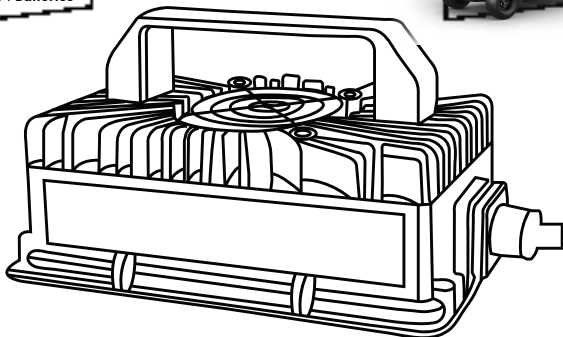


parts world ^{USA}

SMART CHARGER

For Lithium Ion/LiFePO₄ Batteries



VOLT
Revive

LithiumLogic

parts world ^{USA}

Customer Support

If you encounter any issues or need further assistance, please contact Parts World USA:

✉ support@partsworldusa.com
www.partsworldusa.com

Product Description

The **Parts World USA** Smart Lithium Battery Charger is an intelligent, waterproof charger engineered for **24V lithium battery systems** used across a wide range of applications, including golf carts, electric tour buses, utility/maintenance carts, forklifts and pallet trucks (light-duty), floor scrubbers and sweepers, scissor lifts/aerial work platforms, industrial tuggers, AGV/robotics platforms, and other 24V equipment battery packs.

Built with **MCU intelligent control + PWM** and advanced power architecture (**Active PFC + LLC**), it delivers high charging efficiency with stable, reliable, and safe performance for long service life.

Housed in a rugged **sealed aluminum die-cast enclosure** with a **glue-filled, weather-resistant design**, the charger is built for real-world use with a default protection level of **IP67**, providing strong resistance to water, dust, and vibration.

Enhanced Features

LithiumLogic

LithiumLogic profiles your battery in real time using temperature compensation and live charge behavior. It automatically adapts each charging stage to deliver the safest, fastest, and most battery-preserving charge.

VoltRevive

If the battery is seriously over-discharged (e.g. if it is only supplying 8V), our VoltRevive™ repairing kicks in with small currents to slowly repair the battery. This can revive dead batteries and make old batteries feel like new ones!

Temperature Compensated Charging

By automatically adjusting the voltage and current based on our temperature sensors, our temperature-compensated charging technology ensures that your battery charges faster, lasts longer, and stays healthier in any climate, hot or cold!

Set-and-Forget Protection

Equipped with intelligent automatic shutoff and overcharge prevention, this charger allows you to safely leave it connected without constant monitoring for up to 7 days.

Note: We do not recommend leaving the charger plugged in for over 7 days.

Advanced Microcontroller Chip Design

The charger utilizes advanced switching power supply technology, incorporating a high-frequency transformer, temperature sensors and an advanced topology with PFC + LLC circuits to support convenient & safe charging of your battery.

Smart Battery Maintenance for Longevity

Our advanced charging algorithms provide smart maintenance to reduce battery wear and enhance longevity, keeping your batteries in peak condition for years.

Rugged Lightweight Aluminium Shell

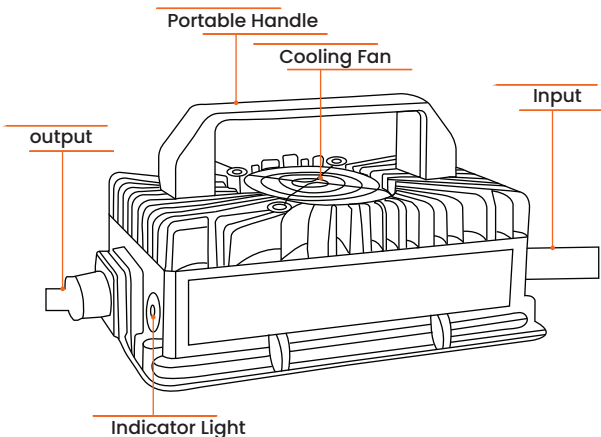
Made from heavy-duty, high-grade aluminum, this shell ensures superior heat dissipation, rust resistance, and corrosion protection. Built for rugged use, it offers long-lasting durability in tough environments.

