Solar Power Systems

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Solar Power Systems - Railroad

Overview

Solar Power Systems provide a reliable and proven source of DC power by converting sunlight directly into electricity. Solar Power Systems are a good fit for railroad wayside applications because they're very economical, require very little maintenance and have no ongoing fueling requirements. Over the years we've designed and offered a variety of system configurations to meet virtually any of your budget and/or site requirements. We also offer comprehensive site survey services for optimum site design and performance.

- Highway Crossings
- Intermediate Signals
- Control Points
- Slide Fences
- PTC Upgrades
- AEI Readers
- Hot Box Detectors
- Switch Machines
- Track Circuits
- Telecom Systems
- Security & Surveillance
- Grid-Tie Systems

RP Series Retractable Mast

Introduced in 2001, following a 3 year development, the patent pending RP Series Retractable Mast system is the first and only mast system of it's kind to retract to ground level along the same axis. The RP Series Retractable Mast provides unparalleled convenience and dramatically improved safety to the installation, operation, troubleshooting and maintenance of pole mounted solar power systems.

How It Works?

The RP Series Retractable Mast features a movable exterior sleeve that travels up and down a fixed mast. This allows equipment (solar arrays) to be mounted to the pole structure at ground level. The equipment (solar arrays) can then be raised along the same axis manually (hand-crank) or via a power drill. In like fashion, periodic maintenance, troubleshooting and equipment replacement can be achieved by lowering the sleeve to ground level. The system remains fully operational, even in its lowered position.

RP Series Mast w/Wind Generator Adaptor (optional)

RP Series Retractable Mast

Versatile
Available in 20' and custom height configurations.

Heavy-Duty Construction
8" and 6" Schedule 40 aluminum masts with retractable sleeves.

Stainless Steel Hardware
Standard corrosion resistant hardware, tamper resistant (option).

Fail-Safe Fall Protection
Sleeve fall protection device (brake) actuates should lifting cable/chain break to prevent sleeve from falling down pole.

Corrosion Resistant Direct Drive Chain
Supports positive raising and lowering functionality.

Multiple Guide Bearings
Provide smooth, bind-free operation of the traveling sleeve.

Can be raised and lowered manually (hand-crank) or via a power drill

Full Length Alignment Track
Maintains equipment directional alignment from the lower to upper positions of the system.

Integrated Wiring Management
All wiring is self-contained within the pole in a helical coiled assembly eliminating wiring handling by personnel when raising and lowering the mast.

360° Rotation of Equipment
Welded rotational collars allow equipment to be rotated a full 360° for proper alignment without slippage down the pole.

Heavy Duty Dual Drive Gear Winch
Robust dual drive gear design gives personnel the choice of either a high gear or low gear to help facilitate faster and easier rasing and lowering capabilities.

System Footprint
Raises and lowers along the same axis as the foundation and thus it's footprint is identical when it's in the raised and lowered positions.

Fully Operational in All Positions
Raising and lowering along the same axis as the foundation enables the mast to be fully operational in both raised and lowered positions. In environments prone to high winds or hurricanes, the mast can be lowered to prevent damage, but all the while remain operational.

Optional Tilt-Down Wind Generator Adaptor
An optional tilt-down adaptor is available for mounting additional equipment (wind generator) to the mast system.

Made in the USA

Mounting Options

Fixed Pole

- 20’ Aluminum Mast
- Cost-effective solution for mounting single or multiple solar arrays to an aluminum fixed pole structure.
- Can be equipped with optional ladder (w/lockable guard) extending up the back of pole for periodic maintenance and troubleshooting.
- Good fit for wayside applications with limited space and/or applications with heavy tree coverage.

Ground / Ballasted Solar

- Flexible & scalable solar mounting option when and where space permits.
- Solar panels are easier to clean and maintain compared to other mount solutions.
- Good fit for wayside applications with very little trees or other obstructions (ex: desert).
- Sub-arrays are supplied pre-assembled & pre-wired for fast & easy installation onsite.
- Ballasted system can be a temporary or permanent solution for increased flexibility.

Balance of System Components

Our systems are configured for the specific geographical location and load demands of your rail application. In like fashion we can provide the balance of system components for a truly turnkey solution; eliminating the need to source components from multiple vendors.

- High-Quality Solar Panels (20+ Year Life Expectancy)
- MPPT Solar Charge Controllers
- Relay Drivers, Converters, Inverters
- Batteries (Lead Acid & Ni-Cd Available)
- Battery Boxes/Enclosures
- Hybrid Solutions Available (Wind Turbines, Fuel Cells, Stirling Engines, TEGs, Generators, etc.)

