



# Battery Specifications and Sizing Chart

<b>AGM Lead Acid Batteries / System</b>	<b>EP-200</b>	<b>EP-600</b>	<b>EP-1200</b>	<b>EP-2000</b>	<b>EP-4000</b>	<b>EP-7000</b>
Battery Voltage DC	24 vdc	36 vdc	48 vdc	72 vdc	108 vdc	108 vdc
Ampere hour charge capacity	200 ah	200 ah	200 ah	200 ah	200 ah	200 ah
Number of batteries, series/parallel	2	3	4	6	9	9
Total Battery Weight (4D, 135 lbs each)	270 lbs	405 lbs	540 lbs	810 lbs	1,215 lbs	1,215 lbs
Size, 8.63" H x 8.70" W x 20.76" L	4-D	4-D	4-D	4-D	4-D	4-D
Number of battery chargers	1	1	2	2	3	3
Max charge time shore power or genset*	1-5 hrs	1-5 hrs	1-5 hrs	1-5 hrs	1-5 hrs	1-5 hrs
Cruising duration, cocktail speed	21.8 hrs-3 kts	11.9 hrs-4kts	12.5 hrs-4 kts	9.7 hrs-4 kts	10.7 hrs-4 kts	8.6 hrs-4 kts
Cruising duration, travel speed	12.8 hrs-4 kts	7.2 hrs-5 kts	7.4 hrs-5 kts	5.8 hrs-5 kts	6.6 hrs-5 kts	5.2 hrs-5 kts
Cruising duration, full throttle	7.7 hrs-5 kts	4.3 hrs-5.5 kts	4.3 hrs-6 kts	4.0hrs-6.5 kts	2.2 hrs-7.5 kts	1.2 hrs-8 kts
Batteries only range, @ travel speed	59 miles	41 miles	43 miles	33 miles	38 miles	30 miles
Battery service, cycles & life	1000/8 yrs	1000/8 yrs	1000/8 yrs	1000/8 yrs	1000/8yrs	1000/8 yrs
Cost per charge 50% DOD @ \$0.18 kW	\$0.43	\$.64	\$.64	\$.64	\$1.94	\$1.94
Batteries + genset range, @ travel speed	Continuous	149 miles	159 miles	77 miles	115 miles	64 miles
Minimum genset rating	.8 kW	1.5 kW	2.0 kW	2.0 kW	3.0 kW	3.0 kW
Batteries + genset + 2 sets of chargers	(1 charger)	continuous	continuous	continuous	continuous	continuous
Minimum genset continuous rating	.8 kW	2.0 kW	3.5 kW	3.5 kW	6.5 kW	6.5 kW

Notes: The above genset ratings are for propulsion only, house kW loads such as lighting, appliances, and other utilities would be added.  
 Continuous cruise can be achieved at travel speed by twice the number of chargers in most cases.  
 \* Max charging time shore power or genset is 1-5 hours typical maximum 50% depth of discharge.

Other considerations:

1. AGM batteries are more expensive than flooded wet cell but they save on greater service life, cycle life, efficiency, with a 15% gain on charging from solar, wind, or shore power.
2. AGMs have a 1% to 2% per month self discharge rate as compared to 1% per day for flooded wet cell batteries.



# Battery Specifications and Sizing Chart

Lithium Iron LiFeMgPO4 / System	EP-200	EP-600	EP-1200	EP-2000	EP-4000	EP-7000
Battery Voltage DC	24 vdc	36 vdc	48 vdc	72 vdc	108 vdc	108 vdc
Ampere hour charge capacity	220 ah	220 ah	220 ah	220 ah	220 ah	220 ah
Number of batteries, series/parallel	4	4	4	12	18	18
Total battery weight (Group 24)	139 lbs	208 lbs	270 lbs	417 lbs	626 lbs	626 lbs
Size, 10.3" H x 5.9" W x 10.6" L	G-24	G-24	G-24	G-24	G-24	G-24
Number of battery chargers	1	1	2	2	3	3
Max charge time shore power or genset*	1-5 hrs	1-5 hrs	1-5 hrs	1-5 hrs	1-5 hrs	1-5 hrs
Cruising duration, cocktail speed	23.9 hrs-3 kts	13.0 hrs-4 kts	13.7 hrs-4 kts	10.7 hrs-4 kts	11.8 hrs-4 kts	9.5 hrs-4 kts
Cruising duration, travel speed	14.0 hrs-4 kts	7.9 hrs-5 kts	8.1 hrs-5 kts	6.4 hrs-5 kts	7.3 hrs-5 kts	5.7 hrs-5 kts
Cruising duration, full throttle	8.5 hrs-5 kts	4.7 hrs-5.5 kts	4.7 hrs-6 kts	4.4 hrs-6.5 kts	2.4 hrs-7.5 kts	1.4 hrs-8 kts
Batteries only range, @ travel speed	65 miles	45 miles	47 miles	36 miles	41 miles	33 miles
Battery service, cycles & life	3,000/12 yrs	3,000/12 yrs	3,000/12 yrs	3,000/12 yrs	3,000/12 yrs	3,000/12 yrs
Cost per charge 50% DOD @ \$0.18/kW	\$0.47	\$.71	\$1.42	\$1.42	\$2.13	\$2.13
Batteries + genset range, @ travel speed	continuous	165 miles	175 miles	84,7 miles	126.5 miles	70.4 miles
Minimum genset rating	.8 kW	1.5 kW	2.0 kW	2.0 kW	3.0 kW	3.0 kW
Batteries + genset + 2 sets of chargers	(1 charger)	continuous	continuous	continuous	continuous	continuous
Minimum genset continuous rating	.8 kW	2.0 kW	3.5 kW	3.5 kW	6.5 kW	6.5 kW

