

Bulletin 100-C Contactors

- 9...85A (4...45kW/5...60 HP)
- AC and DC versions

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Bulletin 193-E Solid-State Overload Relays

- 0.1...85A

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Bulletin 193-T Bimetallic Overload Relays

- 0.1...90A

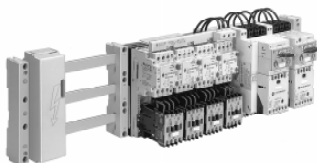
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Bulletin 140 Manual Motor Starter/Protectors

- 0.1...90A

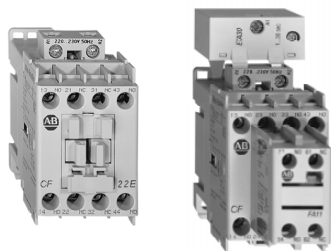
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Bulletin 140 Panel Mounting System

- Modules for 3-Phase Bus Bar Systems

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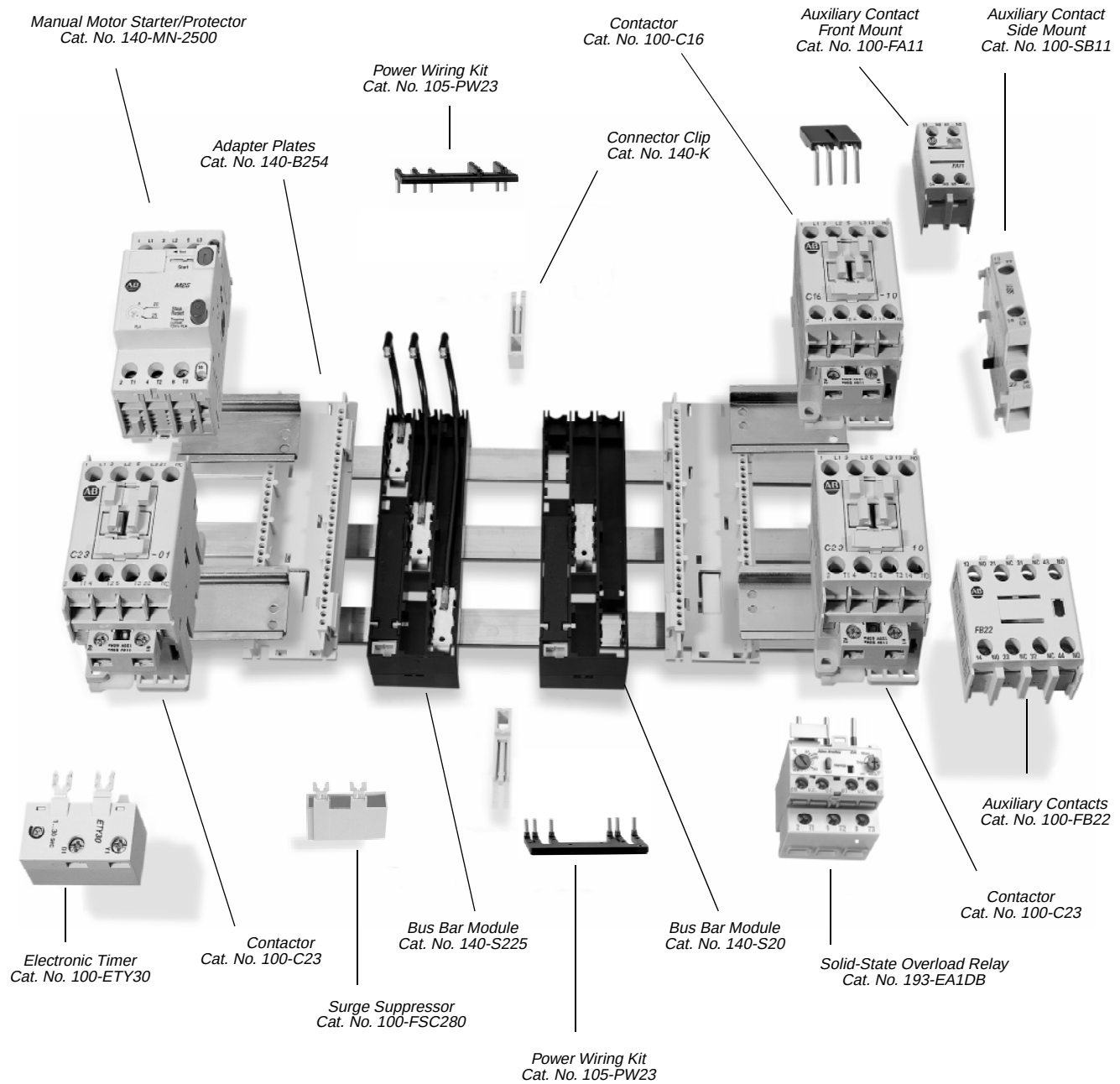
Bulletin 700-CF Control Relays

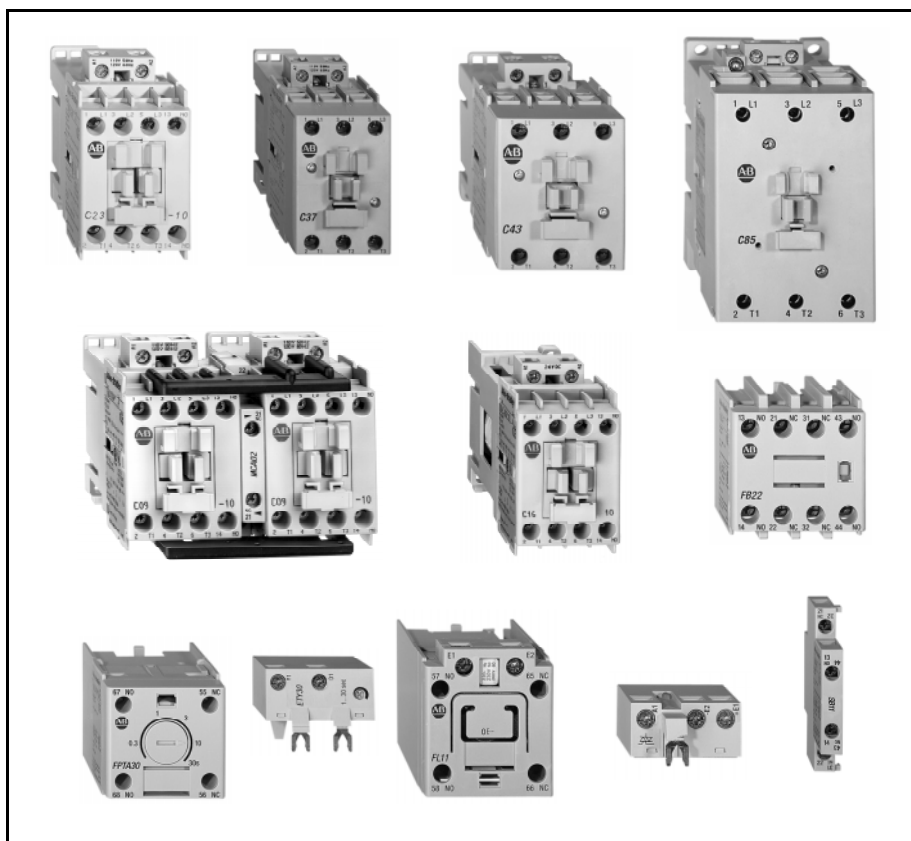
- High Contact Reliability

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MCS Starter Components

Product Information





Bulletin 100-C/104-C

- Compact Sizes from 4...45kW/5...60HP (9...85A)
- AC and DC Coil Control
- Common Accessories for All Contactor Sizes
- Front and Size 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 35mm DIN Mounting Rail
- Environment Friendly Materials

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Description

The MCS-C contactor family along with a wide range of common accessories and MCS-E solid-state overload relays provide the most compact and flexible starter component system available.

Conformity to Standards

IEC 947-4

IEC 947 Type "2" Coordination

UL 508

CSA 22.2 No. 14

Approvals

CE

CSA Certified

UL Listed

Your order must include:

- Cat. No. of contactor selected with coil voltage code.
- If required, Cat. No. of any accessories.
- If required, Cat. No. of replacement coils.

3-Pole AC Contactors



- AC Operating Mechanism
- 3 Main Contacts



Cat. No. 100-C23¹⁰



Cat. No. 100-C37⁰⁰



Cat. No. 100-C43⁰⁰



Cat. No. 100-C85⁰⁰

Ie		Ratings for Switching AC Motors - AC-2, AC-3, AC-4										Aux. Contacts		Cat. No.	*
[A]		kW (50 Hz)				HP (60 Hz)									
AC-3	AC-1	230V	380V 415V 400V	500V	690V	1Ø		3Ø							
460V	40°C		115V	230V	200V	230V	460V	575V	N.O.	N.C.					
9	25	3	4	4	4	1/3	1	2	2	5	7-1/2	1	0	100-C09⊗10	
												0	1	100-C09⊗01	
12	25	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	10	1	0	100-C16⊗10	
												0	1	100-C16⊗01	
23	32	7.5	11	11	10	2	3	5	7-1/2	15	15	1	0	100-C23⊗10	
												0	1	100-C23⊗01	
												0	0	100-C30⊗00	
30	45	10	15	15	15	2	5	7-1/2	10	20	20	1	0	100-C30⊗10	
												0	1	100-C30⊗01	
												0	0	100-C37⊗00	
37	50	11	18.5	18.5	18.5	3	5	10	10	25	25	1	0	100-C37⊗10	
												0	1	100-C37⊗01	
												0	0	100-C43⊗00	
43	63	13	22	22	22	3	7-1/2	10	15	30	30	1	0	100-C43⊗10	
												0	1	100-C43⊗01	
												0	0	100-C60⊗00	
60	90	18.5	30	30	30	5	10	15	20	40	40	1	0	100-C60⊗10	
												0	1	100-C60⊗01	
												0	0	100-C72⊗00	
72	90	22	37	37	37	5	15	20	25	50	50	1	0	100-C72⊗10	
												0	1	100-C72⊗01	
												0	0	100-C85⊗00	
85	100	25	45	45	45	7-1/2	15	25	30	60	60	1	0	100-C85⊗10	
												0	1	100-C85⊗01	

⊗ Voltage Suffix Code and Terminal Position

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

Cat. No. 100-C09¹⁰ becomes Cat. No. 100-C09D10.

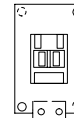
V Hz	12	24	32	36	42	48	100	100- 110	110	120	127	200	200- 220	208	208- 240	220- 230	230	230- 240	240	277	347	380	380- 400	400	400- 415	440	480	500	550	600
50Hz	R	K	V	W	X	Y	KP	-	D	P	S	KG	-	-	-	F	-	VA	T	-	-	-	N	-	G	B	-	M	C	-
60Hz	Q	J	-	V	-	X	KP	-	D	-	-	KG	H	L	-	-	-	A	T	I	E	-	-	-	N	B	-	-	C	-
50/60	-	KJ	-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

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-C09¹⁰
Line Side



Cat. No.
100-C09U¹⁰
Load Side

4-Pole AC Contactors



- AC Operating Mechanism
- 4 Main Contacts



Cat. No. 100-C23[®]400

I _e		Ratings for Switching AC Motors										Contact Configuration, Main Pole		Cat. No.	*
		AC-2, AC-3, AC-4													
[A]		kW (50 Hz)				HP (60 Hz)									
AC-3	AC-1	230V	380V 415V 400V	500V	690V	1 Ø		3 Ø							
460V	40°C		115V			230V	200V	230V	460V	575V	N.O.	N.C.			
9	25	3	4	4	4	1/3	1	2	2	5	7-1/2				
															
															
															
12	25	4	5.5	5.5	5.5	1/2	2	3	3	7-1/2	10				
															
															
															
16	32	5.5	7.5	7.5	7.5	1	3	5	5	10	10				
															
															
															
23	32	7.5	11	11	10	2	3	5	7-1/2	15	15				
															
															

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: 120V, 60 Hz: **Cat. No. 100-C09[®]400** becomes **Cat. No. 100-C09D400**.

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	—	—	—	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	—	—	—	—	KF	—	KA	—	—	—	—	KN	—	KB	—	—	—	—

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* Prices – Consult Sales Office or price list

3-Pole DC Contactors



- DC Operating Mechanism
- 3 Main Contacts



Cat. No. 100-C16ZJ10



Cat. No. 100-C23ZJ10



Cat. No. 100-C43ZJ00



Cat. No. 100-C85DJ00

Ie		Ratings for Switching AC Motors - AC-2, AC-3, AC-4										Auxiliary Contacts		Cat. No.	*
[A]		kW (50 Hz)				HP (60 Hz)									
AC-3	AC-1	230V	380V 415V 400V	500V	690V	1Ø		3Ø							
460V	40°C		115V			230V	200V	230V	460V	575V	N.O.	N.C.			
9	25	3	4	4	4	1/3	1	2	2	5	7-1/2	1 0	0 1	100-C09Ø10 100-C09Ø01	
12	25	4	5.5	5.5	5.5	1/2	2	3	3	7-1/2	10	1 0	0 1	100-C12Ø10 100-C12Ø01	
16	32	5.5	7.5	7.5	7.5	1	3	5	5	10	10	1 0	0 1	100-C16Ø10 100-C16Ø01	
23	32	7.5	11	11	10	2	3	5	7-1/2	15	15	1 0	0 1	100-C23Ø10 100-C23Ø01	
30	45	10	15	15	15	2	5	7-1/2	10	20	20	0 1 0	0 0 1	100-C30Ø00 100-C30Ø10 100-C30Ø01	
37	50	11	18.5	18.5	18.5	3	5	10	10	25	25	0 1 0	0 0 1	100-C37Ø00 100-C37Ø10 100-C37Ø01	
43	63	13	22	22	22	3	7-1/2	10	15	30	30	0 1 0	0 0 1	100-C43Ø00 100-C43Ø10 100-C43Ø01	
60	90	18.5	30	30	30	5	10	15	20	40	40	0 1 0	0 0 1	100-C60Ø00 100-C60Ø10 100-C60Ø01	
72	90	22	37	37	37	5	15	20	25	50	50	0 1 0	0 0 1	100-C72Ø00 100-C72Ø10 100-C72Ø01	
85	100	25	45	45	45	7-1/2	15	25	30	60	60	0 1 0	0 0 1	100-C85Ø00 100-C85Ø10 100-C85Ø01	

⊗ Voltage Suffix Code and Terminal Position

The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: 24V DC:

Cat. No. 100-C09Ø10 becomes Cat. No. 100-C09ZJ10.

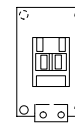
DC Voltages		9	12	24	36	48	60	64	72	80	110	115	125	220	230	250
100-C09...C43	Standard	ZR	ZQ	ZJ	ZW	ZY	ZZ	ZB	ZG	ZE	ZD	ZP	ZS	ZA	ZF	ZT
	with Integrated Diode	-	-	DJ	-	-	-	-	-	-	-	-	-	-	-	-
100-C60...C85		DR	DQ	DJ	DW	DY	DZ	DB	DG	DE	DD	DP	DS	DA	DF	DT

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-C09UZJ10.



Cat. No.
100-C09ZØ10
Line Side



Cat. No.
100-C09UZØ10
Load Side

4-Pole DC Contactors



- DC Operating Mechanism
- 4 Main Contacts



Cat. No. 100-C12ZJ400

I _e		Ratings for Switching AC Motors										Contact Configuration, Main Pole		Cat. No.	*
		AC-2, AC-3, AC-4													
[A]		kW (50 Hz)				HP (60 Hz)									
AC-3	AC-1	230V	380V 415V 400V	500V	690V	1 Ø		3 Ø							
460V	40°C		115V			230V	200V	230V	460V	575V	N.O.	N.C.			
9	25	3	4	4	4	1/3	1	2	2	5	7-1/2	4 3 2	0 1 2	100-C09®400 100-C09®300 100-C09®200	
12	25	4	5.5	5.5	5.5	1/2	2	3	3	7-1/2	10	4 3 2	0 1 2	100-C12®400 100-C12®300 100-C12®200	
16	32	5.5	7.5	7.5	7.5	1	3	5	5	10	10	4 3 2	0 1 2	100-C16®400 100-C16®300 100-C16®200	
23	32	7.5	11	11	10	2	3	5	7-1/2	15	15	4 3 2	0 1 2	100-C23®400 100-C23®300 100-C23®200	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: 24V: **Cat. No. 100-C09®400** becomes **Cat. No. 100-C09ZJ400**.

DC Voltages		9	12	24	36	48	60	64	72	80	110	115	125	220	230	250
100-C09...C23	Standard	ZR	ZQ	ZJ	ZW	ZY	ZZ	ZB	ZG	ZE	ZD	ZP	ZS	ZA	ZF	ZT
	with Integrated Diode	-	-	DJ	-	-	-	-	-	-	-	-	-	-	-	-

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* Prices – Consult Sales Office or price list

Reversing AC Contactors



- AC Operating Mechanism, 3 Main Contacts
- Includes Mechanical/Electrical Interlock
- Includes Reversing Power Wiring



Cat. No. 104-C09 $\otimes$ 22



Cat. No. 104-C30 $\otimes$ 22



Cat. No. 104-C43 $\otimes$ 22

I _e		Ratings for Switching AC Motors										Auxiliary Contacts Installed per Contactor		Cat. No.	*
		AC-2, AC-3, AC-4													
[A]		kW (50 Hz)				HP (60 Hz)									
AC-3	AC-1		380V 415V 400V	500V	690V	1∅		3∅							
460V	40°C		230V			115V	230V	200V	230V	460V	575V	N.O.	N.C.		
9	25	3	4	4	4	1/3	1	2	2	5	7-1/2	1	1	104-C09⊗22	
12	25	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	10	1	1	104-C16⊗22	
23	32	7.5	11	11	10	2	3	5	7-1/2	15	15	1	1	104-C23⊗22	
30	45	10	15	15	15	2	5	7-1/2	10	20	20	0	1	104-C30⊗02	
												1	1	104-C30⊗22	
37	50	11	18.5	18.5	18.5	3	5	10	10	25	25	0	1	104-C37⊗02	
												1	1	104-C37⊗22	
43	63	13	22	22	22	3	7.5	10	15	30	30	0	1	104-C43⊗02	
												1	1	104-C43⊗22	
60	90	18.5	30	30	30	5	10	15	20	40	40	0	1	104-C60⊗02	
												1	1	104-C60⊗22	
72	90	22	37	37	37	5	15	20	25	50	50	0	1	104-C72⊗02	
												1	1	104-C72⊗22	
85	100	25	45	45	45	7-1/2	15	25	30	60	60	0	1	104-C85⊗02	
												1	1	104-C85⊗22	

$\otimes$ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: 120V, 60 Hz: **Cat. No. 104-C09 $\otimes$ 22** becomes **Cat. No. 104-C09D22**.

Standard Coil Voltages	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	—	—	—	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	—	—	—	—	KF	—	KA	—	—	—	—	KN	—	KB	—	—	—	—

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Reversing DC Contactors



- DC Operating Mechanism, 3 Main Contacts, Line Side coil Terminations
- Includes Mechanical/Electrical Interlock
- Includes Reversing Power Wiring



Cat. No. 104-C09ZJ22



Cat. No. 104-C30ZJ22

Ie		Ratings for Switching AC Motors										Auxiliary Contacts Installed per Contactor		Cat. No.	*
		AC-2, AC-3, AC-4													
[A]		kW (50 Hz)				HP (60 Hz)									
AC-3	AC-1	230V	380V 415V 400V	500V	690V	1Ø		3Ø							
460V	40°C		115V			230V	200V	230V	460V	575V	N.O.	N.C.			
9	25	3	4	4	4	1/3	1	2	2	5	7-1/2	1	1	104-C09Ø22	
12	25	4	5.5	5.5	5.5	1/2	2	3	3	7-1/2	10	1	1	104-C12Ø22	
16	32	5.5	7.5	7.5	7.5	1	3	5	5	10	10	1	1	104-C16Ø22	
23	32	7.5	11	11	10	2	3	5	7-1/2	15	15	1	1	104-C23Ø22	
30	45	10	15	15	15	2	5	7-1/2	10	20	20	0	1	104-C30Ø02	
												1	1	104-C30Ø22	
37	50	11	18.5	18.5	18.5	3	5	10	10	25	25	0	1	104-C37Ø02	
												1	1	104-C37Ø22	
43	63	13	22	22	22	3	7.5	10	15	30	30	0	1	104-C43Ø02	
												1	1	104-C43Ø22	
60	90	18.5	30	30	30	5	10	15	20	40	40	0	1	104-C60Ø02	
												1	1	104-C60Ø22	
72	90	22	37	37	37	5	15	20	25	50	50	0	1	104-C72Ø02	
												1	1	104-C72Ø22	
85	100	25	45	45	45	7-1/2	15	25	30	60	60	0	1	104-C85Ø02	
												1	1	104-C85Ø22	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: 120V, 60 Hz: Cat. No. 104-C09Ø22 becomes Cat. No. 104-C09ZJ22.

DC Voltages		9	12	24	36	48	60	64	72	80	110	115	125	220	230	250
104-C09...C43	Standard	ZR	ZQ	ZJ	ZW	ZY	ZZ	ZB	ZG	ZE	ZD	ZP	ZS	ZA	ZF	ZT
	with Integrated Diode	-	-	DJ	-	-	-	-	-	-	-	-	-	-	-	-
104-C60...C85	with Integrated Diode	DR	DQ	DJ	DW	DY	DZ	DB	DG	DE	DD	DP	DS	DA	DF	DT

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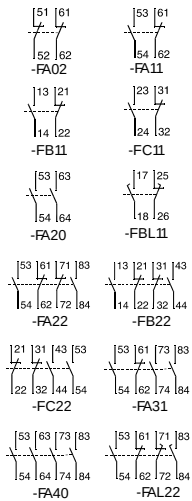
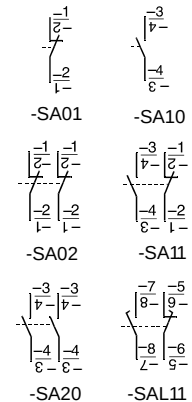
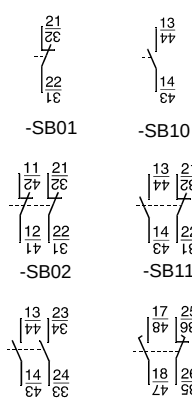
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* Prices – Consult Sales Office or price list

Auxiliary Contacts

	Description	N.O.	N.C.	Connection Diagrams	For Use With	Cat. No.	*
	Auxiliary Contact Blocks for Front Mounting ❶ 2- and 4-pole - Quick and easy mounting without tools - Electronic compatible contacts to 17V, 5mA - Mutual positive guidance to the main contactor poles (except for L types) - Models with equal function with several terminal numbering choices L = Late break / Early make	0	2		100-C all	100-FA02	
		1	1		100-C all C09010...C23010 C30000...C85000 C09001...C23001	100-FA11 100-FB11 100-FC11	
		2	0		100-C all	100-FA20	
		1L	1L		C30000...C85000	100-FBL11	
		2	2		100-C all C09010...C23010 C30000...C85000 C09001...C23001	100-FA22 100-FB22 100-FC22	
		3	1		100-C all	100-FA31	
		4	0		100-C all	100-FA40	
		1+1L	1+1L		100-C all	100-FAL22	
	Auxiliary Contact Blocks for Side Mounting without Sequence Terminal Designations ❶ 1- and 2-pole - Two-way numbering for right or left mounting on the contactor - Quick and easy mounting without tools - Electronic compatible contacts to 17V, 5mA - Mutual positive guidance to the main contactor poles (except for L types) L = Late break/Early make	0	1		100-C all	100-SA01	
		1	0		100-C all	100-SA10	
		0	2		100-C all	100-SA02	
		1	1		100-C all	100-SA11	
		2	0		100-C all	100-SA20	
		L1	L1		100-C all	100-SAL11	
	Auxiliary Contact Blocks for Side Mounting with Sequence Terminal Designations ❶ 1- and 2-pole - Two-way numbering for right or left mounting on the contactor - Quick and easy mounting without tools - Electronic compatible contacts to 17V, 5mA - Mutual positive guidance to the main contactor poles (except for L types) L = Late break/Early make	0	1		100-C all	100-SB01	
		1	0		100-C ❷	100-SB10	
		0	2		100-C ❷	100-SB02	
		1	1		100-C ❷	100-SB11	
		2	0		100-C ❷	100-SB20	
		L1	L1		100-C ❷	100-SBL11	

❶ Up to 8 auxiliary contacts may be mounted (a maximum of 4 N.C. contacts on the front of the contactor and a maximum of 2 N.O. contacts on each side).

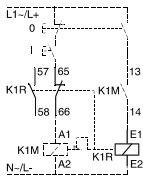
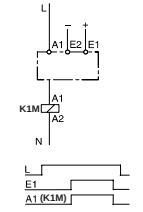
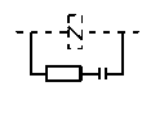
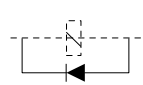
❷ Double Numbering
Left side mounting only is recommended for Cat. No. 100-C09...100-C23 due to double numbering.

