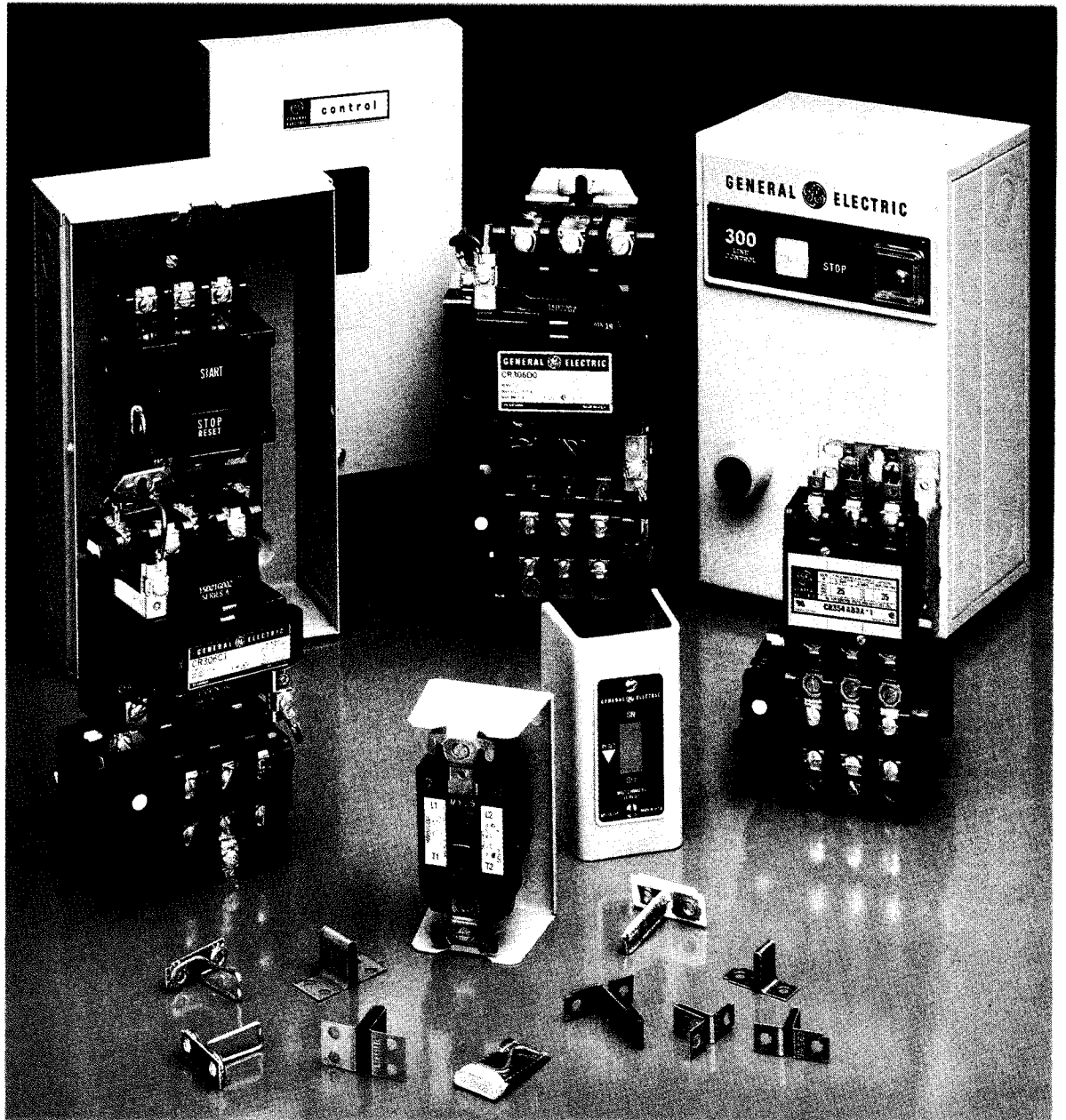




## Heater Selection Guide



Overload Heaters For Full-voltage Magnetic And Manual Starters, Reduced Voltage Starters

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## Selection Of Heaters

Never select a starter for a motor which has higher horsepower rating than that shown on the starter nameplate, even though the normal motor current is within the range of heaters listed for the starter.

When selecting a heater to match a particular motor, use the actual motor nameplate rating for full-load current. The procedure for various types of motors is listed below.

Type Of Motor	Motor Service Factor	How To Use Heater Table
Ac general-purpose fractional hp motors ½ hp and smaller.	1.35	Multiply full-load amperes by 1.10 and use table as published.
Ac general-purpose integral and fractional hp motors, and motors rated 65°C maximum ambient used in a 40°C ambient.	1.15	Use table as published
Ac motor in any enclosure used in maximum rated ambient.	1.00	Multiply full-load amperes by 0.90 and use table as published.
Dc motor in any enclosure used in maximum rated ambient.	1.00	Multiply full-load amperes by 0.90 and use table as published.
Ac or dc short-time rated, 60 minute motor.	.....	Multiply full-load amperes by 0.80 and use table as published.
Ac or dc short-time rated, 30 minute motor.	.....	Multiply full-load amperes by 0.75 and use table as published.
Ac or dc short-time rated, 15 minute motor.	.....	Multiply full-load amperes by 0.70 and use table as published.
Ac or dc short-time rated, 5 minute motor.	.....	Multiply full-load amperes by 0.60 and use table as published.

## Short-circuit Protection

The overload relay is intended only to protect the motor against running overloads and stall. Motor-branch circuit protection, in accordance with the National Electrical Code, should be provided in every case, not to exceed the maximum rating shown opposite each heater on the heater label.

## Ambient Temperature

The published ratings in the heater tables are based upon the assumption that the ambient temperature of the motor and the control is 40°C. For unusual conditions of ambient temperature, contact nearest GE ED&C sales office or distributor.

# Motor Full-load Current Tables

## Approximate Motor Full-load Current Ratings

### Full-load Current Of Motors—Average Expected Values

For three-phase, 60 hertz, GE Type K (NEMA Design B) Tri-Clad

Motor HP	Synchronous Speed RPM	Average Expected Values of Full-load Currents <sup>①</sup>			
		200V	230V	460V	575V
¼ <sup>②</sup>	1800	1.6	1.4	0.70	0.56
	1200	1.7	1.5	0.75	0.60
⅓ <sup>②</sup>	3600	2.0	1.7	0.85	0.68
	1800	1.7	1.5	0.75	0.60
	1200	2.0	1.7	0.85	0.68
½	3600	2.0	1.8	0.88	0.70
	1800	2.3	2.0	1.0	0.80
	1200	2.3	2.0	1.0	0.80
	900	3.2	2.8	1.4	1.40
¾	3600	2.8	2.4	1.2	0.96
	1800	3.2	2.8	1.4	1.1
	1200	3.7	3.2	1.6	1.3
	900	4.4	3.8	1.9	1.5
1	3600	3.7	3.2	1.6	1.3
	1800	4.1	3.6	1.8	1.4
	1200	4.4	3.8	1.9	1.5
	900	5.5	4.8	2.4	1.9
1½	3600	5.3	4.6	2.3	1.6
	1800	6.0	5.2	2.6	2.1
	1200	6.0	5.2	2.6	2.1
	900	7.1	6.2	3.1	2.5
2	3600	6.9	6.0	3.0	2.4
	1800	7.1	6.2	3.1	2.5
	1200	7.6	6.6	3.3	2.6
	900	10.6	9.2	4.6	3.7
3	3600	9.4	8.2	4.1	3.3
	1800	9.9	8.6	4.3	3.4
	1200	12.0	10.4	5.2	4.2
	900	15.4	13.4	6.7	5.4
5	3600	15.4	13.4	6.7	5.4
	1800	16.3	14.2	7.1	5.7
	1200	19.3	16.8	8.4	6.7
	900	19.8	17.2	8.6	6.9
7½	3600	21.6	18.8	9.4	7.5
	1800	23.7	20.6	10.3	8.2
	1200	26.0	23.6	11.3	9.0
	900	28.5	24.8	12.4	9.9
10	3600	27.4	23.8	11.9	9.5
	1800	31.3	27.2	13.6	10.9
	1200	32.7	28.4	14.2	11.4
	900	33.1	28.8	14.4	11.5
15	3600	42.6	37.0	18.5	14.8
	1800	46.7	40.6	20.3	16.2
	1200	45.1	39.2	19.6	15.7
	900	47.6	41.4	20.7	16.6
20	3600	62.3	54.2	27.1	21.7
	1800	59.3	51.6	25.8	20.6
	1200	56.6	48.2	24.6	19.7
	900	63.9	55.6	27.8	22.2

① For expected values on 208-Volt, 50-Hertz, three-phase motors, contact nearest GE Electrical Distribution & Control sales office.

② Open, Type K, General Purpose, NEMA SF, Solid Base, Rolled-Steel-Shell, GE Induction Motors.

700-Line, normal efficiency, drip-proof, normal starting torque, continuous, 40°C ambient (1.15 service factor) horizontal induction motors.

Motor HP	Synchronous Speed RPM	Average Expected Values of Full-load Currents			
		200V	230V	460V	575V
25	3600	72.0	62.6	31.3	25.0
	1800	71.3	62.0	31.0	24.8
	1200	73.8	64.2	32.1	25.7
	900	82.6	71.8	35.9	28.7
30	3600	85.6	74.4	37.2	29.8
	1800	86.0	74.8	37.4	29.9
	1200	88.6	77.0	38.5	30.8
	900	92.2	80.2	40.1	32.1
40	3600	110	95.6	47.8	39.2
	1800	116	100.9	50.4	40.3
	1200	114	99.6	49.8	39.8
	900	122	105.8	52.9	42.3
50	3600	140	122.2	61.1	48.9
	1800	142	123.6	61.8	49.4
	1200	144	125.2	62.6	50.1
	900	159	138.2	69.1	55.3
60	3600	163	141.4	70.7	56.6
	1800	172	149.8	74.9	59.9
	1200	172	149.2	74.6	59.7
	900	176	153.4	76.7	61.4
75	3600	206	178.8	89.4	71.5
	1800	207	180.0	90.0	72.0
	1200	206	179.2	89.6	71.7
	900	221	191.8	95.9	76.7
100	3600	262	228	114	91.2
	1800	281	244	122	97.7
	1200	283	246	123	98.4
	900	296	258	129	103
125	3600	334	290	145	116
	1800	340	296	148	118
	1200	352	306	153	122
	900	370	322	161	129
150	3600	398	346	173	138
	1800	412	348	179	143
	1200	419	364	182	146
	900	435	378	189	151
200	3600	—	446	223	178
	1800	—	468	234	187
	1200	—	482	241	193
250	3600	—	574	287	230
	1800	—	590	295	236
	1200	—	594	297	238
300	3600	—	676	338	270
	1800	—	686	343	274
350	3600	—	774	387	310
	1800	—	792	396	317
400	3600	—	890	445	356

**NOTE:** The listed data is based on approximate full-load current ratings of standard, open, 1.15 service factor, continuous rated GE motors. Full-load current ratings of similar motors of other manufacturers may vary considerably. Therefore, whenever possible use actual full-load current rating given on motor nameplate. Refer to motor manufacturer for full-load currents of single-phase and dc motors.

# Motor Full-load Current Tables

## Approximate Motor Full-load Current Ratings

### Full-load Current Of Motors— Average Expected Values

For three-phase, 60 hertz, GE Type KS (NEMA Design B) Energy Saver™

Motor HP	Synchronous Speed RPM	Average Expected Values of Full-load Currents ①			
		200V	230V	460V	575V
3	1200	10.4	9.0	4.5	3.6
5	1200	16.1	14.0	7.0	5.6
7½	3600	20.2	17.6	8.8	7.0
	1800	20.7	18.0	9.0	7.2
	1200	22.5	19.6	9.8	7.8
10	3600	26.2	22.8	11.4	9.1
	1800	27.6	24.0	12.0	9.6
	1200	29.4	25.6	12.8	10.2
15	3600	40.7	35.4	17.7	14.2
	1800	42.1	36.6	18.3	14.6
	1200	42.1	36.4	18.2	14.6
20	3600	52.2	45.4	22.7	18.1
	1800	54.3	47.2	23.6	18.9
	1200	55.4	48.2	24.1	19.3
25	3600	65.1	56.6	28.3	22.6
	1800	66.0	57.4	28.7	23.0
	1200	69.9	60.8	30.4	24.3
30	3600	76.4	66.4	33.2	26.6
	1800	79.4	69.0	34.5	27.6
	1200	83.3	72.4	36.2	29.0
40	3600	100.7	87.6	43.8	35.0
	1800	104.6	91.0	45.5	36.4
	1200	108.3	94.2	47.1	37.7

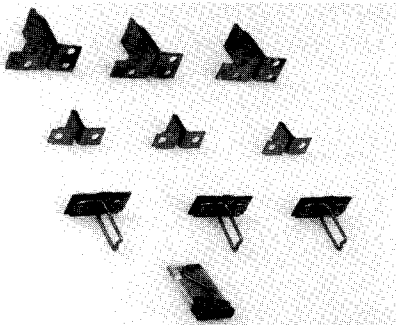
① For expected values on 208-volt, 50-Hertz, three-phase motors, contact nearest GE Electrical Distribution & Control sales office.

high efficiency, drip-proof, normal starting torque, continuous, 40°C ambient (1.15 service factor) horizontal induction motors.

