

NEMA Full Voltage Power Devices

NEMA Rated Full Voltage Starters - Magnetic

CR123C, CR123F Motor Starter Heaters

Heater Selection

Section 1

Magnetic Starters—Full Voltage

Heater Selection Information

To prevent overloading the starter do not select heater(s) for a motor of larger rating than the maximum given on the nameplate for the starter.

For continuous rated motors, with a service factor of 1.15 to 1.25, select the heater with maximum motor Amperes equal to or immediately greater than the motor full-load current (provides a maximum of 125 percent protection). For continuous rated motors with no service factor, multiply the full-load current of the motor by 0.90 and use this value to select the heater.

To protect the heater and starter during a short circuit, provide motor-branch-circuit protection in accordance with Table 430-152 in Article 430 of the National Electrical Code. In no case should the fuse rating exceed 4 times the motor full-load current for single-element fuses, or 2.25 times for dual-element fuses, or the fuse size listed in heater table under Maximum Fuse Rating.

Caution: Overload relays, when furnished with automatic reset, should not be used with two-wire, maintained contact pilot devices such as pressure, float and limit switches, as inadvertent restarting of the motor can occur.

How To Select Heaters

The table below should be used to determine which column of motor full-load Amperes applies for heater selection. Select in order, the basic device—including product number and description, the NEMA Type of enclosure, and the column to be used in the proper table by NEMA Size.

If full-load Amperes of the motor falls between two ratings, select heaters for the higher rating.

Ordering Information

All CR123C and 123F heaters are packaged three to a carton. Items of these heaters being ordered for either customer's stock or any other purpose, are to be specified in multiples of three (such as 3, 6, 9, 12, 15, etc.). Minimum order quantity is three.

Heater Product Number	List Price Each, GO-10H
CR123C (All)	\$9.00
CR123F (All)	\$9.00

Heater Rack Product Number	List Price Each, GO-10D
CR243X10049	\$96.00

Base Product Number Starter/Overload Relay	Description	NEMA Type Enclosure	Quantity Heaters Required	Heater Table Column (Pages 1-154 to 1-155)	
CR306	Single-Phase, 2-Pole, Size 00-2	Open	1	A	
	Single-Phase, 2-Pole, Size 00-2	1, 3R, 4/4X, 12	1	B	
	Single-Phase, 2-Pole, Size 3	Open	2	A	
	Single-Phase, 2-Pole, Size 6	1, 3R, 4/4X, 12	2	B	
CR306	3-Phase, 3-Pole, 3-Leg Protection standard, size 00-5	Open	3	C	
	ambient compensated, size 00, 0, 1, 2 & 5	Open	3	C	
	ambient compensated, size 3	Open	3	D	
	ambient compensated, size 8	Open	3	E	
CR306, CR307, CR308, CR387, CR407, CR408, CR487	3-Phase, 3-Pole, 3-Leg Protection standard, size 00-5	1, 3R, 4/4X, 12	3	D	
	ambient compensated, size 00, 0, 1, 2 & 5	1, 3R, 4/4X, 12	3	C	
	ambient compensated, size 3	1, 3R, 4/4X, 12	3	D	
	ambient compensated, size 8	1, 3R, 4/4X, 12	3	E	
CR309	3-Phase, 3 3-Pole, 3-Leg Protection standard, size 00-5	Open	3-Reverser	6-Two-Speed	C
	ambient compensated, size 00, 0, 1, 2 & 5	Open	3-Reverser	6-Two-Speed	C
	ambient compensated, size 3	Open	3-Reverser	6-Two-Speed	D
	ambient compensated, size 8	Open	3-Reverser	6-Two-Speed	E
CR309, CR410, CR411, CR490	3-Phase, 3 3-Pole, 3-Leg Protection standard, size 00-5	1, 3R, 4/4X, 12	3-Reverser	6-Two-Speed	D
	ambient compensated, size 00, 0, 1, 2 & 5	1, 3R, 4/4X, 12	3-Reverser	6-Two-Speed	C
	ambient compensated, size 3	1, 3R, 4/4X, 12	3-Reverser	6-Two-Speed	D
	ambient compensated, size 8	1, 3R, 4/4X, 12	3-Reverser	6-Two-Speed	E
CR324	Panel-Mounted		See tables, page 1-157		
All NEMA Sizes 6-9	3-Phase, 3-Leg Protection, Standard		See tables, page 1-156		
CR124	Single-Element, Panel-Mounted		See tables, page 1-158		
CR124	Single-Element, Ambient Compensated, Standard and Quick Trip		See tables, page 1-157		