Product Selection—Page 4

Control Modules

	Description	Connection Diagrams	For Use With	Cat. No.	*
	Pneumatic Timing Modules Pneumatic timing element contacts switch after the delay time. The contacts on the main contactor continue to operate without delay. • Continuous adjustment range	ON-Delay 0.3...30 s 1.8...180 s	100-C with AC coils	100-FPTA30 100-FPTA180	
		OFF-Delay 0.3...30 s 1.8...180 s	100-C all	100-FPTB30 100-FPTB180	
	Electronic Timing Modules Delay of the contactor solenoid	ON-Delay 0.1...3 s 1...30 s 10...180 s 110...240V, 50/60Hz 110...250VDC	100-C all	100-ETA3 100-ETA30 100-ETA180	
	100-ETA ON-Delay The contactor is energized at the end of the delay time.	ON-Delay 0.1...3 s 1...30 s 10...180 s 24V DC	100-C with DC coils	100-ETAZJ3 100-ETAZJ30 100-ETAZJ180	
	100-ETB OFF-Delay After interruption of the control signal, the contactor is de-energized at the end of the delay time.	OFF-Delay 0.3...3 s 1...30 s 10...180 s 110...240V 50/60Hz	100-C with AC coils	100-ETB3 100-ETB30 100-ETB180	
	100-ETY 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 90 ms). • Continuous adjustment range • High repeat accuracy	Transition Time Y Contactor 1...30 s 110...240V 50/60Hz	100-C with AC coils	100-ETY30	
	Mechanical Interlocks For interlocking of two contactors. • Common interlock for all 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 all	100-MCA00	
		• Mechanical/electrical • With 2 N.C. auxiliary contacts	100-C all	100-MCA02	

Control Modules, Continued

	Description			Connection Diagrams	For Use With	Cat. No.	*
	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 100-C contactor sizes, 9...85A				100-C with AC coils	100-FL11⊗	
	Interface (electronic) Interface between the DC control signal (PLC) and the AC operating mechanism of the contactor. - Control voltage 18...30 VDC - For coil voltages of 110... 240 VAC - Suitable for all 100-C contactor sizes, 9...85A - Requires no overvoltage protection for the coils				100-C with AC coils	100-JE	
	Surge Suppressors For limitation of coil switching transients. - Plug-in, coil mounted - Suitable for all 100-C contactor sizes, 9...85A - RC, Varistor and Diode Versions	RC Module AC Operating Mechanism	24...48V 50/60 Hz		100-C with AC coils	100-FSC48	
			110...280V 50/60 Hz			100-FSC280	
			380...480V 50/60 Hz			100-FSC480	
		Varistor Module AC/DC Operating Mechanism	12...55V AC / 12...77V DC		100-C all	100-FSV55	
			56...136V AC / 78...180V DC			100-FSV136	
			137...277V AC / 181...350V DC			100-FSV277	
			278...575V AC			100-FSV575	
		Diode Module DC Operating Mechanism	12...250VDC		100-C with DC coils	100-FSD250	

⊗ **Voltage Suffix Code**

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

Voltage ❶	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

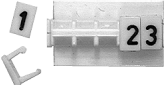
❶ For special voltages, contact your local sales office.

Assembly Components

	Description	For Use With	Pkg. Qty.	Cat. No.	*
 Cat. No. 100-S0	Dovetail Connectors - For use in contactor and starter assemblies. 10 each Single Connector 0mm Spacing Dual Connector 9mm Spacing	100-C all	10 10	100-S0 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	Power Wiring Kits For Reversing Connection with a solid-state or thermal overload relay	100-C09...C23 100-C30...C37 100-C43 100-C60...C85	1	105-PW23 105-PW37 105-PW43 105-PW85	

Marking Systems

- Uniform labeling materials for contactors, motor starting equipment, timing relays and circuit breakers

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

Renewal Parts



AC Standard Control Voltages			100-C09... 100-C16	100-C23... 100-C37	100-C43	100-C60... 100-C85	DC Standard Control Voltages	100-C09... 100-C16	100-C23... 100-C37	100-C43	100-C60... 100-C85
50 Hz	60 Hz	50/60 Hz	Cat. No.	Cat. No.	Cat. No.	Cat. No.	VDC	Cat. No.	Cat. No.	Cat. No.	Cat. No.
	12 V		TA006	TC006	TD006	TE006	9V❶	TA766	TC766	TD766	—
12 V			TA404	TC404	TD404	TE404	9V Diode❶	—	—	—	TE766M
	24 V		TA013	TC013	TD013	TE013	12V	TA708	TC708	TD708	—
24 V			TA407	TC407	TD407	TE407	12V Diode	—	—	—	TE708M
		24 V	TA855	TC855	TD855	TE855	24V❷	TA714	TC714	TD714	—
32 V	36 V		TA481	TC481	TD481	TE481	24V Diode❷	TA714M	TC714M	TD714M	TE714M
36 V			TA410	TC410	TD410	TE410	36V	TA719	TC719	TD719	—
42 V	48 V		TA482	TC482	TD482	TE482	36V Diode	—	—	—	TE719M
48 V			TA414	TC414	TD414	TE414	48V	TA724	TC724	TD724	—
		48 V	TA860	TC860	TD860	TE860	48V Diode	—	—	—	TE724M
100 V	100...110V		TA861	TC861	TD861	TE861	60V	TA774	TC774	TD774	—
110 V	120 V		TA473	TC473	TD473	TE473	60V Diode	—	—	—	TE774M
		110 V	TA856	TC856	TD856	TE856	64V	TA727	TC727	TD727	—
120 V			TA425	TC425	TD425	TE425	64V Diode	—	—	—	TE727M
127 V			TA428	TC428	TD428	TE428	72V	TA728	TC728	TD728	—
200 V	200...220V		TA862	TC862	TD862	TE862	72V Diode	—	—	—	TE728M
		200...230V	TA864	TC864	TD864	TE864	80V	TA729	TC729	TD729	—
	208 V		TA049	TC049	TD049	TE049	80V Diode	—	—	—	TE729M
	208...240V		TA296	TC296	TD296	TE296	110V	TA733	TC733	TD733	—
220 V	240 V		TA474	TC474	TD474	TE474	110V Diode	—	—	—	TE733M
220...230V			TA441	TC441	TD441	TE441	115V	TA734	TC734	TD734	—
		230 V	TA851	TC851	TD851	TE851	115V Diode	—	—	—	TE734M
230...240V			TA440	TC440	TD440	TE440	125V	TA737	TC737	TD737	—
240V	277 V		TA480	TC480	TD480	TE480	125V Diode	—	—	—	TE737M
		240 V	TA858	TC858	TD858	TE858	220V	TA747	TC747	TD747	—
	347 V		TA065	TC065	TD065	TE065	220V Diode	—	—	—	TE747M
	380 V		TA067	TC067	TD067	TE067	230V	TA749	TC749	TD749	—
380...400V	440 V		TA071	TC071	TD071	TE071	230V Diode	—	—	—	TE749M
		400 V	TA863	TC863	TD863	TE863	250V	TA751	TC751	TD751	—
400...415V			TA457	TC457	TD457	TE457	250V Diode	—	—	—	TE751M
440 V	480 V		TA475	TC475	TD475	TE475					
		440 V	TA859	TC859	TD859	TE859					
500 V			TA479	TC479	TD479	TE479					
550 V	600 V		TA476	TC476	TD476	TE476					

- ❶ Voltage operating range: 0.65...1.3 x Us.
❷ Voltage operating range: 0.7...1.25 x Us.

General Ratings

	Cat. No. 100-C09 – 100-C85
Rated Insulation Voltage U_i IEC, AS, BS, SEV, VDE 0660 UL; CSA	690V 600V
Rated Impulse Voltage U_{imp}	8 kV
Rated Voltage U_e Main Contacts AC 50/60Hz DC	115, 200, 208, 230, 240, 380, 400, 415, 460, 500, 575, 690V 24, 48, 110, 115, 220, 230, 300, 440V
Operating Frequency for AC Loads	50...60Hz

Switching Motor Loads

Cat. No.			100-C09	100-C12	100-C16	100-C23	100-C30	100-C37	100-C43	100-C60	100-C72	100-C85
Standard Ratings												
AC-2, AC-3, AC-4 - 50Hz DOL & Reversing 60° C IEC	230V	[A]	11.5	14.5	20	26.5	34	37	42	62	72	85
	240V	[A]	11	14	19	25.5	32.5	36	41	60	70	82
	380V	[A]	9	12	16	23	30	37	43	62	72	85
	400V	[A]	9	12	16	23	30	37	43	62	72	85
	415V	[A]	9	12	15	22	29	36	41	58	69	82
	500V	[A]	7	10	13	18	24	30	34	50	56	68
	690V	[A]	5	7	9.3	12	17	20	25	34	42	49
	230V	[kW]	3	4	5.5	7.5	10	11	13	18.5	22	25
	240V	[kW]	3	4	5.5	7.5	10	11	13	18.5	22	25
	380V	[kW]	4	5.5	7.5	11	15	18.5	22	30	37	45
	400V	[kW]	4	5.5	7.5	11	15	18.5	22	30	37	45
	415V	[kW]	4	5.5	7.5	11	15	18.5	22	30	37	45
	500V	[kW]	4	5.5	7.5	11	15	18.5	22	30	37	45
	690V	[kW]	4	5.5	7.5	11	15	18.5	22	30	37	45
AC-2, AC-3, AC-4 - 60Hz DOL & Reversing 60° C UL/CSA/IEC	1-Ph 115V	[A]	7.2	9.8	16	24	24	34	34	56	56	80
	230V	[A]	8	12	17	17	28	28	40	50	68	68
	115 V	[HP]	1/3	0.5	1	2	2	3	3	5	5	7-1/2
	230 V	[HP]	1	2	3	3	5	5	7-1/2	10	15	15
	3-Ph 200V	[A]	7.8	11	17.5	24	25.3	32.2	32.2	48.3	62.1	78.2
	230 V	[A]	6.8	9.6	15.2	22	28	28	42	54	68	80
	460 V	[A]	7.6	11	14	24	27	34	40	52	65	77
	575 V	[A]	9	11	17	20	22	27	32	52	62	72
	200 V	[HP]	2	3	5	7	7-1/2	10	10	15	20	25
	230 V	[HP]	2	3	5	7-1/2	10	10	15	20	25	30
	460 V	[HP]	5	7-1/2	10	17-1/2	20	25	30	40	50	60
	575 V	[HP]	7-1/2	10	15	18	20	25	30	50	60	70
Max. Operating Rate	AC2 (ops/hr)		500	500	500	400	400	400	400	300	250	200
	AC3 (ops/hr)		700	700	700	600	600	600	600	500	500	500
	AC4 (ops/hr)		200	150	120	80	80	70	70	70	60	50

Bulletin 100-C/104-C
MCS-C Contactors
Specifications, Continued

Electrical Data

Cat. No.			100-C09	100-C12	100-C16	100-C23	100-C30	100-C37	100-C43	100-C60	100-C72	100-C85
AC4 200,000 Operating Cycles	230V	[A]	5.5	7	10	12	15	17	19	28	34	41
	240V	[A]	5.5	7	10	12	15	17	19	28	34	41
	380V	[A]	4.3	6.6	9	10.2	12.2	14.1	16.1	25.5	31	38
	400V	[A]	4.3	6.6	9	10.2	12.2	14.1	16.6	25.5	31.1	38
	415V	[A]	4.3	6.6	9	10.2	12.2	14.1	16.6	25.5	31.1	38
	230V	[kW]	1.6	2	2.8	3.7	4.6	5.2	6.1	8.6	11	13.6
	240V	[kW]	1.5	1.9	2.7	3.5	4.4	5	5.8	8.2	10.5	13
	380V	[kW]	2	3	4	5	6	7	8.5	12.5	16	20
	400V	[kW]	2	3	4	5	6	7	8.5	12.5	16	20
	415V	[kW]	1.9	2.9	3.9	4.8	5.8	6.7	8.2	12	15.4	19.3
60Hz, 1-Phase	115V	[A]	4.4	5.8	7.2	9.8	9.8	13.8	16	24	24	34
	230V	[A]	4.9	6.9	8	10	12	12	17	28	28	40
	115V	[HP]	1/6	1/4	1/3	1/2	1/2	3/4	1	2	2	3
60Hz, 3-Phase	230V	[HP]	1/2	3/4	1	1-1/2	2	2	3	5	5	7-1/2
	200V	[A]	3.7	4.8	7.5	7.8	11	11	11	25.2	25.3	32.2
	230V	[A]	4.2	6.0	6.8	9.6	9.6	9.6	15.2	22	28	28
	460V	[A]	4.3	6.6	6.8	9.6	9.6	9.6	15.2	22	28	28
	575V	[A]	2.7	3.9	6.1	6.1	9.0	11	11	17	22	27
	200V	[HP]	3/4	1	2	2	3	3	3	7-1/2	7-1/2	10
	230V	[HP]	1	1-1/2	2	3	3	3	5	7-1/2	10	10
	460V	[HP]	2	3	5	5	7-1/2	10	10	15	20	25
	575V	[HP]	2	3	5	5	7-1/2	10	10	15	20	25
	Max. Operating Rate	[ops/hour]	400	300	240	160	160	140	140	140	120	110
Star-Delta 50 Hz	230V	[A]	20	25	35	46	59	64	74	107	125	147
	240V	[A]	19	24	33	44	56	62	71	104	121	142
	380V	[A]	16	21	226	40	52	64	74	104	125	147
	400V	[A]	16	21	26	40	52	64	74	104	125	147
	415V	[A]	16	21	26	38	50	62	71	100	120	142
	500V	[A]	12	17	23	31	42	52	59	87	97	118
	690V	[A]	9.3	12	15	20	28	36	43	59	73	85
	230V	[kW]	5.5	7.5	10	14	18	19	23	33	39	47
	240V	[kW]	5.5	7.5	10	14	18	20	23	34	39	47
	380V	[kW]	16	21	26	40	52	64	74	104	125	147
	400V	[kW]	8	11	14	21	28	35	40	58	69	82
	415V	[kW]	8	11	14	21	28	35	40	58	69	82
	500V	[kW]	8	11	15	21	28	35	40	60	67	82
	690V	[kW]	8	11	14	19	28	32	41	56	70	81
Wye-Delta 60 Hz	200V	[A]	17.5	17.5	25.3	25.3	32.2	48.3	62.1	92	120	150
	230V	[A]	15.2	22	28	28	42	54	68	104	130	154
	460V	[A]	14	21	27	34	40	52	65	96	124	156
	575V	[A]	11	17	22	27	32	41	52	73	99	125
	200V	[HP]	5	5	7-1/2	7-1/2	10	15	20	30	40	50
	230V	[HP]	5	7-1/2	10	10	15	20	25	40	50	60
	460V	[HP]	10	15	20	25	30	40	50	75	100	125
	575V	[HP]	10	15	20	25	30	40	50	75	100	125
CSA Elevator Duty	Max FLC	[A]	8.0	11.0	16.0	21.0	27.0	31.0	37.0	43.0	54.0	62.0
	200V	[A]	7.8	11.0	11.0	17.5	25.3	25.3	32.2	32.2	48.3	62.1
	230V	[A]	6.8	9.6	15.2	15.2	22.0	28.0	28.0	42.0	54.0	68.0
	460V	[A]	7.6	11.0	14.0	21.0	27.0	27.0	34.0	40.0	52.0	65.0
	575V	[A]	6.1	9.0	11.0	17.0	22.0	27.0	32.0	41.0	52.0	62.0
	200V	[HP]	2	3	3	5	7-1/2	7-1/2	10	10	15	20
	230V	[HP]	2	2	5	5	7-1/2	10	10	15	20	25
	460V	[HP]	5	7-1/2	10	15	20	20	25	30	40	50
	575V	[HP]	5	7-1/2	10	15	20	25	30	40	50	60

Electrical Data

Cat. No.			100-C09	100-C12	100-C16	100-C23	100-C30	100-C37	100-C43	100-C60	100-C72	100-C85
AC-1 Load, 3 Ø Switching												
Ambient Temperature 40°C	I _{th}	[A]	25	25	32	32	45	50	63	90	90	100
	230V	[kW]	10	10	13	13	18	20	25	36	36	40
	240V	[kW]	10	10	13	13	19	21	26	37	42	40
	380V	[kW]	17	17	22	22	31	35	44	62	62	69
	400V	[kW]	17	17	22	22	31	35	44	62	62	69
	415V	[kW]	18	18	23	23	32	36	45	65	65	72
	500V	[kW]	22	22	28	28	39	43	55	78	78	87
	690V	[kW]	30	30	38	38	54	60	75	108	108	120
Ambient Temperature 60°C	I _{th}	[A]	20	20	24	24	36	40	50	72	72	85
	230V	[kW]	8	8	10	10	14	16	20	29	29	34
	240V	[kW]	8	8	10	10	15	17	21	30	30	35
	380V	[kW]	14	14	17	17	26	28	35	50	50	59
	400V	[kW]	14	14	17	17	26	28	35	50	50	59
	415V	[kW]	14	14	17	17	26	29	36	52	52	61
	500V	[kW]	17	17	21	21	31	35	43	62	62	74
	690V	[kW]	24	24	29	29	43	48	60	86	86	102
Max Operating Rate			(ops/hour)	1,000	1,000	1,000	1,000	1,000	1,000	800	800	600
Load Carrying Capacity (Per UL/CSA)												
Continuous Current	Open	[A]	25	25	30	30	45	50	63	90	90	100
	Enclosed	[A]	25	25	30	30	45	50	63	90	90	100
Max Operating Rate			(ops/hour)	1,000	1,000	1,000	1,000	1,000	1,000	800	800	600
Lighting Loads												
Electric Discharge Lamps - AC-5a, Single Compensated	Open	[A]	23	23	28	28	41	45	57	81	81	90
	Enclosed	[A]	18	18	21	21	32	36	45	65	65	76
Max. capacitance at prospective short circuit current available at the contactor.	10kA	[μF]	1,000	1,000	1,000	1,000	2,700	2,700	3,200	4,000	4,000	4,700
	20kA	[μF]	500	500	500	500	1,350	1,350	1,600	2,000	2,000	2,350
	50kA	[μF]	200	200	200	200	540	540	640	800	800	940
Incandescent Lamps AC-5b			[A]	12	12	12	25	25	35	35	60	70
Transformer Switching - AC-6a												
50 Hz	230V	[A]	5.2	6.5	9.0	12	15	17	19	28	32	38
		[A]	5.0	6.3	8.6	11	15	16	18	27	32	37
		[A]	4.1	5.4	7.2	10	14	17	19	27	32	38
		[A]	4.1	5.4	7.2	10	14	17	19	27	32	38
		[A]	4.1	5.4	6.8	9.9	13	16	18	26	31	37
		[A]	3.2	4.5	5.9	8.1	11	14	15	23	25	31
	240V	[A]	2.3	3.2	4.2	5.4	7.7	9.0	11	15	19	22
		[kVA]	2.1	2.6	3.6	4.8	6.1	6.6	7.7	11	13	15
		[kVA]	2.1	2.6	3.6	4.8	6.1	6.7	7.7	11	13	15
		[kVA]	2.8	3.7	5.0	7.2	9.4	12	13	19	22	27
		[kVA]	2.8	3.7	5.0	7.2	9.4	12	13	19	22	27
		[kVA]	2.9	3.9	4.9	7.1	9.4	12	13	19	22	27
	380V	[kVA]	2.7	3.9	5.1	7.0	9.4	12	12	19	22	27
		[kVA]	2.7	3.8	5.0	6.5	9.1	11	13	19	23	26
		[kVA]	2.7	3.8	5.0	6.5	9.1	11	13	19	23	26
		[kVA]	2.7	3.8	5.0	6.5	9.1	11	13	19	23	26
		[kVA]	2.7	3.8	5.0	6.5	9.1	11	13	19	23	26
		[kVA]	2.7	3.8	5.0	6.5	9.1	11	13	19	23	26

Electrical Data

Cat. No.			100-C09	100-C12	100-C16	100-C23	100-C30	100-C37	100-C43	100-C60	100-C72	100-C85
Short-Circuit Coordination - Contactors or Contactors with Solid-State and Bimetallic Overload Relays												
DIN Fuses - gG, gL												
Available Fault Current		[A]	100,000									
Type "1"		[A]	50	50	50	63	100	125	160	200	250	250
Type "2" (380/400/415V)		[A]	20	25	25	35	50	80	100	125	126	160
Type "2" (690V)		[A]	20	25	25	35	50	80	100	125	125	160
BS88 Fuses												
Available Fault Current		[A]	80,000									
Type "1"		[A]	25	32	35	50	63	80	100	100	125	160
Type "2" (690V)		[A]	25	32	35	50	63	80	100	100	125	160
UL Class CC Fuses												
CSA HRCI-MISC Fuses												
Available Fault Current		[A]	100,000									
Type "1" (600V)		[A]	15	20	30	30	—	—	—	—	—	—
Type "2" (600V)		[A]	15	20	30	30	—	—	—	—	—	—
UL Class J Fuses												
UL Class K1, RK1 Fuses												
CSA HRCI- J Fuses												
Available Fault Current		[A]	100,000									
Type "1" (600V)		[A]	15	20	30	30	40	50	50	80	100	100
Type "2" (600V)		[A]	15	20	30	30	40	50	50	80	100	100
Short Time Current Withstand Ratings												
I_{cw} 60° C	1 s	[A]	210	210	290	380	480	525	650	1,110	1,150	1,250
	4 s	[A]	140	150	220	280	360	390	480	820	860	910
	10 s	[A]	100	120	175	220	290	310	375	640	680	710
	15 s	[A]	90	100	150	200	250	270	325	560	600	620
	60 s	[A]	60	60	90	125	170	175	200	350	370	380
	240 s	[A]	40	40	50	60	100	100	120	190	190	200
	900 s	[A]	30	30	38	38	524	60	75	108	108	120
Off Time Between Operations	Minutes		20	20	20	20	20	20	20	20	20	20
Resistance and Watt Loss le AC3												
Resistance per power pole		[mΩ]	2.7	2.7	2.7	2.0	2.0	2.0	1.5	0.9	0.9	0.9
Watt Loss - 3 power poles		[W]	0.7	1.2	2.1	3.2	5.4	8.2	8.3	9.7	14.0	19.5
Coil and 3 power poles	AC	[W]	3.3	3.8	4.7	6.2	8.4	11.2	11.5	14.2	18.5	2.4
	DC	[W]	6.7	7.2	8.1	12.4	14.6	17.4	18.4	14.6	18.9	12.4
	AC	[W]	2.6	2.6	2.6	3.0	3.0	3.0	3.2	4.5	4.5	4.5
	DC	[W]	6.0	6.0	6.0	9.2	9.2	9.2	10.0	4.9	4.9	4.9

Mechanical Data

Cat. No. 100-		C09	C12	C16	C23	C30	C37	C43	C60	C72	C85
Mechanical Life											
AC	[Mil.]	13	13	13	13	13	13	12	10	10	10
DC	[Mil.]	13	13	13	13	13	13	13	10	10	10
Shipping Weights											
AC - 100-C	[kg]	0.39	0.39	0.39	0.39	0.48	0.49	0.51	1.45	1.45	1.45
	[Lbs]	0.86	0.86	0.86	0.86	1.06	1.08	1.12	3.20	3.20	3.20
AC - 104-C	[kg]	0.85	0.85	0.85	0.85	1.08	1.08	1.15	3.14	3.14	3.14
	[Lbs]	1.89	1.89	1.89	1.89	2.39	2.39	2.54	6.92	6.92	6.92
DC - 100-C	[kg]	0.60	0.60	0.60	0.73	0.85	0.85	1.00	1.47	1.47	1.47
	[Lbs]	1.32	1.32	1.32	1.61	1.87	1.87	2.20	3.24	3.24	3.24
DC - 104-C	[kg]	1.27	1.27	1.27	1.53	1.81	1.81	2.13	3.22	3.22	3.22
	[Lbs]	2.81	2.81	2.81	3.39	4.00	4.00	4.70	7.10	7.10	7.10
Terminations - Power											
Description		Combination: Cross, Slotted, Pozidrive							Allen Head: 4mm, 5/32		
Fine Stranded w/ Ferrule	1 Wire [mm2]	1...4	1...4	1...4	1...4	2.5...10	2.5...10	2.5...16	2.5...35	2.5...35	2.5...35
	2 Wires [mm2]	1...4	1...4	1...4	1...4	2.5...10	2.5...10	2.5...10	2.5...25	2.5...25	2.5...25
Course Stranded/Solid	1 Wire [mm2]	1.5...6	1.5...6	1.5...6	1.5...6	2.5...16	2.5...16	2.5...25	2.5...50	2.5...50	2.5...50
	2 Wires [mm2]	1.5...6	1.5...6	1.5...6	1.5...6	2.5...16	2.5...16	2.5...16	2.5...35	2.5...35	2.5...35
Stranded/Solid (UL/CSA)	1 Wire [AWG]	16...10	16...10	16...10	16...10	14...6	14...6	14...6	14...2	14...2	14...2
	2 Wires [AWG]	16...10	16...10	16...10	16...10	14...6	14...6	14...6	14...2	14...2	14...2
Torque Requirement	[Nm]	1...2.5	1...2.5	1...2.5	1...2.5	1.5...3.5	1.5...5	1.5...3.5	2...6	2...6	2...6
	[Lb-in]	8.9...22	8.9...22	8.9...22	8.9...22	13...31	13...31	13...31	18...52	18...52	18...52
Terminations - Control		Combination: Cross, Slotted, Pozidrive									
Description											
Coils	1 or 2 [mm2]	1.5...6									
	Wires [AWG]	16...10									
Control Modules	1 or 2 [mm2]	1.5...6									
	Wires [AWG]	16...10									
Torque Requirement	[Nm]	1...2.5									
	[Lb-in]	8.9...22									
Type of Protection		IP 2LX per IEC 529 and DIN 40 050 (with wires installed)									
Finger Protection		Safe from touch by fingers and back-of-hand per VDE 0106; Part 100									

Environmental Data

Cat. No.	100-C09	100-C12	100-C16	100-C23	100-C30	100-C37	100-C43	100-C60	100-C72	100-C85
Ambient Temperature										
Storage	-55...+80° C (-67...176° F)									
Operation	-25...+60° C (-13...140° F)									
Conditioned 15% current reduction after AC-1 at >60° C	-25...+70° C (-13...158° F)									
Altitude	2000 meters above sea level per IEC 947-4									
Resistance to Corrosion / Humidity	Damp-alternating climate: cyclic to OEC 68-2, 56 cycles.									
	Dry heat: IEC 68-2, +100° C (212° F), relative humidity <50%, 7 days.									
	Damp tropical: IEC 68-2, +40° C (104° F), relative humidity <92%, 56 days.									
Shock Resistance	IEC 68-2: Half sinusoidal shock 11ms, 30g (in all three directions)									
Vibration Resistance	IEC 68-2: Static >2g, in normal position no malfunction <5g									
Pollution Degree	3									
Operating Position	Refer to Dimension Pages									

