

EP Carry 24 Volt Motor System User Manual



PropEle Electric Boat Motors, Inc.



Dear Customer,

Thank you for purchasing the *EP Carry* portable motor system. This manual will help you learn how to get the most out of your *EP Carry* system and how to care for it.

You can also go to www.electricpaddle.com to find helpful videos and a link to sign up for our occasional newsletters and product updates. If you need more information or have further questions, email us at info@electricpaddle.com or call 425-502-5232 (9am to 5pm, Pacific time).

We appreciate your purchase.

The PropEle Electric Boat Motors Team

Send us a photo of your *EP Carry* on your boat for our blog.

PropEle Electric Boat Motors, Inc. 10404 428th Ave SE North Bend, WA 98045 www.epcarry.com or www.electricpaddle.com Email: info@electricpaddle.com

EP Carry Model 24 volt/230-250 Watts/14 lbs FCC FRN 0026847665

<u>Table of Contents</u>	<u>Page</u>
Important Safety Information	2
About the <i>EP Carry</i> System	3
How to Use the EP Carry System	5
Set Up and Operation	5
After Use	6
Charging	7
Storage	7
Maintenance and Prop Changes	7
Installing on a Beach	8
FAQ/Troubleshooting	8
Warranty, Service and Customer Support	10
Battery Disposal and Recycling	11

Important Safety Information

- Do not let hands or children near the exposed prop; be aware of swimmers and animals during use.
- Do not use or store charger in a damp location or cover during charging.
- Inspect all cords before connecting or using. Do not use a damaged charger or battery.
- Attach the Magnetic Safety Key loop to your wrist or PFD so the motor stops if you fall overboard.
 After reinserting key, turn throttle to off position for 3 seconds before turning on.

- The Magnetic Safety Key contains Neodymium magnets. If you have a pacemaker or other implanted medical device, consult your physician or the implanted device manufacturer prior to handling or use.
- Before each use, check the battery cable connector, and inspect for any corrosion.
- Always keep the battery cable end covered with plastic cap when not in use/attached to the motor cable.
- Do not let the battery cable end sit in water, especially salt water. Allow to dry out and wipe clean before use.
- Check with your shipping or air travel carrier before transporting Lithium LiFEPO4 batteries. Some require Ground Transport only.

Key Product Use Tips

- Do not run the **EP Carry** motor out of the water. It needs to be lubricated by immersion in water during use.
- Do not use oil or other fluids to lubricate the motor or gears/prop.
- Never store the EP Carry upside-down; water can enter the motor cover and become trapped.
- The motor is designed to be waterproof in a normal capsize but not for extended immersion. Remove from water and allow to drain upright or resume use. If immersed in saltwater, rinse the entire motor with fresh water and air-dry.
- Invasive species proliferation: if you use this motor in multiple waterways, be sure to fully drain the lower unit, rinse and dry between waterways. Ask your local fish and wildlife district for more information on how to prevent spreading of invasive species.

About the EP Carry System

EP Carry 24 VOLT SYSTEM CONTENTS

- Motor (comes in 3 shaft length options: Short/Standard, Long, Mini)
- Carry bag for motor
- 24 volt sealed Lithium (LiFePO4) battery pack in a soft, buoyant case
- Charger for battery
- 2 Magnetic safety keys and spare cotter pin
- Transom lock with keys
- User manual

SPECIFICATIONS

Motor Weight

Standard/short shaft motor: 14.05 lbs. Long shaft: 14.27 lbs. Mini shaft: 13.73 lbs.

Battery pack weight

In Battery case: 6.4 lbs.