Active Cooling with Fan

Ideal for long charging cycles and hot environments, our built-in fan prevents overheating, enhances efficiency, extends the lifespan of internal components, and ensures safe operation.

Technical Specifications

Specification	10A	15A	20A	30A	40A
Maximum Power Output	450 W	450 W	800 W	1000 W	1500 W
Input Voltage	90 ~ 300 VAC	90 ~ 300 VAC	90 ~ 300 VAC	90 ~ 300 VAC	90 ~ 300 VAC
Nominal Output Voltage	24V				
Maximum Output Voltage	29.2V				
Maximum Output Current	10A	15A	20A	30A	40A
Nominal Power Efficiency	>90%				
Size	7.3x4.2x4.3 inches	7.3x4.2x4.3 inches	7.3x4.2x4.3 inches	8.6 X 5.3X 4.4 inches	11.1x4.8x2.8 inches
Cooling	Convention Cooling with Fans				
IP Rating	IP67				
VoltRevive™	All our chargers come with our unique VoltRevive™ technology to revive your dead or deeply discharged batteries and keep them going!				
LithiumLogic™	Adaptive intelligence that profiles your battery in real time. Using temperature response and live charge behavior, our chargers deliver safer, faster, and more consistent lithium charging.				
Operating Ambient Temperature	14°F to 113°F				
Storage Temperature	-40°F to 158°F				
Operating Humidity	5~95%				
Cable Length	8.5 ft	8.5 ft	11.5 ft	11.5 ft	11.5 ft
Temperature Sensor	Internal				
Weight	4.4 lbs	4.4 lbs	5.7 lbs	5.7 lbs	6.6 lbs
Compatible with	24V Lithium Ion & LiFePO4 Batteries				



Operational Manual

Before Use

- ⚡ Ensure that the charger output voltage and battery system voltage match (this charger's specs are outlined on the sticker on the charger).
- ⚡ Ensure you are charging a lithium battery pack with a working BMS. If the BMS is asleep or protection is active, the charger may need time to detect/activate charging.
- ⚡ Inspect the charger cables for cuts, pinches, or loose ends. Do not use the charger if the cable, plug, or housing is damaged.
- ⚡ Ensure the charger plug and the battery or vehicle charge receptacles are clean, dry, and free of debris, and that there is no corrosion on the contacts.
- ⚡ Confirm the wall outlet is stable and compatible with the charger's wide-range AC input. Avoid using loose outlets or damaged extension cords.
- ⚡ To ensure optimal charging speed and safe operation, use the charger in a cool, well-ventilated area with clear airflow around the unit (do not cover the charger).

Connecting the Charger to Batteries or Vehicles

- ⚡ **Step 1:** If the battery is connected to a vehicle or an appliance, make sure that the vehicle or appliance is off & will not interrupt charging in some manner. The vehicle should have the parking brake on.
- ⚡ **Step 2:** Access the battery compartment clearly and visually inspect terminals for corrosion, loose hardware, or damaged cables. If connecting to a vehicle, inspect the vehicle's charge receptacle. Make sure it is clean, dry, and not damaged.
- ⚡ **Step 3:** Check the Charger plug & ensure it is clean, dry & not damaged.
- ⚡ **Step 4:** Confirm polarity before connecting:

Red ring = Positive (+)

Black ring = Negative (-)

- ⚡ **Step 4:** Connect the M8 ring terminals/Alligator Clips/SB-50 Connector/M19 Connector/M25 Connector securely to the vehicle's charge receptacle or battery's main terminals. If using M8 rings, tighten firmly so the rings cannot rotate.
- ⚡ **Step 5:** Route cables so they don't get pinched by battery covers, seat bases or any other part of the vehicle or appliance or battery installation.
- ⚡ **Step 6:** Plug the charger's AC input into the wall outlet to begin charging.
- ⚡ **Step 7:** The charger will enter standby/charging behavior and the LED will indicate the charging status (see "Monitor Charging" table below).
- ⚡ **Step 8:** Allow charging to continue uninterrupted. The charger uses fan cooling under full load and may adjust output automatically for protection.

