Allen-Bradley

CENTERLINE 2100 Motor Circuit Protection

Bulletin Numbers 140MG and 140G

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Summary of Changes

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

Topic	Page
Added suffix information to Table 3…Table 7.	6…11
Added SMC™ Units Combination Short Circuit Current Rating (SCCR) Table	16
Added AC Drive Units Combination Short Circuit Current Rating (SCCR) Table for Bulletins 2163Q, 2163R, 2163T, 2163U, 2163V, 2163W, and 2163X	16
Added reference to the combination short circuit current ratings for Bulletin 2155 and Bulletin 2163 units to the Inverse Time Table.	17…19

Table 1 - Suffix/Circuit Breaker Frame Explanation

T G A

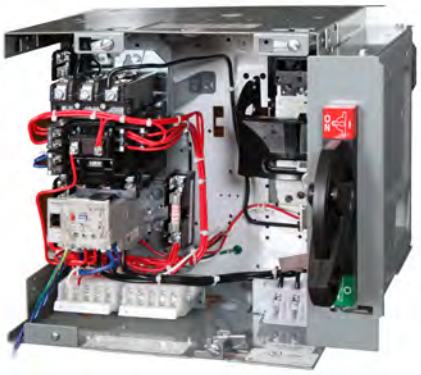
Circuit Breaker Series	
T	140G Inverse Time Breaker
	140MG MCP

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

Circuit Breaker Type	
A	High Interrupting Motor Circuit Protector (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)

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

(1) For SecureConnect™ units, H8P-B30 is used for 3A applications and H8P-B70 is used for 7A applications.

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	Suffix	Unit Combination Short-Circuit Current Rating	140MG Catalog Number Optional	Suffix	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	28	34	40	46	53	59	65	71	77			G8P-B70	TGA	65 kA	H8P-B70	THA	100 kA
			0.25	28	34	40	46	53	59	65	71	77			G8P-B70			H8P-B70		
			0.33	28	34	40	46	53	59	65	71	77			G8P-B70			H8P-B70		
			0.5	28	34	40	46	53	59	65	71	77			G8P-B70			H8P-B70		
			0.75	28	34	40	46	53	59	65	71	77			G8P-B70			H8P-B70		
			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			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	150	200	250	300	350	400	450	500	550			G8P-C50			H8P-C50		
			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		
		#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			H8P-D10		
			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	TJA				
			40	1250	1406	1563	1719	1875	2031	2188	2344	2500			J8P-D25					
		#5	50										400	4000	K8P-D40	TKA				
			60										400	4000	K8P-D40					
			75										400	4000	K8P-D40					
	2113	#6	100										800	8000	M8P-D80	TMA				
			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	Suffix	Unit Combination Short-Circuit Current Rating	140MG Catalog Number Optional	Suffix	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	12	15	17	20	23	25	28	30	33			G8P-B30	TGA	65 kA	H8P-B30	THA	100 kA
			0.25	12	15	17	20	23	25	28	30	33			G8P-B30			H8P-B30		
			0.33	12	15	17	20	23	25	28	30	33			G8P-B30			H8P-B30		
			0.5	12	15	17	20	23	25	28	30	33			G8P-B30			H8P-B30		
			0.75	28	34	40	46	53	59	65	71	77			G8P-B70			H8P-B70		
			1	28	34	40	46	53	59	65	71	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	TJA				
			50	1250	1406	1563	1719	1875	2031	2188	2344	2500			J8P-D25					
		#5	60										400	4000	K8P-D40	TKA				
			75										400	4000	K8P-D40					
			100										400	4000	K8P-D40					
	2113	#6	125										800	8000	M8P-D80	TMA				
			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							
		Size	HP	A	B	C	D	E	F	G	H	I	Min	Max	140MG Catalog Number Default	Suffix	Unit Combination Short-Circuit Current Rating	140MG Catalog Number Optional	Suffix	Unit Combination Short-Circuit Current Rating
Bulletin 500	2107, 2113, 2123	#1	0.125	12	15	17	20	23	25	28	30	33			G8P-B30	TGA	65 kA	H8P-B30	THA	100 kA
			0.25	12	15	17	20	23	25	28	30	33			G8P-B30			H8P-B30		
			0.33	12	15	17	20	23	25	28	30	33			G8P-B30			H8P-B30		
			0.5	12	15	17	20	23	25	28	30	33			G8P-B30			H8P-B30		
			0.75	12	15	17	20	23	25	28	30	33			G8P-B30			H8P-B30		
			1	28	34	40	46	53	59	65	71	77			G8P-B70			H8P-B70		
			1.5	28	34	40	46	53	59	65	71	77			G8P-B70			H8P-B70		
			2	28	34	40	46	53	59	65	71	77			G8P-B70			H8P-B70		
			3	45	60	75	90	105	120	135	150	165			G8P-C15		100 kA	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	625	703	781	859	938	1016	1094	1172	1250			G8P-D12			H8P-D12		
			50	625	703	781	859	938	1016	1094	1172	1250			G8P-D12			H8P-D12		
		#4	60	1000	1125	1250	1375	1500	1625	1750	1875	2000			J8P-D20	TJA				
			75	1250	1406	1563	1719	1875	2031	2188	2344	2500			J8P-D25					
		#5	100										400	4000	K8P-D40	TKA				
			125										400	4000	K8P-D40					
			150										400	4000	K8P-D40					
			200										800	8000	M8P-D80					
		#6	250										800	8000	M8P-D80	TMA				
			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	Suffix	Unit Combination Short-Circuit Current Rating	140MG Catalog Number Optional	Suffix	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	12	15	17	20	23	25	28	30	33			G8P-B30	TGA	65 kA	H8P-B30	THA	100 kA
			0.25	12	15	17	20	23	25	28	30	33			G8P-B30			H8P-B30		
			0.33	12	15	17	20	23	25	28	30	33			G8P-B30			H8P-B30		
			0.5	12	15	17	20	23	25	28	30	33			G8P-B30			H8P-B30		
			0.75	12	15	17	20	23	25	28	30	33			G8P-B30			H8P-B30		
			1	12	15	17	20	23	25	28	30	33			G8P-B30			H8P-B30		
			1.5	28	34	40	46	53	59	65	71	77			G8P-B70			H8P-B70		
			2	28	34	40	46	53	59	65	71	77			G8P-B70			H8P-B70		
			3	45	60	75	90	105	120	135	150	165			G8P-C15		100 kA	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	TJA				
			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	TKA				
			150										400	4000	K8P-D40					
			200										400	4000	K8P-D40					
	2113	#6	250										800	8000	M8P-D80	TMA				
			300										800	8000	M8P-D80					
			350										800	8000	M8P-D80					
			400										800	8000	M8P-D80					

