

Approximate Thermal Unit Selection Based On Horsepower and Voltage

General—Thermal units selected using approximate full-load currents from Table 16.369 will provide a trip current between 101% and 125% of full-load current for many 4-pole, single speed, normal torque, 60 Hz motors. Since full-load current rating of different makes and types of motors vary so widely, these selections may not be suitable.

Thermal units should be selected on the basis of motor nameplate full-load current and service factor. Thermal unit sizes originally selected on an approximate basis should always be rechecked and corrected at the time of installation if required.

How to use Table 16.369:

- Locate the motor horsepower and voltage.
- Determine the approximate full-load current from Table 16.369.
- Use the approximate full-load current in place of actual nameplate full-load current and follow the Selection Procedure on page 16-134.

Table 16.369: Use This Table Only When the Motor Full-Load Current Is Not Known

Motor Horsepower	Motor Full-Load Current					
	Three Ø				Single Ø	
	200 V	230 V	460 V	575 V	115 V	230 V
1/6	—	—	—	—	4.4	2.2
1/4	—	—	—	—	5.8	2.9
1/3	—	—	—	—	7.2	3.6
1/2	2.5	2.2	1.1	0.9	9.8	4.9
3/4	3.7	3.2	1.6	1.3	13.8	6.9
1	4.8	4.2	2.1	1.7	16	8
1-1/2	6.9	6.0	3.0	2.4	20	10
2	7.8	6.8	3.4	2.7	24	12
3	11.0	9.6	4.8	3.9	34	17
5	17.5	15.2	7.6	6.1	56	28
7-1/2	25.3	22	11	9	80	40
10	32.2	28	14	11	—	50
15	48.3	42	21	17	—	—
20	62.1	54	27	22	—	—
25	78.2	68	34	27	—	—
30	92	80	40	32	—	—
40	120	104	52	41	—	—
50	150	130	65	52	—	—
60	177	154	77	62	—	—
75	221	192	96	77	—	—
100	285	248	124	99	—	—
125	359	312	156	125	—	—
150	414	360	180	144	—	—
200	552	480	240	192	—	—

NOTE: These currents should not be used for selection of fuses, circuit breakers or wire sizes. See NEC tables 430-248 through 430-250. For motors rated 208-220 volts, use 230 V column. For motors rated 440 to 550 volts, use 460 and 575 V columns, respectively.

Mounting of the Thermal Units

Always be certain the correct thermal units are installed in the starter before operating the motor. Thermal units should always be mounted so that their type designation can be read from the front of the starter (see Figure 1). Melting alloy thermal units should be mounted so that the tooth of the pawl assembly can engage the teeth of the ratchet wheel when the reset button is pushed.

Mounting surfaces of starter and thermal units should be clean and care should be taken to insure that thermal unit mounting screws are fastened securely.

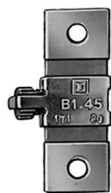


Figure 1

Thermal Unit Table 12

(index and instructions: [page 16-134](#) to [page 16-138](#))

Motor FLC (A)	Thermal Unit Number
92–100.	DD 112.0
101–109.	—
110–119.	—
120–131.	—
132–139.	DD 150.0
140–156.	DD 160.0
157–166.	DD 185.0
167–180.	—
181–189.	—
190–209.	—
210–225.	DD 250.0
226–238.	DD 265.0
239–263.	DD 280.0
264–300.	—

Thermal Unit Table 14

(index and instructions: [page 16-134](#) to [page 16-138](#))