Note: If polarity is reversed, lithium systems may not be protected in the same way as lead-acid. Always double-check +/- before powering the charger.

Using the Provided Adapters

- ⚡ **Step 1:** Inspect the Output Connectors and make sure the sealing surfaces/O-ring area is clean.
- ⚡ **Step 2:** Connect the charger output plug to the adapter cable
The SB-50 connectors require straight pressure & will lock via spring tensions.
For the Circular Connectors: Align the connectors properly and hand-tighten the locking collar until fully seated (do not cross-thread).

The connection with the adapter cables is complete when you cannot easily pull them apart & terminals are fully engaged.

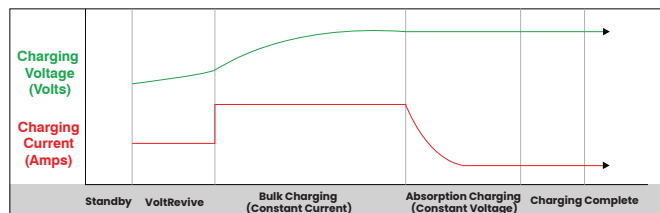
- ⚡ **Step 3:** Follow the steps outlined above to connect the charger to the battery or to the vehicle.

Monitor Charging

🔌 **The charger's indicator light will display the charging status:**

Color	Description	Battery Level
● ●	Alternating Red/ Green (Standby Mode)	Waiting / Battery Not Detected
●	Flashing Red	Battery Charge <80%
●	Flashing Yellow	Battery charge >80%
●	Solid Green	Battery Fully Charged (100%)
●	Slow Flash Red	VoltRevive™ Mode (Low Battery Recovery)

⚡ Charging Stages:



This graph illustrates the charging curve of our LiFePO4 / Lithium battery charger, highlighting the key stages of the charging cycle:

⚡ LithiumLogic (Adaptive Intelligence)

LithiumLogic automatically profiles your battery in real time—using temperature compensation and live charge behavior—to deliver the safest, fastest, and most life-preserving charge possible.

🔌 Standby (Battery Detect – Red/Green Flash)

At the start of the process, the charger powers on and checks for a valid connection and battery conditions. If the battery/BMS is not ready, the charger may remain in this waiting state until the battery is detected.

⚡ VoltRevive™ (Reparative Start – Red Flash)

If the lithium battery is deeply discharged (but still within a recoverable range), the charger begins with a gentle “wake-up” charge. It delivers a low current to safely raise the battery voltage into a stable charging range, preparing it for full-rate charging.

⚡ Bulk Charging (Constant Current – Red Flash)

Once the battery is ready, the charger enters the main fast-charge stage and supplies a steady high current. During this stage, energy transfer is rapid and efficient while the battery voltage steadily rises toward its target level.

⚡ Absorption Charging (Constant Voltage – Yellow Flash)

After the battery approaches full voltage, the charger switches to constant-voltage charging. Voltage remains stable while the current gradually tapers down, ensuring a complete charge without overstressing the lithium battery pack.

🔌 Charge Complete (Auto Shutoff – Green On)

When the battery reaches full charge, the status light turns solid green and the charger completes the cycle with automatic shutoff behavior. This lithium profile is designed to finish safely without a trickle/float stage.

Each stage of the process is carefully regulated to ensure safe, efficient, and complete charging while maintaining the longevity and performance of the battery.

Advanced Safety Mechanisms

Every Parts World USA Lithium Battery Charger is engineered for reliable, safe charging of lithium battery systems, regardless of their end use case. Each unit is built with a quality-focused manufacturing process and verified through inspection and functional testing, giving you peace of mind that your charger is dependable and built for long service life. The Parts World USA lithium charger is equipped with the following advanced safety mechanisms:

