - Cat. No. 140M-RC, Screwless



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

Figure 13 - Mounting position/safety clearance of Cat. No. 140M-C…, 140M-D…, 140M-F…

Cat. No. 140M-C/D… *Cat. No. 140M-F…*



✱ Minimum distance to grounded parts or walls

Figure 14 - Cat. No. 140M-C-TE1 Type E adapter on Cat. No. 140M-C2E…

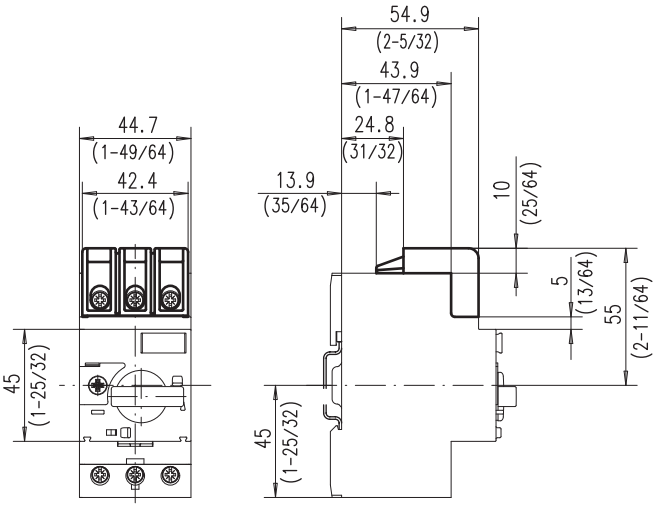


