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## Water Treatment Plant Solar Energy System

**Contract 3114-09-SDH**

**June 25, 2010**

# PROFESSIONAL SERVICES AGREEMENT

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Exhibit A- Sunsense, Inc. REVISED Proposal dated 6/24/10

1.9.1 The Contractor shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, age, handicap, or national origin except when such condition is a legitimate occupational qualification reasonably necessary for the normal operations of the Contractor. The Contractor agrees to post in conspicuous places, visible to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

1.9.2 The Contractor, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, shall state that such Contractor is an Equal Opportunity Employer.

1.9.3 Notices, advertisements, and solicitations placed in accordance with federal law, rule, or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.

**1.10 Ethics:** The Contractor shall not accept or offer gifts or anything of value to, nor enter into any business arrangement with any employee, official, or agent of the City.

**1.11 Failure to Deliver:** In the event of failure of the Contractor to deliver services in accordance with the contract terms and conditions, the City, after due oral or written notice, may procure the services from other sources and hold the Contractor responsible for any costs resulting in additional purchase and/or administrative services. This remedy shall be in addition to any other remedies that the City may have.

**1.12 Performance & Payment Bonds:** Contractor shall furnish a Performance and a Payment Bond, each in an amount at least equal to that specified for the contract amount as security for the faithful performance and payment of all Contractor's obligations under the Contract Documents. These bonds shall remain in effect for the duration of the Warranty Period (as specified in the Special Conditions). Contractor shall also furnish other bonds that may be required by the Special Conditions. All bonds shall be in the forms prescribed by the Contract Documents and be executed by such sureties as (1) are licensed to conduct business in the State of Colorado and (2) are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff, Bureau of Accounts, U.S. Treasury Department. All bonds signed by an agent must be accompanied by a certified copy of the Authority Act. If the surety on any bond furnished by the Contractor is declared bankrupt, or becomes insolvent, or its rights to do business in Colorado are terminated, or it ceases to meet the requirements of clauses (1) and (2) of this section, Contractor shall within five (5) days thereafter substitute another bond and surety, both of which shall be acceptable to the City.

1.12.1 Upon reaching the one year warranty period, the contractor may provide another form of financial obligation to the City in lieu of the performance bond that will provide a financial obligation for the remaining four years of this five year performance warranty. The financial obligation may be in the form of cash, bank letter of credit, or other method proposed by the contractor and approved by the City.

- 1.13 Failure to Enforce:** Failure by the City at any time to enforce the provisions of the contract shall not be construed as a waiver of any such provisions. Such failure to enforce shall not affect the validity of the contract or any part thereof or the right of the City to enforce any provision at any time in accordance with its terms.
- 1.14 Force Majeure:** The Contractor shall not be held responsible for failure to perform the duties and responsibilities imposed by the contract due to legal strikes, fires, riots, rebellions, and acts of God beyond the control of the Contractor, unless otherwise specified in the contract.
- 1.15 Indemnification:** The Contractor shall indemnify and save harmless the City and all its officers, employees, insurers and self-insurance pool, from and against all liability, suits, actions, or other claims of any character, name and description brought for or on account of any injuries or damages received or sustained by any person, persons, or property on account of any negligent act or fault of the Contractor, or of any Contractor's agent, employee, subcontractor or supplier in the execution of, or performance under, this contract. The Contractor shall pay any judgment with costs which may be obtained against the City growing out of such injury or damages.
- 1.16 Independent Contractor:** The Contractor shall be legally considered an independent Contractor and neither the Contractor nor its employees shall, under any circumstances, be considered servants or agents of the City. The City shall be at no time legally responsible for any negligence or other wrongdoing by the Contractor, its servants, or agents. The City shall not withhold from the contract payments to the Contractor for any federal or state unemployment taxes, federal or state income taxes, Social Security Tax or any other amounts for benefits to the Contractor. Further, the City shall not provide to the Contractor any insurance coverage or other benefits, including Workers' Compensation, normally provided by the City for its employees.
- 1.17 Ownership:** All plans, prints, designs, concepts, etc., shall become the property of the City upon receipt of all payments owed the Contractor under the terms of the agreement.
- 1.18 Patents/Copyrights:** The Contractor agrees to protect the City from any claims involving infringements of patents and copyrights. In no event shall the City be liable to the Contractor for any suit arising on the grounds of patent or copyright infringement. Patent and copyright infringements by the Contractor shall cause this contract to be/become null and void.
- 1.19 Remedies:** The Contractor and the City agree that both parties have all rights, duties, and remedies available as stated in the Uniform Commercial Code.
- 1.20 Venue:** This contract shall be deemed to have been made in and shall be construed and interpreted in accordance with the laws of the City of Grand Junction, Mesa County, Colorado. Venue for any action arising out of or under the performance or nonperformance hereof shall be in Mesa County District Court.

## SECTION 2: INSURANCE REQUIREMENTS

- 2.1 Insurance Requirements:** The Contractor agrees to procure and maintain, at its own cost, policy(s) of insurance sufficient to insure against all liability, claims, demands, and other obligations assumed by the Contractor pursuant to this Section. Such insurance shall be in addition to any other insurance requirements imposed by this Contract or by law. The Contractor shall not be relieved of any liability, claims, demands, or other obligations assumed pursuant to this Section by reason of its failure to procure or maintain insurance in sufficient amounts, durations, or types.
- 2.2** Contractor shall procure and maintain and, if applicable, shall cause any Subcontractor of the Contractor to procure and maintain insurance coverage. Such coverage shall be procured and maintained with forms and insurers acceptable to The City of Grand Junction. All coverage shall be continuously maintained to cover all liability, claims, demands, and other obligations assumed by the Contractor pursuant to this Section. In the case of any claims-made policy, the necessary retroactive dates and extended reporting periods shall be procured to maintain such continuous coverage. Minimum coverage limits shall be as indicated below unless specified otherwise in the Special Conditions:

General Liability Insurance policy with a minimum of \$1,000,000 per claim. This policy shall provide coverage to protect the Contractor against liability incurred as a result of the services performed as a result of this contract.

## SECTION 3: SCOPE OF SERVICES, SCHEDULE, COMPENSATION

- 3.1 General:** The scope of work for the Water Treatment Plant Solar Electric System Project includes all equipment, labor, infrastructure, mounting structure assembly, all PV equipment installation, and all AC interface and utility interconnection. Additionally, Sunsense will provide any training required for District employees. The scope of work also includes providing the required insurance, payment/performance bonding and acquisition of all permits.

This contract does not include fencing installation and relocation, trenching on both the DC and AC side of the system and storage, security, trash and sanitation for the duration of the project.

- 3.2 Compensation:** The Contractor shall be paid for Services under this agreement as a total not to exceed **\$503,034 (\$499,699 Project Cost + \$3,335 Contingency)**. Payments will be made within 10 days of contractor submittal and Project Manager's approval of payment application. Such amounts shall be inclusive of all costs of whatsoever nature associated with the Contractor's efforts, including but not limited to salaries, benefits, expenses, overhead, administration, profits and materials. The scope of services and compensation shall only be changed by a properly authorized amendment to this Agreement. No City employee has the authority to bind the City with regard to any payment for any Service, which exceeds the amount payable under the terms of this Agreement. The parties agree to the following fee schedule:

- Contract signing/mobilization, 1st billing 10%.
- Securing equipment/infrastructure, 2nd billing 60%.
- Installation/commissioning, 3rd billing 20%.
- Retainage, 4th billing 10%.

## SECTION 4: EXECUTION

**In Witness whereof**, the parties hereto have caused this Contract to be duly executed, intending to be bound thereby.

### City of Grand Junction

Authorized Signature: Scott Hopkins

Name and Title: Scott Hopkins, Purchasing Supervisor

Date: 6/25/10

### Sunsense, Inc.

Authorized Signature: Scott Ely

Name and Title: Scott Ely, President

Date: 6/25/10

Sunsense, Inc.  
Solar Electric Integrator/Developer



Colorado Rocky Mountain School Solar Farm – 147kW Ground Mount – Carbondale, Colorado

To: Terry Franklin, City of Grand Junction, Utility & Streets Director  
Subject: REVISED Solar Electric System Design, Installation and  
Financing Strategy for the City of Grand Junction Water Treatment Plant

June 24, 2010  
Prepared By: Scott Ely  
Sunsense, Inc.  
PO Box 301  
Carbondale, CO 81623  
Tel: 970.963.1420  
Fax: 970.963-1496  
[scott@sunsensesolar.com](mailto:scott@sunsensesolar.com)  
[www.sunsensesolar.com](http://www.sunsensesolar.com)



June 24, 2010

City of Grand Junction  
333 West Street  
Grand Junction, CO 81501

Dear Terry and Staff,

First, many thanks for the opportunity to provide this Design and Cost Analysis for the City of Grand Junction's proposed 100kW solar electric system at the Water Treatment Plant (WTP). We at SunSense have reviewed, consulted, proposed and installed solar electric systems of all shape and sizes. The WTP represents an excellent opportunity to showcase high quality, highly productive solar electric technologies. The electrical load is quite large, solar access is excellent, the funding is in place and we hope that the City is willing to parlay these prerequisites into an exemplary system to the benefit of the citizens of Grand Junction and the surrounding region.

We welcome another partnership with the City and are confident that combining our skill sets will yield an enviable solar electric system that exceeds expectations and becomes a source of great pride. So please read on and share the vision!

Respectfully,

A handwritten signature in black ink that reads "Scott Ely".

Scott Ely, President  
SunSense, Inc.  
PO Box 301  
Carbondale, CO 81623  
Tel: 970.963.1420  
Fax: 970.963-1496  
scott@sunsensesolar.com





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## **Executive Summary**

The City of Grand Junction's Water Treatment Plant (WTP) is uniquely qualified for the design and installation of on-site solar electric generation. Having identified a large load at the WTP (typical for water and wastewater treatment facilities) the integration of a large-scale solar electric system certainly makes sense. With excellent solar access and ample space for solar electric arrays the system design could easily include expansion in the future.

The WTP solar electric system (the Project) strategy has three primary components; design, installation and financing. The City has entered into a Professional Services Agreement (PSA) with Sunsense to provide the following system design and financial/cost analysis. Following approval of the design and review of the cost analysis, the second phase of the Project is the actual installation of the system.

The installation of solar electricity at the WTP will be a coordinated effort between Sunsense (and subcontractors), the City and Xcel Energy. Detailed project planning will include scheduling, logistics, commissioning, performance and service/maintenance. All appropriate parties will receive training and an excellent warranty strategy will be employed. With multiple installation crews, a stocking warehouse and an extensive knowledge of permitting protocol, Sunsense has the resources to design, build and deliver this system on time and within budget.

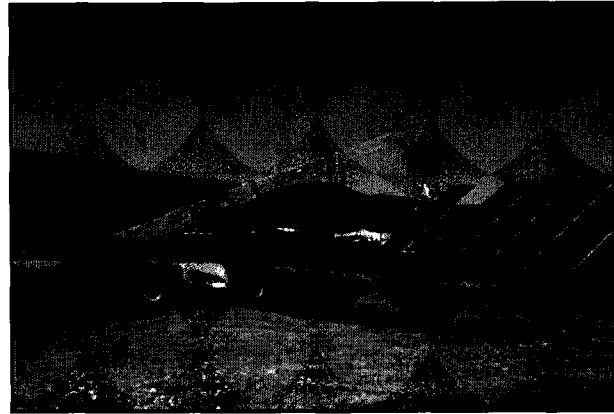
As with any construction project, the selection of a quality contractor is essential. Sunsense is keenly aware of what constitutes a solid solar electric project. Comprehensive and creative system design, high-end components and skilled installation are just the beginning. System performance, monitoring, aesthetics and cost also factor into the equation. Additionally, a quality solar electric integrator will provide the service, support and training needed for long-term productivity of the system. Equally paramount for this project is the ability of this partner to interface effectively with Xcel Energy's Solar\*Rewards Program and their appropriate personnel. These are the platforms from which Sunsense operates.

The WTP PV project is particularly special due in part to previous experience working with the City of Grand Junction. Sunsense was called upon in 2008 to assist City personnel in accessing sites for possible solar electric systems. Along with the Persigo Wastewater Facility and the Convention Center, the WTP was evaluated for solar electric potential. So with approval and installation, the Project would come full circle!

## System Design

Following extensive site work, meetings with City personnel and internal design discussion, the Sunsense team would like to propose the following solution for the WTP PV Project. The design strategy aims to maximize system performance while placing an emphasis on the highest quality products and detailed-oriented installation guidelines. Four ground-mounted arrays utilizing Sharp Solar modules and an accompanying Satcon inverter make for an excellent fit.

The array layout prioritizes placement of the solar arrays for maximum solar access as well as proximity to the WTP building. The ground mount strategy will require a fair amount of infrastructure. Relocation of fencing, installation of a “base structure” and forming a concrete pad for the inverter will lay the foundation for the system. Attachment A – Array Layout Drawings show the array, base structure and wiring layouts as well as a side elevation.