Dimensions

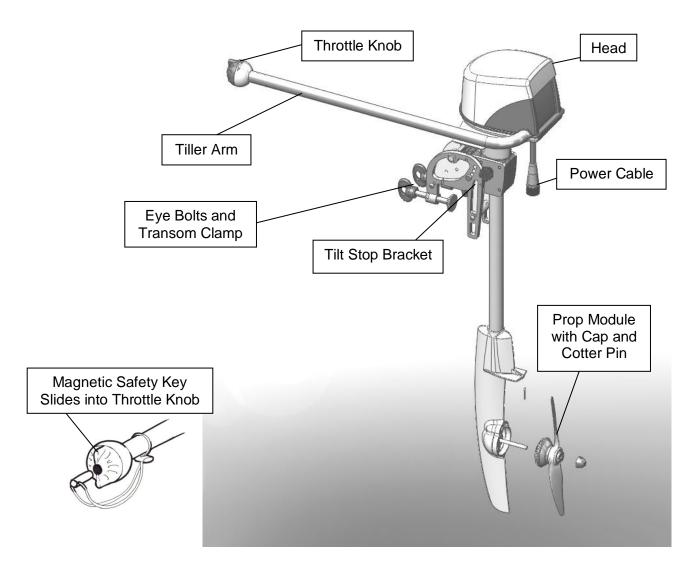
When the transom clamp is turned around and folded inward for storage, the *EP Carry* Motor is widest at the top/Motor head end, and tapers down at the skeg/prop end.

Standard/short shaft: Motor head - 14" widest diameter x 45.1" long Long shaft: Motor head - 14" widest diameter x 50.1" long Mini shaft: Motor head - 14" widest diameter x 40.1" long

Battery pack: 8" x 5" x 6"

USE CONDITIONS

- · Suitable for salt or fresh water use.
- Intended for use on portable displacement craft less than 1,000 lbs. total weight.



SPEED AND THROTTLE CONTROLS

No preset speeds – the throttle is continuously variable. Turn throttle dial <u>clockwise</u> from neutral/off position for <u>forward</u> motion. Turn dial <u>counterclockwise</u> from neutral for <u>reverse</u> motion.

Minimum battery range (24V, 10 Ah LiFePO4 battery):

- At full throttle, runtime is approximately 1 hour.
- At half throttle, runtime is 2 hours.
- At low throttle, runtime is 3.5 hours or more.
- After the above discharge conditions have been reached, the 24 Volt battery controller automatically shuts off to protect the battery from permanent damage.

OUTPUT SPEEDS

Most *EP Carry*-powered dinghies will achieve maximum speeds of 3.5 to 4.0 kts, with narrow and longer craft at the higher end of the speed range, and wider, shorter rigid-hulls in the middle of the range. Canoes and kayaks can reach 5 kts. Inflatables will be at the lower end of the speed

range. Speeds will vary based on boat type and trim more than loading. All speeds are dependent on wind, current and other conditions.

How to Use the EP Carry System

SET UP AND OPERATION

- Grasp the motor on the upper end at the hand hold just under the head, with the prop facing backward. Make sure the transom mount eye screws are fully unscrewed and open, with eyes facing forward.
- 2. Rotate the tiller arm up and over until the throttle knob is facing forward into the boat. Place the motor on the transom (or motor mount), inside the mouth of the transom clamp brackets.
- 3. Tighten the clamp screws until the motor is very firmly tightened in and secure.
- 4. If needed, adjust the tilt stop bracket so the motor is vertical in the water.
- 5. Plug the battery cable into the motor cable until they click together. Push in to lock.
- 6. Safety requires that batteries aboard boats be secured. Place the battery bag so the top loop is between the eye screws. Run the metal stem lock through the eye of one screw, through battery bag loop, and through the other eye, to secure it. Place the locking mechanism in the end of the stem piece and turn the key to lock.
- 7. When in water deep enough for the motor (at least 18 inches), pivot motor into the water by pushing aft (horizontally) on the tiller handle.
- 8. Insert the Magnetic Safety Key (tethered by colored lanyard on tiller arm) into the end of the tiller handle, and turn the throttle knob to neutral/off position for <u>at least 3 seconds</u>. [The time delay is a safety interlock feature to avoid inadvertent operation/propeller spinning.]
- 9. Twist the throttle dial at the end of the knob clockwise for forward, or counterclockwise for reverse.
- 10. When approaching shore, pull hard on the tiller arm (horizontally) to raise the motor out of the water. Avoid hitting the bottom with the prop sand and rocks will wear down the prop and reduce system efficiency. Remove the Magnetic Safety Key.