Motor HP	Synchronous Speed RPM	Average Expected Values of Full-load Currents			
		200V	230V	460V	575V
50	3600	126.0	110.0	55.0	44.0
	1800	132.2	115.0	57.5	46.0
	1200	134.6	117.0	58.5	46.8
60	3600	151.6	131.8	65.9	52.7
	1800	160.8	139.8	69.9	55.9
	1200	161.5	140.4	70.2	56.2
75	3600	187.4	163.0	81.5	65.2
	1800	198.7	172.8	86.4	69.1
	1200	199.4	173.4	86.7	69.4
100	3600	253.0	220.0	110.0	88.0
	1800	264.5	230.0	115.0	92.0
	1200	257.6	224.0	112.0	89.6
125	3600	317.9	276.4	138.2	110.6
	1800	314.6	273.6	136.8	109.4
	1200	319.7	278.0	139.0	111.2
150	3600	381.3	331.6	165.8	132.6
	1800	381.8	332.0	166.0	132.8
	1200	395.6	344.0	172.0	137.6
200	3600	480.7	418.0	209.0	167.2
	1800	499.1	434.0	217.0	173.6
	1200	522.1	454.0	227.0	181.6
250	3600	637.1	554.0	277.0	221.6
	1800	676.2	588.0	294.0	235.2

# NEMA Rated Motor Starter Heater Selection Guide

## Full-voltage Magnetic Starters



## 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 optional 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 catalog 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 motor falls between two ratings, select heaters for higher rating.

## Ordering Information

All heaters listed on pages 7 through 24 are packaged in multiples of three (except CR123H units, page 11, which are one per package). Items of these heaters, ordered either for customer 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.

Base Catalog Number	Description	NEMA Type Enclosure	Quantity Heaters Required	Use Heater Table Column Page 7
CR306, CR309	Single-phase, 2 pole, standard, Size 00-5 Single-phase, 2 pole, standard, Size 00-5	Open 1, 3R, 4, 12	1 1	A B
CR306	3-phase, 3 pole, 3-leg protection standard, Size 00-5 ambient compensated, Size 00, 0, 1, 2, & 5 ambient compensated, Size 3 ambient compensated, Size 4	Open Open Open Open	3 3 3 3	C C D E
CR306, CR307, CR308, CR387	3-phase, 3 pole, 3-leg protection standard, Size 00-5 ambient compensated, Size 00, 0, 1, 2, & 5 ambient compensated, Size 3 ambient compensated, Size 4	1, 3R, 4, 12 1, 3R, 4, 12 1, 3R, 4, 12 1, 3R, 4, 12	3 3 3 3	D C D E
CR309	3-phase, 3-3 pole, 3-leg protection standard, Size 00-5 ambient compensated, Size 00, 0, 1, 2, & 5 ambient compensated, Size 3 ambient compensated, Size 4	Open Open Open Open	3—Reverser 6—2-speed	C C C E
CR309, CR310, CR311, CR390	3-phase, 3-3 pole, 3-leg protection standard, Size 00-5 ambient compensated, Size 00, 0, 1, 2, & 5 ambient compensated, Size 3 ambient compensated, Size 4	1, 3R, 4, 12 1, 3R, 4, 12 1, 3R, 4, 12 1, 3R, 4, 12	3—Reverser 6—2-speed	D C D E
CR340, CR341	3-phase, 3 pole, 3-leg protection ambient compensated, Size 1, 2, & 5 Size 3 Size 4	3R 3R 3R	3 3 3	C D F
CR324	Panel Mounted		Refer To Page 12	
CR360C	3-phase, 3 pole, 3-leg protection standard, except Size 3 & 4 standard, Size 3 standard, Size 4 ambient compensated, except Size 3 & 4 ambient compensated, Size 3 ambient compensated, Size 4	1, 3R, 4, 12 1, 3R, 4, 12 1, 3R, 4, 12 1, 3R, 4, 12 1, 3R, 4, 12 1, 3R, 4, 12	3 3 3 3 3 3	D C G C D F
CR306HH—CR311HH, CR387HH & CR390HH, CR340H & CR341H	3-phase, 3-leg, standard or ambient compensated		Refer Table 7, Page 7	
CR340J, CR341J CR386, CR387, CR388 (NEMA Sizes 7-9)	3-phase, 3-leg protection, standard		Refer to Separate Tables, Page 7	
CR124	Single element, panel mounted		Refer to Page 13	
CR124	Single element, ambient compensated standard and quick trip		Refer to Page 13	

# Heater Selection Tables

## For NEMA Rated Full-voltage Magnetic Starters

Table 1—NEMA Sizes 00, 0, & 1

Max. Motor Full-load Amperes				Heater Cat. No. CR123
A	B	C	D	
0.48	0.46	0.45	0.43	C054A
0.55	0.50	0.49	0.48	C060A
0.57	0.57	0.53	0.53	C066A
0.65	0.62	0.59	0.58	C071A
0.69	0.68	0.65	0.64	C078A
0.83	0.80	0.76	0.74	C087A
0.97	0.91	0.84	0.84	C097A
1.03	0.99	0.93	0.92	C109A
1.12	1.09	1.04	1.02	C118A
1.26	1.22	1.15	1.10	C131A
1.40	1.31	1.27	1.23	C148A
1.46	1.46	1.39	1.38	C163A
1.63	1.59	1.55	1.49	C184A
1.79	1.74	1.73	1.67	C196A
1.97	1.93	1.89	1.79	C220A
2.25	2.13	2.05	1.98	C239A
2.43	2.37	2.28	2.24	C268A
2.60	2.52	2.47	2.43	C301A
2.96	2.87	2.79	2.75	C326A
3.57	3.39	3.31	3.25	C356A
3.86	3.59	3.70	3.43	C379A
4.43	4.31	4.06	4.03	C419A
4.87	4.57	4.47	4.43	C466A
5.37	5.31	4.95	4.94	C526A
5.99	5.86	5.49	5.36	C592A
6.39	6.19	5.91	5.77	C630A
6.87	6.61	6.47	6.35	C695A
7.71	7.61	7.20	6.92	C778A
8.72	8.46	8.22	7.99	C867A
9.50	9.35	8.72	8.47	C955A
10.5	10.4	9.67	9.19	C104B
11.7	11.3	10.4	10.0	C113B
12.2	11.9	11.0	10.7	C125B
13.5	13.0	12.4	12.0	C137B
15.1	14.5	13.2	12.9	C151B
17.5	17.4	15.4	15.1	C163B
18.9	18.6	17.1	16.3	C180B
20.8	20.5	18.1	17.9	C198B
22.4	22.3	20.0	19.7	C214B
25.5	24.7	21.5	21.2	C228B
26.2	25.7	22.5	22.3	C250B
27.0	27.0	23.9	23.5	C273B
--	--	26.3	25.5	C303B
--	--	27.0	27.0	C330B

Table 2—NEMA Size 1P

Max. Motor Full-load Amperes		Heater Cat. No. CR123
A	B	
14.2	14.2	C151B
17.3	17.3	C163B
18.7	18.7	C180B
20.6	20.6	C198B
22.5	22.5	C214B
24.7	24.7	C228B
25.5	25.5	C250B
26.7	26.7	C273B
27.9	27.9	C303B
32.1	32.1	C330B
36.0	36.0	C366B

Table 3—NEMA Size 2

Max. Motor Full-load Amperes				Heater Cat. No. CR123
A	B	C	D	
5.92	5.79	--	--	C592A
6.23	6.12	5.85	5.72	C630A
6.63	6.49	6.47	6.30	C695A
7.72	7.59	7.35	7.04	C778A
8.96	8.71	8.06	7.91	C867A
9.92	9.19	9.03	8.80	C955A
10.4	10.1	9.61	9.27	C104B
11.7	11.2	10.5	9.99	C113B
12.1	11.9	11.6	11.1	C125B
13.5	12.6	12.5	12.1	C137B
14.7	14.5	13.6	13.1	C151B
18.3	17.7	16.7	15.5	C163B
20.1	19.1	17.9	16.8	C180B
22.3	21.4	18.7	18.0	C198B
25.0	22.9	20.4	19.7	C214B
27.7	24.7	22.7	21.6	C228B
29.3	25.9	24.7	23.9	C250B
30.7	27.1	26.3	25.5	C273B
32.7	30.2	29.5	28.2	C303B
35.6	34.8	32.5	31.6	C330B
39.4	38.7	36.7	34.7	C366B
45.0	45.0	41.9	37.8	C400B
--	--	43.2	40.6	C440B
--	--	45.0	45.0	C460B

Table 4—NEMA Size 3

Max. Motor Full-load Amperes		Heater Cat. No. CR123
C	D	
19.3	18.4	F233B
22.1	21.1	F243B
23.4	22.1	F270B
27.0	26.1	F300B
29.1	28.0	F327B
31.8	31.3	F357B
33.9	33.3	F395B
37.6	34.3	F430B
41.9	40.9	F487B
47.7	44.7	F567B
52.1	51.0	F614B
55.8	52.0	F658B
59.7	55.4	F719B
68.1	63.3	F772B
71.5	66.1	F848B
78.2	73.5	F914B
87.5	82.2	F104C
90.0	90.0	F114C

Table 5—NEMA Size 4

Max. Motor Full-load Amperes					Heater Cat. No. CR123
C	D	E	F	G	
32.2	32.0	32.0	31.1	31.1	F357B
34.0	34.2	34.2	33.3	33.3	F395B
36.8	36.7	36.7	35.6	35.6	F430B
44.6	43.9	43.9	42.6	42.6	F487B
48.4	46.6	46.6	45.2	45.2	F567B
53.9	52.6	52.6	51.1	51.1	F614B
57.4	55.6	55.6	53.9	53.9	F658B
60.0	58.7	58.7	56.9	56.9	F719B
69.5	67.1	67.1	65.2	65.2	F772B
71.7	70.6	70.6	68.6	68.6	F848B
79.9	76.3	76.3	74.0	74.0	F914B
92.3	88.7	88.7	86.0	86.0	F104C
97.0	93.4	93.4	90.7	90.7	F114C
108.0	102.0	105.0	103.0	96.9	F118C
118.0	112.0	114.0	109.0	105.0	F133C
131.0	122.0	128.0	119.0	113.0	F149C
135.0	131.0	131.0	131.0	131.0	F161C
--	135.0	135.0	135.0	135.0	F174C

Table 6—NEMA Size 5

Max. Motor Full-load Amperes		Heater Cat. No. CR123
C	D	
118	115	C592A
128	125	C630A
138	135	C695A
155	151	C778A
168	164	C867A
184	179	C955A
200	195	C104B
221	215	C113B
237	231	C125B
262	255	C137B
270	270	C151B

Table 7—NEMA Size 6

Max. Motor Full-load Amperes		Heater Cat. No. CR123
C	D	
197		C220A
214		C239A
238		C268A
258		C301A
290		C326A
346		C356A
387		C379A
424		C419A
467		C466A
516		C526A
540		C592A

Heater Tables NEMA Size 7-9

Information shown in tables for CR386 full-voltage starters can be used by customer to select heaters for CR387 and CR388 Size 7-9 combination starters also. However, for these combination forms, the factory will verify selection and install the required heaters based on available motor data.

Table 8—CR386J Size 7

(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
387	C326A
461	C356A
515	C379A
565	C419A
622	C466A
688	C526A
763	C592A
810	C630A

Table 9—CR386K Size 8

(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
516	C301A
580	C326A
690	C356A
772	C379A
846	C419A
934	C466A
1030	C526A
1147	C592A
1215	C630A

Table 10—CR386L Size 9

(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
1075	C301A
1210	C326A
1440	C356A
1610	C379A
1765	C419A
1950	C466A
2150	C526A
2250	C592A

# Interchangeable Heaters For IEC Application-rated Control Overload Relays

## Heaters For Overload Relays<sup>①</sup> Use 75°C, Copper Conductors Only, For Field Wiring

For continuous rated motors with a service factor of 1.15 to 1.25, select heaters from the heater table. For continuous rated motors with a service factor of 1.0, multiply the motor full-load current by 0.9 and use this value to select heaters.

