

CENTERLINE 2100 Motor Circuit Protection

Catalog Numbers 140MG and 140G



Topic	Page
Suffix/Circuit Breaker Frame Explanation	2
Instantaneous Trip Motor Circuit Protectors (MCP) in Combination NEMA Starter	3
MCP Application	3
Motor-circuit Protector Size and Adjustment	3
Push-to-trip Mechanism	4
Horsepower Ratings	4
Inverse Time Circuit Breakers in Combination NEMA Starter, Soft Starter (SMC), and Variable Frequency AC Drive Units	13
Application	13
Circuit Breaker Operation	13
Circuit Breaker Size and Adjustment	14
Push-to-trip Mechanism	14
Horsepower Ratings	14
Time-current Curves	20



Summary of Changes

This publication contains new and updated information as indicated in the following table.

Topic	Page
Updated Unit Combination Short-Circuit Current Rating in Table 6	10

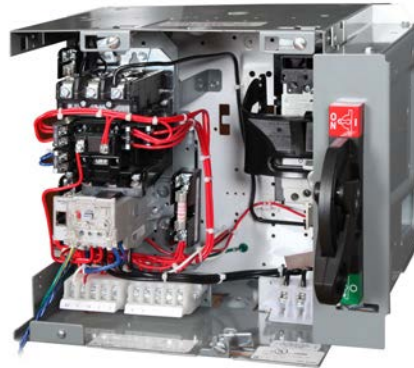
Table 1 - Suffix/Circuit Breaker Frame Explanation

Circuit Breaker Series		T	G	A	Circuit Breaker Type	
T	140G Inverse Time Breaker 140MG MCP					
					M ⁽¹⁾	High Interrupting Inverse Time
					ML ⁽²⁾	High Interrupting Inverse Time with Electronic Trip (LSI)
					MG	High Interrupting Inverse Time with Ground Fault (LSIG)
					X ⁽¹⁾	Extra High Interrupting Inverse Time
					XL ⁽²⁾	Extra High Interrupting Inverse Time with Electronic Trip (LSI)
					XG	Extra High Interrupting Inverse Time with Ground Fault (LSIG)
					U ⁽¹⁾	Ultra High Interrupting Inverse Time (600V only)
					UL ⁽²⁾	Ultra High Interrupting Inverse Time with Electronic Trip (LSI 600V only)
					UG	Ultra High Interrupting Inverse Time with Ground Fault (LSIG 600V only)
Frame						
G	125 A Fixed					
H	125 A Frame and Trip					
J	250 A Frame and Trip					
K	400 A Frame and Trip					
M	800 A Frame and Trip					
N	1200 A Frame					
R	3000 A Frame					

(1) Electronic (LSI) on K, M, and N Frames

(2) Only available on H and J Frames

Instantaneous Trip Motor Circuit Protectors (MCP) in Combination NEMA Starter



MCP Application

The motor-circuit protector application is valid for the following CENTERLINE® 2100 MCC products:

- Bulletin 2107 full-voltage reversing combination starters
- Bulletin 2113 full-voltage non-reversing combination starters
- Bulletin 2123 two-speed non-reversing combination starters

The information in this publication applies to Allen-Bradley® motor circuit protectors (MCP) when they are used in NEMA (size 1...6) combination starters. The particular motor-circuit protector (trip range) supplied with a unit depends on the horsepower or kilowatt rating and voltage that was specified when the unit was ordered. Tables 3...7 list the various combinations and voltage. When using Tables 3...7, be sure to use the line that applies to your voltage.

Motor-circuit Protector Size and Adjustment

Rockwell Automation has made engineering evaluations for the protective device (MCP) selection, sizing, and setting range that is based on the protection rules/requirements and motor criteria as stipulated in NEC, CEC, NEMA, UL, and CSA standards. For example, evaluations have been made for items such as motor full-load currents (FLC), X/R ratios, locked rotor currents, and nominal utilization voltages. If the motor application has criteria that deviates from those criteria that are stated in the standards, higher FLC, and/or motor inrush currents (greater than 1300% of the nominal FLC) can be experienced. Examples of non-standard motor applications include the following: special motors, non/off standard NEMA or application-rated motors, Design B energy efficient, Design E motors, and IEC N motors.

The motor full-load current determines the magnetic trip setting of the motor circuit protector. We recommend selecting an initial trip setting that is approximately eight times the motor nameplate full-load current. The trip setting can be adjusted to a position that corresponds to the determined magnetic trip current.

Trip Settings	Current	Frame Size
A through I	125 A	G and H
	250 A	J
Electronic Trip	300...3000 A	K, M, N, R

To adjust the trip setting, follow these steps.

1. Verify that the motor-circuit protector operating handle is in the OFF/O position.
2. With a small screwdriver, turn the adjustment pointer clockwise to the determined setting (G, H, and J frames) or adjust DIP switches to the determined setting (K and M frames).
3. Verify that the motor circuit protector does not trip during motor starting.

If the motor-circuit protector trips when attempting to start the motor, turn the pointer clockwise to successively higher positions, until the motor-circuit protector no longer trips when attempting to start the motor.

IMPORTANT When the devices are energized, motor peak-inrush current can randomly exceed the maximum limit set by the code.

Per NEC guidelines, set the trip setting of the motor circuit protector to greater than 8, but not more than 13 times the motor full-load current. The controller design is based on this requirement. If Design B or E energy efficient motors (or IEC N motors) are used, you can set the motor circuit protectors higher than 13 times the motor full-load current, but must not exceed 17 times. For these applications, consult the factory for controller and motor circuit protector sizing. See the National Electrical Code (NEC) or the Canadian Electrical Code (CEC) standards for more information.

Push-to-trip Mechanism

The push-to-trip mechanism provides a manual means for tripping the motor circuit protector. When you press the button on the motor-circuit protector cover with a small screwdriver, a plunger rotates the trip bar, which causes the motor circuit protector to trip.

Horsepower Ratings

The horsepower ratings for combination starter units that are listed in Tables 3..7 were determined from full-load currents as specified by the NEC/CEC standards.

Acceptable performance occurs when the motor full-load current is within 15% of the value that corresponds to the horsepower and voltages that are listed in the NEC/CEC standards. Contact your local Allen-Bradley distributor or Rockwell Automation sales representative if the motor full-load current is not within these limits.



ATTENTION: The horsepower ratings and corresponding trip settings in Tables 3..7 are valid only when the combination starter units are equipped with an Allen-Bradley electronic overload relay or a Bulletin 592 eutectic alloy overload relay that has correctly sized heater elements.

When correctly selected, this combination of motor circuit protector and overload relay protects against short circuit and ground fault damage. This combination provides coordinated overcurrent protection in the motor branch circuit for continuous-duty rated motors, as defined in the NEC and CEC standards.