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Product	
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CR123F (All)	\$9.00

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NEMA Sizes 00, 0 and 1

Maximum Motor Full-Load Amperes				Heater Product Number
A	B	C	D	
0.48	0.46	0.45	0.43	CR123C054A
0.55	0.50	0.49	0.48	CR123C060A
0.57	0.57	0.53	0.53	CR123C066A
0.65	0.62	0.59	0.58	CR123C071A
0.69	0.68	0.65	0.64	CR123C078A
0.83	0.80	0.76	0.74	CR123C087A
0.97	0.91	0.84	0.84	CR123C097A
1.03	0.99	0.93	0.92	CR123C109A
1.12	1.09	1.04	1.02	CR123C118A
1.26	1.22	1.15	1.10	CR123C131A
1.40	1.31	1.27	1.23	CR123C148A
1.46	1.46	1.39	1.38	CR123C163A
1.63	1.59	1.55	1.49	CR123C184A
1.79	1.74	1.73	1.67	CR123C196A
1.97	1.93	1.89	1.79	CR123C220A
2.25	2.13	2.05	1.98	CR123C239A
2.43	2.37	2.28	2.24	CR123C268A
2.60	2.52	2.47	2.43	CR123C301A
2.96	2.87	2.79	2.75	CR123C326A
3.57	3.39	3.31	3.25	CR123C356A
3.86	3.59	3.70	3.43	CR123C379A
4.43	4.31	4.06	4.03	CR123C419A
4.87	4.57	4.47	4.43	CR123C466A
5.37	5.31	4.95	4.94	CR123C526A
5.99	5.86	5.49	5.36	CR123C592A
6.39	6.19	5.91	5.77	CR123C630A
6.87	6.61	6.47	6.35	CR123C695A
7.71	7.61	7.20	6.92	CR123C778A
8.72	8.46	8.22	7.99	CR123C867A
9.50	9.35	8.72	8.47	CR123C955A
10.5	10.4	9.67	9.19	CR123C104B
11.7	11.3	10.4	10.0	CR123C113B
12.2	11.9	11.0	10.7	CR123C125B
13.5	13.0	12.4	12.0	CR123C137B
15.1	14.5	13.2	12.9	CR123C151B
17.5	17.4	15.4	15.1	CR123C163B
18.9	18.6	17.1	16.3	CR123C180B
20.8	20.5	18.1	17.9	CR123C198B
22.4	22.3	20.0	19.7	CR123C214B
25.5	24.7	21.5	21.2	CR123C228B
26.2	25.7	22.5	22.3	CR123C250B
27.0	27.0	23.9	23.5	CR123C273B
—	—	26.3	25.5	CR123C303B
—	—	27.0	27.0	CR123C330B

NEMA Size 1P

Maximum Motor Full-Load Amperes		Heater Product Number
A	B	
14.2	14.2	CR123C151B
17.3	17.3	CR123C163B
18.7	18.7	CR123C180B
20.6	20.6	CR123C198B
22.5	22.5	CR123C214B
24.7	24.7	CR123C228B
25.5	25.5	CR123C250B
26.7	26.7	CR123C273B
27.9	27.9	CR123C303B
32.1	32.1	CR123C330B
36.0	36.0	CR123C366B