Coil Data

Cat. No.			100-C09	100-C12	100-C16	100-C23	100-C30	100-C37	100-C43	100-C60	100-C72	100-C85
Voltage Range												
AC: 50Hz, 60Hz, 50/60 Hz	Pickup	[x U _S]	0.85...1.1									
	Dropout	[x U _S]	0.3...0.6									
DC	Pickup	[x U _S]	0.8...1.1									
	Dropout	[x U _S]	0.1...0.6									
Coil Consumption												
AC: 50Hz, 60Hz, 50/60 Hz	Pickup	[VA/W]	70/50	70/50	70/50	70/50	70/50	80/60	130/90	200/110	200/110	200/110
	Hold-in	[VA/W]	8/2.6	8/2.7	8/2.8	9/3	9/3	9/3	10/3.2	16/4.5	16/4.5	16/4.5
DC	Pickup	[W]	6.0	6.0	6.0	9.2	9.2	9.2	10.1	200	200	200
	Hold-in	[W]	6.0	6.0	6.0	9.2	9.2	9.2	10.1	4.5	4.5	4.5
Operating Times												
AC: 50Hz, 60Hz, 50/60 Hz	Pickup	[ms]	15...30	15...30	15...30	15...30	15...30	15...30	15...30	18.5...30	18.5...30	18.5...30
	Dropout	[ms]	10...60	10...60	10...60	10...60	10...60	10...60	10...60	10...60	10...60	10...60
w/ RC Suppressor	Dropout	[ms]	10...60	10...60	10...60	10...60	10...60	10...60	10...60	10...60	10...60	10...60
DC	Pickup	[ms]	40...70	40...70	40...70	40...70	50...80	50...80	50...80	20...40	20...40	20...40
	Dropout	[ms]	7...15	7...15	7...15	7...15	7...15	7...15	7...15	—	—	—
w/ Integ. Suppres.	Dropout	[ms]	14...20	14...20	14...20	17...23	17...23	17...23	17...23	20...35	20...35	20...35
w/ Diode Suppres.	Dropout	[ms]	70...95	70...95	70...95	80...125	80...125	80...125	80...125	80...125	80...125	80...125

Auxiliary Contacts

	Auxiliary Contacts in Contactor Cat. No. 100-C09 – 100-C23										Auxiliary Contacts in Accessories Cat. No. 100-S, 100-F, 100-MC										
Alternating Current Switching																					
AC-1 I_{th}	at 40°C	[A]	25										10								
	at 60°C	[A]	20										6								
AC-15 at Rated Operating Voltage		[V]	24	48	120	240	400	500	600	690	24	48	120	240	400	500	600	690			
		[A]	16	16	14	10	5	2.5	1.8	1	6	6	6	3	2	1.5	1.2	0.7			
Short-Circuit Protection																					
gG Fuse																					
Type 2 Coordination			[A]	10										10							
Rated Impulse Voltage U_{imp}			[kV]	8										6							
Insulation Voltage (between control and load circuit) per DIN, VDE 0106, Part 101 (NAMUR recommendation)			[V]	400										Between auxiliary circuits: 250 V, Between load and direct-connected aux. circuits: 690 V							
Contact reliability per DIN19240 without contamination, normal industrial atmosphere				17V, 5 mA, >10 ⁸ operations per error										17V, 5 mA, >10 ⁸ operations per error							
Positively Guided Contacts				Yes, N.O. and N.C. mutually unrestricted										Yes, N.O. and N.C. mutually unrestricted, including N.C. in relation to N.O. Main contacts of contactor do not provide positive guidance with Cat. Nos. 100-FL & 100-FPT							
Terminal Cross-Sections and Terminals																					
Terminal Type																					
Maximum Wire Size per IEC 947-1				2 x A4										2 x A4							
	Flexible with Wire-End Ferrule	1 Conductor	[mm ²]	1...4										0.5...2.5							
		2 Conductor	[mm ²]	1...4										0.75...2.5							
	Solid/Stranded Conductor	1 Conductor	[mm ²]	1.5...6										0.5...2.5							
		2 Conductor	[mm ²]	1.5...6										0.75...2.5							
Tightening Torque			[Nm]	1...2.5										1...1.5							
Max. Wire Size per UL/CSA			[AWG]	16...10										18...14							
Tightening Torque			[lb-in]	8.9...22										8.9...13.3							

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 947-4-1. 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 Table A.
2. Choose the graph for the utilization category selected.
3. Locate the intersection of the life-load curve for the appropriate contactor with the application's operational current (I_e) found on the horizontal axis.
4. Read the estimated contact life along the vertical axis.

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

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

$$L_{\text{mixed}} = L_{\text{ac3}} / [1 + P_{\text{ac4}} * (L_{\text{ac3}} / L_{\text{ac4}} - 1)], \text{ where:}$$

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

L_{ac3} Approximate contact life in operations for a pure AC-3 utilization category (from the AC-3 life-load curves).

L_{ac4} Approximate contact life in operations for a pure AC-4 utilization category (from the AC-4 life-load curves).

P_{ac4} Percentage of AC-4 operations.

Table A
Utilization Categories and Test Conditions

(Switching conditions for verifying electrical life, (number of operations under load) according to IEC 947-4: -5.)

Test Conditions		Making			Breaking		
		I/I_e	U/U_e	$\cos\phi$	I_c/I_e	U_r/U_e	$\cos\phi$
AC-1	Resistance Furnaces: Non inductive or slightly inductive loads, Resistive Fur- naces	1	1	0.95	1	1	0.95
AC-2	Slip-ring motors: Starting and stopping of running motors	2.5	1	0.65	2.5	1	0.65
AC-3	Squirrel - cage motors: Starting and stopping of running motors	$I_e < 17A$ 6	1 1	0.65 0.35	6 6	1 1	0.65 0.35
		$I_e > 17A$ 6	1 1	0.65 0.35	6 6	1 1	0.65 0.35
AC-4	Squirrel - cage motors: Starting, plugging ❶, inching ❷	$I_e < 17A$ 6	1 1	0.65 0.35	6 6	1 1	0.65 0.35
		$I_e > 17A$ 6	1 1	0.65 0.35	6 6	1 1	0.65 0.35
AC-15	Solenoid of 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

I_c Braking Current

U_r Recovery voltage

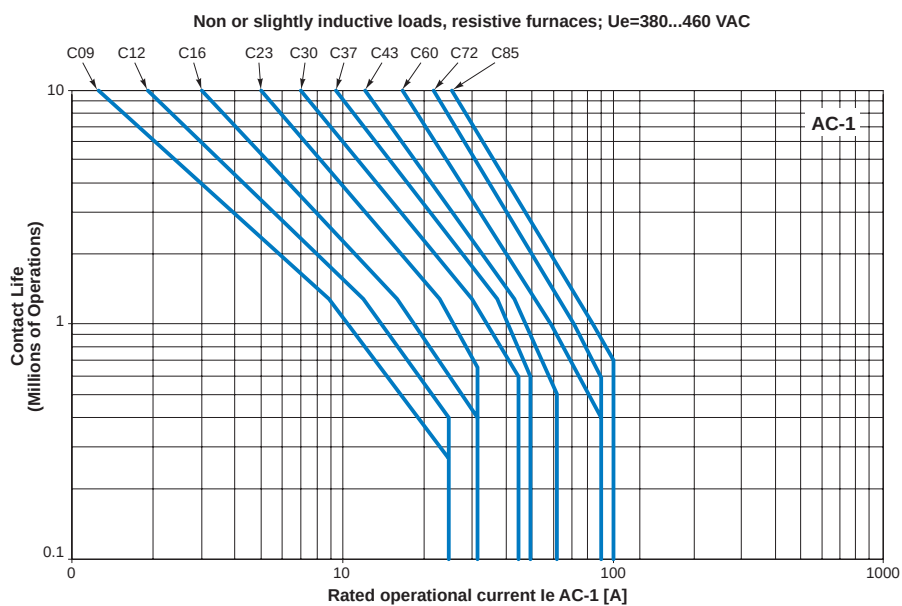
U Off-load voltage

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

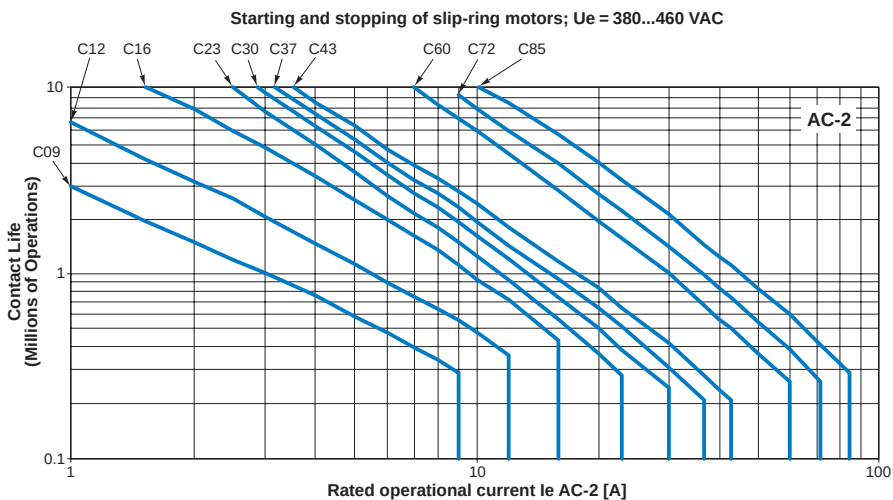
❷ Inching (jogging) is understood as energizing a motor once or repeatedly for short periods to obtain small movements of the driven mechanism.

Life-Load Curve

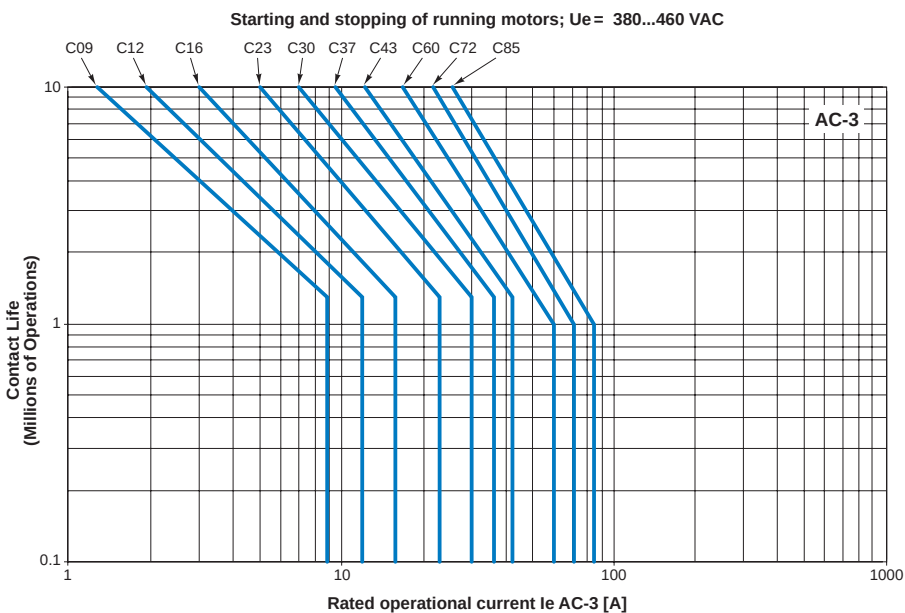
AC-1



AC-2

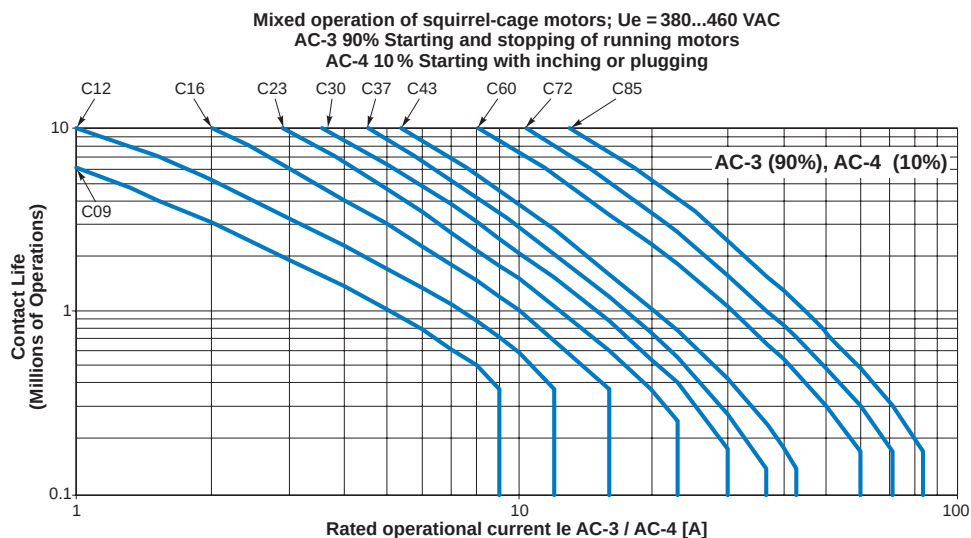


AC-3

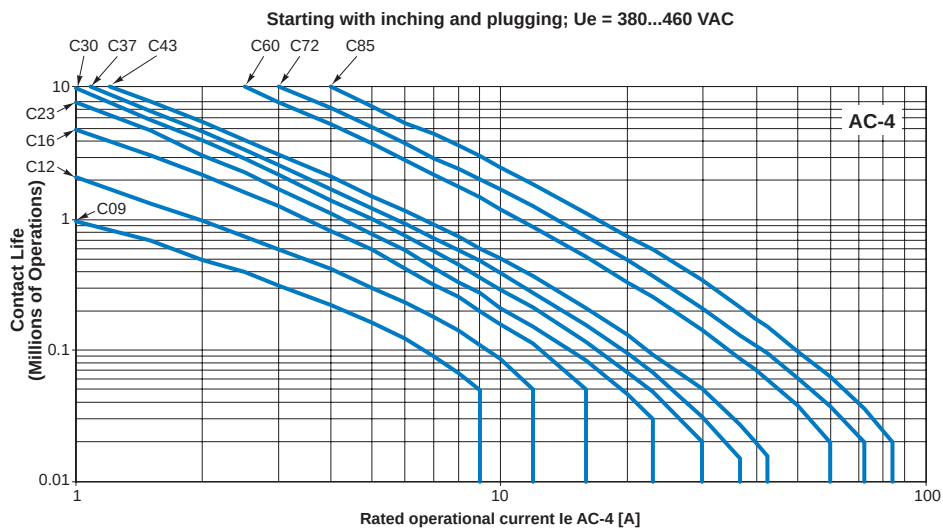


Life-Load Curve

AC-3 90%/AC-4 10%



AC-4



Operating Rates

The estimated contact life shown in the life-load curves is based on the standard operating rates shown in Table B. For applications requiring a higher operating frequency, the maximum operating power (Pn in kW or HP) for a given contactor must be reduced to maintain the same contact life. To find a contactor's maximum operating power, for an operating rate greater than shown in Table B, follow these guidelines:

1. Identify the appropriate curve for the contactor and utilization category from Table B.
2. Locate the required curve.
3. Locate the intersection of the curve with the application's operating rate (ops/hr.) found on the vertical axis.
4. Read the percent of maximum operating power (Pn) of the contactor from the horizontal axis.
5. Multiply the % maximum power by the standard power rating.

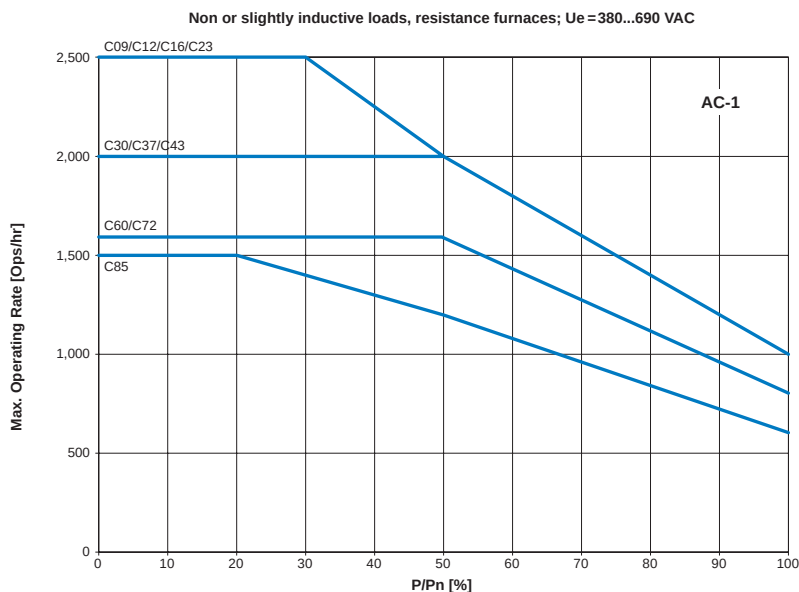
Example: The contactor selected for an AC-4 utilization category application is a Cat. No. 100-C16 (7.5kW at 400V), however, the application requires an operating rate of 200 ops/hr. compared to the standard operating rate of 120 ops per hour shown in Table B.

1. Locate the AC-4 operating rate curve.
2. Locate the intersection of 200 ops/hr on the Cat. No. 100-C16 curve. The data shows that the maximum operating power of the Cat. No. 100-C16 contactor in this application is 60%.
3. Therefore, the maximum power that can be applied to the Cat. No. 100-C16 contactor in this application is 4.5 kW (0.60*7.5kW).

Table B
 Standard Operating Rates, by Contactor and Utilization Category

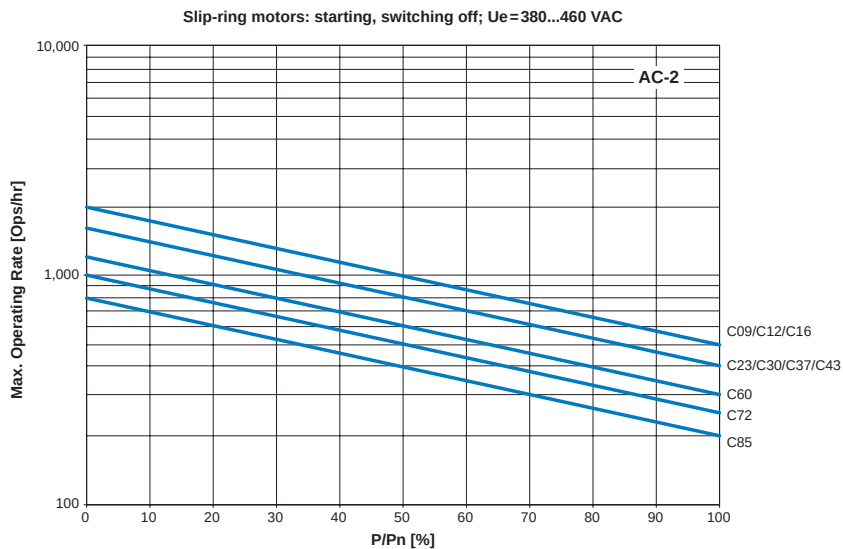
Contactor	AC-1 Max. Ops/Hr.	AC-2 Max. Ops/Hr.	AC-3 Max. Ops/Hr.	AC-4 Max. Ops/Hr.	AC-4 @ I _e for 200K ops. Max. Ops/Hr.
Operating Parameters			40% Duty Cycle 250 ms	250 ms	250ms
Start time:					
100-C09	1000	500	700	200	400
100-C12	1000	500	700	150	300
100-C16	1000	500	700	120	240
100-C23	1000	400	600	80	160
100-C30	1000	400	600	80	160
100-C37	1000	400	600	70	140
100-C43	1000	400	600	70	140
100-C60	800	300	500	70	140
100-C72	800	250	500	60	120
100-C85	600	200	500	50	140

AC-1

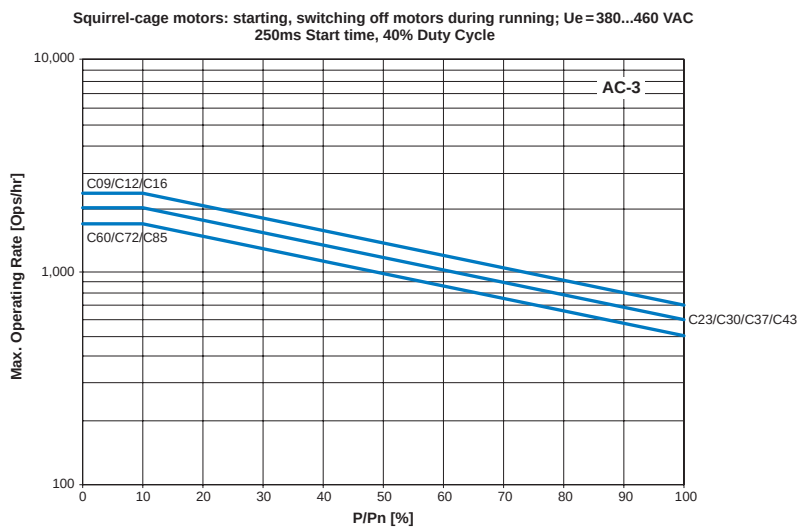


Maximum Operating Rates

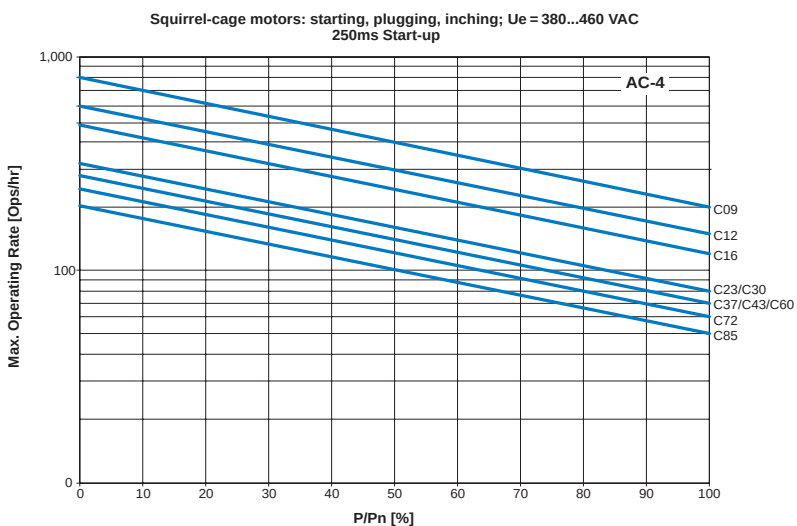
AC-2



AC-3

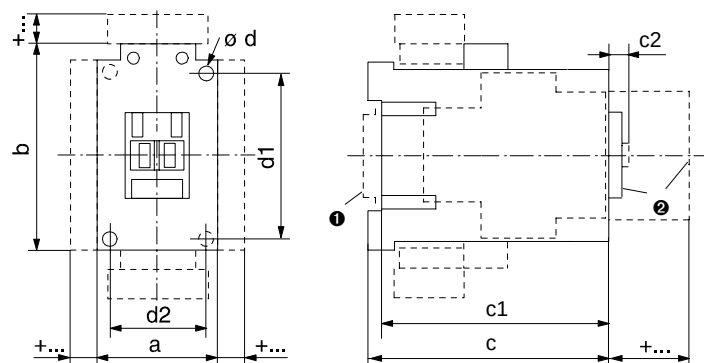


AC-4

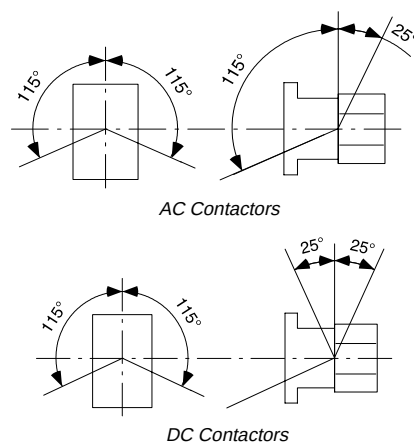


Contactors and Accessories

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



Mounting Position



AC Contactors

Cat. No. ❶	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 (3-3/32)	6 (1/4)	2 St. - 4.5 (2 St. - 3/16)	60 (2-23/64)	35 (1-25/64)
100-C30, 100-C37	45 (1-25/32)	81 (3-3/16)	97.5 (4)	92.6 (3-49/64)	6.5 (17/64)	2 St. - 4.5 (2 St. - 3/16)	60 (2-23/64)	35 (1-25/64)
100-C43	54 (2-1/8)	81 (3-3/16)	100.5 (4-7/64)	95.6 (3-7/8)	6.5 (17/64)	2 St. - 4.5 (2 St. - 3/16)	60 (2-23/64)	45 (1-25/32)
100-C60...100-C85	72 (2-53/64)	122 (4-51/64)	117 (4-49/64)	111.5 (4-35/64)	8.5 (21/64)	4 St. - 5.4 (4 St. - 7/32)	100 (3-15/16)	55 (2-11/64)

DC Contactors

Type	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 (1/4)	2 pcs. - 4.5 (2 pcs.-3/16)	60 (2-23/64)	35 (1-25/64)
100-C23Z	45 (1-25/32)	81 (3-3/16)	123.5 (4-55/64)	119 (4-43/64)	6 (1/4)	2 pcs.- 4.5 (2 pcs.-3/16)	60 (2-23/64)	35 (1-25/64)
100-C30...100-C37	45 (1-25/32)	81 (3-3/16)	141.5 (5-37/64)	136.5 (5-3/8)	6.5 (17/64)	2 pcs.- 4.5 (2 pcs.-3/16)	60 (2-23/64)	35 (1-25/64)
100-C43Z	54 (2-1/8)	81 (3-3/16)	144.5 (5-11/16)	140 (5-33/64)	6.5 (17/64)	2 pcs.- 4.5 (2 pcs.-3/16)	60 (2-23/64)	45 (1-25/32)
100-C60D...100-C85D	72 (2-53/64)	122 (4-51/64)	117 (4-49/64)	111.5 (4-35/64)	8.5 (21/64)	4 pcs.- 5.4 (4 pcs.-7/32)	100 (3-15/16)	55 (2-11/64)

❶ May be mounted to EN 50 022 35 mm DIN rail.