A motor circuit protector that has tripped can indicate the interruption of a high fault current. To be sure of protection against fire and/or shock hazard, examine the current carrying parts of the combination starter units, soft starter controller units, and variable frequency drive AC units and replace if damaged. (Refer to NEMA Standards Publication Number ICS 2.2, Maintenance of Motor Controllers After a Fault Condition, and NEMA Standard Publication Number ICS 2, Parts ICS 2-302.)

Table 2 - Default Motor Circuit Protectors Used at Given Horse Power and Voltage Ratings

140MG-		Voltage				
HP	KW	208	240	380	480	600
0.25	0.125	G8P-B70 (7A)	G8P-B70 (7A)	G8P-B30 (3A)	G8P-B30 (3A)	H8P-B30 (3A)
0.33	0.25					
0.5	0.37					
0.75	0.55					
1	0.75	G8P-C15 (15 A)	G8P-C15 (15 A)	G8P-B70 (7A)	G8P-B70 (7A)	H8P-B70 (7A)
1.5	1.1					
2	1.5	G8P-C30 (30 A)	G8P-C30 (30 A)	G8P-C15 (15 A)	G8P-C15 (15 A)	H8P-C15 (15 A)
3	2.2					
5	3.7					
7.5	5.5	G8P-C50 (50 A)	G8P-C50 (50 A)	G8P-C30 (30 A)	G8P-C30 (30 A)	H8P-C30 (30 A)
10	7.5					
15	11	G8P-D10 (100 A)	G8P-D10 (100 A)	G8P-C70 (70 A)	G8P-C50 (50 A)	H8P-C50 (50 A)
20	15		G8P-D10 (100 A)			
25	18.5	G8P-D12 (125 A)	G8P-D12 (125 A)	G8P-D10 (100 A)	G8P-D10 (100 A)	H8P-D10 (100 A)
30	22	J8P-D15 (150 A)				
40	30	J8P-D25 (250 A)	J8P-D20 (200 A)	G8P-D12 (125 A)	G8P-D10 (100 A)	H8P-D10 (100 A)
50	37	K8P-D40 (400 A)	J8P-D25 (250 A)			
60	45		J8P-D20 (200 A)	J8P-D15 (150 A)	J8P-D15 (150 A)	
75	55		K8P-D40 (400 A)	J8P-D25 (250 A)		J8P-D17 (175 A)
100	75	M8P-D80 (800 A)	M8P-D80 (800 A)	K8P-D40 (400 A)	J8P-D25 (250 A)	J8P-D20 (200 A)
125	90				K8P-D40 (400 A)	K8P-D40 (400 A)
150	112	M8P-D80 (800 A)	M8P-D80 (800 A)	M8P-D80 (800 A)	M8P-D80 (800 A)	M8P-D80 (800 A)
200	150					
250	187					
300	224	M8P-D80 (800 A)	M8P-D80 (800 A)	M8P-D80 (800 A)	M8P-D80 (800 A)	M8P-D80 (800 A)
350	261					
400	300					

Table 3 - Short-Circuit Current Rating - 208V (cULus Listed)

Controller Type	Device/Bulletin	Size/Rating		Magnetic-only Trip Settings									Electronic Trip		140MG Catalog Number Default	Unit Combination Short-Circuit Current Rating	140MG Catalog Number Optional	Unit Combination Short-Circuit Current Rating						
		Size	HP	A	B	C	D	E	F	G	H	I	Min	Max										
Bulletin 500	2107, 2113, 2123	#1	0.125	21	28	35	42	49	56	63	70	77			G8P-B70	65 kA	H8P-B70	100 kA						
			0.25	21	28	35	42	49	56	63	70	77			G8P-B70									
			0.33	21	28	35	42	49	56	63	70	77			G8P-B70									
			0.5	21	28	35	42	49	56	63	70	77			G8P-B70									
			0.75	21	28	35	42	49	56	63	70	77			G8P-B70									
		#1	1	45	60	75	90	105	120	135	150	165			G8P-C15	100 kA	H8P-C15							
			1.5	45	60	75	90	105	120	135	150	165			G8P-C15									
			2	45	60	75	90	105	120	135	150	165			G8P-C15									
			3	90	120	150	180	210	240	270	300	330			G8P-C30									
			5	150	200	250	300	350	400	450	500	550			G8P-C50									
			7.5	150	200	250	300	350	400	450	500	550			G8P-C50									
			#2	10	150	200	250	300	350	400	450	500	550						G8P-C50	H8P-C50				
				#3	15	300	400	500	600	700	800	900	1000	1100								G8P-D10	H8P-D10	
					20	300	400	500	600	700	800	900	1000	1100								G8P-D10		
			#3	25	625	703	781	859	938	1016	1094	1172	1250						G8P-D12	H8P-D12				
		#4		30	750	844	938	1031	1125	1219	1313	1406	1500			J8P-D15								
			#4	40	1250	1406	1563	1719	1875	2031	2188	2344	2500			J8P-D25								
		#5		50										400	4000	K8P-D40								
				60										400	4000	K8P-D40								
				75										400	4000	K8P-D40								
2113	#6	100											800	8000	M8P-D80									
		125										800	8000	M8P-D80										
		150										800	8000	M8P-D80										

Table 4 - Short-Circuit Current Rating - 240V (cULus Listed)

Controller Type	Device/Bulletin	Size/Rating		Magnetic-only Trip Settings									Electronic Trip		140MG Catalog Number Default	Unit Combination Short-Circuit Current Rating	140MG Catalog Number Optional	Unit Combination Short-Circuit Current Rating	
		Size	HP	A	B	C	D	E	F	G	H	I	Min	Max					
Bulletin 500	2107, 2113, 2123	#1	0.125	21	28	35	42	49	56	63	70	77			G8P-B70	65 kA	H8P-B70	100 kA	
			0.25	21	28	35	42	49	56	63	70	77			G8P-B70		H8P-B70		
			0.33	21	28	35	42	49	56	63	70	77			G8P-B70		H8P-B70		
			0.5	21	28	35	42	49	56	63	70	77			G8P-B70		H8P-B70		
			0.75	21	28	35	42	49	56	63	70	77			G8P-B70		H8P-B70		
			1	21	28	35	42	49	56	63	70	77			G8P-B70		H8P-B70		
			1.5	45	60	75	90	105	120	135	150	165			G8P-C15		100 kA		H8P-C15
			2	45	60	75	90	105	120	135	150	165			G8P-C15				H8P-C15
			3	90	120	150	180	210	240	270	300	330			G8P-C30				H8P-C30
			5	90	120	150	180	210	240	270	300	330			G8P-C30				H8P-C30
		7.5	150	200	250	300	350	400	450	500	550			G8P-C50	H8P-C50				
		#2	10	150	200	250	300	350	400	450	500	550			G8P-C50	H8P-C50			
			15	300	400	500	600	700	800	900	1000	1100			G8P-D10	H8P-D10			
		#3	20	300	400	500	600	700	800	900	1000	1100			G8P-D10	H8P-D10			
			25	625	703	781	859	938	1016	1094	1172	1250			G8P-D12	H8P-D12			
			30	625	703	781	859	938	1016	1094	1172	1250			G8P-D12	H8P-D12			
		#4	40	1000	1125	1250	1375	1500	1625	1750	1875	2000			J8P-D20				
			50	1250	1406	1563	1719	1875	2031	2188	2344	2500			J8P-D25				
	#5	60											400	4000	K8P-D40				
		75											400	4000	K8P-D40				
		100											400	4000	K8P-D40				
	2113	#6	125												800	8000	M8P-D80		
			150												800	8000	M8P-D80		
			200												800	8000	M8P-D80		