- ⚡ **CE Compliant:** Our chargers are CE compliant, meeting the highest standards of safety and performance.
- ⚡ **FCC Certified:** Enjoy peace of mind knowing you're using a dependable product certified by the FCC specifically for your safety and satisfaction.
- ⚡ **Over-Current Protection:** Prevents excessive current flow, protecting the charger and connected battery.
- ⚡ **Over-Voltage Protection:** Ensures the battery is not exposed to voltages beyond its rated capacity, with automated shutoff during unsafe conditions.
- ⚡ **Short-Circuit Protection:** Immediately disconnects power in the event of a short circuit, ensuring safety for devices and users.
- ⚡ **Fan Failure Fail-Safe:** Monitors the cooling fan's operation and reduces power output or shuts down the charger in case of fan malfunction, preventing overheating.
- ⚡ **IP67 Waterproof Enclosure:** Offers exceptional resistance to water ingress, ensuring reliable performance in wet conditions.
- ⚡ **Shockproof and Quakeproof Design:** Enhances durability and stability, making the charger suitable for rugged and high-vibration environments.

⚡ Thermally Adaptive Design

Our Parts World USA Smart Lithium Battery Charger features a rugged aluminum die-cast shell designed to dissipate heat efficiently and protect internal components. To support stable charging across different environments, it uses fan cooling under full load and is engineered for long-term reliability in demanding vehicle applications.

To protect the charger and support safe lithium charging, the system includes over-temperature protection with thermal cutback. If internal temperature reaches the set protection level, the charger automatically reduces output and then recovers once conditions return to normal.

If the cooling fan fails, the charger is designed with adaptive operation— it automatically reduces its rating/output to help prevent overheating and keep operation stable.

- ⚡ **Temperature Sensors:** We integrate temperature sensors (thermistors) on the heatsink & near critical components to provide continuous monitoring.
- ⚡ **Thermal Shutdown Circuits:** These circuits automatically turn off or reduce the power to a device if it detects a temperature above a certain threshold, preventing thermal runaway.
- ⚡ **Heat Spreaders:** In addition to the heatsink, we use heat spreaders (which distribute heat more evenly across the surface) to improve cooling efficiency and prevent localized hotspots.
- ⚡ **Optimal Ventilation:** Our casing has an external fan, around which we have created an optimal design of fins to ensure that the fan's airflow is improved & unobstructed.

Whether you're maintaining your golf cart, starting a depleted lithium battery, or upgrading from an older charger, the Parts World USA Smart Lithium Battery Charger delivers efficient, reliable, and safety-focused performance for modern lithium battery systems.

Experience worry-free charging with advanced features and premium performance—get yours today!

- 🔧 **Clean:** Wipe with a soft, dry cloth. Do not use water, solvents, or sprays.
- 🔧 **Inspect before each use:** Check AC cord, output cable, and connectors for cuts, heat damage, loose pins, or corrosion.
- 🔧 **Keep connections dry:** Ensure the charge receptacle/terminals are clean and fully seated for stable charging.
- 🔧 **Cooling airflow:** Keep the fan/fins clear. Do not cover the charger during operation; maintain open airflow.
- 🔧 **Handling:** Disconnect by holding the plug/connector body—do not pull the cable.
- 🔧 **Service:** Do not open or modify the charger.

⚡ Storage

- 🔧 Store in a **cool, dry, indoor** location (preferably in the original box).
- 🔧 Keep at least **8 inches off the floor and 20 inches** away from walls/heat sources/vents; avoid direct sunlight.
- 🔧 Storage limits: **-4°F to +122°F** (normal), humidity **5–95%**.
- 🔧 Long storage: power ON **once every 3 months for ≥ 0.5 hours**.
- 🔧 Keep away from **corrosives, flammables, shock/vibration**, and **strong** magnetic fields.
- 🔧 Coil cables loosely; avoid tight bends at strain relief/connector.