Overload relay tripping current in 40°C ambient is the minimum value of full-load current multiplied by 1.25.

Provide short circuit protection (fuses or circuit breaker) in accordance with the National Electrical Code, except fuses are not to exceed the value shown in the table.

Suitable for use on a circuit capable of delivering not more than 5,000 RMS<sup>②</sup> symmetrical amperes, 600 volts maximum, when protected by fuses or circuit breaker having an interrupting rating not less than the available short circuit current.

**Warning:** Opening of the circuit breaker or fuse(s) may be an indication that a fault current has been interrupted. To provide continued protection against fire or shock hazard, all current-carrying parts and other components of the motor controller should be examined and replaced if damaged. If heater burnout occurs, the complete overload relay must be replaced.

**Note:** Heater tables for CR3S extended range application-rated control are listed on page 9.

Table 11—CR7S, CR4S, IEC Application-rated Control

Motor Full-load Amperes		Heater Cat. No. ③ CR123	Maximum Fuse Rating	Maximum CB Rating ④	Motor Full-load Amperes		Heater Cat. No. ③ CR123	Maximum Fuse Rating	Maximum CB Rating ④
Open	Enclosed				Open	Enclosed			
CR7S (A, B, C, E, F); CR4S (A, B, C, D, E, F)					CR7S (E, F); CR4S (E, F)				
.42-.46	.41-.45	C054A	3	15	17.1-18.8	16.6-18.3	C180B	60	50
.47-.50	.46-.49	C060A	3	15	18.9-19.9	18.4-19.3	C198B	70	50
.51-.54	.50-.52	C066A	3	15	20.0-21.1	19.4-20.9	C214B	70	50
.55-.60	.53-.58	C071A	3	15	21.2-24.0	21.0-23.3	C228B	80	70
.61-.68	.59-.66	C078A	3	15	24.1-24.8	23.4-24.1	C250B	80	70
.69-.82	.67-.80	C087A	3	15	24.9-25.3	24.2-25.3	C273B	90	70
.83-.91	.81-.89	C097A	3	15	CR7SF; CR4S (E, F)				
.92-.97	.90-.94	C109A	3	15	24.9-26.8	24.2-26.0	C273B	90	70
.98-1.06	.95-1.04	C118A	3	15	26.9-29.5	26.1-28.7	C303B	90	70
1.07-1.17	1.05-1.14	C131A	3	15	29.6-32.0	28.8-31.1	C330B	100	100
1.18-1.30	1.15-1.26	C148A	3	15	-----	31.2-32.0	C366B	100	100
1.31-1.42	1.27-1.38	C163A	3	15	CR7S (G, H, J, K); CR4S (G, H, J, K)				
1.43-1.58	1.39-1.54	C184A	3	15	18.5-19.7	17.5-18.9	C180B	60	50
1.59-1.76	1.55-1.71	C196A	6	15	19.8-20.6	19.0-20.3	C198B	70	70
1.77-1.93	1.72-1.88	C220A	6	15	20.7-22.5	20.4-22.2	C214B	70	70
1.94-2.09	1.89-2.03	C239A	6	15	22.6-25.0	22.3-24.6	C228B	80	70
2.10-2.33	2.04-2.26	C268A	6	15	25.1-27.2	24.7-26.9	C250B	90	70
2.34-2.52	2.27-2.45	C301A	6	15	27.3-29.0	27.0-28.7	C273B	90	70
2.53-2.85	2.46-2.77	C326A	6	15	29.1-32.6	28.8-31.7	C303B	100	100
2.86-3.51	2.78-3.41	C356A	10	15	32.7-34.0	31.8-34.0	C330B	110	100
3.52-3.92	3.42-3.81	C379A	10	15	CR7S (H, J, K); CR4S (H, J, K)				
3.93-4.30	3.82-4.18	C419A	15	15	32.7-37.0	31.8-35.4	C330B	110	100
4.31-4.74	4.19-4.61	C466A	15	15	37.1-41.7	35.5-40.2	C366B	125	100
4.75-5.25	4.62-5.10	C526A	15	15	41.8-42.0	40.3-42.0	C400B	150	100
5.26-5.82	5.11-5.66	C592A	20	20	CR7S (J, K); CR4S (J, K)				
5.83-6.27	5.67-6.09	C630A	20	20	41.8-46.2	40.3-43.8	C400B	150	100
6.28-6.86	6.10-6.67	C695A	20	20	46.3-48.8	43.9-46.0	C440B	150	100
6.87-7.63	6.68-7.42	C778A	25	20	48.9-53.7	46.1-50.6	C480B	175	125
7.64-8.71	7.43-8.47	C867A	25	20	53.8-56.0	50.7-55.7	C520B	200	125
8.72-9.00	8.48-9.00	C955A	30	30	-----	55.8-56.0	C580B	200	150
CR7S (B, C, E, F); CR4S (B, C, D, E, F)					CR7SK; CR4SK				
8.72-9.59	8.48-9.32	C955A	30	30	53.8-59.1	-----	C520B	200	125
9.60-10.5	9.33-10.2	C104B	35	30	59.2-66.7	55.8-62.9	C580B	200	150
10.6-11.5	10.3-11.2	C113B	40	40	66.8-71.3	63.0-67.1	C650B	225	150
11.6-12.0	11.3-11.8	C125B	40	40	71.4-72.0	67.2-72.0	C864B	225	150
12.1-12.5	11.9-12.5	C137B	45	40	CR7S (C, E, F); CR4S (C, D, E, F)				
12.1-13.0	11.9-12.6	C137B	45	40	CR7S (C, E, F); CR4S (C, D, E, F)				
13.1-15.0	12.7-14.6	C151B	50	50	CR7S (C, E, F); CR4S (C, D, E, F)				
15.1-17.0	14.7-16.5	C163B	60	50	CR7S (C, E, F); CR4S (C, D, E, F)				
17.1-17.5	16.6-17.5	C180B	60	50	CR7S (C, E, F); CR4S (C, D, E, F)				

① Torque load for overload terminals: 15 to 25 lb-in. for CR7G1AA, 1CA, 2AA, 2CA, 3AA, or 3CA; and CR4G1AA, 1CA, 2AA, or 2CA; and 30 to 40 lb in. for CR7G4AA, 4CA, 5AA, or 5CA; and CR4G3AA, CA.

② Where higher than 5,000 RMS symmetrical Ampere circuit capacity may be involved, contact the nearest GE ED&C sales office for suitability.

③ Three heaters required.

④ CB (circuit breaker) rating for CR7S (E, F, G, H, J, and K) and CR4S (D, E, F, G, H, J, and K) only.

**Note:** CR7S nomenclature indicates an equivalent CR7C contactor plus an appropriate CR7G overload relay.  
CR4S nomenclature indicates an equivalent CR4C contactor plus an appropriate CR4G overload relay.



# Heater Selection Tables For CR3S Extended Range

## Non-ambient-compensated, Open And Enclosed Devices

### Heaters For Overload Relays Heater Amperes Based On 75°C Wire

For continuous rated motors with a service factor of 1.15 to 1.25, select heaters from the heater table. For continuous rated motors with a service factor of 1.0, multiply the motor full load current by 0.9 and use this value to select heaters.

Overload relay tripping current in 40°C ambient is the minimum value of full load current multiplied by 1.25.

**Warning:** Overload relays with automatic reset may automatically start a motor connected to a 2-wire control circuit. When automatic restarting is not desired, use a 3-wire control circuit.

Provide short circuit protection (Fuses or Circuit Breakers) in accordance with the National Electrical Code.

Suitable for use on a circuit capable of delivering not more than 10,000 RMS (18,000 RMS for CR3ST) symmetrical amperes, 600 volts maximum, when protected by Fuses or Circuit Breakers having an interrupting rating not less than the available short circuit current.

**Warning:** Opening of the circuit breaker or fuse(s) may be an indication that a fault current has been interrupted. To provide continued protection against fire or shock hazard, all current-carrying parts and other components of the motor controller should be examined and replaced if damaged. If heater burnout occurs, the complete overload relay must be replaced.

**Table 12—CR3SL, CR3VL**  
(3 Heaters Required)

Open	Enclosed	Heater Cat. No. CR123
Max. Motor Full-load Amperes	Max. Motor Full-load Amperes	
19.3	18.4	F233B
22.1	21.1	F243B
23.4	22.1	F270B
27.0	26.1	F300B
29.1	28.0	F327B
31.8	31.3	F357B
33.9	33.3	F395B
37.6	34.3	F430B
4.19	40.9	F487B
47.7	44.7	F567B
52.1	51.0	F614B
55.8	52.0	F658B
59.7	55.4	F719B
68.1	63.3	F772B
71.5	66.1	F848B
78.2	73.5	F914B
87.5	82.2	F104C
90.0	90.0	F114C

**Table 14—CR3SN, CR3VN**  
(3 Heaters Required)

Open	Enclosed	Heater Cat. No. CR123
Max. Motor Full-load Amperes	Max. Motor Full-load Amperes	
32.2	32.0	F357B
34.0	34.2	F395B
36.8	36.7	F430B
44.6	43.9	F487B
48.4	46.6	F567B
53.9	52.6	F614B
57.4	55.6	F658B
60.0	58.7	F719B
69.5	67.1	F772B
71.7	70.6	F848B
79.9	76.3	F914B
92.3	88.7	F104C
97.0	93.4	F114C
108	102	F118C
118	110	F133C
131	122	F149C
140	131	F161C
—	140	F174C

**Table 16—CR3SR, CR3VR**  
(3 Heaters Required)

Open	Enclosed	Heater Cat. No. CR123
Max. Motor Full-load Amperes	Max. Motor Full-load Amperes	
32.2	32.0	F357B
34.0	34.2	F395B
36.8	36.7	F430B
44.6	43.9	F487B
48.4	46.6	F567B
53.9	52.6	F614B
57.4	55.6	F658B
60.0	58.7	F719B
69.5	67.1	F772B
71.7	70.6	F848B
79.9	76.3	F914B
92.3	88.7	F104C
97.0	93.4	F114C
108	102	F118C
118	110	F133C
131	122	F149C
141	131	F161C
152	145	F174C
175	165	F190C
184	184	F205C

**Table 18—CR3ST, CR3VT**  
(3 Heaters Required)

Open & Enclosed	
Max. Motor Full-load Amperes	Heater Cat. No. CR123
197	C220A
214	C239A
238	C268A
258	C301A
290	C326A
346	C356A
387	C379A
424	C419A
467	C466A
516	C526A
540	C592A

**Table 13—CR3SM, CR3VM**  
(3 Heaters Required)

Open	Enclosed	Heater Cat. No. CR123
Max. Motor Full-load Amperes	Max. Motor Full-load Amperes	
32.2	32.0	F357B
34.0	34.2	F395B
36.8	36.7	F430B
44.6	43.9	F487B
48.4	46.6	F567B
53.9	52.6	F614B
57.4	55.6	F658B
60.0	58.7	F719B
69.5	67.1	F772B
71.7	70.6	F848B
79.9	76.3	F914B
92.3	88.7	F104C
97.0	93.4	F114C
105	102	F118C
—	105	F133C

**Table 15—CR3SP, CR3VP**  
(3 Heaters Required)

Open	Enclosed	Heater Cat. No. CR123
Max. Motor Full-load Amperes	Max. Motor Full-load Amperes	
32.2	32.0	F357B
34.0	34.2	F395B
36.8	36.7	F430B
44.6	43.9	F487B
48.4	46.6	F567B
53.9	52.6	F614B
57.4	55.6	F658B
60.0	58.7	F719B
69.5	67.1	F772B
71.7	70.6	F848B
79.9	76.3	F914B
92.3	88.7	F104C
97.0	93.4	F114C
108	102	F118C
118	110	F133C
131	122	F149C
141	131	F161C
152	145	F174C
170	165	F190C
—	170	F205C

**Table 17—CR3SS, CR3VS**  
(3 Heaters Required)

Open	Enclosed	Heaters Cat. No. CR123
Max. Motor Full-load Amperes	Max. Motor Full-load Amperes	
118	115	C592A
128	125	C630A
138	135	C695A
155	151	C778A
168	164	C867A
184	179	C955A
200	195	C104B
221	215	C113B
237	231	C125B
262	255	C137B
270	270	C151B

**Warning:** Additional control circuit overcurrent protection having the interrupting capacity of the available short circuit may be required. Refer to the National Electrical Code. Fuse holders installed on circuits capable of delivering more than 10,000 RMS symmetrical amperes must be rejection type to prevent insertion of fuses having lower interrupting ratings.