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)
❷ 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)

Bulletin 193

193-EA/ES (MCS-E1)

- Self Powered
- Phase Loss Protection
- Wide Adjustment Range (3.2:1)
- 1 N.O. and 1 N.C. Isolated Auxiliary Contacts
- Choice of Tripping Classes — Class 10 or 20
- Compact Size
- Low Energy Consumption (150mW)

193-EB (MCS-E2)

Also Includes:

- Selectable Trip Class 10, 15 or 20
- Ground Fault Tripping
- Jam/Stall Protection



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Description

The MCS-E is a self-powered solid-state overload relay that provides advanced motor protection when compared to traditional bimetallic overload relays. The MCS-E1 offers motor overload protection with a choice of either trip class 10 or 20. It provides improved protection against the damage caused to motors when operated under phase loss conditions. The MCS-E1 also offers, as standard, a manually operated trip function, visible trip indicator and isolated N.O. alarm contacts. The MCS-E2 overload relay adds to the overload protection of the MCS-E1 overload relay. The MCS-E2 provides selectable ground fault tripping, selectable jam/stall protection and selectable trip classes. A full range of accessories such as anti-tamper shields and panel mounting adapters are available.

Conformity to Standards:

IEC 947-4

CSA C22.2 No. 14

UL 508

Approvals:

CE

CSA Certified

UL Listed

Your order must include:

- The Cat. No. of overload relay selected.
- If required, Cat. No. of any accessories.

Bulletin 193-E
MCS-E Solid-State Overload Relays
Product Selection

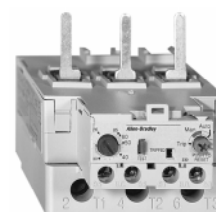
Bulletin 193-EA/193-ES Electronic Motor Protection Relays - Manual Reset



Cat. No. 193-EA1GB



Cat. No. 193-EA1JD



Cat. No. 193-EA1KE

Mounts to Contactor	Reset	Adjustment Range (A)	Trip Class 10		Trip Class 20	
			Cat. No.	*	Cat. No.	*
Manual Reset for 3Ø Applications						
100-M05...100-C23	M	0.1...0.32	193-EA1AB		193-EA2AB	
100-M05...100-C23	M	0.32...1.0	193-EA1CB		193-EA2CB	
100-M05...100-C23	M	1.0...2.9	193-EA1DB		193-EA2DB	
100-M05...100-C23	M	1.6...5.0	193-EA1EB		193-EA2EB	
100-M05...100-C23	M	3.7...12	193-EA1FB		193-EA2FB	
100-C09...100-C23	M	12...32	193-EA1GB		193-EA2GB	
100-C30...100-C37	M	12...37	193-EA1HC		193-EA2HC	
100-C43	M	14...45	193-EA1JD		193-EA2JD	
100-C60...100-C85	M	26...85	193-EA1KE		193-EA2KE	
Manual Reset for 1Ø Applications						
100-M05...100-C23	M	2.0...7.0	193-ES1AB		193-ES2AB	
100-M05...100-C23	M	5.0...15	193-ES1BB		193-ES2BB	
100-C09...100-C23	M	12...32	193-ES1CB		193-ES2CB	
100-C30...100-C37	M	12...37	193-ES1DC		193-ES2DC	
100-C43	M	14...45	193-ES1FD		193-ES2FD	
100-C60...100-C85	M	26...85	193-ES1HE		193-ES2HE	

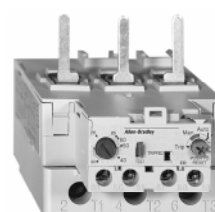
Bulletin 193-EA/193-ES Electronic Motor Protection Relays - Automatic/Manual Reset



Cat. No. 193-EA4GB



Cat. No. 193-EA4JD



Cat. No. 193-EA4KE

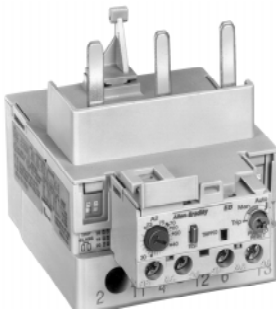
Mounts to Contactor	Reset	Adjustment Range (A)	Trip Class 10		Trip Class 20	
			Cat. No.	*	Cat. No.	*
Automatic/Manual Reset for 3Ø Applications						
100-M05...100-C23	A	0.1...0.32	193-EA4AB		193-EA5AB	
100-M05...100-C23	A	0.32...1.0	193-EA4CB		193-EA5CB	
100-M05...100-C23	A	1.0...2.9	193-EA4DB		193-EA5DB	
100-M05...100-C23	A	1.6...5.0	193-EA4EB		193-EA5EB	
100-M05...100-C23	A	3.7...12	193-EA4FB		193-EA5FB	
100-C09...100-C23	A	12...32	193-EA4GB		193-EA5GB	
100-C30...100-C37	A	12...37	193-EA4HC		193-EA5HC	
100-C43	A	14...45	193-EA4JD		193-EA5JD	
100-C60...100-C85	A	26...85	193-EA4KE		193-EA5KE	
Automatic/Manual Reset for 1Ø Applications						
100-M05...100-C23	A	2.0...7.0	193-ES4AB		193-ES5AB	
100-M05...100-C23	A	5.0...15	193-ES4BB		193-ES5BB	
100-C09...100-C23	A	12...32	193-ES4CB		193-ES5CB	
100-C30...100-C37	A	12...37	193-ES4DC		193-ES5DC	
100-C43	A	14...45	193-ES4FD		193-ES5FD	
100-C60...100-C85	A	26...85	193-ES4HE		193-ES5HE	

Bulletin 193-EB Electronic Motor Protection Relays

Automatic/Manual Reset, Adjustable Trip Class 10, 15 or 20, Jam/Stall and Ground Fault Tripping.



Cat. No. 193-EB1AB



Cat. No. 193-EB1NE

Mounts to Contactor	Reset ❶	Adjustment Range (A)	Cat. No.	*
100-C09...100-C23	A	0.1...0.32	193-EB1AB	
100-C09...100-C23	A	0.32...1.0	193-EB1CB	
100-C09...100-C23	A	1.0...2.9	193-EB1DB	
100-C09...100-C23	A	1.6...5.0	193-EB1EB	
100-C09...100-C23	A	3.7...12	193-EB1FB	
100-C09...100-C23	A	12...32	193-EB1GB	
100-C30...100-C37	A	14...45	193-EB1JC	
100-C43	A	5.0...15	193-EB1SD	
100-C43	A	14...45	193-EB1JD	
100-C60...100-C85	A	23...75	193-EB1ME	
100-C60...100-C85	A	60...85	193-EB1NE	

❶ Ground Fault Tripping is inhibited for approximately 30 seconds to eliminate the possibility of nuisance tripping during motor starting.

Accessories — Page [33](#)
 Specifications — Page [34](#)
 Dimensions — Page [37](#)

Allen-Bradley

* Prices – Consult Sales Office or price list

MCS-E Solid-State Overload Relays

Accessories

Add-on Accessories

	Description	For Use With	Pkg. Qty.	Cat. No.	*
	DIN Rail/Panel Adapter For separate mounting of the electronic motor protection relay, can be mounted to top-hat rail EN 50 02-35	193-EA__ B	1	193-EPM1	
		193-ES__ B		193-EPM1	
		193-EB__ B		193-EPM2	
		193-EA__ C		193-EPM1	
		193-ES__ C		193-EPM1	
		193-EB__ C		193-EPM2	
		193-E__ D		193-EPM2	
		193-E__ E		193-EPM3	
	Anti-Tamper Shield Provides protection against inadvertent adjustment of mode selector and full load current settings.	193-E all	1	193-BC4	
	Current Adjustment Shield Provides protection against inadvertent adjustment of the current setting.	193-E all	1	193-BC5	
	Anti-Tamper Shield for DIP Switches	193-EB__ B 193-EB__ C 193-EB__ D	40	193-BC7	
	Anti-Tamper Shield for DIP Switches	193-EB__ E	40	193-BC6	
 007p193	Remote Reset Solenoid For remote reset of electronic overload relays	193-E all	1	193-ER1⊗	
	External Reset Button for Enclosed Devices Metal construction IP66, non-illuminated with rod (Length: 142 mm, adjustment range 141...159 mm). Please consult push button catalog 800E for additional types.	193-E all	1	800ES-R611WTR08	
	Labeling Material Uniform labeling material for contactors, motor protection devices, timing relays and circuit breakers. For Product Information and Ordering Information, see Bulletin 100-C.			—	—

⊗ Voltage Suffix Code

Available Coil Voltages 12... 600V 50 Hz/12...600V 60 Hz

Standard Coil Voltages

Voltage	24	48	110	115	120	220	220-230	240
50 Hz	J	—	D	—	—	A	F	—
60 Hz	J	—	—	—	D	—	—	A
DC	Z24	Z48	—	Z01	—	—	—	—

Surcharge for special voltages up to 20 pcs. (no surcharge for quantities greater than 20 pcs.)

Main Circuits

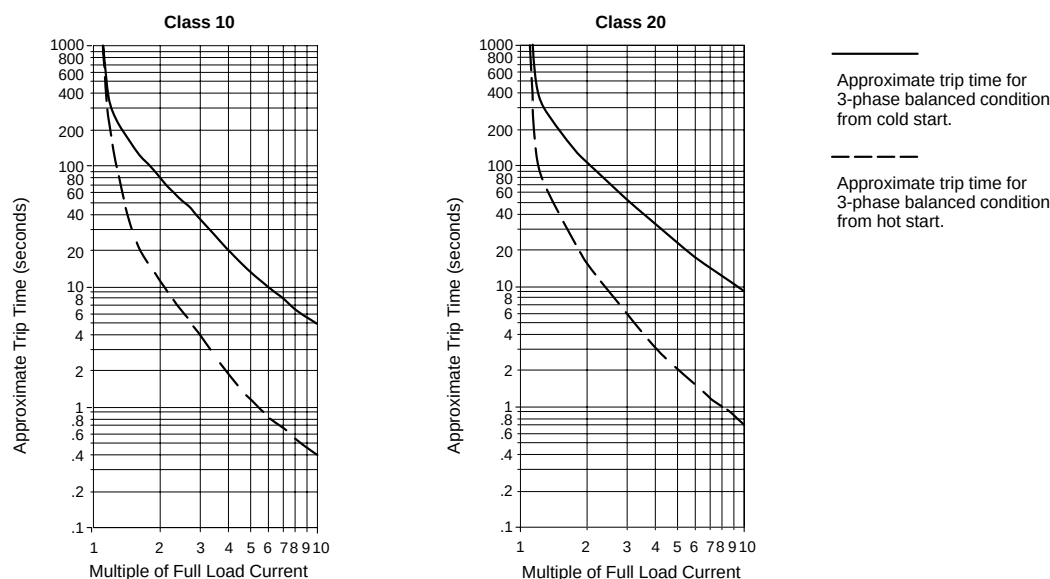
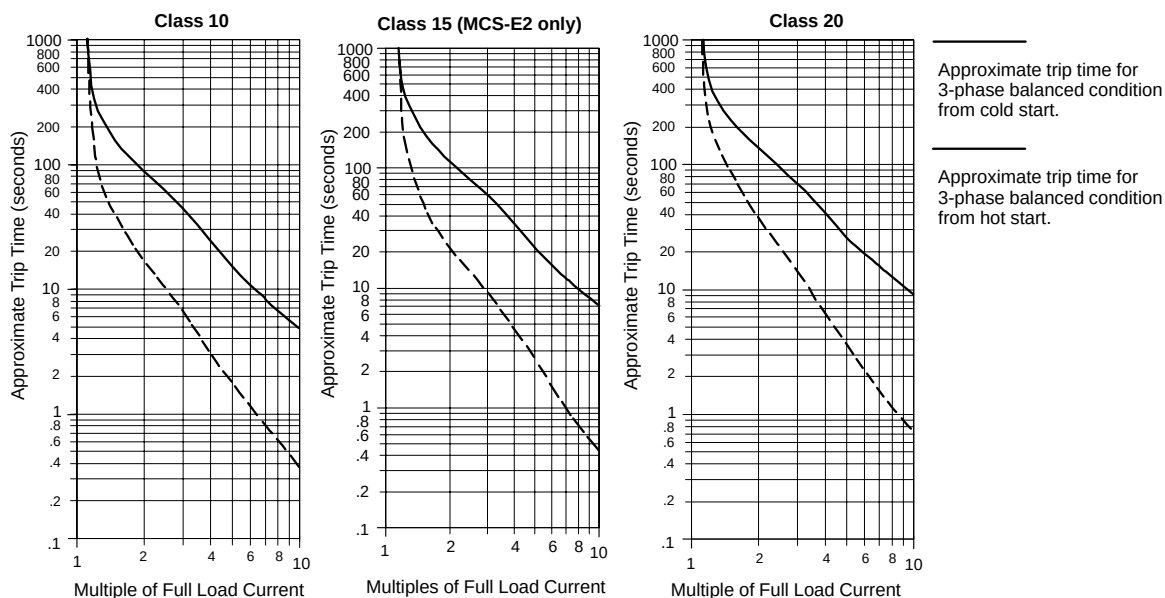
	MCS-E1	Cat. No. 193-E__B	Cat. No. 193-E__C	Cat. No. 193-E__D	Cat. No. 193-E__E
	MCS-E2	–	Cat. No. 193-EB__B, 193-EB__C, 193-EB__D		Cat. No. 193-EB__E
Rated Insulation Voltage U_i	[V]	690			
Rated Impulse Strength U_{imp}	[kV]	6			
Rated Operating Voltage U_e	[V]	690			
Terminal Cross-Sections					
Terminal Type					
Terminal Screws		M4	M5	M8	
 Flexible with Wire End Ferrule	[mm ²]	1 x (1...4) 2 x (1...4)	1 x (2.5...16) 2 x (2.5...10)	1 x (4...35) 2 x (4...25)	
 Solid Conductor Stranded	[mm ²]	1 x (1.5...6) 2 x (1.5...6)	1 x (2.5...25) 2 x (2.5...10)	1 x (4...50) 2 x (4...35)	
Solid/Stranded Conductor	[AWG]	14...8	14...6		2
Recommended Torque	[Nm]	1.8	1.4	1.6	4
	[lb-in]	(16)	(12)	(14)	(35)
Pozidriv Screwdriver	Size	2			2
Slotted Screwdriver	mm	1 x 6			–
Hexagon Socket Size	SW [mm]	–			4

Control Circuits

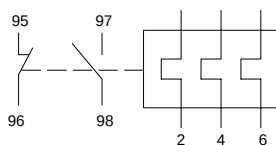
			Cat. No. 193-E__B	Cat. No. 193-E__C	Cat. No. 193-E__D	Cat. No. 193-E__E
Rated Insulation Voltage U_i	[V]	600				
Rated Impulse Strength U_{imp}	[kV]	6				
Rated Operating Voltage U_e	[V]	600				
Rated Operating Current I_e		N.O.  / N.C. 				
AC-15	12...120V	[A]	3/2			
	220...240V	[A]	1.5/1.5			
	380...480V	[A]	0.75/0.75			
	500...600V	[A]	0.6/0.6			
DC-13, at L/R ≤ 15ms	24V	[A]	1.1/1.1			
	110V	[A]	0.4/0.4			
	220V	[A]	0.2/0.2			
	440V	[A]	0.08/0.08			
Conventional Thermal Current I_{th}	[A]	5				
Terminal Cross-Sections						
Terminal Type						
Terminal Screws			M3.5			
 Flexible with Wire End Ferrule	[mm ²]	2 x (0.75...2.5)				
 Solid Conductor	[mm ²]	2 x (0.75...4)				
Solid/Stranded Conductor	[AWG]	18...12				
Recommended Torque	[Nm]	1.4				
	[lb-in]	(12)				
Pozidriv Screwdriver	Size	2				
Slotted Screwdriver	mm	1 x 6				

MCS-E Solid-State Overload Relays**Specifications, Continued****General**

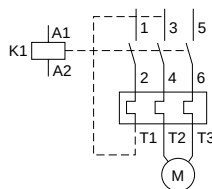
	Cat. No. 193-E__B	Cat. No. 193-E__C	Cat. No. 193-E__D	Cat. No. 193-E__E
Weight [kg (lb)]	0.14 (0.31)	0.17 (0.37)	0.21 (0.46)	0.36 (0.84)
Standards	IEC 947, EN 60 947, DIN VDE 0660			
Approvals	CE, UL, CSA, PTB			
Corrosion Resistance	95% relative humidity, without condensation, 30...60°C			
Ambient Temperature				
open	-20...+60°C (-4...122°F)			
enclosed	-20...+40°C (-4...104°F)			
Temperature Compensation	Continuous			
Shock Resistance (10ms sinusoidal shock) [G]	30			
Type of Protection (in connected state)	IP2LX			

Trip Curves for 1 ϕ Applications (193-ES)Trip Curves for 3 ϕ Applications (193-EA/EB)

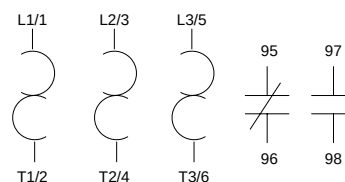
Wiring Schematic



Typical IEC Wiring Schematic



Typical Wiring for 1 Phase Applications

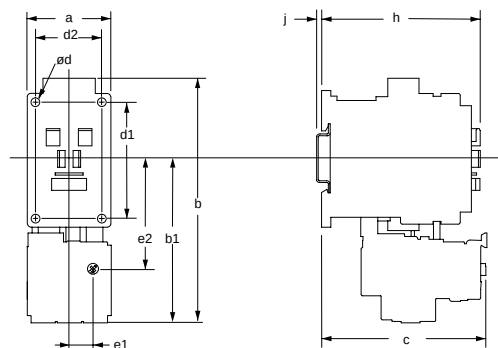


Typical NEMA Wiring Schematic

Bulletin 193-E
MCS-E Solid-State Overload Relays
Approximate Dimensions

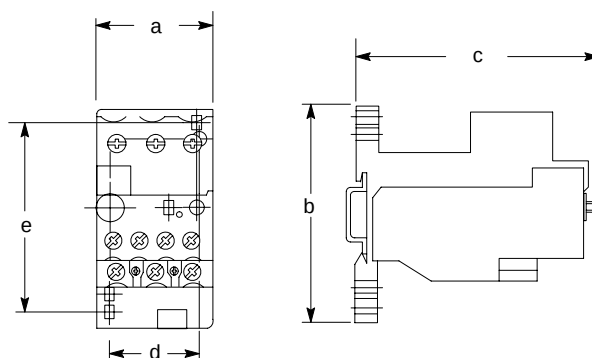
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Mounts to Contactor 100-C

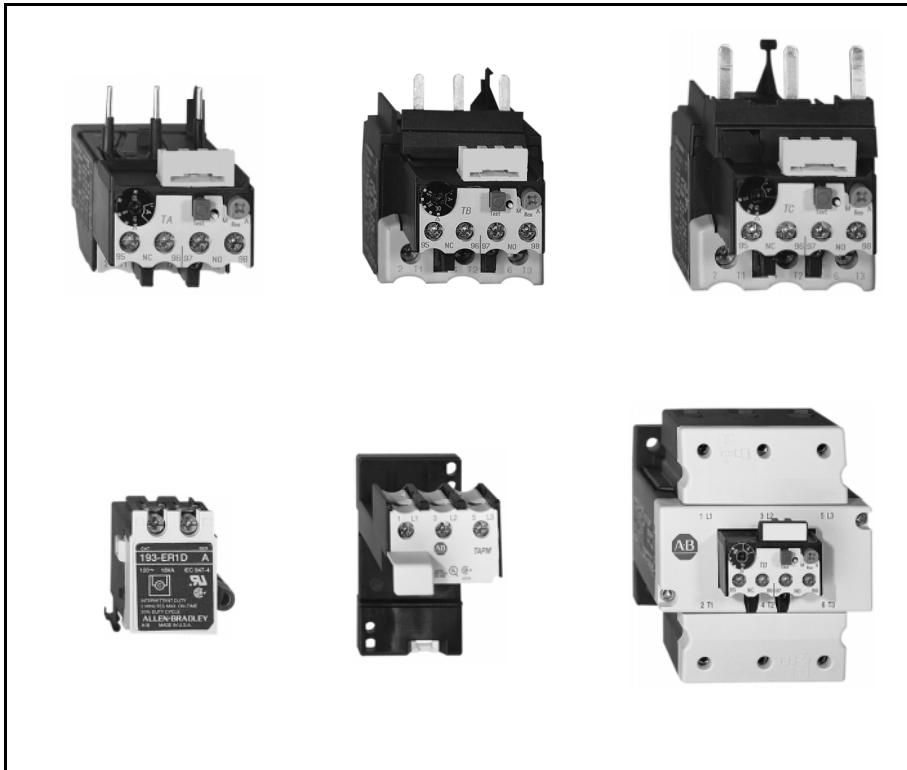


Contactor Cat. No.	a Width	b Height	b1	c Depth	e1	e2	d1	d2	h	j	Ød
100-M05 with 193-EA or -ES	45 (1-25/32)	107 (4-13/64)	83 (3-17/64)	66.6 (2-5/8)	—	50 (1-61/64)	50 (1-61/64)	—	48.2 (1-29/32)	2 (5/64)	Two Ø 4.2 (Two 11/64 Ø)
100-C09, -C12 -C16, -C23 with 193-EA or -ES	45 (1-25/32)	131 (5-11/64)	86 (3-25/64)	88.5 (3-1/2)	16.5 (21/32)	69 (3-25/32)	60 (2-23/64)	35 (1-3/8)	86.5 (3-13/32)	2 (5/64)	Two Ø 4.2 (Two 11/64 Ø)
100-C09, -C12 -C16, -C23 with 193-EB	54 (2-1/8)	137 (5-3/8)	97 (3-13/16)	90.7 (3-37/64)	5.1 (13-64)	59 (2-23/64)	60 (2-23/64)	35 (1-3/8)	85.1 (3-23/64)	2 (5/64)	Two Ø 4.2 (Two 11/64 Ø)
100-C30, -C37 with 193-EA or -ES	45 (1-25/32)	136.5 (5-3/8)	91.5 (3-39/64)	92 (3-39/64)	16.5 (21/32)	69 (2-23/32)	60 (2-23/64)	35 (1-3/8)	104 (4-1/8)	2 (5/64)	Two Ø 4.2 (Two 11/64 Ø)
100-C30, -C37 with 193-EB	54 (2-1/8)	137 (5-3/8)	97 (3-13/16)	92.1 (3-5/8)	5.2 (13/64)	59 (2-23/64)	60 (2-23/64)	35 (1-3/8)	104.7 (4-1/8)	2 (5/64)	Two Ø 4.2 (Two 11/64 Ø)
100-C43 with 193-EA, -ES or -EB	54 (2-1/8)	136.5 (5-3/8)	91.5 (3-39/64)	93 (3-21/32)	22 (7/8)	69 (2-23/32)	60 (2-23/64)	45 (1-49/64)	107 (4-7/32)	2 (5/64)	Two Ø 4.2 (Two 11/64 Ø)
100-C60, -C72, -C85 with 193-EA, -ES or -EB	72 (2-53/64)	188.5 (7-27/64)	120 (4-23/32)	120 (4-23/32)	18 (23/32)	84.5 (3-21/64)	100 (3-15/16)	55 (2-11/64)	125.5 (4-15/16)	2 (5/64)	Four Ø 5.5 (Four 7/32 Ø)

Individual Mounting with Relay Base



Cat. No.	a Width	b Height	c Depth	d	e
193-EPM1	45 (1-25/32)	90 (3-35/64)	75 (2-61/64)	30 (1-3/16)	75 (2-61/64)
193-EPM2	55 (2-11/64)	90 (3-35/64)	96.5 (4-29/32)	40 (1-37/64)	75 (2-61/64)
193-EPM3	70 (2-49/64)	115 (4-17/32)	110 (4-11/32)	55 (2-11/64)	105 (4-9/64)



Bulletin 193-T

- Phase Failure Sensitivity
- Temperature Compensation
- Auxiliary Switch (1 N.O. and 1 N.C. Contact)
- Test/Stop Button
- Manual/Auto Reset Button
- Individual Mounting
- Protection of EEX Electric Motors (PTB)
- “Trip Free” Construction
- Trip Indicator

Description

The Bulletin 193-T Bimetallic Overload Relays are designed for use with Bulletin 100-C contactors and Bulletin 104-C reversing contactors. These Class 10 ambient compensated bimetal overload relays use integral heater elements; therefore, additional heater elements are not required. Further, the design includes a differential mechanism for sensitivity to single phase 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. An isolated normally open contact is standard. An anti-tamper shield is available and snaps on the front of the overload relay to discourage field adjustments of the trip setting and reset mode.

Conformity to Standards:

IEC 947-4
BS 5424
VDE 0660
IEC 947-4 Type 2 Coordination

Approvals:

CE
CSA Certified
UL Listed



Bulletin 140

- 2 Physical Sizes
 - 0.1...90 A
(0.02...45kW @ 400V)
 - 1/2...60HP @ 460V
- Accessories for Front and Side Mounting
- Easy Installation on 35mm DIN Rail (EN 50022)
- High Current Limiting and Interrupting Capacity (up to 100kA)
- Short Circuit Trip Indication (140-CMN)
- Compact Bus Bar System for Reduced Wiring
- Group Motor Installation Rated for North American Applications

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Description

Bulletin 140 Manual Motor Starter and Protector provides magnetic trips and overload protection with ambient temperature compensation. A wide range of accessories makes installation and wiring easy.

Conformity to Standards:

IEC 947-1/2/4/5
ASE 1090-1, 1092-1, 1093-1
VDE 0660 part 101, 104, 200; 0165/83
CSA 22.2 No. 14
UL 508

Approvals:

ASE, Germ. Lloyd, CEBEC, PTB,
DEMKO, SEMKO, Finland, NEMKO

CE
CSA Certified
UL Listed

Your order must include:

- Cat. No. of the manual motor starter and protector selected.
- If required, Cat. No. of any accessories.