Batteries / Battery Boxes

SAFT SUN+ Ni-Cd Batteries™

Batteries play a vital role within your critical power system. Faced with complex charge/discharge cycling patterns imposed by the unpredictability of weather, the high cycling capabilities of SAFT's SUN+ Ni-Cd batteries provide reliable power for solar, even in remote locations and harsh environments. These batteries are purpose designed to provide the ideal energy storage for RES (renewable energy systems) such as PV (photovoltaic) and wind power applications. The SUN+ Ni-Cd offers a number of advantages beyond the limits of conventional batteries:

- Operation in extreme temperatures
- Long-life (20+ Years)
- Charge efficiency: performs at any charge
- Cycling - achieves 10,000 cycles at 15% depth of discharge
- Minimal maintenance

Our parent company - Arthur N. Ulrich Co. is the exclusive rail sales rep for SAFT Ni-Cd Batteres in the United States & Canada

Battery Boxes

Temperature extremes and unwanted exposure can place stress on critical battery systems. Our innovative battery boxes are designed to shield and protect battery systems located in harsh wayside environments.

- All-Welded Aluminum Construction (Steel also available)
- Fully Insulated Paneling
- Tamper Resistant Lockable Lid
- Dual 1" Pre-Fitted Wiring Conduit Access
- 4X Lifting Eyes for Easy Placement
- Hinged Lid & Gas-Shock Lift Assist

Available Sizes:

- Exterior Dimensions: 36"L x 48"W x 24"H
  Interior Dimensions: 32.75"L x 44.75"W x 21"H
- Exterior Dimensions: 54"L x 52"W x 24"H
  Interior Dimensions: 50.75"L x 48.75"W x 21"H
- Exterior Dimensions: 56"L x 56"W x 24"H
  Interior Dimensions: 52.75"L x 52.75"W x 21"H
- Exterior Dimensions: 68"L x 44"W x 24"H
  Interior Dimensions: 64.75"L x 40.75"W x 21"H
- Custom Sizes Available Upon Request

Our Capabilities

Site Survey Services

Not all sites are created equal. Even the most accurate load profile info and geo coordinates can sometimes not be enough to properly size certain sites. With that in mind we offer site survey services where we physically visit the location(s) and perform a variety of measurements and visual inspections.

- Shading & Obstruction Analysis
- Equipment Loading Measurement
- Power Draw Measurement
- Solar Radiation & Surface Meteorology Analysis

Design / Engineering Services

- Complete Software Sizing Reports
- Written Specifications
- CAD Drawings, Schematics, Layouts & One-Line Diagrams
- *Custom Design Services Available

Sourcing / Fabrication / Customization

- Material Procurement
- Pre-Wiring & Pre-Assembly
- System Component Integration
- Material & Workmanship Warranties
- Hybrid System Integration

Pre-Installation / Installation / Support

- System Cutover & Supervision Training
- Detailed I&O Manuals, Drawings & Packages
- Preventive Maintenance Recommendations
- Safety & Maintenance Training
- Replacement & Disposal Services
  (Ex: Battery Recycling)
- Dedicated Technical Support

Hybrid Systems

Micro-Wind Turbines

Wind Generators can provide supplemental power to Solar Power Systems during periods of inclement weather. We utilize the robust SuperWind® Wind Turbines (350W-1.2kW) which can operate under extreme conditions autonomously and automatically for improved reliability.

Solid Oxide Fuel Cells

Solid Oxide Fuel Cells can provide extended-run backup power to Solar Power Systems during periods of inclement weather and limited sunshine to improve overall reliability. Solid Oxide Fuel Cells (250W-1kW) are powered by propane or natural gas and require zero maintenance.

Free-Piston Stirling Engines

Stirling Engines can operate in conjunction with Solar Power Systems for applications with high power requirements and/or provide backup power for periods of inclement weather. Qnergy's PowerGen Stirling Engines are powered by propane or natural gas and can provide 1.2kW to 5.6kW of power.

Thermoelectric Generators (TEGs)

Thermoelectric Generators can increase the reliability of Solar Power Systems by covering peak loads and powering loads during periods of inclement weather. Gentherm TEGs are available from 21W-550W and are best suited for prime power - continuous-run applications.

About Us

RedHawk Energy Systems, LLC is a value-added manufacturing subsidiary of the Arthur N. Ulrich Company. Since the early 1980's, we've helped commercial and industrial customers tackle their critical prime and back-up power challenges with innovative solutions ranging from a few watts to several kilowatts.

- **Solar Power Systems**
- **Solid Oxide Fuel Cells**
- **Free-Piston Stirling Engines**
- **Micro-Wind Turbines**
- **Hybrid Power Systems**
- **Batteries**
- **Battery Boxes**
- **Battery Enclosures**
- **Custom Power Solutions**

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