

MMC Design Chart

Revised by Barton B. Anderson 12/12/07

Using 942C20P15K (.150uF, 2kV)

Mains Frequency 60 Hz

A good mmc is a high peak voltage rating and a low temperature rise.

I recommend a Peak Voltage Rating of (NST rms volts x 1.414) x 2.5 and a temp rise value less than 1.

For example, a 9kV NST = 9000V x 1.414 x 2.5 = 31815 Peak Volts (near this value would be good to look for)

Transformer Specs			Resonant Cap					Static Gap LTR Cap					SRSB LTR Cap				
Type	RMS kV	mA	Nearest Value (uF)	Caps per String	Strings	Peak Voltage Rating	Temp Rise (deg C)	Nearest Value (uF)	Caps per String	Strings	Peak Voltage Rating	Temp Rise (deg C)	Nearest Value (uF)	Caps per String	Strings	Peak Voltage Rating	Temp Rise (deg C)
9/30	9	30	0.0088	17	1	34000	0.355	0.0136	11	1	22000	0.847	0.0214	7	1	14000	2.091
9/30	9	30	●	●	●	●	●	0.0136	22	2	44000	0.212	0.0214	14	2	28000	0.523
9/30	9	30	●	●	●	●	●	●	●	●	●	●	0.0214	21	3	42000	0.232
9/60	9	60	0.0167	9	1	18000	1.265	0.0250	6	1	12000	2.846	0.0429	7	2	14000	2.091
9/60	9	60	0.0167	18	2	36000	0.316	0.0250	12	2	24000	0.712	0.0429	14	4	28000	0.523
9/60	9	60	●	●	●	●	●	0.0250	18	3	36000	0.316	0.0429	21	6	42000	0.232
10/23	10	23	0.0060	25	1	50000	0.202	0.0094	16	1	32000	0.494	0.0167	9	1	18000	1.562
10/23	10	23	●	●	●	●	●	0.0094	32	2	64000	0.124	0.0167	18	2	36000	0.390
10/23	10	23	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
12/30	12	30	0.0065	23	1	46000	0.344	0.0100	15	1	30000	0.810	0.0167	9	1	18000	2.249
12/30	12	30	●	●	●	●	●	0.0100	30	2	60000	0.202	0.0167	18	2	36000	0.562
12/30	12	30	●	●	●	●	●	●	●	●	●	●	0.0167	27	3	54000	0.250
12/60	12	60	0.0136	11	1	22000	1.506	0.0188	8	1	16000	2.846	0.0333	9	2	18000	2.249
12/60	12	60	0.0136	22	2	44000	0.367	0.0188	16	2	32000	0.712	0.0333	18	4	36000	0.562
12/60	12	60	●	●	●	●	●	0.0188	24	3	48000	0.316	0.0333	27	6	54000	0.250
12/90	12	90	0.0188	8	1	16000	2.846	0.0300	10	2	20000	1.822	0.0500	9	3	18000	2.249
12/90	12	90	0.0188	16	2	32000	0.712	0.0300	20	4	40000	0.455	0.0500	18	6	36000	0.562
12/90	12	90	0.0188	24	3	48000	0.316	0.0300	30	6	60000	0.202	0.0500	27	9	54000	0.250
12/120	12	120	0.0273	11	2	22000	1.506	0.0375	8	2	16000	2.846	0.0667	9	4	18000	2.249
12/120	12	120	0.0273	22	4	44000	0.376	0.0375	16	4	32000	0.712	0.0667	18	8	36000	0.562
12/120	12	120	●	●	●	●	●	0.0375	24	6	48000	0.316	0.0667	27	16	54000	0.250
15/30	15	30	0.0054	28	1	56000	0.363	0.0079	19	1	38000	0.789	0.0136	11	1	22000	2.352
15/30	15	30	●	●	●	●	●	0.0079	38	2	76000	0.197	0.0136	22	2	44000	0.588
15/30	15	30	●	●	●	●	●	●	●	●	●	●	0.0136	33	3	66000	0.261
15/60	15	60	0.0107	14	1	28000	1.452	0.0150	10	1	20000	2.846	0.0273	11	2	22000	2.352
15/60	15	60	0.0107	28	2	56000	0.363	0.0150	20	2	40000	0.712	0.0273	22	4	44000	0.588
15/60	15	60	●	●	●	●	●	0.0150	30	3	60000	0.316	0.0273	33	6	66000	0.261
15/90	15	90	0.0150	10	1	20000	2.846	0.0231	13	2	26000	1.684	0.0409	11	3	22000	2.352
15/90	15	90	0.0150	20	2	40000	0.712	0.0231	26	4	52000	0.421	0.0409	22	6	44000	0.588
15/90	15	90	0.0150	30	3	60000	0.316	0.0231	39	6	78000	0.187	0.0409	33	9	66000	0.261
15/120	15	120	0.0214	14	2	28000	1.452	0.0300	10	2	20000	2.846	0.0545	11	4	22000	2.352
15/120	15	120	0.0214	28	4	56000	0.363	0.0300	20	4	40000	0.712	0.0545	22	8	44000	0.588
15/120	15	120	●	●	●	●	●	0.0300	30	6	60000	0.316	0.0545	33	16	66000	0.261