# Heater Selection Tables For Reduced-voltage Motor Control

## Reduced-voltage Starters—How To Select Heaters

Listed values are for continuous rated motors with 1.15 service factor. For continuous rated motors with 1.0 service factor, multiply full-load current of motor by 0.9 and use this value to select heater(s).

1. Find device table. (Example: CR331E.)
2. Determine maximum motor full-load amperes of your device. Then find heater catalog number. (Example: CR331E, if maximum amperes is 53.9, then heater catalog number will be CR123F658B.)

**Table 19—CR330C, Size 1 PW**  
(6 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
11.0	C592A
11.8	C630A
12.9	C695A
14.4	C778A
16.4	C867A
17.4	C955A
19.3	C104B
20.1	C113B
22.0	C125B
24.8	C137B
26.4	C151B
30.8	C163B
34.2	C180B
36.2	C198B
40.0	C214B
43.0	C228B
45.0	C250B

**Table 20—CR330D, Size 2 PW**  
(6 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
27.2	C151B
33.4	C163B
35.8	C180B
37.8	C198B
40.8	C214B
45.4	C228B
49.4	C250B
52.6	C273B
59.0	C303B
65.0	C330B
73.3	C366B
77.9	C400B

**Table 21—CR330E, Size 3 PW**  
(6 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
54.0	F300B
58.2	F327B
63.6	F357B
67.9	F395B
72.9	F430B
86.4	F487B
92.5	F567B
107.4	F614B
111.6	F658B
119.3	F719B
136.2	F772B
143.0	F848B

**Table 22—CR330F, Size 4 PW**  
(6 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
96.8	F567B
111.2	F614B
114.8	F658B
120.1	F719B
138.9	F772B
143.4	F848B
159.9	F914B
184.7	F104C
193.8	F114C
210.0	F118C
226.0	F133C
248.0	F149C

**Table 23—CR330G, Size 5 PW**  
(6 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
230	C592A
250	C630A
270	C695A
302	C778A
328	C867A
358	C955A
390	C104B
430	C113B
462	C125B
510	C137B

**Table 24—CR331D, Size 2**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
7.15	C867A
7.58	C955A
8.39	C104B
9.11	C113B
9.67	C125B
11.0	C137B
12.0	C151B
14.4	C163B
16.3	C180B
17.3	C198B
19.3	C214B
20.9	C228B
22.9	C250B
24.7	C273B
28.0	C303B
31.1	C330B
35.9	C366B
41.5	C400B
43.4	C440B
45.0	C460B

**Table 25—CR331E, Size 3**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
25.1	F300B
27.0	F327B
30.5	F357B
31.5	F395B
33.9	F430B
40.1	F487B
43.1	F567B
48.4	F614B
54.0	F658B
57.0	F719B
64.5	F772B
68.6	F848B
73.3	F914B
83.6	F104C
90.0	F114C

**Table 26—CR331F, Size 4**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
33.9	F430B
40.1	F487B
43.1	F567B
48.4	F614B
54.0	F658B
57.0	F719B
64.5	F772B
68.6	F848B
73.3	F914B
83.6	F104C
93.0	F114C
106.0	F118C
123.0	F133C
131.0	F149C
135.0	F161C

**Table 27—CR331G, Size 5**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
125	C630A
135	C695A
151	C778A
164	C867A
179	C955A
195	C104B
215	C113B
231	C125B
255	C137B
270	C151B

**Table 28—CR332C, Size 1YD**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
12.4	C867A
13.1	C955A
14.5	C104B
15.8	C113B
16.8	C125B
19.1	C137B
20.6	C151B
24.8	C163B
27.9	C180B
29.8	C198B
32.3	C214B
34.6	C228B
36.7	C250B
40.5	C273B
43.8	C303B
46.8	C330B

**Table 29—CR332D, Size 2YD**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
20.8	C151B
24.9	C163B
28.2	C180B
30.0	C198B
32.4	C214B
35.1	C228B
38.5	C250B
42.8	C273B
47.0	C303B
55.6	C330B
62.2	C366B
69.7	C400B
72.9	C440B
77.9	C460B

**Table 30—CR332E, Size 3YD**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
43.5	F300B
45.4	F327B
52.8	F357B
54.6	F395B
58.6	F430B
67.3	F487B
72.3	F567B
83.8	F614B
90.7	F658B
95.7	F719B
111.7	F772B
122.5	F848B
135.1	F914B
154.0	F104C
156.0	F114C

**Table 31—CR332F, Size 4YD**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
72.3	F430B
83.8	F487B
90.7	F567B
95.7	F614B
111.7	F658B
122.5	F719B
135.1	F772B
154.0	F848B
166.1	F914B
188.8	F104C
213.0	F114C
226.9	F118C
233.0	F133C

**Table 32—CR332G, Size 5YD**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
216	C630A
234	C695A
262	C778A
284	C867A
310	C955A
338	C104B
372	C113B
400	C125B
442	C137B
467	C151B



**Current Devices** *Note: If full-load amperes falls between increments, use next higher rating.*

**Heaters For CR324 Standard  
And Ambient Compensated  
Block Overloads—Panel Mounted  
(Not Mounted Directly On Starters)**

**Table 35**  
CR324C, Size 0–1

Max. Motor Full-load Amperes	Heater Cat. No. CR123	Max. Fuse Rating
.39	C054A	3
.42	C060A	3
.45	C066A	3
.51	C071A	3
.56	C078A	3
.65	C087A	3
.73	C097A	3
.81	C109A	3
.90	C118A	3
1.00	C131A	3
1.10	C148A	3
1.21	C163A	3
1.35	C184A	3
1.50	C196A	6
1.64	C220A	6
1.78	C239A	6
1.98	C268A	6
2.15	C301A	6
2.42	C326A	6
2.88	C356A	10
3.22	C379A	12
3.53	C419A	12
3.89	C466A	15
4.30	C526A	15
4.77	C592A	15
5.14	C630A	20
5.63	C695A	20
6.26	C778A	25
7.15	C867A	25
7.58	C955A	30
8.39	C104B	30
9.11	C113B	35
9.67	C125B	35
11.0	C137B	40
11.9	C151B	45
14.3	C163B	50
16.1	C180B	60
17.2	C198B	60
19.2	C214B ①	70
20.6	C228B ①	80
21.8	C250B ①	80
23.4	C273B ①	80
26.1	C303B ①	90
27.0	C330B ①	90

① For use with Size 1 contactors only.

**Table 36**  
CR324D, Size 2

Max. Motor Full-load Amperes	Heater Cat. No. CR123	Max. Fuse Rating
5.14	C630A	20
5.63	C695A	20
6.26	C778A	20
7.15	C867A	25
7.58	C955A	30
8.39	C104B	30
9.11	C113B	35
9.67	C125B	35
11.0	C137B	40
12.0	C151B	45
14.4	C163B	60
16.3	C180B	60
17.3	C198B	60
19.3	C214B	70
20.9	C228B	80
22.9	C250B	90
24.7	C273B	90
28.0	C303B	100
32.1	C330B	110
35.9	C366B	125
41.5	C400B	150
43.4	C440B	150
45.0	C460B	150

**Table 37**  
CR324E, Size 3

Max. Motor Full-load Amperes	Heater Cat. No. CR123	Max. Fuse Rating
18.0	F233B	70
20.5	F243B	80
21.7	F270B	80
25.1	F300B	90
27.0	F327B	100
30.5	F357B	110
32.5	F395B	125
33.9	F430B	125
38.9	F487B	150
44.4	F567B	175
48.4	F614B	175
52.4	F658B	200
57.0	F719B	225
64.5	F772B	225
68.8	F848B	250
75.7	F914B	275
86.2	F104C	275
90.0	F114C	300

**Table 38—**  
CR324F, Size 4 With Manual Reset

Max. Motor Full-load Amperes	Heater Cat. No. CR123	Max. Fuse Rating
30.5	F357B	100
32.5	F395B	125
33.9	F430B	125
38.9	F487B	150
44.4	F567B	175
48.4	F614B	175
52.4	F658B	200
57.0	F719B	225
64.5	F772B	225
68.8	F848B	250
75.7	F914B	275
86.2	F104C	275
93.0	F114C	300
109	F118C	350
123	F133C	400
131	F149C	400
135	F161C	400

**Table 38—(Continued)**  
CR324F, Size 4 With Automatic Reset Option

Max. Motor Full-load Amperes	Heater Cat. No. CR123	Max. Fuse Rating
32.2	F357B	110
34.0	F395B	125
36.8	F430B	125
44.6	F487B	150
48.4	F567B	175
53.9	F614B	175
57.4	F658B	200
60.0	F719B	225
69.5	F772B	225
71.7	F848B	250
79.9	F914B	275
92.3	F104C	300
96.9	F114C	350
105	F118C	400
113	F133C	400
124	F149C	400
135	F161C	400



# Current Devices *Note: If full-load amperes falls between increments, use next higher rating.*

## Heater Selection Tables For Definite Purpose Control, CR354

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 Max. Fuse Rating.

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

These tables are not to be used to select heaters for Hermetic Motor applications. Contact nearest GE sales office for information.

**Table 44—Three-phase (25- and 30-ampere)**  
(Heater Amperes Based on 75°C Wire)

Open Type ①		
3-phase (3 Heaters Required)		
Maximum Motor Full-load Amperes		Heater Catalog Number
25-ampere Starter	30-ampere Starter	CR123
.39	.39	C054A
.42	.42	C060A
.45	.45	C066A
.51	.51	C071A
.56	.56	C078A
.65	.65	C087A
.73	.73	C097A
.81	.81	C109A
.90	.90	C118A
1.00	1.00	C131A
1.10	1.10	C148A
1.21	1.21	C163A
1.35	1.35	C184A
1.50	1.50	C196A
1.64	1.64	C220A
1.78	1.78	C239A
1.98	1.98	C268A
2.15	2.15	C301A
2.42	2.42	C326A
2.83	2.83	C356A
3.22	3.22	C379A
3.53	3.53	C419A
3.89	3.89	C466A
4.30	4.30	C526A
4.77	4.77	C592A
5.14	5.14	C630A
5.63	5.63	C695A
6.26	6.26	C778A
7.15	7.15	C867A
7.58	7.58	C955A
8.39	8.39	C104B
9.11	9.11	C113B
9.67	9.67	C125B
11.0	11.0	C137B
11.9	11.9	C151B
14.3	14.3	C163B
16.1	16.1	C180B
17.2	17.2	C198B
19.2	19.2	C214B
20.6	20.6	C228B
21.8	21.8	C250B
23.4	23.4	C273B
25.0	26.1	C303B
---	28.9	C330B
---	30.0	C366B

**Table 45—Three-phase (40- and 50-ampere)**  
(Heater Amperes Based on 75°C Wire)  
All heaters are packaged three to a carton

Open Type ①		
3-phase (3 Heaters Required)		
Maximum Motor Full-load Amperes		Heater Catalog Number
40-ampere Starter	50-ampere Starter	CR123
5.95	6.37	C630A
6.55	6.97	C695A
7.32	7.83	C778A
8.23	8.78	C867A
9.15	9.77	C955A
9.64	10.2	C104B
10.4	11.0	C113B
11.5	12.7	C125B
12.6	13.4	C137B
13.6	15.1	C151B
16.1	17.2	C163B
17.5	---	C180B
---	18.7	C180B
18.7	20.8	C198B
20.5	23.1	C214B
22.5	25.6	C228B
24.8	28.4	C250B
26.5	31.3	C273B
29.3	35.8	C303B
32.7	40.7	C330B
36.0	46.5	C366B
39.3	50.0	C400B
40.0	---	C400B

**Table 46—Single-phase (25-, 30-, 40-, and 50-ampere)**  
(Heater Amperes Based on 75°C Wire)  
All heaters are packaged three to a carton.

