

Heater Element Specifications

Bulletin Number 592

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Additional Resources

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

Resource	Description
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.ab.com	Provides declarations of conformity, certificates, and other certification details.

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



 <p style="text-align: center;">Type W Heater Elements</p>	<p>Eutectic Alloy Overload Relay Heater Elements</p> <ul style="list-style-type: none"> • Type J — CLASS 10 • Type P — CLASS 20 (Bul. 600 ONLY) • Type W — CLASS 20 • Type WL — CLASS 30 <p>Note: Heater Element Type W/WL does not currently meet the material restrictions related to EU ROHS</p>	
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Description

Overload Relay Class Designation

United States Industry Standards (NEMA ICS 2 Part 4) designate an overload relay by a class number indicating the maximum time in seconds at which it will trip when carrying a current equal to 600 percent of its current rating.

A Class 10 overload relay will trip in 10 seconds or less at a current equal to 600 percent of its rating.

A Class 20 overload relay will trip in 20 seconds or less at a current equal to 600 percent of its rating.

A Class 30 overload relay will trip in 30 seconds or less at a current equal to 600 percent of its rating.

Allen-Bradley standard overload relay protection is provided using Type W heater elements for the 500 Line. This provides Class 20 operation and is recommended for General Applications.

Specific Applications may require Class 10 or Class 30 overload relays. Class 10 overload relays are often used with hermetic motors, submersible pumps, or motors with short locked rotor time capability. Class 30 overload relays should be used with motors driving high inertia loads, where additional accelerating time is needed and the safe permissible locked rotor time of the motor is within Class 30 performance requirements.

For applications requiring Class 30 protection, Type WL heater elements are available. To order, use the applicable Type W selection table, follow the heater element selection instructions and change the “W” in the Heater Type Number to “WL”.

For applications requiring Class 10 overload relays, Type J elements are available. See page 1-170 for Index to Heater Element Selection Tables.

Heater Element Selection

The “Full Load Amperes” listed in the tables are to be used for heater element selection. For Type J and W Heater Elements, the rating of the relay in amperes at +40 °C (+104 °F) is 115% of the “Full Load Amperes” listed for the “Heater Type Number”. For Type WL Heater Elements, the rating is 120% of the “Full Load Amperes” listed for the “Heater Type Number.”

Refer to the motor nameplate for the full load current, the service factor, and/or the motor classification by application and temperature rise.

Use this motor nameplate information, the application rules, and the “Full Load Amperes” listed in the proper table (see Index) to determine the “Heater Type Number.”

The following is for motors rated for Continuous Duty:

For motors with marked service factor of not less than 1.15, or motors with a marked temperature rise not over +40 °C (+104 °F), apply application rules 1 through 3. Apply application rules 2 and 3 when the temperature difference does not exceed +10 °C (+18 °F). When the temperature difference is greater, see below.

1. **The Same Temperature at the Controller and the Motor** — Select the “Heater Type Number” with the listed “Full Load Amperes” nearest the full load value shown on the motor nameplate.
2. **Higher Temperature at the Controller than at the Motor** — If the full load current value shown on the motor nameplate is between the listed “Full Load Amperes”, select the “Heater Type Number” with the higher value.
3. **Lower Temperature at the Controller than at the Motor** — If the full load current value shown on the motor nameplate is between the listed “Full Load Amperes”, select the “Heater Type Number” with the lower value.

For motors with Marked Service Factor of less than 1.15, select the “Heater Type Number” one rating smaller than determined by the rules in paragraphs 1, 2 and 3.

Motors rated for Intermittent Duty — Please contact your local Rockwell Automation sales office or Allen-Bradley distributor for additional information.

Heater Element Selection Procedure — When Temperature at Controller is ±10 °C (±18 °F) Greater than Temperature at Motor

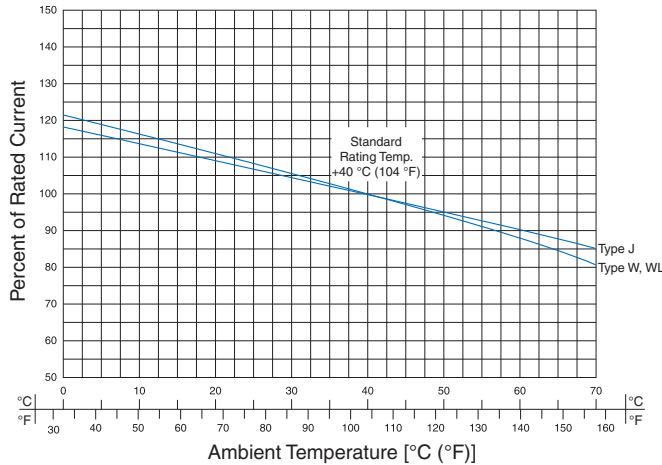
Ambient Temperature Correction

The ambient temperature at the motor and controller is the same in most applications. Under this condition, the overload relay is designed to sense changes in ambient temperature and also protect the motor over a range of temperatures.

Output that a motor can safely deliver varies with temperature. The motor can deliver its full rated horsepower at an ambient temperature specified by the motor manufacturers, normally +40 °C (+104 °F). At high temperatures (higher than +40 °C) less than 100% of the normal rated current can be drawn from the motor without shortening the insulation life. At lower temperatures (less than +40 °C) more than 100% of the normal rated current could be drawn from the motor without shortening the insulation life. Thus, there is an inverse relationship between motor ambient temperature and motor output. In any motor, allowable output decreases as the ambient temperature is raised and vice versa.

Heater Element Selection Procedure — When Temperature at Controller is ±10 °C (±18 °F) Greater than Temperature at Motor (Continued)

Ambient Temperature Correction Curve
(See Performance Data on page Important-3)



When the temperature difference between the motor and controller does not exceed +10 °C the heater elements should be selected according to the directions given in the Heater Element Selection, page 2.

When the temperature difference is more than +10 °C an ambient temperature correction factor should be used as part of the process for selecting heater elements. The ambient temperature correction curve shown above shows the factor by which heater selection rating changes with ambient temperature changes.

Heater Element Selection Procedure

In solving problems where ambient temperature correction is necessary, the following simple procedure is recommended:

1. First find the correction factor ratio (“C.F.R.”). This is the ratio of correction factor of the motor ambient temperature (C.F.m) to the correction factor for the controller ambient temperature (C.F.c). The formula for calculating the correction factor ratio is:

$$C.F.R. = \frac{C.F. \text{ motor}}{C.F. \text{ controller}}$$

Both correction factors are selected from the curve for the type of heater element to be used. The heater element selection tables are based on a +40 °C ambient temperature. This means the correction factor for a +40 °C is 1.00. In other words, there is no correction factor at +40 °C.

2. Next in this heater element selection process is to adjust the motor nameplate full load current (FLC) by the C.F. Ratio. This readjusted value of motor nameplate full load current (FLC) is the yardstick in selecting the proper heater element.
3. The last step is to refer to the suggested heater element table and pick the element whose rating for the given controller size is closest to FLC.

Examples — To become familiar with this heater element selection process, consider a few examples.

Example 1. Starter at Normal +40 °C Ambient — Motor Lower. 3-Phase, AC, squirrel cage motor, 25 Hp, 460V, 60 Hz, 1800 rpm, FLC of 34 A, service factor 1.15, *Temperature at starter +40 °C, Temperature at motor +25 °C, Type W heater elements will be used.*

In Example 1, the motor is at a much cooler ambient temperature (+25 °C) compared to the controller which is at the normal +40 °C. Because the motor is normally rated for use at +40 °C, it will deliver a little more than its rated horsepower. This means that a heater element with a higher than normal motor nameplate full load current rating can be used.

Referring to the Type W ambient temperature correction curve on this page for a motor at +25 °C ambient, the motor correction factor (C.F. motor) is shown to be 108%. The correction factor for the starter ambient temperature is 100% since it is at +40 °C. Thus,

$$C.F. \text{ Ratio} = \frac{C.F. \text{ motor}}{C.F. \text{ controller}} = \frac{108\%}{100\%} = 1.08$$

Now, using this correction factor, the readjusted full load current value can be determined by:

$$FLC = 34.0 \times 1.08 = 36.7 \text{ A}$$

A Bulletin 512, Size 2, was specified for this application. The directions for heater element selection indicate that Table 153 should be used. The table shows that 36.7 A falls between two values, 35.0 A (W66) and 38.0 A (W67). Because 38.0 A is closer to the requirement, select the heater element W67.

Example 2. Starter at Normal +40 °C Ambient — Motor Higher. 3-Phase AC, squirrel cage motor, 25 Hp, 460V, 60 Hz, 1800 rpm. FLC of 34 A, service factor 1.15. Type W heater elements, *Temperature at starter +40 °C, Temperature at motor +55 °C.*

This represents a situation where the motor ambient temperature is higher than +40 °C. In this example, the motor is at +55 °C ambient temperature and the controller is at +40 °C. When the motor is functioning in a warmer environment than the controller it will not be able to deliver the normal horsepower. To protect it from damage, it becomes necessary to downsize the heater element compared to the same motor operating in a +40 °C ambient temperature. Referring to the Type W ambient temperature correction curve, the correction factor would be:

$$C.F. \text{ Ratio} = \frac{C.F. \text{ motor}}{C.F. \text{ controller}} = \frac{91\%}{100\%} = 0.91$$

Having determined the correction factor, the current rating to be used when selecting a heater element would be:

$$FLC = 34.0 \times 0.91 = 30.9 \text{ A}$$

For Bulletin 512, Size 2, again refer to Table 153. The value of 30.9 A falls between 30.0 A (W64) and 32.5 A (W66). Since 30.0 is closer to 30.9 specify the W64 heater element.

Example 3: Starter Lower than +40 °C — Motor Higher. 3-Phase, AC, squirrel cage motor, 25 Hp, 460V, 60 Hz, 1800 rpm. FLC of 34 A, service factor 1.15. Type W heater elements, *Temperature at starter +25 °C, Temperature at motor +55 °C.*

Next, consider a case where both the controller and the motor are at ambient temperatures other than +40 °C. In Example 3 the temperature of the controller is +25 °C ambient (cooler) while the temperature of the motor is +55 °C ambient (warmer). As stated earlier, a motor running in a warmer environment will deliver less than its normal horsepower. This requires downsizing the heater element rating. The controller in this case is in a cooler environment which prevents the heater element from heating up as much as in a +40 °C ambient temperature. This also requires downsizing the heater element rating to provide adequate protection. Thus, the net effect of a warmer motor and a cooler controller is to further downsize the heater element. Using the Type W temperature correction curve, the correction factor in this case is:

$$C.F. \text{ Ratio} = \frac{C.F. \text{ motor}}{C.F. \text{ controller}} = \frac{91\%}{108\%} = 0.84$$

The readjusted value of current FLC for this example is:

$$FLC = 34.0 \times 0.84 = 28.6 \text{ A}$$

Table 153 shows that this value falls between 28.0 A (W63) and 30.0 A (W64). Because 28.0 A is closer to the requirement, select the heater element W63.

Heater Element Selection Procedure

Example 4: Starter Above +40 °C — Motor Lower. 3-Phase, AC, squirrel cage motor, 25 Hp, 460V, 60 Hz, 1800 rpm. FLC of 34 A, service factor 1.15. Type W heater elements, *Temperature at starter +65 °C, Temperature at motor +35 °C.*

Now, consider the effect of a controller in a warmer environment and a motor in a cooler environment. In Example 4, the controller is at +65 °C ambient (warmer) and the motor at +35 °C ambient (cooler). As mentioned earlier, a motor at a cooler temperature can deliver more than its normal horsepower. The controller when in a warmer environment will heat up faster causing the eutectic alloy to melt before the normal overload condition. This requires upsizing the heater element rating. Referring to the Type W ambient temperature correction curve, the correction factor in this case is:

$$\text{C.F. Ratio} = \frac{\text{C.F. motor}}{\text{C.F. controller}} = \frac{103\%}{84.5\%} = 1.22$$

This correction factor allows a heater element with current rating of:

$$\begin{aligned} \text{FLC} &= 34.0 \times 1.22 \\ &= 41.48 \text{ A} \end{aligned}$$

Referring to Table 153, this value of 41.4 A falls between 40.5 A (W68) and 43.5 A (W69). Because 40.5 A is closer to the requirement, select heater element W68.

Example 5: Starter Above +40 °C — Motor Above. 3-Phase, AC, squirrel cage motor, 25 Hp, 460V, 60 Hz, 1800 rpm. FLC of 35 A, service factor 1.15. Type W heater elements, *Temperature at starter +45 °C, Temperature at motor +60 °C.*

Next, take an example where both the controller and the motor are both warmer than +40 °C ambient temperature but their ambient temperatures are different. For instance, the controller could be at +45 °C ambient and the motor is at +60 °C ambient. Since the difference in their ambient temperatures is greater than +10 °C an ambient temperature correction must be made. In Example 5 the correction factor is given by:

$$\text{C.F. Ratio} = \frac{\text{C.F. motor}}{\text{C.F. controller}} = \frac{88\%}{97\%} = 0.91$$

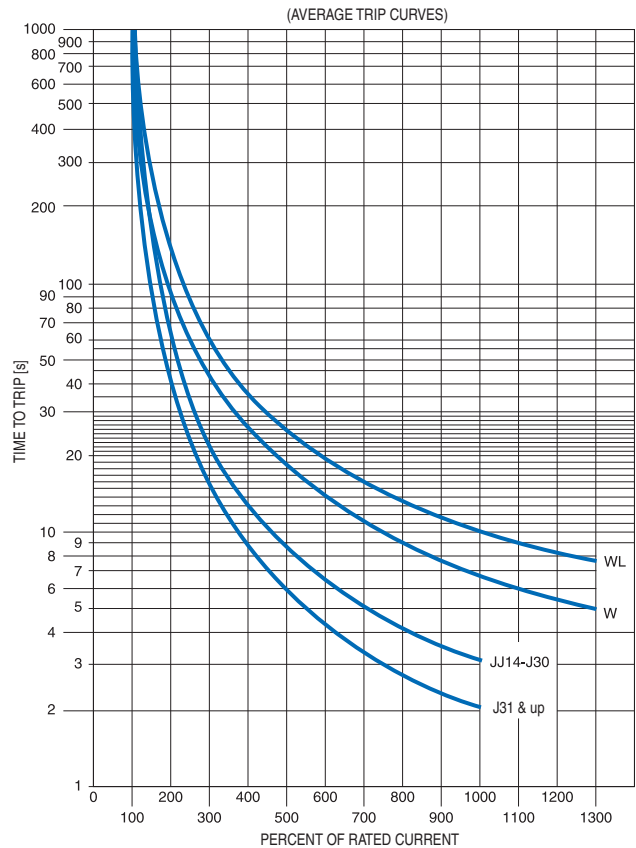
This means that the rating of the heater element should be 90% of the normal nameplate motor full load current or:

$$35.0 \times 0.91 = 31.9 \text{ A}$$

For Bulletin 512, Size 2 controller, Table 153 shows this rating to fall between 30.0 A (W64) and 32.5 A (W65). Because 32.5 A is closer, select heater element W65. Note here that the net effect has been to downsize the heater element rating compared to a normal +40 °C ambient operation.

Note: The heater element selection tables are designed to accommodate motor service factors of 1.15 or greater, as given in all the preceding examples. If the service factor had been less than 1.15 (for example, S.F. = 1.0) a heater element one rating smaller than selected in each example would have been the correct choice. This would provide protection at 10% lower current levels.

