Power Ratings

R-H rates speaker power handling two ways: "RMS" power and "Program" (PGM) power. RMS power is the maximum power level that a speaker can handle on a long term basis as measured with an RMS responding voltmeter and calculated with the rated impedance. For subwoofers this is usually measured with sine waves and is equivalent to the "RMS sine wave" power rating. For most other speakers it is measured with shaped pink noise and is equivalent to the "AES" power. Program power is twice (+3 dB) the RMS power.

The proper power amplifier size for a given speaker is between the RMS and PGM ratings. To eliminate clipping of the power amplifier, it would need to have a RMS power rating equal to the program power rating of the speaker. However, most power amplifiers have the ability to put out more power than their RMS rating for short periods of time. This is usually referred to as the dynamic headroom of the amp and is typically 2 to 3 dB. Also a moderate amount of clipping is relatively inaudible. Therefore, it is acceptable to use an amplifier with a RMS power rating the same as the speaker's RMS power rating with little effect on system performance. R-H speakers are labeled with both numbers (RMS and PGM) as a guide to selecting appropriate amplifiers.

R-H controllers have their thermal power limits set to the RMS power rating of the speaker. The peak limiter is set to the largest instantaneous voltage the driver can safely handle on a repetitive basis. This is usually 6 dB higher than the RMS power for woofers and 4 dB higher for high frequency drivers. Using a controller makes it safe to use larger amplifiers for their peak capability while protecting the speaker against overloads.

Sensitivity

The rated sensitivity for each driver in a speaker system is determined by the most sensitive one octave band within it's normal operating frequency range. The attenuation of a passive speaker's crossover network decreases the sensitivity at some frequencies but increases the apparent power handling of the speaker system. The maximum output SPL remains the same. Rather than have different sensitivities and power handling specifications for active and passive systems, the rated sensitivity and power are based on the active system's raw driver responses.

The rated sensitivity of passive R-H speaker systems corresponds to the sensitivity of the low frequency section. The high frequency section is typically rated for less power than the woofer section, but since it typically has higher sensitivity it is attenuated to roughly the same apparent power handling level.

Maximum Output SPL

Maximum output sound pressure level for R-H speakers can be calculated from the rated program power and the rated sensitivity. It can be measured acoustically by using a SPL meter set to the Peak measurement position with program material having a peak to average level of greater than 6 dB and having significant content in the frequency range where the sensitivity is evaluated.