Notes: The above genset ratings are for propulsion only, house kW loads such as lighting, appliances, and other utilities would be added.  
 Continuous cruise can be achieved at travel speed by twice the number of chargers in most cases.  
 \* Max charging time shore power or genset is 1-5 hours typical maximum 50% depth of discharge.

Other considerations:

1. The above information is gathered from Valence data sheets for their model U24-12RT LiFeMgPO4 batteries.
2. Valence does not make or sell chargers, the above was calculated using 18 amp LiFeMgPO4 chargers.



# Battery Specifications and Sizing Chart

Flooded Lead Acid Batteries/System	EP-200	EP-600	EP-1200	EP-2000	EP-4000	EP-7000
Battery Voltage DC	24 vdc	36 vdc	48 vdc	72 vdc	108 vdc	108 vdc
Ampere hour charge capacity	200 ah	200 ah	200 ah	200 ah	200 ah	200 ah
Number of batteries, series/parallel	2	3	4	6	9	9
Total battery weight (4D, 129 lbs each)	259 lbs	389 lbs	540 lbs	778 lbs	1,158 lbs	1,158 lbs
Size, 8.63" H x 8.70" W x 20.76" L	4-D	4-D	4-D	4-D	4-D	4-D
Number of battery chargers	1	1	2	2	3	3
Max charge time shore power or genset*	1-5 hrs	1-5 hrs	1-5 hrs	1-5 hrs	1-5 hrs	1-5 hrs
Cruising duration, cocktail speed	21.8 hrs-3 kts	11.9 hrs-4 kts	12.5 hrs-4 kts	9.7 hrs-4 kts	10.7 hrs-4 kts	8.6 hrs-4 kts
Cruising duration, travel speed	12.8 hrs-4 kts	7.2 hrs-5 kts	7.4 hrs-5 kts	5.8 hrs-5 kts	6.6 hrs-5 kts	5.2 hrs-5 kts
Cruising duration, full throttle	7.7 hrs-5 kts	4.3 hrs-5.5 kts	4.3 hrs-6 kts	4 hrs-6.5 kts	2.2 hrs-7.5 kts	1.2 hrs-8 kts
Batteries only range, @ travel speed	59 miles	41 miles	43 miles	33 miles	38 miles	30 miles
Battery service, cycles & life	500/4 yrs	500/4 yrs	500/ 4 yrs	500/4 yrs	500/4 yrs	500/4 yrs
Cost per charge 50% DOD @ \$0.18/kW	\$0.49	\$74	\$1.49	\$1.49	\$2.23	\$2.23
Batteries + genset range, @ travel speed	Continuous	149 miles	159 miles	77 miles	115 miles	64 miles
Minimum genset rating	.8 kW	1.5 kW	2.0 kW	2.0 kW	3.0 kW	3.0 kW
Batteries + genset + 2 sets of chargers	(1 charger)	continuous	continuous	continuous	continuous	continuous
Minimum genset continuous rating	.8 kW	2.0 kW	3.5 kW	3.5 kW	6.5kW	6.5 kW

Notes: The above genset ratings are for propulsion only, house kW loads such as lighting, appliances, and other utilities would be added.  
 Continuous cruise can be achieved at travel speed by twice the number of chargers in most cases.  
 \* Max charging time shore power or genset is 1-5 hours typical maximum 50% depth of discharge.

Other considerations:

1. Flooded wet cells convert 15% to 20% of their electrical energy into waste heat whereas AGMs lose only 4%, therefore solar panels and wind generators must be at least 15% larger to compensate for the wet cell losses.
2. Flooded wet cell batteries self discharge at a rate of 1% per day, whereas AGMs discharge at a rate of 1% per month.
3. AGMs can be force charged in less than an hour with a larger charger, flooded wet cells must take a minimum of 5 hours.
4. Flooded wet cells are not well suited for use in sailboats.