Open Type ①				
Single-phase (1 Heater Required)				
Maximum Motor Full-load Amperes				Heater Cat. No.
25-ampere Starter	30-ampere Starter	40-ampere Starter	50-ampere Starter	CR123
6.07	6.07	6.07	6.15	C592A
6.42	6.42	6.42	6.47	C630A
6.81	6.81	6.81	6.84	C695A
7.96	7.96	7.96	7.72	C778A
9.14	9.14	9.14	8.99	C867A
9.64	9.64	9.64	9.87	C955A
10.6	10.6	10.6	10.6	C104B
11.7	11.7	11.7	12.0	C113B
12.4	12.4	12.4	12.3	C125B
13.2	13.2	13.2	14.0	C137B
15.2	15.2	15.2	15.7	C151B
18.5	18.5	18.5	17.6	C163B
20.0	20.0	20.0	20.1	C180B
22.4	22.4	22.4	23.3	C198B
24.0	24.0	24.0	27.0	C214B
25.0	25.9	25.9	29.8	C228B
---	27.1	27.1	32.2	C250B
---	28.4	28.4	33.9	C273B
---	30.0	31.5	36.7	C303B
---	---	36.5	42.5	C330B
---	---	40.0	46.2	C366B
---	---	---	50.0	C400B

① Heater selection table applies to open starters and to starters with ambient compensated overload relays when used in Type 1 enclosures.



# Obsolete Devices *Note: If full-load amperes falls between increments, use next higher rating.*

## Reduced-voltage Motor Starters

**Table 54—CR230C, Size 1PW**  
(6 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
10.98	C592A
11.82	C630A
12.94	C695A
14.40	C778A
16.44	C867A
17.44	C955A
19.34	C104B
20.08	C113B
22.00	C125B
24.80	C137B
36.4	C151B
30.8	C163B
34.2	C180B
36.2	C198B
40.0	C214B
43.0	C228B
45.0	C250B

**Table 57—CR230F, Size 4PW**  
(6 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
75.8	F430B
92.0	F487B
99.8	F567B
111.2	F614B
118.4	F658B
123.8	F719B
143.2	F772B
147.8	F848B
164.8	F914B
190.4	F104C
199.8	F114C
210.0	F118C
226.0	F133C
248.0	F149C

**Table 60—CR231E, Size 3**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
25.1	F300B
27.0	F327B
30.5	F357B
32.5	F395B
34.9	F430B
40.1	F487B
44.4	F567B
49.9	F614B
54.0	F658B
58.8	F719B
66.5	F772B
70.7	F848B
78.0	F914B
88.9	F104C
90.0	F114C

**Table 63—CR232C, Size 1YD**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
14.3	C867A
15.1	C955A
16.8	C104B
18.0	C113B
19.1	C125B
21.6	C137B
22.9	C151B
26.7	C163B
29.6	C180B
31.4	C198B
34.7	C214B
37.3	C228B
39.0	C250B
41.4	C273B
45.6	C303B
47.0	C330B

**Table 55—CR230D, Size 2PW**  
(6 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
18.06	C955A
19.22	C104B
21.0	C113B
23.2	C125B
25.0	C137B
27.2	C151B
33.4	C163B
35.8	C180B
37.4	C198B
40.8	C214B
45.4	C228B
49.4	C250B
52.6	C273B
59.0	C303B
67.0	C330B
75.6	C366B

**Table 58—CR230G, Size 5PW**  
(6 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
174.6	C419A
192.2	C466A
212.8	C526A
236	C592A
256	C630A
276	C695A
310	C778A
336	C867A
368	C955A
400	C104B
442	C113B
474	C125B
524	C137B
540	C151B

**Table 61—CR231F, Size 4**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
34.9	F430B
40.1	F487B
44.4	F567B
49.9	F614B
54.0	F658B
58.8	F719B
66.5	F772B
70.7	F848B
78.0	F914B
88.9	F104C
95.9	F114C
109.0	F118C
123.0	F133C
131.0	F149C
135.0	F161C

**Table 64—CR232D, Size 2YD**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
18.2	C113B
20.1	C125B
21.7	C137B
23.6	C151B
28.9	C163B
31.0	C180B
32.4	C198B
35.4	C214B
39.3	C228B
42.8	C250B
43.3	C273B
51.1	C303B
58.1	C330B
65.5	C366B
72.6	C400B
74.9	C440B
78.0	C460B

**Table 56—CR230E, Size 3PW**  
(6 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
44.2	F243B
46.8	F270B
54.0	F300B
58.2	F327B
65.6	F357B
70.0	F395B
75.2	F430B
86.4	F487B
95.4	F567B
107.4	F614B
115.0	F658B
123.0	F719B
140.4	F772B
147.4	F848B

**Table 59—CR231D, Size 2**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
8.06	C867A
9.03	C955A
9.61	C104B
10.5	C113B
11.6	C125B
12.5	C137B
13.6	C151B
16.7	C163B
17.9	C180B
18.7	C198B
20.4	C214B
22.7	C228B
24.7	C250B
26.3	C273B
29.5	C303B
33.5	C330B
37.8	C366B
41.9	C400B
43.2	C440B
45.0	C460B

**Table 62—CR231G, Size 5**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
118	C592A
128	C630A
138	C695A
155	C778A
168	C867A
184	C955A
200	C104B
221	C113B
237	C125B
262	C137B
270	C151B

**Table 65—CR232E, Size 3YD**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
43.5	F300B
46.8	F327B
52.8	F357B
56.3	F395B
60.4	F430B
69.4	F487B
76.9	F567B
86.4	F614B
93.5	F658B
101.8	F719B
115.2	F772B
122.5	F848B
135.1	F914B
154.0	F104C
156.0	F114C



# Obsolete Devices *Note: If full-load amperes falls between increments, use next higher rating.*

## Reduced-voltage Motor Starters (Continued)

**Table 66—CR232F, Size 4YD**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
76.9	F567B
86.4	F614B
93.5	F658B
101.8	F719B
115.2	F772B
122.5	F848B
135.1	F914B
154.0	F104C
166.1	F114C
188.8	F118C
213.0	F133C
226.9	F149C
233.0	F161C

**Table 67—CR232G, Size 5YD**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
166.5	C466A
184.3	C526A
204.4	C592A
222	C630A
239	C695A
269	C778A
291	C867A
320	C955A
347	C104B
383	C113B
411	C125B
453	C137B
467	C151B

**Table 68—CR233C, Size 1**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
5.49	C592A
5.91	C630A
6.47	C695A
7.20	C778A
8.22	C867A
8.72	C955A
9.67	C104B
10.4	C113B
11.0	C125B
12.4	C137B
13.2	C151B
15.4	C163B
17.1	C180B
18.1	C198B
20.0	C214B
21.5	C228B
22.5	C250B
23.9	C273B
26.3	C303B
27.0	C330B

**Table 69—CR134D**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
6.63	C695A
7.59	C778A
8.39	C867A
9.20	C955A
9.93	C104B
11.2	C113B
12.5	C125B
14.1	C137B
15.5	C151B
17.4	C163B
19.8	C180B
21.2	C198B
22.7	C214B
24.9	C228B
27.3	C250B
29.7	C273B
34.2	C303B
40.2	C330B
45.0	C366B

**Table 70—CR134E**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
23.8	F243B
26.0	F270B
28.5	F300B
31.2	F327B
34.2	F357B
37.6	F395B
41.2	F430B
45.3	F487B
49.6	F567B
54.3	F614B
59.6	F658B
65.7	F719B
71.5	F772B
78.8	F848B
86.3	F914B
94.8	F104C
100	F114C

**Table 71—CR134F**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
51.6	F614B
56.8	F658B
64.0	F719B
69.5	F772B
76.5	F848B
82.6	F914B
89.7	F104C
98.5	F114C
110	F118C
121	F133C
150	F149C

**Table 72—CR134G**  
(6 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
108	F614B
118	F658B
129	F719B
141	F772B
152	F848B
164	F914B
176	F104C
188	F114C
199	F118C
211	F133C

**Table 73—CR134H**  
(6 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
80.0	F395B
84.0	F430B
89.5	F487B
99.0	F567B
110	F614B
122	F658B
135	F719B
148	F772B
162	F848B
177	F914B
193	F104C
210	F114C
230	F118C
249	F133C
270	F149C
292	F161C
300	F174C

**Table 74—CR234D**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
6.63	C695A
7.59	C778A
8.39	C867A
9.20	C955A
9.93	C104B
11.2	C113B
12.5	C125B
14.1	C137B
15.5	C151B
17.4	C163B
19.8	C180B
21.2	C198B
22.7	C214B
24.9	C228B
27.3	C250B
29.7	C273B
34.2	C303B
40.2	C330B
45.0	C366B
50.0	C400B

**Table 75—CR234E**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
23.8	F243B
26.0	F270B
28.5	F300B
31.2	F327B
34.2	F357B
37.6	F395B
41.2	F430B
45.3	F487B
49.6	F567B
54.3	F614B
59.6	F658B
65.7	F719B
71.5	F772B
78.8	F848B
86.3	F914B

**Table 76—CR234F**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
51.6	F614B
56.8	F658B
64.0	F719B
69.5	F772B
76.5	F848B
82.6	F914B
89.7	F104C
98.5	F114C
110	F118C
121	F133C
150	F149C

**Table 77—CR234G**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
34.3	F395B
38.9	F430B
45.3	F487B
49.0	F567B
52.6	F614B
57.4	F658B
61.6	F719B
67.8	F772B
73.0	F848B
83.1	F914B
94.7	F104C
105	F118C
118	F133C
133	F149C
145	F161C
157	F174C
170	F190C
185	F205C
200	F223C

**Table 78—CR234H**  
(3 Heaters Required)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
79.9	C419A
90.1	C466A
100	C526A
107	C592A
114	C630A
127	C695A
137	C778A
147	C867A
159	C955A
170	C104B
185	C113B
202	C125B
218	C137B
231	C151B
250	C163B
270	C180B
300	C198B
320	C214B

# Obsolete Devices *Note: If full-load amperes falls between increments, use next higher rating.*

**Table 83—NEMA Sizes 00, 0, & 1**

Use Column A For:  
CR106, CR109①, Open, Types 4, 7, 9  
CR110, CR111①, all enclosures  
CR124A1②③, Open or Type 1  
CR133C④

Use Column B For:  
CR106, CR109①, Types 1, 12  
CR107, CR108①, all enclosures  
CR160C1④

Max. Motor Full-load Amperes		Heater Cat. No. CR123
Column A	Column B	
.33	.31	C036A
.37	.34	C039A
.41	.38	C043A
.46	.43	C048A
.52	.47	C054A
.57	.52	C060A
.61	.56	C066A
.67	.62	C071A
.75	.69	C078A
.84	.77	C087A
.94	.87	C097A
1.03	.94	C109A
1.14	1.04	C118A
1.30	1.18	C131A
1.42	1.30	C148A
1.61	1.47	C163A
1.72	1.56	C184A
1.93	1.75	C196A
2.10	1.90	C220A
2.34	2.13	C239A
2.64	2.40	C268A
2.86	2.60	C301A
3.13	2.84	C326A
3.32	3.02	C356A
3.68	3.34	C379A
4.08	3.72	C419A
4.61	4.20	C466A
5.21	4.73	C526A
5.62	5.02	C592A
6.12	5.55	C630A
6.83	6.21	C695A
7.70	6.92	C778A
8.48	7.64	C867A
9.19	8.31	C955A
9.92	9.04	C104B
11.1	9.99	C113B
12.2	10.9	C125B
13.5	12.0	C137B
14.6	13.0	C151B
16.1	14.3	C163B
17.9	15.8	C180B
19.3	17.0	C198B
20.6	18.1	C214B
22.6	19.9	C228B
24.8	21.8	C250B
27.0	24.2	C273B
---	26.3	C303B
---	27.0	C330B

**Table 84—CR106K, Size 1P③**

Type Enclosure		Device
Open 4, 7, 9	1, 12	CR106
Max. Motor Full-load Amperes		Heater Cat. No. CR123
15.1	---	C151B
16.7	15.0	C163B
18.5	16.6	C180B
20.0	17.9	C198B
21.4	19.0	C214B
23.5	20.9	C228B
25.8	22.9	C250B
28.7	25.4	C273B
31.2	27.6	C303B
36.0	30.7	C330B
---	33.5	C366B
---	36.0	C400B

**Table 85—NEMA Size 2**

Use Column A For:  
CR106, CR109①, Open Types 4, 7, 9  
CR110, CR111①, all enclosures  
CR124B1②③, all  
CR131D, CR133D, CR134D①, all

Use Column B For:  
CR106, CR109①, Types 1, 12  
CR107, CR108①, all enclosures  
CR160C2④