⚡ Safety Warnings

Before using your Parts World USA Lithium Battery Charger, please read the following safety precautions:

- 🔧 Always operate the charger in a well-ventilated area with clear airflow around the unit and fan.
 - 🔧 Use this charger only with the correct battery system voltage and lithium chemistry it is designed for.
 - 🔧 This charger is intended for lithium packs with a working BMS. If the BMS is in protection/sleep mode, charging may not start immediately.
 - 🔧 Keep the charger away from direct sunlight, heat sources, and sealed/airtight compartments while charging.
 - 🔧 Never cover the aluminum casing or block the fan/vents. Maintain at least 15 cm (6 in.) clearance above the fan.
 - 🔧 Do not charge if the AC cord, plug, output cable, or connectors are damaged, loose, melted, or corroded.
 - 🔧 There is a risk of electrical shock. Never touch uninsulated parts of the AC/DC connectors or exposed battery terminals.
 - 🔧 For M8 ring terminals / M25 adapter, ensure correct polarity: Red = Positive (+) and Black = Negative (-). Incorrect polarity or a short circuit can cause faults and damage.
 - 🔧 Keep the AC plug and wall outlet dry. Do not use the charger if water has entered the AC connection area.
 - 🔧 Do not attempt to disassemble, modify, or service the charger. There are no user-serviceable parts inside.
- ⚠️ **Danger:** Never alter the AC cord or force the plug if it does not fit your outlet. Improper connections can lead to electric shock.
 - ⚠️ **Danger:** Do not attempt to repair or service the charger yourself. Opening the charger may expose you to high voltages and other hazards.
 - ⚠️ **Danger:** Never splice the AC power cord.
 - ⚠️ **Danger:** Damaged cords or plugs pose a risk of electric shock or electrocution.
 - ⚠️ **Caution:** When using an extension cord, use a grounded 3-wire cord rated for the load. Keep the AC connection as far from the battery compartment as possible.
 - ⚠️ **Caution:** Although the charger can operate in high temperatures, ensure proper ventilation and cooling to maintain safe, efficient operation.

Quick Troubleshooting

LED Status / Pattern	What It Means	What To Do
No LED	No power / LED not working	Try another outlet • Re-seat AC plug • If still no LED, service/replace
●● Alternating (Red & Green)	Battery not detected / standby	Re-insert plug fully • Inspect charge port for damage • Older vehicles/carts may need OBC bypass
Tri-color cycle (Red x2, Yellow x2, Green ON, repeat)	Charger starting/ stopping repeatedly	Commonly OBC cycling • Use OBC bypass • Battery may be aged/damaged
● 1 flash, pause	Output over-voltage protection	Verify correct charger voltage for battery system
● 2 flashes, pause	Output over-current protection	Unplug, wait, retry once • If repeats, service/replace
● 3 flashes, pause	Output under-voltage / reverse polarity / shor	Unplug immediately • Check polarity/shorts • Battery may be too low/damaged
● 4 flashes, pause	Over-temperature protection	Move to open area • Keep ≥15 cm clearance • Clear fan blockage

Troubleshooting and FAQs

Q1. Charger will not power on (no lights).

Verify the outlet works; fully re-seat the AC plug and inspect the cord for damage.

If no power remains, discontinue use and contact support.

Q2. Powers on but will not charge / stays in Standby (●●).

Ensure the output connector is fully seated and check the cart receptacle/terminals for corrosion, heat damage, looseness, or deformation.

Older carts with an OBC system may require an OBC bypass.

Q3. Stuck in VoltRevive™ Mode (● slow flash).

VoltRevive™ is a low-voltage recovery mode; allow time for pack voltage to rise into the normal range.

Extremely low batteries or hard-locked BMS conditions may prevent charging and require service.

Q4. Charging is very slow or stalls above 80% (● flash).

The constant-voltage top-off stage can take longer depending on the battery and BMS; keep the charger connected and avoid power cycling.

Ensure connectors are tight and not overheating; if charging never completes, inspect the battery/BMS.

Q5. Charger feels hot or shows over-temperature behavior.

Warm housing is normal during high-power charging; ensure open airflow with at least 15 cm (6 in.) clearance and no obstructions.

If overheating persists in a cool, shaded area, stop use and contact support.

Q6. Fully charged (● solid) but runtime is low.

Lithium battery meters may be inaccurate; check battery health and BMS condition if low runtime persists.

Aged or damaged batteries may not retain full capacity even after a complete charge.

Q7. Can the charger “wake up” lithium batteries?

Supports low-voltage recovery if the pack still has minimum detectable voltage.

Severely depleted packs or hard-protected BMS states may require inspection or service.