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

Controller Type	Device/ Bulletin	Size/Rating		Magnetic-only Trip Settings									Electronic Trip		140MG Catalog Number Default	Suffix	Unit Combination Short-Circuit Current Rating	140MG Catalog Number Optional	Suffix	Unit Combination Short-Circuit Current Rating
		Size	HP	A	B	C	D	E	F	G	H	I	Min	Max						
Bulletin 300[1]	2107, 2113 Space Saving NEMA	#1	0.25	12	15	17	20	23	25	28	30	33			G8P-B30	TGA	65 kA	H8P-B30	THA	65 kA
			0.33	12	15	17	20	23	25	28	30	33			G8P-B30			H8P-B30		
			0.5	12	15	17	20	23	25	28	30	33			G8P-B30			H8P-B30		
			0.75	12	15	17	20	23	25	28	30	33			G8P-B30			H8P-B30		
			1	12	15	17	20	23	25	28	30	33			G8P-B30			H8P-B30		
			1.5	28	34	40	46	53	59	65	71	77			G8P-B70			H8P-B70		
			2	28	34	40	46	53	59	65	71	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	TJA				
			75	825	984	1094	1203	1313	1422	1531	1641	1750			J8P-D17					
			100	1250	1406	1563	1719	1875	2031	2188	2344	2500			J8P-D25					

(1) E300™ Electronic Overload Relay is not available with Space Saving Units.