Following installation of the base structure, the design turns to the assembly of the mounting structure. The strategy here is to assemble multiple sub-arrays on vertical rail members (in this case, five modules per sub-array) which are tested, mounted, aligned and wired prior to installation. A forklift and custom “harness” are used to lift the sub-arrays into place on the base structure (see photo above).



One of the better quality PV racking manufacturers is Direct Power & Water from Albuquerque, NM. Direct Power & Water manufacturers a large ground mount (LGM) package that includes the vertical rails, custom gimbals, bracing/bracing collars and associated mounting hardware (see Attachment B – LGM Spec Sheet). Designed for wind and snow loading, the LGM provides a safe and secure foundation for solar electric arrays.

The reasons for selecting the Sharp Solar product are simple. High quality product from a well-known manufacturer, excellent pricing and ARRA compliance all contribute to selection (see Attachment B – Sharp Spec Sheet). The Sharp product was specified for the Two Rivers Convention Center and Visitors Center solar electric projects.

The inverter will rest on the concrete pad behind the Southeast corner of the South array. The inverter of choice for this project is the Satcon PowerGate Plus 100kW (see Attachment B – Satcon Spec Sheet). A single inverter strategy is specified due to the minimizing of connections and the industrial nature of the unit.

Monitoring of the solar electric system will be handled through the standard package offered by Satcon. This will allow web-based production monitoring as well as troubleshooting. Monitoring upgrades are available (similar to the monitoring at the Convention Center and Visitors Center) providing nice graphics and basic solar electric information. Production monitoring will be handled by Xcel Energy.

Sunsense has secured the services of a local Electrical Engineer (Ron Slade) to assist with plotting the AC interconnection strategy for the WTP PV system. Attachment C – WTP Electrical is an electrical representation of how Sunsense proposes to install the DC side of the system as well as the interface of the AC side of the solar electric system with Xcel Energy. The REVISED electrical drawing will be supplied in a large format.

As the City weighs the benefits of this overall system design, Sunsense would like to recognize one important specification, estimated production. The National Renewable Energy Laboratory (NREL) provides a PV production estimator called PV Watts. PV Watts takes basic weather data and system design information to calculate estimated system production and associated savings. Attachment D – Performance Data highlights this data and provides another decision-making tool for the City.

Warranty coverage is another important consideration in the selection of both the solar electric contractor and the specified equipment. Attachment E– Warranty Info presents the associated warranty coverage the City can expect from Sunsense and the system components. Please note that Satcon offers a five-year standard warranty with options to extend to 10, 15 and 20 years. The City has elected to purchase the 20-year warranty package.



### Installation Experience & Qualifications

Over the past several years, Sunsense Inc. has quickly grown into one of the premier solar electric design and installation companies in Western Colorado. Sunsense provides turnkey services for solar electric systems of all sizes and specifications to a broad array of clients. Commitment to our clients is demonstrated through the building of a full-time, certified staff, stocking warehouse and an ever expanding list of in-house services including design, engineering, purchasing, accounting, sales and operations. The Sunsense goal is to proactively build a long-term, sustainable business based on quality, consistency, credibility and service to our clients.

Now in our 20<sup>th</sup> year, Sunsense has gained extensive knowledge in all areas of the solar electric industry. Long established, solid relationships with quality equipment manufacturers allow Sunsense to provide excellent system performance, warranty support and extremely competitive project pricing. Sunsense understands that comprehensive Project Management and communication are the keys to any successful solar electric project.



Certification and safety training are a priority for Sunsense. The North American Board of Certified Energy Practitioners (NABCEP) provides a national certification program for PV installers. Sunsense currently employs (5) NABCEP Certified PV Installers, the most of any company in Western Colorado.



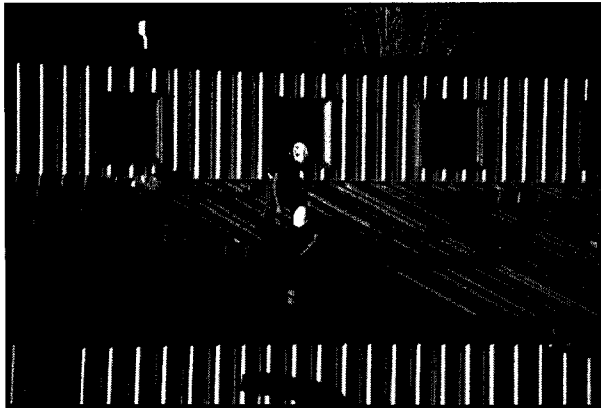
Sunsense also supports a large network of capable, certified subcontractors in various parts of the state. From PV installers to excavators and electricians, hiring specialized local subcontractors to participate in these larger scale projects creates good will and an economic boost for the community.

The Sunsense Team for the WTP PV Project will include:

- Scott Ely – President of Sunsense - Scott will handle all proposal and contractual administration as well as oversee the entire project.
- Jeff Lauckhart – NABCEP Certified PV Systems Designer – Jeff has four years of solar electric design experience and will be responsible for all solar electric design work on the Project. This includes site planning, array layout, balance of systems (BOS) location, product specification and interfacing with electrical and structural engineers, AC electricians and Xcel Energy.

- Charlie Chacos – Logistics Manager – Charlie will be responsible for all product procurement, shipping logistics and installation scheduling.
- Jes Sanderford - NABCEP Certified PV Project Manager – Jes will coordinate the installation crew, provide all safety and security measures, handle all quality control issues and be the on-site representative for Sunsense.
- Subcontractors – The WTP PV project will allow Sunsense to work directly with local partners. Relationships have been established with Ron Slade, an Electrical Engineer, as well as EC Electric in Grand Junction. Sunsense experience with large-scale commercial/municipal projects combined with the certified and competent services provided by Ron Slade and EC Electric AND the City of Grand Junction personnel make for an excellent synergy of skills. Local suppliers will be utilized for materials and local services will support the installation crew.

Larger scale commercial projects such as the WTP require extended “umbrella” coverage as well as bonding capability both of which have been secured by Sunsense. Please note that Sunsense requires any engineering (or other professional) subcontractor to supply Professional Liability coverage. See Attachment F – Insurance/Bonding for a review of pertinent coverage.

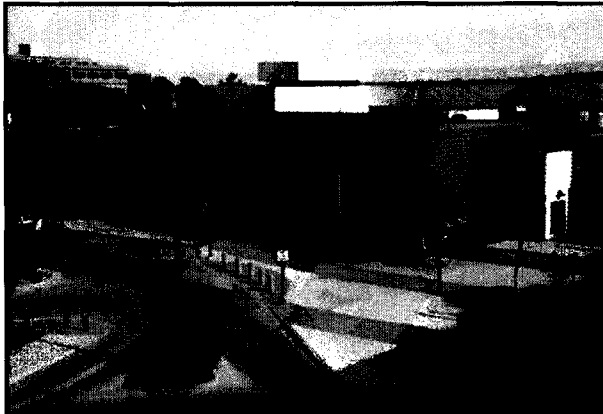


Sunsense takes great pride in our safety record and our approach to safety both in the office and in the field. Attachment G – Safety Info includes the Sunsense Health & Safety Policy, a Sunsense Solar Safety Manual excerpt (addressing hazards) and our Field Checklist. As noted, Sunsense utilizes an internal Solar Safety/Instruction Manual as a supplement to standard OSHA safety guidelines. Regular safety trainings

are scheduled for all installations and a safety protocol is incorporated into each project. Accountability is the bottom line.

Sunsense is a recognized leader in developing partnerships with municipalities, their staffs and governing bodies to produce a logical, productive strategy and Work Plan for the completion of any solar electric project. Coordinating these municipal goals with existing facilities, local utilities, building/electrical inspectors and the appropriate structural and electrical engineers is also essential. The circle is then closed by understanding and interfacing effectively with the press and the public in order to provide much needed education.

With a solid design in place, Sunsense would like to review the scope of work and report the associated costs related to the Project. The scope of work for the WTP PV Project includes infrastructure, mounting structure assembly, all PV equipment installation, all AC interface and utility interconnection. Additionally, Sunsense will provide any training required for District employees. The scope of work also includes providing the required insurance, performance bonding and acquisition of all permits.



As part of the Project scope of work, the City has agreed to handle certain functions in an effort to reduce costs. The City's scope of work includes all fencing installation and relocation, trenching on both the DC and AC side of the system and storage, security, trash and sanitation for the duration of the project.

Equally important to this project is the timeline. Delivery time frames, rebate requirements, weather issues and scheduling around the City and its resources all warrant a tight time line. Please see Attachment H – WTP Timeline for a closer look at time frames for the project. Note that this REVISED Proposal has warranted a shift in the timeline. Basically, add a month to the time frames noted (Final Design/Contract in June, Project Completion/Reporting in September).



**Cost Analysis**

The associated costs and financial considerations are listed below. The key to this project revolves around utility rebates from Xcel Energy and other incentives. The Xcel rebate package is a combination of rebates for rated output of the system (rated rebate) and Renewable Energy Credits (RECs). Additional incentives include savings on the utility bill and in the case of a PPA, a federal tax credit. While the flat rebate is capped at \$2/W up to 100kW, the REC rebate is production-based and is distributed on a reservation basis. Sunsense has secured the REC payment for the City in the amount of \$100/MWh.

The following basic cost breakdown reflects self-financing the Project:

System cost (\$4.94/W x 101,920W)	\$503,034
Less Xcel rated rebate (\$2/W x 101,920W)	<u>\$200,000</u>
Balance after rated rebate	\$303,034

Please note that a contingency in the amount of \$3,335 has been allocated for use in the project. Should this not be needed, Sunsense will reimburse the City this amount upon completion of the project. This is the result of a minor system re-design.

Xcel REC payment (\$100/MWh x 156MWh/yr)	\$15,600
Energy savings per year (per PV Watts)	<u>\$7,488</u>
Annual savings from system production	\$23,088
Simple payback (at current utility rates)	13.13 years

It should also be noted that peripheral costs include the PSA for design (\$5000) and the costs incurred by the City for the aforementioned scope of work (fencing, trenching, etc.). Should the City need further clarification, please advise.

**Summary**

As the energy market shifts to greener technologies, more and more large-scale solar electric systems are being proposed. Commercial buildings, municipal applications and utilities are all looking at the advantages of energy efficiency, solar electricity and other renewable technologies to reduce and/or supplement their power demand. Management of these projects requires a skilled technical component (design, specification, installation and service) and solid financial footing. Sunsense brings the entire package together.





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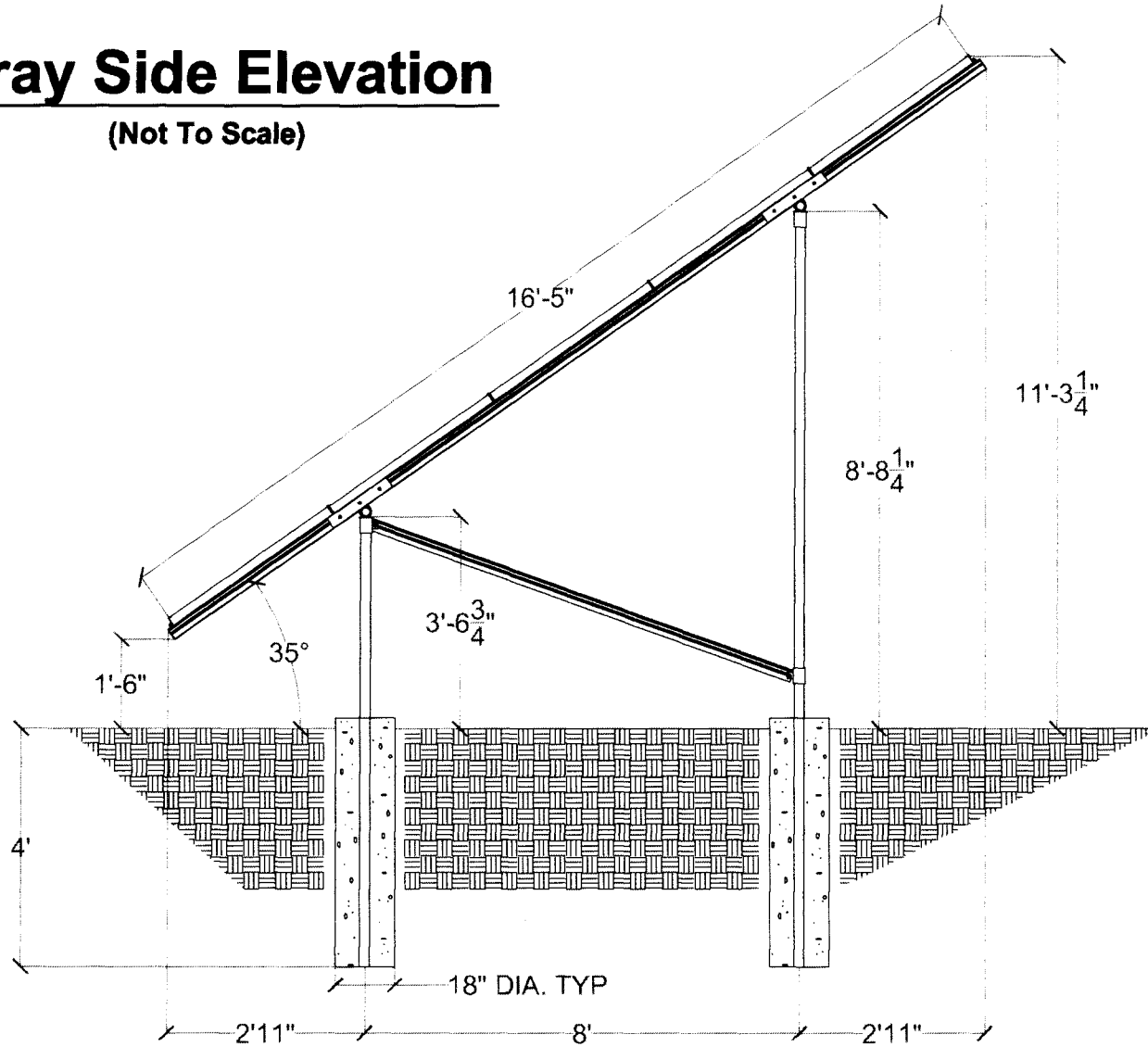
The City of Grand Junction WTP PV project is ready for action. Sunsense is excited and prepared to provide turnkey services for the Project. Deliverables include:

- A highly productive, expandable, system design.
- Quality, long-lasting products from recognized leading manufacturers.
- A detail-oriented, dedicated team focused on communication.
- Certified installation crew and local subcontractors.
- An enviable end product.