Time — Current Characteristics at +40 °C (+104 °F)



Index to Heater Element Selection Tables

Bulletin Number	Encl. Type	Size	Table No.			
			Manual Reset			
			Type W Element		Type J Element	
		1Ø, One Element	3Ø or 1Ø, Three Elements	1Ø, One Element	3Ø or 1Ø, Three Elements	
105, 109	Open	9...30 A	—	180	—	182
		36...110 A	—	191	—	187
		180 A	—	195	—	196
505	Open, 1, 3R/4/12	00	127	180	55	182
		0...4	156	151	164	162
		5	—	347	—	547
505	Open 1, 3R/4/12, 4/4X	6	—	195	—	196
		7...8	—	133	—	132
505	4/4X	0...4	—	146	—	158
		5	—	177	—	178
505	4X	0...2	—	145	—	158
505	Unilock 3R/7 & 9	0...1	—	166	—	159
505	Bolted 3R/7 & 9, 7 & 9	0...3	—	171	—	172
		4	156	168	164	162
505V	Open	0...4	—	154	—	—
506, 507	1, 3R/12, 4/4X, 4X	0...4	—	152	—	161
		5	—	347	—	547
507	1, 3R/4/12, 4/4X, 4X	6	—	195	—	196
		7	—	134	—	165
507	Bolted 3R/7 & 9, 7 & 9	0...2	—	168	—	172
		3	—	168	—	162
		4	—	171	—	172
509	Open, 1, 3R/12	00	127	180	55	182
509	Open	0...4, 1P	156	152	164	163
509	1, 3R/4/12	0...4	155	150	164	162
509 with control xfrmer	1, 3R/4/12	0...4, 1P	156	150	164	162
509	Open, 1, 3R/4/12	5	—	347	—	547
509	Open, 1, 3R/4/12, 4/4X	6	—	195	—	196
509	Open 1, 3R/4/12, 4/4X	7...8	—	133	—	132
509	4/4X	0...3	—	144	—	158
		4	—	148	—	—
		5	—	177	—	178
509	4X	0...2	156	146	164	158
		0...4	—	166	—	159
509	Unilock 3R/7 & 9	5	—	177	—	178
		0...3, 1P	156	171	164	172
509	Bolted 3R/7 & 9, 7 & 9	4	—	171	—	162
		5	—	171	—	547
512	1, 3R/4/12, 4/4X, 4X	0...4	—	152	—	163
		5	—	347	—	547
		6	—	195	—	196
512M	3R/4/12	1...2	—	153	—	163
513	1, 3R/4/12, 4/4X, 4X	0...4	—	152	—	160
		5	—	347	—	547
		6	—	195	—	196
513	Unilock 3R/7 & 9	7	—	134	—	165
		0...4	—	167	—	159
513	Unilock 3R/7 & 9	5	—	169	—	178

Bulletin Number	Encl. Type	Size	Table No.			
			Manual Reset			
			Type W Element		Type J Element	
		1Ø, One Element	3Ø or 1Ø, Three Elements	1Ø, One Element	3Ø or 1Ø, Three Elements	
513	Bolted 3R/7 & 9, 7 & 9	0...3	—	168	—	172
		4	—	168	—	160
		5	—	168	—	160
520	Open, 1, 3R/4/12	0...4	—	152	—	162
		5	—	347	—	547
		6	—	195	—	196
		7	—	133	—	132
520	4/4X	0...4	—	146	—	158
		5	—	177	—	178
520	4X	0...2	—	145	—	158
520E	Bolted 3R/7 & 9, 7 & 9	0...3	—	171	—	172
		4	—	168	—	162
520F & G	Bolted 3R/7 & 9, 7 & 9	0...2	—	168	—	172
		3	—	168	—	162
530*	1	1PW... 2PW	—	150	—	162
		3PW... 4PW	—	148	—	162
		5PW	—	347	—	547
		6PW	—	195	—	196
		7PW... 8PW	—	133	—	132
540*	1	1YD... 4YD	—	152	—	162
		5YD	—	347	—	547
		6YD	—	195	—	196
		7YD... 8YD	—	133	—	132
570	1	2...4	—	154	—	162
		5	—	347	—	547
		6	—	195	—	196
		7...8...9	—	133	—	132
592	Open	24...32 A	—	180	—	182
		40...165 A	192	191	198	187
592	1	40...165 A	192	181	198	183
592 with current xfrmer	Open	—	—	195	—	196
600	All	—	—	—	5 (Type P)	—
609, 609RS, 609TS, 609U, 609TU	All	0...1...1P	112	110	117	116
1232X, 1233X	—	0...2	—	152	—	163
		3, 4	—	149	—	163
		5	—	347	—	547

* When selecting heater elements for Bulletin 530, divide the motor nameplate full load amperes by 2.00 — use this value to select the proper "Heater Element Cat. No."

* When selecting heater elements for Bulletin 540, divide the motor nameplate full load amperes by 1.73 — use this value to select the proper "Heater Element Cat. No."

TABLE 5	
Heater Element Cat. No.	Full Load Amperes
P1	0.17
P2	0.21
P3	0.25
P4	0.32
P5	0.39
P6	0.46
P7	0.57
P8	0.71
P9	0.79
P10	0.87
P11	0.98
P12	1.08
P13	1.19
P14	1.30
P15	1.43
P16	1.58
P17	1.75
P18	1.88
P19	2.13
P20	2.40
P21	2.58
P22	2.92
P23	3.09
P24	3.32
P25	3.37
P26	4.16
P27	4.51
P28	4.93
P29	5.43
P30	6.03
P31	6.83
P32	7.72
P33	8.24
P34	8.90
P35	9.60
P36	10.8
P37	12.0
P38	13.5
P39	15.2

TABLE 55						
Heater Element Cat. No.	Full Load Amperes					
	Size 00	Size 0	Size 1	Size 1P	Size 2	Size 3
JJ14	0.22	0.22	0.22	—	—	—
JJ13	0.24	0.24	0.24	—	—	—
JJ12	0.27	0.27	0.27	—	—	—
JJ11	0.30	0.30	0.30	—	—	—
JJ10	0.33	0.33	0.33	—	—	—
JJ9	0.36	0.36	0.36	—	—	—
JJ8	0.40	0.40	0.40	—	—	—
JJ7	0.44	0.44	0.44	—	—	—
JJ6	0.48	0.48	0.48	—	—	—
JJ5	0.53	0.53	0.53	—	—	—
JJ4	0.58	0.58	0.58	—	—	—
JJ3	0.65	0.65	0.65	—	—	—
JJ2	0.71	0.71	0.71	—	—	—
JJ1	0.78	0.78	0.78	—	—	—
J1	0.87	0.87	0.87	—	—	—
J2	0.95	0.95	0.95	—	—	—
J3	1.05	1.05	1.05	—	—	—
J4	1.16	1.16	1.16	—	—	—
J5	1.28	1.28	1.28	—	—	—
J6	1.41	1.41	1.41	—	—	—
J7	1.55	1.55	1.55	—	—	—
J8	1.70	1.70	1.70	—	—	—
J9	1.87	1.87	1.87	—	—	—
J10	2.06	2.06	2.06	—	—	—
J11	2.27	2.27	2.27	—	—	—
J12	2.51	2.51	2.51	—	—	—
J13	2.78	2.78	2.78	—	—	—
J14	3.07	3.07	3.07	—	—	—
J15	3.38	3.38	3.38	—	—	—
J16	3.72	3.72	3.72	—	—	—
J17	4.10	4.10	4.10	—	—	—
J18	4.52	4.52	4.52	—	—	—
J19	4.98	4.98	4.98	—	—	—
J20	5.49	5.49	5.49	—	—	—
J21	6.04	6.04	6.04	—	—	—
J22	6.66	6.66	6.66	—	—	—
J23	7.35	7.35	7.35	—	—	—
J24	8.13	8.13	8.13	—	—	—
J25	8.96	8.96	8.96	—	—	—
J26	9.90	9.90	9.90	—	—	—
J27	—	10.9	10.9	11.0	—	—
J28	—	12.0	12.0	12.2	—	—
J29	—	13.2	13.2	13.4	—	—
J30	—	14.6	14.6	14.8	—	—
J31	—	16.1	16.1	16.3	—	—
J32	—	17.7	17.7	17.9	18.3	—
J33	—	—	19.5	19.8	20.2	—
J34	—	—	21.4	21.8	22.2	—
J35	—	—	23.6	24.0	24.4	—
J36	—	—	26.0	26.4	26.9	—
J37	—	—	28.5	29.0	29.8	—
J38	—	—	—	32.0	33.0	—
J39	—	—	—	35.0	36.5	40.5
J40	—	—	—	38.5	40.5	45.5
J41	—	—	—	—	45.5	51
J42	—	—	—	—	—	56
J43	—	—	—	—	—	62
J44	—	—	—	—	—	68
J45	—	—	—	—	—	74
J46	—	—	—	—	—	82
J70	—	—	—	—	—	90
J71	—	—	—	—	—	—
J72	—	—	—	—	—	—
J73	—	—	—	—	—	—
J74	—	—	—	—	—	—

Refer to Heater Element Selection Procedure on page 2 before using tables.

TABLE 110		
Heater Element Cat. No.	Full Load Amperes	
	Size 0	Size 1
W10	0.18	0.18
W11	0.20	0.20
W12	0.22	0.22
W13	0.24	0.24
W14	0.27	0.27
W15	0.30	0.30
W16	0.33	0.33
W17	0.36	0.36
W18	0.40	0.40
W19	0.44	0.44
W20	0.48	0.48
W21	0.53	0.53
W22	0.59	0.59
W23	0.65	0.65
W24	0.71	0.71
W25	0.78	0.78
W26	0.86	0.86
W27	0.95	0.95
W28	1.05	1.05
W29	1.16	1.16
W30	1.27	1.27
W31	1.41	1.41
W32	1.55	1.55
W33	1.71	1.71
W34	1.89	1.89
W35	2.08	2.08
W36	2.30	2.30
W37	2.53	2.53
W38	2.79	2.79
W39	3.07	3.07
W40	3.38	3.38
W41	3.73	3.73
W42	4.11	4.11
W43	4.51	4.51
W44	4.96	4.96
W45	5.44	5.44
W46	5.98	5.98
W47	6.57	6.57
W48	7.21	7.21
W49	7.92	7.92
W50	8.70	8.70
W51	9.57	9.5
W52	10.5	10.5
W53	11.6	11.6
W54	12.7	12.7
W55	14.0	14.0
W56	15.4	15.4
W57	16.8	16.8
W58	18.3	18.3
W59	—	19.9
W60	—	21.7
W61	—	23.6
W62	—	25.7
W63	—	28.0

TABLE 112			
Heater Element Cat. No.	Full Load Amperes		
	Size 0	Size 1	Size 1P
W10	0.21	0.21	—
W11	0.23	0.23	—
W12	0.25	0.25	—
W13	0.28	0.28	—
W14	0.31	0.31	—
W15	0.34	0.34	—
W16	0.37	0.37	—
W17	0.41	0.41	—
W18	0.45	0.45	—
W19	0.49	0.49	—
W20	0.54	0.54	—
W21	0.59	0.59	—
W22	0.65	0.65	—
W23	0.71	0.71	—
W24	0.78	0.78	—
W25	0.86	0.86	—
W26	0.94	0.94	—
W27	1.04	1.04	—
W28	1.14	1.14	—
W29	1.26	1.26	—
W30	1.39	1.39	—
W31	1.53	1.53	—
W32	1.69	1.69	—
W33	1.86	1.86	—
W34	2.05	2.05	—
W35	2.26	2.26	—
W36	2.49	2.49	—
W37	2.74	2.74	—
W38	3.02	3.02	—
W39	3.33	3.33	—
W40	3.67	3.67	—
W41	4.04	4.04	—
W42	4.45	4.45	—
W43	4.89	4.89	—
W44	5.38	5.38	—
W45	5.92	5.92	—
W46	6.51	6.51	—
W47	7.16	7.16	—
W48	7.87	7.87	—
W49	8.66	8.66	—
W50	9.52	9.52	—
W51	10.5	10.5	10.5
W52	11.5	11.5	11.5
W53	12.6	12.6	12.6
W54	13.9	13.9	13.9
W55	15.2	15.2	15.2
W56	16.7	16.7	16.7
W57	18.3	18.3	18.3
W58	—	19.9	19.9
W59	—	21.8	21.8
W60	—	23.8	23.8
W61	—	26.0	26.0
W62	—	28.5	28.5
W63	—	—	31.0
W64	—	—	34.0
W65	—	—	37.0

Refer to Heater Element Selection Procedure on page 2 before using tables.

TABLE 116		
Heater Element Cat. No.	Full Load Amperes	
	Size 0	Size 1
JJ14	0.19	0.19
JJ13	0.21	0.21
JJ12	0.23	0.23
JJ11	0.26	0.26
JJ10	0.29	0.29
JJ9	0.31	0.31
JJ8	0.35	0.35
JJ7	0.39	0.39
JJ6	0.43	0.43
JJ5	0.47	0.47
JJ4	0.52	0.52
JJ3	0.58	0.58
JJ2	0.64	0.64
JJ1	0.71	0.71
J1	0.79	0.79
J2	0.87	0.87
J3	0.96	0.96
J4	1.07	1.07
J5	1.18	1.18
J6	1.31	1.31
J7	1.45	1.45
J8	1.60	1.60
J9	1.76	1.76
J10	1.94	1.94
J11	2.13	2.13
J12	2.35	2.35
J13	2.59	2.59
J14	2.85	2.85
J15	3.14	3.14
J16	3.45	3.45
J17	3.80	3.80
J18	4.19	4.19
J19	4.62	4.62
J20	5.08	5.08
J21	5.60	5.60
J22	6.17	6.17
J23	6.80	6.80
J24	7.48	7.48
J25	8.24	8.24
J26	9.08	9.08
J27	10.0	10.0
J28	11.0	11.0
J29	12.2	12.2
J30	13.6	13.6
J31	15.1	15.1
J32	16.7	16.7
J33	18.6	18.6
J34	—	20.4
J35	—	22.5
J36	—	24.8
J37	—	27.5
J38	—	—
J39	—	—
J40	—	—

TABLE 117			
Heater Element Cat. No.	Full Load Amperes		
	Size 0	Size 1	Size 1P
JJ14	0.20	0.20	—
JJ13	0.22	0.22	—
JJ12	0.24	0.24	—
JJ11	0.27	0.27	—
JJ10	0.30	0.30	—
JJ9	0.33	0.33	—
JJ8	0.37	0.37	—
JJ7	0.40	0.40	—
JJ6	0.45	0.45	—
JJ5	0.50	0.50	—
JJ4	0.55	0.55	—
JJ3	0.60	0.60	—
JJ2	0.67	0.67	—
JJ1	0.74	0.74	—
J1	0.82	0.82	—
J2	0.91	0.91	—
J3	1.00	1.00	—
J4	1.11	1.11	—
J5	1.22	1.22	—
J6	1.35	1.35	—
J7	1.49	1.49	—
J8	1.66	1.66	—
J9	1.83	1.83	—
J10	2.02	2.02	—
J11	2.24	2.24	—
J12	2.48	2.48	—
J13	2.75	2.75	—
J14	3.03	3.03	—
J15	3.35	3.35	—
J16	3.70	3.70	—
J17	4.10	4.10	—
J18	4.53	4.53	—
J19	5.01	5.01	—
J20	5.54	5.54	—
J21	6.13	6.13	—
J22	6.78	6.78	—
J23	7.49	7.49	—
J24	8.29	8.29	—
J25	9.16	9.16	—
J26	10.1	10.1	—
J27	11.2	11.2	—
J28	12.4	12.4	12.4
J29	13.7	13.7	13.7
J30	15.2	15.2	15.2
J31	16.8	16.8	16.8
J32	18.5	18.5	18.5
J33	—	20.5	20.5
J34	—	22.8	22.8
J35	—	25.0	25.0
J36	—	27.5	27.5
J37	—	—	30.0
J38	—	—	33.5
J39	—	—	36.0
J40	—	—	—

Refer to Heater Element Selection Procedure on page 2 before using tables.

TABLE 127	
Heater Element Cat. No.	Full Load Amperes
	Size 00
W10	0.21
W11	0.23
W12	0.25
W13	0.27
W14	0.30
W15	0.34
W16	0.37
W17	0.41
W18	0.45
W19	0.50
W20	0.55
W21	0.60
W22	0.65
W23	0.71
W24	0.78
W25	0.86
W26	0.95
W27	1.04
W28	1.14
W29	1.25
W30	1.36
W31	1.50
W32	1.65
W33	1.82
W34	2.01
W35	2.21
W36	2.45
W37	2.67
W38	3.00
W39	3.31
W40	3.65
W41	4.06
W42	4.49
W43	4.98
W44	5.48
W45	6.06
W46	6.68
W47	7.35
W48	8.09
W49	8.90
W50	9.80

TABLE 132		
Heater Element Cat. No.	Full Load Amperes	
	Size 7	Size 8
J7	231	350
J8	253	380
J9	276	415
J10	305	455
J11	330	495
J12	360	540
J13	400	600
J14	440	660
J15	485	722
J16	530	795
J17	585	880
J18	645	965
J19	710	1160
J20	780	1170
J21	860	1290

TABLE 133		
Heater Element Cat. No.	Full Load Amperes	
	Size 7	Size 8
W29	—	—
W30	—	—
W31	230	345
W32	248	375
W33	272	410
W34	305	460
W35	325	485
W36	355	535
W37	390	585
W38	430	645
W39	475	710
W40	520	780
W41	575	860
W42	630	945
W43	690	1035
W44	755	1135
W45	835	1255

TABLE 134	
Heater Element Cat. No.	Size 7
W29	240
W30	261
W31	285
W32	310
W33	340
W34	370
W35	405
W36	445
W37	490
W38	540
W39	590
W40	650
W41	710
W42	780
W43	860
W44	—

Refer to Heater Element Selection Procedure on page 2 before using tables.