Table 5 - Short-Circuit Current Rating - 380V (units at this voltage are not cULus Listed)

Controller Type	Device/Bulletin	Size/Rating		Magnetic-only Trip Settings									Electronic Trip			Unit Combination Short-Circuit Current Rating	140MG Catalog Number Optional	Unit Combination Short-Circuit Current Rating			
		Size	HP	A	B	C	D	E	F	G	H	I	Min	Max	140MG Catalog Number Default						
Bulletin 500	2107, 2113, 2123	#1	0.125	9	12	15	18	21	24	27	30	33			G8P-B30	65 kA	H8P-B30	100 kA			
			0.25	9	12	15	18	21	24	27	30	33			G8P-B30						
			0.33	9	12	15	18	21	24	27	30	33			G8P-B30						
			0.5	9	12	15	18	21	24	27	30	33			G8P-B30						
			0.75	9	12	15	18	21	24	27	30	33			G8P-B30						
			1	21	28	35	42	49	56	63	70	77			G8P-B70						
			1.5	21	28	35	42	49	56	63	70	77			G8P-B70						
			2	21	28	35	42	49	56	63	70	77			G8P-B70						
			3	45	60	75	90	105	120	135	150	165			G8P-C15						
			5	45	60	75	90	105	120	135	150	165			G8P-C15						
		#2	7.5	90	120	150	180	210	240	270	300	330			G8P-C30	100 kA	H8P-C30				
			10	90	120	150	180	210	240	270	300	330			G8P-C30						
		#3	15	210	280	350	420	490	560	630	700	770			G8P-C70				H8P-C70		
			20	210	280	350	420	490	560	630	700	770			G8P-C70						
			25	210	280	350	420	490	560	630	700	770			G8P-C70						
		#4	30	300	400	500	600	700	800	900	1000	1100			G8P-D10				H8P-D10		
			40	625	703	781	859	938	1016	1094	1172	1250			G8P-D12						
			50	625	703	781	859	938	1016	1094	1172	1250			G8P-D12						
		#5	60	1000	1125	1250	1375	1500	1625	1750	1875	2000			J8P-D20						
			75	1250	1406	1563	1719	1875	2031	2188	2344	2500			J8P-D25						
		#6	100											400	4000				K8P-D40		
			125											400	4000				K8P-D40		
			150											400	4000	K8P-D40					
			200											800	8000	M8P-D80					
		#7	250											800	8000	M8P-D80					
			300											800	8000	M8P-D80					

Table 6 - Short-Circuit Current Rating - 480V (cULus Listed)

Controller Type	Device/Bulletin	Size/Rating		Magnetic-only Trip Settings									Electronic Trip		140MG Catalog Number Default	Unit Combination Short-Circuit Current Rating	140MG Catalog Number Optional	Unit Combination Short-Circuit Current Rating	
		Size	HP	A	B	C	D	E	F	G	H	I	Min	Max					
Bulletin 500	2107, 2113, 2123	#1	0.125	9	12	15	18	21	24	27	30	33			G8P-B30	65 kA	H8P-B30	100 kA	
			0.25	9	12	15	18	21	24	27	30	33			G8P-B30		H8P-B30		
			0.33	9	12	15	18	21	24	27	30	33			G8P-B30		H8P-B30		
			0.5	9	12	15	18	21	24	27	30	33			G8P-B30		H8P-B30		
			0.75	9	12	15	18	21	24	27	30	33			G8P-B30		H8P-B30		
			1	21	28	35	42	49	56	63	70	77			G8P-B70		H8P-B70		
			1.5	21	28	35	42	49	56	63	70	77			G8P-B70		H8P-B70		
			2	21	28	35	42	49	56	63	70	77			G8P-B70		H8P-B70		
			3	45	60	75	90	105	120	135	150	165			G8P-C15		H8P-C15		
			5	45	60	75	90	105	120	135	150	165			G8P-C15		H8P-C15		
			7.5	90	120	150	180	210	240	270	300	330			G8P-C30		H8P-C30		
			10	90	120	150	180	210	240	270	300	330			G8P-C30		H8P-C30		
			#2	15	150	200	250	300	350	400	450	500	550				G8P-C50		H8P-C50
				20	150	200	250	300	350	400	450	500	550				G8P-C50		H8P-C50
	25	150		200	250	300	350	400	450	500	550			G8P-C50	H8P-C50				
	#3	30	300	400	500	600	700	800	900	1000	1100			G8P-D10	H8P-D10				
		40	300	400	500	600	700	800	900	1000	1100			G8P-D10	H8P-D10				
		50	300	400	500	600	700	800	900	1000	1100			G8P-D10	H8P-D10				
	#4	60	750	844	938	1031	1125	1219	1313	1406	1500			J8P-D15					
		75	875	984	1094	1203	1313	1422	1531	1641	1750			J8P-D17					
		100	1250	1406	1563	1719	1875	2031	2188	2344	2500			J8P-D25					
	#5	125											400	4000	K8P-D40				
		150											400	4000	K8P-D40				
		200											400	4000	K8P-D40				
	2113	#6	250										800	8000	M8P-D80				
			300										800	8000	M8P-D80				
			350										800	8000	M8P-D80				
			400										800	8000	M8P-D80				

Table 6 - Short-Circuit Current Rating - 480V (cULus Listed)