3-Pole Manual Motor Starter/Protector ①



Cat. No. 140-MN-1000



Cat. No. 140-CMN-9000

Adjustable Range of Overload Release [A]	Instantaneous (Magnetic) Trip Current [A]	Ratings AC-2, AC-3 ②						<i>I</i> _{cu} ③	<i>I</i> _{cs} ④	Pkg. Qty.	Cat. No.	*
		3 Ø [kW] (50 Hz)			3 Ø [HP] (60 Hz) ⑤			400/415 V				
		230V	400V	690V	230V	460V	575V	[kA]	[kA]			
0.1...0.16	1.8	—	0.02	—	—	—	—	100	100	1	140-MN-0016	
0.16...0.25	2.8	—	0.04	—	—	—	—	100	100		140-MN-0025	
0.25...0.4	4.4	—	0.06/0.09	—	—	—	—	100	100		140-MN-0040	
0.4...0.63	6.9	0.06/0.09	0.09/0.12	0.25	—	—	—	100	100		140-MN-0063	
0.63...1.0	11	0.09/0.12	0.18/0.37	0.37/0.55	—	1/2	1/2	100	100		140-MN-0100	
1.0...1.6	18	0.18/0.35	0.37/0.55	0.75/1.1	—	3/4	1	100	100		140-MN-0160	
1.6...2.5	28	0.37	0.55/0.75	1.5	1/2	1	1-1/2	100	100		140-MN-0250	
2.5...4.0	44	0.55/0.75	1.1/1.5	2.2/3.0	1	1	3	100	100		140-MN-0400	
4.0...6.3	69	1.1/1.5	2.2/2.5	3.7/4.0	1-1/2	3	5	100	100		140-MN-0630	
6.3...10	110	1.5/3.0	3.0/5.5	5.5/7.5	3	5	7-1/2	20	16		140-MN-1000	
10...16	176	3.7/4.0	5.5/7.5	10/12.5	5	10	10	10	6	140-MN-1600		
16...20	220	5.5	7.5/10	15/16	5	10	15	8	6	140-MN-2000		
20...25	275	5.5/7.5	11/12.5	18.5/22	7-1/2	15	20	8	6	140-MN-2500		
16...25	350	5.5/7.5	7.5/12.5	15/22	7-1/2	15	20	65	65	1	140-CMN-2500	
25...40	560	10/11	15/22	25/30	10	30	30	65	50		140-CMN-4000	
40...63	882	12.5/20	25/31.5	37/55	20	40	60	65	50		140-CMN-6300	
63...90	1260	22/25	37/45	63/75	30	60	75	50	25		140-CMN-9000	

① The Bulletin 140 MCS-M meets the circuit breaker requirements of IEC 947-2. This device, however, does not meet CSA and UL circuit breaker requirements. The Bulletin 140 is CSA Certified and UL Listed as a Manual Motor Controller and is rated for Group Motor Installation.

② Utilization categories and conditions for testing for alternating current per IEC 947:

- AC-2 starting and reversing of wound-rotor motors
- AC-3 starting and stopping squirrel cage induction motors

IEC 947-2 performance categories:

- I_{cu} Operational after completing O-t-CO test sequence
- I_{cs} Suitable for normal operation after completing O-t-CO-t-CO test sequence
- O = Open
- CO = Close and open
- t = Time (open)

③ Ultimate short circuit breaking capacity.

④ Rated short circuit breaking capacity.

⑤ For North American applications: HP ratings shown in the table are for reference. The final selection of the manual starter depends on the actual motor full load current and service factor as follows:

- **For motor with service factor of 1.15, or greater.** Use motor nameplate full load current and choose the motor starter with the appropriate current range. Example: Motor F.L.C. = 4.2A; S.F. = 1.15. Select **Cat. No. 140-MN-0630**.
- **For motor with service factor less than 1.15.** Use motor nameplate full load current times 0.9 and choose the motor starter with the appropriate current range. Example: Motor F.L.C. = 4.2A; S.F. = 1.0; 4.2A x 0.9 = 3.78A. Select **Cat. No. 140-MN-0400**.

Accessories — Page 43

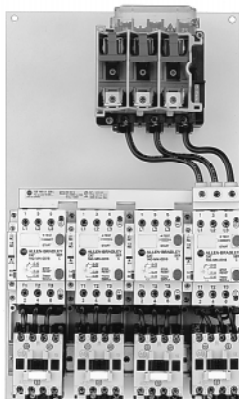
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MCS-M Manual Motor Starter/Protectors

Product Selection, Continued

Group Motor Applications — For U. S. and Canada



Cat. Nos. listed in the table below are CSA Certified and UL Listed for group motor installations ("Group Fusing") as defined in the Canadian and U.S. National Electrical Codes.

Group Motor Applications ① — Series C Devices

Adjustable Range of Overload Release (A)	Max. Short Circuit Current				Max. Backup Protection ②	1Ø HP ③			3Ø HP			Cat. No.	*
	140-MN-_____ / 140-CMN-_____		140-MN-_____ + CL2										
	(kA) 480V	(kA) 600V	(kA) 480V	(kA) 600V	Fuses or Circuit Breaker (Amperes) 480V 600V	115V 60 Hz	200V 60 Hz	230V 60 Hz	230V 60 Hz	460V 60 Hz	575V 60 Hz		
0.1...0.16	42	42	—	—	1200A	—	—	—	—	—	—	140-MN-0016	
0.16...0.25	42	42	—	—	1200A	—	—	—	—	—	—	140-MN-0025	
0.25...0.40	42	42	—	—	1200A	—	—	—	—	—	—	140-MN-0040	
0.40...0.63	42	42	—	—	1200A	—	—	—	—	—	—	140-MN-0063	
0.63...1.0	42	42	—	—	1200A	—	—	—	—	—	1/2	140-MN-0100	
1.0...1.6	42	42	—	—	1200A	—	—	—	—	1/2	3/4	140-MN-0160	
1.6...2.5	42	42	—	—	1200A	1/10	1/8	1/6	1/2	1	1-1/2	140-MN-0250	
2.5...4.0	42	42	—	—	1200A	1/8	1/4	1/3	3/4	2	3	140-MN-0400	
4.0...6.3	42	10	42	42	1200A	1/4	1/2	1/2	1-1/2	3	5	140-MN-0630	
6.3...10.0	14	10	42	42	1200A	1/2	1	1-1/2	3	5	7-1/2	140-MN-1000	
10.0...16.0	10	5	42	14	1200A	1	2	2	5	10	10	140-MN-1600	
16.0...20.0	10	5	14	10	1200A	1-1/2	3	3	5	10	15	140-MN-2000	
20.0...25.0	10	5	10	10	1200A	2	3	3	7-1/2	15	20	140-MN-2500	
16.0...25.0	65	42	—	—	2000A	2	3	3	7-1/2	15	20	140-CMN-2500	
25.0...40.0	65	42	—	—	2000A	3	5	7-1/2	10	30	30	140-CMN-4000	
40.0...63.0	65	42	—	—	2000A	5	10	10	20	40	60	140-CMN-6300	
63.0...90.0	65	30	—	—	2000A	7-1/2	15	20	30	60	75	140-CMN-9000	

① For CANADIAN AND U.S. APPLICATIONS:

Horsepower 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 service factor as follows:

- **For motor with service factor of 1.15, or greater.** Use motor nameplate full load current and choose the motor starter with the appropriate current range. Example: Motor F.L.C. = 4.2A; S.F. = 1.15. Select **Cat. No. 140-MN-0630**.
- **For motor with service factor less than 1.15.** Use motor nameplate full load current times 0.9 and choose the motor starter with the appropriate current range. Example: Motor F.L.C. = 4.2A; S.F. = 1.0. 4.2A x 0.9 = 3.78A. Select **Cat. No. 140-MN-0400**.

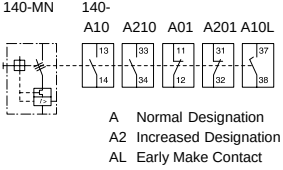
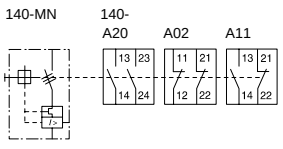
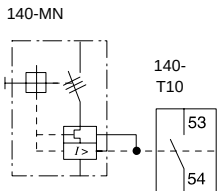
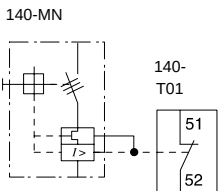
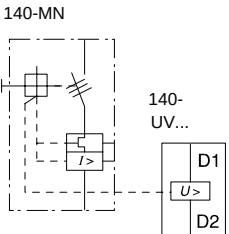
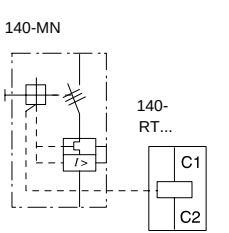
② The maximum fuse or circuit breaker selection for the group will be that dictated by the Canadian or U.S. Electrical Codes.

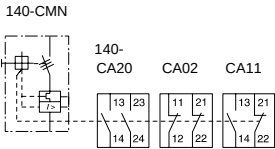
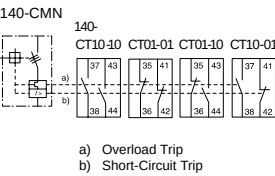
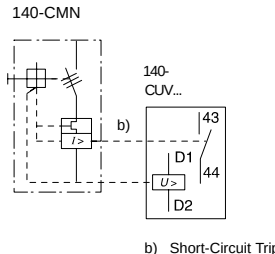
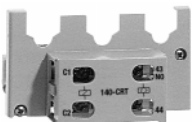
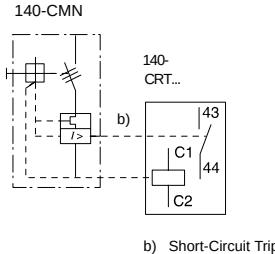
③ The single phase horsepower ratings are based on wiring the 3 poles of the device in series.

Accessories — Page 43

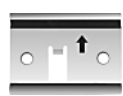
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Approximate Dimensions — Page 58

	Description	Wiring Diagram	For Use With	Pkg. Qty.	Cat. No.	*
	Auxiliary Contacts - Internal mounting 1-Pole - Use with compact bus-bars with 45mm spacing	 A Normal Designation A2 Increased Designation AL Early Make Contact	140-MN	10	140-A10	
					140-A210	
					140-A01	
					140-A201	
					140-A10L	
	Auxiliary Contacts - External, for left side mounting 2-Pole - Use with compact bus-bars with 54mm spacing		140-MN	10	140-A20	
					140-A02	
					140-A11	
	Trip Indicating Auxiliary Contact - Internal mounting 1-Pole - Use with compact bus-bars with 45mm spacing		140-MN	10	140-T10	
					140-T01	
	Undervoltage Trip Unit Right side mounting		140-MN	10		
	Voltage:					
	24V 50 Hz				140-UV-KJ	
	120V 60 Hz				140-UV-DD	
	208V 60 Hz				140-UV-H	
	240...260V 60 Hz				140-UV-A	
	460V 60 Hz				140-UV-N	
	Shunt Trip Unit Right side mounting		140-MN	10		
	Voltage:					
	24V 50 Hz				140-RT-KJ	
	120V 60 Hz				140-RT-DD	
	240...260V 60 Hz				140-RT-A	
	480V 60 Hz				140-RT-B	

	Description	Wiring Diagram	For Use With	Pkg. Qty.	Cat. No.	*
	Auxiliary Contacts - Internal, front mounted 2-Pole		140-CMN	1	140-CA20	
					140-CA02	
					140-CA11	
	Trip Indicating Auxiliary Contacts - Internal, front mounted 2-Pole		140-CMN	1	140-CT10-10	
					140-CT01-01	
					140-CT01-10	
					140-CT10-01	
	Undervoltage Trip Unit - Internal, front mounted - Integrated short-circuit trip indication		140-CMN	1	140-CUV-KJ	
	Voltage: 24V 50/60 Hz				140-CUV-D	
	110V 50 Hz/120V 60 Hz				140-CUV-A	
	Shunt Trip Unit - Internal, front mounted - Integrated short-circuit trip indication		140-CMN	1	140-CRT-KJ	
	Voltage: 24V 50/60 Hz				140-CRT-D	
	110V 50 Hz/120V 60 Hz				140-CRT-A	
	220V 50 Hz/240V 60 Hz					

	Description	For Use With	Pkg. Qty.	Cat. No.	*
	Current Limiter - Use in single or group installations to increase short circuit interrupting capacity. - DIN rail mounting next to Bul. 140-MN, or Bul. 140-MN can be snapped on to current limiter.	140-MN	10	140-CL2	
 Cat. No. 140-LD	Three-Phase Terminal For use with three-phase commoning link 65A 600V maximum Bottom feed	140-MN	10	140-LD	
 Cat. No. 140-L2	For use with three-phase commoning link 65A 600V maximum Top feed, overlaps commoning link, 5.260mm ² ...13.296mm ² (#10...#6 AWG)		10	140-L2	
	Three-Phase Commoning Link For lineside connection of adjacent starters 65A For 45mm Spacing (Can not be used with 140-DC1 Adapter Plate)	140-MN	10		
	For linking 2 Bulletin 140 Starters			140-L452	
	For linking 3 Bulletin 140 Starters			140-L453	
	For linking 4 Bulletin 140 Starters			140-L454	
	For linking 5 Bulletin 140 Starters			140-L455	
	For lineside connection of adjacent starters 65A For 54mm Spacing (Can be used with 140-DC1 Adapter Plate)				
	For linking 2 Bulletin 140 Starters			140-L12	
	For linking 3 Bulletin 140 Starters			140-L13	
	Terminal Cover For use with three-phase commoning link Covers unused terminations.		10	140-L3	
 Adapter Plate	Adapter Plate — Installs on 35mm DIN rail Holds manual motor starter and Cat. No. 100-A09, -A12, -A18 or -A24 contactor	140-MN	3	140-DC1	
	Connector Kit — Simplifies power wiring between: Bulletin 140 and Bulletin 100 Contactor	140-MN	1	140-N11	
	Bulletin 140 and Bulletin 100M Miniature Contactor		1	140-N21	
	Bulletin 140 and Bulletin 100DC Operated Contactor		1	140-N31	

		Description	For Use With	Pkg. Qty.	Cat. No.	*
 Cat. No. 140-E41	 Cat. No. 140-E55	IP41 Enclosure IP41 Non-Metallic Enclosure with Knockouts for PG16 and PG21 Fittings. Suitable for flexible cable with internal ground wire or conduit when externally grounded around the outside of the enclosure.	140-MN	1	140-E41	
		IP55 Enclosure IP55 Non-Metallic Enclosure with Knockouts for PG16 and PG21 Fittings. Suitable for flexible cable with internal ground wire or conduit when externally grounded around the outside of the enclosure.		1	140-E55	
		Push Button Membrane		1	140-N18	
 Pilot Light	Pilot Light — For above enclosures	Red Pilot Light		1	140-LR___❶	
		Green Pilot Light	140-LG___❶			
		White Pilot Light	140-LW___❶			
		Yellow Pilot Light	140-LY___❶			
	Locking Attachment For IP55 and IP41 enclosures, permits locking starter in the “OFF” position with up to 3 padlocks. Accepts up to 8.5mm (5/16”) locks. Note: Not compatible with pilot lights.		140-MN	1	140-N22	
	Padlock Attachment Permits padlocking the “Start” button in the off position. Accepts 8mm (5/16”) padlock — up to three padlocks.		140-MN	1	140-N24	
	Panel Mounting Adapter Permits screw mounting of Bulletin 140		140-MN	1	140-N12	
	Padlockable Operating Knob - Accepts 8mm (5/16”) padlock — up to three padlocks. - Permits padlocking in the off position.	black	140-CMN	1	140-KN	
		red/yellow			140-KRY	

❶ Voltages: 120, 240, 400, 415, 480. Insert voltage selected at the end of Cat. No. Example: **Cat. No. 140-LR120**. Not compatible with locking attachment **Cat. No. 140-N22**.

IEC Performance Data

	Cat. No. 140-MN...												
	0.16A	0.25A	0.4A	0.63A	1A	1.6A	2.5A	4A	6.3A	10A	16A	20A	25A
Switching of Standard Three-Phase Motors													
AC-2, AC-3													
230/240V [kW]	—	—	—	0.06/0.09	0.09/0.12	0.18/0.25	0.37	0.55/0.75	1.1/1.5	1.5/3.0	3.7/4.0	5.5	5.5/7.5
400/415V [kW]	0.02	0.04	0.06/0.09	0.09/0.12	0.18/0.37	0.37/0.55	0.55/0.75	1.1/1.5	2.2/2.5	3.0/5.5	5.5/7.5	7.5/10	11/12.5
500V [kW]	—	—	—	0.25	0.37	0.55/0.75	1.1	1.5/2.2	2.5/3.0	3.7/6.3	7.5/10	11	12.5/16
690V [kW]	—	—	—	0.25	0.37/0.55	0.75/1.1	1.5	2.2/3.0	3.7/4.0	5.5/7.5	10/12.5	15/16	18.5/22
Back-Up Fuses													
gG, aM, only if $I_{cc} > I_{cu}$													
230/240V [A]	—	—	—	—	—	—	—	—	—	—	125	125	125
400/415V [A]	—	—	—	—	—	—	—	—	—	125	125	125	125
500V [A]	—	—	—	—	—	—	—	—	100	100	100	100	100
690V [A]	—	—	—	—	—	—	50	50	63	80	80	80	80
Ultimate Short-Circuit Breaking Capacity I_{cu}													
230/240V [kA]	100	100	100	100	100	100	100	100	100	100	30	20	20
400/415V [kA]	100	100	100	100	100	100	100	100	100	20	10	8	8
500V [kA]	100	100	100	100	100	100	100	100	30	6	6	6	6
690V [kA]	100	100	100	100	100	100	4.5	8	8	4.5	3	3	3
Rated Short-Circuit Breaking Capacity I_{cs}													
230/240V [kA]	100	100	100	100	100	100	100	100	100	100	20	16	16
400/415V [kA]	100	100	100	100	100	100	100	100	100	16	6	6	6
500V [kA]	100	100	100	100	100	100	100	100	20	6	4.5	4.5	4.5
690V [kA]	100	100	100	100	100	100	4.5	6	6	3	3	3	3

Specifications: UL/CSA Ratings as a Manual Motor Starter

(UL 508, CSA C22.2 No. 14)

	Cat. No. 140-MN...												
	0.16A	0.25A	0.4A	0.63A	1A	1.6A	2.5A	4A	6.3A	10A	16A	20A	25A
Max. Short-Circuit Current													
480V [kA]	42	42	42	42	42	42	42	42	42	14	10	10	10
600V [kA]	42	42	42	42	42	42	42	42	10	10	5	5	5
Motor Load, 1 Phase													
115V [HP]	—	—	—	—	—	—	1/10	1/8	1/4	1/2	1	1-1/2	2
200V [HP]	—	—	—	—	—	—	—	—	—	—	—	—	—
230V [HP]	—	—	—	—	—	—	1/6	1/3	1/2	1-1/2	2	3	3
Motor Load, 3 Phase													
200V [HP]	—	—	—	—	—	—	1/2	3/4	1-1/2	2	3	5	5
230V [HP]	—	—	—	—	—	—	1/2	1	1-1/2	3	5	5	7-1/2
460V [HP]	—	—	—	—	1/2	3/4	1	2	3	5	10	10	15
575V [HP]	—	—	—	—	1/2	1	1-1/2	3	5	7-1/2	10	15	20
Max. Back-Up Short-Circuit Protective Device (Fuse or Circuit Breaker)													
[A]	1200												

Manual Motor Starter/Protectors

Specifications, Continued

IEC Performance Data

		Cat. No. 140-CMN...			
		25A	40A	63A	90A
Switching of Standard Three-Phase Motors					
AC-2, AC-3					
230/240V	[kW]	5.5/7.5	10/11	12.5/20	22/25
400/415V	[kW]	7.5/12.5	15/22	25/31.5	37/45
500V	[kW]	11/16	18.5/25	30/40	45/55
690V	[kW]	15/22	25/30	37/55	63/75
Back-Up Fuses					
gG, aM, only if $I_{cc} > I_{cu}$					
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 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	6	6	6

Specifications: CSA/UL Ratings as a Manual Motor Starter

(CSA C22.2, UL 508 No. 14)

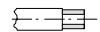
		Cat. No. 140-CMN...			
		25A	40A	63A	90A
Max. Short-Circuit Current					
480V	[kA]	65	65	65	65
600V	[kA]	42	42	42	30
Motor Load, 1 Phase					
115V	[HP]	2	3	5	7-1/2
200V	[HP]	3	5	10	15
230V	[HP]	3	7-1/2	10	20
Motor Load, 3 Phase					
200V	[HP]	—	—	—	—
230V	[HP]	7-1/2	10	20	30
460V	[HP]	15	30	40	60
575V	[HP]	20	30	60	75
Max. Back-Up Short-Circuit Protective Device (Fuse or Circuit Breaker)		2000			
	[A]				

General

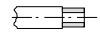
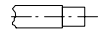
	Cat. No. 140-MN...	Cat. No. 140-CMN...
Rated Insulation Voltage IEC, SEV, VDE 0660	690V	
CSA, UL	600V	
Rated Frequency	40...60 Hz	
Life Span Mechanical	100 000 operations	30 000 operations
Electrical	100 000 operations	10 000 operations at 63A 5 000 operations at 90A
Frequency of Operation	max. 30 operations/hour	max. 20 operations/hour
Ambient Temperature Storage	-25...+80°C (-13...176°F)	
Operation	-25...+60°C (-13...140°F)	
Corrosion Resistance Resistance to heat and humidity	C IV (per IEC 68) 40°C, 92%, 56 days	
Resistance to cyclic temperature stress and humidity	23°C, 83% / 40°C, 93%, 56 cycles	
Type of Protection	IP20 in closed state	
Shock Resistance	30 G, 20 ms	in testing
Resistance to Vibration Frequency range	10...150 Hz	
In all directions	>7.5 G	in testing
Rated Thermal Current I_{th} IEC, SEV, VDE 0660 At 40°C ambient temperature	—	—
At 60°C ambient temperature	0.1...25A	16...90A
Rated Current I_e	13 adjustment ranges 0.1...25A	4 adjustment ranges 16...90A
Rated Impulse Voltage/Pollution Degree U_{imp} /Degree		
Main circuits	—	6 kV/3
Auxiliary circuits	—	6 kV/3
Overload Protection Characteristic	motor protection per IEC 947	
Temperature compensation	-20...+60°C (-4...140°F)	
Phase failure protection	—	differential release
Magnetic Release Operating current	fixed setting 11 x $I_{e\max}$ $I_{e\max}$ = maximum value of adjustment range	fixed setting 14 x $I_{e\max}$
Power Loss P_v At rated current and with switch at operating temperature	7 W	33 W

Bulletin 140
Manual Motor Starter/Protectors
Specifications, Continued

General, Continued

	Cat. No. 140-MN...	Cat. No. 140-CMN...
Standards	IEC 947-1/2/4/5; EN 60947; UL 508; CSA 22.2	
Approvals	CE, SEV, Germ. Lloyd, CEBEC, PTB, DEMKO, SEMKO, SETI, NEMKO, UL, CSA, Bureau Veritas, Lloyd's Reg. of Shipping, Maritime Reg. of Shipping, RINA, KEMA	CE, CSA, UL, Lloyd's Reg. of Shipping (in preparation)
Terminals Terminal type		
 Flexible [mm ²]	1 x 1...4	1 x 2.5...35
 Stranded [mm ²]	1 x 1...6	1 x 4...50
Breakaway torque [Nm]	2.5	6...10
 Stranded [AVG]	No. 16...10	No. 12...2
Breakaway torque [lb-in.]	20...26	53...120
Weight 3-pole [g (lb)]	290 (0.64)	1845 (4.10)

Accessories

	Auxiliary Contacts for Internal Mounting on Cat. No. 140-MN, 140-A...				Auxiliary Contacts for Left Side Mounting on Cat. No. 140-MN, 140-A...			
Rated Thermal Current I_{th} At 40°C ambient temperature (A) At 60°C ambient temperature (A)	6 4				10 6			
NEMA Contact Rating (CSA/UL approval) AC DC	B 600 Standard Pilot Duty R 300 Light Pilot Duty				B 600 Standard Pilot Duty R 300 Light Pilot Duty			
Contacts Contact reliability per DIN 19 240 Bifurcated contacts	—				solid-state, hard wired			
Back-Up Fuses gl, gL (A)	16				16			
Rated Current AC-15: DC-13:	230/240V 2A	400/415V 1A	500V 0.8A	690V 0.5A	230/240V 2A	400/415V 1A	500V 0.8A	690V 0.5A
	24V 2A	48V 0.6A	110V 0.2A	220V 0.1A	24V 2A	48V 0.6A	110V 0.2A	220V 0.1A
Terminals Terminal type								
 Flexible [mm ²]	1 x 0.75...2.5				1 x 0.75...2.5			
 Stranded [mm ²]	1 x 0.75...4				1 x 0.75...4			
Breakaway Torque [Nm]	2.5				2.5			
 Stranded [AWG]	No. 18...14				No. 18...14			
Breakaway Torque [lb-in.]	20...26				20...26			
Weight [g (lb)]	12 (0.03)				35 (0.08)			

Accessories, Continued

	Auxiliary Contacts for Front Mounting on Cat. No. 140-CMN, 140-CA...						Auxiliary Trip Indicating Contacts for Internal Mounting on Cat. No. 140-MN, 140-T...			
Rated Thermal Current I_{th} At 40°C ambient temperature (A) At 60°C ambient temperature (A)	10 6						6 4			
NEMA Contact Rating (CSA/UL Approvals) AC DC	B 600 Standard Pilot Duty R 300 Light Pilot Duty						B 600 Standard Pilot Duty R 300 Light Pilot Duty			
Back-Up Fuses gl, gL (A)	16						16			
Rated Current AC-15: DC-13:	230/240V 3A	400V 2.5A	500V 1.5A	690V 0.75A			230/240V 2A	400/415V 1A	500V 0.8A	690V 0.5A
	24V 2A	48V 0.6A	110V 0.2A	220V 0.1A	440V 0.04A		24V 2A	48V 0.6A	110V 0.2A	230V 0.1A
Terminals Terminal type										
 Flexible [mm ²]	2 x 0.75...2.5						1 x 0.75...2.5			
 Stranded [mm ²]	2 x 0.75...2.5						1 x 0.75...4			
Breakaway Torque [Nm]	1...1.5						2.5			
 Stranded [AWG]	No. 18...14						No. 18...14			
Breakaway Torque [lb-in.]	8.8...10.3						20...26			
Weight [g (lb)]	31 (0.07)						13 (0.03)			

