



Modular High Frequency Battery Chargers

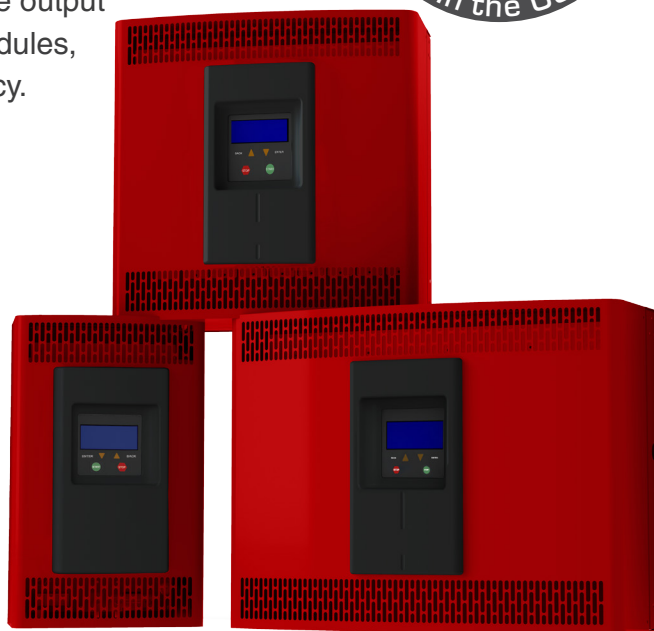
CONVENTIONAL, OPPORTUNITY & FAST MODULAR CHARGERS

Innovative modular architecture with long term savings

The REVOLUTION Series is an innovative line of high frequency battery chargers that incorporates cutting edge modular power design that delivers peak efficiency greater than 93% and efficiencies greater than 90% throughout the entire charge cycle. As the charge cycle progresses and the output current tapers down, the charger will turn off unneeded modules, allowing the remaining modules to operate at peak efficiency.

- + Modular architecture that is scalable and reliable
- + Multi-voltage 1.3kW power modules, that can be combined to produce over 30kW output
- + "Plug and Play" utility makes expansion easy and inexpensive
- + Can be programmed for conventional, opportunity or fast applications
- + Single cable outputs for up to 450 amps
- + No Downtime! Charger remains operational if a power module fails

The REVOLUTION Series is a combination of cutting edge charging and energy management technologies, with a smaller footprint, lower acquisition costs, easy maintenance, and flexible configurations, which makes updating your fleet of electric lift trucks a more attractive investment than ever before. Free your operation from spare batteries, daily battery changes, battery storage areas, and energy inefficient charging!

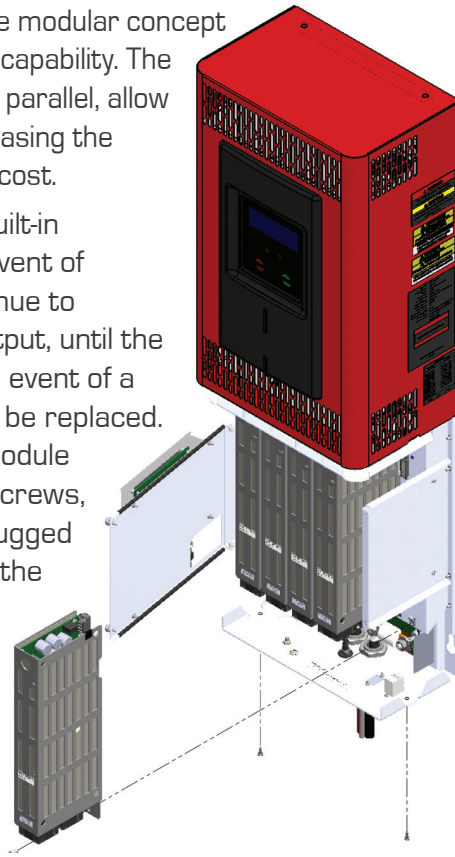


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Variable Configuration Architecture

The REVOLUTION series of chargers are modular concept chargers offering multiple configuration capability. The independent power modules, installed in parallel, allow the user to add individual modules, increasing the charger's output for a minimal upgrade cost.

The parallel module design provides built-in redundancy that ensures that in the event of a module failure the charger will continue to operate, at a slightly lower current output, until the problematic module is replaced. In the event of a module failure, the module can quickly be replaced. The charger display will indicate the module failure and with the removal of a few screws, the faulted module can simply be unplugged and a new module plugged in, replace the door, re-energize the charger, and it is back to work. The unique modular architecture provides unmatched value, as diagnosis and repair of an REVOLUTION is the simplest and fastest of any charger in service today.