Figure 15 - Cat. No. 140M-C-TE1 Type E adapter on Cat. No. 140M-D8E…

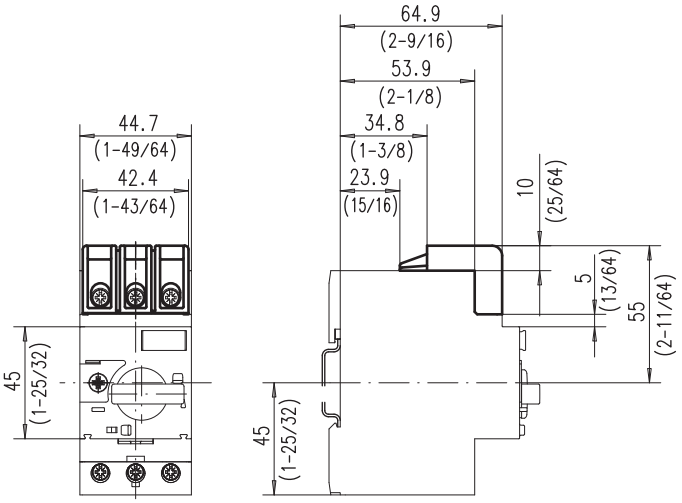


Figure 16 - Cat. No. 140M-C-TE1 Type E adapter on Cat. No. 140M-F8E…

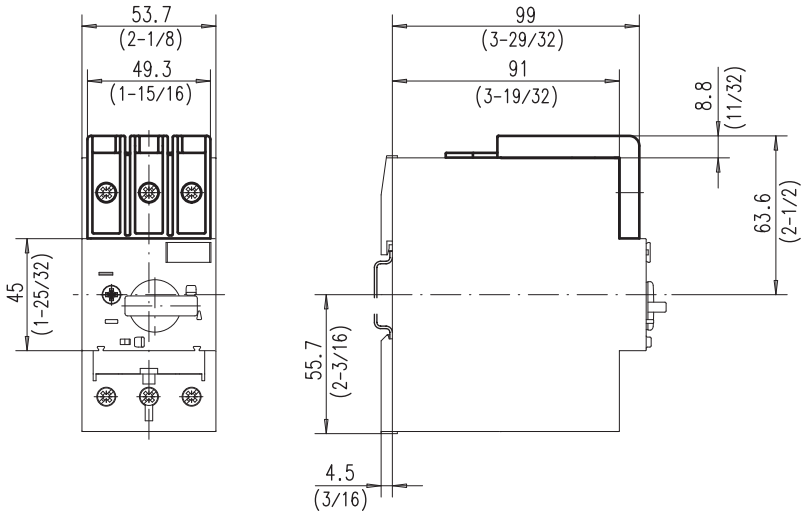


Figure 17 - Screw Adapter 140M-C-N45 for 140M-C2/D8 and 140M-F8

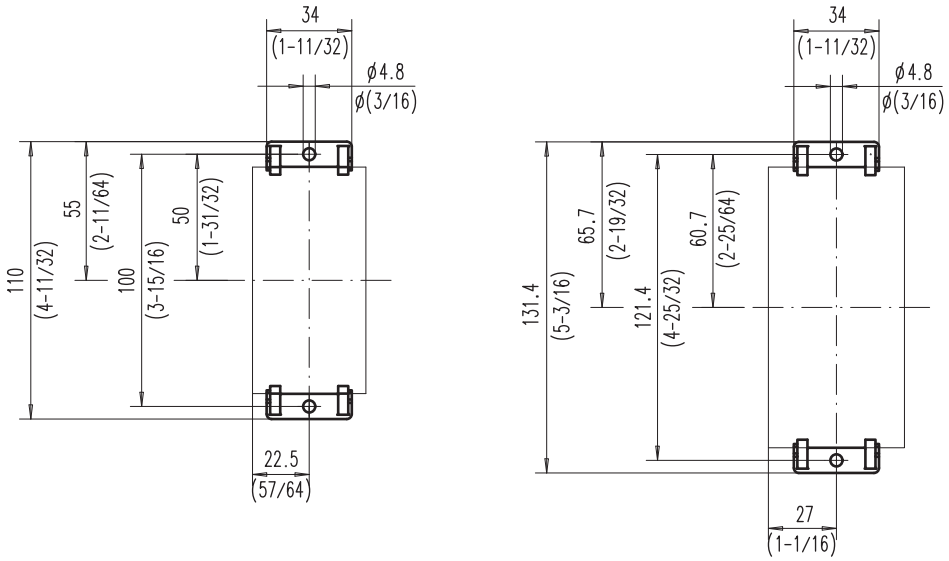
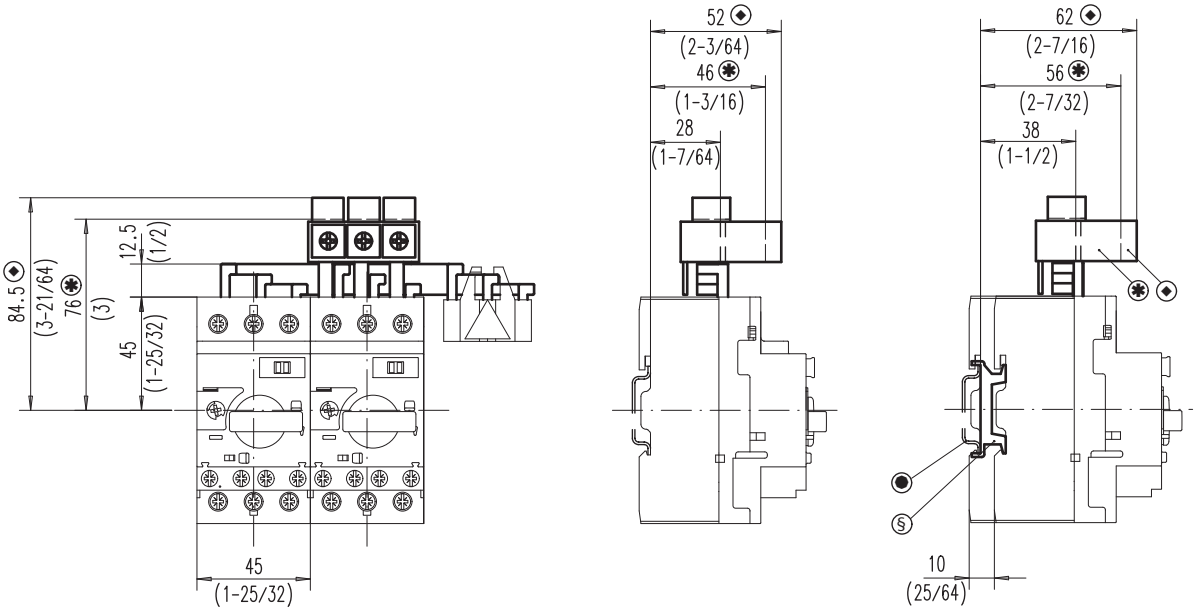


