M359 Input Power and Current

To calculate the Input Power of the M359 for any load above 500W start by calculating the Battery Charger consumption (**Pchg** in Watts) as a function of the Battery Charge Level % (**BCL**) using Equation 1 below:

For BCL lower than 50% use: **Pchg**= 250W
For BCL higher than 50% use: **Pchg = 250 x (100-BCL)/50** (Equation 1)

Next, using Table 1, find the Conversion Efficiency (**Eff**) applicable to the operating conditions, when **Pout** is the load on the M359 AC Output and **Pchg** is the charger consumption you have calculated in the previous step:

Table 1

(Pout + Pchg)	Eff
500W	0.84
700W	0.86
1,000W	0.88
1,500W	0.86
1,800W	0.84
2,000W (and up)	0.83
For intermediate power: use linear extrapolation	

Next, calculate the Input Power into the M359 (**Pin**), by inserting the **Pchg** and **Eff** (that you have fond in the previous steps) into Equation 2 below:

Pin = (Pout + Pchg) / Eff + 50W (Equation 2).

Examples:

1. **Operating Conditions: Pout =1,000W, Battery Charge Level (BCL) is 30%, Vin = 118VAC**

   Since BCL is lower than 50%, **Pchg** = 250W

   From Table 1 the **Eff** for (1,000W + 250W) is about 0.87.
   From Equation 2 we calculate **Pin** using **Pchg** of 250W and **Eff** of 0.87:

   Pin = (1,000 +250)/0.87 +50 = 1,487 +50 = 1,537W

   By dividing the Input Power **Pin** by the input voltage (118VAC) we find the Input Current:

   Iac = 1,537W/118V = 13Amp.

2. **Operating Conditions: Pout =1,000W, Battery is fully charged, Vin = 112VAC**

   Calculating Pchg using Equation 1:

   Pchg = 250 x (100-100)/50 = 0W

   From Table 1 the **Eff** for (1,000W + 0W) is about 0.88.

   From Equation 2 we calculate **Pin** using **Pchg** of 0W and **Eff** of 0.88:

   Pin = (1,000)/0.88 +50 = 1,136 +50 = 1,186W

   By dividing the Input Power **Pin** by the input voltage (114VAC) we find the Input Current:

   Iac = 1,186W/112V = 10.6Amp

3. **Operating Conditions: Pout =1,500W, Battery Charge Level is 70%, Vin = 118VAC**

   Calculating **Pchg** using Equestion 1:

   Pchg = 250 x (100-70)/50 =150W

   From Table 1 the **Eff** for (1,500W + 150W) is about 0.85.

   From Equation 2 we calculate **Pin** using **Pchg** of 150W and Eff of 0.85:

   Pin = (1,500 +150)/0.85 +50 = 1,941 +50 = 1,991W

   By dividing the Input Power **Pin** by the input voltage (112VAC) we find the Input Current:

   Iac = 1,991W/112V = 17.8Amp