

## Directions for using the Tables

Each appliance and electronic device will have a label either showing the input power in watts or an input voltage and amperage rating. If it has an input wattage, disregard the voltage and amperage and skip that section in the tables below.

**Step 1:** Multiply the input Volts by the input Amps (current) to determine the input watts.

**Step 2:** Determine the amount of time on average each day the item will be used. (Divide total minutes by 60 to obtain the number in hours for the table.)

**Step 3:** Multiply Watts by Time Used Each Day to determine the total watthours for each item.

**Step 4:** Add Watthour Subtotals A, B, C to obtain your total daily electricity usage.

**Step 5:** Divide total daily Watthours by DC voltage of batteries (typically 12V) to determine Amphours (Ah) required each day. As a buffer, you can add 10% in case you missed a few things or add to your consumption in the future.

**Step 6 (Lead acid/AGM):** A lead acid or AGM battery can only safely be discharged to 50% to prevent damage to the battery. Take your Ah requirement from Step 5 and double it to determine your lead acid battery bank size in Ah.

**Step 6 (Lithium Ion):** A Lithium Ion battery can be fully discharged without damage to the battery, however prolonged life will be achieved if you don't. 80% is a good number, so divide the Ah from Step 5 by .8 to determine the battery bank Ah size for lithium batteries.

**Step 7:** Rule of thumb - Double the daily Ah usage (at 12 V) from step 5 to determine your solar panel wattage requirement. For example, if you determined your Ah to be 430 Ah after adding a buffer, you should have a minimum of 860 watts of solar panels to recharge your bank.

Note: If your battery bank voltage is anything other than 12V, recalculate Step 5 using 12V before doing Step 7.

If any item in Section A or B does not apply to your RV skip it. Use Section C for any item not already listed in Sections A and B.

Section A									
Large Appliances	Volts (V)	x	Amps (I)	=	Watts (W)	x	Time Used Each Day (hours)	=	Watthours (Wh)
Refrigerator		x		=		x		=	
Furnace		x		=		x		=	
Microwave		x		=		x		=	
Dishwasher		x		=		x		=	
Stovetop		x		=		x		=	
Range		x		=		x		=	
Washer		x		=		x		=	
Dryer		x		=		x		=	
Elec. Water Heater		x		=		x		=	
Bed Lift Motor		x		=		x		=	
Slides		x		=		x		=	
Landing Gear		x		=		x		=	
Fireplace		x		=		x		=	
<b>Subtotal A</b>									

Air conditioners use a large amount of energy for a long time. An off-grid system is usually not designed to run Acs. However, you can include them here to help give you an idea of how much battery and solar you would need to run them for any amount of time.

Air Conditioner 1		x		=		x		=	
Air Conditioner 2		x		=		x		=	
Air Conditioner 3		x		=		x		=	
<b>Subtotal</b>									

## Section B

Small Appliances & Electronics	Volts (V)	x	Amps (I)	=	Watts (W)	x	Time Used Each Day (hours)	=	Watthours (Wh)
Coffee Maker		x		=		x		=	
Mixer		x		=		x		=	
Crockpot/Instant Pot		x		=		x		=	
Toaster		x		=		x		=	
Hair Dryer		x		=		x		=	
Curling Iron		x		=		x		=	
Flat Iron		x		=		x		=	
Vacuum		x		=		x		=	
Fan		x		=		x		=	
Air Compressor		x		=		x		=	
Phone 1		x		=		x		=	
Phone 2		x		=		x		=	
Tablet 1		x		=		x		=	
Tablet 2		x		=		x		=	
Computer		x		=		x		=	
TV		x		=		x		=	
Soundbar		x		=		x		=	
CD/DVD Player		x		=		x		=	
Gaming System		x		=		x		=	
Coffee Grinder		x		=		x		=	
Air fryer		x		=		x		=	
Blender		x		=		x		=	
Oil Diffuser		x		=		x		=	
Toothbrush/Razor		x		=		x		=	
Sound Machine		x		=		x		=	
Ice Maker		x		=		x		=	
CPAP		x		=		x		=	
Dehumidifier		x		=		x		=	
Workout Eqpt		x		=		x		=	
<b>Subtotal B</b>									

Section C									
Additional Items	Volts (V)	x	Amps (I)	=	Watts (W)	x	Time Used Each Day (hours)	=	Watthours (Wh)
		x		=		x		=	
		x		=		x		=	
		x		=		x		=	
		x		=		x		=	
		x		=		x		=	
		x		=		x		=	
		x		=		x		=	
		x		=		x		=	
		x		=		x		=	
		x		=		x		=	
		x		=		x		=	
		x		=		x		=	
		x		=		x		=	
		x		=		x		=	
<b>Subtotal C</b>									

Step 4	
Subtotal A	
Subtotal B	
Subtotal C	
Total Watthours	

Step 6 (Lead Acid/AGM)	
Ah per day	
	<b>x</b> 2
Ah Battery Bank	

Step 5	
Total Wh	
Battery Voltage	<b>÷</b>
Total Ah	
Add 10% buffer	<b>x</b> 1.1
Total Ah per day	

Step 6 (Lithium Ion)	
Ah per day	
	<b>÷</b> .8
Ah Battery Bank	

Step 7	
Ah (12V)	
	<b>x</b> 2
Solar Panel (W)	