

Altitude Ratings

The following table lists the MCC derating factors necessary at altitudes of 6,600 ft (2,000 m) and higher.

Altitude	Altitude Rating Correction Factors ¹		
	Full Load Current	System Voltage	Ambient Temperature
6,600 ft (2,000 m)	1.0	1.0	1.0
8,500 ft (2,600 m)	0.99	0.95	1.0
13,000 ft (3,900 m)	0.96	0.80	0.95
14,000 ft (4,300 m)	0.95	0.80	0.90
15,000 ft (4,600 m)	0.93	0.80	0.85

¹ For variable frequency drives above 3,300 ft (1,000 m), derate the output current rating by 1% for each additional 330 ft (100 m) up to a maximum of 9,900 ft (3,000 m).

For solid state reduced voltage starters above 3,300 ft (1,000 m), derate the nominal output current by 2.2% for each additional 330 ft (100 m) up to a maximum of 6,600 ft (2,000 m).

Motor Control Center Heat Dissipation

The following table lists the approximate heat dissipation of various MCC units. This information is often requested by engineers who are sizing HVAC equipment to cool and ventilate equipment rooms. Values include an estimate of heat dissipated by the MCC Power Bus. To use, add the values for each of the units in the MCC. Values are given in BTUs per hour and watts.

The values given are for "typical" applications, and include an adjustment for power bus contribution. Make the following adjustments for special situations:

- Add 10–20 percent to the total heat dissipation for MCCs that make extensive use of relays, timers, and other control devices.
- Add 10 percent to the total heat dissipation for MCCs with 1200–1600 A main bus.
- Add 20 percent to the total heat dissipation for MCCs with 2000–2500 A main bus.

Typical Heat Dissipation Values¹

Description	Size/Rating	Heat Dissipation	
		BTUs/hr	Watts
Combination Starters (Circuit Breaker or Fusible Disconnect)	1	270	79
	2	360	106
	3	720	210
	4	1440	420
	5	2400	700
Main and Branch Feeder Breakers	15–150 A	270	79
	175–250 A	720	210
	300–400 A	780	230
	500–600 A	1320	390
	700–800 A	2220	650
	900–1200	5802	1700
	1600 A	8020	2350
	2000 A	12,628	3700
	2500 A	27,815	8150
Main and Branch Feeder Switches	30 A	126	37
	60 A	156	46
	100 A	282	85
	200 A	780	230
	400 A	1020	300
	600 A	2047	600
	800 A	3242	950
	1200 A	8874	2600
	1600 A	15,529	4550
	2000 A	24,232	7100

¹ For programmable logic controllers, unit heat dissipation can be significant. Contact the MCC Technical Assistance Group (TAG) for the heat dissipation of these devices.

Typical Heat Dissipation Values (Continued)

Description	Motor Rated HP @ 480V	Heat Dissipation					
		BTUs/hr			Watts		
		Drive	Line Reactor 3% / 5%	Load Reactor or Filter	Drive	Line Reactor 3% / 5%	Load Reactor or Filter
Combination Altivar 61 AC drives (variable torque rated)	1	150	27 / 41	255	44	8 / 12	75
	2	150	48 / 48	255	45	14 / 14	75
	3	218	68 / 68	273	64	20 / 20	80
	5	389	99 / 89	307	119	29 / 26	90
	7.5	491	106 / 140	324	144	31 / 41	95
	10	608	147 / 147	324	178	43 / 43	95
	15	741	177 / 208	375	217	52 / 61	110
	20	1092	180 / 180	444	320	53 / 53	130
	25	1338	184 / 184	444	392	54 / 54	130
	30	1662	212 / 222	461	487	62 / 65	135
	40	2447	229 / 242	495	717	67 / 71	145
	50	3331	246 / 276	870	976	72 / 81	255
	60	4301 ¹	— / 328	870	1260 ¹	— / 96	255
	75	4928 ¹	— / 369	836	1444 ¹	— / 108	245
	100	5690 ¹	— / 614	921	1667 ¹	— / 180	270
	125	8447 ¹	— / 470	887	2475 ¹	— / 138	260
	150	11002 ¹	— / 498	904	3224 ¹	— / 146	265
	200	13016 ¹	— / 747	990	3814 ¹	— / 219	290
	250	14676 ¹	— / 1197	1109	4300 ¹	— / 351	325
	300	17450 ¹	— / 2682	1024	5113 ¹	— / 786	300
	350	19717 ¹	— / 2560	1535	5777 ¹	— / 750	450
	400	22931 ¹	— / 2491	1621	6719 ¹	— / 730	475
	450	24665 ¹	— / 2642	—	7227 ¹	— / 774	—
	500	52927 ¹	— / 2379	—	8281 ¹	— / 697	—
Combination Altivar 71 AC drives (constant torque rated)	1	150	27 / 41	255	44	8 / 12	75
	2	218	48 / 48	255	64	14 / 14	75
	3	297	68 / 68	273	87	20 / 20	80
	5	492	99 / 89	307	144	29 / 26	90
	7.5	608	106 / 140	324	178	31 / 41	95
	10	741	147 / 147	324	217	43 / 43	95
	15	1092	177 / 208	375	320	52 / 61	110
	20	1338	180 / 180	444	392	53 / 53	130
	25	1659	184 / 184	444	486	54 / 54	130
	30	2447	212 / 222	461	717	62 / 65	135
	40	3331	229 / 242	495	976	67 / 71	145
	50	4253 ¹	— / 276	870	1246 ¹	— / 81	255
	60	4936 ¹	— / 328	870	1446 ¹	— / 96	255
	75	5607 ¹	— / 369	836	1643 ¹	— / 108	245
	100	5446 ¹	— / 470	921	2475 ¹	— / 138	270
	125	8774 ¹	— / 498	887	2571 ¹	— / 146	260
	150	9638 ¹	— / 747	904	2824 ¹	— / 219	265
	200	10205 ¹	— / 1197	990	2990 ¹	— / 351	290
	250	14146 ¹	— / 2242	1109	4145 ¹	— / 657	325
	300	17877 ¹	— / 2229	1024	5238 ¹	— / 653	300
	350	18556 ¹	— / 2160	1535	5437 ¹	— / 633	450
	400	21279 ¹	— / 2449	1621	6235 ¹	— / 716	475
	450	24719 ¹	— / 2058	—	7243 ¹	— / 603	—
Description	Soft Start Frame	Heat Dissipation					
		BTUs/hr			Watts		
Combination Altistart 48 Soft Start (includes shorting contactor as standard)	10	51			15		
	15	51			15		
	20	85			25		
	25	85			25		
	30	85			25		
	40	85			25		
	50	85			25		
	60	85			25		
	75	85			25		
	100	85			25		
	125	85			25		
	150	171			50		
	200	171			50		
	250	171			50		
	300	273			80		
	350	273			80		
	400	273			80		
	500	273			80		

¹ A 3% line reactor is standard in these drive sizes.