USE TIPS

- The motor acts as a rudder, and your course is maintained without holding the handle.
- The throttle maintains its setting without being held.
- Always sit within easy reach of the tiller arm and controls for safety.
- <u>RESET</u>: When the safety interlock shuts off your motor (for example, when the key is removed or when the power cord is removed and replaced), it is always necessary to reset it. Return the knob to neutral/off power setting and wait 3 seconds to enable motor operation.
- The Magnetic Safety Key lanyard is attached to the tiller arm, and can slide back to help retain the key in its hole until it is removed.
- The short Magnetic Safety Key lanyard should be looped around the tiller handle for storage and use. To enable use as a man-overboard safety disable switch, loop a length of cording attached to your PFD through the key loop so that key pops out when the cord is pulled. Another way to assure the motor cuts out in an emergency is to pass fingers through the loop of the lanyard so when the hand is removed, the key comes out.
- Always carry your spare Magnetic Safety Key, a spare prop module, and a spare cotter pin.

OBSTRUCTIONS

The motor will kick up when you hit an obstruction under the water. Push horizontally back on the tiller arm to lower the motor after you have passed the obstruction.

If the obstruction hits the prop, it may engage the Electronic Shear Pin feature. The motor will automatically stop to prevent damage. You can **reset** the system by turning the throttle to neutral/off position for at least **3 seconds**, then turning the throttle back on.

AFTER USE

Charge battery promptly to maintain optimal lifetime charging.

Rinse prop/gear module every few weeks if using in salt water. Dip prop and lower unit in a bucket of fresh water up to the top of the propeller, or pour a glass of fresh water into the gear case opening just above the prop, then allow to drain and dry upright.

Cover the battery cable end with its protective cap when not in use (dry it out first if damp).

Dry thoroughly before storing.

Important tips to maximize motor life:

- Run motor only while prop and blade are in water. The gear case requires water for lubrication.
- Don't throw or drop the motor or store it under heavy items. Never lift or tie up boat by the motor.
- Completely air-dry motor in an upright position before stowing in bag. If stored wet and upside-down, water may stagnate in the motor cover.
- Cleaning of your motor should be limited to rinsing and wiping with a damp cloth. Plastic and painted surfaces may be attacked by cleaning solvents.
- As with all propeller-driven outboards, use in active surf conditions may cause premature gear and bearing wear.

Important tips to maximize battery life:

- Always charge fully, until the indicator light turns green.
- Recharge your pack as soon as practical, within a few days of use, especially if it has
 discharged completely.
- Charge battery pack at least once a year.
- Never lift battery by its cord.
- Disconnect from the charger when done, ideally within 24 hours
- LiFePO4 batteries are memory-free and do not require special treatment other than to fully charge between uses.
- LiFePO4 batteries are considered hazardous materials by many shippers and some air carriers will not allow air shipment as baggage.

BATTERY BAG

The sealed battery pack is housed in a soft, padded carry bag. The unit is buoyant should you drop it overboard. If it is immersed, and the cable connector was not attached to the motor, check inside the connector and dry out any moisture before connecting to the motor. If the bag gets wet, remove the battery and soft padding pieces, and air-dry all parts before storing.

The battery bag can be secured aboard your boat by passing the lock stem through the transom mount eye screws and through the top loop on the battery bag. Safety requires that batteries aboard boats be secure. On dinghies and other boats with transoms, the stem lock secures the motor to the boat but acts only as a visible deterrent from theft of the battery – it can still be

removed by opening or cutting the bag. You may wish to carry your battery with you to prevent theft.

CHARGING

To use the charger, plug in to the AC power source and connect the battery to the charger the same way as you would to the motor, pushing the connectors together until they click.

- The charge indicator light on the face of the charger block surface will be red when the battery is charging.
- When the battery is fully charged (after 5 hours or less), the indicator light will turn green.
- After charging, disconnect the battery and unplug the charger from the AC power supply.
- Do NOT charge a damaged battery pack.