Controller Type	Device/Bulletin	Size/Rating		Magnetic-only Trip Settings									Electronic Trip		140MG Catalog Number Default	Unit Combination Short-Circuit Current Rating	140MG Catalog Number Optional	Unit Combination Short-Circuit Current Rating
		Size	HP	A	B	C	D	E	F	G	H	I	Min	Max				
Bulletin 300	2107, 2113 Space Saving NEMA	#1	0.25	9	12	15	18	21	24	27	30	33			G8P-B30	65 kA	H8P-B30	65 kA
			0.33	9	12	15	18	21	24	27	30	33			G8P-B30		H8P-B30	
			0.5	9	12	15	18	21	24	27	30	33			G8P-B30		H8P-B30	
			0.75	9	12	15	18	21	24	27	30	33			G8P-B30		H8P-B30	
			1	21	28	35	42	49	56	63	70	77			G8P-B70		H8P-B70	
			1.5	21	28	35	42	49	56	63	70	77			G8P-B70		H8P-B70	
			2	21	28	35	42	49	56	63	70	77			G8P-B70		H8P-B70	
			3	45	60	75	90	105	120	135	150	165			G8P-C15		H8P-C15	
			5	45	60	75	90	105	120	135	150	165			G8P-C15		H8P-C15	
			7.5	90	120	150	180	210	240	270	300	330			G8P-C30		H8P-C30	
		10	90	120	150	180	210	240	270	300	330			G8P-C30	H8P-C30			
		#2	15	150	200	250	300	350	400	450	500	550			G8P-C50		H8P-C50	
			20	150	200	250	300	350	400	450	500	550			G8P-C50		H8P-C50	
			25	150	200	250	300	350	400	450	500	550			G8P-C50		H8P-C50	
		#3	30	300	400	500	600	700	800	900	1000	1100			G8P-D10		H8P-D10	
			40	300	400	500	600	700	800	900	1000	1100			G8P-D10		H8P-D10	
			50	300	400	500	600	700	800	900	1000	1100			G8P-D10		H8P-D10	
	2113 Space Saving NEMA	#4	60	750	844	938	1031	1125	1219	1313	1406	1500			J8P-D15			
			75	825	984	1094	1203	1313	1422	1531	1641	1750			J8P-D17			
			100	1250	1406	1563	1719	1875	2031	2188	2344	2500			J8P-D25			

Table 7 - Short-Circuit Current Rating - 600V (cULus Listed)

Controller Type	Device / Bulletin	Size/Rating		Magnetic-only Trip Settings									Electronic Trip		140MG Catalog Number	Unit Combination Short-Circuit Current Rating	140G Catalog Number Optional	Unit Combination Short-Circuit Current Rating				
		Size	HP	A	B	C	D	E	F	G	H	I	Min	Max								
Bulletin 500	2107, 2113, 2123	#1	0.125	9	12	15	18	21	24	27	30	33			H8P-B30	42 kA	H15H3-C25 ⁽¹⁾	65 kA				
			0.25	9	12	15	18	21	24	27	30	33			H8P-B30							
			0.33	9	12	15	18	21	24	27	30	33			H8P-B30							
			0.5	9	12	15	18	21	24	27	30	33			H8P-B30							
			0.75	9	12	15	18	21	24	27	30	33			H8P-B30							
			1	9	12	15	18	21	24	27	30	33			H8P-B30							
			1.5	21	28	35	42	49	56	63	70	77			H8P-B70							
			2	21	28	35	42	49	56	63	70	77			H8P-B30							
			3	21	28	35	42	49	56	63	70	77			H8P-B30							
			5	45	60	75	90	105	120	135	150	165			H8P-C15							
		#2	7.5	90	120	150	180	210	240	270	300	330			H8P-C30	50 kA	H15H3-C60 ⁽¹⁾	65 kA				
			10	90	120	150	180	210	240	270	300	330			H8P-C30							
			15	150	200	250	300	350	400	450	500	550			H8P-C50							
			20	150	200	250	300	350	400	450	500	550			H8P-C50							
			25	150	200	250	300	350	400	450	500	550			H8P-C50							
			#3	30	300	400	500	600	700	800	900	1000	1100						H8P-D10	65 kA	H15H3-D10 ⁽¹⁾	100 kA
				40	300	400	500	600	700	800	900	1000	1100						H8P-D10			
				50	300	400	500	600	700	800	900	1000	1100						H8P-D10			
			#4	60	750	844	938	1031	1125	1219	1313	1406	1500						J8P-D15	65 kA	K15H3-D30 ⁽²⁾	100 kA
				75	750	844	938	1031	1125	1219	1313	1406	1500						J8P-D15			
		100		1000	1125	1250	1375	1500	1625	1750	1875	2000			J8P-D20							
		#5	125											400	4000	K8P-D40	65 kA					
			150											400	4000	K8P-D40						
			200											400	4000	K8P-D40						
		#6	250											800	8000	M8P-D80	50 kA					
			300											800	8000	M8P-D80						
			350											800	8000	M8P-D80						
			400											800	8000	M8P-D80						

Table 7 - Short-Circuit Current Rating - 600V (cULus Listed) (continued)

Controller Type	Device / Bulletin	Size/Rating		Magnetic-only Trip Settings									Electronic Trip		140MG Catalog Number	Unit Combination Short-Circuit Current Rating	140G Catalog Number Optional	Unit Combination Short-Circuit Current Rating
		Size	HP	A	B	C	D	E	F	G	H	I	Min	Max				
Bulletin 300	2107, 2113 Space Saving NEMA	#1	0.25	9	12	15	18	21	24	27	30	33			H8P-B30	35 kA		
			0.33	9	12	15	18	21	24	27	30	33			H8P-B30			
			0.5	9	12	15	18	21	24	27	30	33			H8P-B30			
			0.75	9	12	15	18	21	24	27	30	33			H8P-B30			
			1	9	12	15	18	21	24	27	30	33			H8P-B30			
			1.5	21	28	35	42	49	56	63	70	77			H8P-B70			
			2	21	28	35	42	49	56	63	70	77			H8P-B70			
			3	21	28	35	42	49	56	63	70	77			H8P-B70			
			5	45	60	75	90	105	120	135	150	165			H8P-C15			
			7.5	90	120	150	180	210	240	270	300	330			H8P-C30			
		10	90	120	150	180	210	240	270	300	330			H8P-C30				
		#2	15	150	200	250	300	350	400	450	500	550			H8P-C50			
			20	150	200	250	300	350	400	450	500	550			H8P-C50			
			25	150	200	250	300	350	400	450	500	550			H8P-C50			
		#3	30	300	400	500	600	700	800	900	1000	1100			H8P-D10			
			40	300	400	500	600	700	800	900	1000	1100			H8P-D10			
			50	300	400	500	600	700	800	900	1000	1100			H8P-D10			
		#4	60	750	844	938	1031	1125	1219	1313	1406	1500			J8P-D15			
			75	750	844	938	1031	1125	1219	1313	1406	1500			J8P-D15			
			100	1000	1125	1250	1375	1500	1625	1750	1875	2000			J8P-D20			

(1) For details on 140G-H15H3-___ breakers, see [Table 9](#).

(2) For details on 140G-K15H3-___ breakers, see [Table 9](#).

Inverse Time Circuit Breakers in Combination NEMA Starter, Soft Starter (SMC), and Variable Frequency AC Drive Units



Application

Circuit breaker application is valid for the following CENTERLINE 2100 MCC products:

- Bulletin 2107 Full Voltage Reversing Combination Starters
- Bulletin 2113 Full Voltage Non-reversing Combination Starters
- Bulletin 2123 Two Speed Non-reversing Combination Starters
- Bulletin 2155 Combination Soft Starter Controllers
- Bulletin 2163 Variable Frequency AC Combination Drive Units

The information in this publication applies to Allen-Bradley inverse time, thermal magnetic, or solid-state circuit breakers when they are used in NEMA (size 1...6) combination starter, soft starter controller, and variable frequency AC drive units.