NEMA Size 2

Maximum Motor Full-Load Amperes				Heater Product Number
A	B	C	D	
5.92	5.79	—	—	CR123C592A
6.23	6.12	5.85	5.72	CR123C630A
6.63	6.49	6.47	6.30	CR123C695A
7.72	7.59	7.35	7.04	CR123C778A
8.96	8.71	8.06	7.91	CR123C867A
9.92	9.19	9.03	8.80	CR123C955A
10.4	10.1	9.61	9.27	CR123C104B
11.7	11.2	10.5	9.99	CR123C113B
12.1	11.9	11.6	11.1	CR123C125B
13.5	12.6	12.5	12.1	CR123C137B
14.7	14.5	13.6	13.1	CR123C151B
18.3	17.7	16.7	15.5	CR123C163B
20.1	19.1	17.9	16.8	CR123C180B
22.3	21.4	18.7	18.0	CR123C198B
25.0	22.9	20.4	19.7	CR123C214B
27.7	24.7	22.7	21.6	CR123C228B
29.3	25.9	24.7	23.9	CR123C250B
30.7	27.1	26.3	25.5	CR123C273B
32.7	30.2	29.5	28.2	CR123C303B
35.6	34.8	32.5	31.6	CR123C330B
39.4	38.7	36.7	34.7	CR123C366B
45.0	45.0	41.9	37.8	CR123C400B
—	—	43.2	40.6	CR123C440B
—	—	45.0	45.0	CR123C460B



Product Number Selection Instructions: See page 1-153

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CR123C (All)	\$9.00
CR123F (All)	\$9.00

All CR123C and 123F heaters are packaged three to a carton. Items of these heaters, being ordered for either customer's stock or any other purpose, are to be specified in multiples of three (such as 3, 6, 9, 12, 15, etc.). Minimum order quantity is three.

NEMA Size 3

Maximum Motor Full-Load Amperes				Heater Product Number
A	B	C	D	
20.2	19.4	—	—	CR123F199B
21.0	20.1	—	—	CR123F218B
21.8	21.1	19.3	18.4	CR123F233B
24.5	24.6	22.1	21.1	CR123F243B
25.7	25.2	23.4	22.1	CR123F270B
29.2	29.2	27.0	26.1	CR123F300B
33.5	32.8	29.1	28.0	CR123F327B
37.0	35.1	31.8	31.3	CR123F357B
39.2	38.4	33.9	33.3	CR123F395B
42.7	40.4	37.6	34.3	CR123F430B
45.7	45.7	41.9	40.9	CR123F487B
48.4	48.9	47.7	44.7	CR123F567B
54.9	54.7	52.1	51.0	CR123F614B
62.7	58.6	55.8	52.0	CR123F658B
67.5	63.4	59.7	55.4	CR123F719B
77.1	72.3	68.1	63.3	CR123F772B
81.5	76.6	71.5	66.1	CR123F848B
86.3	83.8	78.2	73.5	CR123F914B
90.0	90.0	87.5	82.2	CR123F104C
—	—	90.0	90.0	CR123F114C

NEMA Size 5

Maximum Motor Full-Load Amperes		Heater Product Number
C	D	
118	115	CR123C592A
128	125	CR123C630A
138	135	CR123C695A
155	151	CR123C778A
168	164	CR123C867A
184	179	CR123C955A
200	195	CR123C104B
221	215	CR123C113B
237	231	CR123C125B
262	255	CR123C137B
270	270	CR123C151B

NEMA Size 4

Maximum Motor Full-Load Amperes			Heater Product Number
C	D	E	
32.2	32.0	32.0	CR123F357B
34.0	34.2	34.2	CR123F395B
36.8	36.7	36.7	CR123F430B
44.6	43.9	43.9	CR123F487B
48.4	46.6	46.6	CR123F567B
53.9	52.6	52.6	CR123F614B
57.4	55.6	55.6	CR123F658B
60.0	58.7	58.7	CR123F719B
69.5	67.1	67.1	CR123F772B
71.7	70.6	70.6	CR123F848B
79.9	76.3	76.3	CR123F914B
92.3	88.7	88.7	CR123F104C
97.0	93.4	93.4	CR123F114C
108.0	102.0	105.0	CR123F118C
118.0	110.0	114.0	CR123F133C
131.0	122.0	128.0	CR123F149C
135.0	131.0	131.0	CR123F161C
—	135.0	135.0	CR123F174C

