



MACRO-TECH SERIES

MA-36x12

AC Power Draw and Thermal Dissipation

The information provided on this page is calculated data based on driving both channels to rated output using the 1 kHz Maximum Average Power rating method.

Other parameters used in calculation include a conservative idle current estimate of 90 watts and a conservative estimate of efficiency at 65%.

Information is provided only for getting an idea of current draw and heat produced. Actual performance will vary depending on environment, program material, load, signal, and AC mains voltage and frequency.

Values of calculated current draw are intended to represent average draw corresponding to the thermal breaker requirements that should be met to handle the amplifier as a load on the AC mains.

Peak current draw with dynamic program material may be significantly higher. Thermal information is provided to assist with calculating air conditioning needs. The data here should not be construed as specifications.

Duty cycle of various program material:

- Individual speech: 10%
- Acoustic/chamber music: 20%
- Full-range rock music: 30%
- Compressed rock music: 40%
- Pink noise: 50%

Here are the equations used to calculate the data presented in Figure 1:

$$\text{AC Mains Power Draw (watts)} = \frac{\text{Total output power with all channels driven (watts)} \times \text{Duty Cycle}}{\text{Amplifier Efficiency (.65)}} + \text{Quiescent Power Draw (watts)}$$

The quiescent power draw is a maximum value and includes power drawn by the fan. The following equation converts power draw in watts to current draw in amperes:

$$\text{Current Draw (amperes)} = \frac{\text{AC Mains Power Draw (watts)}}{\text{AC Mains Voltage} \times \text{Power Factor (.83)}}$$

The value used for Power Factor is 0.83. The Power Factor variable is needed to compensate for the difference in phase between the AC mains voltage and current. The following equation is used to calculate thermal dissipation:

$$\text{Thermal Dissipation (btu/hr)} = \left(\frac{\text{Total output power with all channels driven (watts)} \times \text{Duty Cycle} \times .35}{\text{Amplifier Efficiency (.65)}} + \text{Quiescent Power Draw (watts)} \right) \times 3.415$$

The value used for inefficiency is 1.00-efficiency. The factor 3.415 converts watts to btu/hr. Thermal dissipation in btu is divided by the constant 3.968 to get kcal. If you plan to measure output power under real-world conditions, the following equation may also be helpful:

$$\text{Thermal Dissipation (btu/hr)} = \left(\frac{\text{Total measured output power from all channels (watts)} \times .35}{\text{Amplifier Efficiency (.65)}} + \text{Quiescent Power Draw (watts)} \right) \times 3.415$$

Macro-Tech 36x12

Duty Cycle	L O A D														
	AC Mains Power Draw (Watts)	8 Ohm				4 Ohm				2 Ohm					
		100-120 V	230 V	btu/hr	kcal/hr	AC Mains Power Draw (Watts)	100-120 V	230 V	btu/hr	kcal/hr	AC Mains Power Draw (Watts)	100-120 V	230 V	btu/hr	kcal/hr
50%	1190	12.0	6.2	1622	409	1663	16.7	8.7	2188	551	1994	20.0	10.4	2583	651
40%	970	9.7	5.1	1359	342	1348	13.5	7.1	1812	457	1613	16.2	8.5	2128	536
30%	750	7.5	3.9	1096	276	1034	10.4	5.4	1436	362	1232	12.4	6.5	1673	422
20%	530	5.3	2.8	833	210	719	7.2	3.4	1059	267	852	8.6	4.5	1218	307
10%	310	3.1	1.6	570	144	405	4.1	2.1	683	172	471	4.7	2.5	762	192



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