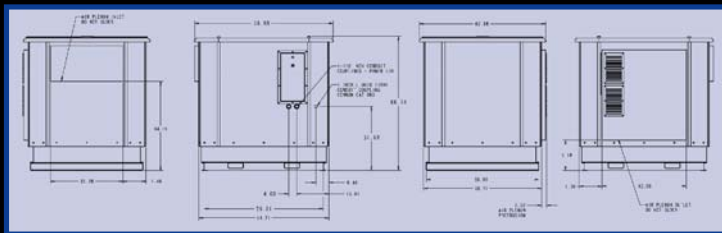


**Zinc-Flow® 45****24V****-48V****125V**

Part Number	ZF45V24	ZF45V48	ZF45V125
<b>Electrical</b>			
Rated Output	0 to 30,000 W	0 to 30,000 W	0 to 30,000 W
Voltage (Nominal)	24 VDC	-48 VDC	125 VDC
Voltage Range	21 to 27 VDC	-42 to -54 VDC	109 to 140 VDC
Input Current	440 Amps	220 Amps	85 Amps
Output Current	1,250 Amps	625 Amps	240 Amps
Energy Storage	1,875 Amp-hour, scalable	938 Amp-hour, scalable	360 Amp-hour, scalable
Peak Efficiency	73%	73%	73%
System User Alarms	Over 300 selectable operating points and alarms	Over 300 selectable operating points and alarms	Over 300 selectable operating points and alarms
Web Management	IP Addressable Interface (Standard)	IP Addressable Interface (Standard)	IP Addressable Interface (Standard)
Interface	10Base-T / Ethernet (Standard), C-form contact closures (Standard) or High-speed wireless broadband (Optional)	10Base-T / Ethernet (Standard), C-form contact closures (Standard) or High-speed wireless broadband (Optional)	10Base-T / Ethernet (Standard), C-form contact closures (Standard) or High-speed wireless broadband (Optional)
<b>Environmental</b>			
Temperature	-5C to +40C Starting -25C to +60C Operating -25C to +40C Storage	-5C to +40C Starting -25C to +60C Operating -25C to +40C Storage	-5C to +40C Starting -25C to +60C Operating -25C to +40C Storage
Humidity	0% to 100% RH, condensing, operating or storage	0% to 100% RH, condensing, operating or storage	0% to 100% RH, condensing, operating or storage
Cooling	Integrated liquid-air heat exchanger (standard) and (optional) integrated chiller system	Integrated liquid-air heat exchanger (standard) and (optional) integrated chiller system	Integrated liquid-air heat exchanger (standard) and (optional) integrated chiller system
<b>Physical</b>			
Dimensions	66.7" H x 68.9" W x 62.9" D (169.5 cm H x 175 cm W x 159.7 cm D)	66.7" H x 68.9" W x 62.9" D (169.5 cm H x 175 cm W x 159.7 cm D)	66.7" H x 68.9" W x 62.9" D (169.5 cm H x 175 cm W x 159.7 cm D)
Weight	5,325 lbs (1622 kg)	5,325 lbs (1622 kg)	5,325 lbs (1622 kg)
<b>Warranty, Safety &amp; Conformance</b>			
Industry Approvals	UL 1778, FCC Part 15 Class A, NFPA 1 & 70, GR-63 (pending), GR-1089 (pending), GR-487 (pending)	UL 1778, FCC Part 15 Class A, NFPA 1 & 70, GR-63 (pending), GR-1089 (pending), GR-487 (pending)	UL 1778, FCC Part 15 Class A, NFPA 1 & 70, GR-63 (pending), GR-1089 (pending), GR-487 (pending)
Standard Warranty	1 Year Parts & Labor	1 Year Parts & Labor	1 Year Parts & Labor



**Premium Power**

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*Energizing the Present, Protecting the Future*



**Premium Power**

# Zinc-Flow® 45

*Regenerative fuel cell with DC output power, for uninterrupted operation of mission-critical site infrastructure*



**Regenerative, Reliable, Renewable**

# Zinc-Flow® 45

Regenerative energy storage to ensure the continuous operation of communications network infrastructure and electric utility substations



## Special Features

- Patented **Zinc-Flow®** regenerative fuel cell technology
- Reliable, instantaneous response to all power events
- 45 kWh energy storage capacity
- Energy ratings:  
1,875 Amp-hour @ 24 VDC  
938 Amp-hour @ -48 VDC  
360 Amp-hour @ 125 VDC
- Meets wide range of power requirements up to 30 kW
- 100% deep discharge without degradation
- Unlimited charge-discharge cycling
- Rapid recovery time
- Scalable and modular
- Small footprint
- Meets latest industry standards

The **Zinc-Flow® 45** regenerative fuel cell is a modular, redundant, scalable DC power solution for wireless, fiber and broadband communications networks as well as electric utility substations. Premium Power's patented **Zinc-Flow® 45** regenerative fuel cell technology provides high-density energy storage in a footprint roughly half the size of comparable solutions based on lead-acid batteries. Unlike PEM (Hydrogen) fuel cells, **Zinc-Flow® 45** is simple to operate, low cost to maintain, and requires no fuel. The **Zinc-Flow® 45** is designed to meet a full range of requirements, delivering high reliability and long runtime at a substantial cost savings.