	Trip Indicating Contacts for Front Mounting on Cat. No. 140-CMN, 140-CT...						Integrated Short-Circuit Indicator in Cat. No. 140-CUV...and 140-CRT...				
Rated Thermal Current I_{th} At 40°C ambient temperature (A) At 60°C ambient temperature (A)	10 6						2 2				
NEMA Contact Rating (CSA/UL Approvals) AC DC	B 600 Standard Pilot Duty R 300 Light Pilot Duty						in preparation				
Back-Up Fuses gl, gL (A)	16						—				
Rated Current AC-15: DC-13:	230V 3A	400V 2.5A	500V 1.5A	690V 0.75A	—		AC-14: 24V 1.5A	110V 1.5A	230V 1.0A	400V 1.0A	500V 0.75A
	24V 2A	48V 0.6A	110V 0.2A	230V 0.1A	440V 0.04A		DC-13: 24V 1.5A	48V 0.5A	60V 0.4A	110V 0.2A	—
Terminals Terminal type											
 Flexible [mm ²]	2 x 0.75...2.5						2 x 0.75...2.5				
 Stranded [mm ²]	2 x 0.75...2.5						2 x 0.75...2.5				
Breakaway Torque [Nm]	1...1.5						1...1.5				
 Stranded [AWG]	No. 18...12						No. 18...12				
Breakaway Torque [lb-in.]	8.8...10.3						8.8...10.3				
Weight [g (lb)]	31 (0.07)						91 (0.21)				

Accessories, Continued

	Undervoltage Trip Unit for Right Side Mounting on Cat. No. 140-MN, 140-UV...	Undervoltage Trip Unit for Front Mounting on Cat. No. 140-CMN, 140-CUV...
Operating Voltage		
Pickup	$0.8...1.1 \times U_s$	$0.8...1.1 \times U_s$
Dropout	$0.7...0.35 \times U_s$	$0.7...0.35 \times U_s$
Duty Cycle	Continuous	Continuous
Control Voltages		
min.:	12V 50 Hz/14V 60 Hz	12V 50 Hz/14V 60 Hz
max.:	600V 50 Hz	600V 50 Hz
Coil Performance		
Pickup	8.5 VA, 6 W	upon inquiry
Dropout	3 VA, 1.2 W	upon inquiry
Terminals		
Terminal type		
 Flexible [mm ²]	1 x 0.75...2.5	2 x 0.75...2.5
 Stranded [mm ²]	1 x 0.75...4	2 x 0.75...2.5
Breakaway Torque [Nm]	2.5	1...1.5
 Stranded [AWG]	No. 18...14	No. 18...12
Breakaway Torque [lb-in.]	20...26	8.8...10.3
Weight [g (lb)]	104 (0.23)	94 (0.21)

	Shunt Trip for Right Side Mounting on Cat. No. 140-MN, 140-RT...	Shunt Trip for Front Mounting on Cat. No. 140-CMN, 140-CRT...
Operating Voltage		
Pickup	$0.7...1.1 \times U_s$	$0.7...1.1 \times U_s$
Dropout	—	—
Duty Cycle	Continuous	Continuous
Control Voltages		
min.:	12V 50 Hz/14V 60 Hz	12V 50 Hz/14V 60 Hz
max.:	600V 50 Hz	600V 50 Hz
Coil Performance		
Pickup	8.5 VA, 6 W	upon inquiry
Dropout	3 VA, 1.2 W	upon inquiry
Terminals		
Terminal type		
 Flexible [mm ²]	1 x 0.75...2.5	2 x 0.75...2.5
 Stranded [mm ²]	1 x 0.75...4	2 x 0.75...2.5
Breakaway Torque [Nm]	2.5	1...1.5
 Stranded [AWG]	No. 18...14	No. 18...12
Breakaway Torque [lb-in.]	20...26	8.8...10.3
Weight [g (lb)]	100 (0.22)	94 (0.21)

Accessories, Continued

				Cat. No. 140-CL2 Current Limiter													
Rated Voltage (V)				690													
Continuous Current (A)				65													
Rated Short-Circuit Breaking Capacity I_{cu} / I_{cs}																	
Thermal Release	Magnetic Release	140-MN Manual Motor Starter/Protector								140-MN Manual Motor Starter/Protector with 140-CL2 Current Limiter							
		Breaking Capacity I_{cu} / I_{cs}								Breaking Capacity I_{cu} / I_{cs}							
		per IEC 947-2, 40...60 Hz at:								per IEC 947-2, 40...60 Hz at:							
Adjustment Range	Operating Current	230/240V		400/415V		500V		690V		230/240V		400/415V		500V		690V	
		I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}
[A]	[A]	[kA]	[kA]	[kA]	[kA]	[kA]	[kA]	[kA]	[kA]	[kA]	[kA]	[kA]	[kA]	[kA]	[kA]	[kA]	[kA]
0.1...0.16	1.8	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
0.16...0.25	2.8	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
0.25...0.4	4.4	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
0.4...0.63	6.9	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
0.63...1.0	11	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
1.0...1.6	18	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
1.6...2.5	28	100	100	100	100	100	100	4.5	4.5	100	100	100	100	100	100	4.5	4.5
2.5...4.0	44	100	100	100	100	100	100	8	6	100	100	100	100	100	100	8	6
4.0...6.3	69	100	100	100	100	30	20	8	6	100	100	100	100	50	50	8	6
6.3...10	110	100	100	20	16	6	6	4.5	3	100	100	50	50	50	50	4.5	3
10...16	176	30	20	10	6	6	4.5	3	3	50	50	50	50	20	20	3	3
16...20	220	20	16	8	6	6	4.5	3	3	50	50	50	50	10	4.5	3	3
20...25	275	20	16	8	6	6	4.5	3	3	50	50	50	50	10	4.5	3	3
Terminals				No. 2, 4, 6 (over)								No. 1, 3, 5 (under)					
Terminal type																	
	Flexible	[mm ²]		1 x 0.75...4								1x 4...16					
	Stranded	[mm ²]		1 x 0.75...6								1 x 6...25					
	Breakaway Torque	[Nm]		2.5								2.5					
	Stranded	[AWG]		No. 14...10								No. 14...6					
	Breakaway Torque	[lb-in.]		25...29								20...26					
Weight				[g (lb)]		210 (0.46)											

I_{cs} Rated short-circuit breaking capacity

I_{cu} Ultimate short-circuit breaking capacity

IEC 947-2 Performance Categories:

I_{cu} Operational after completing O-t-CO test sequence

I_{cs} Suitable for normal operation after completing O-t-CO-t-CO test sequence

O = Open

CO = Close and open

t = Time (open)

Accessories, Continued

			Cat. No. 140-LD Three-Phase Terminal		Cat. No. 140-L2 Three-Phase Terminal
Terminals			No. 2, 4, 6 (over)	No. 2, 4, 6 (over)	No. 1, 3, 5
Terminal type					
	Flexible	[mm ²]	1 x 0.75...4	1 x 4...16	1 x 4...16
	Stranded	[mm ²]	1 x 0.75...6	1 x 6...25	—
	Breakaway Torque	[Nm]	2.5	2.5	4
	Stranded	[AWG]	No. 14...6	No. 14...10	No. 14...6
	Breakaway Torque	[lb-in.]	25...29	20...26	36
Weight			151 (0.33)		36 (0.08)

			Cat. No. 140-L45 Compact Bus Bars	Cat. No. 140-L1 Compact Bus Bars
Rated Insulation Voltage			690V	690V
Rated Thermal Current I_{th}			63A	63A
Weight			42 (0.09) (140-L452) 69 (0.15) (140-L453) 94 (0.21) (140-L454) 119 (0.26) (140-L455)	45 (0.10) (140-L12) 76 (0.17) (140-L13) 104 (0.23) (140-L11) 135 (0.30) (140-L1)

			Cat. No. 140-L3 Blank Space Cover	
Weight			3.3 (0.01)	

			Cat. No. 140-E41 Enclosure	Cat. No. 140-E55 Enclosure
Type of Protection			IP41	IP55 (with seal and protective membrane)
Ambient Temperature			–25°C...+ 40°C (–13...104°F)	–25°C...+ 40°C (–13...104°F)
Weight			250 (0.55)	258 (0.57)

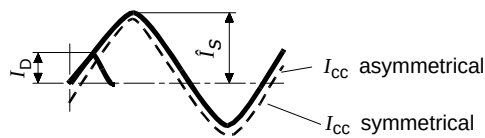
			Cat. No. 140-N18 Push Button Membrane	
Weight			8 (0.02)	

			Cat. No. 140-L...Pilot Light	
Type of Protection			IP54	
Operating Voltages			120, 240, 400, 415, 480V	
Weight			10 (0.02)	

			Cat. No. 140-N22 Locking Attachment	Cat. No. 140-N24 Locking Attachment
Weight			19 (0.04)	11 (0.02)

			Cat. No. 140-N12 Screw Adapter	Cat. No. 140-K...Operating Knob
Weight			16 (0.04)	16 (0.04)

Cut-Off Current

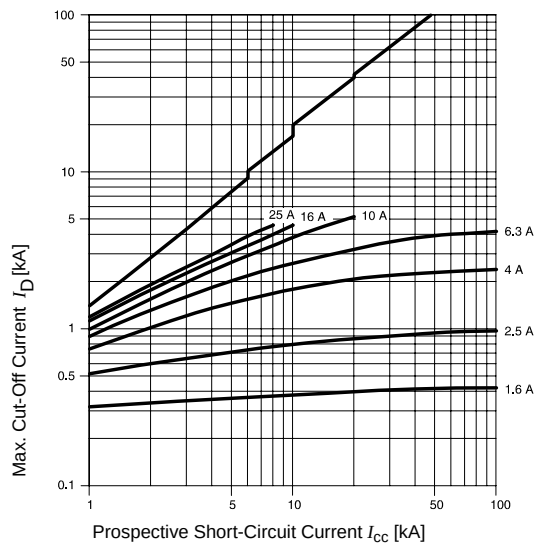


The 140-MN limits solid short-circuit current I_{cc} (prospective short-circuit current). I_D is the maximum cut-off current (highest instantaneous value of the limited short-circuit current). This value is indicated in the following diagrams as a function of the prospective system short-circuit current.

140-MN Manual Motor Starter/Protector

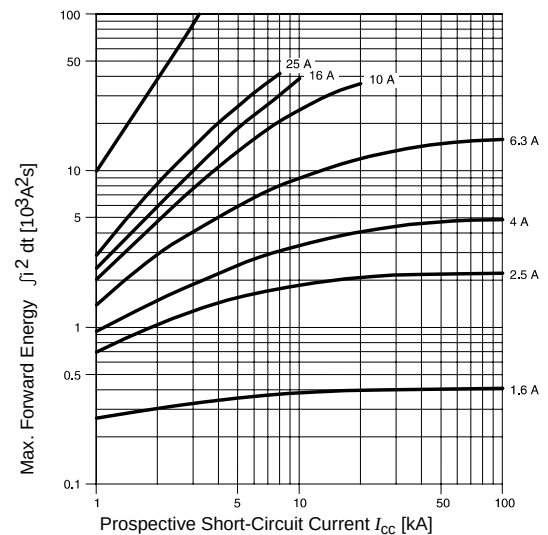
Maximum cut-off current

Rated operating voltage 400V



Maximum forward energy

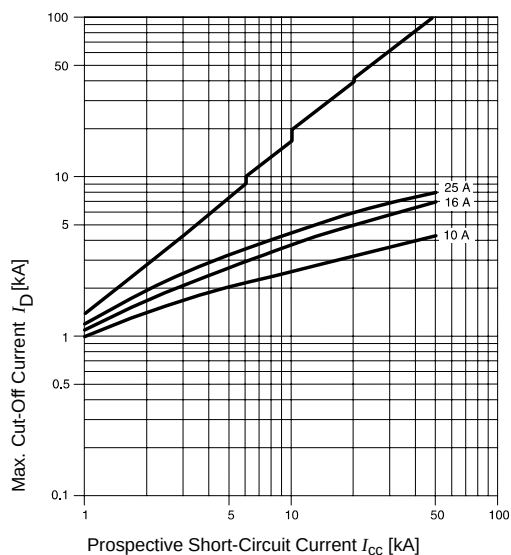
Rated operating voltage 400V



140-MN Manual Motor Starter/Protector with 140-CL2 Current Limiter

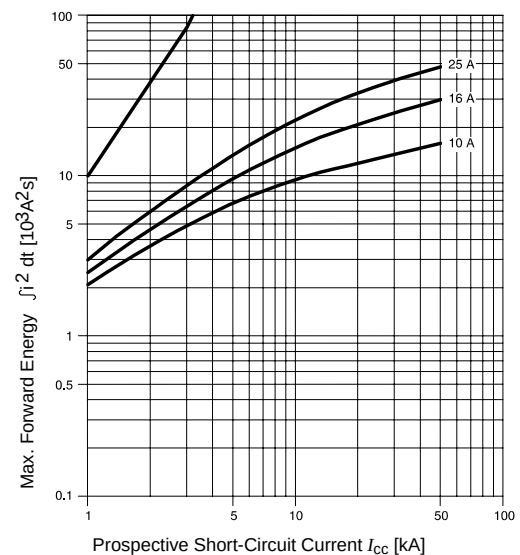
Maximum cut-off current

Rated operating voltage 400V



Maximum forward energy

Rated operating voltage 400V

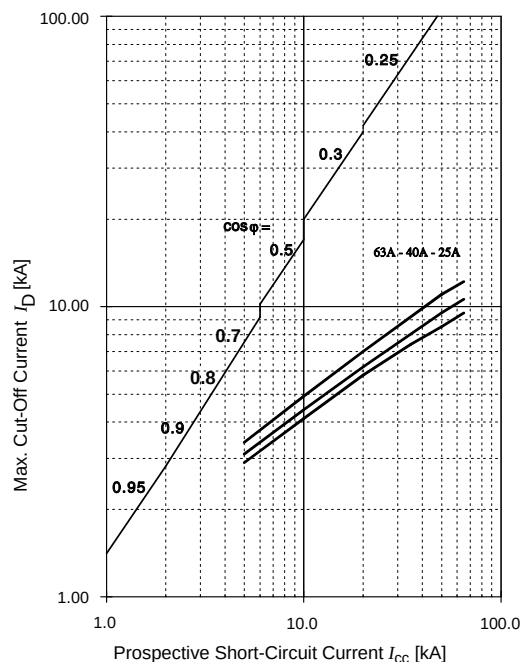


Cut-Off Current, Continued

140-CMN Manual Motor Starter/Protector

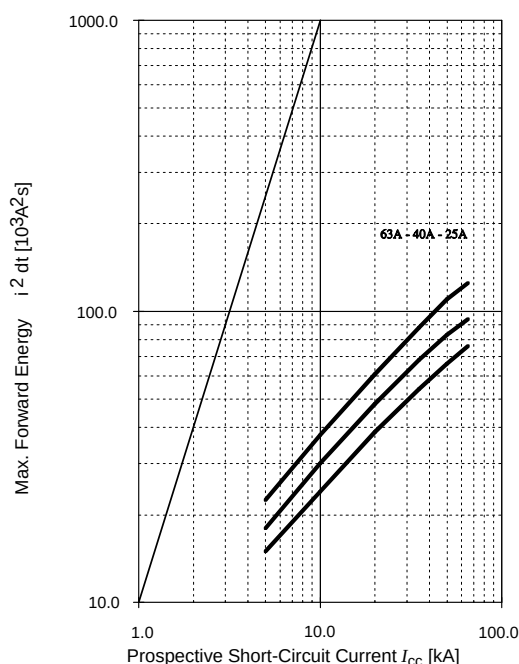
Maximum cut-off current

Rated operating voltage 415V



Maximum forward energy

Rated operating voltage 415V

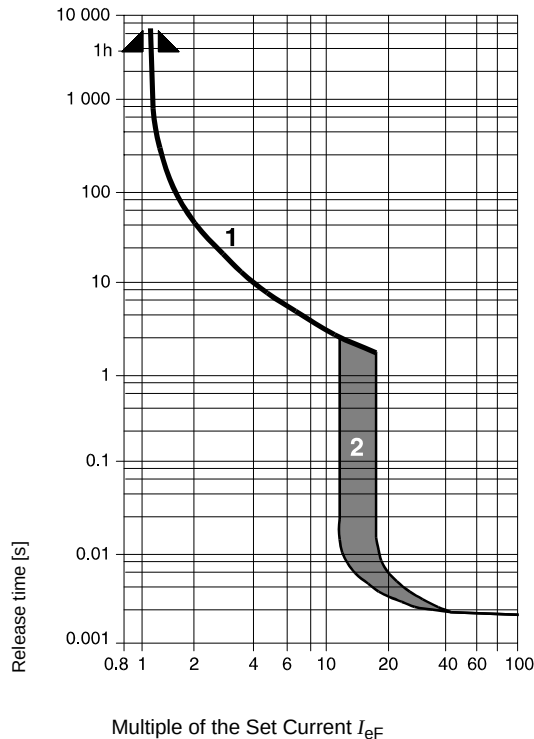


Protection of PVC Insulated Leads Against Overload and During Short-Circuit

Cat. No.	Protected Min. Copper Cross-Section at 400V 50 Hz							As per IEC 364 and CENELEC coordination documents 384-3 and 384-4.
	10mm ²	6mm ²	4mm ²	2.5mm ²	1.5mm ²	1mm ²	0.75mm ²	
140-MN-0400		●	●	●	●	●	●	In the 140 series manual motor starter/protector, overload protection is achieved by means of the adjustable thermal releases. The maximum possible tripping current is substantially lower than in fused overload protection. Short-circuit protection is provided by the non-adjustable magnetic release which is capable of opening the main contacts very quickly. The short total breaking time limits temperature rise in the lead to a minimum in the event of a short-circuit.
140-MN-0630		●	●	●	●	●	●	
140-MN-1000		●	●	●	●	●	—	
140-MN-1600		●	●	●	●	—	—	
140-MN-2000		●	●	●	—	—	—	
140-MN-2500		●	●	●	—	—	—	
140-CMN-2500	●	●	●	●				
140-CMN-4000	●	●	●	—				
140-CMN-6300	●	●	—	—				
140-CMN-9000	●	—	—	—				

Time-Current Characteristic

140-MN Manual Motor Starter/Protector



1) Thermal Releases Operating Current:

The adjustable current-dependent delayed bimetal release protects motors against overload. The characteristic shows the mean at 20°C ambient temperature starting from the cold state. In equipment at operating temperature, release time is less than or equal to release time from the cold state. The precise routine test guarantees motor protection even when a phase is interrupted.

Motor protection in protection type EExe:

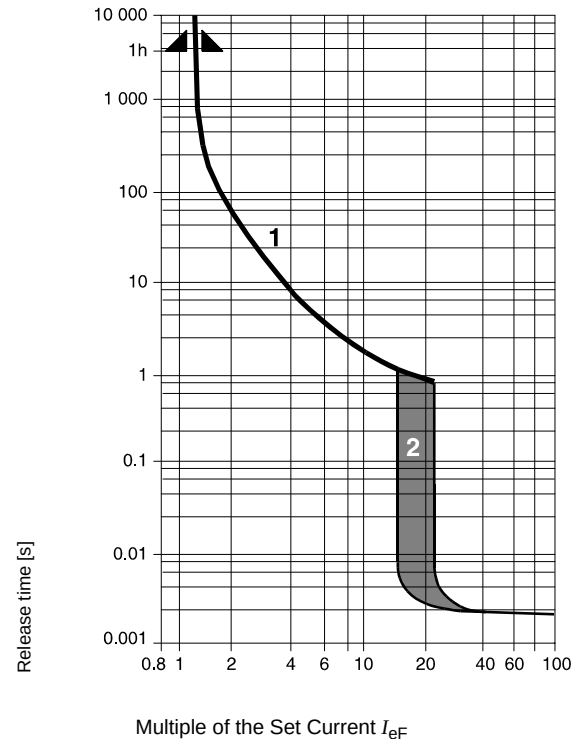
Pursuant to VDE 0165/83, the release time of the cold overload release must be less than the allowed locked-rotor time t_E of the motor.

The specific tripping characteristics must be available at the operating site. If necessary, they can be ordered from the appropriate Allen-Bradley sales office. For new systems, protection equipment must be provided for motors in accordance with VDE 0165/83, section 6.1.4.3.3. Such protection equipment must ensure motor protection even in the event of a phase failure.

The 140-MN Manual Motor Starter/Protector meets this condition for motors of up to 3 kW rated output. In motors with a rated output greater than 3 kW, additional protection devices must be provided which ensure motor protection even in the event of a phase failure.

The 140-CMN Manual Motor Starter/Protector meets these conditions for all rated power outputs.

140-CMN Manual Motor Starter/Protector



2) Operating Current for Magnetic Releases:

Electromagnetic instantaneous releases react at a set tripping current.

At the upper thermal release setting, this tripping current is 11 times (140-MN) or 14 times (140-CMN) the set current; at a lower setting it is correspondingly higher.

Current To Be Set:

Thermal releases meet the requirements for a thermal release for a starter in accordance with IEC 947. If a different value is specified (such as reduced I_e in motors with a coolant temperature higher than 40°C or a site altitude >2000 m above M.S.L.), the rated operating current I_e must be adjusted.

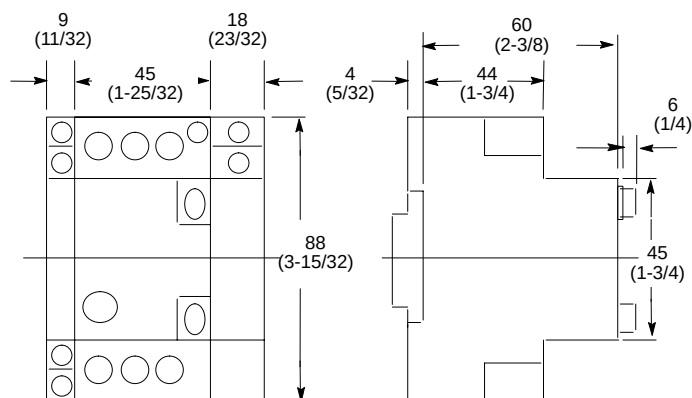
Note:

In certain applications such as in multi-speed motors or star-delta starters for heavy duty start and/or reduced motor lead cross-sections, the Bulletin 140 devices are used only as short-circuit protection, while overload protection is accomplished by thermal overload relays.

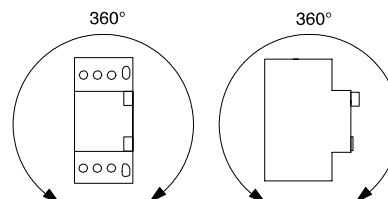
The Bulletin 140 circuit breaker must be set for a 20% higher current so that only the downstream thermal overload relays trip in the event of an overload.