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

Controller Type	Device / Bulletin	Size/Rating		Magnetic-only Trip Settings									Electronic Trip		140MG Catalog Number	Suffix	Unit Combination Short-Circuit Current Rating	140G Catalog Number Optional	Suffix	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	12	15	17	20	23	25	28	30	33			H8P-B30	THA	42 kA	H15H3-C25(2)	THUL	65 kA
			0.25	12	15	17	20	23	25	28	30	33			H8P-B30					
			0.33	12	15	17	20	23	25	28	30	33			H8P-B30					
			0.5	12	15	17	20	23	25	28	30	33			H8P-B30					
			0.75	12	15	17	20	23	25	28	30	33			H8P-B30					
			1	12	15	17	20	23	25	28	30	33			H8P-B30					
			1.5	28	34	40	46	53	59	65	71	77			H8P-B70					
			2	28	34	40	46	53	59	65	71	77			H8P-B70					
			3	28	34	40	46	53	59	65	71	77			H8P-B70					
			5	45	60	75	90	105	120	135	150	165			H8P-C15		50 kA			
			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			H15H3-C60(2)		
			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			H15H3-D10(2)		
			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	TJA	50 kA	K15H3-D30(3)	TKU	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	TKA	65 kA			
			150										400	4000	K8P-D40					
			200										400	4000	K8P-D40					
		#6	250										800	8000	M8P-D80	TMA	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	Suffix	Unit Combination Short-Circuit Current Rating	140G Catalog Number Optional	Suffix	Unit Combination Short-Circuit Current Rating
		Size	HP	A	B	C	D	E	F	G	H	I	Min	Max						
Bulletin 300[1]	2107, 2113 Space Saving NEMA	#1	0.25	12	15	17	20	23	25	28	30	33			H8P-B30	THA	35 kA			
			0.33	12	15	17	20	23	25	28	30	33			H8P-B30					
			0.5	12	15	17	20	23	25	28	30	33			H8P-B30					
			0.75	12	15	17	20	23	25	28	30	33			H8P-B30					
			1	12	15	17	20	23	25	28	30	33			H8P-B30					
			1.5	28	34	40	46	53	59	65	71	77			H8P-B70					
			2	28	34	40	46	53	59	65	71	77			H8P-B70					
			3	28	34	40	46	53	59	65	71	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	TJA				
			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) E300 Electronic Overload Relay is not available with Space Saving Units.
(2) For details on 140G-H15H3-_ _ _ breakers, see Table 11.
(3) For details on 140G-K15H3-_ _ _ breakers, see Table 11.

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 (SMC)
- 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 11 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)				
3	2.2	G6C3-C30 (30 A)	G6C3-C20 (20 A)			
5	3.7	G6C3-C40 (40 A)	G6C3-C30 (30 A)	G6C3-C20 (20 A)	G6C3-C20 (20 A)	
7.5	5.5	G6C3-C70 (70 A)	G6C3-C50 (50 A)	G6C3-C30 (30 A)	G6C3-C30 (30 A)	H0C3-C20 (20 A)
10	7.5		G6C3-C70 (70 A)	G6C3-C40 (40 A)		H0C3-C30 (30 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					
30	22	J6F3-D22 (225 A)		G6C3-D10 (100 A)	G6C3-D10 (100 A)	H0C3-C70 (70 A)
40	30		J6F3-D25 (250 A)	G6C3-D12 (125 A)	G6C3-D12 (125 A)	H0F3-D10 (100 A)
50	37	K6H3-D40 (400 A)				
60	45		K6H3-D40 (400 A)	J6F3-D25 (250 A)	J6F3-D20 (200 A)	J0F3-D17 (175 A)
75	55				J6F3-D25 (250 A)	J0F3-D20 (200 A)
100	75	M6H3-D60 (600 A)		K6H3-D40 (400 A)		
125	90	M6H3-D80 (800 A)	M6H3-D80 (800 A)		K6H3-D40 (400 A)	K0H3-D40 (400 A)
150	112					
200	150			M6H3-D80 (800 A)		
250	187				M6H3-D80 (800 A)	M0H3-D60 (600 A)
300	224					M0H3-D80 (800 A)
350	261					
400	300					

(1) See Table 11 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 - SMC Units Combination Short Circuit Current Rating (SCCR) Table