Circuit Breaker Operation

Inverse time circuit-breakers are designed to trip at 100...125% of their continuous current rating. They are also designed to trip, on an inverse-time basis, at overcurrents up to the magnetic or electronic trip current setting of the circuit breaker. The circuit breaker manufacturer sets the continuous current ratings for the thermal magnetic circuit-breakers. The continuous current rating of circuit breakers with solid-state trip mechanisms depends on the installed rating plug.

Allen-Bradley G-frame and H-frame (up to 70 A) circuit breakers have a non-adjustable, instantaneous magnetic-trip mechanism that is set by the circuit breaker manufacturer. All other frame sizes have an adjustable, instantaneous trip mechanism that can be set to a desired current value. See [Table 8](#) for the instantaneous trip ranges and settings.

Circuit Breaker Size and Adjustment

Rockwell Automation has made engineering evaluations for the protective device (circuit breaker) selection, sizing, and setting range that is based on the protection rules/requirements and motor criteria as stipulated in NEC, CEC, NEMA, UL, and CSA standards. For example, evaluations have been made for items such as motor full-load currents (FLC), X/R ratios, locked rotor currents, and nominal utilization voltages. If the motor application has criteria that deviates from the criteria that are stated in the standards, higher FLC and/or motor inrush currents (greater than 1300% of the nominal FLC) can be experienced. Examples of non-standard motor applications include the following: special motors, non/off standard NEMA motors, energy efficient motors, Design B energy efficient, Design E motors, and IEC N motors.

For circuit breakers with adjustable instantaneous trip, determine the desired instantaneous trip current by using the National Electrical Code (NEC) or Canadian Electrical Code (CEC) standard, and the instructions that are provided with the combination starter unit. See [Table 8](#) and choose the trip setting that has the desired trip current. See [Table 9](#) for other optional breaker choices for the given trip current.

Follow these steps to adjust the trip setting.

1. Verify that the circuit breaker operating-handle is in the OFF/O position.
2. With a small screwdriver, turn each trip setting dial clockwise (or adjust DIP switches) to the determined setting. If there are multiple dials on the circuit breaker, set all dials to the same value.
3. Verify that the circuit breaker does not trip during motor starting.

Push-to-trip Mechanism

The push-to-trip mechanism provides a manual means for tripping the motor circuit protector. When you press the test button on the circuit breaker cover with a small screwdriver, a plunger rotates the trip bar, which causes the motor circuit protector to trip.

Horsepower Ratings

The horsepower ratings for combination starter units, soft starter controller units, and variable frequency AC drive units that are listed in [Table 8](#) were determined from full-load currents as specified in the NEC/CEC standards.

Acceptable performance occurs when the motor full-load current is within 15% of the value that corresponds to the horsepower ratings and voltages that are listed in the NEC/CEC standards. Contact your local Allen-Bradley distributor or Rockwell Automation sales representative if the motor full-load current is not within these limits.



ATTENTION: The horsepower ratings and corresponding trip settings in [Table 8](#) are valid only when the combination starter units are equipped with an Allen-Bradley solid-state or electronic overload relay or a Bulletin 592 eutectic alloy overload relay with correctly sized heater elements.

When correctly selected, this combination of circuit breaker and overload relay protects against short circuit and ground fault damage. This combination provides coordinated overcurrent protection in the motor branch circuit for continuous-duty rated motors, as defined in the NEC and CEC standards.

The circuit breaker that has tripped can indicate the interruption of a high fault current. To be sure of protection against fire and/or shock hazard, examine the current carrying parts of the combination starter units, soft starter controller units, and variable frequency AC drive units and replace if damaged. (Refer to NEMA Standards Publication Number ICS 2.2, Maintenance of Motor Controllers After a Fault Condition, and NEMA Standard Publication Number ICS 2, Parts ICS 2-302.)

Table 8 - Default Inverse-time Breakers Used at Given Horse Power and Voltage Ratings

140G ⁽¹⁾		Voltage (breaker trip rating)				
HP	KW	208	240	380	480	600 ⁽²⁾
0.25	0.125	G6C3-C15 (15 A)	G6C3-C15 (15 A)	G6C3-C15 (15 A)	G6C3-C15 (15 A)	H0C3-C15 (15 A)
0.33	0.25					
0.5	0.37					
0.75	0.55					
1	0.75					
1.5	1.1					
2	1.5	G6C3-C20 (20 A)	G6C3-C20 (20 A)	G6C3-C20 (20 A)	G6C3-C20 (20 A)	H0C3-C20 (20 A)
3	2.2	G6C3-C30 (30 A)				
5	3.7	G6C3-C40 (40 A)	G6C3-C30 (30 A)	G6C3-C20 (20 A)	G6C3-C20 (20 A)	H0C3-C30 (30 A)
7.5	5.5	G6C3-C70 (70 A)	G6C3-C50 (50 A)	G6C3-C30 (30 A)		
10	7.5		G6C3-C70 (70 A)	G6C3-C40 (40 A)		
15	11	G6C3-D12 (125 A)	G6C3-D10 (100 A)	G6C3-C60 (60 A)	G6C3-C60 (60 A)	H0C3-C40 (40 A)
20	15		G6C3-D12 (125 A)	G6C3-C80 (80 A)		H0C3-C60 (60 A)
25	18.5			G6C3-D10 (100 A)		G6C3-D10 (100 A)
30	22		J6F3-D22 (225 A)	J6F3-D25 (250 A)		G6C3-D12 (125 A)
40	30	K6H3-D40 (400 A)	K6H3-D40 (400 A)	J6F3-D25 (250 A)	J6F3-D20 (200 A)	J0F3-D17 (175 A)
50	37				J6F3-D25 (250 A)	J0F3-D20 (200 A)
60	45			M6H3-D60 (600 A)	M6H3-D80 (800 A)	K6H3-D40 (400 A)
75	55	M6H3-D80 (800 A)	M6H3-D80 (800 A)			
100	75			M6H3-D80 (800 A)	M6H3-D80 (800 A)	M6H3-D80 (800 A)
125	90	M6H3-D80 (800 A)	M6H3-D80 (800 A)			
150	112			M6H3-D80 (800 A)	M6H3-D80 (800 A)	M6H3-D80 (800 A)
200	150	M6H3-D80 (800 A)	M6H3-D80 (800 A)			
250	187			M6H3-D80 (800 A)	M6H3-D80 (800 A)	M6H3-D80 (800 A)
300	224	M6H3-D80 (800 A)	M6H3-D80 (800 A)			
350	261			M6H3-D80 (800 A)	M6H3-D80 (800 A)	M6H3-D80 (800 A)
400	300	M6H3-D80 (800 A)	M6H3-D80 (800 A)			

(1) See [Table 9](#) for more detailed information about the breaker.