## Simple To Install & Maintain

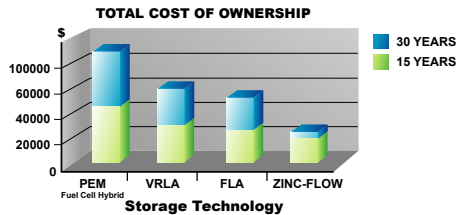
- Outdoor or indoor placement
- Can operate in harsh weather environments
- Installation in less than 4 hours
- Integrated Web management
- Works with utility or renewable power sources
- More than 30 years operable life
- Substantial installation /operation savings

## Environmentally Friendly

- 100% disposable or recyclable
- No explosives or toxic metals
- No on-site fuel storage or refueling issues
- Safe, quiet, simple operation

## DC Power Solutions That Are Dynamic, Not Static

The need to provide 100% uptime of your mission-critical site infrastructure has never been greater. Today the reliability and availability of the power that supplies your operations is counted on 24 x 7, 365 days a year. A single power outage can mean loss of service for tens of thousands of customers, and the corresponding result to your company's bottom line can be devastating. With service level expectations on the rise and your OPEX budget on the decline, will your DC power system be there when you need it most?



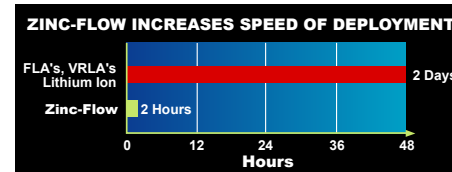
Source: Electric Power Research Institute, 2005 Handbook of Alternative Technologies for Substation Emergency Power

Legacy DC power systems typically employ lead-acid batteries to provide energy storage. Despite their widespread use and commercial acceptance, the challenges in effectively operating VRLA and FLA batteries are many.

Stationary lead-acid battery strings can be damaged during extended power outages, a result of deep cycling. Consequently, only 10-20% of their stored energy is available for discharge and even so, traditional batteries are limited to 200 cycles at best. In addition to restricted methods of use, the integrity and capacity of lead-acid batteries can be highly unpredictable. They are susceptible to overcharging and operating abuse. This necessitates regular labor-intensive maintenance, costly battery monitoring apparatus and the associated burden of high operating expenses. To complicate matters, the negative environmental impact associated with lead-acid batteries has increased the cost of disposal and recycling dramatically.

## High Performance Reliability in a Versatile, Scalable, Compact Design

The **Zinc-Flow® 45** is an adaptive, high-availability DC power system with advanced energy storage. Premium Power's environmentally friendly Zinc-Bromide regenerative fuel cell technology outperforms lead-acid batteries to ensure the continuous operation of mission-critical site infrastructure. Typical applications include electric utility transmission/ distribution substations, wireless cell and POP sites, wireline Central Offices, cable headends and hubs, and remote power applications.



With its rain-tight enclosure, the **Zinc-Flow® 45** can be placed outdoors (or indoors) and operates in a variety of harsh weather conditions where other fuel cells have been demonstrated to fail. Our turnkey design increases speed of deployment while reducing construction and operating costs.

**Zinc-Flow® 45** provides instantaneous voltage support that is operator programmable and has an energy density twice that of lead-acid batteries. It can discharge 100% of its stored energy over thousands and thousands of cycles. Compact, scalable, turnkey and easy to deploy, our systems deliver 30 years of operable life with minimal, simple maintenance.

Each **Zinc-Flow® 45** includes system management software that provides a Graphical User Interface for real-time display of power operations along with data graphing capability. Connectivity via high-speed wireless broadband or Ethernet/10Base-T network cabling provides remote monitoring, programmable alarm notifications and complete system control from any PC with Internet access.

## Premium Power - Company & Products

Premium Power Corporation was founded in 2002 and is recognized as a worldwide leader in the development and manufacturing of regenerative fuel cell power systems. Our products are used by many of the world's largest companies for a wide range of AC and DC power applications.

The **Zinc-Flow® 45** is available in +24V, -48V and +125VDC Input/Output voltages. The system is designed to charge off of your existing DC bus, using your existing rectifier/s, or can be outfitted with integrated rectification to accept single-phase AC input power. Just like a battery, the **Zinc-Flow® 45** provides instantaneous voltage response in the event of a utility power failure. It has the capability of supporting connected loads ranging from 1 to 30 kW.

The **Zinc-Flow® 45** easily performs short-duration, high current discharges which are typical during the operation of substation switchgear. At the same time, the system can deliver low-rate, long duration discharge for a variety of communications network and utility applications. This unique flexibility makes sizing, selection and deployment streamlined and cost effective.

## How to Order Zinc-Flow 45 Power Products

By combining our base model with available integrated system options, you can select the specific product that meets your exact needs.

Zinc-Flow Part Number	Capacity (kWh)	Nominal Input / Output Voltage (VDC)	OPTIONAL Integrated AC Input Rectifier/Charger (230VAC, 60Hz)	OPTIONAL Integrated Environmental Control Package
ZF	45	V24, V48, or V125	UPS	HW

Example Orderable Part Number: **ZF45V125UPS**

## Graphical User Interface