The battery charges with either 120v 60 Hz or 240v 50Hz. You can also charge your battery by plugging the charger into a 150 Watt (or larger) modified sine wave inverter attached to a boat's battery bank. The *Voltcube* 150 Watt Digital Power Inverter is verified/tested to work well). The charger draws 60 Watts when charging. When charging is complete, it continues to draw 2 Watts until disconnected. Read the full instructions in the charger package for more information.

STORAGE

For the most compact storage or to place in the soft carry bag, twist the transom mount around the shaft and raise the tiller arm to lay flat against the shaft.

The system may be stored inside any dry space.

Protect from extremes of temperature/freezing (under -4°F) and high temperature (over 140°F) heating. Rinse off the prop and transom clamp with fresh water and let dry before long-term storage.

Disconnect the battery from charger after charging cycle is complete. During long term storage, charge the battery every 6 months.

MAINTENANCE AND PROP CHANGES

The *EP Carry* propeller module is the only typical wear component in the motor. It uses the surrounding water for lubrication so there are no seals or lubricants to maintain. This eliminates pollution of our waterways.

Rinse the prop/gear module at least every few weeks if using in salt water. Dip prop and lower unit in a bucket of fresh water up to the top of the propeller, or pour a glass of fresh water into the gear case opening just above the prop, then allow to drain and dry upright.

Tropical Regions Salt Water Maintenance: Rinse the prop/gear with fresh water every week. Rinse and wipe off the transom clamp/tilt mechanism and metal pin weekly to avoid salt build-up.

Replace the prop module after each 100 hours of use. Additional replacement propellers are available for purchase.

The propeller module is a single assembly that contains the main drive gear, propeller bearings and propeller. It is replaceable in the field and economical to buy. Any grinding sounds, intermittent operation or slow labored operation can generally be rectified by cleaning or by replacing this component.

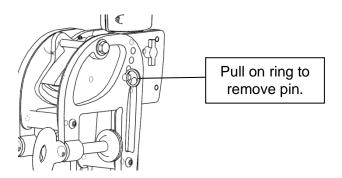
<u>To remove the propeller</u>, straighten the cotter pin and pull it out, then withdraw the plastic cap and the propeller module from the output shaft. Take care not to drop or lose the pin, cap or prop module. To install a new prop, insert propeller module, insert the pin and the cap, and <u>spread the cotter pin</u>. The output shaft does not turn.

There are no other user-serviceable parts in the lower unit.

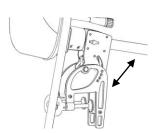
INSTALLING THE EP Carry TO A BOAT ON A BEACH OR FLAT SURFACE

When installing the motor to a beached boat, the motor must be in a raised position to clear the beach. The automatic reverse latch prevents raising the clamp when the motor is not yet mounted, so removal of the tilt pin is necessary. The pin is re-installed once the clamp in the raised position.

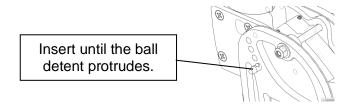
• Remove tilt pin by pulling on the ring handle (the split ring remains connected to the pin).



Raise the clamp assembly.



• Re-insert the pin into the hole corresponding to your transom rake. Push in until the ball detent protrudes. You can install from either side. Replace split ring on pin.



Mount your motor. Launch and move away from the beach. Once in water at least 18" deep, push on the tiller arm to lower the motor. Insert key, wait 3 seconds and turn the throttle to go.

Frequently Asked Questions - FAQS

What makes the *EP Carry* system different?

It's the most easily portable, at about 20 lbs. including 24 volt Lithium battery pack, and easiest to set up, operate and store.

POWER INTERRUPTION

For safety, the motor turns off for each of the following fault conditions. Check each of the following in order of likelihood, followed by testing operation by turning the power adjust dial to the off position for at least 3 seconds before attempting to operate.