(2) For units that use the 140G-H15 circuit breakers (indicated by THUL catalog string), see [Table 7](#) for correct circuit breaker information.

Table 9 - Inverse Time Table

Amps	Size/Rating Circuit Breaker Part No.	Short-Circuit Current Rating at Given Voltage ⁽¹⁾			Protection Type	Magnetic Trip Setting	Min	Mid	Max	Magnetic Trip Setting Min	Magnetic Trip Setting Max	MCC Catalog String Suffix Code
		208/ 240V	380/ 480V	600V								
		Fixed	Thermal-magnetic Adjustable				Electronic Trip Adjustable					
15	140G-G6C3-C15	100 kA	65 kA	-----	TMF	500	N/A		N/A		TGM	
	140G-H6C3-C15	100 kA	65 kA	-----		400	N/A		N/A		THM	
	140G-H0C3-C15	-----	100 kA	35 kA		N/A		N/A		THX		
	140G-J15H3-C15	-----	-----	100 kA	LSI ⁽³⁾	N/A		N/A		TJUL		
20	140G-G6C3-C20	100 kA	65 kA	-----	TMF	500	N/A		N/A		TGM	
	140G-H6C3-C20	100 kA	65 kA	-----		400	N/A		N/A		THM	
	140G-H0C3-C20	-----	100 kA	35 kA		N/A		N/A		THX		
25	140G-H6H3-C25	100 kA	65 kA	-----	LSI ⁽³⁾	N/A		N/A		25	250	THML
	140G-H0H3-C25	-----	100 kA	35 kA		N/A		N/A				THXL
	140G-H15H3-C25	-----	-----	42 kA ⁽²⁾		N/A		N/A				THUL
30	140G-G6C3-C30	100 kA	65 kA	-----	TMF	500	N/A		N/A		TGM	
	140G-H6C3-C30	100 kA	65 kA	-----		400	N/A		N/A		THM	
	140G-H0C3-C30	-----	100 kA	35 kA		N/A		N/A		THX		
	140G-J15C3-C30	-----	-----	100 kA		N/A		N/A		TJU		
40	140G-G6C3-C40	100 kA	65 kA	-----	TMF	500	N/A		N/A		TGM	
	140G-H6C3-C40	100 kA	65 kA	-----		400	N/A		N/A		THM	
	140G-H0C3-C40	-----	100 kA	35 kA		N/A		N/A		THX		
	140G-J15C3-C40	-----	-----	100 kA		N/A		N/A		TJU		
	140G-J15H3-C40	-----	-----	100 kA	LSI ⁽³⁾	N/A		N/A		TJUL		
50	140G-G6C3-C50	100 kA	65 kA	-----	TMF	500	N/A		N/A		TGM	
	140G-H6C3-C50	100 kA	65 kA	-----		500	N/A		N/A		THM	
	140G-H0C3-C50	-----	100 kA	35 kA		N/A		N/A		THX		
	140G-J15C3-C50	-----	-----	100 kA		N/A		N/A		TJU		
60	140G-G6C3-C60	100 kA	65 kA	-----	TMF	600	N/A		N/A		TGM	
	140G-H6C3-C60	100 kA	65 kA	-----		600	N/A		N/A		THM	
	140G-H0C3-C60	-----	100 kA	35 kA		N/A		N/A		THX		
	140G-H6H3-C60	100 kA	65 kA	-----	LSI ⁽³⁾	N/A		N/A		60	600	THML
	140G-H0H3-C60	-----	100 kA	35 kA		N/A		N/A				THXL
	140G-H15H3-C60	-----	-----	42 kA ⁽²⁾		N/A		N/A				THUL
	140G-J15C3-C60	-----	-----	100 kA	TMF	N/A		N/A		N/A		TJU
	140G-J15H3-C60	-----	-----	100 kA	LSI ⁽³⁾	N/A		N/A		N/A		TJUL
70	140G-G6C3-C70	100 kA	65 kA	-----	TMF	700	N/A		N/A		TGM	
	140G-H6C3-C70	100 kA	65 kA	-----		700	N/A		N/A		THM	
	140G-H0C3-C70	-----	100 kA	35 kA		N/A		N/A		THX		
	140G-J6C3-C70	100 kA	65 kA	-----		700	N/A		N/A		TJM	
	140G-J0C3-C70	-----	100 kA	35 kA		N/A		N/A		TJX		
	140G-J15C3-C70	-----	-----	100 kA		N/A		N/A		TJU		

(1) Short-circuit current rating that is shown indicates quick-delivery offering.
 (2) Except with 2107, 2113, and 2123 units. See [Table 7](#) for combination rating.
 (3) Adjustable from 40...100% of breaker rating in 2% increments.

Table 9 - Inverse Time Table (continued)