These are goals that the Sunsense Team strives for in each and every project. The City of Grand Junction has been extremely forthright, timely and responsive. We appreciate your consideration of Sunsense as your Solar Electric Integrator and are committed to making the project a tremendous resource for power generation, financial benefit and public education.

# Array Side Elevation

(Not To Scale)



## City of Grand Junction

Water Treatment Plant Solar Electric System

Site Address: 244 26 1/4 Rd  
Grand Junction, CO 81503

Drawn By: JWL

Date: 4-20-2010

Version: 1.0

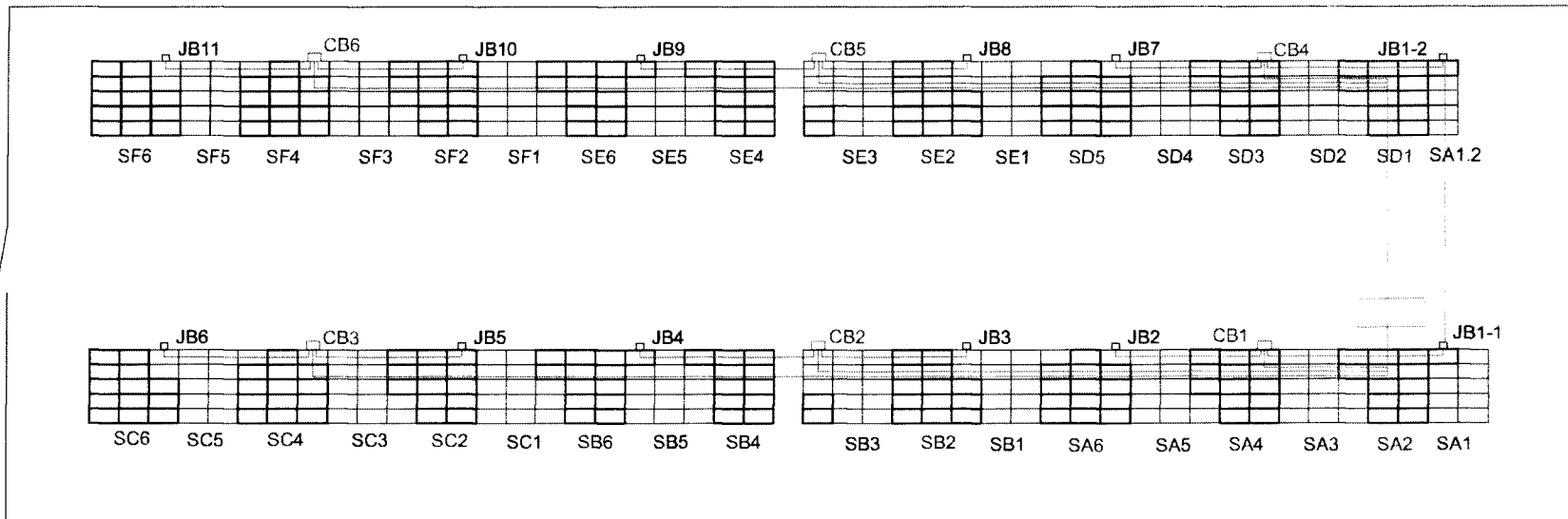


PO Box 301  
Carbondale, CO 81623


P 970.963.1420  
F 970.963.1496

# Array String Map & Junction Box Layout

(Not To Scale)

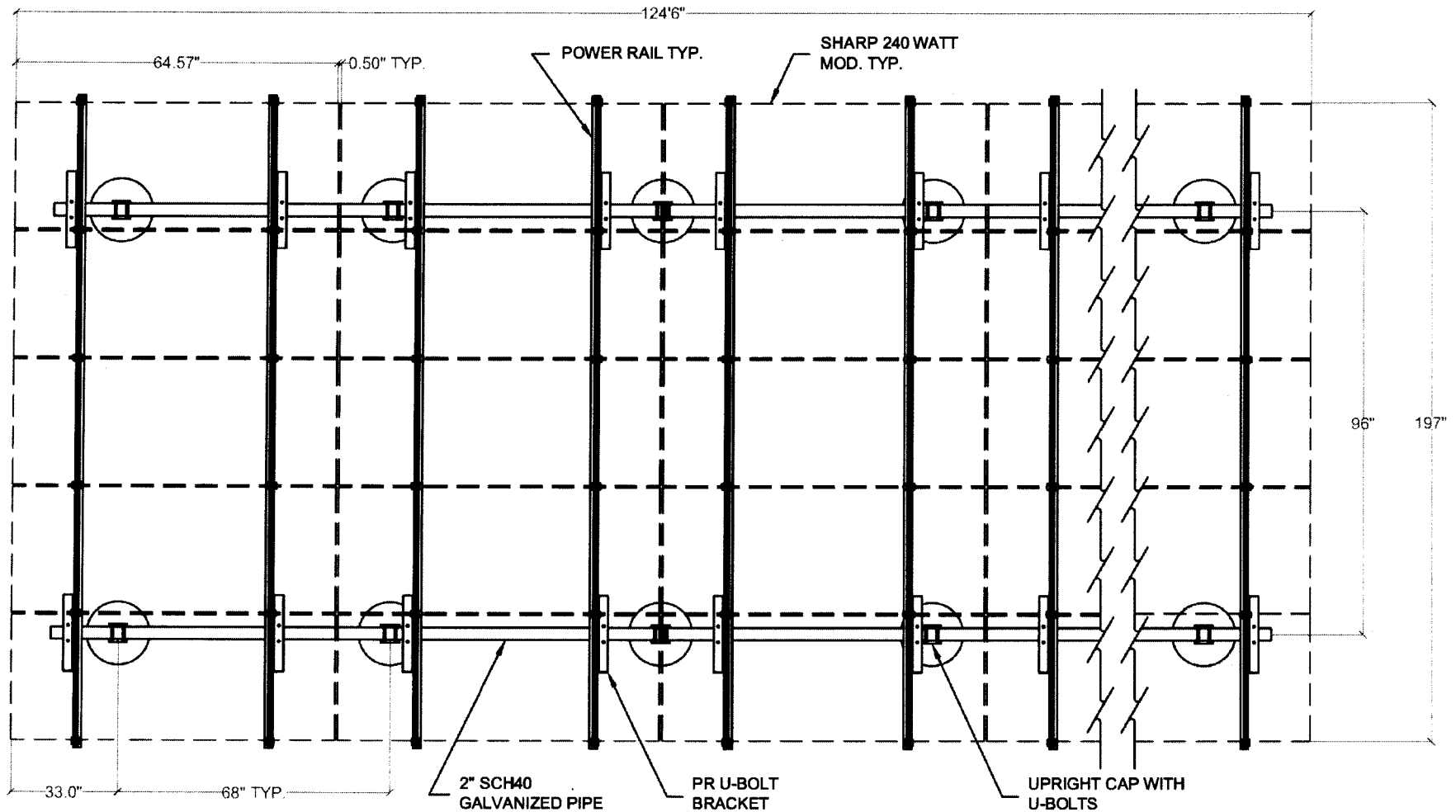



- S\*\* Series Strings
- S\*\*
- J\*\* Junction Box
- C\*\* Combiner Box

<b>City of Grand Junction</b> Water Treatment Plant Solar Electric System			 <b>SUNSENSE</b> solar electric & renewable energy	
Site Address: 244 26 1/4 Rd Grand Junction, CO 81503			PO Box 301 Carbondale, CO 81623	
Drawn By: JWL	Date: 6-22-10	Version: 1.2	P 970.963.1420 F 970.963.1496	

# Base Structure Layout 1 (x3)

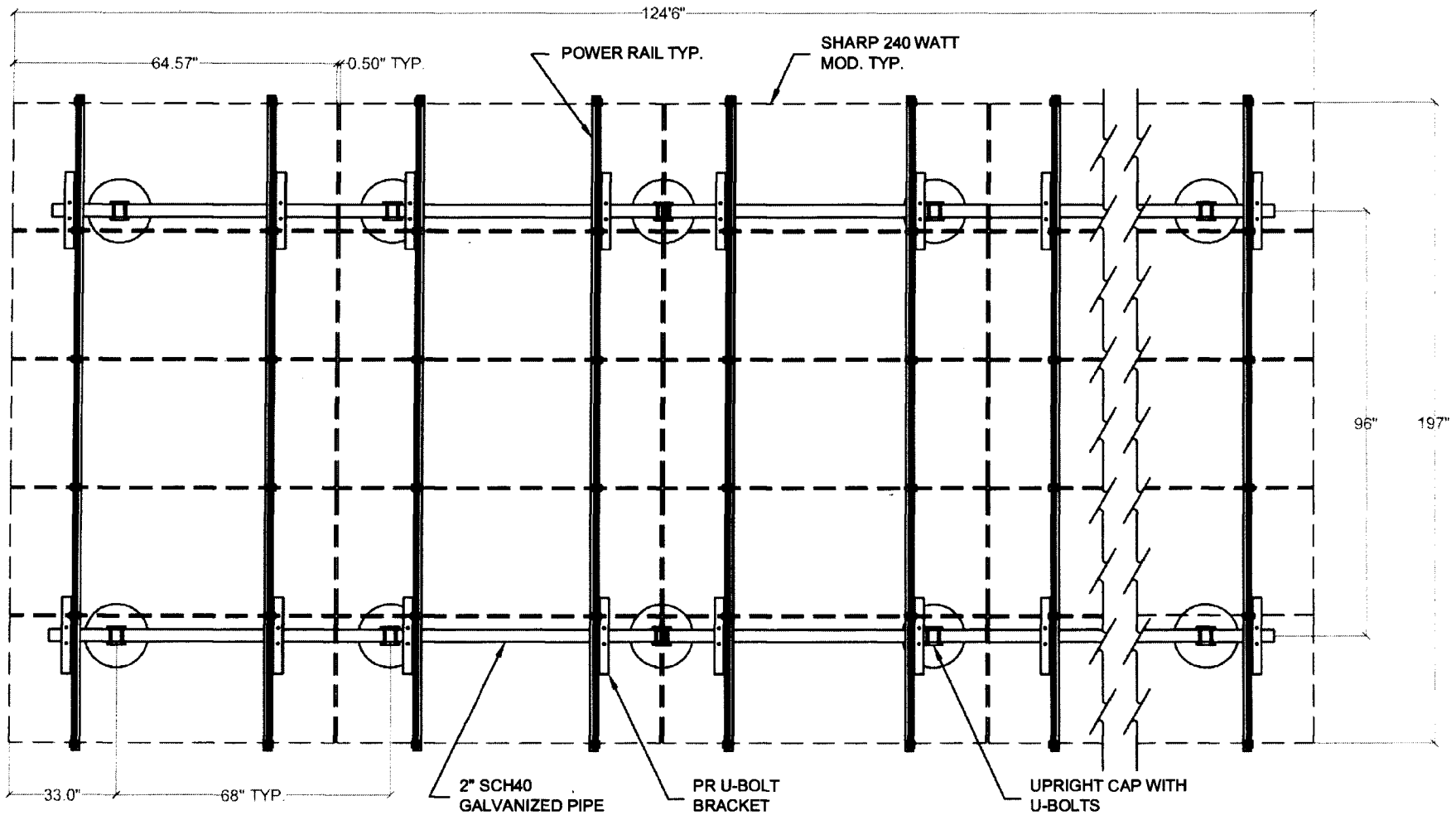
(Partial, Not To Scale)