Unmatched energy savings

- + Highest charging efficiency throughout the entire charge cycle
- + Lowest energy costs related to battery charging
- + Latest generation MOSFET power conversion technology
- + CEC Compliant

Cost effective with long term savings

- + Charger can be programmed for lead acid and lithium batteries
- + Eliminates the need to replace chargers as your lift truck/battery fleet changes in the future
- + PowerCharge.Net monitoring system option allows you to collect and analyze fleet utilization information from a single location, optimizing your cost savings

The REVOLUTION charger, when combined with the PowerTrac data logger, has the ability to be multi-voltage (24/36/48), allowing the charger to automatically recognize and charge a wide range of batteries and amp hour capacities. Plus, it provides detailed fleet management information.

REVOLUTION Charger Specifications

| Model | Module Size | Output Voltage | 4kW | 5kW | 6kW | 8kW | 9kW | 10kW | 12kW | 13kW | 14kW | 15kW | 18kW | 21kW | 23kW | 26kW | 29kW | 31kW | |
|------------------------|-------------|----------------|--|---------|----------|----------|----------|---------|---------|---------|---------|---------|---------|-----------------------|-----------------------|-----------------------|-----------------------|---------|---------|
| Maximum Current Output | 5X | 36 24V/36V | 90 | 120 | 150 | | | | | | | | | | | | | | |
| | | 48 24V/36V/48V | 75/67 | 100/90 | 125/112 | | | | | | | | | | | | | | |
| | 8X | 36 24V/36V | | | 150 | 180 | 210 | 240 | | | | | | | | | | | |
| | | 48 24V/36V/48V | | | 125/112 | 150/135 | 170/157 | 200/180 | | | | | | | | | | | |
| | 12X | 36 24V/36V | | | | | | 240 | 270 | 300 | 330 | 350 | | | | | | | |
| | | 48 24V/36V/48V | | | | | | 200/180 | 225/202 | 250/225 | 275/247 | 300/270 | | | | | | | |
| | 16X | 36 24V/36V | | | | | | | | | | | 360 | 420 ^{SC} | 480 | | | | |
| | | 48 24V/36V/48V | | | | | | | | | | | 300/270 | 350/315 ^{SC} | 400/360 ^{SC} | | | | |
| | 24X | 36 24V/36V | | | | | | | | | | | | | | 540 | 600 | 660 | 700 |
| | | 48 24V/36V/48V | | | | | | | | | | | | | | 450/405 ^{SC} | 500/450 ^{SC} | 550/495 | 600/540 |
| Number of Modules | | | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | |
| Charger kW Rating | | | 3.9 | 5.2 | 6.5 | 7.8 | 9.1 | 10.4 | 11.7 | 13.0 | 14.3 | 15.6 | 18.2 | 20.8 | 23.4 | 26.0 | 28.6 | 31.2 | |
| Input Current Draw | | | 5.5 | 7.4 | 9.2 | 11.1 | 12.9 | 14.8 | 16.6 | 18.5 | 20.3 | 22.2 | 25.9 | 29.6 | 33.3 | 37.0 | 40.7 | 44.4 | |
| AC Breaker | | | 5X: 15A | 8X: 20A | 12X: 30A | 16X: 40A | 24X: 60A | | | | | | | | | | | | |
| Max. Input Current | | | 5X: 10A | 8X: 15A | 12X: 22A | 16X: 30A | 24X: 44A | | | | | | | | | | | | |
| Input Voltage | | | 480VAC, 3-phase ± 10% | | | | | | | | | | | | | | | | |
| Efficiency | | | Total charge cycle efficiency > 90% | | | | | | | | | | | | | | | | |
| | | | Peak charging efficiency > 93% | | | | | | | | | | | | | | | | |
| User Interface | | | LCD/Keypad, Ethernet (optional) | | | | | | | | | | | | | | | | |
| Cooling | | | Forced air (fans) | | | | | | | | | | | | | | | | |
| Dimensions (WxDxH) | | | 5X: 12.5" x 8.5" x 20.25" 8X: 18.5" x 9.5" x 21" 12X: 26.5" x 9.5" x 21" 16X: 22" x 10" x 48" 24X: 30" x 10" x 48" | | | | | | | | | | | | | | | | |
| Weight | | | 5X: ≤ 56 lbs 8X: ≤ 81 lbs 12X: ≤ 120 lbs 16X: ≤ 210 lbs 24X: ≤ 300 lbs | | | | | | | | | | | | | | | | |
| Certifications | | | UL and cUL listed; CEC Compliant | | | | | | | | | | | | | | | | |

Conventional charge rate based on 17% start rate
Opportunity charge rate based on 25% start rate
Fast charge rate based on 40% start rate

48V chargers are capable of charging 24/36/48 batteries
36V chargers are capable of charging 24/36 batteries

^{SC}Single cable versions available please contact
Power Designers for more details

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