Figure 18 - Cat. No. 140M-C with Busbar



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

Figure 19 - 140M-C-SHS Screw Adapter

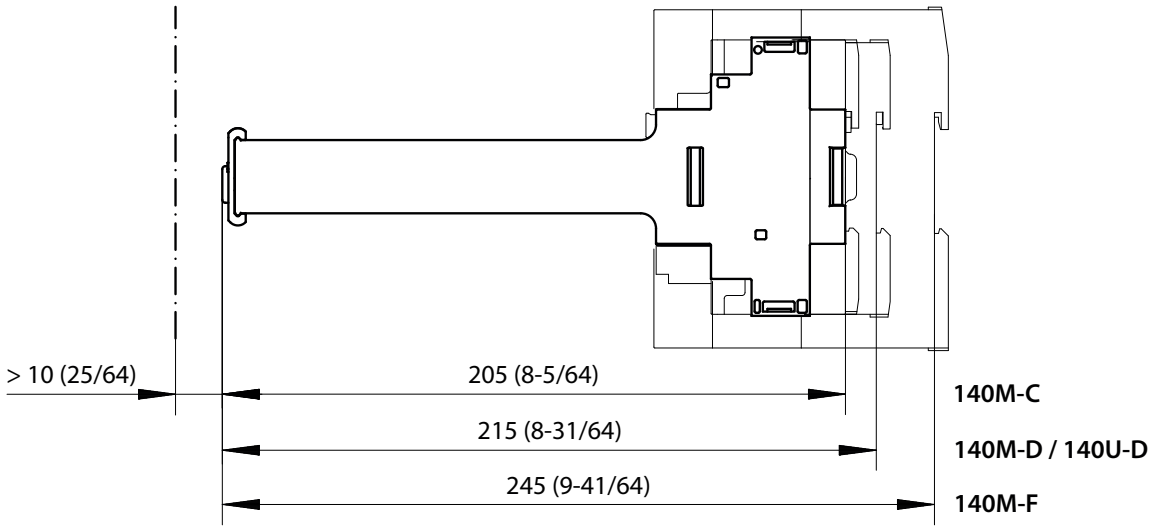
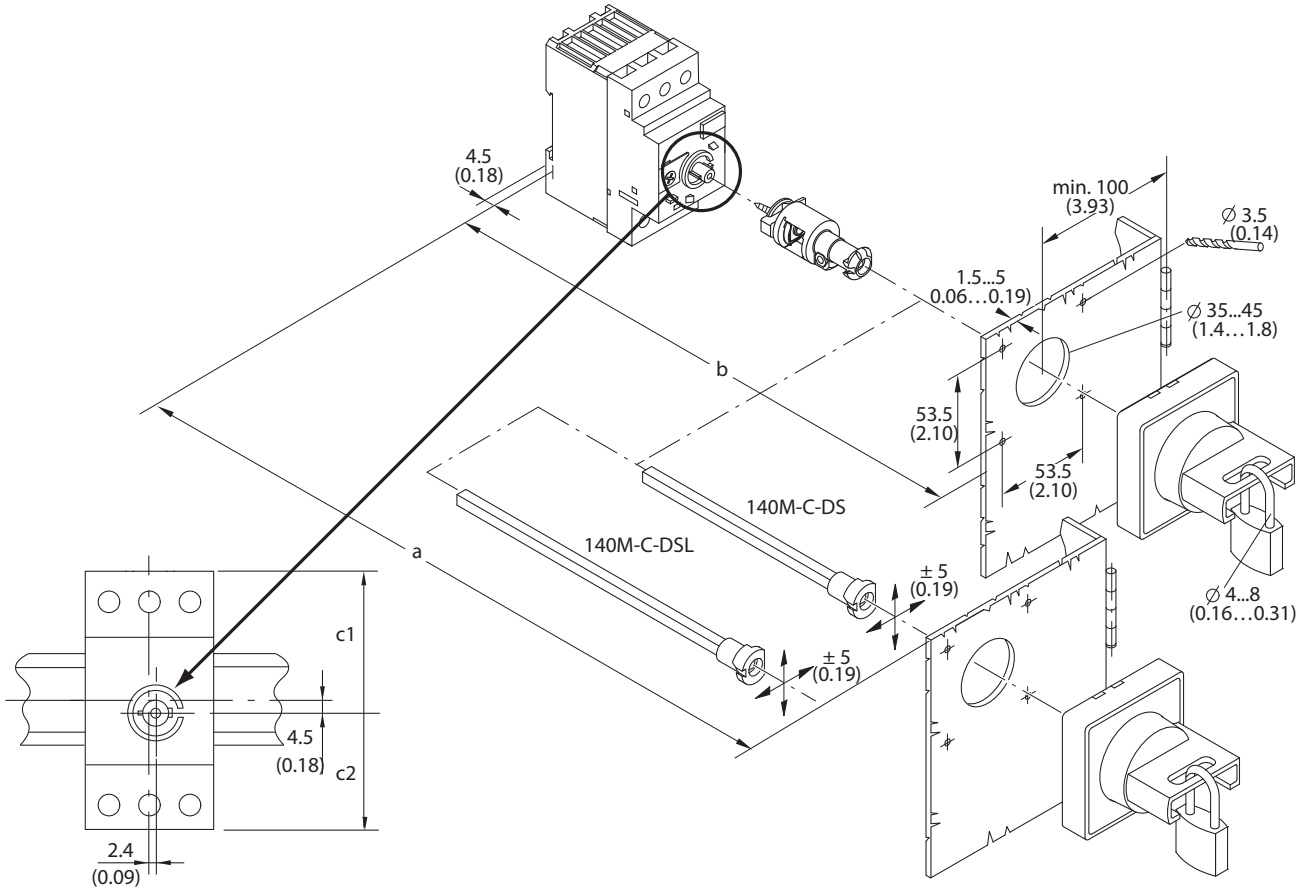