MMC Design Chart

Revised by Barton B. Anderson 12/15/07

Using 942C20P15K (.150uF, 2kV)

Mains Frequency

50 Hz

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For example, a 9kV NST = 9000V x 1.414 x 2.5 = 31815 Peak Volts (near this value would be good to look for)

Transformer Specs			Resonant Cap					Static Gap LTR Cap					SRSG LTR Cap				
Type	RMS kV	mA	Nearest Value (uF)	Caps per String	Strings	Peak Voltage Rating	Temp Rise (deg C)	Nearest Value (uF)	Caps per String	Strings	Peak Voltage Rating	Temp Rise (deg C)	Nearest Value (uF)	Caps per String	Strings	Peak Voltage Rating	Temp Rise (deg C)
9/30	9	30	0.0107	14	1	28000	0.871	0.0167	9	1	18000	2.109	0.0250	6	1	12000	4.744
9/30	9	30	0.0107	28	2	56000	0.218	0.0167	18	2	36000	0.527	0.0250	12	2	24000	1.186
9/30	9	30	●	●	●	●	●	●	●	●	●	●	0.0250	18	3	36000	0.527
9/60	9	60	0.0214	7	1	14000	3.486	0.0333	9	2	18000	2.109	0.0500	6	2	12000	4.744
9/60	9	60	0.0214	14	2	28000	0.871	0.0333	18	4	36000	0.527	0.0500	12	4	24000	1.186
9/60	9	60	0.0214	21	3	42000	0.387	●	●	●	●	●	0.0500	18	6	36000	0.527
10/23	10	23	0.0075	20	1	40000	0.527	0.0115	13	1	26000	1.248	0.0188	8	1	16000	3.295
10/23	10	23	●	●	●	●	●	0.0115	26	2	52000	0.312	0.0188	16	2	32000	0.824
10/23	10	23	●	●	●	●	●	●	●	●	●	●	0.0188	24	3	48000	0.366
12/30	12	30	0.0079	19	1	38000	0.841	0.0125	12	1	24000	2.109	0.0214	7	1	14000	6.196
12/30	12	30	0.0079	38	2	76000	0.210	0.0125	24	2	48000	0.527	0.0214	14	2	28000	1.549
12/30	12	30	●	●	●	●	●	●	●	●	●	●	0.0214	21	3	36000	0.688
12/30	12	30	●	●	●	●	●	●	●	●	●	●	0.0214	28	4	56000	0.387
12/60	12	60	0.0167	9	1	18000	3.748	0.0250	12	2	24000	2.109	0.0375	8	2	16000	4.744
12/60	12	60	0.0167	18	2	36000	0.937	0.0250	24	4	48000	0.527	0.0375	16	4	32000	1.186
12/60	12	60	0.0167	27	3	54000	0.416	●	●	●	●	●	0.0375	24	6	48000	0.527
12/90	12	90	0.0237	19	3	38000	0.841	0.0375	8	2	16000	4.744	0.0563	8	3	16000	4.744
12/90	12	90	0.0237	38	6	76000	0.210	0.0375	16	4	32000	1.186	0.0563	16	6	32000	1.186
12/90	12	90	●	●	●	●	●	0.0375	24	6	48000	0.527	0.0563	24	9	48000	0.527
12/120	12	120	0.0333	9	2	18000	3.748	0.0500	9	3	18000	3.748	0.0750	8	4	16000	4.744
12/120	12	120	0.0333	18	4	36000	0.937	0.0500	18	6	36000	0.937	0.0750	16	8	32000	1.186
12/120	12	120	0.0333	27	6	54000	0.416	0.0500	27	9	54000	0.416	0.0750	24	12	48000	0.527
15/30	15	30	0.0065	23	1	46000	0.897	0.0100	15	1	30000	2.109	0.0150	10	1	20000	4.744
15/30	15	30	0.0065	46	2	92000	0.224	0.0100	30	2	60000	0.527	0.0150	20	2	40000	1.186
15/30	15	30	●	●	●	●	●	●	●	●	●	●	0.0150	30	3	60000	0.527
15/60	15	60	0.0125	12	1	24000	3.295	0.0200	15	2	30000	2.109	0.0300	10	2	20000	4.744
15/60	15	60	0.0125	24	2	48000	0.824	0.0200	30	4	60000	0.527	0.0300	20	4	40000	1.186
15/60	15	60	0.0125	36	3	72000	0.366	●	●	●	●	●	0.0300	30	6	60000	0.527
15/90	15	90	0.0188	16	2	32000	1.853	0.0273	11	2	22000	3.921	0.0450	10	3	20000	4.744
15/90	15	90	0.0188	32	4	64000	0.463	0.0273	22	4	44000	0.980	0.0450	20	6	40000	1.186
15/90	15	90	●	●	●	●	●	0.0273	33	6	66000	0.436	0.0450	30	9	60000	0.527
15/120	15	120	0.0250	12	2	24000	3.295	0.0375	12	3	24000	3.295	0.0600	10	4	20000	4.744
15/120	15	120	0.0250	24	4	48000	0.824	0.0375	24	6	48000	0.824	0.0600	20	8	40000	1.186
15/120	15	120	0.0250	36	6	72000	0.366	0.0375	36	9	72000	0.366	0.0600	30	12	60000	0.527