Amps	Size/Rating	Short-Circuit Current Rating at Given Voltage ⁽¹⁾			Protection Type	Magnetic Trip Setting	Min			Mid			Max	Magnetic Trip Setting Min	Magnetic Trip Setting Max	MCC Catalog String Suffix Code	
	Circuit Breaker Part No.	208/240V	380/480V	600V			Fixed	Thermal-magnetic Adjustable									Electronic Trip Adjustable
80	140G-G6C3-C80	100 kA	65 kA	-----	TMF	800	N/A						N/A	TGM			
	140G-H6F3-C80	100 kA	65 kA	-----	TMA	N/A	400	500	600	700	800	N/A	THM				
	140G-H0F3-C80	-----	100 kA	35 kA		N/A	N/A						N/A	THX			
	140G-J15F3-C80	-----	-----	100 kA		N/A	N/A						N/A	TJU			
90	140G-G6C3-C90	100 kA	65 kA	-----	TMF	900	N/A						N/A	TGM			
	140G-H6F3-C90	100 kA	65 kA	-----	TMA	N/A	450	562.5	675	787.5	900	N/A	THM				
	140G-H0F3-C90	-----	100 kA	35 kA		N/A	N/A						N/A	THX			
	140G-J6F3-C90	100 kA	65 kA	-----		N/A	450	562.5	675	787.5	900	N/A	TJM				
	140G-J0F3-C90	-----	100 kA	35 kA		N/A	N/A						N/A	TJX			
	140G-J15F3-C90	-----	-----	100 kA		N/A	N/A						N/A	TJU			
100	140G-G6C3-D10	100 kA	65 kA	-----	TMF	1000	N/A						N/A	TGM			
	140G-H6F3-D10	100 kA	65 kA	-----	TMA	N/A	500	625	750	875	1000	N/A	THM				
	140G-H0F3-D10	-----	100 kA	35 kA		N/A	N/A						N/A	THX			
	140G-H6H3-D10	100 kA	65 kA	-----	LSI ⁽³⁾	N/A	N/A						100	1000	THML		
	140G-H0H3-D10	-----	100 kA	35 kA		N/A	N/A								THXL		
	140G-H15H3-D10	-----	-----	42 kA ⁽²⁾		N/A	N/A								THUL		
	140G-J6F3-D10	100 kA	65 kA	-----	TMA	N/A	500	625	750	875	1000	N/A	TJM				
	140G-J0F3-D10	-----	100 kA	35 kA		N/A	N/A						N/A	TJX			
	140G-J6H3-D10	100 kA	65 kA	-----	LSI ⁽³⁾	N/A	N/A						100	1000	TJML		
	140G-J0H3-D10	-----	100 kA	35 kA		N/A	N/A								TJXL		
	140G-J15F3-D10	-----	-----	100 kA	TMA	N/A	N/A								TJU		
	140G-J15H3-D10	-----	-----	100 kA	LSI ⁽³⁾	N/A	N/A								TJUL		
125	140G-G6C3-D12	100 kA	65 kA	-----	TMF	1200	N/A						N/A	TGM			
	140G-H6F3-D12	100 kA	65 kA	-----	TMA	N/A	625	781.25	937.5	1093.75	1250	N/A	THM				
	140G-H0F3-D12	-----	100 kA	35 kA		N/A	N/A						N/A	THX			
	140G-H6H3-D12	100 kA	65 kA	-----	LSI ⁽³⁾	N/A	N/A						125	1250	THML		
	140G-H0H3-D12	-----	100 kA	35 kA		N/A	N/A								THXL		
	140G-J6F3-D12	100 kA	65 kA	-----	TMA	N/A	625	781.25	937.5	1093.75	1250	N/A	TJM				
	140G-J0F3-D12	-----	100 kA	35 kA		N/A	N/A						N/A	TJX			
	140G-J15F3-D12	-----	-----	100 kA		N/A	N/A								TJU		
150	140G-J6F3-D15	100 kA	65 kA	-----	TMA	N/A	750	937.5	1125	1312.5	1500	N/A	TJM				
	140G-J0F3-D15	-----	100 kA	35 kA		N/A	N/A						N/A	TJX			
	140G-J6H3-D15	100 kA	65 kA	-----	LSI ⁽³⁾	N/A	N/A						150	1500	TJML		
	140G-J0H3-D15	-----	100 kA	35 kA		N/A	N/A								TJXL		
	140G-J15F3-D15	-----	-----	100 kA	TMA	N/A	N/A								TJU		
	140G-J15H3-D15	-----	-----	100 kA	LSI ⁽³⁾	N/A	N/A								TJUL		

(1) Short-circuit current rating that is shown indicates quick-delivery offering.
 (2) Except with 2107, 2113, and 2123 units. See Table 7 for combination rating.
 (3) Adjustable from 40...100% of breaker rating in 2% increments.

Table 9 - Inverse Time Table (continued)

Amps	Size/Rating	Short-Circuit Current Rating at Given Voltage ⁽¹⁾			Protection Type	Magnetic Trip Setting	Min			Mid			Max			Magnetic Trip Setting Min	Magnetic Trip Setting Max	MCC Catalog String Suffix Code			
	Circuit Breaker Part No.	208/240V	380/480V	600V			Fixed	Thermal-magnetic Adjustable											Electronic Trip Adjustable		
								875	1094	1313	1532	1750	200	2000							
175	140G-J6F3-D17	100 kA	65 kA	-----	TMA	N/A	875	1094	1313	1532	1750	N/A		TJM							
	140G-J0F3-D17	-----	100 kA	35 kA		N/A						N/A			TJX						
	140G-J6H3-D17	100 kA	65 kA	-----	LSI ⁽³⁾	N/A	N/A									175	1750	TJML			
	140G-J0H3-D17	-----	100 kA	35 kA		N/A	N/A											TJXL			
200	140G-J6F3-D20	100 kA	65 kA	-----	TMA	N/A	1000	1250	1500	1750	2000	N/A		TJM							
	140G-J0F3-D20	-----	100 kA	35 kA		N/A						N/A			TJX						
	140G-J6H3-D20	100 kA	65 kA	-----	LSI ⁽³⁾	N/A	N/A									200	2000	TJML			
	140G-J0H3-D20	-----	100 kA	35 kA		N/A	N/A											TJXL			
250	140G-J6F3-D25	100 kA	65 kA	-----	TMA	N/A	1250	1563	1875	2188	2500	N/A		TJM							
	140G-J0F3-D25	-----	100 kA	35 kA		N/A						N/A			TJX						
	140G-J6H3-D25	100 kA	65 kA	-----	LSI ⁽³⁾	N/A	N/A									250	2500	TJML			
	140G-J0H3-D25	-----	100 kA	35 kA		N/A	N/A											TJXL			
300	140G-K6H3-D30	100 kA	65 kA	-----	LSI ⁽²⁾	N/A	N/A									450	3600	TKM			
	140G-K0H3-D30	-----	100 kA	65 kA		N/A	N/A											TKX			
	140G-K15H3-D30	-----	-----	100 kA		N/A	N/A											TKU			
400	140G-K6H3-D40	100 kA	65 kA	-----	LSI ⁽²⁾	N/A	N/A									600	4800	TKM			
	140G-K0H3-D40	-----	100 kA	65 kA		N/A	N/A											TKX			
	140G-K15H3-D40	-----	-----	100 kA		N/A	N/A											TKU			
600	140G-M6H3-D60	100 kA	65 kA	-----	LSI ⁽³⁾	N/A	N/A									900	7200	TMM			
	140G-M0H3-D60	-----	100 kA	42 kA		N/A	N/A											TMX			
	140G-M6I3-D60	100 kA	65 kA	-----	LSIG ⁽³⁾	N/A	N/A											TMMG			
	140G-M0I3-D60	-----	100 kA	42 kA		N/A	N/A											TMXG			
800	140G-M6H3-D80	100 kA	65 kA	-----	LSI ⁽³⁾	N/A	N/A									1200	9600	TMM			
	140G-M0H3-D80	-----	100 kA	42 kA		N/A	N/A											TMX			
	140G-M6I3-D80	100 kA	65 kA	-----	LSIG ⁽³⁾	N/A	N/A											TMMG			
	140G-M0I3-D80	-----	100 kA	42 kA		N/A	N/A											TMXG			
1200	140G-N6H3-E12	100 kA	65 kA	-----	LSI ⁽³⁾	N/A	N/A									1200	12000	TNM			
	140G-N0H3-E12	-----	100 kA	65 kA		N/A	N/A											TNX			
	140G-N6I3-E12	100 kA	65 kA	-----	LSIG ⁽⁴⁾	N/A	N/A											TNMG			
	140G-N0I3-E12	-----	100 kA	65 kA		N/A	N/A											TNXG			
2000	140G-R12I3-E20	100 kA	100 kA	100 kA	LSIG ⁽⁴⁾	N/A	N/A									2000	20000	TRUG			
2500	140G-R12I3-E25	100 kA	100 kA	100 kA	LSIG ⁽⁴⁾	N/A	N/A									2500	25000	TRUG			
3000	140G-R12I3-E30	100 kA	100 kA	100 kA	LSIG ⁽⁴⁾	N/A	N/A									3000	30000	TRUG			

(1) Short-circuit current rating that is shown indicates quick-delivery offering.
 (2) Adjustable from 40...100% of breaker rating in 2% increments.
 (3) Adjustable from 40...100% of breaker rating in 4% increments.
 (4) Adjustable from 40...100% of breaker rating in 2.5% increments.

