# ELECTRICPROPULSION

## battery specifications and sizing chart **AGM LEAD ACID**

| AGM Lead Acid Batteries / System | EP-600 | EP-1200 | EP-2000 | EP-4000 | EP-7000 |
|---|---|---|---|---|---|
| Battery Voltage DC | 36 vdc | 72 vdc | 72 vdc | 108 vdc | 108 vdc |
| Ampere hour charge capacity | 200 ah | 200 ah | 200 ah | 200 ah | 200 ah |
| Number of batteries, series/parallel | 3 | 4 | 6 | 9 | 9 |
| Total Battery Weight (4D, 129 lbs each) | 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 |
| Number of battery chargers | 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 |
| Cruising duration, cocktail speed | 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 | 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 | 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 | 41 miles | 43 miles | 33 miles | 38 miles | 30 miles |
| Battery service, cycles & life | 1000/8 yrs | 1000/8 yrs | 1000/8 yrs | 1000/8yrs | 1000/8 yrs |
| Cost per charge 50% DOD @ $0.18 kW | $.64 | $.64 | $.64 | $1.94 | $1.94 |
| Batteries + genset range, @ travel speed | 149 miles | 159 miles | 77 miles | 115 miles | 64 miles |
| Minimum genset rating | 1.5 kW | 2.0 kW | 2.0 kW | 3.0 kW | 3.0 kW |
| Batteries + genset + 2 sets of chargers | continuous | continuous | continuous | continuous | continuous |
| Minimum genset continuous rating | 2.0 kW | 3.5 kW | 3.5 kW | 6.5 kW | 6.5 kW |

*Elco makes electrical propulsion systems for sailboats and displacement yachts from 12' /4 m. to 52'/16 m.*

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

# ELECTRICPROPULSION

## battery specifications and sizing chart **LITHIUM IRON LIFEMGPO4**

| Lithium Iron LiFeMgPO4 / System | EP-600 | EP-1200 | EP-2000 | EP-4000 | EP-7000 |
|---|---|---|---|---|---|
| Battery Voltage DC | 36 vdc | 48 vdc | 72 vdc | 108 vdc | 108 vdc |
| Ampere hour charge capacity | 220 ah | 220 ah | 220 ah | 220 ah | 220 ah |
| Number of batteries, series/parallel | 6 | 4 | 12 | 18 | 18 |
| Total battery weight (Group 24) | 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 |
| Number of battery chargers | 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 |
| Cruising duration, cocktail speed | 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 | 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 | 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 | 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 |
| Cost per charge 50% DOD @ $0.18/kW | $.71 | $1.42 | $1.42 | $2.13 | $2.13 |
| Batteries + genset range, @ travel speed | 165 miles | 175 miles | 84,7 miles | 126.5 miles | 70.4 miles |
| Minimum genset rating | 1.5 kW | 2.0 kW | 2.0 kW | 3.0 kW | 3.0 kW |
| Batteries + genset + 2 sets of chargers | continuous | continuous | continuous | continuous | continuous |
| Minimum genset continuous rating | 2.0 kW | 3.5 kW | 3.5 kW | 6.5 kW | 6.5 kW |

*Elco makes electrical propulsion systems for sailboats and displacement yachts from 12' /4 m. to 52'/16 m.*

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

# ELECTRICPROPULSION

## battery specifications and sizing chart **FLOODED LEAD ACID**

| AGM Lead Acid Batteries / System | EP-600 | EP-1200 | EP-2000 | EP-4000 | EP-7000 |
|---|---|---|---|---|---|
| Battery Voltage DC | 36 vdc | 72 vdc | 72 vdc | 108 vdc | 108 vdc |
| Ampere hour charge capacity | 200 ah | 200 ah | 200 ah | 200 ah | 200 ah |
| Number of batteries, series/parallel | 3 | 4 | 6 | 9 | 9 |
| Total battery weight (4D, 129 lbs each) | 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 |
| Number of battery chargers | 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 |
| Cruising duration, cocktail speed | 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 | 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 | 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 | 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 |
| Cost per charge 50% DOD @ $0.18/kW | $74 | $1.49 | $1.49 | $2.23 | $2.23 |
| Batteries + genset range, @ travel speed | 149 miles | 159 miles | 77 miles | 115 miles | 64 miles |
| Minimum genset rating | 1.5 kW | 2.0 kW | 2.0 kW | 3.0 kW | 3.0 kW |
| Batteries + genset + 2 sets of chargers | continuous | continuous | continuous | continuous | continuous |
| Minimum genset continuous rating | 2.0 kW | 3.5 kW | 3.5 kW | 6.5kW | 6.5 kW |

*Elco makes electrical propulsion systems for sailboats and displacement yachts from 12' /4 m. to 52'/16 m.*

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:
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. Flooded wet cell batteries self discharge at a rate of 1% per day, whereas AGMs discharge at a rate of 1% per month. AGMs can be force charged in less than an hour with a larger charger, flooded wet cells must take a minimum of 5 hours. Flooded wet cells are not well suited for use in sailboats.