Max. Motor Full-load Amperes		Heater Cat. No. CR123
Column A	Column B	
6.63	---	C695A
7.59	6.89	C778A
8.39	7.76	C867A
9.20	8.63	C955A
9.93	9.53	C104B
11.2	10.7	C113B
12.5	11.7	C125B
14.1	12.8	C137B
15.5	14.3	C151B
17.4	16.1	C163B
19.8	17.9	C180B
21.2	19.3	C198B
22.7	21.4	C214B
24.9	22.6	C228B
27.3	24.6	C250B
29.7	26.7	C273B
34.2	30.0	C303B
40.2	34.8	C330B
45.0	40.1	C366B
---	43.3	C400B
---	45.0	C440B

**Table 86—NEMA Size 3**

Use Column A For:  
CR106, CR109①, Open, Types 4, 7, 9  
CR110, CR111①, all enclosures  
CR131E①, all  
CR133E①, all enclosures

Use Column B For:  
CR106, CR109①, Types 1, 12  
CR107, CR108①, all enclosures

Max. Motor Full-load Amperes		Heater Cat. No. CR123
Column A	Column B	
23.1	20.9	F243B
26.3	23.5	F270B
28.5	25.5	F300B
30.9	27.7	F327B
33.8	30.3	F357B
36.5	32.8	F395B
41.1	37.1	F430B
47.6	42.9	F487B
52.5	47.0	F567B
56.8	50.1	F614B
61.9	54.5	F658B
67.9	58.5	F719B
75.5	64.1	F772B
79.6	68.6	F848B
87.9	77.5	F914B
90.0	83.2	F104C
---	90.0	F114C

**Table 87—NEMA Size 4**

Use Column A For:  
CR106, CR109①, Open, Types 4, 7, 9  
CR110, CR111①, all enclosures  
CR131F①, all  
CR133F①, all enclosures

Use Column B For:  
CR106, CR109①, Types 1, 12  
CR107, CR108①, all enclosures

Max. Motor Full-load Amperes		Heater Cat. No. CR123
Column A	Column B	
37.8	34.3	F395B
42.6	38.9	F430B
49.8	45.3	F487B
54.2	49.0	F567B
59.0	52.6	F614B
65.5	57.4	F658B
70.8	61.6	F719B
79.1	67.8	F772B
83.6	73.0	F848B
92.9	83.1	F914B
100	94.7	F104C
110	---	F114C
124	105	F118C
133	118	F133C
---	133	F149C

**Table 88—NEMA Size 5**

Use Column A For:  
CR106, CR109①, Open, Types 4, 7, 9  
CR110, CR111①, all enclosures  
CR131G, CR133G④, all

Use Column B For:  
CR106, CR109①, Types 1, 12  
CR107, CR108①, all enclosures

Max. Motor Full-load Amperes		Heater Cat. No. CR123
Column A	Column B	
76.2	---	C379A
84.2	79.9	C419A
94.6	90.1	C466A
105	100	C526A
111	107	C592A
122	114	C630A
137	127	C695A
153	137	C778A
170	147	C867A
185	159	C955A
201	170	C104B
223	185	C113B
244	202	C125B
266	218	C137B
270	231	C151B
---	250	C163B
---	270	C180B

① Three heaters required, Single-phase—One heater, Two-speed controllers require six heaters.

② Do not use table for CR124 relays mounted directly on magnetic starters. Refer to table for starter involved.

③ One heater required.

④ Three heaters required.

# Obsolete Devices *Note: If full-load amperes falls between increments, use next higher rating.*

**Table 89—CR130C, Size 1PW①**

Max. Motor Full-load Amperes	Heater Cat. No. CR123
4.16	C239A
4.66	C268A
5.24	C301A
5.66	C326A
6.20	C356A
6.60	C379A
7.28	C419A
8.10	C466A
9.14	C526A
10.30	C592A
10.96	C630A
12.08	C695A
13.5	C778A
15.0	C867A
16.6	C955A
18.0	C104B
19.6	C113B
21.8	C125B
23.8	C137B
26.2	C151B
28.4	C163B
31.2	C180B
34.4	C198B
37.2	C214B
39.6	C228B
43.4	C250B
47.4	C273B
52.6	C303B

**Table 90—CR130D, Size 2PW①**

Max. Motor Full-load Amperes	Heater Cat. No. CR123
13.26	C695A
15.18	C778A
16.78	C867A
18.40	C955A
19.86	C104B
22.4	C113B
25.0	C125B
28.1	C137B
31.0	C151B
34.8	C163B
39.6	C180B
42.4	C198B
43.4	C214B
49.8	C228B
54.6	C250B
59.4	C273B
68.4	C303B
80.4	C330B
92.0	C366B

**Table 91—CR130E, Size 3PW①**  
**CR130F, Size 4PW①**

Max. Motor Full-load Amperes		Heater Cat. No. CR123
CR130E Size 3PW	CR130F Size 4PW	
46.2	---	F243B
52.6	---	F270B
57.0	---	F300B
61.8	---	F327B
67.6	---	F357B
73.0	75.6	F395B
82.2	85.2	F430B
95.2	99.6	F487B
105	108	F567B
113	118	F614B
123	131	F658B
135	141	F719B
151	158	F772B
159	167	F848B
175	185	F914B
180	200	F104C
---	220	F114C
---	248	F118C
---	270	F133C

**Table 92—CR130G, Size 5PW①**

Max. Motor Full-load Amperes	Heater Cat. No. CR123
152	C379A
168	C419A
189	C466A
210	C526A
222	C592A
244	C630A
274	C695A
306	C778A
340	C867A
370	C955A
402	C104B
446	C113B
488	C125B
532	C137B
540	C151B

**Table 93—CR132C, Size 1YD②**

Max. Motor Full-load Amperes	Heater Cat. No. CR123	Max. Fuse Rating
4.69	C301A	10
5.42	C326A	10
5.75	C356A	10
6.38	C379A	10
7.07	C419A	15
7.99	C466A	15
9.03	C526A	20
9.74	C592A	20
10.6	C630A	20
11.8	C695A	25
13.3	C778A	25
14.7	C867A	30
15.9	C955A	30
17.2	C104B	30
19.2	C113B	35
21.1	C125B	40
23.4	C137B	45
25.3	C151B	45
27.9	C163B	50
31.0	C180B	60
33.5	C198B	60
35.7	C214B	70
39.2	C228B	70
43.0	C250B	80
47.8	C273B	90

**Table 94—CR132D, Size 2YD②**

Max. Motor Full-load Amperes	Heater Cat. No. CR123	Max. Fuse Rating
11.5	C695A	20
13.1	C778A	25
14.5	C867A	30
16.0	C955A	30
17.2	C104B	30
19.4	C113B	35
21.6	C125B	40
24.4	C137B	40
26.8	C151B	50
30.2	C163B	50
34.3	C180B	60
36.7	C198B	70
39.3	C214B	70
43.1	C228B	80
47.3	C250B	80
51.5	C273B	100
59.2	C303B	110
69.6	C330B	125
80.0	C366B	150

**Table 95—CR132E, Size 3YD②**

Max. Motor Full-load Amperes	Heater Cat. No. CR123	Max. Fuse Rating
41.2	F243B	80
45.1	F270B	90
49.4	F300B	100
54.1	F327B	110
59.3	F357B	125
65.2	F395B	125
71.4	F430B	150
78.5	F487B	150
86.0	F567B	175
94.1	F614B	200
103	F658B	200
114	F719B	225
124	F772B	250
137	F848B	300
150	F914B	300
158	F104C	300

**Table 96—CR132F, Size 4YD②**

Max. Motor Full-load Amperes	Heater Cat. No. CR123	Max. Fuse Rating
89.4	F614B	200
98.4	F658B	200
111	F719B	250
120	F772B	250
133	F848B	300
143	F914B	300
155	F104C	300
171	F114C	300
191	F118C	400
210	F133C	400
234	F149C	400

**Table 97—CR132G, Size 5YD②**

Max. Motor Full-load Amperes	Heater Cat. No. CR123
132	C379A
146	C419A
164	C466A
182	C526A
192	C592A
211	C630A
237	C695A
264	C778A
294	C867A
320	C955A
347	C104B
386	C113B
422	C125B
460	C137B
467	C151B

① Six heaters required.

② Three heaters required.

# Obsolete Devices *Note: If full-load amperes falls between increments, use next higher rating.*

**Table 98**—Enclosed Type Starters

CR7006D53, G3D, G3E; CR7008A43, C43;  
CR7009B33; CR7107K63  
*Heaters for these devices are no longer available*

**Table 99**—Open or Enclosed

CR1061B2, C1, C2, F1  
*Heaters for these devices are no longer available.*

**Table 100**—Open or Enclosed

CR1061H and G  
*Heaters for these devices are no longer available.*

**Table 101**—Open or Enclosed

CR1062B6, B7, B8, E2E, and J3  
CR1062C4, C5, E3D, J4, and K2A  
*Heaters for these devices are no longer available.*

**Table 102**—Open or Enclosed

CR1062M, Size M-0; CR1062N, Size M-1

Max. Motor Full-load Amperes		Heater Cat. No. For General Use CR123	Heater Cat. No. For Group Fuses Size M-0 Only
2-pole Forms ①	3-, 4-pole Forms ②		
.38	.36	C036A	③
.43	.43	C039A	③
.46	.43	C043A	③
.50	.48	C048A	③
.57	.53	C054A	③
.63	.59	C060A	③
.70	.65	C066A	③
.76	.71	C071A	③
.83	.78	C078A	③
.92	.88	C087A	③
1.06	1.00	C087A	③
1.12	1.06	C097A	③
1.24	1.17	C109A	③
1.36	1.29	C118A	③
1.52	1.43	C131A	③
1.66	1.60	C148A	③
1.84	1.74	C163A	③
2.02	1.91	C184A	③
2.20	2.08	C196A	③
2.42	2.28	C220A	③
2.68	2.52	C239A	③
2.96	2.79	C268A	③
3.24	3.05	C301A	③
3.53	3.32	C326A	③
3.86	3.64	C356A	③
4.25	4.00	C379A	③
4.65	4.39	C419A	③
5.12	4.85	C466A	③
5.61	5.30	C526A	③
6.15	5.80	C592A	③
6.76	6.44	C630A	③
7.43	7.00	C695A	③
8.13	7.65	C788A	③
8.98	8.40	C867A	③
9.73	9.20	C955A	③
10.7	10.2	C955A	③
11.7	11.0	C104B	③
12.9	12.2	C113B	③
14.1	13.3	C125B	③
15.4	14.5	C137B	③
16.7	15.8	C151B	③

Continued in next column.

**Table 102**—Open or Enclosed (Continued)

CR1062N Only, Sizes M-1 and M-1P

Max. Motor Full-load Amperes		Heater Cat. No. For General use CR123
2-pole Forms ①	3-, 4-pole Forms ②	
18.3	17.1	C163B
19.8	18.7	C180B
21.6	20.2	C198B
22.2	21.7	C214B
23.9	---	C228B
25.4	---	C250B
28.0	---	C273B
31.0	---	C330B
33.0	---	C366B
36.0	---	C400B
38.0	---	C400B

**Table 103**—CR1034D ②

Max. Motor Full-load Amperes	Heater Cat. No. CR123
3.43	C358A
3.75	C379A
4.13	C419A
4.54	C466A
5.00	C526A
5.49	C592A
6.04	C630A
6.63	C695A
7.30	C778A
8.00	C867A
8.75	C955A
9.65	C955A
10.0	C104B
10.7	C113B
12.2	C125B
13.7	C137B
15.5	C151B
16.1	C163B
18.3	C180B
20.9	C198B
23.1	C214B
24.7	C228B
27.6	C250B
30.4	C273B
33.0	C303B
38.0	C330B
43.3	C366B
49.0	C400B

**Table 104**—

Use Column A For: CR1034E; CR7051E200

Use Column B For: CR1034F; CR7051F200

Max. Motor Full-load Amperes		Heater Cat. No. CR123
Column A	Column B	
16.4	---	F181B
17.9	---	F199B
19.7	---	F218B
21.7	---	F233B
23.8	---	F243B
26.0	---	F270B
28.5	---	F300B
31.2	---	F327B
34.2	---	F357B
37.6	---	F395B
41.2	---	F430B
45.3	---	F487B
49.6	---	F567B
54.3	51.6	F614B
59.6	56.8	F658B
65.7	64.0	F719B
71.5	69.5	F772B
78.8	76.5	F848B
86.3	82.6	F914B
94.8	89.7	F104C
100	98.5	F114C
---	110	F118C
---	121	F133C
---	150	F149C

**Table 105**—CR1034G200 ④, G150 ④

Max. Motor Full-load Amperes		Heater Cat. No. CR123
CR1034G200	CR1034G150	
---	80.0	F395B
---	84.0	F430B
---	89.4	F487B
---	99.0	F567B
---	110.0	F614B
108	122	F658B
118	135	F719B
129	148	F772B
141	162	F848B
152	177	F914B
164	193	F104C
176	210	F114C
188	230	F118C
199	249	F133C
211	270	F149C
---	292	F161C
---	300	F174C

**Table 106**—CR7050E100, Size 3PW ④

Max. Motor Full-load Amperes		Heater Cat. No. CR123
Open	Enclosed	
47.7	42.5	F243B
52.0	46.5	F270B
57.1	50.9	F300B
62.5	55.5	F327B
68.5	60.7	F357B
75.3	66.9	F395B
82.2	73.1	F430B
90.7	80.1	F487B
99.3	90.1	F567B
108.7	98.3	F614B
119.3	106.5	F658B
131.5	116.1	F719B
143.1	124.9	F772B
157.7	135.3	F848B
172.3	147.0	F914B
189.7	167.0	F104C
200.0	180.0	F114C

**Table 107**—

CR7050F100, Size 4PW ④

CR7050G200, Size 5PW ④

Max. Motor Full-load Amperes		Heater Cat. No. CR123
CR7050F100	CR7050G200	
---	179	F395B
---	187	F430B
---	201	F487B
---	221	F567B
103.3	241	F614B
113.7	265	F658B
128.1	291	F719B
139.1	321	F772B
153.1	353	F848B
165.5	383	F914B
179.5	427	F104C
197.1	475	F114C
221.0	517	F118C
243.0	569	F133C
300.0	600	F149C

① One heater required.