1. Assure the Magnetic Safety Key is fully inserted; remove, inspect for debris (remove), and replace it.

- 2. Disconnect battery cable from the motor, inspect for debris (remove carefully) and reconnect. Assure the connector is securely attached to the motor.
- 3. Assure the battery is sufficiently charged. How long has the motor run since last charge? Connect spare battery, if available.
- 4. Pull tiller arm to raise prop and inspect for weeds or other entanglements. For weeds, while motor is raised up, briefly turn throttle on to spin them off. For stubborn weeds, repeat using reverse gear, or remove by hand after first removing the Safety Key. For other entanglements such as fishing line, remove by hand.

PERFORMANCE

How fast will my boat go?

Your boat's hull shape, waterline length, load, the type of boat, weather, tides and other factors will affect your speed.

How much runtime per battery charge?

Runtime depends on throttle setting. Full throttle runs 1 hour, half-throttle 2 hours, slower trolling speed is 3+ hours.

How far can I travel with EP Carry?

Range is calculated as speed x runtime. Each battery pack runtime is fixed at 1 hour at full throttle, 2 hours at half-throttle, and 3 hours or longer at trolling speeds. Your boat's speed will be determined by hull shape, length of your waterline, loaded weight and weather such as wind and currents. For an 8' hard shell dinghy at 350 lbs. full throttle range would be about 4.2 nautical miles, half throttle range would be about 8.4 nautical miles, and at low throttle would be up to 12.6 nautical miles.

K2 ENERGY LITHIUM IRON PHOSPHATE BATTERY PACKS

How long will the battery pack last?

Batteries are manufactured by K2 Energy. Each battery pack has a lifetime of at least 2000 charge/discharge cycles.

Do the batteries require special care?

Store in a cool dry place out of sunlight and extreme temperatures, and air-dry before storage.

Recharge soon after each outing for longest life. Charge until the charger light turns green, and disconnect batteries from chargers within 24 hours to save energy.

Are the batteries dangerous?

All high power batteries are dangerous to persons, property and to the environment if improperly discarded. Recycle responsibly. We offer free recycling of our batteries to our customers who request in advance.

Is there a danger to the magnetic key?

Generally no, but if you have an implanted device for your heart, consult your doctor before using.

FIND THE SIZE TO FIT YOUR BOAT

How do I know what length shaft to buy?

The Standard/Short shaft size fits the majority of boats. Measure from the waterline to your transom top. If it is between 13 and 17 inches, use the Standard/Short shaft model. If it is more than 17 inches (up to 22 inches), select the Long shaft model. If it is under 13 inches a special Mini version can be custom ordered. If transom height is over 22 inches, your boat is significantly large and likely needs a more powerful motor or a mounting kit. Call Customer Service for further help.

Can I use a tiller extension with the *EP Carry*?

No, but the tiller arm is very long – 22 inches from the transom or mounting plate. If you cannot reach the long tiller arm from your seated position, then your boat might not be safely operated

with this model. For safety you should always be able to reach the propeller to clear it in case you become entangled by submerged lines. Use a side mount for your motor if necessary to keep within safe reach.

CONTROLS

How do the controls work?

The throttle control is at the end of the tiller handle. The knob has an easy control dial. The Safety Key sits inside the throttle dial for quick power-down situations. The Safety Interlock System requires turning the throttle dial to off for **3 seconds** after the key is removed and plugged back in. The Safety Key may be attached to a lanyard on your PFD.

Will the propeller go on without warning?

Pull out the Safety Key to stop the propeller from turning. Until the Safety Key is replaced, the prop will not be powered. The Safety Interlock System requires turning the throttle dial to off for 3 seconds after the key is removed and plugged back in.

Is the propeller weedless?

The prop will cut through lighter vegetation. If you collect some tougher weeds, stop your motor, pull the arm to tilt it up, and then start it again for a moment. If the vegetation is still there, repeat using the reverse gear. If vegetation still clings, remove the Safety Key, pull on tiller handle to tilt up, and clear manually without leaning overboard.

What if the propeller gets caught in fishing line?

Remove the Safety Key, then tilt the motor up and detangle by hand. Remove prop if necessary to detangle.

Is the propeller weak or flimsy?

No. It is made of glass-filled nylon and is remarkably resilient and strong. However, if you routinely run the prop against shells or rocks, it will wear out the tips faster and lose efficiency.