<b>City of Grand Junction</b> Water Treatment Plant Solar Electric System			 solar electric & renewable energy
Site Address: 244 26 1/4 Rd Grand Junction, CO 81503			
Drawn By: JWL	Date: 6-22-2010	Version: 1.2	PO Box 301 Carbondale, CO 81623
			P 970.963.1420 F 970.963.1496

# Base Structure Layout 2 (x1)

(Partial, Not To Scale)



## City of Grand Junction

Water Treatment Plant, Solar Electric System

Site Address: 244 26 1/4 Rd  
Grand Junction, CO 81503

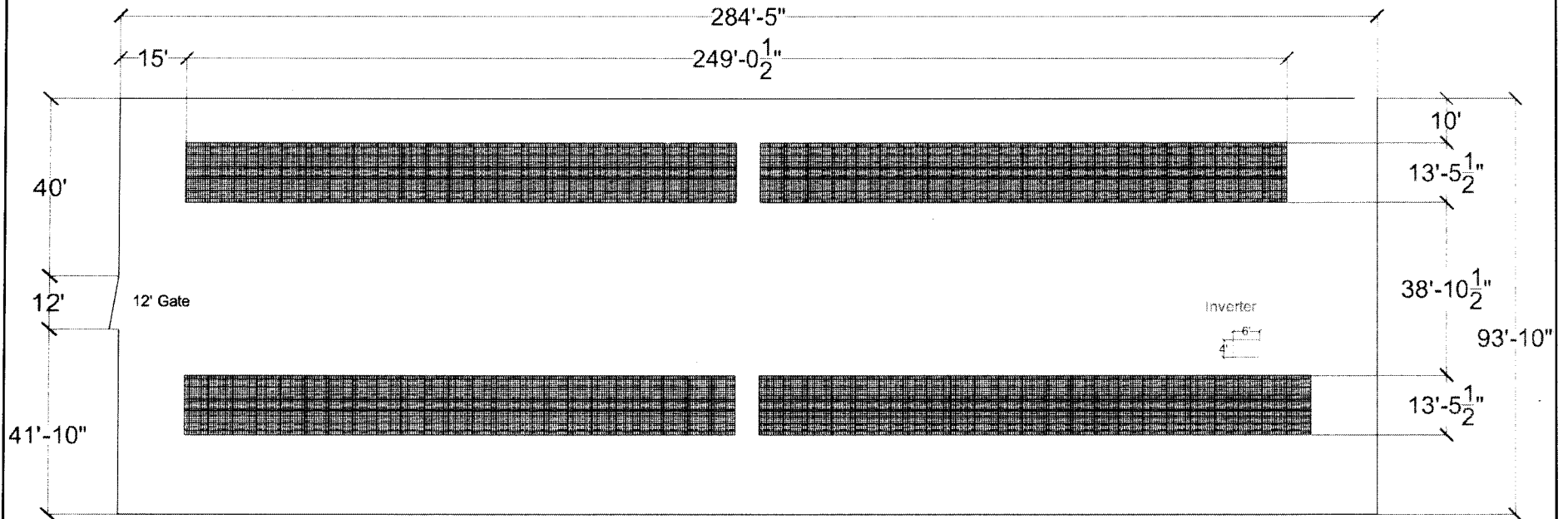
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PO Box 301 P 970.963.1420  
Carbondale, CO 81623 F 970.963.1496

# Dimensioned Array Layout

(Not To Scale)



<b>City of Grand Junction</b>			 <p><b>SUNSENSE</b> solar electric &amp; renewable energy</p>	
Water Treatment Plant Solar Electric System				
Site Address: 244 26 1/4 Rd			PO Box 301                      P 970.963.1420 Carbondale, CO 81623      F 970.963.1496	
Grand Junction, CO 81503				
Drawn By: JWL	Date: 6-22-10	Version: 1.2		

**D  
&  
W**

**QUALITY HARDWARE FOR THE PV INDUSTRY**

# Large Ground Mount



The basic structure is made with 2" SCH40 galvanized pipe that is supplied by the installer. We provide all of the aluminum fittings, the POWER RAIL™, and the design.

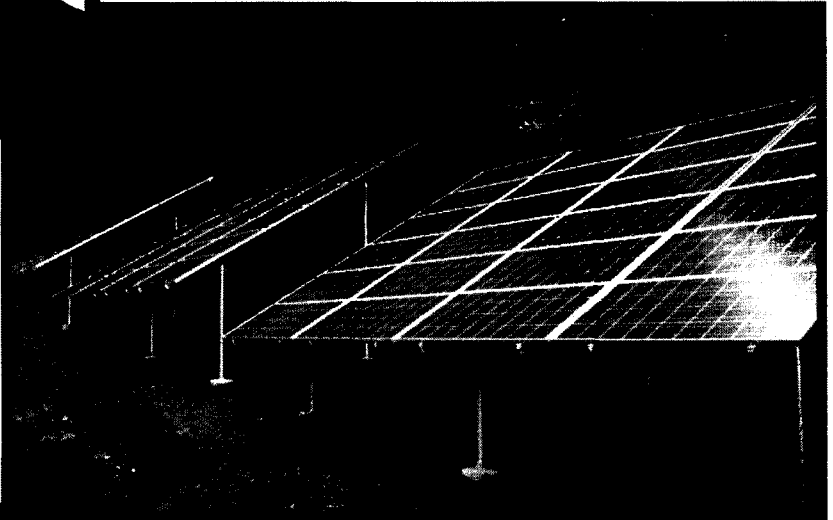
Our POWER RAIL extrusion is 6061-T6 aluminum.

Top caps and diagonal braces/sliders are TIG-welded 6061-T6 aluminum.

Rail brackets are made of 2"x2"x1/4" 6061-T6 aluminum angle.

**LGMs are designed and warranted to withstand 90-mph winds in an exposure category C setting.**

**All racking hardware including U-bolts, end-clamps and mid-clamps are stainless steel.**



**DIRECT POWER AND WATER CORPORATION**

**4000-B Vassar Dr NE**

**Albuquerque, NM 87107**

**Ph: 800-260-3792 Fax: 505-889-3548**



Clean power.

### Unparalleled Performance

Satcon enables you to closely match array capacities to achieve maximum energy throughput.

+20%

#### Edge™ MPPT

- Features a proprietary maximum power point tracking (MPPT) system
- Provides rapid and accurate control
- Improves performance by up to 20%, even in challenging climate conditions
- Boosts overall PV plant kilowatt yield
- Provides a wide range of operation across all photovoltaic cell technologies, including thin film, monocrystalline, and polycrystalline PV panels

#### Power Efficiency

- Full array nameplate power rating maintained throughout the entire MPPT DC voltage range
- Superior dynamic performance in cloudy conditions

#### Printed Circuit Board Durability

- Wide thermal operating range: -40° C (-40° F) to 85° C (185° F)
- Conformal coated to withstand extreme humidity and air-pollution levels

#### Proven Reliability

Rugged and reliable, PowerGate Plus PV inverters are engineered from the ground up to meet the demands of large-scale installations.

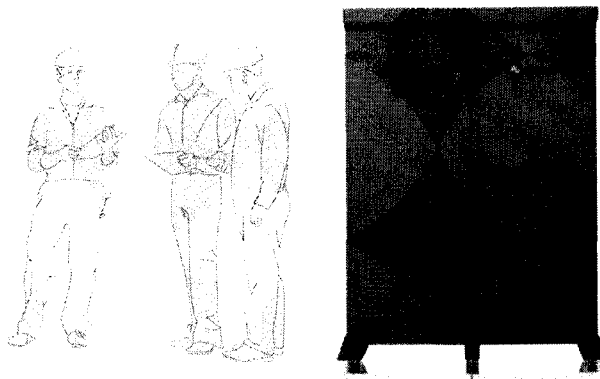
#### Low Maintenance

- Modular components make service efficient
- Dual cooling fans

#### Safety

- Seismic Zone 4 compliant
- Built-in DC and AC disconnect switches
- Integrated DC two-pole disconnect switch isolates the inverter (with the exception of the GFDI circuit) from the photovoltaic power system to allow inspection and maintenance
- Built-in isolation transformer
- Protective cover over exposed power connections

## PowerGate® Plus 100 kW Commercial Solar PV Inverter



PowerGate Plus 100 kW Specifications		UL/CSA	CE
<b>Input Parameters</b>			
Maximum Array Input Voltage		600V DC (UL)	•
		900V DC (CE)	•
Input Voltage Range (MPPT; Full Power)		315–600V DC	•
		420–850V DC	•
Maximum Input Current		331A DC	•
		248A DC	•
<b>Output Parameters</b>			
Output Voltage Range (L-L)	208V AC	183–229V AC	•
	240V AC	211–264V AC	•
	400V AC	352–440V AC	•
	480V AC	422–528V AC	•
Nominal Output Voltage		208V AC	•
		240V AC	•
		400V AC	•
		480V AC	•
Output Frequency Range		59.5–60.5 Hz	•
		49.5–50.5 Hz	•
AC Voltage Range Set Points		-12%/+10%	•
Nominal Output Frequency		60 Hz	•
		50 Hz	•
Number of Phases		3	•
Maximum Output Current per Phase	208V AC	278A	•
	240V AC	241A	•
	400V AC	145A	•
	480V AC	121A	•

• Standard ○ Optional





### Output Options

#### PowerGate Plus 100 kW

UL/CSA	208V AC Output
	240V AC Output
	480V AC Output
CE	400V AC Output

### Streamlined Design

With all components encased in a single, space-saving enclosure, PowerGate Plus PV inverters are easy to install, operate, and maintain.

#### Single Cabinet with Small Footprint

No clearance required for sides and back

Convenient access to all components

Large in-floor cable glands make access to DC and AC cables easy

#### Rugged Construction

Engineered for outdoor environments

#### Output Transformer

Provides galvanic isolation

Matches the output voltage of the PV inverter to the grid

Satcon Corporate Boston, MA P 617.897.2400 E sales@satcon.com	Satcon Canada Burlington, ON P 905.639.4692 E sales@satcon.com
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Satcon West Fremont, CA P 510.226.3800 E sales@satcon.com	Satcon Spain Madrid, Spain P 34 917610275 E sales@satcon.com
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PowerGate Plus 100 kW Specifications		UL/CSA	CE
Maximum Overcurrent Protection per Phase	208V AC	334A	•
	240V AC	289A	•
	400V AC	174A	•
	480V AC	145A	•
CEC-Weighted Efficiency	96%		•
Maximum Continuous Output Power	100kW (100kVA)		•
Tare Losses	208V AC	-62.34 W	•
	240V AC	-61.57 W	•
	400V AC	-64.5W	•
	480V AC	-66.13 W	•
Power Factor at Full Load	>0.99		•
Harmonic Distortion	<3% THD		•
Temperature			
Operating Ambient Temperature Range (Full Power)	-20° C to +50° C		•
Storage Temperature Range	-30° C to +70° C		•
Cooling	Forced Air		•
Noise			
Noise Level	<65 dB(A)		•
Combiner			
Number of Inputs and Fuse Rating	5 (110A DC) (Opt.)		○
	6 (100A DC) (Opt.)		○
Inverter Cabinet			
Enclosure Rating (Outdoor) (IEC Grade)	NEMA 3R, IP44		•
Enclosure Finish (14-Gauge, Powder-Coated Steel)	RAL-7032		•
Base and Door Finish (16-Gauge, Powder-Coated Steel)	RAL-7032		•
Cabinet Dimensions (Height x Width x Depth)	80" x 57" x 30.84" (203.2 cm x 144.78 cm x 78.33 cm)		
Cabinet Weight	2,350 lbs.	1,066 kg	
Transformer			
Integrated Internal Transformer			•
Low Voltage Tap Line <sup>1</sup>	20%		•
Testing and Certification			
UL1741, CSA 107.1-01, IEEE 1547, IEEE C62.41.2			•
Zone 4 Seismic Rating			•
Warranty			
Five Years			•
Extended Warranty (10, 15, or 20 years) (Optional)			○
Extended Service Agreement (Optional)			○
Intelligent Monitoring			
Satcon PV View® Plus (Optional)			○
Satcon PV Zone (Optional)			○
Third-Party Compatibility			
• Standard			
○ Optional			

- Standard
- Optional

<sup>1</sup> The 20% boost tap on the isolation transformer increases the AC voltage output range for applications where the solar array DC operating voltage is at or near the lower end of the DC input range. This boost allows for continued inverter operation at lower DC voltage input levels.

Note: Specifications are subject to change.