Motor FLC (A)			Thermal Unit Number
1 T.U.	2 T.U.	3 T.U.	
0.43–0.47	0.41–0.45	0.40–0.41	A .49
0.48–0.51	0.46–0.50	0.42–0.46	A .54
0.52–0.56	0.51–0.55	0.47–0.51	A .59
0.57–0.64	0.56–0.62	0.52–0.57	A .65
0.65–0.69	0.63–0.67	0.58–0.62	A .71
0.70–0.76	0.68–0.72	0.63–0.67	A .78
0.77–0.84	0.73–0.81	0.68–0.75	A .86
0.85–0.91	0.82–0.88	0.76–0.80	A .95
0.92–1.01	0.89–0.97	0.81–0.89	A 1.02
1.02–1.15	0.98–1.08	0.90–1.02	A 1.16
1.16–1.23	1.09–1.18	1.03–1.09	A 1.25
1.24–1.37	1.19–1.32	1.10–1.21	A 1.39
1.38–1.45	1.33–1.40	1.22–1.29	A 1.54
1.46–1.56	1.41–1.48	1.30–1.37	A 1.63
1.57–1.67	1.49–1.60	1.38–1.48	A 1.75
1.68–1.77	1.61–1.72	1.49–1.58	A 1.86
1.78–1.92	1.73–1.84	1.59–1.72	A 1.99
1.93–2.09	1.85–2.00	1.73–1.85	A 2.15
2.10–2.31	2.01–2.22	1.86–2.05	A 2.31
2.32–2.56	2.23–2.45	2.06–2.29	A 2.57
2.57–2.92	2.46–2.82	2.30–2.62	A 2.81
2.93–3.16	2.83–3.08	2.63–2.84	A 3.61
3.17–3.48	3.09–3.39	2.85–3.10	A 3.95
3.49–3.83	3.40–3.75	3.11–3.46	A 4.32
3.84–4.24	3.76–4.16	3.47–3.85	A 4.79
4.25–4.62	4.17–4.51	3.86–4.16	A 5.30
4.63–4.92	4.52–4.83	4.17–4.46	A 5.78
4.93–5.61	4.84–5.49	4.47–5.08	A 6.20
5.62–5.85	5.50–5.67	5.09–5.35	A 6.99
5.86–6.36	5.68–6.16	5.36–5.82	A 7.65
6.37–6.99	6.17–6.75	5.83–6.34	A 8.38
7.00–7.67	6.76–7.00	6.35–6.95	A 9.25
7.68–8.15	—	6.96–7.00	A 9.85
8.16–9.00	—	—	A 11.0

Thermal Unit Table 13

(index and instructions: [page 16-134](#) to [page 16-138](#))

Motor FLC (A)			Thermal Unit Number
1 T.U.	2 T.U.	3 T.U.	
0.29–0.31	0.29–0.31	0.28–0.30	B 0.44
0.32–0.34	0.32–0.34	0.31–0.34	B 0.51
0.35–0.38	0.35–0.38	0.35–0.37	B 0.57
0.39–0.45	0.39–0.45	0.38–0.44	B 0.63
0.46–0.54	0.46–0.54	0.45–0.53	B 0.71
0.55–0.61	0.55–0.61	0.54–0.59	B 0.81
0.62–0.66	0.62–0.66	0.60–0.64	B 0.92
0.67–0.73	0.67–0.73	0.65–0.72	B 1.03
0.74–0.81	0.74–0.81	0.73–0.80	B 1.16
0.82–0.94	0.82–0.94	0.81–0.90	B 1.30
0.95–1.05	0.95–1.05	0.91–1.03	B 1.45
1.06–1.22	1.06–1.22	1.04–1.14	B 1.67
1.23–1.34	1.23–1.34	1.15–1.27	B 1.88
1.35–1.51	1.35–1.51	1.28–1.43	B 2.10
1.52–1.71	1.52–1.71	1.44–1.62	B 2.40
1.72–1.93	1.72–1.93	1.63–1.77	B 2.65
1.94–2.14	1.94–2.14	1.78–1.97	B 3.00
2.15–2.40	2.15–2.40	1.98–2.32	B 3.30
2.41–2.72	2.41–2.72	2.33–2.51	B 3.70
2.73–3.15	2.73–3.15	2.52–2.99	B 4.15
3.16–3.55	3.16–3.55	3.00–3.42	B 4.85
3.56–4.00	3.56–4.00	3.43–3.75	B 5.50
4.01–4.40	4.01–4.40	3.76–3.98	B 6.25
4.41–4.88	4.41–4.88	3.99–4.48	B 6.90
4.89–5.19	4.89–5.19	4.49–4.93	B 7.70
5.20–5.73	5.20–5.73	4.94–5.21	B 8.20
5.74–6.39	5.74–6.39	5.22–5.84	B 9.10
6.40–7.13	6.40–7.13	5.85–6.67	B 10.2
7.14–7.90	7.14–7.90	6.68–7.54	B 11.5
7.91–8.55	7.91–8.55	7.55–8.14	B 12.8
8.56–9.53	8.56–9.53	8.15–8.72	B 14.0
9.54–10.6	9.54–10.6	8.73–9.66	B 15.5
10.7–11.8	10.7–11.8	9.67–10.5	B 17.5
11.9–13.2	11.9–12.0	10.6–11.3	B 19.5
13.3–14.9	—	11.4–12.0	B 22.0
15.0–16.6	—	—	B 25.0
16.7–18.0	—	—	B 28.0
Following Selections for Size 1 Only			
—	11.9–13.2	—	B 19.5
—	13.3–14.9	11.4–12.7	B 22.0
—	15.0–16.6	12.8–14.1	B 25.0
16.7–18.9	16.7–18.9	14.2–15.9	B 28.0
19.0–21.2	19.0–21.2	16.0–17.5	B 32.0
21.3–23.0	21.3–23.0	17.6–19.7	B 36.0
23.1–25.5	23.1–25.5	19.8–21.9	B 40.0
25.6–26.0	25.6–26.0	22.0–24.4	B 45.0
—	—	24.5–26.0	B 50.0