Is the propeller dangerous?

Like all propellers it must be handled with care. Use the Safety Key to quickly turn off power and avoid accidental strikes.

Is there a reverse gear?

Yes. Turn the throttle dial to the left for reverse.

Will the EP Carry withstand groundings?

Yes, it is very robust, though very lightweight. The hard skeg protects the prop and kicks up if you hit an obstruction. However, the prop tips will wear out faster with repeated groundings and reduce your distance/range.

What if my boat turns over with the motor running?

Once you're upright and bailed, reset your throttle and continue use. The motor is waterproof, as is the buoyant battery. After full immersion, rinse unit with fresh water after your journey.

Does the *EP Carry* make my boat a powerboat?

In many areas, motors this small are not regulated on boats under 16 ft. but they are in some waters and locations. Check your local regulations. In Washington state, registration is not required for use on boats 16 feet and under in inland/non-Federally-regulated, navigable waters, or if they are tenders to larger, registered boats in any waters.

Is the *EP Carry* silent?

No. While it is dramatically quieter than a gasoline motor, it is not completely silent. You can expect to hear the natural sounds and conversations around you but it still makes a hum. When you first set up your motor system, you will want to adjust clamp tightness and location to minimize vibration sounds. A thin rubber pad under the clamp could also minimize noise.

How do I mount the *EP Carry* to my boat?

The motor easily clamps onto the transom of your boat, and is hand-tightened. Boats without transoms require a mounting device.

Can I screw the motor directly to the side of my boat?

No. The tilt mechanism must allow the motor to tilt up to the rear.

Warranty, Service and Customer Support

For problems with any *EP Carry* product components, call Customer Service at 425-502-5232. You will need pre-authorization to arrange for return and repair at our factory. There are no authorized service facilities other than the factory in Washington State. In some cases your warranty could be voided if unauthorized repairs are made.

PropEle Electric Boat Motors, Inc. guarantees the original purchaser that the product is free from material and manufacturing faults for 2 years from the date of purchase. Your product registration was automatic when you purchased your unit. If the motor is sold to another person, contact us to transfer warranty to new owner. This obligation does not cover the incidental costs of a warranty claim or any other financial losses (e.g. costs for towing, telecommunication, food, accommodation, loss of earnings, etc.).

Products that are used commercially or by public authorities are excluded from this two-year warranty. In these cases, the statutory warranty applies.

PropEle will determine whether faulty parts may be repaired or replaced. At this time, there are no authorized dealers or repair facilities other than at our U.S. factory. Unauthorized repairs can void your warranty. No other entity has the authority to make legally binding statements on behalf of PropEle Electric Boat Motors, Inc.

Normal wear and tear is excluded from the warranty. PropEle is entitled to refuse a warranty claim if:

- the product has been used improperly; for example, if the operating and care instructions in the manual were not followed, or
- the product was altered or modified, or parts and accessories were added that are not expressly permitted or recommended by PropEle.

Before returning anything, you must request a return authorization from PropEle Electric Boat Motors Inc. You can contact us by phone, email or mail:

Telephone: 425-502-5232

Email: info@electricpaddle.com

10404 428th Ave SE, North Bend, WA 98045

Battery Disposal and Recycling

Lithium batteries contain hazardous materials and pose hazards for the environment and ground water if discarded in the trash. They should be recycled at the end of usable life. PropEle will accept returns of *EP Carry* materials for proper recycling if you request a recycling authorization in advance. Otherwise, please recycle locally and responsibly.

PropEle Electric Boat Motors, Inc.

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Protected by U.S. Patents No. 8,597,066; 8,747,171; 9,004,964 and other patents pending.