Bulletin No. 2155		System Voltage		
SMC Amp Rating	**MCC Catalog String Suffix Code**	**208/ 240V**	**380/ 480V**	**600V**
3…201 A	TGM, THM, TJM	100 kA	65 kA	100 kA
251… 480 A	TKM, TMM	65 kA	65 kA	65 kA
3…201 A	TGX, THX, TJX	100 kA	100 kA	100 kA
251…480 A	TKX, TMX	65 kA	65 kA	65 kA

Table 10 - AC Drive Units Combination Short Circuit Current Rating (SCCR) Table for Bulletins 2163Q, 2163R, 2163T, 2163U, 2163V, 2163W, and 2163X

Bulletin Number	Frame (Catalog Code Suffix)	Drive Input Fuses?	With Drive Input Fuse Class	Horsepower	Short Circuit Withstand Ratings (amperes rms symmetrical)	
					480V	**600V**
2163T	T_M	Yes	CC, J	All Ratings	100 kA	100 kA
2163Q	T_M	Yes	J	All Ratings	100 kA	100 kA
2163R	T_M	Yes	J	All Ratings	100 kA	100 kA
2163U, V	T_M	Yes	J	All Ratings	100 kA	100 kA
2163U, V	T_X	Yes	J	All Ratings	100 kA	100 kA
2163U, V	T_M	No	---	All Ratings	65 kA	N/A
2163U, V	T_X	No	---	All Ratings	100 kA	N/A
2163W, X	T_M	Yes	CC	0.5…10 HP	100 kA	100 kA
2163W, X	T_M	Yes	J	15…20 HP	100 kA	100 kA
2163W, X	T_X	Yes	CC	15…20 HP	100 kA	100 kA
2163W, X	T_X	Yes	J	0.5…10 HP	100 kA	100 kA

Table 11 - Inverse Time Table

Amps	MCC Catalog String Suffix Code	Size/Rating	Short-Circuit Current Rating at Given Voltage[1] [2]									
		Circuit Breaker Part No.	208/ 240V	380/ 480V	600V	Protection Type	Magnetic Trip Setting	Min	Mid	Max	Magnetic Trip Setting Min	Magnetic Trip Setting Max
							Fixed	Thermal-magnetic Adjustable			Electronic Trip Adjustable	
15	TGM	140G-G6C3-C15	100 kA	65 kA	------	TMF	500	N/A			N/A	
	THM	140G-H6C3-C15	100 kA	65 kA	------		400	N/A			N/A	
	THX	140G-H0C3-C15	------	100 kA	35 kA			N/A			N/A	
	TJUL	140G-J15H3-C15	------	------	100 kA	LSI [4]	N/A	N/A			N/A	
20	TGM	140G-G6C3-C20	100 kA	65 kA	------	TMF	500	N/A			N/A	
	THM	140G-H6C3-C20	100 kA	65 kA	------		400	N/A			N/A	
	THX	140G-H0C3-C20	------	100 kA	35 kA			N/A			N/A	
25	THML	140G-H6H3-C25	100 kA	65 kA	------	LSI [4]	N/A	N/A			25	250
	THXL	140G-H0H3-C25	------	100 kA	35 kA		N/A	N/A				
	THUL	140G-H15H3-C25	------	------	42 kA[3]		N/A	N/A				
30	TGM	140G-G6C3-C30	100 kA	65 kA	------	TMF	500	N/A			N/A	
	THM	140G-H6C3-C30	100 kA	65 kA	------		400	N/A			N/A	
	THX	140G-H0C3-C30	------	100 kA	35 kA			N/A			N/A	
	TJU	140G-J15C3-C30	------	------	100 kA		N/A	N/A				
40	TGM	140G-G6C3-C40	100 kA	65 kA	------	TMF	500	N/A			N/A	
	THM	140G-H6C3-C40	100 kA	65 kA	------		400	N/A			N/A	
	THX	140G-H0C3-C40	------	100 kA	35 kA			N/A			N/A	
	TJU	140G-J15C3-C40	------	------	100 kA		N/A	N/A			N/A	
	TJUL	140G-J15H3-C40	------	------	100 kA	LSI [4]	N/A	N/A			N/A	
50	TGM	140G-G6C3-C50	100 kA	65 kA	------	TMF	500	N/A			N/A	
	THM	140G-H6C3-C50	100 kA	65 kA	------		500	N/A			N/A	
	THX	140G-H0C3-C50	------	100 kA	35 kA			N/A			N/A	
	TJU	140G-J15C3-C50	------	------	100 kA		N/A	N/A			N/A	
60	TGM	140G-G6C3-C60	100 kA	65 kA	------	TMF	600	N/A			N/A	
	THM	140G-H6C3-C60	100 kA	65 kA	------		600	N/A			N/A	
	THX	140G-H0C3-C60	------	100 kA	35 kA		N/A	N/A			N/A	
	THML	140G-H6H3-C60	100 kA	65 kA	------	LSI [4]	N/A	N/A			60	600
	THXL	140G-H0H3-C60	------	100 kA	35 kA		N/A	N/A				
	THUL	140G-H15H3-C60	------	------	42 kA[3]		N/A	N/A				
	TJU	140G-J15C3-C60	------	------	100 kA	TMF	N/A	N/A			N/A	
	TJUL	140G-J15H3-C60	------	------	100 kA	LSI [4]	N/A	N/A			N/A	