Time-current Curves

See Molded Case Circuit Breakers, Motor Protection Circuit Breakers, and Motor Circuit Protectors Technical Data, publication [140G-TD100](#), to view the time-current curves that are associated with the following equipment.

Topic
Time-current Curves for Bulletin 140MG-G Motor Circuit Protectors, 600Y/347V AC (50/60 Hz), 3...125 A
Time-current Curves for Bulletin 140MG-H Motor Circuit Protectors, 600V AC (50/60 Hz), 3...100 A
Time-current Curves for Bulletin 140MG-H Motor Circuit Protectors 600V AC (50/60 Hz), 125 A
Time-current Curves for Bulletin 140MG-J Motor Circuit Protectors, 600V AC (50/60 Hz), 150...250 A
Time-current Curves for Bulletin 140MG-K Motor Circuit Protectors, 600V AC (50/60 Hz), 300 A, 400 A
Time-current Curves for Bulletin 140MG-M Motor Circuit Protectors, 600V AC (50/60 Hz) 600 A, 800 A
Time-current Curves for Bulletin 140G-G Thermomagnetic Molded Case Circuit Breaker, 600Y/347V AC, 15...30 A
Time-current Curves for Bulletin 140G-G Thermomagnetic Molded Case Circuit Breaker, 600Y/347V AC, 35...50 A
Time-current Curves for Bulletin 140G-G Thermomagnetic Molded Case Circuit Breaker, 600Y/347V AC, 60...100 A
Time-current Curves for Bulletin 140G-G Thermomagnetic Molded Case Circuit Breaker, 600Y/347V AC, 125 A
Time-current Curves for Bulletin 140G-H Thermomagnetic Molded Case Circuit Breaker, 600V AC, 15...30 A
Time-current Curves for Bulletin 140G-H Thermomagnetic Molded Case Circuit Breaker, 600V AC, 35...50 A
Time-current Curves for Bulletin 140G-H Thermomagnetic Molded Case Circuit Breaker, 600V AC, 60...70 A
Time-current Curves for Bulletin 140G-H Thermomagnetic Molded Case Circuit Breaker, 600V AC, 80...100 A
Time-current Curves for Bulletin 140G-H Thermomagnetic Molded Case Circuit Breaker, 600V AC, 110...125 A
Time-current Curves for Bulletin 140G-H Thermomagnetic Molded Case Circuit Breaker, 600V AC (50/60 Hz), 25 A, 60 A, 100 A, 125 A
Time-current Curves for Bulletin 140G-H Thermomagnetic Molded Case Circuit Breaker, Ground Fault Protection Curve, 600V AC (50/60 Hz), 25 A, 60 A, 100 A, 125 A
Time-current Curves for Bulletin 140G-J Thermomagnetic Molded Case Circuit Breaker, 600V AC, 25...50 A
Time-current Curves for Bulletin 140G-J Thermomagnetic Molded Case Circuit Breaker, 600V AC, 60...70 A
Time-current Curves for Bulletin 140G-J Thermomagnetic Molded Case Circuit Breaker, 600V AC, 80...100 A
Time-current Curves for Bulletin 140G-J Thermomagnetic Molded Case Circuit Breaker, 600V AC, 110...150 A
Time-current Curves for Bulletin 140G-J Thermomagnetic Molded Case Circuit Breaker, 600V AC, 160...225 A
Time-current Curves for Bulletin 140G-J Thermomagnetic Molded Case Circuit Breaker, 600V AC, 250 A
Time-current Curves for Bulletin 140G-J Molded Case Circuit Breaker, 600V AC (50/60 Hz), 40 A, 60 A, 100 A, 150 A, 250 A
Time-current Curves for Bulletin 140G-J Molded Case Circuit Breaker, Ground Fault Protection Curve 600V AC (50/60 Hz), 25 A, 60 A, 100 A, 125 A
Time-current Curves for Bulletin 140G-K Molded Case Circuit Breaker, 600V AC, (50/60 Hz) 300 A, 400 A
Time-current Curves for Bulletin 140G-K Molded Case Circuit Breaker, Ground Fault Protection Curve, 600V AC, (50/60 Hz) 300 A, 400 A
Time-current Curves for Bulletin 140G-M Molded Case Circuit Breaker, 600V AC (50/60 Hz) 600 A, 800 A
Time-current Curves for Bulletin 140G-M Molded Case Circuit Breaker, Ground Fault Protection Curve, 600V AC (50/60 Hz) 600 A, 800 A
Time-current Curves for Bulletin 140G-N (-NS) Molded Case Circuit Breaker, 600V AC (50/60 Hz) 1200 A
Time-current Curves for Bulletin 140G-N (-NS) Molded Case Circuit Breaker, Ground Fault Protection Curve
Time-current Curves for Bulletin 140G-R Molded Case Circuit Breaker, 600V AC (50/60 Hz) 2000 A, 2500 A, 3000 A

Additional Resources

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

Resource	Description
CENTERLINE 2100 Low Voltage Motor Control Centers Instruction Manual, publication 2100-INO12	Provides general instructions for MCC Units.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation® industrial system.
Product Certifications website, http://www.ab.com	Provides declarations of conformity, certificates, and other certification details.

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

Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	www.rockwellautomation.com/knowledgebase
Local Technical Support Phone Numbers	Locate the phone number for your country.	www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	www.rockwellautomation.com/literature
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	www.rockwellautomation.com/global/support/pcdc.page

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete the How Are We Doing? form at http://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002_-en-e.pdf.

Rockwell Automation maintains current product environmental information on its website at <http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page>.

Allen-Bradley, Rockwell Software, Rockwell Automation, CENTERLINE, and LISTEN. THINK. SOLVE. are trademarks of Rockwell Automation, Inc. Trademarks not belonging to Rockwell Automation are property of their respective companies.

Rockwell Otomasyon Ticaret A.Ş., Kar Plaza İş Merkezi E Blok Kat:6 34752 İçerenköy, İstanbul, Tel: +90 (216) 5698400

www.rockwellautomation.com

Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
Europe/Middle East/Africa: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Publication 2100-TD032F-EN-P - January 2016

Supersedes Publication 2100-TD032E-EN-P - November 2015

Copyright © 2016 Rockwell Automation, Inc. All rights reserved. Printed in the U.S.A.