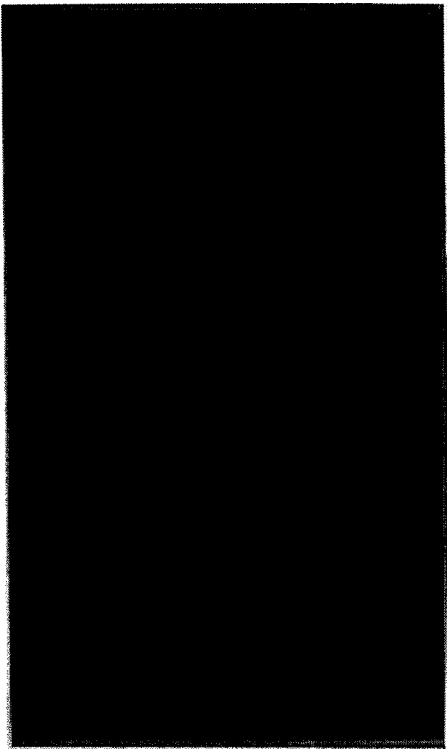
# SHARP®

solar electricity

## 224 WATT

**MULTI-PURPOSE MODULE**

NEC 2008 Compliant



**ND-224UC1**

**MULTI-PURPOSE 224 WATT  
MODULE FROM THE WORLD'S  
TRUSTED SOURCE FOR SOLAR.**

Using breakthrough technology, made possible by nearly 50 years of proprietary research and development, Sharp's ND-224UC1 solar module incorporates an advanced surface texturing process to increase light absorption and improve efficiency. Common applications include commercial and residential grid-tied roof systems as well as ground mounted arrays. Designed to withstand rigorous operating conditions, this module offers high power output per square foot of solar array.

Business leaders install this module in large commercial applications, demonstrating financial astuteness and environmental stewardship.

### **ENGINEERING EXCELLENCE**

High module efficiency for an outstanding balance of size and weight to power and performance.

### **DURABLE**

Tempered glass, EVA lamination and weatherproof backskin provide long-life and enhanced cell performance.

### **RELIABLE**

25-year limited warranty on power output.

### **HIGH PERFORMANCE**

This module uses an advanced surface texturing process to increase light absorption and improve efficiency.



Sharp multi-purpose modules offer industry-leading performance for a variety of applications.

Improved Frame Technology

### **SHARP: THE NAME TO TRUST**

When you choose Sharp, you get more than well-engineered products. You also get Sharp's proven reliability, outstanding customer service and the assurance of our 25-year limited warranty on power output. A global leader in solar electricity, Sharp powers more homes and businesses than any other solar manufacturer worldwide.

**BECOME POWERFUL**

# 224 WATT

ND-224UC1

NEC 2008 Compliant  
Module output cables now 12 AWG with locking connectors

## ELECTRICAL CHARACTERISTICS

Maximum Power (Pmax)*	224 W
Tolerance of Pmax	+10%/-5%
Type of Cell	Polycrystalline silicon
Cell Configuration	60 in series
Open Circuit Voltage (Voc)	36.6 V
Maximum Power Voltage (Vpm)	29.3 V
Short Circuit Current (Isc)	8.33 A
Maximum Power Current (Ipm)	7.66 A
Module Efficiency (%)	13.74%
Maximum System (DC) Voltage	600 V
Series Fuse Rating	15 A
NOCT	47.5°C
Temperature Coefficient (Pmax)	-0.485%/°C
Temperature Coefficient (Voc)	-0.36%/°C
Temperature Coefficient (Isc)	0.053%/°C

\*Measured at (STC) Standard Test Conditions: 25°C, 1 kW/m<sup>2</sup> insolation, AM 1.5

## MECHANICAL CHARACTERISTICS

Dimensions (A x B x C below)	39.1" x 64.6" x 1.8"/994 x 1640 x 46 mm
Cable Length (l)	43.3"/1100 mm
Output Interconnect Cable**	12 AWG with MC4 Locking Connector
Weight	44.1 lbs / 20.0 kg
Max Load	50 psf (2400 Pascals)

\*\*A safety lock clip (Multi Contact part number PV-SSH4) may be required in readily accessible locations per NEC 2008 690.33 (C)

## QUALIFICATIONS

UL Listed	UL 1703
Fire Rating	Class C

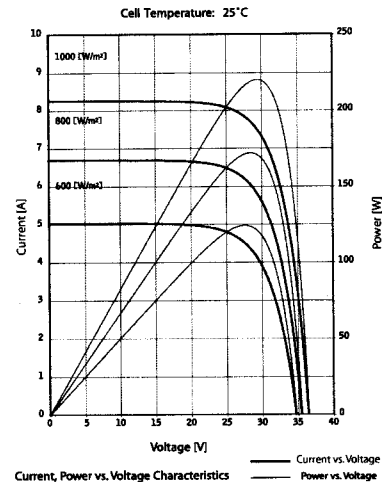


## WARRANTY

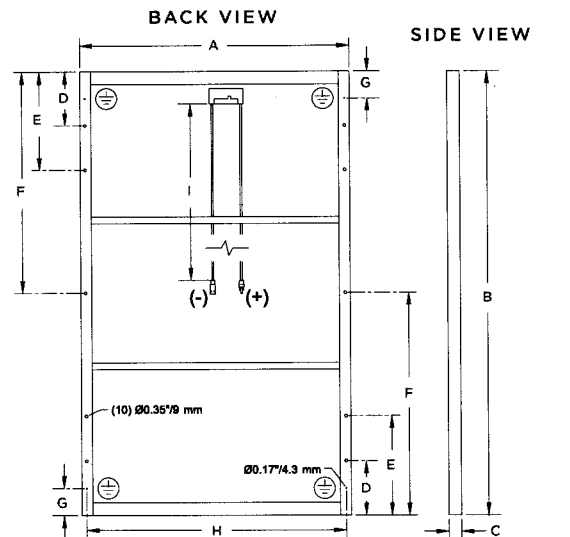
25-year limited warranty on power output  
Contact Sharp for complete warranty information

Design and specifications are subject to change without notice.  
Sharp is a registered trademark of Sharp Corporation. All other trademarks are property of their respective owners. Contact Sharp to obtain the latest product manuals before using any Sharp device. Cover photo: Solar installation by Pacific Power Management, Auburn CA.

## IV CURVES



## DIMENSIONS



A	B	C	D	E
39.1"/994 mm	64.6"/1640 mm	1.8"/46 mm	7.9"/200 mm	14.4"/365 mm
F	G	H	I	
32.3"/820 mm	3.9"/100 mm	37.7"/958 mm	43.3"/1100 mm	

Contact Sharp for tolerance specifications

# SHARP®

SHARP ELECTRONICS CORPORATION  
5901 Bolsa Avenue, Huntington Beach, CA 92647  
1-800-SOLAR-06 • Email: sharpsolar@sharpusa.com  
www.sharpusa.com/solar



# Grand Junction Water Treatment Plant Performance Data



**AC ENERGY  
&  
COST SAVINGS**

Station Identification	
City:	Grand_Junction
State:	Colorado
Latitude:	39.12° N
Longitude:	108.53° W
Elevation:	1475 m
PV System Specifications	
DC Rating:	101.9 kW
DC to AC Derate Factor:	0.770
AC Rating:	78.5 kW
Array Type:	Fixed Tilt
Array Tilt:	35.0°
Array Azimuth:	180.0°
Energy Specifications	
Cost of Electricity:	4.8 ¢/kWh

Results			
Month	Solar Radiation (kWh/m <sup>2</sup> /day)	AC Energy (kWh)	Energy Value (\$)
1	4.48	10882	522.34
2	5.19	11243	539.66
3	5.76	13630	654.24
4	6.36	14058	674.78
5	6.73	14905	715.44
6	7.08	14733	707.18
7	6.85	14473	694.70
8	6.89	14767	708.82
9	6.57	13950	669.60
10	5.73	12809	614.83
11	4.68	10829	519.79
12	3.96	9723	466.70
Year	5.86	156002	7488.10*

\*Actual savings depend on current cost per kWh.



**DPW | SOLAR**

**PREFORMED LINE PRODUCTS**

**FULL  
WARRANTY  
STATEMENT**

**DIRECT POWER AND WATER CORPORATION LIMITED WARRANTY**

Direct Power & Water Corporation (DPW) warrants to the original end customer only that its products shall be free from defects in materials and workmanship under normal and proper usage for a period of ten years from the date of shipment by DPW.

The sole remedy shall be repair or replace, at DPW's sole option, any DPW product which proves to be defective within such warranty period. This warranty shall not apply if the DPW product has been damaged by unreasonable use, accident, negligence, service or modification by anyone other than DPW, or by any other cause unrelated to materials and workmanship. Rust and corrosion on painted components are not covered by this Warranty.

No product will be returned to DPW without its prior Return Authorization (RA) and the original purchase receipt as proof of purchase. To receive in-warranty service, DPW must receive the product within the warranty period, and accompanied by proof of purchase and an RA number. For an RA number, contact DPW at 4000-B Vassar Dr NE, Albuquerque, New Mexico 87107 or (505) 889-3585. Purchasers must prepay all delivery costs and shipping charges to return product under this warranty policy. If DPW discovers that any product returned is not covered by the foregoing warranty, DPW reserves the right to charge purchaser for all transportation costs and expenses incurred by DPW in examining, processing or handling such product.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR OTHERWISE ARISING BY OPERATION OF LAW, TRADE, USAGE OR COURSE OF DEALING, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. DPW SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES OF ANY KIND, NOR UNDER ANY CIRCUMSTANCE SHALL DPW BE LIABLE FOR DAMAGES BEYOND THE PRICE OF THE PRODUCT PURCHASED BY PURCHASER, WHETHER IN CONTRACT, IN TORT OR UNDER ANY WARRANTY OR OTHER USE, AND WHETHER OR NOT SAID LOSS, COST, PENALTY OR DAMAGE WAS REASONABLY FORESEEABLE.

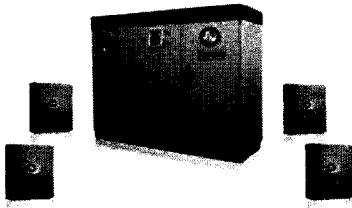
Product will be considered accepted by Purchaser unless DPW receives written notice of such nonacceptance within ten (10) days of such delivery to purchaser.

DPW is not responsible for loss or damage to product owned by purchaser and located on the DPW's premises caused by fire or other casualties beyond DPW's control.

**DIRECT POWER AND WATER CORPORATION**  
**A subsidiary of Preformed Line Products**  
**4000-B Vassar Drive NE, Albuquerque, NM 87107**  
**Ph: 505-889-3585 Fax: 505-889-3548**



# Satcon Warranty, Preventative Maintenance and Uptime Guarantee Plans



The industry's most comprehensive preventative maintenance program.

Maximize Total System Performance

99% Uptime Guarantee

Minimize Risk

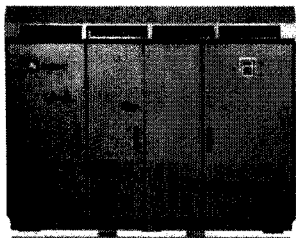
20 Year Complete Factory Warranty

Lower Total Cost of Ownership

Scheduled Preventative Maintenance

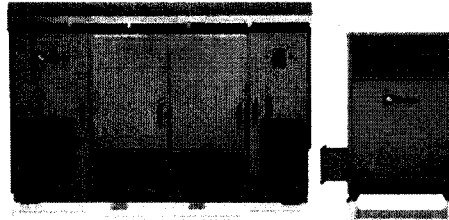
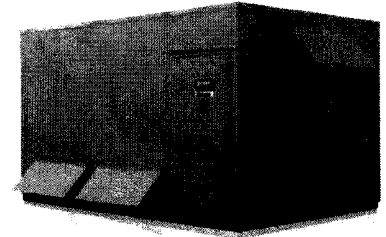
Maximize Reliability and Uptime

Bring inverter life span expectancy to parity with panels



## Maximize System Performance Over the Entire Lifespan of Your Project

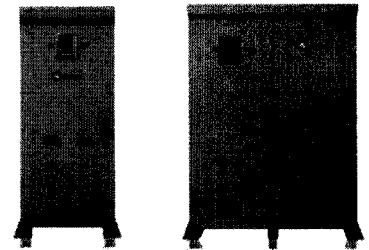
Satcon's Global Services Organization is dedicated to ensuring that each Satcon solution performs with the highest levels of efficiency and reliability throughout its entire lifespan. Our global service team can help commission, maintain and repair your photovoltaic PV inverter. Our solution experts will respond to any issue that you may have to give you confidence that the key component in your system is operating at the highest levels of performance at all times.



Satcon's industry-leading suite of service plan options, including Standard Warranty, Extended Warranty, Preventative Maintenance Plan, and Uptime Guarantee, will reduce system downtime and lower your total cost of ownership, enabling you to mitigate risk, while at the same time delivering an increased return on your investment.

### Standard Satcon 5-Year Warranty

All Satcon solar photovoltaic inverters come with a standard 5-year unlimited hour usage warranty covering service parts and labor used in accordance with the Inverter Service Schedule. The Standard Warranty does not cover filters, fuses or any additional parts that are consumable. The plan will cease either on the plan end date as specified in the terms (years) of warranty coverage unless an additional extension has been purchased through our extended warranty program.



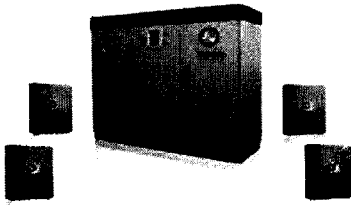
### Extended Warranty

The Satcon Extended Warranty Plan is an extension of the Satcon 5-year unlimited hour usage warranty for a period of up to 20 years. The Satcon Extended Warranty can be purchased in five-year blocks at any time at an additional cost within the Warranty period prior to the expiration of the current Warranty term<sup>1</sup>. Terms and conditions will be the same as those applying to the Standard Inverter Warranty.