(1) Short-circuit current rating that is shown indicates quick-delivery offering.
(2) For 2155 units, see Table 9 for combination short circuit current ratings. For 2163 units, see Table 10 for combination short circuit current ratings.
(3) Except with 2107, 2113, and 2123 units. See Table 7 for combination short circuit current rating.
(4) Adjustable from 40…100% of breaker rating in 2% increments.
(5) Adjustable from 40…100% of breaker rating in 4% increments.
(6) Adjustable from 40…100% of breaker rating in 2.5% increments.

Table 11 - Inverse Time Table (continued)

Amps	MCC Catalog String Suffix Code	Size/Rating	Short-Circuit Current Rating at Given Voltage[1] [2]										
		Circuit Breaker Part No.	208/240V	380/480V	600V	Protection Type	Magnetic Trip Setting	Min		Mid		Max	Magnetic Trip Setting Min	Magnetic Trip Setting Max
							Fixed	Thermal-magnetic Adjustable					Electronic Trip Adjustable	
70	TGM	140G-G6C3-C70	100 kA	65 kA	------	TMF	700	N/A					N/A	
	THM	140G-H6C3-C70	100 kA	65 kA	------		700	N/A					N/A	
	THX	140G-H0C3-C70	------	100 kA	35 kA			N/A					N/A	
	TJM	140G-J6C3-C70	100 kA	65 kA	------		700	N/A					N/A	
	TJX	140G-J0C3-C70	------	100 kA	35 kA			N/A					N/A	
	TJU	140G-J15C3-C70	------	------	100 kA		N/A	N/A					N/A	
80	TGM	140G-G6C3-C80	100 kA	65 kA	------	TMF	800	N/A					N/A	
	THM	140G-H6F3-C80	100 kA	65 kA	------	TMA	N/A	400	500	600	700	800	N/A	
	THX	140G-H0F3-C80	------	100 kA	35 kA								N/A	
	TJU	140G-J15F3-C80	------	------	100 kA		N/A	N/A					N/A	
90	TGM	140G-G6C3-C90	100 kA	65 kA	------	TMF	900	N/A					N/A	
	THM	140G-H6F3-C90	100 kA	65 kA	------	TMA	N/A	450	562.5	675	787.5	900	N/A	
	THX	140G-H0F3-C90	------	100 kA	35 kA		N/A						N/A	
	TJM	140G-J6F3-C90	100 kA	65 kA	------		N/A	450	562.5	675	787.5	900		
	TJX	140G-J0F3-C90	------	100 kA	35 kA									
	TJU	140G-J15F3-C90	------	------	100 kA		N/A	N/A					N/A	
100	TGM	140G-G6C3-D10	100 kA	65 kA	------	TMF	1000	N/A					N/A	
	THM	140G-H6F3-D10	100 kA	65 kA	------	TMA	N/A	500	625	750	875	1000	N/A	
	THX	140G-H0F3-D10	------	100 kA	35 kA								N/A	
	THML	140G-H6H3-D10	100 kA	65 kA	------	LSI [4]		N/A					100	1000
	THXL	140G-H0H3-D10	------	100 kA	35 kA			N/A						
	THUL	140G-H15H3-D10	------	------	42 kA[3]			N/A						
	TJM	140G-J6F3-D10	100 kA	65 kA	------	TMA	N/A	500	625	750	875	1000	N/A	
	TJX	140G-J0F3-D10	------	100 kA	35 kA									
	TJML	140G-J6H3-D10	100 kA	65 kA	------	LSI [4]		N/A					100	1000
	TJXL	140G-J0H3-D10	------	100 kA	35 kA									
	TJU	140G-J15F3-D10	------	------	100 kA	TMA		N/A						
	TJUL	140G-J15H3-D10	------	------	100 kA	LSI [4]		N/A						