Bulletin 140
Manual Motor Starter/Protectors
Approximate Dimensions

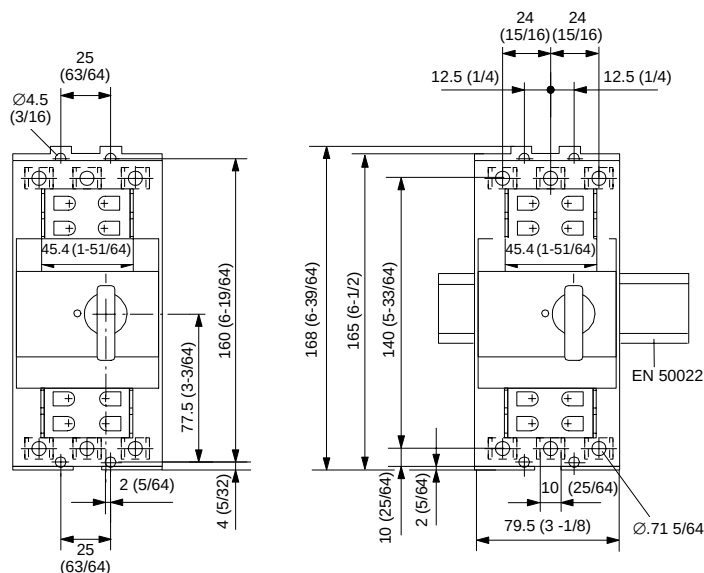
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



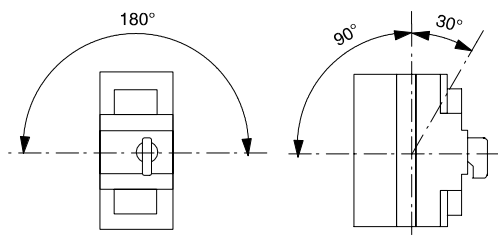
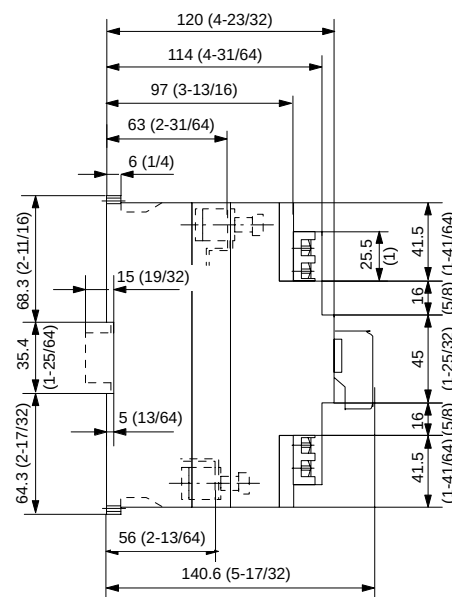
Cat. No. 140-MN +
Cat. No. 140-UV/RT +
Auxiliary Contacts Cat. No. 140-A11/A20/A02



Mounting Position
Cat. No. 140-MN

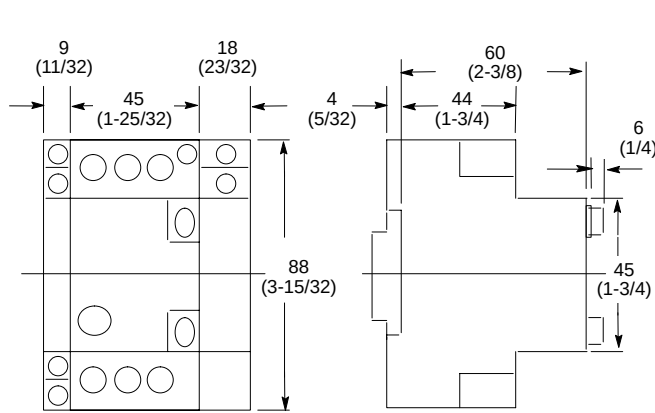


Cat. No. 140-CMN

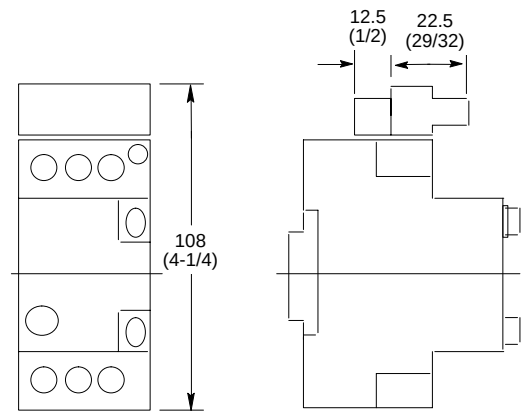


Mounting Position
Cat. No. 140-CMN

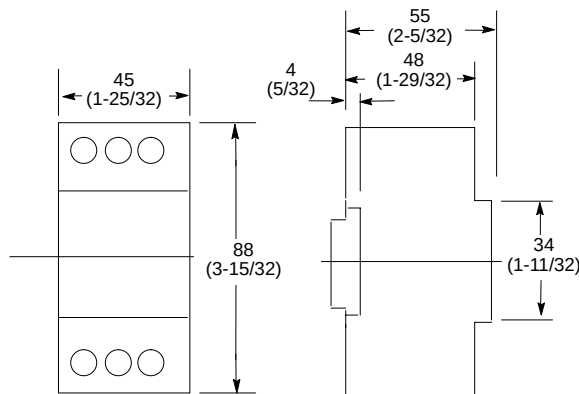
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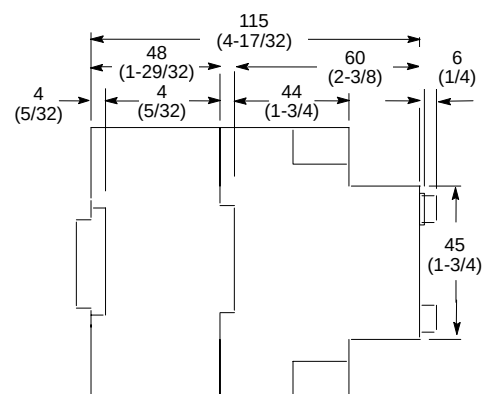
**Cat. No. 140-MN +
 Cat. No. 140-UV/RT +
 Auxiliary Contacts Cat. No. 140-A11/A20/A02**



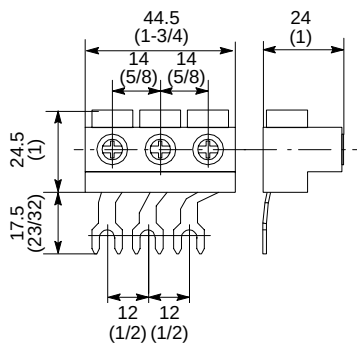
**Cat. No. 140-MN +
 Commoning Link Cat. No. 140-L
 Terminal Cat. No. 140-L**



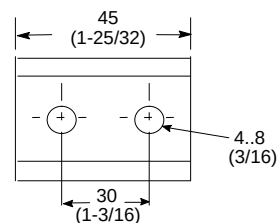
**Current Limiter Cat. No. 140-CL2 or
 Terminal Cat. No. 140-LD**



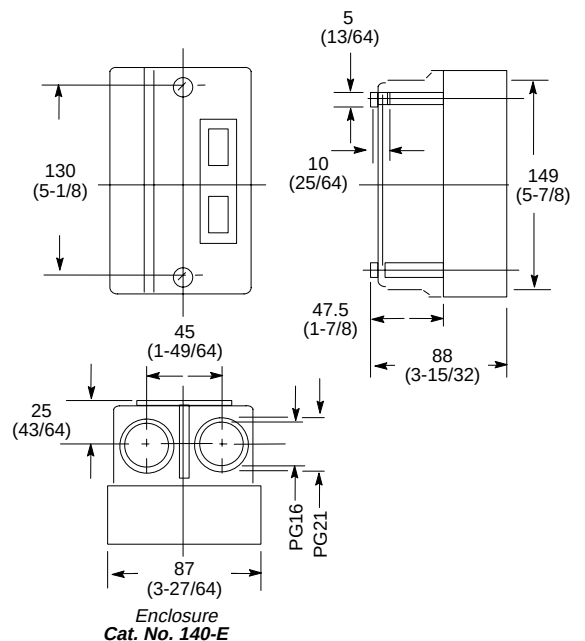
**Cat. No. 140-MN + Cat. No. 140-CL2 or
 Cat. No. 140-LD**



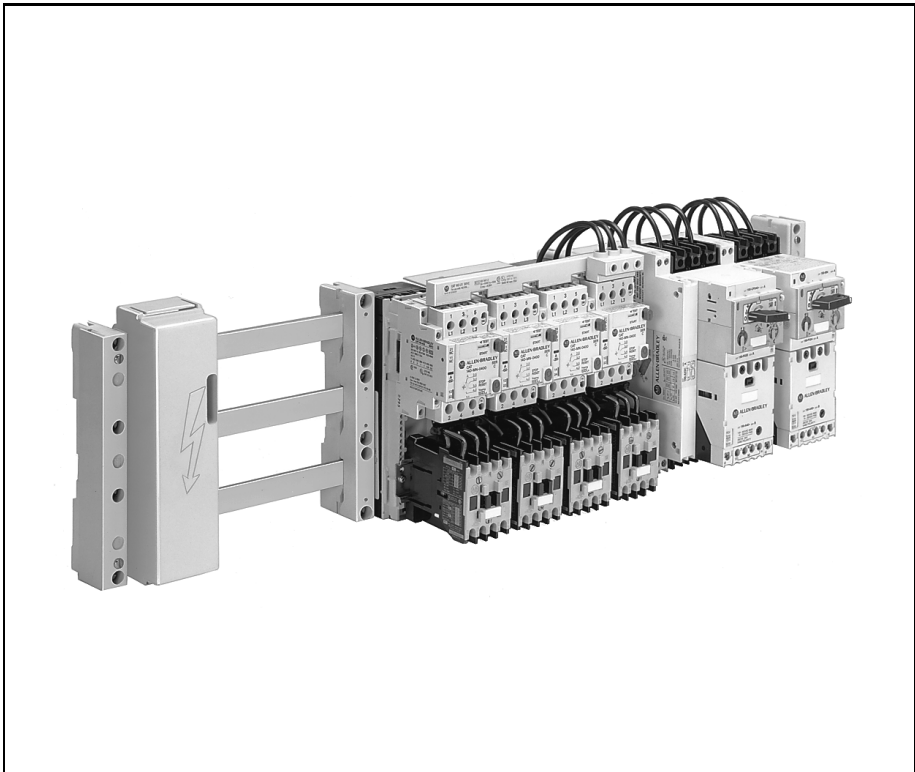
Cat. No. 140-L2



**Panel Mounting Adaptor
 Cat. No. 140-N12**



**Enclosure
 Cat. No. 140-E**



Bulletin 140

- Modularity = Flexibility
- Simplifies Installation and Engineering Layouts
- Labor Saving Pre-Construction
- Greater Flexibility for Modifications, Replacing Components, and Extending Existing Systems

TABLE OF CONTENTS

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Description

The Bulletin 140 Panel System simplifies panel design and installation using three phase bus bar. The system consists of modules which accommodate 35mm DIN rail mounting motor starters, contactors, overload relays and accessories. Assembly of the modules including installation and interwiring of electrical components may be accomplished at the work bench. These modules can then be “snapped on” the bus bar for line side power connection. The modules may be easily moved or rearranged as future circuit changes may require.

Conformity to Standards:

- CEC Part 1/87
- IEC 947-1
- IEC 439-1
- IEC 364
- NEC 88
- VDE 0106, Part 100
- CSA C22.2 No. 14
- UL 486

Approvals:

- CE
- CSA Certified
- UL Listed

Your order must include:

- Cat. No. of bus bar, terminal, terminal cover, end cover and support selected.
- Cat. No. of any accessories, if required.

	Description	DIN Rail 35mm	Size [mm]	Pkg. Qty.	Cat. No.	*
	Component Mounting Plate Mounting plate for installation of equipment. Snaps on to bus bar snap-on modules.	1 x 7.5	54 x 180	10	140-B154	
		2 x 7.5		10	140-B254	
		1 x 15	81 x 180	10	140-B181	
		2 x 7.5		10	140-B281	
		2 x 7.5	108 x 180 ❶	10	140-B2108	
		without DIN rail	54 x 180	10	140-B054	
		without DIN rail	81 x 180	10	140-B081	
	Screw-On Module For mounting component mounting plates on standard panels or to a DIN rail.		54	10	140-W1	
	Bus Bar Snap-On Modules Clips onto bus bar and provides feed to the components. Model without equipment feed to be used for mechanical stabilization when several modules are used.	Rated Current [A]	Pole Center Spacing [mm]	Pkg. Qty.	Cat. No.	*
		25	40	10	140-S125	
		25 long leads	40	10	140-S125L	
		63 ❶	40	1	140-S163	
		63 ❶ long leads	40	1	140-S163L	
		100	40	1	140-S1100	
		without equipment feed		10	140-S10	
		25	60	10	140-S225	
		25 long leads	60	10	140-S225L	
		63 ❶	60	1	140-S263	
		63 ❶ long leads	60	1	140-S263L	
		100	60	1	140-S2100	
		without equipment feed		10	140-S20	
	Bus Bar 1500mm in length	Rated Current [A]	Size [mm]	Pkg. Qty.	Cat. No.	*
		204	12 x 5	6	140-BB125	
		240	15 x 5	6	140-BB155	
		274	20 x 5	6	140-BB205	
		327	25 x 5	6	140-BB255	
		379	30 x 5	6	140-BB305	

❶ Rated 45A UL.

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 Approximate Dimensions — Page 66

Allen-Bradley

* Prices – Consult Sales Office or price list

MCS-P Panel Mounting System

Product Selection, Continued

	Description	DIN Rail 35mm	Size [mm]	I_{th} ❶ [A]	Pkg. Qty.	Cat. No.	*
	Equipment Modules 40mm Pole Center Spacing Pre-assembled module snaps onto bus bar. Consists of a component mounting plate and bus bar snap-on module.	1 x 7.5	54 x 180	25	1	140-GS1125	
		2 x 7.5	54 x 180	25	1	140-GS1225	
		1 x 7.5	54 x 180	63 ❷	1	140-GS1163	
		1 x 7.5	54 x 180	63 ❷	1	140-GS1163L	
		2 x 7.5	54 x 180	—	1	140-GS120	
		1 x 15	81 x 180	25	1	140-GS2125	
		1 x 7.5	81 x 180	63 ❷	1	140-GS2163	
		1 x 15	81 x 180	100	1	140-GS21100	
		1 x 15	81 x 180	—	1	140-GS210	
	Equipment Modules 60mm Pole Center Spacing Pre-assembled module snaps onto bus bar. Consists of a component mounting plate and bus bar snap-on module.	1 x 7.5	54 x 180	25	1	140-GS3125	
		2 x 7.5	54 x 180	25	1	140-GS3225	
		1 x 7.5	54 x 180	63 ❷	1	140-GS3163	
		1 x 7.5	54 x 180	63 ❷	1	140-GS3163L	
		2 x 7.5	54 x 180	—	1	140-GS320	
		1 x 15	81 x 180	25	1	140-GS4125	
		1 x 7.5	81 x 180	63 ❷	1	140-GS4163	
		1 x 15	81 x 180	100	1	140-GS41100	
		1 x 15	81 x 180	—	1	140-GS410	
	Equipment Module with Movable DIN Rail 40mm Pole Center Spacing The movable DIN rail makes it possible to move the lower DIN rail in a vertical direction.	2 x 7.5	54 x 180	25	1	140-GSMR12-25	
	Equipment Module with Movable DIN Rail 60mm Pole Center Spacing The movable DIN rail makes it possible to move the lower DIN rail in a vertical direction.	1 x 15	54 x 180	25	1	140-GSMR32-25	
	Power Terminal 40mm Pole Center Spacing Equipment mount specially designed for group feed via current limiters. Equipment feed is from bus-bars.	1 x 7.5	54 x 140	63 ❷	1	140-S11V35	

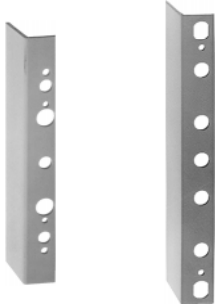
❶ I_{th} = Rated Thermal Current.

❷ Rated 45A UL.

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Specifications — Page 65

Approximate Dimensions — Page 66

	Description	Conductor Cross-Section [mm ²]	Bus Bar Thickness [mm]	Pkg. Qty.	Cat. No.	*
	Supply Terminals Individual terminals for bus-bar feed.	2.5...16 (#14-6 AWG)	5	25	140-V116	
			10	25	140-V216	
		2.5...35 (#14-2 AWG)	5	25	140-V135	
			10	25	140-V235	
		35...70 (#2-00 AWG)	5	25	140-V170	
			10	25	140-V270	
	Terminal Cover Cover provides protection against accidental contact with terminals and bus bar. Can be used with 40mm and 60mm pole center spacing.		180 (Height)	1	140-BK60	
	Description	Bus-Bar [mm]	Size [mm]	Pkg. Qty.	Cat. No.	*
	Bus-Bar Support 40mm Pole Center Spacing 3-pole, 660V 50/60 Hz. Flame-resistant polymer.	12 x 5 15 x 5		10	140-T40	
	60mm Pole Center Spacing 3-pole, 660V 50/60 Hz. Flame-resistant polymer. The bus bar support can easily be adjusted with a locking slide to accommodate different sizes of bus bar.	12 x 5 15 x 5, 15 x 10 20 x 5, 20 x 10 25 x 5, 25 x 10 30 x 5, 30 x 10		10	140-T60	
	End Cover Prevents contact with the bus-bar ends. The end cover is screwed to the bus-bar support.		40	10	140-T40E	
			60	10	140-T60E	
	Dovetail Connector Clip Dovetail connector clips are used to provide more stability between equipment modules.			10	140-K	

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Approximate Dimensions — Page 66

MCS-P Panel Mounting System

Accessories, Continued

	Description	Bus-Bar [mm]	Size [mm]	Pkg. Qty.	Cat. No.	*
	End Covers for Equipment Modules Provides finger protection, prevents contact with the bus-bar system when using mounting bases.	bottom	54	10	140-C11	
		top (3-pole opening)			140-C12	
		bottom	81	10	140-C21	
		top (3-pole opening)			140-C22	
	DIN Rail Support	For 54mm wide mounting base	7.5 x 54	10	140-H1	
		For 81mm wide mounting base	7.5 x 81	10	140-H2	
			15 x 81	10	140-H3	
	Insulating Cover Provides finger protection against exposed bus bar.	12...25 x 5		10	140-BS5	
		12...30 x 10		10	140-BS10	
	Mobile DIN Rail For add-on to 54mm component mounting plate.	without control plug		1	140-MR54	
	Control Plug, Complete Holder, pin unit Socket unit for external leads	control plug, 6-pole		1	140-PH54-06	
		control plug, 10-pole		1	140-PH54-10	
	Blocking Module Prevents modules from sliding when bus-bars are mounted vertically.	12...25 x 5		10	140-BB	
	Spacing Clip For 6.3mm bus-bar thickness.	12...25 x 5		10	140-CL	

Mounting System

Shipping Weights [g (lb)]			
Component Mounting Plate		Power Terminal	
140-B154	95 (0.21)	140-S11V35	270 (0.60)
140-B254	110 (0.24)	Supply Terminals	
140-B181	155 (0.34)	140-V116	21 (0.05)
140-B281	170 (0.37)	140-V216	23 (0.05)
140-B054	75 (0.16)	140-V135	44 (0.10)
140-B081	100 (0.22)	140-V235	47 (0.10)
Screw-On Module		140-V170	75 (0.17)
140-W1	46 (0.10)	140-V270	79 (0.17)
Bus Bar Snap-On Module		Bus-Bar Support	
140-S125	200 (0.44)	140-T40	66 (0.15)
140-S125L	210 (0.46)	140-T60	150 (0.33)
140-S163	280 (0.62)	End Covers	
140-S163L	290 (0.64)	140-T40E	66 (0.15)
140-S1100	480 (1.06)	140-T60E	150 (0.33)
140-S10	155 (0.34)	Terminal Cover	
140-S225	200 (0.44)	140-BK60	100 (0.22)
140-S225L	215 (0.47)	Dovetail Connector Clip	
140-S263	280 (0.62)	140-K	3 (0.01)
140-S263L	300 (0.66)	End Covers for Equipment Modules	
140-S2100	490 (1.08)	140-C11	8 (0.02)
140-S20	155 (0.34)	140-C12	7 (0.02)
Equipment Modules		140-C21	11 (0.02)
140-GS1125	290 (0.64)	140-C22	10 (0.02)
140-GS1225	305 (0.67)	Support DIN Rails	
140-GS1163	370 (0.82)	140-H1	18 (0.04)
140-GS1163L	385 (0.85)	140-H2	28 (0.06)
140-GS120	265 (0.58)	140-H3	53 (0.12)
140-GS2125	350 (0.77)	Insulating Cover	
140-GS2163	430 (0.95)	140-BS5	70 (0.15)
140-GS21100	630 (1.39)	140-BS10	90 (0.20)
140-GS210	310 (0.68)	Blocking Module	
140-GS3125	290 (0.64)	140-BB	4 (0.01)
140-GS3225	310 (0.68)	Spacing Clip	
140-GS3163	370 (0.82)	140-CL	1 (0.01)
140-GS3163L	390 (0.86)		
140-GS320	265 (0.58)		
140-GS4125	350 (0.77)		
140-GS4163	430 (0.95)		
140-GS41100	640 (1.41)		
140-GS410	310 (0.68)		

Standards

IEC 947-4, EN 60439-1

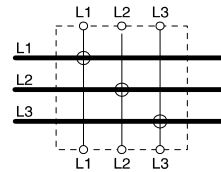
Approvals

CSA, CE, UL-listed

Specifications

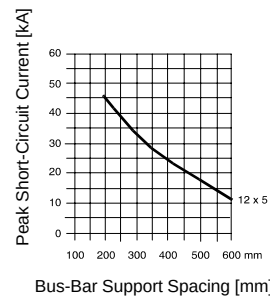
Power Terminal	
Rated Thermal Current	63A ❶
Rated Insulation Voltage	690V
Conductor size	line 4...16mm ² load 6...35mm ²

Connection Diagram

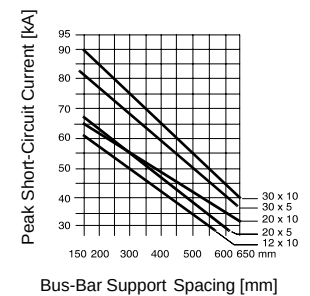


Bus-Bar-System

40mm Bus-Bar Spacing



60mm Bus-Bar Spacing

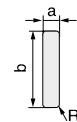


Current carrying capacity per DIN 43 671

Continuous currents for bus-bars of E-Cu with rectangular cross-section in interior systems, at 35°C (95°F) ambient temperature and 65°C (149°F) bar temperature.

Bus-Bar Approximate Dimensions [mm]	AC to 60 Hz [A]
12 x 5	204
15 x 5	240
20 x 10	427
20 x 5	274
25 x 5	327
30 x 5	379
30 x 10	573

Dimensional accuracy of bus-bars per DIN 1759

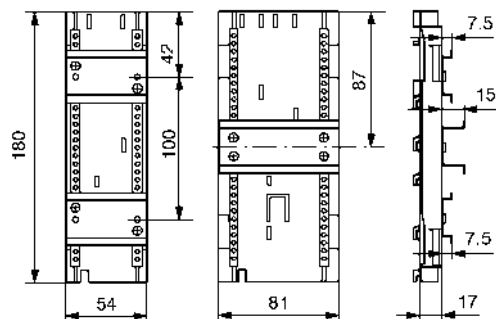


Thickness a [mm]	5	10			
Tolerance	±0.07	±0.07			
Width b [mm]	12	15	20	25	30
Tolerance	±0.08	±0.1	±0.15	±0.15	±0.15
Edge rounding R at thickness a [mm]	5	10			
acceptable R	0.2	0.4			

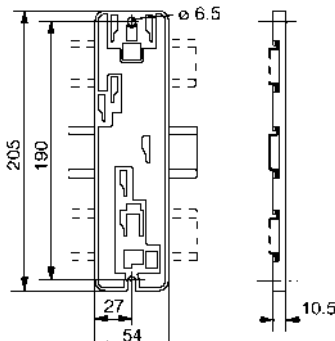
❶ Rated for 45A UL.

Dimensions are shown in millimeters (inches).

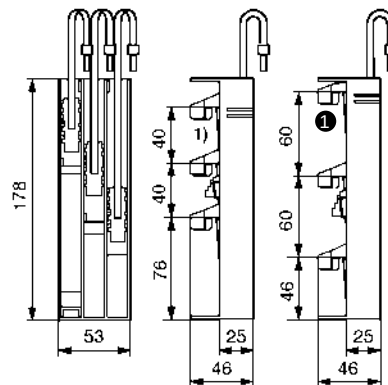
Dimensions are not intended for manufacturing purposes.



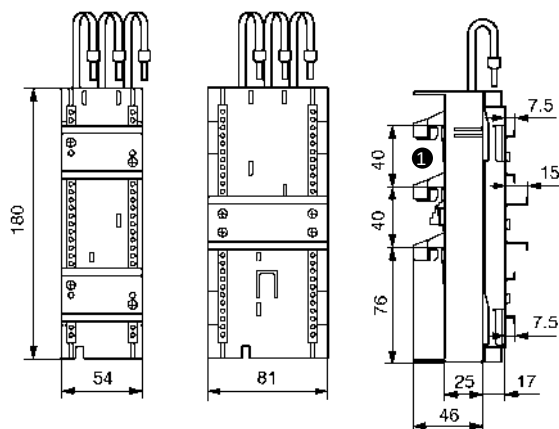
Cat. No. 140-B
Component Mounting Plate



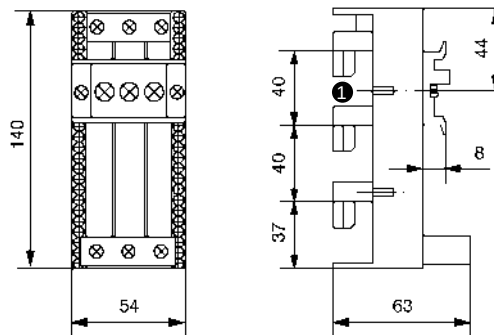
Cat. No. 140-W1
Screw-On Module



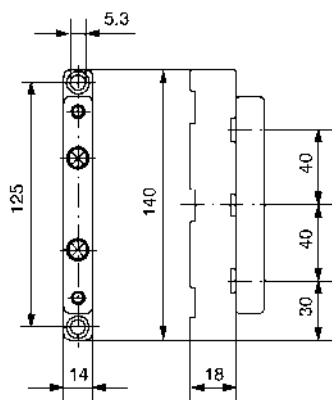
Cat. No. 140-S
Bus Bar Snap-On Module



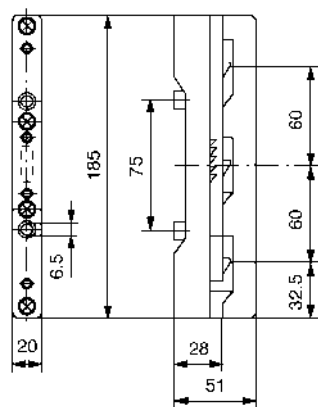
Cat. No. 140-GS
Equipment Module



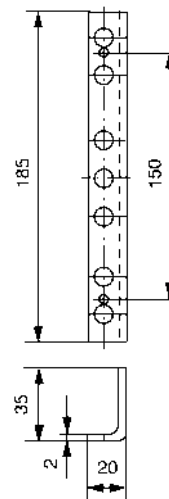
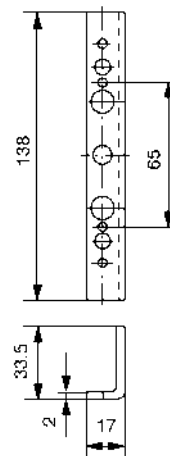
Cat. No. 140-S11V35
Power Terminal



Cat. No. 140-T
Bus-Bar Support

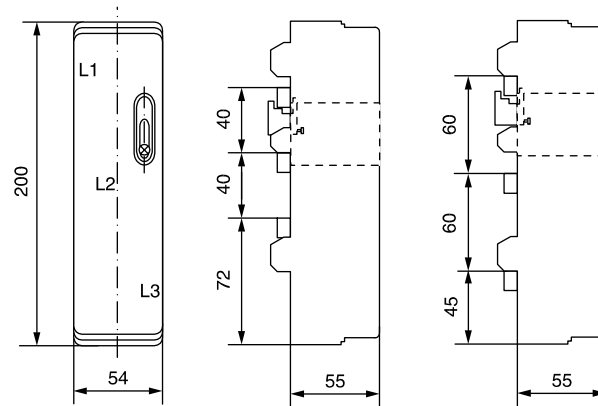


Cat. No. 140-T-E
End Cover

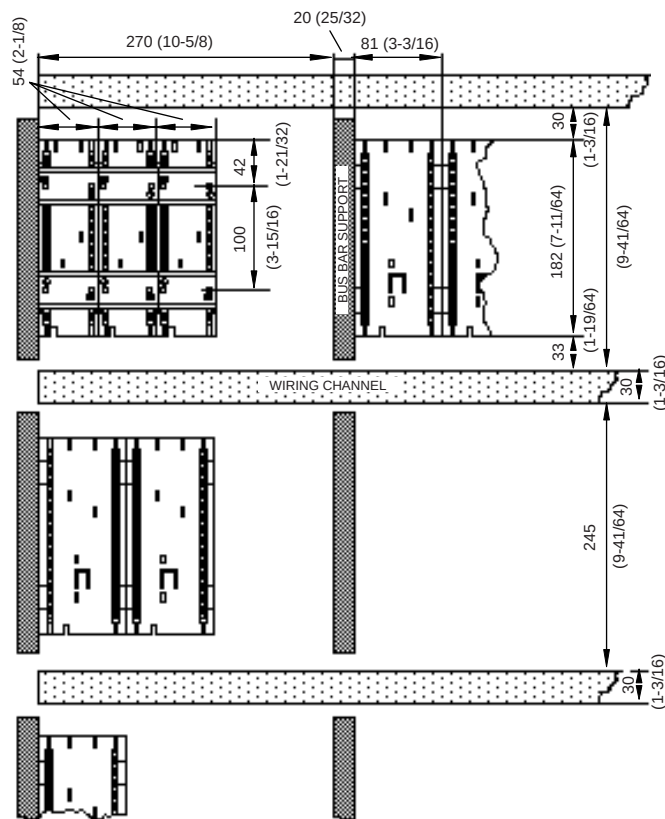


❶ For 5mm bus-bar thickness break out filler pieces for 10mm bus-bar thickness. See page 65 for maximum bus-bar width.