<sup>1</sup> Prior to an Extended Warranty purchase, a Satcon Technician or Authorized Service Agent must perform a chargeable evaluation to the product to ensure its eligibility for an Extended Warranty. This Extended Warranty Plan will cover only service parts and labor used in accordance with the Inverter Service Schedule.



## Satcon Warranty, Preventative Maintenance and Uptime Guarantee Plans



Maximize Total System Performance

99% Uptime Guarantee

Minimize Risk

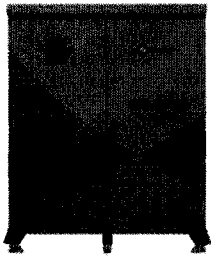
20 Year Complete Factory Warranty

Lower Total Cost of Ownership

Scheduled Preventative Maintenance

Maximize Reliability and Uptime

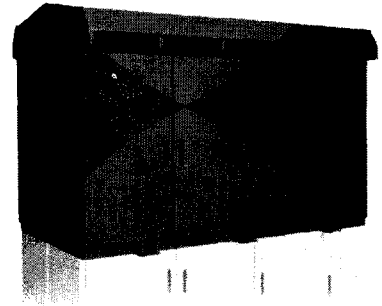
Bring inverter life span expectancy to parity with panel's



### Preventative Maintenance Plan

Satcon offers Preventative Maintenance (PM) Plans to ensure your solutions operate at the highest levels of efficiency and reliability throughout the lifespan of your installation. Administrated by and on behalf of Satcon, our experts will care for your PV inverter with annual and semi-annual service. Benefits include:

- Budgeted package to reduce unbudgeted maintenance costs
- Inspected, calibrated and correct electronic subsystems
- Software updates
- Transferable to Third Party upon notification
- Improved product reliability
- Peace of mind/hassle free operation



Additional items included with Satcon Preventative Maintenance Program:

- All upgrades to unit completed as needed
- Regular software updates for main board, free of charge
- Update and install any items that have had Engineering modifications made for the unit – free of charge, including but not limited to the following parts:
  - RDC's
  - DPCB's
  - IGBT's (if required)
  - Cabling
  - Capacitors
- As needed free consumable parts (filters, fans, etc.) and labor
- Thermal scans of the unit during servicing, free of charge
- Communications checkups and software revisions as new releases become available, free of charge
- 24/7 onsite located Service technician(s) – If project is larger than 50MW
- Commissioning services free of charge – If project is larger than 50MW
- Free 2 day training of any personnel on site dealing with the inverters

*Only Satcon approved parts are used and work must be consistent with manual and warranty. Warranty is transferable to a third party upon notification. Pricing can be obtained from your Satcon Sales Representative by product, quantity and location.*

The Preventative Maintenance Plan is available in five-year blocks up to twenty years and can be added at any time while the inverter is within the term of an active Warranty period.

### Uptime Guarantee

Upon the purchase of a Preventative Maintenance (PM) Plan, you can acquire our 99% Uptime Guarantee. If the inverter is not delivering power due to inverter failure for any portion of daylight hours, the system owner will be compensated for the energy (kWh) that would have been delivered by a fully functional inverter. This energy will be calculated based on the solar irradiance, the array capacity, the rate per kWh, and the system efficiency for the hours when the inverter is down.<sup>2</sup> This plan will start paying if the inverter failure downtime exceeds 44 daylight hours per year (average) and is based on a total of 4,380 daylight hours per year (average).<sup>3</sup>

Satcon Service Representatives are available 24 hours a day, 365 days a year at 1-866-568-0244 (or Outside Canada and the US: +1-905-639-4692) or via email [support@satcon.com](mailto:support@satcon.com).

<sup>2</sup> Calculations will be completed ref IEEE726 and NERC / GADS formulas

<sup>3</sup> The Uptime Guarantee needs to be supported by the Preventative Maintenance Plan. During the regularly scheduled maintenance, if a replacement parts are recommended, they need to be replaced (at an additional cost) so that the Uptime Guarantee can be supported. If the decision is made to not follow the recommendations of replacement parts, then the Uptime Guarantee will be affected.





# Satcon Warranty, Preventative Maintenance and Uptime Guarantee Plans

Term	Standard Warranty				Extended Warranty				Preventative Maintenance Plan				Uptime Guarantee			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Unlimited hour usage	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Service parts and labor	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Transformer (including wiring)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
IGBT's	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
DPCD, Gate Driver Board, RDC's and all electronics	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Fans	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Combiners (without fuses)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
GFDI (without fuses)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Cabinet	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Gasket and seals	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
HMI & OIT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Consumable parts (filters, etc.)	□Δ	□Δ	□Δ	□Δ	•	•	•	•	•	•	•	•	•	•	•	•
Protection devices (fuses, surge parts, etc.)	□Δ	□Δ	□Δ	□Δ	•	•	•	•	•	•	•	•	•	•	•	•
Annual Preventative Maintenance	○	○	○	○	•	•	•	•	•	•	•	•	•	•	•	•
Measure and record phase-to-phase input voltages and currents	□	□	□	□	•	•	•	•	•	•	•	•	•	•	•	•
Review system performance with the owner in order to address questions	○	○	○	○	•	•	•	•	•	•	•	•	•	•	•	•
Issue written inspection report	Δ	Δ	Δ	Δ	•	•	•	•	•	•	•	•	•	•	•	•
Semi-Annual Preventative Maintenance	○	○	○	○	•	•	•	•	•	•	•	•	•	•	•	•
Check appearance/cleanliness of the cabinet, ventilation system and insulated surfaces	Δ	Δ	Δ	Δ	•	•	•	•	•	•	•	•	•	•	•	•
Inspect subassemblies, cabling, wiring harnesses, contacts and major components	Δ	Δ	Δ	Δ	•	•	•	•	•	•	•	•	•	•	•	•
Torque terminals, connectors and bolts	Δ	Δ	Δ	Δ	•	•	•	•	•	•	•	•	•	•	•	•
Check the operation of all safety devices (Emergency stop, door switches, GFDI)	Δ	Δ	Δ	Δ	•	•	•	•	•	•	•	•	•	•	•	•
Check for corrosion on all terminals and cables	Δ	Δ	Δ	Δ	•	•	•	•	•	•	•	•	•	•	•	•
Check the condition of both the AC & DC surge suppressors	Δ	Δ	Δ	Δ	•	•	•	•	•	•	•	•	•	•	•	•
Check power capacitors for signs of damage	Δ	Δ	Δ	Δ	•	•	•	•	•	•	•	•	•	•	•	•
Measure and record all low-voltage power supply levels	Δ	Δ	Δ	Δ	•	•	•	•	•	•	•	•	•	•	•	•
Check control fuse clips	Δ	Δ	Δ	Δ	•	•	•	•	•	•	•	•	•	•	•	•
Check cable entry plates	Δ	Δ	Δ	Δ	•	•	•	•	•	•	•	•	•	•	•	•
Check charging resistors	Δ	Δ	Δ	Δ	•	•	•	•	•	•	•	•	•	•	•	•

- Standard
- Not included
- Δ Customer responsible for maintenance task to be completed by electrician
- Customer must engage Satcon or Satcon trained technician to complete task

Note: Specifications are subject to change.



# Satcon Warranty, Preventative Maintenance and Uptime Guarantee Plans

	Standard Warranty	Extended Warranty				Preventative Maintenance Plan				Uptime Guarantee			
Check fan for correct rotation, blades and bearings	△	△	△	△	●	●	●	●	●	●	●	●	
Check inverter transformer cooling fans	△	△	△	△	●	●	●	●	●	●	●	●	
Check anti condensation heaters	△	△	△	△	●	●	●	●	●	●	●	●	
Inspect (clean or replace) air filter elements	△	△	△	△	●	●	●	●	●	●	●	●	
Record ambient and operating temperature	△	△	△	△	●	●	●	●	●	●	●	●	
Check that sensors are securely attached and reading correct temperatures	△	△	△	△	●	●	●	●	●	●	●	●	
Perform temperature checks on all breakers, connections, and associated controls	△	△	△	△	●	●	●	●	●	●	●	●	
Check fuses for open or signs of heating (Inverter & Combiner)	△	△	△	△	●	●	●	●	●	●	●	●	
Check IGBTs and inverter boards for discoloration	△	△	△	△	●	●	●	●	●	●	●	●	
Record HMI voltage and current readings	△	△	△	△	●	●	●	●	●	●	●	●	
Check for upgrades - hardware and software	□	□	□	□	●	●	●	●	●	●	●	●	
Correct all deficiencies detected	□	□	□	□	●	●	●	●	●	●	●	●	
Attach / complete maintenance schedule card	△	△	△	△	●	●	●	●	●	●	●	●	
Issue written inspection report	△	△	△	△	●	●	●	●	●	●	●	●	
Compensation for inverter caused downtime	○	○	○	○	○	○	○	○	○	●	●	●	

- Standard
- Not included
- △ Customer responsible for maintenance task to be completed by electrician
- Customer must engage Satcon or Satcon trained technician to complete task

Note: Specifications are subject to change.

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Satcon West  
2925 Bayview Drive  
Fremont, CA 94538  
P: 510.226.3800  
F: 510.226.3801  
E: sales@satcon.com


Satcon Canada  
835 Harrington Court  
Burlington, ON L7N 3P3  
Canada  
P: 905.639.4692  
F: 905.639.0961  
E: sales@satcon.com

Satcon Greece  
Athanasiou Diakou 2 &  
Marathonas Ave  
Gerakas 15344  
Greece  
P: 30 210 6654424  
F: 30 210 6654425  
E: sales@satcon.com

Satcon Czech Republic  
Classic 7 Business Park  
Jankovcova 1037/49  
170 00 Praha 7  
Czech Republic  
P: 420 255 729 610  
F: 420 255 729 611  
E: sales@satcon.com

Satcon Shenzhen China  
Room 1112, 11/F, International  
Chamber of Commerce,  
No. 168 FuHua San Road,  
FuTian District, Shenzhen, P.R.C.  
518048  
P: +86 755 61682588  
F: +86 755 61682599  
E: sales@satcon.com

Satcon Shanghai China  
Room 2308, 23/F, New  
HongQiao Center Building,  
No. 83 LouGuanShan Road,  
Changning District,  
Shanghai, P.R.C.  
P: 139.1811.2818  
E: sales@satcon.com

 <b>Satcon</b>	Satcon Technology Corporation Service Dept. – Warranty Reg. 2925 Bayview Drive Fremont, CA 94538	Name: Twenty (20) Year Warranty for Photovoltaic Inverters	
		Number: COMM-023	
		Revision level: 002	Date: 02/12/2010
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***SATCON TWENTY (20) YEAR WARRANTY  
FOR PHOTOVOLTAIC INVERTERS***

**1.0 DEFINITIONS**


- 1.1. "Manual" means the current Satcon Installation, Operation and Maintenance Guide for the Product covered under this Warranty.
- 1.2. "Operator" means the owner or end-user of the Product for which Service will be performed under the Plan.
- 1.3. "The Product" means the Photovoltaic Inverter purchased from Satcon by Operator.
- 1.4. The "Registration Form" is the Photovoltaic Inverter Warranty Registration Form as set forth in Exhibit A of this Warranty. The Registration Form must be completed and returned to Satcon .
- 1.5. "Service Call" means a Site visit by Satcon technicians in response to a claim.
- 1.6. "Site" means the location of Operator's Product that is covered under this Warranty.
- 1.7. "Warranty Period" means the period of time the Product is covered under this Warranty.
- 1.8. "The Warranty" means this Warranty for Photovoltaic Inverters.

**2.0 WARRANTY**

- 2.1. Satcon warrants that any Product sold hereunder shall be free from defects in material and workmanship and shall substantially conform to the applicable specifications for the Warranty Period terminating two-hundred-forty-six (246) months from the date of delivery or two-hundred-forty (240) months from the date of first use for commercial purposes (but no later than 6 months from the date of delivery), whichever occurs first. The termination date of the warranty is set forth in Article 4 of Exhibit A ("Photovoltaic Inverter Warranty Registration Form") to this Warranty, which should be completed by Operator and returned to Satcon within 14 days of date of first use for commercial purposes.
- 2.2. In full satisfaction of any claim under this warranty, Satcon shall, if satisfied after its inspection, tests or other assessment that the Product is defective, either (i) repair any defective part or parts, or (ii) make available to purchaser or end-user ("Operator") such repaired or replacement part or parts or such service as is required to in Satcon's opinion correct the defect. Parts shall be delivered in accordance with the delivery terms applicable to the parts and services hereunder and any excess or replaced parts shall be returned FCA Seller's factory (INCOTERMS 2000). Service shall be performed during times mutually agreed upon in advance by Satcon and Operator. Satcon and Operator shall mutually agree upon the conduct of any tests required to determine whether a Product is defective in advance of conducting such tests.