Thermal Unit Table 15

(index and instructions: [page 16-134](#) to [page 16-138](#))

Motor FLC (A)			Thermal Unit Number
1 T.U.	2 T.U.	3 T.U.	
0.31–0.33	0.31–0.33	0.29–0.31	B 0.44
0.34–0.36	0.34–0.36	0.32–0.36	B 0.51
0.37–0.40	0.37–0.40	0.37–0.38	B 0.57
0.41–0.48	0.41–0.48	0.39–0.46	B 0.63
0.49–0.57	0.49–0.57	0.47–0.55	B 0.71
0.58–0.64	0.58–0.64	0.56–0.61	B 0.81
0.65–0.70	0.65–0.70	0.62–0.66	B 0.92
0.71–0.77	0.71–0.77	0.67–0.75	B 1.03
0.78–0.85	0.78–0.85	0.76–0.83	B 1.16
0.86–0.99	0.86–0.99	0.84–0.93	B 1.30
1.00–1.10	1.00–1.10	0.94–1.06	B 1.45
1.11–1.28	1.11–1.28	1.07–1.18	B 1.67
1.29–1.41	1.29–1.41	1.19–1.31	B 1.88
1.42–1.58	1.42–1.58	1.32–1.47	B 2.10
1.59–1.80	1.59–1.80	1.48–1.67	B 2.40
1.81–2.03	1.81–2.03	1.68–1.83	B 2.65
2.04–2.25	2.04–2.25	1.84–2.04	B 3.00
2.26–2.51	2.26–2.51	2.05–2.38	B 3.30
2.52–2.83	2.52–2.83	2.39–2.60	B 3.70
2.84–3.29	2.84–3.29	2.61–3.13	B 4.15
3.30–3.75	3.30–3.75	3.14–3.59	B 4.85
3.76–4.22	3.76–4.22	3.60–3.94	B 5.50
4.23–4.65	4.23–4.65	3.95–4.19	B 6.25
4.66–5.16	4.66–5.16	4.20–4.72	B 6.90
5.17–5.53	5.17–5.53	4.73–5.21	B 7.70
5.54–6.09	5.54–6.09	5.22–5.51	B 8.20
6.10–6.80	6.10–6.80	5.52–6.17	B 9.10
6.81–7.60	6.81–7.60	6.18–7.07	B 10.2
7.61–8.35	7.61–8.35	7.08–8.05	B 11.5
8.36–9.04	8.36–9.04	8.06–8.69	B 12.8
9.05–9.99	9.05–9.99	8.70–9.32	B 14.0
10.0–11.1	10.0–11.1	9.33–10.2	B 15.5
11.2–12.3	11.2–12.0	10.3–11.3	B 17.5
12.4–13.7	—	11.4–12.0	B 19.5
13.8–15.4	—	—	B 22.0
15.5–18.0	—	—	B 25.0
Following Selections for Size 1 Only			
—	11.2–12.3	—	B 17.5
—	12.4–13.7	11.4–12.1	B 19.5
—	13.8–15.4	12.2–13.7	B 22.0
15.5–17.2	15.5–17.2	13.8–15.2	B 25.0
17.3–19.4	17.3–19.4	15.3–17.2	B 28.0
19.5–21.7	19.5–21.7	17.3–18.9	B 32.0
21.8–23.9	21.8–23.9	19.0–21.4	B 36.0
24.0–26.0	24.0–26.0	21.5–23.7	B 40.0
—	—	23.8–26.0	B 45.0