(1) Short-circuit current rating that is shown indicates quick-delivery offering.
(2) For 2155 units, see Table 9 for combination short circuit current ratings. For 2163 units, see Table 10 for combination short circuit current ratings.
(3) Except with 2107, 2113, and 2123 units. See Table 7 for combination short circuit current rating.
(4) Adjustable from 40…100% of breaker rating in 2% increments.
(5) Adjustable from 40…100% of breaker rating in 4% increments.
(6) Adjustable from 40…100% of breaker rating in 2.5% increments.

Table 11 - Inverse Time Table (continued)

Amps	MCC Catalog String Suffix Code	Size/Rating	Short-Circuit Current Rating at Given Voltage[1] [2]										
		Circuit Breaker Part No.	208/ 240V	380/ 480V	600V	Protection Type	Magnetic Trip Setting	Min		Mid		Max	Magnetic Trip Setting Min	Magnetic Trip Setting Max
							Fixed	Thermal-magnetic Adjustable					Electronic Trip Adjustable	
125	TGM	140G-G6C3-D12	100 kA	65 kA	------	TMF	1200	N/A					N/A	
	THM	140G-H6F3-D12	100 kA	65 kA	------	TMA	N/A	625	781.25	937.5	1093.75	1250	N/A	
	THX	140G-H0F3-D12	------	100 kA	35 kA		N/A						N/A	
	THML	140G-H6H3-D12	100 kA	65 kA	------	LSI [4]	N/A	N/A					125	1250
	THXL	140G-H0H3-D12	------	100 kA	35 kA		N/A	N/A						
	TJM	140G-J6F3-D12	100 kA	65 kA	------	TMA	N/A	625	781.25	937.5	1093.75	1250	N/A	
	TJX	140G-J0F3-D12	------	100 kA	35 kA									
	TJU	140G-J15F3-D12	------	------	100 kA		N/A	N/A						
150	TJM	140G-J6F3-D15	100 kA	65 kA	------	TMA	N/A	750	937.5	1125	1312.5	1500	N/A	
	TJX	140G-J0F3-D15	------	100 kA	35 kA		N/A						N/A	
	TJML	140G-J6H3-D15	100 kA	65 kA	------	LSI [4]	N/A	N/A					150	1500
	TJXL	140G-J0H3-D15	------	100 kA	35 kA		N/A	N/A						
	TJU	140G-J15F3-D15	------	------	100 kA	TMA	N/A	N/A						
	TJUL	140G-J15H3-D15	------	------	100 kA	LSI [4]		N/A						
175	TJM	140G-J6F3-D17	100 kA	65 kA	------	TMA	N/A	875	1094	1313	1532	1750	N/A	
	TJX	140G-J0F3-D17	------	100 kA	35 kA		N/A						N/A	
	TJML	140G-J6H3-D17	100 kA	65 kA	------	LSI [5]	N/A	N/A					175	1750
	TJXL	140G-J0H3-D17	------	100 kA	35 kA		N/A	N/A						
200	TJM	140G-J6F3-D20	100 kA	65 kA	------	TMA	N/A	1000	1250	1500	1750	2000	N/A	
	TJX	140G-J0F3-D20	------	100 kA	35 kA		N/A						N/A	
	TJML	140G-J6H3-D20	100 kA	65 kA	------	LSI [5]	N/A	N/A					200	2000
	TJXL	140G-J0H3-D20	------	100 kA	35 kA		N/A	N/A						
250	TJM	140G-J6F3-D25	100 kA	65 kA	------	TMA	N/A	1250	1563	1875	2188	2500	N/A	
	TJX	140G-J0F3-D25	------	100 kA	35 kA		N/A						N/A	
	TJML	140G-J6H3-D25	100 kA	65 kA	------	LSI [5]	N/A	N/A					250	2500
	TJXL	140G-J0H3-D25	------	100 kA	35 kA		N/A	N/A						
300	TKM	140G-K6H3-D30	100 kA	65 kA	------	LSI [4]	N/A	N/A					450	3600
	TKX	140G-K0H3-D30	------	100 kA	65 kA		N/A	N/A						
	TKU	140G-K15H3-D30	------	------	100 kA		N/A	N/A						