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HIGH CAPACITY K2B24V10EB ENERGY BATTERY DATA



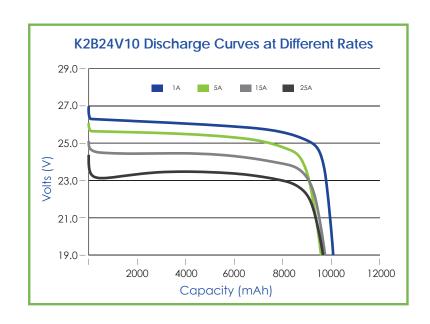
UNDOT 38.3 Tested | RoHS Compliant UL 2054 Certified | IEC 62133 Certified

SPECIFICATIONS		
Nominal Capacity @ C/5 (Ah)		9.6
Average Operating Voltage@ C/5	(V) 2	25.6
Weight (kg/lbs)	2.5 /	5.51
Height (mm/in)	65.0 / 6	5.57
Width (mm/in)	89.5 / 3	.52
Length (mm/in)	115 / 4	.53

RECOMMENDED OPERATING CONDITIONS		
Continuous Discharge (A)	≤ 9.6	
Pulse Discharge (A) 30 Seconds	25	
Charge Current (A)	≤ 4.8	
Charge Voltage Cutoff (V)	29.2	
Discharge Voltage Cutoff (V)	20.0	
High Operating Temp (°C)	60	
Low Operating Temp (°C)	-20	

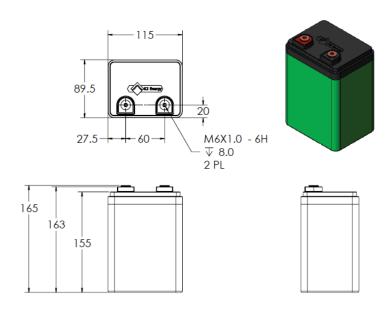
MAXIMUM OPERATING CONDITIONS	
Continuous Discharge (A)	≤ 24
Pulse Discharge (A) ≤2 seconds	40
Charge Current (A)	≤ 9.6
Charge Voltage Cutoff (V)	32.8
Discharge Voltage Cutoff (V)	16.0
Max Modules in Series	1

Performance may vary depending on application. All specifications and operation conditions are subject to change without notice. This data is for evaluation purposes only. No guarantee is intended or implied by this data. MDS. P0008 REV- A



K2B24V10 Constant Current Time Profile @ 25°C				
C/20 (0.48 A)	C/2 (4.8 A)	1C (9.6 A)	2C (19.2 A)	2.6C (25 A)
20 hrs	2 hrs	60 min	29 min	24 min
ADVANCED FEATURES				
Short Circuit Protection	High Voltage Cut Off	Low Votage Cut Off	Cell Balancing	Compatible with most 24V Lead Acid Chargers

DIMENSIONS:





K2 LITHIUM K 2 C 2 4 V 2 A SMART CHARGER



DESCRIPTION AC Input Voltage AC 50 / 60 Hz 100-240V Input Current 1.8A Output Voltage DC 29.2V **Output Load** 2.0A

CHARACTERISTICS

Operating Conditions		
Operating Tem	perature	0° - 40° C
Storage Tempe	erature	-20° - 60°C
Operating Hum	nidity	10% -90% RH
Storage Humid	ity	5% -90% RH
Caution	Indoor use on	y K2 batteries only
Dimensions	5.5	i1 in X 2.44in X 1.40 in
Terminal End		SAE
SAE Adaptors	XLR 2 Pin SAE plug	Alligator Clips Faston
Safety Rating	UL, CE, FCC, PA	AE, SAA, GS, RoHS



Superior Charge

Fully automatic charger for 24V battery systems - Quick charge capabile



K2 Lithium Compatible

Supports mulitple K2 battery packs: K2 Lithium 24V Batteries



Safety Management

Short circuit management - Overcharge prevention with LED indicators



Light Weight

Light weight and compact design for portiblity and



Life Extension

Automatic charge and shut off extends battery life and performance

Performance may vary depending on application environmental conditions All specifications and operation conditions are subject to change without notice. Failure to use the product according to the specifications and operating conditions could result in property damage or injury to users and seller disclaims all liability relative to such use. This information is for evaluation purposes only. No warrantees or guarantees are intended or implied by this data. Purchase of this product is subject to the company's standard terms and conditions. ©Copyright 2011 K2 Energy Solutions, Inc

K2 SAE Terminals (Custom terminals available)