Figure 20 - 140M-C-D…66



	With Cat. No. 140-M-C-DS Shaft				With Cat. No. 140-M-C-DSL Shaft			
Cat. No.	**a**	**b**	**c1**	**c2**	**a**	**b**	**c1**	**c2**
140M-C	117…338 (4.6…13.3)	105.5 ±5 (4.15 ±0.19)	49.5 (1.95)	40.5 (1.6)	117…438 (4.6…17.2)	105.5 ±5 (4.15 ±0.19)	49.5 (1.95)	40.5 (1.6)
140M-D	126…347 (4.96…13.66)	114.5 ±5 (4.5 ±0.19)	49.5 (1.95)	40.5 (1.6)	126…497 (4.96…19.56)	114.5 ±5 (4.5 ±0.19)	49.5 (1.95)	40.5 (1.6)
140M-F	148.6…369.6 (5.85…14.55)	137.1 ±5 (5.39 ±0.19)	59.35 (2.34)	50.35 (1.98)	148.6…519 (5.85…20.43)	137.1 ±5 (5.39 ±0.19)	59.35 (2.34)	50.35 (1.98)

Figure 21 - 140M-C-WBE

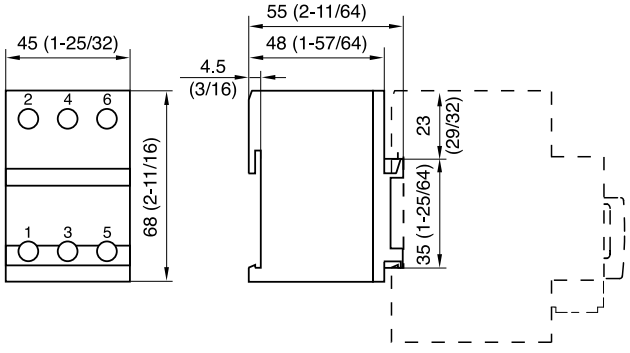


Figure 22 - Cat. No. 198E…

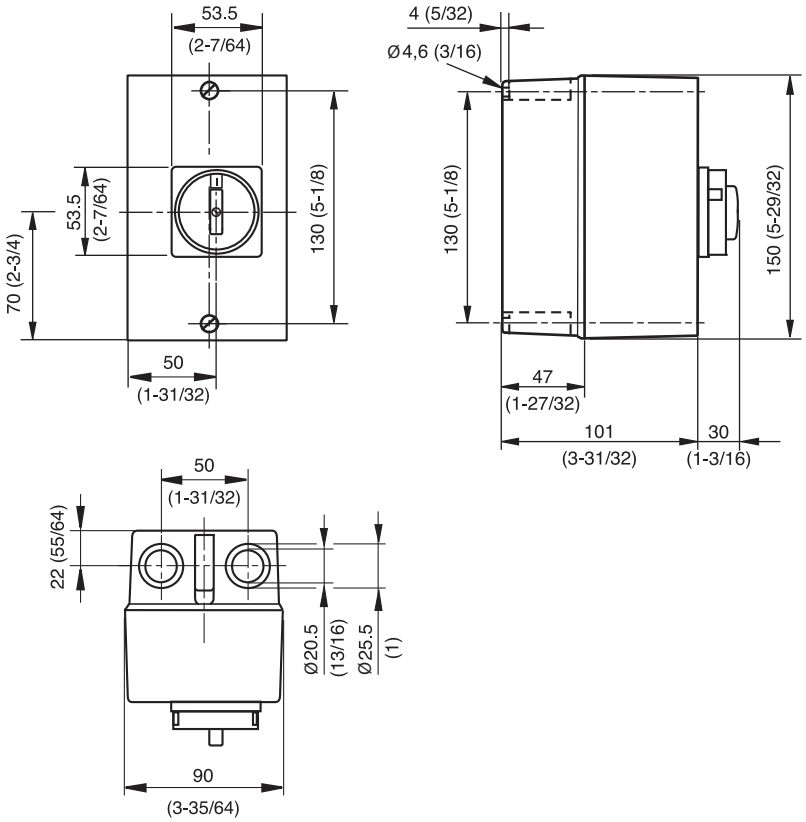
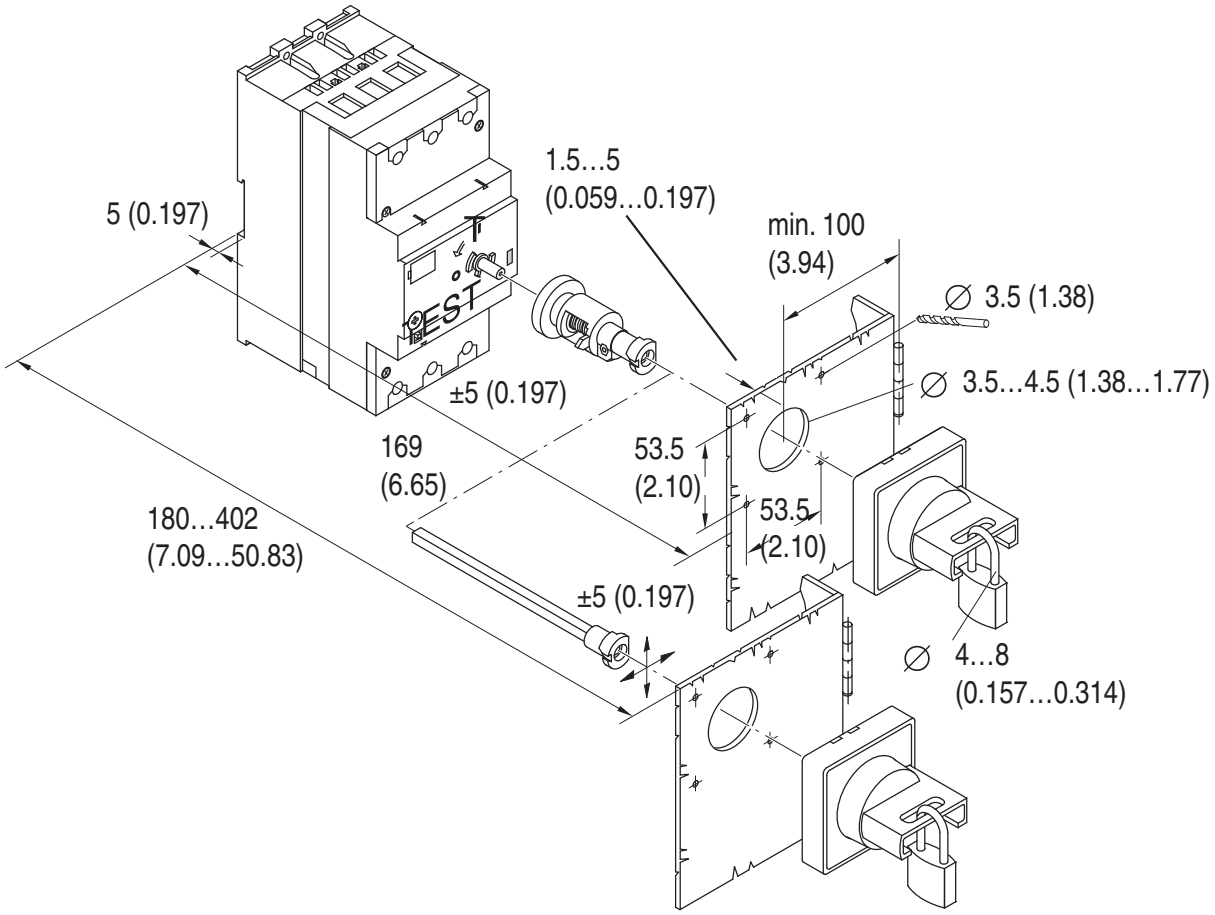


Figure 23 - 140-CD…



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