TABLE 144					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
W10	0.18	0.18	—	—	—
W11	0.20	0.20	—	—	—
W12	0.22	0.22	—	—	—
W13	0.24	0.24	—	—	—
W14	0.26	0.26	—	—	—
W15	0.29	0.29	—	—	—
W16	0.32	0.32	—	—	—
W17	0.35	0.35	—	—	—
W18	0.38	0.38	—	—	—
W19	0.42	0.42	—	—	—
W20	0.46	0.46	—	—	—
W21	0.51	0.51	—	—	—
W22	0.56	0.56	—	—	—
W23	0.62	0.62	—	—	—
W24	0.68	0.68	—	—	—
W25	0.75	0.75	—	—	—
W26	0.82	0.82	—	—	—
W27	0.90	0.90	—	—	—
W28	0.99	0.99	—	—	—
W29	1.09	1.09	—	—	—
W30	1.20	1.20	—	—	—
W31	1.32	1.32	—	—	—
W32	1.45	1.45	—	—	—
W33	1.59	1.59	—	—	—
W34	1.75	1.75	—	—	—
W35	1.93	1.93	—	—	—
W36	2.12	2.12	—	—	—
W37	2.33	2.33	—	—	—
W38	2.56	2.56	—	—	—
W39	2.81	2.81	—	—	—
W40	3.09	3.09	—	—	—
W41	3.40	3.40	—	—	—
W42	3.74	3.74	—	—	—
W43	4.11	4.11	—	—	—
W44	4.52	4.52	—	—	—
W45	4.97	4.97	—	—	—
W46	5.46	5.46	5.60	—	—
W47	6.01	6.01	6.15	—	—
W48	6.60	6.60	6.76	—	—
W49	7.26	7.26	7.43	—	—
W50	7.98	7.98	8.17	—	—
W51	8.78	8.78	8.98	—	—
W52	9.65	9.65	9.87	—	—
W53	10.6	10.6	10.8	—	—
W54	11.7	11.7	11.9	—	—
W55	12.8	12.8	13.1	—	—
W56	14.1	14.1	14.4	—	—
W57	15.4	15.4	15.7	—	—
W58	16.8	16.8	17.1	—	—
W59	18.3	18.3	18.6	—	—
W60	—	19.8	20.1	—	—
W61	—	21.3	21.7	25.5	—
W62	—	22.7	23.1	28.1	—
W63	—	24.4	24.8	31.0	32.0
W64	—	26.2	28.6	34.0	35.0
W65	—	28.2	30.5	37.0	38.5
W66	—	—	33.0	40.0	42.5
W67	—	—	35.5	43.5	46.5
W68	—	—	38.0	47	51
W69	—	—	40.5	51	55
W70	—	—	43.5	55	59
W71	—	—	47.0	59	64
W72	—	—	—	63	69
W73	—	—	—	67	74
W74	—	—	—	71	79
W75	—	—	—	76	84
W76	—	—	—	80	90
W77	—	—	—	85	96
W78	—	—	—	90	102
W79	—	—	—	—	107
W80	—	—	—	—	113
W81	—	—	—	—	118
W82	—	—	—	—	124
W83	—	—	—	—	130
W84	—	—	—	—	135
W85	—	—	—	—	—

TABLE 145			
Heater Element Cat. No.	Full Load Amperes		
	Size 0	Size 1	Size 2
W10	0.18	0.18	—
W11	0.20	0.20	—
W12	0.22	0.22	—
W13	0.24	0.24	—
W14	0.27	0.27	—
W15	0.30	0.30	—
W16	0.33	0.33	—
W17	0.36	0.36	—
W18	0.40	0.40	—
W19	0.44	0.44	—
W20	0.49	0.49	—
W21	0.54	0.54	—
W22	0.60	0.60	—
W23	0.66	0.66	—
W24	0.73	0.73	—
W25	0.80	0.80	—
W26	0.88	0.88	—
W27	0.97	0.97	—
W28	1.06	1.06	—
W29	1.17	1.17	—
W30	1.29	1.29	—
W31	1.42	1.42	—
W32	1.56	1.56	—
W33	1.71	1.71	—
W34	1.89	1.89	—
W35	2.08	2.08	—
W36	2.28	2.28	—
W37	2.51	2.51	—
W38	2.76	2.76	—
W39	3.04	3.04	—
W40	3.34	3.34	—
W41	3.68	3.68	—
W42	4.05	4.05	—
W43	4.45	4.45	—
W44	4.90	4.90	—
W45	5.39	5.39	5.58
W46	5.88	5.88	6.11
W47	6.41	6.41	6.70
W48	6.99	6.99	7.34
W49	7.63	7.63	7.97
W50	8.32	8.32	8.69
W51	9.07	9.07	9.52
W52	9.89	9.89	10.4
W53	10.8	10.8	11.4
W54	11.8	11.8	12.5
W55	12.9	12.9	13.6
W56	14.2	14.2	14.9
W57	15.5	15.5	16.2
W58	16.8	16.8	17.4
W59	18.5	18.5	19.3
W60	—	20.3	21.0
W61	—	22.2	23.0
W62	—	24.0	25.0
W63	—	26.1	27.1
W64	—	28.4	29.6
W65	—	—	32.0
W66	—	—	34.5
W67	—	—	38.0
W68	—	—	41.5
W69	—	—	45.0
W70	—	—	—
W71	—	—	—
W72	—	—	—
W73	—	—	—
W74	—	—	—
W75	—	—	—
W76	—	—	—
W77	—	—	—
W78	—	—	—
W79	—	—	—
W80	—	—	—
W81	—	—	—
W82	—	—	—
W83	—	—	—
W84	—	—	—
W85	—	—	—

Heater Element Specifications

For Application on Bulletin 100/500/609/1200 Line Starters

TABLE 146					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
W10	0.18	0.18	—	—	—
W11	0.20	0.20	—	—	—
W12	0.22	0.22	—	—	—
W13	0.24	0.24	—	—	—
W14	0.27	0.27	—	—	—
W15	0.30	0.30	—	—	—
W16	0.33	0.33	—	—	—
W17	0.36	0.36	—	—	—
W18	0.40	0.40	—	—	—
W19	0.44	0.44	—	—	—
W20	0.49	0.49	—	—	—
W21	0.54	0.54	—	—	—
W22	0.60	0.60	—	—	—
W23	0.66	0.66	—	—	—
W24	0.73	0.73	—	—	—
W25	0.80	0.80	—	—	—
W26	0.88	0.88	—	—	—
W27	0.97	0.97	—	—	—
W28	1.06	1.06	—	—	—
W29	1.17	1.17	—	—	—
W30	1.29	1.29	—	—	—
W31	1.42	1.42	—	—	—
W32	1.56	1.56	—	—	—
W33	1.71	1.71	—	—	—
W34	1.89	1.89	—	—	—
W35	2.08	2.08	—	—	—
W36	2.28	2.28	—	—	—
W37	2.51	2.51	—	—	—
W38	2.76	2.76	—	—	—
W39	3.04	3.04	—	—	—
W40	3.34	3.34	—	—	—
W41	3.68	3.68	—	—	—
W42	4.05	4.05	—	—	—
W43	4.45	4.45	—	—	—
W44	4.90	4.90	—	—	—
W45	5.39	5.39	5.53	—	—
W46	5.88	5.88	6.04	—	—
W47	6.41	6.41	6.60	—	—
W48	6.99	6.99	7.21	—	—
W49	7.63	7.63	7.87	—	—
W50	8.32	8.32	8.60	—	—
W51	9.07	9.07	9.39	—	—
W52	9.89	9.89	10.3	—	—
W53	10.8	10.8	11.2	—	—
W54	11.8	11.8	12.2	—	—
W55	12.8	12.8	13.3	—	—
W56	14.0	14.0	14.6	—	—
W57	15.3	15.3	15.8	—	—
W58	16.7	16.7	17.3	—	—
W59	18.1	18.1	18.9	—	—
W60	—	19.7	20.6	—	—
W61	—	21.5	22.5	25.5	—
W62	—	23.5	24.6	28.1	—
W63	—	25.7	26.8	31.0	32.0
W64	—	27.5	29.4	34.0	35.0
W65	—	—	32.0	37.0	38.5
W66	—	—	34.5	40.0	42.5
W67	—	—	37.5	43.5	46.5
W68	—	—	41.0	47.0	51
W69	—	—	44.5	51	55
W70	—	—	47.0	55	59
W71	—	—	—	59	64
W72	—	—	—	63	69
W73	—	—	—	67	74
W74	—	—	—	71	79
W75	—	—	—	76	84
W76	—	—	—	80	90
W77	—	—	—	85	96
W78	—	—	—	90	102
W79	—	—	—	—	107
W80	—	—	—	—	113
W81	—	—	—	—	118
W82	—	—	—	—	124
W83	—	—	—	—	130
W84	—	—	—	—	135

TABLE 148					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
W10	0.19	0.19	—	—	—
W11	0.21	0.21	—	—	—
W12	0.23	0.23	—	—	—
W13	0.25	0.25	—	—	—
W14	0.28	0.28	—	—	—
W15	0.30	0.30	—	—	—
W16	0.33	0.33	—	—	—
W17	0.36	0.36	—	—	—
W18	0.39	0.39	—	—	—
W19	0.43	0.43	—	—	—
W20	0.48	0.48	—	—	—
W21	0.52	0.52	—	—	—
W22	0.57	0.57	—	—	—
W23	0.62	0.62	—	—	—
W24	0.69	0.69	—	—	—
W25	0.76	0.76	—	—	—
W26	0.83	0.83	—	—	—
W27	0.91	0.91	—	—	—
W28	1.01	1.01	—	—	—
W29	1.12	1.12	—	—	—
W30	1.22	1.22	—	—	—
W31	1.34	1.34	—	—	—
W32	1.47	1.47	—	—	—
W33	1.62	1.62	—	—	—
W34	1.78	1.78	—	—	—
W35	1.96	1.96	—	—	—
W36	2.15	2.15	—	—	—
W37	2.36	2.36	—	—	—
W38	2.60	2.60	—	—	—
W39	2.86	2.86	—	—	—
W40	3.16	3.16	—	—	—
W41	3.48	3.48	—	—	—
W42	3.84	3.84	—	—	—
W43	4.22	4.22	—	—	—
W44	4.65	4.65	—	—	—
W45	5.12	5.12	5.13	—	—
W46	5.63	5.63	5.64	—	—
W47	6.20	6.20	6.22	—	—
W48	6.82	6.82	6.85	—	—
W49	7.51	7.51	7.56	—	—
W50	8.23	8.23	8.45	—	—
W51	9.07	9.07	9.32	—	—
W52	9.95	9.95	10.3	10.6	—
W53	10.8	10.8	11.4	11.6	—
W54	11.9	11.9	12.4	12.6	—
W55	13.0	13.0	13.6	13.9	—
W56	14.2	14.2	14.8	15.3	—
W57	15.5	15.5	16.1	16.9	17.3
W58	16.4	16.4	17.3	18.7	19.0
W59	17.7	17.7	18.7	20.7	21.0
W60	19.7	19.7	20.6	22.8	23.1
W61	—	21.7	22.7	25.1	25.5
W62	—	24.2	25.2	27.5	28.0
W63	—	27.0	28.0	30.5	31.0
W64	—	—	30.0	33.5	34.0
W65	—	—	32.5	36.5	37.0
W66	—	—	35.0	39.5	40.0
W67	—	—	38.0	42.5	44.0
W68	—	—	40.5	46	48.5
W69	—	—	43.5	50	53.0
W70	—	—	46.5	54	57.0
W71	—	—	—	58	62.0
W72	—	—	—	62	67.0
W73	—	—	—	67	72.0
W74	—	—	—	72	77.0
W75	—	—	—	76	82.0
W76	—	—	—	81	87.0
W77	—	—	—	86	93.0
W78	—	—	—	90	99.0
W79	—	—	—	—	105
W80	—	—	—	—	112
W81	—	—	—	—	117
W82	—	—	—	—	123
W83	—	—	—	—	129
W84	—	—	—	—	135
W85	—	—	—	—	—

TABLE 149					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
W10	0.18	0.18	—	—	—
W11	0.20	0.20	—	—	—
W12	0.22	0.22	—	—	—
W13	0.24	0.24	—	—	—
W14	0.27	0.27	—	—	—
W15	0.30	0.30	—	—	—
W16	0.33	0.33	—	—	—
W17	0.36	0.36	—	—	—
W18	0.40	0.40	—	—	—
W19	0.44	0.44	—	—	—
W20	0.49	0.49	—	—	—
W21	0.54	0.54	—	—	—
W22	0.60	0.60	—	—	—
W23	0.66	0.66	—	—	—
W24	0.73	0.73	—	—	—
W25	0.80	0.80	—	—	—
W26	0.88	0.88	—	—	—
W27	0.97	0.97	—	—	—
W28	1.06	1.06	—	—	—
W29	1.17	1.17	—	—	—
W30	1.29	1.29	—	—	—
W31	1.42	1.42	—	—	—
W32	1.56	1.56	—	—	—
W33	1.71	1.71	—	—	—
W34	1.89	1.89	—	—	—
W35	2.08	2.08	—	—	—
W36	2.28	2.28	—	—	—
W37	2.51	2.51	—	—	—
W38	2.76	2.76	—	—	—
W39	3.04	3.04	—	—	—
W40	3.34	3.34	—	—	—
W41	3.68	3.68	—	—	—
W42	4.05	4.05	—	—	—
W43	4.45	4.45	—	—	—
W44	4.90	4.90	—	—	—
W45	5.39	5.39	5.53	—	—
W46	5.88	5.88	6.00	—	—
W47	6.41	6.41	6.60	—	—
W48	6.99	6.99	7.20	—	—
W49	7.63	7.63	7.84	—	—
W50	8.32	8.32	8.53	—	—
W51	9.07	9.07	9.30	—	—
W52	9.89	9.89	10.2	10.6	—
W53	10.8	10.8	11.2	11.6	—
W54	11.8	11.8	12.2	12.6	—
W55	12.8	12.8	13.2	13.9	—
W56	14.0	14.0	14.4	15.3	—
W57	15.3	15.3	15.8	16.9	18.5
W58	16.2	16.2	16.8	18.7	20.5
W59	17.6	17.6	18.3	20.7	22.5
W60	19.5	19.5	20.3	22.8	25.0
W61	—	21.5	22.4	25.1	27.5
W62	—	23.4	24.4	27.5	30.0
W63	—	25.7	26.8	30.5	33.0
W64	—	27.5	28.7	33.5	36.0
W65	—	—	31.5	37.0	39.5
W66	—	—	34.0	41.0	43.0
W67	—	—	37.0	44.0	47.5
W68	—	—	40.5	47.5	52.0
W69	—	—	43.5	52.0	56.0
W70	—	—	46.5	57.0	61.0
W71	—	—	—	61.0	66.0
W72	—	—	—	66.0	71.0
W73	—	—	—	71.0	76.0
W74	—	—	—	75.0	81.0
W75	—	—	—	79.0	87.0
W76	—	—	—	83.0	93.0
W77	—	—	—	87.0	99.0
W78	—	—	—	91.0	105
W79	—	—	—	—	111
W80	—	—	—	—	118
W81	—	—	—	—	125
W82	—	—	—	—	132
W83	—	—	—	—	139
W84	—	—	—	—	—

TABLE 150					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
W10	0.18	0.18	—	—	—
W11	0.20	0.20	—	—	—
W12	0.22	0.22	—	—	—
W13	0.24	0.24	—	—	—
W14	0.26	0.26	—	—	—
W15	0.28	0.28	—	—	—
W16	0.31	0.31	—	—	—
W17	0.34	0.34	—	—	—
W18	0.37	0.37	—	—	—
W19	0.41	0.41	—	—	—
W20	0.46	0.46	—	—	—
W21	0.50	0.50	—	—	—
W22	0.55	0.55	—	—	—
W23	0.60	0.60	—	—	—
W24	0.67	0.67	—	—	—
W25	0.73	0.73	—	—	—
W26	0.80	0.80	—	—	—
W27	0.88	0.88	—	—	—
W28	0.97	0.97	—	—	—
W29	1.07	1.07	—	—	—
W30	1.17	1.17	—	—	—
W31	1.29	1.29	—	—	—
W32	1.42	1.42	—	—	—
W33	1.57	1.57	—	—	—
W34	1.73	1.73	—	—	—
W35	1.90	1.90	—	—	—
W36	2.08	2.08	—	—	—
W37	2.28	2.28	—	—	—
W38	2.51	2.51	—	—	—
W39	2.76	2.76	—	—	—
W40	3.04	3.04	—	—	—
W41	3.34	3.34	—	—	—
W42	3.68	3.68	—	—	—
W43	4.04	4.04	—	—	—
W44	4.46	4.46	—	—	—
W45	4.94	4.94	5.13	—	—
W46	5.46	5.46	5.64	—	—
W47	6.03	6.03	6.22	—	—
W48	6.65	6.65	6.85	—	—
W49	7.33	7.33	7.56	—	—
W50	8.13	8.13	8.45	—	—
W51	8.95	8.95	9.32	—	—
W52	9.90	9.90	10.3	10.4	—
W53	10.7	10.7	11.3	11.4	—
W54	11.7	11.7	12.3	12.5	—
W55	12.8	12.8	13.4	13.7	—
W56	14.0	14.0	14.5	15.1	—
W57	15.3	15.3	15.8	16.7	18.5
W58	16.2	16.2	16.7	18.4	20.5
W59	17.5	17.5	18.0	20.3	22.5
W60	19.4	19.4	19.9	22.5	25.0
W61	—	21.3	21.9	24.8	27.5
W62	—	23.3	24.2	27.2	30.0
W63	—	25.5	26.8	30.0	33.0
W64	—	27.2	28.7	33.0	36.0
W65	—	—	31.0	36.0	39.5
W66	—	—	33.5	39.5	43.0
W67	—	—	36.0	43.5	47.0
W68	—	—	38.5	47.5	51.0
W69	—	—	41.5	52.0	56.0
W70	—	—	45.0	56.0	61.0
W71	—	—	—	60.0	66.0
W72	—	—	—	65.0	71.0
W73	—	—	—	69.0	76.0
W74	—	—	—	74.0	82.0
W75	—	—	—	79.0	87.0
W76	—	—	—	85.0	93.0
W77	—	—	—	91.0	99.0
W78	—	—	—	—	105
W79	—	—	—	—	111
W80	—	—	—	—	118
W81	—	—	—	—	125
W82	—	—	—	—	132
W83	—	—	—	—	139
W84	—	—	—	—	—
W85	—	—	—	—	—