(1) Short-circuit current rating that is shown indicates quick-delivery offering.
(2) For 2155 units, see Table 9 for combination short circuit current ratings. For 2163 units, see Table 10 for combination short circuit current ratings.
(3) Except with 2107, 2113, and 2123 units. See Table 7 for combination short circuit current rating.
(4) Adjustable from 40…100% of breaker rating in 2% increments.
(5) Adjustable from 40…100% of breaker rating in 4% increments.
(6) Adjustable from 40…100% of breaker rating in 2.5% increments.

Table 11 - Inverse Time Table (continued)

Amps	MCC Catalog String Suffix Code	Size/Rating	Short-Circuit Current Rating at Given Voltage(1) (2)									
		Circuit Breaker Part No.	208/ 240V	380/ 480V	600V	Protection Type	Magnetic Trip Setting	Min	Mid	Max	Magnetic Trip Setting Min	Magnetic Trip Setting Max
							Fixed	Thermal-magnetic Adjustable			Electronic Trip Adjustable	
400	TKM	140G-K6H3-D40	100 kA	65 kA	------	LSI (4)	N/A	N/A			600	4800
	TKX	140G-K0H3-D40	------	100 kA	65 kA		N/A	N/A				
	TKU	140G-K15H3-D40	------	------	100 kA		N/A	N/A				
600	TMM	140G-M6H3-D60	100 kA	65 kA	------	LSI (5)	N/A	N/A			900	7200
	TMX	140G-M0H3-D60	------	100 kA	42 kA		N/A	N/A				
	TMMG	140G-M6I3-D60	100 kA	65 kA	------	LSIG (5)	N/A	N/A				
	TMXG	140G-M0I3-D60	------	100 kA	42 kA		N/A	N/A				
800	TMM	140G-M6H3-D80	100 kA	65 kA	------	LSI (5)	N/A	N/A			1200	9600
	TMX	140G-M0H3-D80	------	100 kA	42 kA		N/A	N/A				
	TMMG	140G-M6I3-D80	100 kA	65 kA	------	LSIG (5)	N/A	N/A				
	TMXG	140G-M0I3-D80	------	100 kA	42 kA		N/A	N/A				
1200	TNMG	140G-N6I3-E12	100 kA	65 kA	------	LSIG-MM(6)	N/A	N/A			1200	12000
	TNXG	140G-N0I3-E12	------	100 kA	65 kA		N/A	N/A				
2000	TRUG	140G-R12I3-E20	100 kA	100 kA	100 kA	LSIG-MM (6)	N/A	N/A			2000	20000
2500	TRUG	140G-R12I3-E25	100 kA	100 kA	100 kA	LSIG-MM (6)	N/A	N/A			2500	25000
3000	TRUG	140G-R12I3-E30	100 kA	100 kA	100 kA	LSIG-MM (6)	N/A	N/A			3000	30000

(1) Short-circuit current rating that is shown indicates quick-delivery offering.
(2) For 2155 units, see Table 9 for combination short circuit current ratings. For 2163 units, see Table 10 for combination short circuit current ratings.
(3) Except with 2107, 2113, and 2123 units. See Table 7 for combination short circuit current rating.
(4) Adjustable from 40…100% of breaker rating in 2% increments.
(5) Adjustable from 40…100% of breaker rating in 4% increments.
(6) 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
Molded Case Circuit Breakers, Motor Protection Circuit Breakers, and Motor Circuit Protectors Technical Data, publication 140G-TD100	Provides time-current curves that are associated with the circuit breakers and circuit protectors.
CENTERLINE 2100 Low Voltage Motor Control Centers Instruction Manual, publication 2100-IN012	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, rok.auto/certifications	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.

Notes:

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

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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.

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