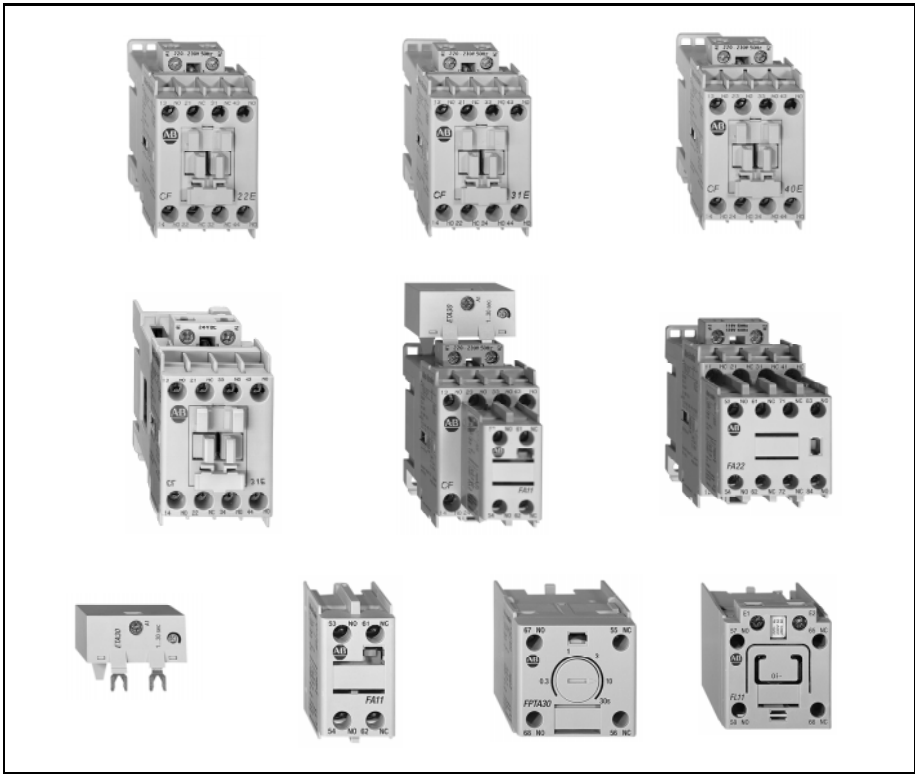
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



Cat. No. 140-BK
 Terminal Cover



Typical Layout



Bulletin 700-CF

- AC and DC Operating Mechanisms
- Direct Drive/Positive Guided Auxiliary Contacts
- Guarded Terminals with Backed-Out Terminal Screws
- Front and Side Mounted Auxiliary Contacts
- Electronic and Pneumatic Timing Modules
- Environment Friendly Materials
- Space-Saving Coil Modules
- Common accessories with Bulletin 100-C Contactors

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Description

Bulletin 700-CF range of 4 pole relays combined with its adder decks, timers and accessories provides a highly flexible line of world acceptable devices.

Conformity to Standards

IEC 947-5-1
EN 50011, EN 50005, EN 50022
UL 508
VDE 0660
CSA C22.2 Part 14

Approvals

CE
CSA Certified
UL Listed, File E14840, Guide NKCR

Your order must include:

- Cat. No. of the relays required, complete with coil suffix.
- Cat. No. of adder decks, timers and accessories required.
- If required, the part number of replacement coils.

Type CF Control Relays — 4 Pole AC Voltage



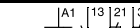
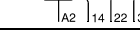
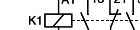
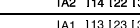
Cat. No. 700-CF220⊗



Cat. No. 700-CF310⊗



Cat. No. 700-CF400⊗

AC-1		AC-11 and AC-15							Connection Diagrams	Contacts		Cat. No.	*
I_e [A]		I_e [A]											
40°C	60°C	24/48V	120V	240V	400V	500V	600V	690V		N.O.	N.C.		
25	20	16	14	10	5	2.5	1.8	1		2	2	700-CF220⊗	
										3	1	700-CF310⊗	
										4	0	700-CF400⊗	
										0	4	700-CF040⊗	

⊗ **Voltage Suffix Code**

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 700-CF220** becomes **Cat. No. 700-CF220F**.

Voltage	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	—	—	—	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	—	—	—	—	KF	—	KA	—	—	—	—	KN	—	KB	—	—	—	—

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Approximate Dimensions — Page 78

Allen-Bradley

* Prices – Consult Sales Office or price list

MCS-F Control Relays

Product Selection, Continued

Type CF Control Relays — 6 and 8 Pole



Cat. No. 700-CFZ 1420



Cat. No. 700-CFZ 0530

Type CF Control Relays with Overlapping Side Mounted Contacts

AC-1		AC-11 and AC-15							L.H. Aux.	Relay Arrangement	R.H. Aux.	Contacts		Overlapping Side Mounted Contacts		Cat. No.	*
I _e [A]		I _e [A]										N.O.	N.C.	N.O.	N.C.		
40°C	60°C	24/48V	120V	240V	400V	500V	600V	690V									
25	20	16	14	10	5	2.5	1.8	1		4	0	1	1	700-CFZ1510®			
										3	1	1	1	700-CFZ1420®			
										2	2	1	1	700-CFZ1330®			
25	20	16	14	10	5	2.5	1.8	1		4	0	2	2	700-CFZ2620®			
										3	1	2	2	700-CFZ2530®			
										2	2	2	2	700-CFZ2440®			

Type CF Control Relays with Standard Side Mounted Contacts

AC-1		AC-11 and AC-15								L.H. Aux.	Relay Arrangement	R.H. Aux.	Contacts		Standard Side Mounted Contacts		Cat. No.	*
I _e [A]		I _e [A]											N.O.	N.C.	N.O.	N.C.		
40°C	60°C	24/48V	120V	240V	400V	500V	600V	690V										
25	20	16	14	10	5	2.5	1.8	1				4	0	1	1	700-CFZ0510⊗		
												3	1	1	1	700-CFZ0420⊗		
												2	2	1	1	700-CFZ0330⊗		
												4	0	2	2	700-CFZ0620⊗		
												3	1	2	2	700-CFZ0530⊗		
												2	2	2	2	700-CFZ0440⊗		

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 700-CFZ0510®** becomes **Cat. No. 700-CFZ0510F**.

Voltage	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	—	—	—	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	—	—	—	—	KF	—	KA	—	—	—	—	KN	—	KB	—	—	—	—

Type CF Control Relays — 4 Pole DC Voltage



Cat. No. 700-CF220Z⊗



Cat. No. 700-CF310Z⊗



Cat. No. 700-CF400Z⊗

AC-1		AC-11 and AC-15								Contacts		Cat. No.	*
I_e [A]		I_e [A]											
40°C	60°C	24/48V	120V	240V	400V	500V	600V	690V		Connection Diagrams	N.O.		
25	20	16	14	10	5	2.5	1.8	1	A1 A2 13 14 21 22 31 32 43 44	2	2	700-CF220Z⊗	
									A1 A2 13 14 21 22 31 32 43 44	3	1	700-CF310Z⊗	
									A1 A2 13 14 23 24 33 34 43 44	4	0	700-CF400Z⊗	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 700-CF220Z⊗** becomes **Cat. No. 700-CF220ZJ** for 24V DC.

Voltage		9	12	24	36	48	60	64	72	80	110	115	125	220	230	250
Standard	DC	R	Q	J	W	Y	Z	B	G	E	D	P	S	A	F	T
with Diode Suppressor	DC	-	-	DJ❶	-	-	-	-	-	-	-	-	-	-	-	-

- ❶ When ordering DJ coil with built-in surge suppression, remove Z from the Cat. No. Example: **Cat. No. 700-CF400Z⊗10** becomes **Cat. No. 700-CF400DJ10**

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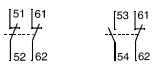
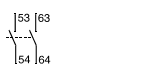
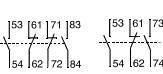
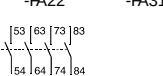
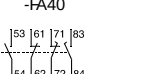
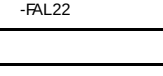
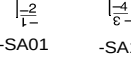
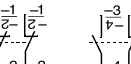
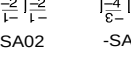
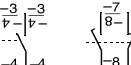
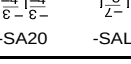
Allen-Bradley

* Prices – Consult Sales Office or price list

MCS-F Control Relays

Accessories

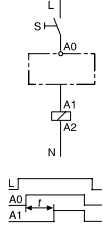
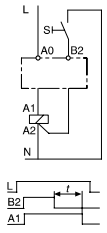
Auxiliary Contacts

	Description	N.O.	N.C.	Connection Diagrams	For Use With	Cat. No.	*
	Auxiliary Contacts — Front Mounted ❶ • 2 and 4 Pole • Easy addition to relays • Contact compatible with electronics • Positive guided contacts L = Late break/early make	0	2		700-CF	100-FA02	
		1	1	-FA02 -FA11	700-CF	100-FA11	
		2	0		700-CF	100-FA20	
		2	2		700-CF	100-FA22	
		3	1		700-CF	100-FA31	
		4	0		700-CF	100-FA40	
		1+1L	1+1L		700-CF	100-FAL22	
	Auxiliary Contact Blocks for Side Mounting without Sequence Terminal Designations ❷ • 1 and 2 pole • Two-way numbering for right or left mounting on the contactor • Quick and easy mounting without tools • Electronic compatible contacts to 17V, 5 mA • Mutual positive guidance and to the main relay poles (except for L types) L = Late break/Early make	0	1		700-CF	100-SA01	
		1	0		700-CF	100-SA10	
		0	2		700-CF	100-SA02	
		1	1		700-CF	100-SA11	
		2	0		700-CF	100-SA20	
		L1	L1		700-CF	100-SAL11	
				-SA01 -SA10 -SA02 -SA1 -SA20 -SAL1			

❶ Control Relay and Auxiliary Contact

❷ Up to 8 auxiliary contacts may be mounted (a maximum of 4 N.C. contacts on the front of the contactor and a maximum of 2 N.O. contacts on each side).

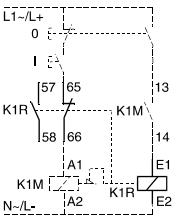
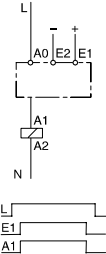
Control Modules

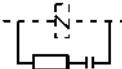
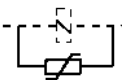
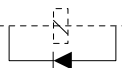
	Description	Connection Diagrams	For Use With	Cat. No.	*
031fptpta  Cat. No. 100-FPTA30	Pneumatic Timing Module Pneumatic timing element contacts operate after the set time; the contacts on the control relay continue to operate without delay. Continuous adjustment range	ON-Delay 0.3...30 s Range 1.8...180 s Range 	700-CF with AC Coils	100-FPTA30 100-FPTA180	
		OFF-Delay 0.3...30 s Range 1.8...180 s Range 	700-CF all	100-FPTB30 100-FPTB180	
036peta  Cat. No. 100-ETA30	Electronic Timing Module 100-ETA The contactor is switched on after the end of the delay time.	ON-Delay 0.3...3 s Range 1...30 s Range 10...180 s Range 110...240V 50/60 Hz 110...250VDC 	700-CF all	100-ETA3 100-ETA30 100-ETA180	
034petb  Cat. No. 100-ETB30		OFF-Delay 0.3...3 s 1...30 s 10...180 s 110...240V 50/60 Hz 	700-CF with AC Coils	100-ETB3 100-ETB30 100-ETB180	

MCS-F Control Relays

Accessories, Continued

Control Modules, Continued

	Description	Connection Diagrams	For Use With	Cat. No.	*
 033pf11 Mechanical Latch In contactors with latching, the contactor coil is immediately switched off after closing by the contact on the latch (65-66). Consequently, no holding current flows, and it can be used with all contactor models with AC operating mechanism (with AC coils), also for DC operation. Auxiliary Contacts 1 N.O. + 1 N.C. Cat. No. 100-FL⊗			700-CF	100-FL11⊗	
 037pa1 Interface (Electronic) Interface between the DC control signal (PLC) and the AC operating mechanism of the contactor. - Control Voltage 18...30VDC - Relay Control Voltage 110...240VAC - For use with 100-C/700-CF Cat. No. 100-JE			700-CF	100-JE	

	Description		Connection Diagrams	For Use With	Cat. No.	*	
	Surge Suppressors For limitation of coil switching transients. • Coil mounted • Suitable for all 700-CF sizes • RC, Varistor and Diode Versions	RC Module AC Operating Mechanism	24...48V 50/60 Hz		700-CF	100-FSC48	
			110...280V 50/60 Hz			100-FSC280	
			380...480V 50/60 Hz			100-FSC480	
		Varistor Module AC/DC Operating Mechanism	12...55V AC / 12...77V DC		700-CF	100-FSV55	
			56...136V AC / 78...180V DC			100-FSV136	
			137...277V AC / 181...350V DC			100-FSV277	
			278...575V AC			100-FSV575	
		Diode Module DC Operating Mechanism	12...250VDC		700-CF with DC coils	100-FSD250	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 100-FL11⊗** becomes **Cat. No. 100-FL11J.❶**

Voltage	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

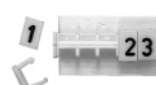
❶ For special voltages, consult Allen-Bradley Sales Office.

Assembly Components

	Description	For Use With	Pkg. Qty.	Cat. No.	*
 964072 Cat. No. 100-SCCA  Cat. No. 100-SCFA	Protective Covers - Provides protection against unintended manual operation - For contactors and front mounted auxiliary contacts	700-CF, all	10	100-SCCA	
		100-FA, FB, FC, FP, FL	1	100-SCFA	

Marking Systems

Uniform labeling materials for contactors, motor startup equipment, timing relays and circuit breakers.

	Description	Pkg. Qty.	Cat. No.	*
 label 132	Label Sheet 10 sheets with 105 self-adhesive paper labels each, 6 x 17mm	10	100-FMS	
 100fmp 84	Marking Tag Sheet 10 sheets with 160 perforated paper labels each, 6 x 17mm - To be used with a transparent cover	10	100-FMP	
 1	Transparent Cover 100 each - To be used with marking tag sheets	100	100-FMC	
 1 23	Marking Tag Carriers 100 each - To be used with label frame:	System V4/V5 System Bull. 1492W 100 100	100-FMA1 100-FMA2	

Coils

	AC Voltages			Cat. No. 700-CF	DC Voltages	Cat. No. 700-CF
	50 Hz	60 Hz	50/60 Hz			
	—	12V	—	TA006	9 V	TA766
	12V	—	—	TA404	12 V	TA708
	—	24V	—	TA013	24 V Diode	TA714M
	24V	—	—	TA407	24 V	TA714
	—	—	24V	TA855	36 V	TA719
	32V	36V	—	TA481	48 V	TA724
	36V	—	—	TA410	60 V	TA774
	42V	48V	—	TA482	64 V	TA727
	48V	—	—	TA414	72 V	TA728
	—	—	48V	TA860	80 V	TA729
	100V	100...110V	—	TA861	110 V	TA733
	110V	120V	—	TA473	115 V	TA734
	—	—	110V	TA856	125 V	TA737
	120V	—	—	TA425	220 V	TA747
	127V	—	—	TA428	230 V	TA749
	200V	200...220V	—	TA862	250 V	TA751
	—	208V	—	TA049		
	—	208...240V	—	TA296		
	220V	240V	—	TA474		
	230V	—	—	TA441		
	—	—	230V	TA851		
	208...240V	—	—	TA440		
	240V	277V	—	TA480		
	—	—	240V	TA858		
	—	347V	—	TA065		
	—	380V	—	TA067		
	380V	440V	—	TA071		
	—	—	400V	TA863		
	400...415V	—	—	TA457		
	440V	480V	—	TA475		
	—	—	440V	TA859		
	500V	—	—	TA479		
	550V	600V	—	TA476		

MCS-F Control Relays

Specifications

General

			Cat. No. 700-CF	Auxiliary Contact Front Mount
Contact Ratings — NEMA			A600, P600	A600, Q600
Contact Ratings — IEC AC-15 at rated voltage IEC 947, EN 60947	24V		16A	6A
	48V		16A	6A
	120V		14A	6A
	240V		10A	5A
	400V		5A	3A
	480V/500V		2.5A	1.6A
	600V		1.8A	1.2A
	690V		1A	1.0A
AC-1 (Non-inductive, or slightly inductive loads, resistance fur- naces) IEC 947, EN 60947	40°C	I_{th}	25A	10A
	60°C	I_{th}	20A	6A
Switching DC Loads				
L/R 1ms, Resistive Loads	24V		12A	12A
	48V		9A	9A
	110V		3.5A	3.5A
	220V		0.55A	0.55A
	440V		0.2A	0.2A
L/R 15ms, Resistive Loads	24V		9A	9A
	48V		5A	5A
	110V		2A	2A
	220V		0.4A	0.4A
	440V		0.16A	0.16A
DC-13 IEC 947, EN 60947	24V		5A	5A
	48V		2A	2A
	125V		0.7A	0.7A
	220V		0.25A	0.25A
	440V		0.12A	0.12A
Minimum Contact Rating	17V		5 mA	5 mA
Positively Guided Contacts			Yes, N.O. and N.C. mutually unrestricted	Yes, N.O. and N.C. mutually unrestricted including N.C. in relation to N.O. Main contacts of control relay do not provide positive guidance with Cat. Nos. 100-FL and 100-FP.
Mechanical Life		[Mil]	15	15
Electrical Life	AC-15 (240V, 3A)	[Mil]	1.5	1.5
Weight	AC Op. Mechanism	[g]	390	—
Terminal Cross-Sections				
Terminal Type				
Terminal Size per IEC 947-1			2 x A4	2 x A4
 Flexible with Wire End Ferrule	1 Conductor	[mm ²]	1...4	0.5...2.5
	2 Conductor	[mm ²]	1...4	0.75...2.5
 Solid	1 Conductor	[mm ²]	1.5...6	0.5...2.5
	2 Conductor	[mm ²]	1.5...6	0.75...2.5
Tightening Torque			[Nm]	1...1.5
Max. Wire Size per UL/CSA			[AWG]	18...14
Tightening Torque			[lb-in]	8.9...13.3

Control Circuit

			Cat. No. 700-CF
Operating Voltage			
AC 50/60 Hz	Pickup	[x U _s]	0.85...1.1
	Dropout	[x U _s]	0.3...0.6
	Pickup	[x U _s]	0.8...1.1
	Dropout	[x U _s]	0.1...0.6
Coil Consumption			
AC 50/60 Hz	Inrush	[VA/W]	70/50
	Seal	[VA/W]	8/2.6
DC	Inrush/Seal	[W]	6.0
Operating Times			
AC- 50/60 Hz	Pickup Time	[ms]	15...30
	Dropout Time	[ms]	10...60
DC	Pickup Time	[ms]	40...70
	Dropout Time	[ms]	7...15
Latch Attachment Release			
Coil Consumption		[VA/W] [W]	AC 45VA/40W DC 25W
Contact Signal Duration		[min/ max]	0.03...15s
Timing Attachment			
Reset Time		[ms]	10...70
100-ETA			
100-ETB			
Repeat Accuracy			± 10%

- ❶ For 9V DC, code ZR, use operating voltage 0.65...1.3 x U_s.
For 24V DC, code ZJ or DJ, use operating voltage 0.7...1.25 x U_s.

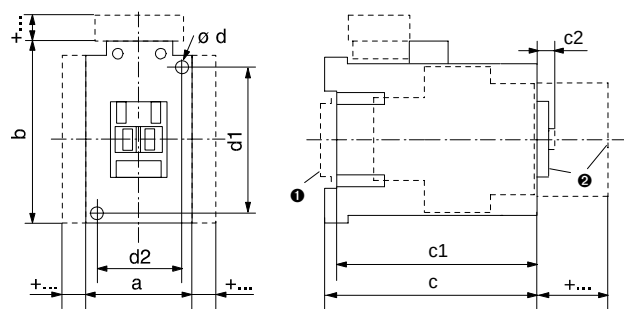
General

	Cat. No. 700-CF
Rated Insulation Voltage U_i	
IEC	690V
UL; CSA	600V
Rated Impulse Strength U_{imp}	8 kV
High Test Voltage	
1 minute (per IEC 947-4)	2500V
Rated Voltage U_e	
AC	115, 230, 400, 500, 690V
DC	24, 48, 110, 220, 440V
Rated Frequency	50/60 Hz, DC
Ambient Temperature	
Storage	–55...+80 °C (–67...176 °F)
Operation at nominal current	–25...+60 °C (–13...140 °F)
Conditioned 15% current reduction after AC-1 at > 60°C	–25...+70 °C (–13...158 °F)
Corrosion Resistance	humid-alternating climate, cyclic, per IEC 68-2-30 and DIN 50 016, 56 cycles
Altitude	2000m M.S.L., per IEC 947-4
Type of Protection	
IP 2LX (IEC 529 and DIN 40050)	in connected state
Finger Protection	safe from touch by fingers and back of hand per VDE 0106, Part 100

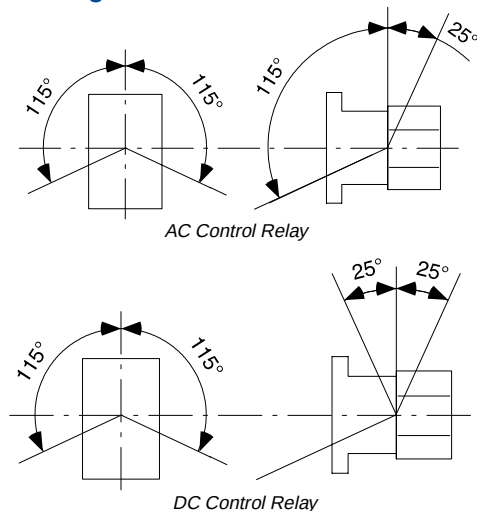
MCS-F Control Relays

Approximate Dimensions

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



Mounting Position



Relay

Type	a	b	c	c1	c2	Ød	d1	d2
700-CF	45 (1-25/32)	81 (3-3/16)	80.5 (3-11/64)	75.5 (3-3/32)	6 (1/4)	2 St. ± 4.5 (2 St. ± 3/16)	60 (2-23/64)	35 (1-25/64)
700-CF__Z	45 (1-25/32)	81 (3-3/16)	106.5 (4-3/16)	101.5 (4)	6 (1/4)	2 pcs. - 4.5 (2 pcs.-3/16)	60 (2-23/64)	35 (1-25/64)

1 May be mounted to 35mm EN 50 022 DIN rail.

Accessories

Contactor with	AC Control Relay		DC Control Relay	
	mm	(inches)	mm	(inches)
Auxiliary Contact for Front Mounting 2 or 4 pole	$c/c1 + 39$	$(c/c1 + 1 - 37/64)$	$c/c1 + 39$	$(c/c1 + 1 - 37/64)$
Auxiliary Contact for Side Mounting 1 or 2 pole	$a + 9$	$(a + 23/64)$	$a + 9$	$(a + 23/64)$
Pneumatic Timing Module	$c/c1 + 58$	$(c/c1 + 2 - 23/64)$	—	—
Electronic Timing Module on coil terminal side	$b + 24$	$(b + 15/16)$	$b + 24$	$(b + 15/16)$
Mechanical Interlock on side of contactor	$a + 9$	$(a + 23/64)$	$a + 9$	$(a + 23/64)$
Mechanical Latching	$c/c1 + 61$	$(c/c1 + 2 - 31/64)$	—	—
Interface on coil terminal side	$b + 9$	$(b + 23/64)$	—	—
Protective Element on coil terminal side	$b + 3$	$(b + 1/8)$	$b + 3$	$(b + 1/8)$
2 Labeling with:				
label sheet	+0	(+0)	+0	(+0)
marking tag with cover	+0	(+0)	+0	(+0)
marking tag carrier for System V4/V5	+5.5	(+7/32)	+5.5	(+7/32)
marking tag carrier for System Bull. 1492W	+5.5	(+7/32)	+5.5	(+7/32)