Heater Element Specifications

For Application on Bulletin 100/500/609/1200 Line Starters

TABLE 151					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
W10	0.19	0.19	—	—	—
W11	0.21	0.21	—	—	—
W12	0.23	0.23	—	—	—
W13	0.25	0.25	—	—	—
W14	0.28	0.28	—	—	—
W15	0.30	0.30	—	—	—
W16	0.33	0.33	—	—	—
W17	0.36	0.36	—	—	—
W18	0.39	0.39	—	—	—
W19	0.43	0.43	—	—	—
W20	0.48	0.48	—	—	—
W21	0.52	0.52	—	—	—
W22	0.57	0.57	—	—	—
W23	0.62	0.62	—	—	—
W24	0.69	0.69	—	—	—
W25	0.76	0.76	—	—	—
W26	0.83	0.83	—	—	—
W27	0.91	0.91	—	—	—
W28	1.01	1.01	—	—	—
W29	1.12	1.12	—	—	—
W30	1.22	1.22	—	—	—
W31	1.34	1.34	—	—	—
W32	1.47	1.47	—	—	—
W33	1.62	1.62	—	—	—
W34	1.78	1.78	—	—	—
W35	1.96	1.96	—	—	—
W36	2.15	2.15	—	—	—
W37	2.36	2.36	—	—	—
W38	2.60	2.60	—	—	—
W39	2.86	2.86	—	—	—
W40	3.16	3.16	—	—	—
W41	3.48	3.48	—	—	—
W42	3.84	3.84	—	—	—
W43	4.22	4.22	—	—	—
W44	4.65	4.65	—	—	—
W45	5.12	5.12	5.13	—	—
W46	5.63	5.63	5.64	—	—
W47	6.20	6.20	6.22	—	—
W48	6.82	6.82	6.85	—	—
W49	7.51	7.51	7.56	—	—
W50	8.23	8.23	8.45	—	—
W51	9.07	9.07	9.32	—	—
W52	9.95	9.95	10.3	10.6	—
W53	10.8	10.8	11.3	11.6	—
W54	11.9	11.9	12.3	12.6	—
W55	13.0	13.0	13.4	13.9	—
W56	14.2	14.2	14.5	15.3	—
W57	15.5	15.5	15.8	16.9	—
W58	16.4	16.4	16.7	18.7	—
W59	17.7	17.7	18.1	20.7	—
W60	19.7	19.7	20.0	22.8	—
W61	—	21.7	22.0	25.1	25.0
W62	—	24.2	24.5	27.5	27.7
W63	—	27.0	27.3	30.5	31.0
W64	—	—	29.2	33.5	34.0
W65	—	—	31.5	36.5	38.0
W66	—	—	34.5	40.0	41.5
W67	—	—	37.0	44.0	45.5
W68	—	—	39.5	48.0	49.0
W69	—	—	42.5	52.0	53.0
W70	—	—	46.0	57.0	57.0
W71	—	—	—	61.0	62.0
W72	—	—	—	66.0	67.0
W73	—	—	—	70.0	72.0
W74	—	—	—	75.0	77.0
W75	—	—	—	80.0	84.0
W76	—	—	—	86.0	92.0
W77	—	—	—	92.0	97.0
W78	—	—	—	—	102
W79	—	—	—	—	109
W80	—	—	—	—	117
W81	—	—	—	—	125
W82	—	—	—	—	130
W83	—	—	—	—	136
W84	—	—	—	—	—
W85	—	—	—	—	—

TABLE 152					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
W10	0.19	0.19	—	—	—
W11	0.21	0.21	—	—	—
W12	0.23	0.23	—	—	—
W13	0.25	0.25	—	—	—
W14	0.28	0.28	—	—	—
W15	0.31	0.31	—	—	—
W16	0.34	0.34	—	—	—
W17	0.37	0.37	—	—	—
W18	0.41	0.41	—	—	—
W19	0.45	0.45	—	—	—
W20	0.50	0.50	—	—	—
W21	0.55	0.55	—	—	—
W22	0.60	0.60	—	—	—
W23	0.66	0.66	—	—	—
W24	0.73	0.73	—	—	—
W25	0.80	0.80	—	—	—
W26	0.88	0.88	—	—	—
W27	0.97	0.97	—	—	—
W28	1.06	1.06	—	—	—
W29	1.16	1.16	—	—	—
W30	1.27	1.27	—	—	—
W31	1.39	1.39	—	—	—
W32	1.51	1.51	—	—	—
W33	1.65	1.65	—	—	—
W34	1.80	1.80	—	—	—
W35	1.96	1.96	—	—	—
W36	2.15	2.15	—	—	—
W37	2.36	2.36	—	—	—
W38	2.60	2.60	—	—	—
W39	2.86	2.86	—	—	—
W40	3.16	3.16	—	—	—
W41	3.48	3.48	—	—	—
W42	3.85	3.85	—	—	—
W43	4.23	4.23	—	—	—
W44	4.68	4.68	—	—	—
W45	5.18	5.18	5.25	—	—
W46	5.68	5.68	5.81	—	—
W47	6.28	6.28	6.41	—	—
W48	6.94	6.94	7.09	—	—
W49	7.71	7.71	7.86	—	—
W50	8.45	8.45	8.56	—	—
W51	9.29	9.29	9.40	—	—
W52	10.3	10.3	10.4	10.6	—
W53	11.4	11.4	11.5	11.6	—
W54	12.5	12.5	12.6	12.6	—
W55	13.7	13.7	13.8	13.9	—
W56	15.0	15.0	15.1	15.3	—
W57	16.3	16.3	16.4	16.9	18.5
W58	17.6	17.6	17.7	18.7	20.5
W59	18.9	18.9	19.1	20.7	22.5
W60	—	20.9	21.1	22.8	25.0
W61	—	22.9	23.2	25.1	27.5
W62	—	25.0	25.7	27.5	30.0
W63	—	27.6	28.5	30.5	33.0
W64	—	—	30.5	33.5	36.0
W65	—	—	33.0	36.5	39.5
W66	—	—	35.5	40.0	43.0
W67	—	—	38.5	44.0	47.0
W68	—	—	41.5	48.5	51.0
W69	—	—	45.0	53.0	56.0
W70	—	—	—	58.0	61.0
W71	—	—	—	62.0	66.0
W72	—	—	—	67.0	72.0
W73	—	—	—	72.0	77.0
W74	—	—	—	77.0	83.0
W75	—	—	—	82.0	89.0
W76	—	—	—	88.0	95.0
W77	—	—	—	94.0	102
W78	—	—	—	—	108
W79	—	—	—	—	116
W80	—	—	—	—	123
W81	—	—	—	—	130
W82	—	—	—	—	137
W83	—	—	—	—	—

TABLE 153					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
W10	0.19	0.19	—	—	—
W11	0.21	0.21	—	—	—
W12	0.23	0.23	—	—	—
W13	0.25	0.25	—	—	—
W14	0.28	0.28	—	—	—
W15	0.31	0.31	—	—	—
W16	0.34	0.34	—	—	—
W17	0.37	0.37	—	—	—
W18	0.41	0.41	—	—	—
W19	0.45	0.45	—	—	—
W20	0.5	0.50	—	—	—
W21	0.55	0.55	—	—	—
W22	0.6	0.60	—	—	—
W23	0.66	0.66	—	—	—
W24	0.73	0.73	—	—	—
W25	0.8	0.80	—	—	—
W26	0.88	0.88	—	—	—
W27	0.97	0.97	—	—	—
W28	1.06	1.06	—	—	—
W29	1.16	1.16	—	—	—
W30	1.27	1.27	—	—	—
W31	1.39	1.39	—	—	—
W32	1.51	1.51	—	—	—
W33	1.65	1.65	—	—	—
W34	1.8	1.80	—	—	—
W35	1.98	1.98	—	—	—
W36	2.18	2.18	—	—	—
W37	2.39	2.39	—	—	—
W38	2.63	2.63	—	—	—
W39	2.9	2.90	—	—	—
W40	3.19	3.19	—	—	—
W41	3.5	3.50	—	—	—
W42	3.85	3.85	—	—	—
W43	4.24	4.24	—	—	—
W44	4.66	4.66	—	—	—
W45	5.13	5.13	5.25	—	—
W46	5.64	5.64	5.78	—	—
W47	6.2	6.20	6.35	—	—
W48	6.82	6.82	6.99	—	—
W49	7.51	7.51	7.69	—	—
W50	8.25	8.25	8.45	—	—
W51	9.07	9.07	9.32	—	—
W52	9.98	9.98	10.3	10.6	—
W53	11	11.0	11.4	11.6	—
W54	12.1	12.1	12.4	12.6	—
W55	13.3	13.3	13.6	13.9	—
W56	14.6	14.6	15.0	15.3	—
W57	16	16.0	16.4	16.9	18.5
W58	17.4	17.4	17.8	18.7	20.5
W59	19	19.0	19.5	20.7	22.5
W60	—	20.7	21.2	22.8	25.0
W61	—	22.7	23.3	25.1	27.5
W62	—	24.7	25.3	27.5	30.0
W63	—	27.0	28.0	30.5	33.0
W64	—	—	30.0	33.5	36.0
W65	—	—	32.5	36.5	39.5
W66	—	—	35.0	39.5	43.0
W67	—	—	38.0	42.5	47.0
W68	—	—	40.5	46.0	51.0
W69	—	—	43.5	50.0	56.0
W70	—	—	46.5	54.0	61.0
W71	—	—	—	58.0	66.0
W72	—	—	—	62.0	71.0
W73	—	—	—	67.0	76.0
W74	—	—	—	72.0	82.0
W75	—	—	—	76.0	87.0
W76	—	—	—	81.0	93.0
W77	—	—	—	86.0	99.0
W78	—	—	—	90.0	105
W79	—	—	—	—	111
W80	—	—	—	—	118
W81	—	—	—	—	125
W82	—	—	—	—	132
W83	—	—	—	—	139
W84	—	—	—	—	—

TABLE 154					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
W10	0.20	0.20	—	—	—
W11	0.22	0.22	—	—	—
W12	0.24	0.24	—	—	—
W13	0.26	0.26	—	—	—
W14	0.29	0.29	—	—	—
W15	0.32	0.32	—	—	—
W16	0.35	0.35	—	—	—
W17	0.38	0.38	—	—	—
W18	0.42	0.42	—	—	—
W19	0.47	0.47	—	—	—
W20	0.51	0.51	—	—	—
W21	0.56	0.56	—	—	—
W22	0.61	0.61	—	—	—
W23	0.67	0.67	—	—	—
W24	0.74	0.74	—	—	—
W25	0.81	0.81	—	—	—
W26	0.89	0.89	—	—	—
W27	0.98	0.98	—	—	—
W28	1.08	1.08	—	—	—
W29	1.19	1.19	—	—	—
W30	1.30	1.30	—	—	—
W31	1.43	1.43	—	—	—
W32	1.55	1.55	—	—	—
W33	1.70	1.70	—	—	—
W34	1.90	1.90	—	—	—
W35	2.02	2.02	—	—	—
W36	2.22	2.22	—	—	—
W37	2.43	2.43	—	—	—
W38	2.68	2.68	—	—	—
W39	2.96	2.96	—	—	—
W40	3.25	3.25	—	—	—
W41	3.58	3.58	—	—	—
W42	3.94	3.94	—	—	—
W43	4.30	4.30	—	—	—
W44	4.72	4.72	—	—	—
W45	5.22	5.22	5.25	—	—
W46	5.78	5.78	5.81	—	—
W47	6.38	6.38	6.41	—	—
W48	7.06	7.06	7.09	—	—
W49	7.83	7.83	7.86	—	—
W50	8.55	8.55	8.58	—	—
W51	9.41	9.41	9.48	—	—
W52	10.5	10.5	10.6	11.1	—
W53	11.6	11.6	11.7	12.2	—
W54	12.7	12.7	12.8	13.4	—
W55	14.0	14.0	14.1	14.7	—
W56	15.3	15.3	15.4	16.3	—
W57	16.7	16.7	16.9	17.9	19.5
W58	18.0	18.0	18.3	19.7	21.4
W59	—	19.3	19.9	21.7	23.7
W60	—	21.3	21.9	23.8	26.0
W61	—	23.3	24.2	26.1	28.7
W62	—	25.6	26.8	28.7	31.5
W63	—	28.1	29.6	31.5	34.5
W64	—	—	32.5	34.5	37.5
W65	—	—	35.0	38.0	41.0
W66	—	—	37.5	41.5	44.5
W67	—	—	41.0	45.5	48.5
W68	—	—	45.0	49.5	53
W69	—	—	—	54	58
W70	—	—	—	59	63
W71	—	—	—	64	68
W72	—	—	—	70	74
W73	—	—	—	76	80
W74	—	—	—	81	86
W75	—	—	—	87	92
W76	—	—	—	93	98
W77	—	—	—	—	105
W78	—	—	—	—	112
W79	—	—	—	—	120
W80	—	—	—	—	128
W81	—	—	—	—	136
W82	—	—	—	—	—
W83	—	—	—	—	—
W84	—	—	—	—	—
W85	—	—	—	—	—

Heater Element Specifications

For Application on Bulletin 100/500/609/1200 Line Starters

TABLE 155					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 1P	Size 2	Size 3
W10	0.20	0.20	—	—	—
W11	0.22	0.22	—	—	—
W12	0.24	0.24	—	—	—
W13	0.26	0.26	—	—	—
W14	0.29	0.29	—	—	—
W15	0.32	0.32	—	—	—
W16	0.35	0.35	—	—	—
W17	0.39	0.39	—	—	—
W18	0.43	0.43	—	—	—
W19	0.47	0.47	—	—	—
W20	0.51	0.51	—	—	—
W21	0.56	0.56	—	—	—
W22	0.61	0.61	—	—	—
W23	0.67	0.67	—	—	—
W24	0.74	0.74	—	—	—
W25	0.81	0.81	—	—	—
W26	0.89	0.89	—	—	—
W27	0.98	0.98	—	—	—
W28	1.08	1.08	—	—	—
W29	1.19	1.19	—	—	—
W30	1.30	1.30	—	—	—
W31	1.43	1.43	—	—	—
W32	1.56	1.56	—	—	—
W33	1.70	1.70	—	—	—
W34	1.88	1.88	—	—	—
W35	2.05	2.05	—	—	—
W36	2.24	2.24	—	—	—
W37	2.44	2.44	—	—	—
W38	2.69	2.69	—	—	—
W39	2.97	2.97	—	—	—
W40	3.30	3.30	—	—	—
W41	3.64	3.64	—	—	—
W42	4.10	4.10	—	—	—
W43	4.57	4.57	—	—	—
W44	5.01	5.01	—	—	—
W45	5.51	5.51	—	5.48	—
W46	6.06	6.06	—	6.09	—
W47	6.62	6.62	—	6.65	—
W48	7.22	7.22	—	7.26	—
W49	7.89	7.89	—	7.94	—
W50	8.62	8.62	—	8.68	—
W51	9.41	9.41	—	9.48	—
W52	10.5	10.5	—	10.6	11.5
W53	11.6	11.6	11.6	11.7	12.6
W54	12.7	12.7	12.7	12.8	13.8
W55	14.0	14.0	14.0	14.1	15.1
W56	15.3	15.3	15.3	15.4	16.7
W57	16.7	16.7	16.7	16.8	18.3
W58	18.0	18.0	18.0	18.1	20.1
W59	—	19.3	19.3	19.5	22.1
W60	—	21.3	21.3	21.5	24.4
W61	—	23.3	23.3	23.8	27.0
W62	—	25.6	25.6	26.4	29.5
W63	—	28.1	28.1	29.2	32.5
W64	—	—	30.5	31.5	35.0
W65	—	—	32.5	34.0	38.5
W66	—	—	34.0	36.5	42.0
W67	—	—	36.0	39.5	46.0
W68	—	—	—	42.5	50
W69	—	—	—	46.0	54
W70	—	—	—	—	59
W71	—	—	—	—	64
W72	—	—	—	—	70
W73	—	—	—	—	76
W74	—	—	—	—	81
W75	—	—	—	—	87
W76	—	—	—	—	93
W77	—	—	—	—	—
W78	—	—	—	—	—
W79	—	—	—	—	—
W80	—	—	—	—	—