② Three heaters required.

③ For reference only. Heaters no longer available.

④ Four heaters required.

# Obsolete Devcies *Note: If full-load amperes falls between increments, use next higher rating.*

**Table 108—Enclosed Starters**

CR4006A; CR4009A; CR7006B11A;  
CR7006D50, D51, D52, G10, G11;  
CR7008A40, A41, C40, C41;  
CR7009B32, B32, B40, B50, B51;  
CR7010A70, A71, C70, C71;  
CR7107K30, K31, K32, K40, K41, K42, K50,  
K51, K61, K62;  
CR7108A20, A21, C20, C21

Max. Motor Full-load Amperes	Heater Cat. No. CR123
.31	C036A
.36	C039A
.42	C048A
.48	C060A
.56	C066A
.65	C071A
.74	C078A
.82	C087A
.91	C097A
1.04	C109A
1.16	C131A
1.33	C148A
1.52	C163A
1.74	C184A
2.00	C220A
2.32	C268A
2.61	C301A
3.04	C326A
3.48	C379A
4.00	C419A
4.70	C526A
5.40	C630A
6.10	C630A
6.90	C778A
7.90	C867A
8.70	C955A
9.80	C104B
10.5	C113B
11.8	C125B
13.6	C151B
15.1	C163B
16.7	C180B
19.1	C198B
22.2	C228B
24.0	C250B
27.5	C330B
31.3	C330B
35.2	C400B
40.0	C400B
45.0	C490B

**Table 109—**

Use Column A For:  
Open Starters, CR7006D50, D51;  
CR7009B31, B40, B50, B51;  
CR7107K51  
Relays, CR2824, —41C, —41H  
Use Column B For:  
Open Starters, CR7006D52;  
CR7009B32; CR7107K32, K42, K62  
Encl. Starters, CR7008A42, C42;  
CR7010A72, C72; CR7108A22, C22

Max. Full-load Amperes		Heater Cat. No. CR123
Column A	Column B	
.35	.35	C036A
.40	.40	C039A
.46	.46	C048A
.54	.54	C060A
.64	.64	C066A
.73	.73	C078A
.83	.83	C087A
.93	.93	C087A
1.02	1.02	C097A
1.15	1.15	C109A
1.30	1.30	C131A
1.50	1.50	C148A
1.71	1.71	C163A
1.96	1.96	C184A
2.24	2.24	C220A
2.61	2.61	C268A
3.0	3.0	C301A
3.4	3.4	C326A
3.9	3.9	C379A
4.5	4.5	C419A

*Continued in next column.*

**Table 109—(Continued)**

Max. Motor Full-load Amperes		Heater Cat. No. CR123
Column A	Column B	
5.3	5.3	C526A
6.1	6.1	C630A
6.8	—	C778A
—	6.8	C778A
—	7.8	C778A
8.9	8.9	C867A
9.4	9.4	C955A
11.0	11.0	C104B
11.8	11.8	C113B
13.2	13.0	C125B
15.3	14.7	C151B
16.9	16.5	C163B
19.0	18.2	C180B
22.2	20.9	C198B
26.0	23.9	C228B
28.5	27.2	C250B
—	31.3	C330B
33.1	—	C330B
—	35.6	C330B
38.7	—	C330B
43.5	38.2	C366B
50.0	43.5	C400B
—	50.0	C400B

**Table 110**

NEMA Type Enclosure		Device
All	Enclosed	
Open 4, 7, 9	1, 5, 12	CR7009A, Size 00 CR7056C213, Size 1 CR4006 and CR7006, Size 0 or 1 CR7008, Size 0 or 1
Open 1, 4	1, 1A, 4, 5 7, 9, 12	CR4009, Size 0 or 1 CR7056C213, Size 1 CR7010, Size 0 or 1 CR7101 and CR7108 Size 0 or 1
Max. Motor Full-load Amperes		Heater Cat. No. CR123
.33	.30	C036A
.35	.32	C039A
.39	.36	C043A
.42	.39	C048A
.46	.42	C054A
.50	.46	C060A
.56	.52	C066A
.62	.57	C071A
.67	.62	C078A
.75	.70	C087A
.85	.79	C087A
.90	.83	C097A
.90	.92	C109A
1.09	1.00	C118A
1.20	1.10	C131A
1.32	1.21	C148A
1.45	1.34	C163A
1.60	1.48	C184A
1.76	1.62	C196A
1.93	1.78	C220A
2.12	2.17	C239A
2.35	2.17	C268A
2.58	2.38	C301A
2.84	2.62	C326A
3.11	2.88	C356A
3.42	3.16	C379A
3.77	3.48	C419A
4.10	3.82	C466A
4.50	4.10	C526A
5.00	4.60	C592A
5.5	5.1	C630A
6.0	5.6	C695A
6.6	6.2	C778A
7.3	6.8	C867A
8.0	7.4	C955A
8.7	8.0	C955A
9.5	8.7	C104B
10.4	9.4	C113B
11.5	10.2	C125B
12.7	11.3	C137B
13.8	12.2	C151B
15.2	13.4	C163B
16.8	14.8	C180B
18.7	16.2	C198B
20.7	17.9	C214B
22.5	19.5	C228B
25.0	21.2	C250B
—	22.5	C273B

**Table 111—Size 2①**

NEMA Type Enclosure		Device
Open, 4, 7, 9	1, 12	
	1, 4, 7, 9, 12	CR7006
Open, 1, 4 7, 9, 12		CR7009 and CR7010
Open, 1, 4 7, 9, 12		CR7107 and CR7108
Max. Motor Full-load Amperes		Heater Cat. No. CR123
3.43	3.13	C356A
3.75	3.44	C379A
4.13	3.78	C419A
4.54	4.16	C466A
5.00	4.57	C526A
5.49	5.03	C592A
6.04	5.52	C630A
6.63	6.07	C695A
7.30	6.67	C778A
8.00	7.35	C867A
8.75	8.05	C955A
9.65	8.78	C955A
10.0	9.05	C104B
10.7	9.83	C113B
12.2	11.0	C125B
13.7	12.3	C137B
15.5	13.7	C151B
16.1	14.5	C163B
18.3	16.3	C180B
20.9	18.5	C198B
23.1	20.7	C214B
24.7	22.2	C228B
27.6	24.5	C250B
30.4	27.5	C273B
33.0	28.9	C303B
38.0	32.8	C330B
43.3	37.0	C366B
49.0	42.0	C400B

**Table 112—NEMA Size 3**

Use Column A For:  
CR2825A103 (H, J, K)②—Type 1  
CR7006E①—Open, Types 4, 7, 9  
CR7009E & CR7010E① all enclosures  
CR7051E201①—all  
CR7107E & CR7108E③—all enclosures

Use Column B For:  
CR7006E①—Types 1, 12  
CR7008E①—all enclosures  
CR7056E213①—all

Max. Motor Full-load Amperes		Heater Cat. No. CR123
Column A	Column B	
23.8	21.2	F243B
26.0	23.2	F270B
28.5	25.4	F300B
31.2	27.7	F327B
34.2	30.3	F357B
37.6	33.4	F395B
41.2	36.5	F430B
45.3	40.0	F487B
49.6	45.0	F567B
54.3	49.3	F614B
59.6	53.2	F658B
65.7	58.0	F719B
71.5	62.4	F772B
78.8	67.6	F848B
86.3	73.0	F914B
94.8	83.0	F104C
100.0	90.0	F114C

- ① Three heaters required. Two-speed controllers require three heaters for each speed.
- ② Do not use tables for CR2824 or CR2825 relays mounted directly on magnetic starter. Refer to table for starter involved.
- ③ Four heaters required; Eight on CR7107 and CR7108 (Size 5).

# Obsolete Devices

**Table 113—NEMA Size 4**

CR7006F<sup>①</sup>, CR7008F<sup>①</sup>, CR7009F<sup>①</sup>, CR7010F<sup>①</sup>  
 CR7051F201<sup>①</sup>, CR7056F213<sup>①</sup>  
 CR7107F<sup>③</sup>, CR7108F<sup>③</sup>

Max. Motor Full-load Amperes	Heater Cat. No. CR123
51.6	F614B
56.8	F658B
64.0	F719B
69.5	F772B
76.5	F848B
82.6	F914B
89.7	F104C
98.5	F114C
110	F118C
121	F133C
150	F149C

**Table 114—NEMA Size 5**

Device	NEMA Enclosure Type	Device	NEMA Enclosure Type	
CR7006G <sup>③</sup> CR7008G <sup>③</sup> CR7009G <sup>③</sup> CR7010G <sup>③</sup> CR7107G <sup>③</sup> CR7108G <sup>③</sup>	All Enclosed Forms	CR2824-42G <sup>①</sup>	Open	
		CR7006G <sup>③</sup> CR7008G <sup>③</sup> CR7009G <sup>③</sup> CR7010G <sup>③</sup> CR7107G <sup>③</sup> CR7108G <sup>③</sup>	All Open Forms	
		CR7051G <sup>③</sup> CR7056G <sup>③</sup>	All	
Max. Motor Full-load Amperes		Heater Cat. No. CR123	Max. Motor Full-load Amperes	Heater Cat. No. CR123
80.0		F395B	89	F395B
84.0		F430B	93	F430B
89.5	F487B	100	F487B	
99.0	F567B	110	F567B	
110	F614B	120	F614B	
122	F658B	132	F658B	
135	F719B	145	F719B	
148	F772B	160	F772B	
162	F848B	176	F848B	
177	F914B	191	F914B	
193	F104C	213	F104C	
210	F114C	237	F114C	
230	F118C	258	F118C	
249	F133C	284	F133C	
270	F149C	300	F149C	
292	F161C	----	----	
300	F174C	----	----	

**Table 115—Size 4, CR2824-42D<sup>②④</sup>**

Max. Motor Full-load Amperes	Heater Cat. No. CR123
17.2	F181B
19.0	F199B
21.0	F218B
22.9	F233B
24.8	F243B
27.2	F270B
30.0	F300B
33.0	F327B
36.2	F357B
40.0	F395B
44.0	F430B
49.6	F487B
56.5	F567B
64.2	F614B
71.8	F658B
76.4	F719B
86.6	F772B
94.7	F848B
103	F914B
115	F104C
130	F114C
135	F118C

**Table 116**

Relays:  
 CR2824-1A, -2B, -3B, -2D, -3D  
 Enclosed-type Starters:  
 CR7006D7A, D7B, D7CA, D7P, D7T  
 CR7006G3A; CR7008A3, B23, C3  
 CR7107K6, K10

*Heaters for these devices are no longer available.*

**Table 117**

CR2824-41M<sup>②④</sup> Size 2, Open  
 CR2825A102P, R, & S<sup>②</sup> Enclosed

Max. Motor Full-load Amperes	Heater Cat. No. CR123
3.78	C356A
3.72	C379A
4.10	C419A
4.50	C466A
4.95	C526A
5.45	C592A
6.00	C630A
6.60	C695A
7.25	C778A
7.89	C867A
8.70	C955A
9.65	C995A
10.60	C104B
11.65	C113B
12.80	C125B
14.10	C137B
15.40	C151B
16.95	C163B
18.70	C180B
20.80	C198B
23.00	C214B
24.80	C228B
27.60	C250B
30.40	C273B
33.00	C303B
38.00	C330B
43.30	C366B
49.00	C400B