**3.0 THIS WARRANTY SHALL BE VOID IN THE EVENT OF THE FOLLOWING:**

- 3.1. The Products have been damaged in shipment or improperly stored, installed or maintained or otherwise have not been used in conformance with the Satcon current Manual or have been altered or repaired without Satcon's prior written consent;
- 3.2. Operator fails to notify Satcon in writing within seventy-two (72) hours of any claim under this warranty; or

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- 3.3. Operator fails to make any Product subject of a claim available for inspection and correction within seventy-two (72) hours of notice of the claim.

**4.0 THIS WARRANTY DOES NOT COVER THE FOLLOWING:**

- 4.1. Damage, malfunction, or degradation of electrical output caused, directly or indirectly, by any repair or replacement using a part or service not provided or authorized in writing by Satcon;
- 4.2. Damage, malfunction, or degradation of electrical output resulting, directly or indirectly, from Operator or third party abuse, accident, alteration, improper use, negligence or vandalism, or from earthquake beyond the Product’s rating, fire, flood, direct lightning strike to the Product, other acts of God or severe weather beyond the Product’s rating or by any other events outside of the control of Satcon;
- 4.3. Damage, malfunction, or degradation of electrical output resulting, directly or indirectly, from any third party components or monitoring systems that are either supplied by Operator or specified by Operator or purchased by Satcon on behalf of Operator, and incorporated into the Product;
- 4.4. Non-scheduled maintenance and repairs as a direct result of improper maintenance or the non-performance of maintenance, as set forth in the Satcon current Manual.
- 4.5. Internal and/or external damage as a result of non-Satcon involved shipping, installation that is not provided by Satcon, or any repair that is not covered during the Warranty Period.
- 4.6. Additional maintenance that may be required as a result of the Product being operated in severe, extreme or unusual conditions or otherwise not in accordance with the Satcon current Manual.
- 4.7. Additional maintenance that may be required as a result of any modification made to the Product that was not approved by Satcon.
- 4.8. Additional maintenance that may be required as a result of the following:
- 4.8.1. Accidental damage, abuse, misuse or consequential damage as a result of such an action, which is not caused by Satcon.
  - 4.8.2. Failure to use the Product in accordance with the instructions contained in the Satcon current Manual.
  - 4.8.3. Failure to ensure that the Product is properly, regularly and punctually serviced in accordance with the instructions and recommendations specified in the Satcon current Manual.
  - 4.8.4. The Product being serviced by persons other than Satcon-authorized personnel.
  - 4.8.5. Installation of non-Satcon approved parts.
  - 4.8.6. Any repairs required as a result of continued operation of the Product once a defect has occurred (Including over-temperature situations or inadequate air flow)

**5.0 THIS WARRANTY IS CONDITIONAL UPON THE FOLLOWING:**

- 5.1. If applicable, the installation and operation, at Seller’s sole discretion, of Seller’s remote monitoring system to verify the performance of any Product sold under this Agreement;

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- 5.2. Satisfactory inspection by Satcon’s service representative, at Satcon’s sole discretion, not more frequently than once a year;
- 5.3. Satisfactory rectification by Operator, at its sole expense, of any adverse or dangerous conditions or circumstances identified by monitoring or inspection;
- 5.4. Operator executing and delivering to Satcon, the Registration Form and, if applicable, the Satcon remote monitoring licensing agreements.
- 5.5. The customer is responsible for performing annual preventative maintenance per the Satcon current Manual:

**6.0 SITE ACCESS FOR SERVICE CALLS:**

- 6.1. Operator shall provide Satcon Service personnel with access to the Site and any special instructions for access to the Site. Satcon shall have no liability in the event that access is not provided to the Site and Operator will be invoiced for any costs incurred by Satcon in the event an additional visit is required to the Site due to lack of access.
- 6.2. It is the Operator's responsibility to notify Satcon of any hazards at the Site and assure that the Site is free from hazards or obstructions, and that all safety precautions are followed at the Site.

**7.0 FORCE MAJEURE.**


- 7.1. Neither Party shall be liable hereunder by reason of any failure or delay in the performance of its obligations hereunder on account of acts of God or other cause which is beyond the reasonable control of such Party and could not have been avoided by the exercise of reasonable prudence, including but not limited to natural disasters (e.g. earthquakes, floods, landslides), explosions, fire, destruction of machines, equipment, factories and of any kind of installation, prolonged break-down of transport, telecommunication or electric current or other circumstances with comparable effects (e.g. terroristic attacks, nuclear accidents, war, civil war or similar uprising, general strike, strike, lock-out). In the event of the occurrence of any force majeure event, the affected Party shall notify the other Party immediately in writing of the invocation of this Section, and each Party's obligations hereunder to the other shall be suspended for the duration of such force majeure event; provided, however, that the affected Party shall be obligated to use its commercially reasonable efforts to restore performance hereunder as soon as reasonably practicable, and provided, further, that if such event continues for more than thirty (30) days in the aggregate in any six (6) month period, the non-affected Party shall have the right to terminate this Agreement at any time upon written Notice to the other Party.

**8.0 ASSIGNMENT**

- 8.1. This warranty extends to the Operator, including any subsequent Operator or a lessee or assignee of a lease, at the same Site during the Warranty Period of the Product purchased by Operator, with the exception that the continuation of the warranty for an installed Product relocated to another site is subject to a site inspection by Satcon at the new Site prior to installation, at Operator’s expense.

**9.0 INSURANCE**


Each Party shall maintain the following insurance coverage to insure risks at the Site:

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- 9.1. Workers Compensation providing statutory limits and coverage and Employer’s Liability, in an amount not less than Five Hundred Thousand Dollars (US\$500,000) policy limits.
- 9.2. Commercial General Liability covering bodily injury (including death) and property damage in an amount not less than One Million Dollars (US\$1,000,000) per occurrence. This includes premises Operations, Contractual Liability, Products and Completed Operations, and Broad Form Property Damage.
- 9.3. Commercial Automobile Liability in an amount not less than One Million Dollars (US\$1,000,000) combined single limit per accident, covering all owned, non-owned, leased, rented or hired autos used in connection with the performance of this Plan.

**10.0 LIMITS OF LIABILITY**

- 10.1. THIS WARRANTY CONSTITUTES OPERATOR’S SOLE AND EXCLUSIVE REMEDY FOR CLAIMS AGAINST SATCON IN RESPECT TO DEFECTIVE OR NON-CONFORMING PRODUCTS HEREUNDER AND IS IN LIEU OF ALL OTHER WARRANTIES, CONDITIONS, GUARANTEES OR REPRESENTATIONS FROM SATCON RELATING TO THE PRODUCTS HEREUNDER, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, IN CONTRACT, TORT OR OTHERWISE, INCLUDING WITHOUT RESTRICTION, ANY WARRANTIES OF MERCHANTABILITY OR FOR FITNESS OF PURPOSE, AND ANY SUCH WARRANTY, CONDITION, GUARANTEE OR REPRESENTATION IS HEREBY EXCLUDED.
- 10.2. IN NO EVENT SHALL ANY CLAIM, FAILURE OF ANY PRODUCT HEREUNDER, OR BREACH OF THIS WARRANTY, RENDER SATCON, ITS AFFILIATES, SUBCONTRACTORS OR SUPPLIERS LIABLE TO OPERATOR OR ITS AFFILIATES FOR INDIRECT OR CONSEQUENTIAL DAMAGES OR LOSS OF USE ASSOCIATED WITH WARRANTY CLAIMS FOR LOST PROFITS OR LOSS OF REVENUES, OR ANY ASSOCIATED EQUIPMENT, COST OF CAPITAL, COST OF SUBSTITUTE EQUIPMENT, FACILITIES, SERVICES OR REPLACEMENT POWER, DOWNTIME COSTS, CLAIMS OF OPERATOR’S CUSTOMERS FOR SUCH DAMAGES, OR FOR ANY OTHER SPECIAL, CONSEQUENTIAL, INCIDENTAL, INDIRECT OR EXEMPLARY DAMAGES.
- 10.3. SATCON’S TOTAL LIABILITY FOR ANY AND ALL WARRANTY CLAIMS AND COSTS UNDER THIS WARRANTY SHALL NOT EXCEED THE TOTAL AMOUNT OF PAYMENTS RECEIVED BY SATCON FOR THE PRODUCT THAT IS THE SUBJECT OF A CLAIM.

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**EXHIBIT A**

**PHOTOVOLTAIC INVERTER WARRANTY REGISTRATION FORM**

This completed Registration form must be returned to Satcon at the following address at time of first use for commercial purposes:

**Satcon Technology Corporation**  
**Service Department – Warranty Registration**  
**2925 Bayview Drive**  
**Fremont, CA 94538**  
Support@satcon.com

**1. OPERATOR:**

<b>Operator Name:</b>	
<b>Operator Type:</b>	<input type="checkbox"/> Integrator <input type="checkbox"/> Site Owner <input type="checkbox"/> Financier / PPA <input type="checkbox"/> Other _____
<b>Street Address:</b>	
<b>City, State, Zip Code:</b>	
<b>Contact Name:</b>	
<b>Contact Phone:</b>	
<b>Contact Email:</b>	

**2. PRODUCT SUBJECT TO THIS WARRANTY: (Enter Information From Inverter Nameplate)**

<b>Model #:</b>	
<b>Serial #:</b>	

**3. SITE OF THE PRODUCT:**

<b>Site Name:</b>	
<b>Street Address:</b>	
<b>City, State, Zip Code:</b>	

**4. WARRANTY TERMINATION DATE:**

<b>Date of First Use:</b>	
<b>Date of Delivery:</b>	
<b>Warranty Period:</b>	20 Years
<b>TO BE COMPLETED BY SATCON:</b>	
<b>Termination Date of Warranty:</b>	

**SATCON TECHNOLOGY CORPORATION**

**OPERATOR:**

By: \_\_\_\_\_ By: \_\_\_\_\_

Printed Name: \_\_\_\_\_ Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_ Title: \_\_\_\_\_

Date: \_\_\_\_\_ Date: \_\_\_\_\_



## SHARP ELECTRONICS CORPORATION PHOTOVOLTAIC MODULE LIMITED WARRANTY

Sharp Electronics Corporation warrants to the first consumer purchaser that this Sharp brand product (the "Product"), when shipped in its original container, will be free from defective workmanship and materials, and agrees that it will, at its option, either repair the defect or replace the defective Product or part thereof with a new or remanufactured equivalent at no charge to the purchaser for parts or labor for the period(s) set forth below.

This warranty does not apply to any appearance items of the Product nor to the additional excluded item(s) set forth below nor to any Product the exterior of which has been damaged or defaced, which has been subjected to misuse, abnormal service or handling, or which has been altered or modified in design or construction.

In order to enforce the rights under this limited warranty, the purchaser should follow the steps set forth below and provide proof of purchase to the servicer.

The limited warranty described herein is in addition to whatever implied warranties may be granted to purchasers by law. ALL IMPLIED WARRANTIES INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR USE ARE LIMITED TO THE PERIOD(S) FROM THE DATE OF THE PURCHASE SET FORTH BELOW. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Neither the sales personnel of the seller nor any other person is authorized to make any warranties other than those described herein, or to extend the duration of any warranties beyond the time period described above on behalf of Sharp.

The warranties described herein shall be the sole and exclusive warranties granted by Sharp and shall be the sole and exclusive remedy available to the purchaser. Correction of defects, in the manner and for the period of time described herein, shall constitute complete fulfillment of all liabilities and responsibilities of Sharp to the purchaser with respect to the Product and shall constitute full satisfaction of all claims, whether based on contract, negligence, strict liability or otherwise. In no event shall Sharp be liable, or in any way responsible, for any damages or defects in the Product which were caused by repairs or attempted repairs performed by anyone other than an authorized servicer. Nor shall Sharp be liable or in any way responsible for any incidental or consequential economic or property damage. Some states do not allow the exclusion of incidental or consequential damages, so the above exclusion may not apply to you.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY ALSO HAVE OTHER RIGHTS, WHICH VARY FROM STATE TO STATE.

Product Model Number & Description:

NT-S5E1U, NT-185U1, NT-180U1, NT-R5E1U, NT-175U1, NT-170U1, ND-216U2, ND-216U1F, ND-208U2, ND-208U1, ND-208U1F, ND-205U1, ND-200U2, ND-200U1, ND-200U1F, ND-187U2, ND-187U1, ND-187U1F, ND-181U2, ND-181U1, ND-181U1F, ND-167U1Y, ND-167U2, ND-167U1, ND-167U3, ND-167U3A, ND-167U1F, NE-175U1, NE-170U1, NE-Q5E2U, NE-165U5, NE-165U1, NE-160U1, ND-162U2, ND-162U1, ND-162U1F, ND-162U1Y, ND-160U1Z, ND-160U3, ND-L5E1U, ND-L5E1UF, ND-125U2, ND-125U1F, ND-L3E1U, ND-L3EJE, ND-L3EJEA, ND-L3EJEF, ND-123JEF, ND-123UJF, ND-60RU1, ND-62RU1, ND-62RU1F, ND-62RU2, NE-80E1U, NE-80EJE, NE-80EJEA, ND-Q0E2U, ND-N6E1U, ND-N2ECU, ND-N2ECUF, ND-N0ECU,

SHARP ELECTRONICS CORPORATION  
Sharp Plaza, Mahwah, New Jersey 07430-2135





NE-K125U2, ND-72ELU, ND-72ELUF, ND-72ERU, ND-72ERUF, ND-70ELU, ND-70ERU, ND-224U1F, ND-224U2, ND-220U1F, ND-220U2, ND-130UJF, ND-65RU1F, ND-176U1Y, ND-198U1F, ND-V230A1, NT-175UC1, NE-170UC1, ND-U230C1, ND-224UC1, ND-U224C1, ND-220UC1, ND-216UC1, ND-U216C1, ND-208UC1, ND-198UC1, ND-187UC1, ND-176UC1, ND-N2ECUC, ND-72ERUC/ND-72ELUC, NU-U230F3, NU-U235F1.