TABLE 156						
Heater Element Cat. No.	Full Load Amperes					
	Size 0	Size 1	Size 1P	Size 2	Size 3	Size 4
W10	0.20	0.20	—	—	—	—
W11	0.22	0.22	—	—	—	—
W12	0.24	0.24	—	—	—	—
W13	0.26	0.26	—	—	—	—
W14	0.29	0.29	—	—	—	—
W15	0.32	0.32	—	—	—	—
W16	0.35	0.35	—	—	—	—
W17	0.39	0.39	—	—	—	—
W18	0.43	0.43	—	—	—	—
W19	0.47	0.47	—	—	—	—
W20	0.51	0.51	—	—	—	—
W21	0.56	0.56	—	—	—	—
W22	0.61	0.61	—	—	—	—
W23	0.67	0.67	—	—	—	—
W24	0.74	0.74	—	—	—	—
W25	0.81	0.81	—	—	—	—
W26	0.89	0.89	—	—	—	—
W27	0.98	0.98	—	—	—	—
W28	1.08	1.08	—	—	—	—
W29	1.19	1.19	—	—	—	—
W30	1.30	1.30	—	—	—	—
W31	1.43	1.43	—	—	—	—
W32	1.57	1.57	—	—	—	—
W33	1.72	1.72	—	—	—	—
W34	1.90	1.90	—	—	—	—
W35	2.08	2.08	—	—	—	—
W36	2.28	2.28	—	—	—	—
W37	2.49	2.49	—	—	—	—
W38	2.74	2.74	—	—	—	—
W39	3.02	3.02	—	—	—	—
W40	3.33	3.33	—	—	—	—
W41	3.68	3.68	—	—	—	—
W42	4.14	4.14	—	—	—	—
W43	4.61	4.61	—	—	—	—
W44	5.06	5.06	—	—	—	—
W45	5.56	5.56	—	5.57	—	—
W46	6.11	6.11	—	6.12	—	—
W47	6.72	6.72	—	6.73	—	—
W48	7.40	7.40	—	7.38	—	—
W49	8.18	8.18	—	8.20	—	—
W50	8.88	8.88	—	8.92	—	—
W51	9.70	9.70	—	9.81	—	—
W52	10.8	10.8	—	10.9	11.7	—
W53	11.8	11.8	11.8	11.9	12.8	—
W54	12.9	12.9	12.9	13.0	13.9	—
W55	14.2	14.2	14.2	14.3	15.2	—
W56	15.5	15.5	15.5	15.6	16.8	—
W57	17.0	17.0	17.0	17.1	18.5	19.5
W58	18.3	18.3	18.3	18.5	20.2	21.4
W59	—	19.9	19.9	20.1	22.2	23.7
W60	—	22.0	22.0	22.2	24.5	26.0
W61	—	24.3	24.3	24.5	27.1	28.7
W62	—	27.0	27.0	27.2	29.9	31.5
W63	—	—	29.5	30.0	32.5	34.5
W64	—	—	32.0	33.0	35.5	37.5
W65	—	—	34.0	35.5	39.0	41.0
W66	—	—	36.0	38.0	42.5	44.5
W67	—	—	—	41.5	47.0	48.5
W68	—	—	—	45.0	52	53
W69	—	—	—	—	57	58
W70	—	—	—	—	62	63
W71	—	—	—	—	67	68
W72	—	—	—	—	73	74
W73	—	—	—	—	79	80
W74	—	—	—	—	85	86
W75	—	—	—	—	92	93
W76	—	—	—	—	—	100
W77	—	—	—	—	—	108
W78	—	—	—	—	—	116
W79	—	—	—	—	—	125
W80	—	—	—	—	—	135
W81	—	—	—	—	—	—
W82	—	—	—	—	—	—
W83	—	—	—	—	—	—
W84	—	—	—	—	—	—
W85	—	—	—	—	—	—

Refer to Heater Element Selection Procedure on page 2 before using tables.

TABLE 158					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
JJ14	0.19	0.19	—	—	—
JJ13	0.21	0.21	—	—	—
JJ12	0.23	0.23	—	—	—
JJ11	0.26	0.26	—	—	—
JJ10	0.28	0.28	—	—	—
JJ9	0.31	0.31	—	—	—
JJ8	0.34	0.34	—	—	—
JJ7	0.38	0.38	—	—	—
JJ6	0.42	0.42	—	—	—
JJ5	0.46	0.46	—	—	—
JJ4	0.51	0.51	—	—	—
JJ3	0.57	0.57	—	—	—
JJ2	0.63	0.63	—	—	—
JJ1	0.69	0.69	—	—	—
J1	0.76	0.76	—	—	—
J2	0.84	0.84	—	—	—
J3	0.92	0.92	—	—	—
J4	1.02	1.02	—	—	—
J5	1.12	1.12	—	—	—
J6	1.23	1.23	—	—	—
J7	1.36	1.36	—	—	—
J8	1.50	1.50	—	—	—
J9	1.65	1.65	—	—	—
J10	1.82	1.82	—	—	—
J11	2.00	2.00	—	—	—
J12	2.20	2.20	—	—	—
J13	2.43	2.43	—	—	—
J14	2.68	2.68	—	—	—
J15	2.95	2.95	—	—	—
J16	3.25	3.25	—	—	—
J17	3.58	3.58	—	—	—
J18	3.96	3.96	—	—	—
J19	4.37	4.37	—	—	—
J20	4.82	4.82	—	—	—
J21	5.32	5.32	—	—	—
J22	5.87	5.87	—	—	—
J23	6.48	6.48	—	—	—
J24	7.15	7.15	—	—	—
J25	7.89	7.89	—	—	—
J26	8.70	8.70	8.84	—	—
J27	9.56	9.56	9.71	—	—
J28	10.5	10.5	10.7	—	—
J29	11.5	11.5	11.8	—	—
J30	12.7	12.7	13.0	—	—
J31	13.9	13.9	14.4	—	—
J32	15.3	15.3	15.9	—	—
J33	16.8	16.8	17.6	—	—
J34	18.5	18.5	19.4	21.6	—
J35	—	20.3	21.4	23.9	—
J36	—	22.3	23.5	26.5	—
J37	—	24.5	25.8	29.3	—
J38	—	27.0	28.8	32.5	34.5
J39	—	—	32.5	36.0	38
J40	—	—	36.0	40.0	42
J41	—	—	39.0	44.0	46
J42	—	—	42.0	49	51
J43	—	—	45.0	55	57
J44	—	—	—	60	62
J45	—	—	—	66	68
J46	—	—	—	72	74
J70	—	—	—	78	80
J71	—	—	—	84	87
J72	—	—	—	92	95
J73	—	—	—	—	104
J74	—	—	—	—	113
J75	—	—	—	—	122
J76	—	—	—	—	132
J77	—	—	—	—	143

TABLE 159					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
JJ14	0.19	0.19	—	—	—
JJ13	0.21	0.21	—	—	—
JJ12	0.23	0.23	—	—	—
JJ11	0.26	0.26	—	—	—
JJ10	0.28	0.28	—	—	—
JJ9	0.31	0.31	—	—	—
JJ8	0.34	0.34	—	—	—
JJ7	0.38	0.38	—	—	—
JJ6	0.42	0.42	—	—	—
JJ5	0.46	0.46	—	—	—
JJ4	0.51	0.51	—	—	—
JJ3	0.57	0.57	—	—	—
JJ2	0.63	0.63	—	—	—
JJ1	0.69	0.69	—	—	—
J1	0.76	0.76	—	—	—
J2	0.84	0.84	—	—	—
J3	0.92	0.92	—	—	—
J4	1.02	1.02	—	—	—
J5	1.12	1.12	—	—	—
J6	1.23	1.23	—	—	—
J7	1.36	1.36	—	—	—
J8	1.50	1.50	—	—	—
J9	1.65	1.65	—	—	—
J10	1.82	1.82	—	—	—
J11	2.00	2.00	—	—	—
J12	2.20	2.20	—	—	—
J13	2.43	2.43	—	—	—
J14	2.68	2.68	—	—	—
J15	2.95	2.95	—	—	—
J16	3.25	3.25	—	—	—
J17	3.59	3.59	—	—	—
J18	3.96	3.96	—	—	—
J19	4.37	4.37	—	—	—
J20	4.82	4.82	—	—	—
J21	5.32	5.32	—	—	—
J22	5.87	5.87	—	—	—
J23	6.48	6.48	—	—	—
J24	7.15	7.15	—	—	—
J25	7.89	7.89	—	—	—
J26	8.70	8.70	8.84	—	—
J27	9.56	9.56	9.71	—	—
J28	10.5	10.5	10.7	—	—
J29	11.5	11.5	11.7	—	—
J30	12.7	12.7	12.9	—	—
J31	13.9	13.9	14.2	—	—
J32	15.3	15.3	15.8	—	—
J33	16.8	16.8	17.5	—	—
J34	18.5	18.5	19.4	20.9	—
J35	—	20.3	21.2	23.2	—
J36	—	22.3	23.2	25.7	—
J37	—	24.6	25.3	28.4	31.5
J38	—	27.0	27.7	31.5	35.0
J39	—	—	30.5	35.0	38.5
J40	—	—	33.0	39.0	43.0
J41	—	—	36.0	43.5	47.0
J42	—	—	39.5	48.5	51
J43	—	—	43.0	54	56
J44	—	—	47.0	59	61
J45	—	—	—	64	67
J46	—	—	—	70	73
J70	—	—	—	77	81
J71	—	—	—	85	90
J72	—	—	—	92	99
J73	—	—	—	—	108
J74	—	—	—	—	118
J75	—	—	—	—	129
J76	—	—	—	—	140

Refer to Heater Element Selection Procedure on page 2 before using tables.

Heater Element Specifications

For Application on Bulletin 100/500/609/1200 Line Starters

TABLE 160						
Heater Element Cat. No.	Full Load Amperes					
	Size 0	Size 1	Size 2	Size 3	Size 4	Size 5
JJ14	0.19	0.19	—	—	—	—
JJ13	0.21	0.21	—	—	—	—
JJ12	0.23	0.23	—	—	—	—
JJ11	0.26	0.26	—	—	—	—
JJ10	0.28	0.28	—	—	—	—
JJ9	0.31	0.31	—	—	—	—
JJ8	0.34	0.34	—	—	—	—
JJ7	0.38	0.38	—	—	—	—
JJ6	0.42	0.42	—	—	—	—
JJ5	0.46	0.46	—	—	—	—
JJ4	0.51	0.51	—	—	—	—
JJ3	0.57	0.57	—	—	—	—
JJ2	0.63	0.63	—	—	—	—
JJ1	0.69	0.69	—	—	—	—
J1	0.76	0.76	—	—	—	—
J2	0.84	0.84	—	—	—	—
J3	0.93	0.93	—	—	—	—
J4	1.03	1.03	—	—	—	—
J5	1.14	1.14	—	—	—	—
J6	1.26	1.26	—	—	—	76
J7	1.39	1.39	—	—	—	83
J8	1.53	1.53	—	—	—	91
J9	1.68	1.68	—	—	—	100
J10	1.86	1.86	—	—	—	108
J11	2.05	2.05	—	—	—	117
J12	2.25	2.25	—	—	—	127
J13	2.48	2.48	—	—	—	138
J14	2.73	2.73	—	—	—	150
J15	3.01	3.01	—	—	—	165
J16	3.31	3.31	—	—	—	179
J17	3.65	3.65	—	—	—	195
J18	4.02	4.02	—	—	—	211
J19	4.42	4.42	—	—	—	230
J20	4.87	4.87	—	—	—	250
J21	5.37	5.37	—	—	—	272
J22	5.91	5.91	—	—	—	—
J23	6.50	6.50	6.50	—	—	—
J24	7.19	7.19	7.21	—	—	—
J25	7.94	7.94	7.99	—	—	—
J26	8.78	8.78	8.85	—	—	—
J27	9.71	9.71	9.81	—	—	—
J28	10.7	10.7	10.9	—	—	—
J29	11.8	11.8	12.1	—	—	—
J30	13.1	13.1	13.4	—	—	—
J31	14.5	14.5	14.9	—	—	—
J32	16.0	16.0	16.5	—	—	—
J33	17.7	17.7	18.3	—	—	—
J34	19.6	19.6	20.2	22.2	—	—
J35	—	21.6	22.4	24.5	—	—
J36	—	23.9	24.8	27.1	—	—
J37	—	26.4	27.4	29.9	—	—
J38	—	29.3	30.5	33.0	33.5	—
J39	—	—	33.5	36.5	37.5	—
J40	—	—	37.0	40.5	41.5	—
J41	—	—	41.0	45.0	46.5	—
J42	—	—	45.5	50	52	—
J43	—	—	—	56	57	—
J44	—	—	—	61	63	—
J45	—	—	—	67	68	—
J46	—	—	—	73	75	—
J70	—	—	—	80	83	—
J71	—	—	—	87	91	—
J72	—	—	—	95	99	—
J73	—	—	—	—	108	—
J74	—	—	—	—	117	—
J75	—	—	—	—	126	—
J76	—	—	—	—	135	—

TABLE 161					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
JJ14	0.19	0.19	—	—	—
JJ13	0.21	0.21	—	—	—
JJ12	0.23	0.23	—	—	—
JJ11	0.26	0.26	—	—	—
JJ10	0.28	0.28	—	—	—
JJ9	0.31	0.31	—	—	—
JJ8	0.34	0.34	—	—	—
JJ7	0.38	0.38	—	—	—
JJ6	0.42	0.42	—	—	—
JJ5	0.46	0.46	—	—	—
JJ4	0.51	0.51	—	—	—
JJ3	0.57	0.57	—	—	—
JJ2	0.63	0.63	—	—	—
JJ1	0.69	0.69	—	—	—
J1	0.76	0.76	—	—	—
J2	0.84	0.84	—	—	—
J3	0.93	0.93	—	—	—
J4	1.03	1.03	—	—	—
J5	1.13	1.13	—	—	—
J6	1.24	1.24	—	—	—
J7	1.37	1.37	—	—	—
J8	1.51	1.51	—	—	—
J9	1.66	1.66	—	—	—
J10	1.84	1.84	—	—	—
J11	2.02	2.02	—	—	—
J12	2.22	2.22	—	—	—
J13	2.45	2.45	—	—	—
J14	2.70	2.70	—	—	—
J15	2.97	2.97	—	—	—
J16	3.27	3.27	—	—	—
J17	3.61	3.61	—	—	—
J18	3.98	3.98	—	—	—
J19	4.39	4.39	—	—	—
J20	4.84	4.84	—	—	—
J21	5.34	5.34	—	—	—
J22	5.89	5.89	—	—	—
J23	6.49	6.49	—	—	—
J24	7.16	7.16	—	—	—
J25	7.91	7.91	—	—	—
J26	8.73	8.73	9.11	—	—
J27	9.58	9.58	10.1	—	—
J28	10.6	10.6	11.1	—	—
J29	11.7	11.7	12.2	—	—
J30	13.0	13.0	13.5	—	—
J31	14.4	14.4	14.9	—	—
J32	15.9	15.9	16.4	—	—
J33	17.6	17.6	18.1	—	—
J34	19.5	19.5	20.0	22.2	—
J35	—	21.5	22.1	24.5	—
J36	—	23.6	24.3	27.1	—
J37	—	25.9	26.8	29.9	—
J38	—	28.5	29.5	33.0	34.5
J39	—	—	32.5	36.5	38.5
J40	—	—	35.5	40.5	42.5
J41	—	—	39.0	45.0	47.0
J42	—	—	43.0	50	52
J43	—	—	47.5	56	58
J44	—	—	—	61	64
J45	—	—	—	67	70
J46	—	—	—	73	77
J70	—	—	—	80	85
J71	—	—	—	87	93
J72	—	—	—	95	102
J73	—	—	—	—	112
J74	—	—	—	—	123
J75	—	—	—	—	135

Refer to Heater Element Selection Procedure on page 2 before using tables.