**Table 118**

NEMA Enclosure		Device	
Open	1	CR7006D38	
----	1	CR7008A5 CR7008C5	
Max. Motor Full-load Amperes	Use CR9905G101A2 Overload Relay And Heater Cat. No. <sup>⑤</sup> CR123	Heaters Required	
20	----	F181B	2
26	20	F199B	2
29	26	F218B	2
---	29	F233B	2
34	---	F300B	2
38	34	F327B	2
---	38	F357B	2
44	---	F199B	4
---	44	F218B	4
48	---	F233B	4
57	48	F243B	4
---	57	F270B	4
65	---	F300B	4
73	65	F327B	4
82	73	F357B	4
89	80	F395B	4
93	84	F430B	4
100	89.5	F487B	4
110	96	F567B	4
120	110	F614B	4
132	120	F658B	4
145	135	F719B	4
160	145	F772B	4
176	162	F848B	4
191	177	F914B	4
213	192	F104C	4
237	210	F114C	4
258	230	F118C	4
284	249	F133C	4
300	270	F149C	4

**Table 119—Sizes 0 & 1**

CR2824-41L<sup>②④</sup> Open  
 CR2825A102T, W, & X<sup>②</sup> Enclosed

Max. Motor Full-load Amperes	Heater Cat. No. CR123
.36	C036A
.38	C039A
.42	C043A
.46	C048A
.54	C054A
.61	C060A
.67	C071A
.73	C078A
.82	C087A
.93	C087A
.98	C097A
1.08	C109A
1.18	C118A
1.30	C131A
1.43	C148A
1.58	C163A
1.74	C184A
1.91	C196A
2.10	C220A
2.31	C239A
2.55	C268A
2.80	C301A
3.08	C326A
3.38	C356A
3.72	C379A
4.10	C419A
4.50	C466A
4.95	C526A
5.45	C592A
6.00	C630A
6.60	C695A
7.25	C778A
7.89	C867A
8.70	C955A
9.65	C995A
10.60	C104B
11.65	C113B
12.80	C125B
14.10	C137B
15.40	C151B
16.95	C163B
18.70	C180B
20.80	C198B
23.00	C214B
24.79	C228B
27.60	C250B
30.40	C273B
33.00	C303B
38.00	C330B
43.30	C366B
49.00	C400B

**Table 120**

Relays:  
 CR2824-1B, -2C, -2E, -3C, -3E

Enclosed Starters:  
 CR7006D7DC, D7DD, D7E, D31;  
 CR7006G4A; CR7008A4, B24, C4;  
 CR7009B26

Open Starters:  
 CR7006D7DU, CR7006D31

*Heaters for these devices are no longer available.*

① Three heaters required. Two-speed controllers require three heaters for each speed.

② Do not use tables for CR2824 or CR2825 relays mounted directly on magnetic starters. Refer to table for starter involved.

③ Four heaters required; eight on CR7107 and CR7108 (Size 5).

④ One heater required.

⑤ Supersedes CR2824 TC221 (Cat. No. 2019555) series relays and heaters.

# Obsolete Devices

## Table 121

Enclosed Starters  
CR7006B1G, B1H, B1L, B1R, D30, D40CV, G2;  
CR7008A1, A2, B21, B22, C1, C2;  
CR7009B18

Open Starters:  
CR7006D30, D40

Heaters for these devices are no longer available.

## Table 122—Size 4

CR9906F104A Replacement Kit<sup>②</sup> for  
CR2824B1A, Kit consists of CR2824—42D relay &  
bracket for use on CR7006D54 and  
CR7107K34, K44, K64 open starters and these  
enclosed starters: CR7006D54, G4B, G4C;  
CR7008A44, B14, C44; CR7009B34; CR7101A74;  
and CR7107K34, K44, K64.

(See Tables 124 and 127)

Max. Motor Full-load Amperes	Heater Cat. No. CR123
56.1	F614B
62.2	F658B
67.1	F719B
73.4	F772B
79.1	F848B
84.6	F914B
93.6	F104C
103.0	F114C
114.0	F118C
125.0	F133C
135.0	F149C

## Table 123—Size 3

CR2824—42B<sup>②③</sup>

Max. Motor Full-load Amperes	Heater Cat. No. CR123
24.8	F243B
27.2	F270B
30.0	F300B
33.0	F327B
36.2	F357B
40.0	F395B
44.0	F430B
48.4	F487B
53.3	F567B
58.6	F614B
64.4	F658B
71.3	F719B
78.0	F772B
86.0	F848B
94.8	F914B
100	F104C

## Table 124—Size 4

Enclosed Starters:  
CR7006D54, G4B, G4C  
CR7009B34; CR7107K34, K44, K64

Heaters for these devices are no longer available.

## Table 125

Enclosed Starters:  
CR7010A73, C73; CR7108A23, C23

Open Starters:  
CR7006D53; CR7009B33; CR7107K63

Heaters for these devices are no longer available.

## Table 126—Size 2

CR7056D213

Max. Motor Full-load Amperes	Heater Cat. No. CR123
3.13	C356A
3.44	C379A
3.78	C419A
4.16	C466A
4.57	C526A
5.03	C592A
5.52	C630A
6.07	C695A
6.67	C778A
7.35	C867A
8.05	C955A
8.78	C955A
9.05	C104B
9.83	C113B
11.0	C125B
12.3	C137B
13.7	C151B
14.5	C163B
16.3	C180B
18.5	C198B
20.7	C214B
22.2	C228B
24.5	C250B
27.5	C273B
28.9	C303B
32.8	C330B
37.0	C366B
42.0	C400B

## Table 127—Size 4 Relays

CR2824B1A, B1B

Enclosed Starters:

CR7008A44, B14, C44; CR7010A74

Open Starters:

CR7006D54; CR7107K34, K44, K64

Heaters for these devices are no longer available.

## Table 128—Size 2PW<sup>③</sup>

CR7050D100

Max. Motor Full-load Amperes		Heater Cat. No. CR123
Open	Enclosed	
6.87	6.27	C356A
7.51	6.89	C379A
8.27	7.57	C419A
9.09	8.23	C466A
10.01	9.15	C526A
10.99	10.07	C592A
12.09	11.05	C630A
13.27	12.15	C695A
14.61	13.25	C778A
16.01	14.71	C867A
17.51	16.11	C955A
19.31	17.57	C955A
20.10	18.11	C104B
21.50	19.67	C113B
24.50	22.10	C125B
27.5	24.7	C137B
31.1	27.6	C151B
32.3	29.1	C163B
36.7	31.7	C180B
41.9	37.1	C198B
46.3	41.5	C214B
49.5	44.5	C228B
53.3	49.1	C250B
60.9	55.1	C273B
67.9	57.9	C303B
77.9	65.7	C330B
86.7	74.1	C366B
99.9	84.0	C400B

## Table 129

Enclosed Starters: CR7009B24

Heaters for this device are no longer available.

## Table 130

CR1034G100<sup>④</sup>

Max. Motor Full-load Amperes	Heater Cat. No. CR123
105	C196A
115	C220A
127	C239A
142	C268A
154	C301A
170	C326A
192	C356A
205	C379A

## Table 131—Size 2

Enclosed Starters:

CR7051D200<sup>④</sup>

Max. Motor Full-load Amperes	Heater Cat. No. CR123
.36	C036A
.38	C039A
.42	C043A
.46	C048A
.50	C054A
.54	C060A
.61	C066A
.67	C071A
.73	C078A
.82	C087A
.93	C087A
.98	C097A
1.08	C109A
1.18	C118A
1.30	C131A
1.43	C148A
1.58	C163A
1.74	C184A
1.91	C196A
2.10	C220A
2.31	C239A
2.55	C268A
2.80	C301A
3.08	C326A
3.43	C356A
3.75	C379A
4.13	C419A
4.54	C466A
5.00	C526A
5.49	C592A
6.04	C630A
6.63	C695A
7.30	C778A
8.00	C867A
8.75	C955A
9.65	C955A
10.0	C104B
10.7	C113B
12.2	C125B
13.7	C137B
15.5	C151B
16.1	C163B
18.3	C180B
20.9	C198B
23.1	C214B
24.7	C228B
27.6	C250B
30.4	C273B
33.0	C303B
38.0	C330B
43.3	C366B
49.0	C400B
56.0	C400B

① One heater required.

② Do not use tables for CR2824, CR2825, or CR124 relays mounted directly on magnetic starters. Refer to table for starter involved.

③ Six heaters required.

④ Three heaters required.

# Obsolete Devices

**Table 132**

Enclosed Starters:  
CR7107K7

Heaters for this device are no longer available.

**Table 133**

Enclosed Starters:  
CR7006B1A, G1B, D40; CR7009B20

Heaters for these devices are no longer available.

**Table 134**—Size 1½ ①

Open or Enclosed: CR7006C103

Max. Motor Full-load Amperes	Heater Cat. No. CR123
16.3	C180B
18.5	C198B
20.7	C214B
22.2	C228B
24.5	C250B
27.5	C273B
28.9	C303B
32.8	C330B
37.0	C366B

① Six heaters required.

## Heater Cross Reference

Old Heater Catalog Number	Superseded By	Old Heater Catalog Number	Superseded By	Old Heater Catalog Number	Superseded By
81D224	CR123C039A	81D265	CR123C151B	81D558	CR123C198B
81D225	CR123C043A	81D266	CR123C366B	81D559	CR123C214B
81D226	CR123C400B	81D267	CR123C163B	81D560	CR123C228B
81D227	CR123C490B	81D268	CR123C330B	81D561	CR123C250B
81D228	CR123C036A	81D270	CR123C440B	81D562	CR123C273B
81D229	CR123C039A	81D522	CR123C087A	81D563	CR123C460B
81D230	CR123C048A	81D525	CR123C054A	81D564	CR123C500B
81D231	CR123C060A	81D526	CR123C066A	81D565	CR123C550B
81D232	CR123C066A	81D527	CR123C071A	81D566	CR123C600B
81D233	CR123C078A	81D528	CR123C087A	81D570	CR123F161C
81D234	CR123C071A	81D529	CR123C097A	81D571	CR123F174C
81D235	CR123C087A	81D530	CR123C109A	81D572	CR123F190C
81D236	CR123C097A	81D531	CR123C118A	81D573	CR123F205C
81D237	CR123C109A	81D532	CR123C148A	81D574	CR123F223C
81D238	CR123C131A	81D533	CR123C163A	81D576	CR123F181B
81D239	CR123C148A	81D534	CR123C184A	81D577	CR123F199B
81D240	CR123C163A	81D535	CR123C196A	81D578	CR123F218B
81D241	CR123C184A	81D536	CR123C220A	81D579	CR123F233B
81D242	CR123C220A	81D537	CR123C239A	81D580	CR123F243B
81D243	CR123C268A	81D538	CR123C268A	81D581	CR123F270B
81D244	CR123C301A	81D539	CR123C301A	81D582	CR123F300B
81D245	CR123C326A	81D540	CR123C326A	81D583	CR123F327B
81D246	CR123C379A	81D541	CR123C356A	81D584	CR123F357B
81D247	CR123C419A	81D542	CR123C379A	81D585	CR123F395B
81D248	CR123C526A	81D543	CR123C419A	81D586	CR123F430B
81D249	CR123C630A	81D544	CR123C466A	81D587	CR123F487B
81D250	CR123C778A	81D545	CR123C526A	81D588	CR123F567B
81D251	CR123C867A	81D546	CR123C592A	81D589	CR123F614B
81D252	CR123C955A	81D547	CR123C630A	81D590	CR123F658B
81D253	CR123C104B	81D548	CR123C695A	81D591	CR123F719B
81D254	CR123C113B	81D549	CR123C778A	81D592	CR123F772B
81D255	CR123C125B	81D550	CR123C867A	81D593	CR123F848B
81D256	CR123C180B	81D551	CR123C955A	81D594	CR123F914B
81D257	CR123C198B	81D552	CR123C955A	81D595	CR123F104C
81D258	CR123C228B	81D553	CR123C104B	81D596	CR123F114C
81D259	CR123C250B	81D553	CR123C104B	81D597	CR123F118C
81D261	CR123C303B	81D554	CR123C113B	81D598	CR123F133C
81D262	CR123C330B	81D555	CR123C125B	81D599	CR123F149C
81D263	CR123C400B	81D556	CR123C137B		
81D264	CR123C630A	81D557	CR123C151B		





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