TABLE 162					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
JJ14	0.19	0.19	—	—	—
JJ13	0.21	0.21	—	—	—
JJ12	0.23	0.23	—	—	—
JJ11	0.26	0.26	—	—	—
JJ10	0.28	0.28	—	—	—
JJ9	0.31	0.31	—	—	—
JJ8	0.34	0.34	—	—	—
JJ7	0.38	0.38	—	—	—
JJ6	0.42	0.42	—	—	—
JJ5	0.46	0.46	—	—	—
JJ4	0.51	0.51	—	—	—
JJ3	0.57	0.57	—	—	—
JJ2	0.63	0.63	—	—	—
JJ1	0.69	0.69	—	—	—
J1	0.76	0.76	—	—	—
J2	0.84	0.84	—	—	—
J3	0.92	0.92	—	—	—
J4	1.02	1.02	—	—	—
J5	1.12	1.12	—	—	—
J6	1.23	1.23	—	—	—
J7	1.36	1.36	—	—	—
J8	1.50	1.50	—	—	—
J9	1.65	1.65	—	—	—
J10	1.82	1.82	—	—	—
J11	2.00	2.00	—	—	—
J12	2.20	2.20	—	—	—
J13	2.43	2.43	—	—	—
J14	2.68	2.68	—	—	—
J15	2.95	2.95	—	—	—
J16	3.25	3.25	—	—	—
J17	3.59	3.59	—	—	—
J18	3.99	3.99	—	—	—
J19	4.42	4.42	—	—	—
J20	4.87	4.87	—	—	—
J21	5.41	5.41	—	—	—
J22	5.98	5.98	6.04	—	—
J23	6.61	6.61	6.73	—	—
J24	7.26	7.26	7.41	—	—
J25	7.98	7.98	8.19	—	—
J26	8.77	8.77	9.05	—	—
J27	9.61	9.61	10.0	—	—
J28	10.6	10.6	11.1	—	—
J29	11.7	11.7	12.2	—	—
J30	13.0	13.0	13.5	—	—
J31	14.4	14.4	14.9	—	—
J32	15.9	15.9	16.5	—	—
J33	17.5	17.5	18.3	—	—
J34	19.4	19.4	20.2	21.6	—
J35	—	21.3	22.4	23.9	—
J36	—	23.3	24.8	26.5	—
J37	—	25.5	27.4	29.3	—
J38	—	28.0	30.5	32.5	33.5
J39	—	—	33.5	36.0	37.5
J40	—	—	37.5	40.0	41.0
J41	—	—	41.0	44.5	46.5
J42	—	—	45.0	49.5	52
J43	—	—	—	55	57
J44	—	—	—	60	63
J45	—	—	—	66	68
J46	—	—	—	72	75
J70	—	—	—	78	83
J71	—	—	—	85	91
J72	—	—	—	92	99
J73	—	—	—	—	108
J74	—	—	—	—	117
J75	—	—	—	—	126
J76	—	—	—	—	135

TABLE 163					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
JJ14	0.19	0.19	—	—	—
JJ13	0.21	0.21	—	—	—
JJ12	0.23	0.23	—	—	—
JJ11	0.26	0.26	—	—	—
JJ10	0.28	0.28	—	—	—
JJ9	0.31	0.31	—	—	—
JJ8	0.34	0.34	—	—	—
JJ7	0.38	0.38	—	—	—
JJ6	0.42	0.42	—	—	—
JJ5	0.46	0.46	—	—	—
JJ4	0.51	0.51	—	—	—
JJ3	0.57	0.57	—	—	—
JJ2	0.63	0.63	—	—	—
JJ1	0.69	0.69	—	—	—
J1	0.77	0.77	—	—	—
J2	0.86	0.86	—	—	—
J3	0.95	0.95	—	—	—
J4	1.06	1.06	—	—	—
J5	1.18	1.18	—	—	—
J6	1.32	1.32	—	—	—
J7	1.44	1.44	—	—	—
J8	1.58	1.58	—	—	—
J9	1.72	1.72	—	—	—
J10	1.88	1.88	—	—	—
J11	2.06	2.06	—	—	—
J12	2.25	2.25	—	—	—
J13	2.48	2.48	—	—	—
J14	2.73	2.73	—	—	—
J15	3.01	3.01	—	—	—
J16	3.31	3.31	—	—	—
J17	3.65	3.65	—	—	—
J18	4.02	4.02	—	—	—
J19	4.42	4.42	—	—	—
J20	4.87	4.87	—	—	—
J21	5.37	5.37	—	—	—
J22	5.91	5.91	—	—	—
J23	6.50	6.50	6.50	—	—
J24	7.19	7.19	7.21	—	—
J25	7.94	7.94	8.52	—	—
J26	8.78	8.78	9.30	—	—
J27	9.71	9.71	10.2	—	—
J28	10.7	10.7	11.1	—	—
J29	11.8	11.8	12.1	—	—
J30	13.1	13.1	13.4	—	—
J31	14.5	14.5	14.9	—	—
J32	16.0	16.0	16.5	—	—
J33	17.7	17.7	18.3	—	—
J34	19.6	19.6	20.2	21.8	—
J35	—	21.7	22.4	23.9	—
J36	—	23.9	24.8	26.6	—
J37	—	26.4	27.4	29.6	—
J38	—	29.3	30.5	33.0	33.5
J39	—	—	33.5	37.0	37.5
J40	—	—	37.0	41.0	41.5
J41	—	—	41.0	45.5	46.0
J42	—	—	45.5	51	52
J43	—	—	—	56	57
J44	—	—	—	61	63
J45	—	—	—	67	69
J46	—	—	—	73	76
J70	—	—	—	79	84
J71	—	—	—	87	92
J72	—	—	—	95	102
J73	—	—	—	—	112
J74	—	—	—	—	123
J75	—	—	—	—	135

Refer to Heater Element Selection Procedure on page 2 before using tables.

Heater Element Specifications

For Application on Bulletin 100/500/609/1200 Line Starters

TABLE 164					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 1P	Size 2	Size 3
JJ14	0.20	0.20	—	—	—
JJ13	0.22	0.22	—	—	—
JJ12	0.24	0.24	—	—	—
JJ11	0.27	0.27	—	—	—
JJ10	0.30	0.30	—	—	—
JJ9	0.33	0.33	—	—	—
JJ8	0.36	0.36	—	—	—
JJ7	0.40	0.40	—	—	—
JJ6	0.44	0.44	—	—	—
JJ5	0.49	0.49	—	—	—
JJ4	0.54	0.54	—	—	—
JJ3	0.59	0.59	—	—	—
JJ2	0.65	0.65	—	—	—
JJ1	0.72	0.72	—	—	—
J1	0.80	0.80	—	—	—
J2	0.88	0.88	—	—	—
J3	0.97	0.97	—	—	—
J4	1.07	1.07	—	—	—
J5	1.18	1.18	—	—	—
J6	1.31	1.31	—	—	—
J7	1.44	1.44	—	—	—
J8	1.59	1.59	—	—	—
J9	1.76	1.76	—	—	—
J10	1.94	1.94	—	—	—
J11	2.14	2.14	—	—	—
J12	2.36	2.36	—	—	—
J13	2.60	2.60	—	—	—
J14	2.86	2.86	—	—	—
J15	3.15	3.15	—	—	—
J16	3.46	3.46	—	—	—
J17	3.81	3.81	—	—	—
J18	4.19	4.19	—	—	—
J19	4.61	4.61	—	—	—
J20	5.07	5.07	—	—	—
J21	5.58	5.58	—	—	—
J22	6.14	6.14	—	—	—
J23	6.75	6.75	—	6.75	—
J24	7.47	7.47	—	7.49	—
J25	8.26	8.26	—	8.31	—
J26	9.14	9.14	—	9.22	—
J27	10.1	10.1	—	10.2	—
J28	11.2	11.2	11.2	11.3	—
J29	12.4	12.4	12.4	12.6	—
J30	13.7	13.7	13.7	14.0	—
J31	15.2	15.2	15.2	15.5	—
J32	16.8	16.8	16.8	17.1	—
J33	18.6	18.6	18.6	19.0	—
J34	—	20.5	20.5	21.0	23.3
J35	—	22.7	22.7	23.2	25.8
J36	—	25.1	25.1	25.7	28.8
J37	—	27.8	27.8	28.4	31.5
J38	—	—	30.5	31.5	35.5
J39	—	—	34.0	35.0	39.5
J40	—	—	38.0	39.0	44.0
J41	—	—	—	43.5	47.0
J42	—	—	—	48.0	52
J43	—	—	—	—	58
J44	—	—	—	—	63
J45	—	—	—	—	69
J46	—	—	—	—	76
J70	—	—	—	—	84
J71	—	—	—	—	92
J72	—	—	—	—	—
J73	—	—	—	—	—
J74	—	—	—	—	—
J75	—	—	—	—	—

TABLE 165	
Heater Element Cat. No.	Full Load Amperes
	Size 7
J5	230
J6	253
J7	279
J8	310
J9	340
J10	375
J11	410
J12	455
J13	500
J14	550
J15	610
J16	670
J17	740
J18	810
J19	—

Refer to Heater Element Selection Procedure on page 2 before using tables.

TABLE 166						
Heater Element Cat. No.	Full Load Amperes					
	Size 0	Size 1	Size 2	Size 3	Size 4	Size 5
W10	0.19	0.19	—	—	—	—
W11	0.21	0.21	—	—	—	—
W12	0.23	0.23	—	—	—	—
W13	0.25	0.25	—	—	—	—
W14	0.27	0.27	—	—	—	—
W15	0.30	0.30	—	—	—	—
W16	0.32	0.32	—	—	—	—
W17	0.36	0.36	—	—	—	—
W18	0.39	0.39	—	—	—	—
W19	0.43	0.43	—	—	—	—
W20	0.47	0.47	—	—	—	—
W21	0.52	0.52	—	—	—	—
W22	0.56	0.56	—	—	—	—
W23	0.62	0.62	—	—	—	—
W24	0.68	0.68	—	—	—	—
W25	0.74	0.74	—	—	—	—
W26	0.82	0.82	—	—	—	—
W27	0.90	0.90	—	—	—	—
W28	0.98	0.98	—	—	—	—
W29	1.05	1.05	—	—	—	72
W30	1.16	1.16	—	—	—	78
W31	1.29	1.29	—	—	—	85
W32	1.40	1.40	—	—	—	92
W33	1.55	1.55	—	—	—	100
W34	1.70	1.70	—	—	—	109
W35	1.84	1.84	—	—	—	118
W36	2.02	2.02	—	—	—	128
W37	2.22	2.22	—	—	—	139
W38	2.45	2.45	—	—	—	151
W39	2.63	2.63	—	—	—	164
W40	2.89	2.89	—	—	—	181
W41	3.17	3.17	—	—	—	198
W42	3.48	3.48	—	—	—	218
W43	3.82	3.82	—	—	—	240
W44	4.19	4.19	—	—	—	—
W45	4.60	4.60	5.1	—	—	—
W46	5.05	5.05	5.6	—	—	—
W47	5.54	5.54	6.12	—	—	—
W48	6.08	6.08	6.65	—	—	—
W49	6.68	6.68	7.25	—	—	—
W50	7.33	7.33	7.9	—	—	—
W51	8.05	8.05	8.6	—	—	—
W52	8.83	8.83	9.4	—	—	—
W53	9.70	9.70	10.2	—	—	—
W54	10.6	10.6	11.2	—	—	—
W55	11.7	11.7	12.2	—	—	—
W56	12.8	12.8	13.4	—	—	—
W57	14.1	14.1	14.7	—	—	—
W58	15.5	15.5	16.2	—	—	—
W59	17.0	17.0	17.7	—	—	—
W60	18.6	18.6	19.4	—	—	—
W61	—	20.4	21.3	25.0	—	—
W62	—	22.4	23.4	27.3	—	—
W63	—	24.6	25.6	29.8	—	—
W64	—	27.0	28.1	32.5	33.5	—
W65	—	—	30	35.5	37.0	—
W66	—	—	32.5	39.0	40.5	—
W67	—	—	35	42.0	44.5	—
W68	—	—	37.5	46.0	49.0	—
W69	—	—	40	51.0	54.0	—
W70	—	—	42.0	55.0	59.0	—
W71	—	—	44.5	59.0	64.0	—
W72	—	—	47.0	64.0	69.0	—
W73	—	—	—	69.0	74.0	—
W74	—	—	—	74.0	79.0	—
W75	—	—	—	79.0	84.0	—
W76	—	—	—	83.0	90.0	—
W77	—	—	—	88.0	96.0	—
W78	—	—	—	93.0	102	—
W79	—	—	—	—	108	—
W80	—	—	—	—	116	—
W81	—	—	—	—	123	—
W82	—	—	—	—	131	—
W83	—	—	—	—	139	—
W84	—	—	—	—	—	—
W85	—	—	—	—	—	—

TABLE 167						
Heater Element Cat. No.	Full Load Amperes					
	Size 0	Size 1	Size 2	Size 3	Size 4	Size 5
W10	0.20	0.20	—	—	—	—
W11	0.22	0.22	—	—	—	—
W12	0.24	0.24	—	—	—	—
W13	0.26	0.26	—	—	—	—
W14	0.28	0.28	—	—	—	—
W15	0.31	0.31	—	—	—	—
W16	0.34	0.34	—	—	—	—
W17	0.37	0.37	—	—	—	—
W18	0.41	0.41	—	—	—	—
W19	0.45	0.45	—	—	—	—
W20	0.49	0.49	—	—	—	—
W21	0.54	0.54	—	—	—	—
W22	0.59	0.59	—	—	—	—
W23	0.65	0.65	—	—	—	—
W24	0.71	0.71	—	—	—	—
W25	0.78	0.78	—	—	—	—
W26	0.85	0.85	—	—	—	—
W27	0.93	0.93	—	—	—	—
W28	1.01	1.01	—	—	—	—
W29	1.12	1.12	—	—	—	72
W30	1.22	1.22	—	—	—	78
W31	1.34	1.34	—	—	—	84
W32	1.47	1.47	—	—	—	91
W33	1.61	1.61	—	—	—	99
W34	1.76	1.76	—	—	—	107
W35	1.93	1.93	—	—	—	116
W36	2.11	2.11	—	—	—	125
W37	2.31	2.31	—	—	—	136
W38	2.53	2.53	—	—	—	147
W39	2.77	2.77	—	—	—	159
W40	3.03	3.03	—	—	—	174
W41	3.32	3.32	—	—	—	191
W42	3.63	3.63	—	—	—	210
W43	3.97	3.97	—	—	—	—
W44	4.35	4.35	4.58	—	—	—
W45	4.76	4.76	5.02	—	—	—
W46	5.21	5.21	5.50	—	—	—
W47	5.71	5.71	6.02	—	—	—
W48	6.25	6.25	6.60	—	—	—
W49	6.84	6.84	7.23	—	—	—
W50	7.48	7.48	7.92	—	—	—
W51	8.20	8.20	8.68	—	—	—
W52	8.98	8.98	9.51	—	—	—
W53	9.83	9.83	10.4	—	—	—
W54	10.8	10.8	11.4	—	—	—
W55	11.8	11.8	12.5	—	—	—
W56	12.9	12.9	13.7	—	—	—
W57	14.1	14.1	15.0	—	—	—
W58	15.5	15.5	16.4	—	—	—
W59	17.0	17.0	17.9	—	—	—
W60	18.7	18.7	19.5	—	—	—
W61	—	20.5	21.3	25.5	—	—
W62	—	22.4	23.3	28.0	—	—
W63	—	24.6	25.4	30.5	32.0	—
W64	—	27.0	27.4	33.5	35.0	—
W65	—	—	29.5	36.5	38.0	—
W66	—	—	32.0	40.0	41.5	—
W67	—	—	34.5	43.5	45.0	—
W68	—	—	37.0	47.5	49.0	—
W69	—	—	39.0	51.0	54.0	—
W70	—	—	41.0	55.0	58.0	—
W71	—	—	43.0	60.0	63.0	—
W72	—	—	45.0	65.0	68.0	—
W73	—	—	—	69.0	73.0	—
W74	—	—	—	74.0	79.0	—
W75	—	—	—	78.0	85.0	—
W76	—	—	—	83.0	90.0	—
W77	—	—	—	88.0	97.0	—
W78	—	—	—	93.0	103	—
W79	—	—	—	—	109	—
W80	—	—	—	—	115	—
W81	—	—	—	—	121	—
W82	—	—	—	—	126	—
W83	—	—	—	—	131	—
W84	—	—	—	—	137	—
W85	—	—	—	—	—	—

Heater Element Specifications

For Application on Bulletin 100/500/609/1200 Line Starters

TABLE 168						
Heater Element Cat. No.	Full Load Amperes					
	Size 0	Size 1	Size 2	Size 3	Size 4	Size 5
W10	0.18	0.18	—	—	—	—
W11	0.20	0.20	—	—	—	—
W12	0.22	0.22	—	—	—	—
W13	0.24	0.24	—	—	—	—
W14	0.26	0.26	—	—	—	—
W15	0.29	0.29	—	—	—	—
W16	0.32	0.32	—	—	—	—
W17	0.35	0.35	—	—	—	—
W18	0.39	0.39	—	—	—	—
W19	0.43	0.43	—	—	—	—
W20	0.47	0.47	—	—	—	—
W21	0.51	0.51	—	—	—	—
W22	0.56	0.56	—	—	—	—
W23	0.61	0.61	—	—	—	—
W24	0.67	0.67	—	—	—	—
W25	0.74	0.74	—	—	—	—
W26	0.82	0.82	—	—	—	—
W27	0.94	0.94	—	—	—	—
W28	1.02	1.02	—	—	—	—
W29	1.12	1.12	—	—	—	70
W30	1.23	1.23	—	—	—	76
W31	1.38	1.38	—	—	—	82
W32	1.50	1.50	—	—	—	90
W33	1.64	1.64	—	—	—	98
W34	1.78	1.78	—	—	—	106
W35	1.95	1.95	—	—	—	115
W36	2.10	2.10	—	—	—	125
W37	2.28	2.28	—	—	—	137
W38	2.57	2.57	—	—	—	150
W39	2.83	2.83	—	—	—	162
W40	3.12	3.12	—	—	—	176
W41	3.47	3.47	—	—	—	191
W42	3.84	3.84	—	—	—	210
W43	4.26	4.26	—	—	—	230
W44	4.68	4.68	4.78	—	—	249
W45	5.18	5.18	5.28	—	—	270
W46	5.71	5.71	5.79	—	—	—
W47	6.28	6.28	6.35	—	—	—
W48	6.90	6.90	6.97	—	—	—
W49	7.59	7.59	7.65	—	—	—
W50	8.35	8.35	8.40	—	—	—
W51	9.28	9.28	9.30	—	—	—
W52	10.2	10.2	10.2	—	—	—
W53	11.2	11.2	11.2	—	—	—
W54	12.1	12.1	12.2	—	—	—
W55	13.3	13.3	13.4	—	—	—
W56	14.5	14.5	14.7	—	—	—
W57	15.7	15.7	16.1	—	—	—
W58	16.6	16.6	17.6	—	—	—
W59	17.8	17.8	19.3	—	—	—
W60	19.6	19.6	21.1	—	—	—
W61	—	21.5	22.9	25.0	—	—
W62	—	23.5	25.0	27.7	—	—
W63	—	25.7	27.1	30.5	—	—
W64	—	28.2	29.5	34.0	34.0	—
W65	—	—	32.0	36.5	37.0	—
W66	—	—	34.5	39.5	40.0	—
W67	—	—	37.0	42.5	44.0	—
W68	—	—	40.0	46.0	48.5	—
W69	—	—	42.5	51	53	—
W70	—	—	45.0	55	57	—
W71	—	—	—	59	62	—
W72	—	—	—	64	67	—
W73	—	—	—	69	72	—
W74	—	—	—	74	77	—
W75	—	—	—	79	82	—
W76	—	—	—	83	87	—
W77	—	—	—	88	93	—
W78	—	—	—	93	99	—
W79	—	—	—	—	105	—
W80	—	—	—	—	112	—
W81	—	—	—	—	117	—
W82	—	—	—	—	123	—
W83	—	—	—	—	129	—
W84	—	—	—	—	135	—

TABLE 169	
Heater Element Cat. No.	Full Load Amperes
	Size 5
W29	70
W30	77
W31	85
W32	89
W33	94
W34	100
W35	107
W36	118
W37	127
W38	140
W39	154
W40	167
W41	181
W42	194
W43	207
W44	221

Refer to Heater Element Selection Procedure on page 2 before using tables.

TABLE 171							
Heater Element Cat. No.	Full Load Amperes						
	Size 00	Size 0	Size 1	Size 2	Size 3	Size 4	Size 5
W10	0.17	0.17	0.17	—	—	—	—
W11	0.19	0.19	0.19	—	—	—	—
W12	0.21	0.21	0.21	—	—	—	—
W13	0.22	0.22	0.22	—	—	—	—
W14	0.25	0.25	0.25	—	—	—	—
W15	0.28	0.28	0.28	—	—	—	—
W16	0.31	0.31	0.31	—	—	—	—
W17	0.34	0.34	0.34	—	—	—	—
W18	0.37	0.37	0.37	—	—	—	—
W19	0.42	0.42	0.42	—	—	—	—
W20	0.46	0.46	0.46	—	—	—	—
W21	0.50	0.50	0.50	—	—	—	—
W22	0.56	0.56	0.56	—	—	—	—
W23	0.62	0.62	0.62	—	—	—	—
W24	0.69	0.69	0.69	—	—	—	—
W25	0.76	0.76	0.76	—	—	—	—
W26	0.84	0.84	0.84	—	—	—	—
W27	0.93	0.93	0.93	—	—	—	—
W28	1.02	1.02	1.02	—	—	—	—
W29	1.13	1.13	1.13	—	—	—	71
W30	1.25	1.25	1.25	—	—	—	78
W31	1.38	1.38	1.38	—	—	—	85
W32	1.49	1.49	1.49	—	—	—	92
W33	1.61	1.61	1.61	—	—	—	100
W34	1.74	1.74	1.74	—	—	—	109
W35	1.89	1.89	1.89	—	—	—	119
W36	2.04	2.04	2.04	—	—	—	130
W37	2.22	2.22	2.22	—	—	—	140
W38	2.49	2.49	2.49	—	—	—	153
W39	2.75	2.75	2.75	—	—	—	166
W40	3.03	3.03	3.03	—	—	—	180
W41	3.37	3.37	3.37	—	—	—	200
W42	3.73	3.73	3.73	—	—	—	222
W43	4.13	4.13	4.13	—	—	—	248
W44	4.55	4.55	4.55	—	—	—	267
W45	5.02	5.02	5.02	—	—	—	295
W46	5.53	5.53	5.53	—	—	—	—
W47	6.08	6.08	6.08	—	—	—	—
W48	6.68	6.68	6.68	—	—	—	—
W49	7.34	7.34	7.34	—	—	—	—
W50	8.07	8.07	8.07	8.31	—	—	—
W51	8.95	8.95	8.95	9.26	—	—	—
W52	9.83	9.83	9.83	10.2	—	—	—
W53	—	10.8	10.8	11.1	—	—	—
W54	—	11.6	11.6	12.1	12.5	—	—
W55	—	12.7	12.7	13.1	13.8	—	—
W56	—	13.8	13.8	14.5	15.2	—	—
W57	—	14.9	14.9	15.8	16.5	—	—
W58	—	15.7	15.7	16.9	17.9	—	—
W59	—	17.0	17.0	18.1	19.7	—	—
W60	—	18.4	18.4	19.8	21.8	—	—
W61	—	—	20.0	21.6	24.2	—	—
W62	—	—	21.8	23.7	26.5	—	—
W63	—	—	24.5	26.0	29.3	—	—
W64	—	—	27.8	28.6	32.0	33.5	—
W65	—	—	—	31.0	36.0	37.0	—
W66	—	—	—	34.0	38.0	40.5	—
W67	—	—	—	37.0	42.0	44.5	—
W68	—	—	—	40.0	46.0	49.0	—
W69	—	—	—	43.0	50.0	54.0	—
W70	—	—	—	46.0	53	59	—
W71	—	—	—	—	58	64	—
W72	—	—	—	—	62	69	—
W73	—	—	—	—	66	74	—
W74	—	—	—	—	70	79	—
W75	—	—	—	—	74	84	—
W76	—	—	—	—	80	90	—
W77	—	—	—	—	85	96	—
W78	—	—	—	—	89	102	—
W79	—	—	—	—	94	108	—
W80	—	—	—	—	—	116	—
W81	—	—	—	—	—	123	—
W82	—	—	—	—	—	131	—
W83	—	—	—	—	—	139	—

TABLE 172					
Heater Element Cat. No.	Full Load Amperes				
	Size 0	Size 1	Size 2	Size 3	Size 4
JJ14	0.19	0.19	—	—	—
JJ13	0.21	0.21	—	—	—
JJ12	0.23	0.23	—	—	—
JJ11	0.26	0.26	—	—	—
JJ10	0.29	0.29	—	—	—
JJ9	0.31	0.31	—	—	—
JJ8	0.35	0.35	—	—	—
JJ7	0.38	0.38	—	—	—
JJ6	0.41	0.41	—	—	—
JJ5	0.46	0.46	—	—	—
JJ4	0.50	0.50	—	—	—
JJ3	0.56	0.56	—	—	—
JJ2	0.61	0.61	—	—	—
JJ1	0.67	0.67	—	—	—
J1	0.75	0.75	—	—	—
J2	0.82	0.82	—	—	—
J3	0.91	0.91	—	—	—
J4	1.00	1.00	—	—	—
J5	1.11	1.11	—	—	—
J6	1.22	1.22	—	—	—
J7	1.34	1.34	—	—	—
J8	1.47	1.47	—	—	—
J9	1.62	1.62	—	—	—
J10	1.78	1.78	—	—	—
J11	1.96	1.96	—	—	—
J12	2.17	2.17	—	—	—
J13	2.40	2.40	—	—	—
J14	2.65	2.65	—	—	—
J15	2.92	2.92	—	—	—
J16	3.21	3.21	—	—	—
J17	3.54	3.54	—	—	—
J18	3.91	3.91	—	—	—
J19	4.30	4.30	—	—	—
J20	4.75	4.75	—	—	—
J21	5.22	5.22	—	—	—
J22	5.76	5.76	—	—	—
J23	6.36	6.36	—	—	—
J24	7.03	7.03	—	—	—
J25	7.75	7.75	8.08	—	—
J26	8.57	8.57	8.90	—	—
J27	9.44	9.44	9.86	—	—
J28	10.4	10.4	10.8	—	—
J29	11.4	11.4	11.9	13.1	—
J30	12.7	12.7	13.2	14.5	—
J31	14.0	14.0	14.5	15.9	—
J32	15.4	15.4	15.9	17.6	—
J33	17.0	17.0	17.6	19.4	—
J34	18.7	18.7	20.5	21.3	—
J35	—	20.6	22.4	23.4	—
J36	—	22.8	24.6	25.7	—
J37	—	25.1	27.1	28.5	31.5
J38	—	27.9	29.8	31.5	35.0
J39	—	—	33.0	35.0	38.5
J40	—	—	36.0	39.0	43.0
J41	—	—	40.0	44.0	47.0
J42	—	—	43.0	48	51
J43	—	—	47.0	53	56
J44	—	—	—	58	61
J45	—	—	—	62	67
J46	—	—	—	69	73
J70	—	—	—	75	81
J71	—	—	—	81	90
J72	—	—	—	89	99
J73	—	—	—	96	108
J74	—	—	—	—	118
J75	—	—	—	—	129
J76	—	—	—	—	140

TABLE 177	
Heater Element Cat. No.	Full Load Amperes
	Size 5
W29	70
W30	76
W31	82
W32	90
W33	98
W34	106
W35	115
W36	125
W37	137
W38	150
W39	162
W40	176
W41	191
W42	210
W43	230
W44	248
W45	270

TABLE 178	
Heater Element Cat. No.	Full Load Amperes
	Size 5
J5	68
J6	75
J7	82
J8	90
J9	99
J10	108
J11	118
J12	128
J13	140
J14	154
J15	168
J16	184
J17	200
J18	220
J19	233
J20	258
J21	282

TABLE 180	
Heater Element Cat. No.	Full Load Amps
	24/32 A/Size 00
W10	0.19
W11	0.20
W12	0.23
W13	0.25
W14	0.28
W15	0.31
W16	0.34
W17	0.37
W18	0.40
W19	0.44
W20	0.49
W21	0.55
W22	0.61
W23	0.69
W24	0.77
W25	0.86
W26	0.93
W27	1.02
W28	1.11
W29	1.22
W30	1.33
W31	1.50
W32	1.60
W33	1.70
W34	1.90
W35	2.01
W36	2.28
W37	2.50
W38	2.72
W39	3.00
W40	3.34
W41	3.67
W42	4.00
W43	4.40
W44	5.00
W45	5.52
W46	5.95
W47	6.60
W48	7.20
W49	8.00
W50	8.76
W51	9.60
W52	10.7
W53	11.9
W54	13.0
W55	14.2
W56	15.5
W57	16.9
W58	18.0
W59	20.0
W60	21.7
W61	24.0
W62	26.2
W63	29.0
W64	34.0

Refer to Heater Element Selection Procedure on page 2 before using tables.

TABLE 181						
Heater Element Cat. No.	Full Load Amperes					
	Size 24 A	Size 32 A	Size 40 A	Size 62A	Size 125 A	Size 165 A
W10	0.19	0.19	0.19	—	—	—
W11	0.20	0.2	0.21	—	—	—
W12	0.22	0.22	0.23	—	—	—
W13	0.24	0.24	0.25	—	—	—
W14	0.27	0.27	0.28	—	—	—
W15	0.29	0.29	0.31	—	—	—
W16	0.32	0.32	0.34	—	—	—
W17	0.36	0.36	0.37	—	—	—
W18	0.39	0.39	0.41	—	—	—
W19	0.44	0.44	0.45	—	—	—
W20	0.49	0.49	0.50	—	—	—
W21	0.54	0.54	0.55	—	—	—
W22	0.6	0.60	0.60	—	—	—
W23	0.67	0.67	0.66	—	—	—
W24	0.74	0.74	0.73	—	—	—
W25	0.84	0.84	0.80	—	—	—
W26	0.9	0.90	0.88	—	—	—
W27	1	1.00	0.97	—	—	—
W28	1.1	1.10	1.06	—	—	—
W29	1.22	1.22	1.16	—	—	—
W30	1.31	1.31	1.27	—	—	—
W31	1.43	1.43	1.39	—	—	—
W32	1.55	1.55	1.51	—	—	—
W33	1.66	1.66	1.65	—	—	—
W34	1.8	1.80	1.80	—	—	—
W35	1.97	1.97	1.96	—	—	—
W36	2.12	2.12	2.15	—	—	—
W37	2.33	2.33	2.36	—	—	—
W38	2.59	2.59	2.60	—	—	—
W39	2.84	2.84	2.86	—	—	—
W40	3.15	3.15	3.16	—	—	—
W41	3.46	3.46	3.48	—	—	—
W42	3.84	3.84	3.85	—	—	—
W43	4.27	4.27	4.23	—	—	—
W44	4.73	4.73	4.68	—	—	—
W45	5.36	5.36	5.18	—	—	—
W46	5.82	5.82	5.68	—	—	—
W47	6.33	6.33	6.28	—	—	—
W48	6.97	6.97	6.94	—	—	—
W49	7.63	7.63	7.71	—	—	—
W50	8.49	8.49	8.45	—	—	—
W51	9.24	9.24	9.29	9.40	—	—
W52	10.1	10.1	10.3	10.4	—	—
W53	11.1	11.1	11.4	11.5	—	—
W54	12.2	12.2	12.5	12.6	—	—
W55	13.6	13.6	13.7	13.8	—	—
W56	14.6	14.6	15.0	15.1	—	—
W57	15.7	15.7	16.3	16.4	—	—
W58	17.2	17.2	17.6	17.7	—	—
W59	18.9	18.9	18.9	19.1	—	—
W60	20.5	20.5	20.9	21.1	—	—
W61	22.2	22.2	22.9	23.2	25.1	—
W62	24.3	24.3	25.0	25.7	27.5	—
W63	—	26.4	27.6	28.5	30.5	—
W64	—	28.5	30.0	30.5	33.5	—
W65	—	32.5	32.0	33.0	36.5	—
W66	—	—	34.0	35.5	40	43.0
W67	—	—	37.0	38.5	44	47.0
W68	—	—	39.0	41.5	48.5	51
W69	—	—	41.0	45.0	53	56
W70	—	—	—	48.5	58	61
W71	—	—	—	53	62	66
W72	—	—	—	56	67	72
W73	—	—	—	58	72	77
W74	—	—	—	60	77	83
W75	—	—	—	62	82	89
W76	—	—	—	—	88	95
W77	—	—	—	—	94	102
W78	—	—	—	—	98	108
W79	—	—	—	—	102	116
W80	—	—	—	—	108	123
W81	—	—	—	—	117	130
W82	—	—	—	—	125	137
W83	—	—	—	—	—	150
W84	—	—	—	—	—	160
W85	—	—	—	—	—	165

TABLE 182	
Heater Element Cat. No.	Full Load Amps
	24/32 A/Size 00
JJ14	0.21
JJ13	0.22
JJ12	0.24
JJ11	0.26
JJ10	0.28
JJ9	0.30
JJ8	0.34
JJ7	0.38
JJ6	0.42
JJ5	0.47
JJ4	0.52
JJ3	0.58
JJ2	0.64
JJ1	0.71
J1	0.79
J2	0.89
J3	0.98
J4	1.10
J5	1.22
J6	1.35
J7	1.47
J8	1.59
J9	1.76
J10	1.94
J11	2.10
J12	2.30
J13	2.50
J14	2.76
J15	3.00
J16	3.24
J17	3.57
J18	3.90
J19	4.31
J20	4.77
J21	5.20
J22	5.80
J23	6.40
J24	7.02
J25	7.97
J26	8.80
J27	9.82
J28	11.0
J29	12.2
J30	13.6
J31	15.0
J32	17.0
J33	18.2
J34	20.8
J35	24.0

Refer to Heater Element Selection Procedure on page 2 before using tables.

Heater Element Specifications

For Application on Bulletin 100/500/609/1200 Line Starters

TABLE 183						
Heater Element Cat. No.	Full Load Amperes					
	Size 24 A	Size 32 A	Size 40 A	Size 62A	Size 125 A	Size 165 A
JJ14	0.20	0.20	0.19	—	—	—
JJ13	0.21	0.21	0.21	—	—	—
JJ12	0.23	0.23	0.23	—	—	—
JJ11	0.25	0.25	0.26	—	—	—
JJ10	0.27	0.27	0.28	—	—	—
JJ9	0.29	0.29	0.31	—	—	—
JJ8	0.33	0.33	0.34	—	—	—
JJ7	0.37	0.37	0.38	—	—	—
JJ6	0.41	0.41	0.42	—	—	—
JJ5	0.45	0.45	0.46	—	—	—
JJ4	0.50	0.50	0.51	—	—	—
JJ3	0.55	0.55	0.57	—	—	—
JJ2	0.62	0.62	0.63	—	—	—
JJ1	0.68	0.68	0.69	—	—	—
J1	0.78	0.78	0.77	—	—	—
J2	0.84	0.84	0.86	—	—	—
J3	0.93	0.93	0.95	—	—	—
J4	1.05	1.05	1.06	—	—	—
J5	1.17	1.17	1.18	—	—	—
J6	1.30	1.30	1.32	—	—	—
J7	1.44	1.44	1.44	—	—	—
J8	1.61	1.61	1.58	—	—	—
J9	1.80	1.80	1.72	—	—	—
J10	1.93	1.93	1.88	—	—	—
J11	2.12	2.12	2.06	—	—	—
J12	2.30	2.30	2.25	—	—	—
J13	2.50	2.50	2.48	—	—	—
J14	2.73	2.73	2.73	—	—	—
J15	2.95	2.95	3.01	—	—	—
J16	3.20	3.20	3.31	—	—	—
J17	3.54	3.54	3.65	—	—	—
J18	3.90	3.90	4.02	—	—	—
J19	4.28	4.28	4.42	—	—	—
J20	4.65	4.65	4.87	—	—	—
J21	5.18	5.18	5.37	—	—	—
J22	5.75	5.75	5.91	—	—	—
J23	6.40	6.40	6.50	—	—	—
J24	7.10	7.10	7.19	—	—	—
J25	7.82	7.82	7.94	—	—	—
J26	8.75	8.75	8.78	9.30	—	—
J27	9.63	9.63	9.71	10.2	—	—
J28	10.9	10.9	10.7	11.1	—	—
J29	12.0	12.0	11.8	12.1	—	—
J30	13.2	13.2	13.1	13.4	—	—
J31	14.9	14.9	14.5	14.9	—	—
J32	16.4	16.4	16.0	16.5	—	—
J33	17.6	17.6	17.7	18.3	—	—
J34	19.4	19.4	19.6	20.2	—	—
J35	22.7	22.7	21.7	22.4	—	—
J36	24.2	24.2	23.9	24.8	26.6	—
J37	—	26.9	26.4	27.4	29.6	—
J38	—	30.0	29.3	30.5	33.0	—
J39	—	34.0	33.0	33.5	37.0	—
J40	—	—	36.0	37.0	41.0	45.1
J41	—	—	38.5	41.0	45.5	46
J42	—	—	40.5	45.5	51.0	52
J43	—	—	—	50.0	56.0	57
J44	—	—	—	54.0	61.0	63
J45	—	—	—	57.0	67.0	69
J46	—	—	—	60.0	73.0	76
J70	—	—	—	63.0	79.0	84
J71	—	—	—	—	87.0	92
J72	—	—	—	—	95.0	102
J73	—	—	—	—	101	112
J74	—	—	—	—	111	123
J75	—	—	—	—	122	135
J76	—	—	—	—	—	150
J77	—	—	—	—	—	158
J78	—	—	—	—	—	161

TABLE 187				
Heater Element Cat. No.	Full Load Amperes			
	Cat. No. 592-BOV16	Cat. No. 592-COV16	Cat. No. 592-DOV16	Cat. No. 592-EOV16
JJ14	0.19	—	—	—
JJ13	0.21	—	—	—
JJ12	0.23	—	—	—
JJ11	0.26	—	—	—
JJ10	0.28	—	—	—
JJ9	0.31	—	—	—
JJ8	0.34	—	—	—
JJ7	0.38	—	—	—
JJ6	0.42	—	—	—
JJ5	0.46	—	—	—
JJ4	0.51	—	—	—
JJ3	0.57	—	—	—
JJ2	0.63	—	—	—
JJ1	0.69	—	—	—
J1	0.77	—	—	—
J2	0.86	—	—	—
J3	0.95	—	—	—
J4	1.06	—	—	—
J5	1.18	—	—	—
J6	1.32	—	—	—
J7	1.44	—	—	—
J8	1.58	—	—	—
J9	1.72	—	—	—
J10	1.88	—	—	—
J11	2.06	—	—	—
J12	2.25	—	—	—
J13	2.48	—	—	—
J14	2.73	—	—	—
J15	3.01	—	—	—
J16	3.31	—	—	—
J17	3.65	—	—	—
J18	4.02	—	—	—
J19	4.42	—	—	—
J20	4.87	—	—	—
J21	5.37	—	—	—
J22	5.91	—	—	—
J23	6.50	—	—	—
J24	7.19	—	—	—
J25	7.94	—	—	—
J26	8.78	9.3	—	—
J27	9.71	10.2	—	—
J28	10.7	11.1	—	—
J29	11.8	12.1	—	—
J30	13.1	13.4	—	—
J31	14.5	14.9	—	—
J32	16.0	16.5	—	—
J33	17.7	18.3	—	—
J34	19.6	20.2	—	—
J35	21.7	22.4	—	—
J36	23.9	24.8	26.6	—
J37	26.4	27.4	29.6	—
J38	29.3	30.5	33.0	—
J39	33.0	33.5	37.0	—
J40	36.0	37.0	41.0	41.5
J41	38.5	41.0	45.5	46.0
J42	42.5	45.5	51	52
J43	—	50	56	57
J44	—	56	61	63
J45	—	59	67	69
J46	—	62	73	76
J70	—	68	79	84
J71	—	—	87	92
J72	—	—	95	102
J73	—	—	105	112
J74	—	—	116	123
J75	—	—	125	135
J76	—	—	—	155
J77	—	—	—	165
J78	—	—	—	172

TABLE 191				
Heater Element Cat. No.	Full Load Amperes			
	Cat. No. 592-BOV16	Cat. No. 592-COV16	Cat. No. 592-DOV16	Cat. No. 592-EOV16
W10	0.20	—	—	—
W11	0.22	—	—	—
W12	0.24	—	—	—
W13	0.26	—	—	—
W14	0.29	—	—	—
W15	0.32	—	—	—
W16	0.35	—	—	—
W17	0.38	—	—	—
W18	0.42	—	—	—
W19	0.47	—	—	—
W20	0.51	—	—	—
W21	0.56	—	—	—
W22	0.61	—	—	—
W23	0.67	—	—	—
W24	0.74	—	—	—
W25	0.81	—	—	—
W26	0.89	—	—	—
W27	0.98	—	—	—
W28	1.08	—	—	—
W29	1.19	—	—	—
W30	1.30	—	—	—
W31	1.43	—	—	—
W32	1.55	—	—	—
W33	1.70	—	—	—
W34	1.90	—	—	—
W35	2.02	—	—	—
W36	2.22	—	—	—
W37	2.43	—	—	—
W38	2.68	—	—	—
W39	2.96	—	—	—
W40	3.25	—	—	—
W41	3.58	—	—	—
W42	3.94	—	—	—
W43	4.30	—	—	—
W44	4.72	—	—	—
W45	5.22	—	—	—
W46	5.78	—	—	—
W47	6.38	—	—	—
W48	7.06	—	—	—
W49	7.83	—	—	—
W50	8.55	—	—	—
W51	9.41	9.48	—	—
W52	10.5	10.6	—	—
W53	11.6	11.7	—	—
W54	12.7	12.8	—	—
W55	14.0	14.1	—	—
W56	15.3	15.4	—	—
W57	16.7	16.9	—	—
W58	18.0	18.3	—	—
W59	19.3	19.9	—	—
W60	21.3	21.9	—	—
W61	23.3	24.2	26.1	—
W62	25.6	26.8	28.7	—
W63	28.1	29.6	31.5	—
W64	31.0	32.5	34.5	—
W65	34.0	35.0	38.0	41.0
W66	36.0	37.5	41.5	44.5
W67	38.0	41.0	45.5	48.5
W68	41.0	45.0	49.5	53
W69	—	48.0	54	58
W70	—	52	59	63
W71	—	57	64	68
W72	—	60	70	74
W73	—	63	76	80
W74	—	65	81	86
W75	—	68	87	92
W76	—	—	93	98
W77	—	—	100	105
W78	—	—	105	112
W79	—	—	110	120
W80	—	—	120	128
W81	—	—	—	136
W82	—	—	—	145
W83	—	—	—	154
W84	—	—	—	162
W85	—	—	—	170

TABLE 192				
Heater Element Cat. No.	Full Load Amperes			
	Size 40 A	Size 68 A	Size 120 A	Size 184 A
W10	0.21	—	—	—
W11	0.23	—	—	—
W12	0.25	—	—	—
W13	0.27	—	—	—
W14	0.30	—	—	—
W15	0.34	—	—	—
W16	0.37	—	—	—
W17	0.41	—	—	—
W18	0.45	—	—	—
W19	0.50	—	—	—
W20	0.55	—	—	—
W21	0.60	—	—	—
W22	0.65	—	—	—
W23	0.71	—	—	—
W24	0.78	—	—	—
W25	0.86	—	—	—
W26	0.95	—	—	—
W27	1.04	—	—	—
W28	1.14	—	—	—
W29	1.25	—	—	—
W30	1.36	—	—	—
W31	1.50	—	—	—
W32	1.65	—	—	—
W33	1.82	—	—	—
W34	2.01	—	—	—
W35	2.21	—	—	—
W36	2.45	—	—	—
W37	2.67	—	—	—
W38	3.00	—	—	—
W39	3.31	—	—	—
W40	3.65	—	—	—
W41	4.06	—	—	—
W42	4.49	—	—	—
W43	4.98	—	—	—
W44	5.48	—	—	—
W45	6.06	—	—	—
W46	6.68	—	—	—
W47	7.35	—	—	—
W48	8.09	—	—	—
W49	8.90	9.03	—	—
W50	9.80	9.96	—	—
W51	10.9	11.1	—	—
W52	12.0	12.2	—	—
W53	13.2	13.3	—	—
W54	14.3	14.6	—	—
W55	15.7	15.8	—	—
W56	17.1	17.5	—	—
W57	18.6	19.1	—	—
W58	19.7	20.5	—	—
W59	21.4	21.9	—	—
W60	23.4	24.1	25.6	—
W61	25.8	26.4	27.8	—
W62	28.4	29.1	30.0	—
W63	31.0	32.0	34.0	—
W64	35.5	35.5	38.5	—
W65	38.5	39.0	42.5	43.5
W66	41.0	42.5	44.5	47.5
W67	—	47.5	50	52
W68	—	53	54	58
W69	—	57	60	61
W70	—	60	65	66
W71	—	65	73	74
W72	—	71	78	80
W73	—	—	87	89
W74	—	—	94	97
W75	—	—	100	104
W76	—	—	109	113
W77	—	—	113	125
W78	—	—	121	133
W79	—	—	—	142
W80	—	—	—	153
W81	—	—	—	165
W82	—	—	—	170
W83	—	—	—	184

Heater Element Specifications

For Application on Bulletin 100/500/609/1200 Line Starters

TABLE 195				
Heater Element Cat. No.	Full Load Amperes			
	Cat. No. 592-TPD200 184 A	Cat. No. 592-TPD300 304 A	Cat. No. 592-TPD400 496 A	NEMA Size 6 Cat. No. 592-TPD630 608 A
W26	—	—	—	115
W27	43*	—	78	125
W28	45*	—	85	135
W29	50*	—	94	147
W30	54*	—	104	165
W31	59*	—	114	179
W32	65*	—	125	196
W33	70	—	139	216
W34	75	127	150	232
W36	89	151	175	287
W37	98	166	195	315
W38	110	183	215	350
W39	120	198	235	385
W40	132	218	260	420
W41	143	239	293	465
W42	155	260	320	515
W43	170	285	350	570*
W44	193	310	380	630
W45	—	—	415	—
W46	—	—	455	—
W47	—	—	500	—
W48	—	—	550	—

TABLE 196				
Heater Element Cat. No.	Full Load Amperes			
	Cat. No. 592-TPD200 184 A	Cat. No. 592-TPD300 304 A	Cat. No. 592-TPD400 496 A	NEMA Size 6 Cat. No. 592-TPD630 608 A
J7	64*	—	115	195
J8	72*	—	127	220
J9	74*	—	140	239
J10	85*	125	155	260
J11	87*	142	170	285
J12	96	155	186	315
J13	107	172	205	340
J14	116	188	215	375
J15	128	205	145	410
J16	139	225	270	450
J17	153	250	296	495
J18	168	275	330	540*
J19	184	305	360	590
J20	200	—	400	640
J21	215	—	440	—
J22	—	—	480	—
J23	—	—	520	—

* Exceeds 20 seconds at six times rating, providing Class 30 protection.
 * Maximum element for NEMA Size 6.

TABLE 198				
Heater Element Cat. No.	Full Load Amperes			
	Size 40 A	Size 68 A	Size 120 A	Size 184 A
JJ14	0.22	—	—	—
JJ13	0.24	—	—	—
JJ12	0.27	—	—	—
JJ11	0.30	—	—	—
JJ10	0.33	—	—	—
JJ9	0.36	—	—	—
JJ8	0.40	—	—	—
JJ7	0.44	—	—	—
JJ6	0.48	—	—	—
JJ5	0.53	—	—	—
JJ4	0.58	—	—	—
JJ3	0.65	—	—	—
JJ2	0.71	—	—	—
JJ1	0.78	—	—	—
J1	0.87	—	—	—
J2	0.95	—	—	—
J3	1.05	—	—	—
J4	1.16	—	—	—
J5	1.28	—	—	—
J6	1.41	—	—	—
J7	1.55	—	—	—
J8	1.70	—	—	—
J9	1.87	—	—	—
J10	2.06	—	—	—
J11	2.27	—	—	—
J12	2.51	—	—	—
J13	2.78	—	—	—
J14	3.07	—	—	—
J15	3.38	—	—	—
J16	3.72	—	—	—
J17	4.10	—	—	—
J18	4.52	—	—	—
J19	4.98	—	—	—
J20	5.49	—	—	—
J21	6.04	—	—	—
J22	6.66	—	—	—
J23	7.35	—	—	—
J24	8.13	—	—	—
J25	8.96	9.03	—	—
J26	9.90	9.95	—	—
J27	10.9	11.0	—	—
J28	12.0	12.3	—	—
J29	13.2	13.8	—	—
J30	14.6	15.3	—	—
J31	16.1	17.1	—	—
J32	18.6	18.8	—	—
J33	20.9	21.1	—	—
J34	22.8	23.5	24.5	—
J35	25.1	26.0	29.9	—
J36	28.5	29.1	33.0	—
J37	33.0	33.5	35.0	—
J38	35.5	36.0	39.5	—
J39	38.5	39.5	44.0	42.0
J40	42.0	44.0	47.5	48.5
J41	—	50.0	54	55
J42	—	56.0	59	62
J43	—	61.0	65	68
J44	—	67.0	72	75
J45	—	70.0	78	81
J46	—	—	87	90
J70	—	—	95	98
J71	—	—	105	108
J72	—	—	118	120
J73	—	—	126	131
J74	—	—	—	148
J75	—	—	—	160
J76	—	—	—	179
J77	—	—	—	198

Refer to Heater Element Selection Procedure on page 2 before using tables.

TABLE 347	
Heater Element Cat. No.	Full Load Amps
	Size 5
W29	77
W30	83
W31	90
W32	98
W33	107
W34	116
W35	126
W36	138
W37	150
W38	164
W39	178
W40	194
W41	212
W42	232
W43	254
W44	279
W45	—
W46	—
W47	—
W48	—
W49	—

TABLE 547	
Heater Element Cat. No.	Full Load Amps
	Size 5
J5	72
J6	79
J7	87
J8	94
J9	103
J10	113
J11	124
J12	135
J13	148
J14	162
J15	177
J16	194
J17	212
J18	232
J19	254
J20	278
J21	—

Refer to Heater Element Selection Procedure on page 2 before using tables.

Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

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