(Be sure to have this information available when you need service for your product.)

Warranty Period for this Product:

The warranty period for material defects and workmanship is one year from date of purchase. The warranty period with respect to power output continues for a total of 25 years from date of purchase, the first 10 years at 90% minimum rated power output and the balance of 15 years at 80% minimum rated power output.

This warranty is transferable when product remains installed in original location at the time of product warranty registration.

**Additional Item(s) Excluded from Warranty Coverage**

Warranty coverage does not apply when:

- a) the Product is improperly installed,
- b) the Product is installed in a mobile or marine environment, subjected to improper voltage or power surges or abnormal environmental conditions (such as acid rain or other pollution),
- c) the components in the construction base on which the module is mounted are defective
- d) external corrosion, mold discoloration or the like occurs.

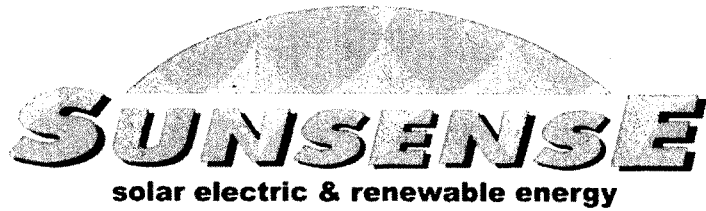
Where to Obtain Service:

Warranty service is available at a Sharp Authorized Dealer located in the United States. To find the location of the nearest Sharp Authorized Dealer, call Sharp toll free at 1-800 SOLAR06 (800-765-2706).

Call toll free at 1-800-765-2706 to obtain a Return Authorization Number and shipping instructions. **Proof of Purchase** will be required.

What to do to Obtain Service:

Ship prepaid or carry in your Product to a Sharp Authorized Dealer. Be sure to have **Proof of Purchase** available. If you ship the Product, be sure it is insured and packaged securely. Sharp will not be responsible for the costs of de-installation or reinstallation.



## **WARRANTY POLICY**

Sunsense Inc. is a full-time, full-service solar electric and renewable energy company. The following outline reflects the basic policies of Sunsense with regard to warranty of both service work and products.

Design, construction and installation services are under warranty by Sunsense for a period of (5) five years upon completion of the project (provided invoice amount is paid in full). During this period, Sunsense will replace or repair, based on its own determination, any portion of workmanship that has proven to fail.

All parts and equipment used for construction of the project are subject to manufacturers warranties. Sunsense will repair or replace any faulty equipment for a period of (5) five years after which the client will be responsible for warranty issues.

Sunsense will not be responsible for unauthorized design revisions nor will Sunsense be responsible for materials and equipment not purchased through Sunsense.

Sunsense stands behind this warranty policy and will make every effort to work with our clients to provide the highest quality service under fair and reasonable terms.

# ACORD CERTIFICATE OF LIABILITY INSURANCE

OP ID LK  
SUNSE-5

DATE (MM/DD/YYYY)  
01/25/10

**PRODUCER**  
Neil-Garing Agency, Inc.  
PO Box 1576  
Glenwood Springs CO 81602  
Phone: 970-945-9111 Fax: 970-945-2350

**INSURED**  
Sunsense Inc  
Scott Ely  
1629 Dolores Way Suite E  
Carbondale CO 81623

**THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.**

INSURERS AFFORDING COVERAGE	NAIC #
INSURER A: Acuity Insurance Co.	14184
INSURER B: Pinnacol Assurance	
INSURER C:	
INSURER D:	
INSURER E:	

**COVERAGES**

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR ADD'L LTR INSRD	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS
A	<b>GENERAL LIABILITY</b> <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY CLAIMS MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC	L72431	11/01/09	11/01/10	EACH OCCURRENCE \$ 1,000,000
	DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 250,000				
	MED EXP (Any one person) \$ 10,000				
	PERSONAL & ADV INJURY \$ 3,000,000				
	GENERAL AGGREGATE \$ 3,000,000				
					PRODUCTS - COMP/OP AGG \$ 3,000,000
A	<b>AUTOMOBILE LIABILITY</b> <input checked="" type="checkbox"/> ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS HIRED AUTOS NON-OWNED AUTOS	L72431	11/01/09	11/01/10	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000
					BODILY INJURY (Per person) \$
					BODILY INJURY (Per accident) \$
					PROPERTY DAMAGE (Per accident) \$
	<b>GARAGE LIABILITY</b> ANY AUTO				AUTO ONLY - EA ACCIDENT \$ OTHER THAN EA ACC \$ AUTO ONLY: AGG \$
A	<b>EXCESS/UMBRELLA LIABILITY</b> <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> CLAIMS MADE DEDUCTIBLE RETENTION \$	L72431	11/01/09	11/01/10	EACH OCCURRENCE \$ 2,000,000
					AGGREGATE \$ 2,000,000
					\$
B	<b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b> ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? If yes, describe under SPECIAL PROVISIONS below	4103541	04/01/09	04/01/10	<input checked="" type="checkbox"/> WC STATU-TORY LIMITS <input checked="" type="checkbox"/> OTH-ER
					E.L. EACH ACCIDENT \$ 500,000
					E.L. DISEASE - EA EMPLOYEE \$ 500,000
	OTHER				E.L. DISEASE - POLICY LIMIT \$ 500,000

**DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / EXCLUSIONS ADDED BY ENDORSEMENT / SPECIAL PROVISIONS**  
10-day notice of cancellation applies for non-payment of premium.

**CERTIFICATE HOLDER**

**CANCELLATION**  
SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.  
AUTHORIZED REPRESENTATIVE  
*[Signature]*

## **IMPORTANT**

If the certificate holder is an **ADDITIONAL INSURED**, the policy(ies) must be endorsed. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

If **SUBROGATION IS WAIVED**, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

## **DISCLAIMER**

The Certificate of Insurance on the reverse side of this form does not constitute a contract between the issuing insurer(s), authorized representative or producer, and the certificate holder, nor does it affirmatively or negatively amend, extend or alter the coverage afforded by the policies listed thereon.

*Neil-Garing*  
INSURANCE

January 25, 2010

Re: Sunsense Inc  
Bonding

To Whom It May Concern:

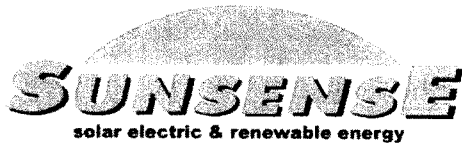
We are pleased to share with you our experience as the agent of the surety, AMCO Insurance Company, for Sunsense, Inc. We consider Sunsense, Inc one of our outstanding and valued clients in whom we have the highest confidence. It has been a privilege to provide surety bonds for Sunsense. Through the years this company has, in our opinion, remained properly financed, well equipped and capably managed.

AMCO Insurance Company is prepared to give favorable consideration to the execution of contract performance and payment bonds for Sunsense, Inc. Please note that the decision to issue performance and payment bonds for Sunsense, Inc will be subject to our standard underwriting at the time of the final bond request, which will include but not be limited to the acceptability of the contract documents, bond forms and financing. We assume no liability to third parties or to you if for any reason we do not execute said bonds.

We are pleased to share with you our experience with this fine organization. If you require any additional information, please let us know.

Best Regards,

Craig Smiley  
agent



## **Sunsense Solar Safety/Instruction Manual**

### **Hazard Evaluation and Control (excerpt from Manual)**

#### **Identifying hazards**

Identifying Hazards is the first and most crucial step in creating a safe-and-injury-free workplace. Often times identifying hazards is as easy as looking at the space around you.

- Is the area clean and free of trip or impalement hazards?
- Are there any uncovered holes or edges without guardrails?
- Are there any overhead hazards, such as people working above or overhead power lines?

Other times identifying hazards can be harder and require a sharper eye or even training.

- Are ladders set up and secured properly?
- If scaffolding is used, is it level and tied off as often as necessary?
- Is there risk of an electrical or any type of contained energy hazard?
- Have ladders, guardrails, scaffolding, and PPE been well inspected for potential faults?
- Are all corded tools protected with GFCI's?

#### **Hazard Containment**

Once hazards have been identified, the next step should be thinking about how they can be removed, avoided, or contained.

- Can the work be performed in another, safer, area?
- Can the area be cleared of trip or impalement hazards?
- Can ladders and scaffolding be set up and tied off as to meet or exceed OSHA standards?
- Has all damaged equipment (i.e. Ladders, PPE, power tools, or extension cords) been marked "damaged" and removed from service?

#### **Engineered Controls**

If the identified hazards cannot be contained engineering controls must be put into place. This is another area where a trained competent person should be utilized.

- If there is an unprotected edge that presents a fall hazard, then guardrails must be erected with a top plate between 39" and 42". A toe board at 3 ½" and a mid rail.
- If there is an open hole it must be adequately covered.

- If impalement hazards cannot be removed they must be capped with “mushroom caps” or other OSHA certified device.
- If it is possible to perform the work, at least 4’ away from leading edge, than a warning line must be erected around work zone that is stable enough to withstand a 30lb force and marked with red flags appropriately.

There are many other engineering controls that can be used to mitigate hazards that should be put in place by a competent person and inspected regularly.

### **Personal Protection Equipment**

When hazards cannot be contained, and engineering controls are not feasible, then proper PPE must be utilized. The type of PPE to be used should be chosen wisely, and if an infrastructure is needed, like that required by fall protection equipment, a competent person should set it up. PPE includes, but is not limited to:

- Safety glasses
- Work gloves
- Safety harness
- Ropes, Lanyards, and Rope Grabs
- Hard Hats

### **Accident Response**

Before accidents occur all employees on sight should know where first aid supplies are kept, where the nearest hospital is, and where emergency numbers are listed. This way everyone is ready to properly respond to an accident. Sunsense keeps at least one first aid certified crew member on site at all times to help with proper response procedure.

### **Accident Investigation**

Accidents resulting in “lost time” must be investigated as soon as possible. Sunsense adheres to these five steps for effective accident investigation.

- **Gather Information:** The investigation team learns the facts about the accident and interviews witnesses and others involved. An accident investigation form helps document the facts and organize the information.
- **Analyze Facts:** The investigation team identifies the accident’s causes and contributing factors, and determines how the accident could have been prevented.
- **Report Findings:** A written report is prepared that describes who was involved, where the accident occurred, when it happened, and what caused it. The report recommends what can be done to prevent the accident from happening again.
- **Act on recommendations:** Management reviews the report and determines how to prevent the accident from happening again.
- **Follow up:** The investigation team ensures that appropriate action was taken to prevent accident from reoccurring.







# JOB SAFETY ANALYSIS

**Checklist:**

- Personal Protective Equipment
- Hearing Protection
- Eye and Face Protection
- Hand Protection
- Feet Protection
- Fall Protection
- Fire Protection
- Clean-Up Equipment
- Lifting Equipment
- Right Tools for the Job
- Incident Reporting Procedure
- Emergency Notification
- First Aid
- Other:
- Other:

**Permit:**

- Posted & Visible?
- 
- 

**Detailed Access / Egress Routes For This Job:**


Corrective Actions:	Follow-Up:

On-Site Personnel:	Signature:



## **Sunsense Health & Safety Policy Statement**

The health and safety of all Sunsense employees is our foremost business consideration. No employee will be required to do a job that he or she considers unsafe. Sunsense will comply with all applicable OSHA workplace safety and health requirements and maintain occupational health and safety standards that equal or exceed the best industry practices.

Sunsense will establish a safety committee, consisting of management and labor representatives whose responsibility will be to identify hazards and unsafe work practices, removing obstacles to prevent accidents, and helping evaluate Sunsense's effort to achieve an accident-and-injury-free workplace.

Sunsense pledges to:

- Provide mechanical and physical safeguards wherever necessary.
- Conduct routine safety and health inspections to find and eliminate unsafe working conditions, control health hazards, and comply with applicable OSHA safety and health requirements.
- Train all employees in safe work practices and procedures.
- Provide employees with necessary personal protective equipment and train them to use and care for it properly.
- Enforce company health and safety rules and require employees to follow the rules as a condition of employment.
- Investigate accidents to determine the cause and to prevent similar incidents.

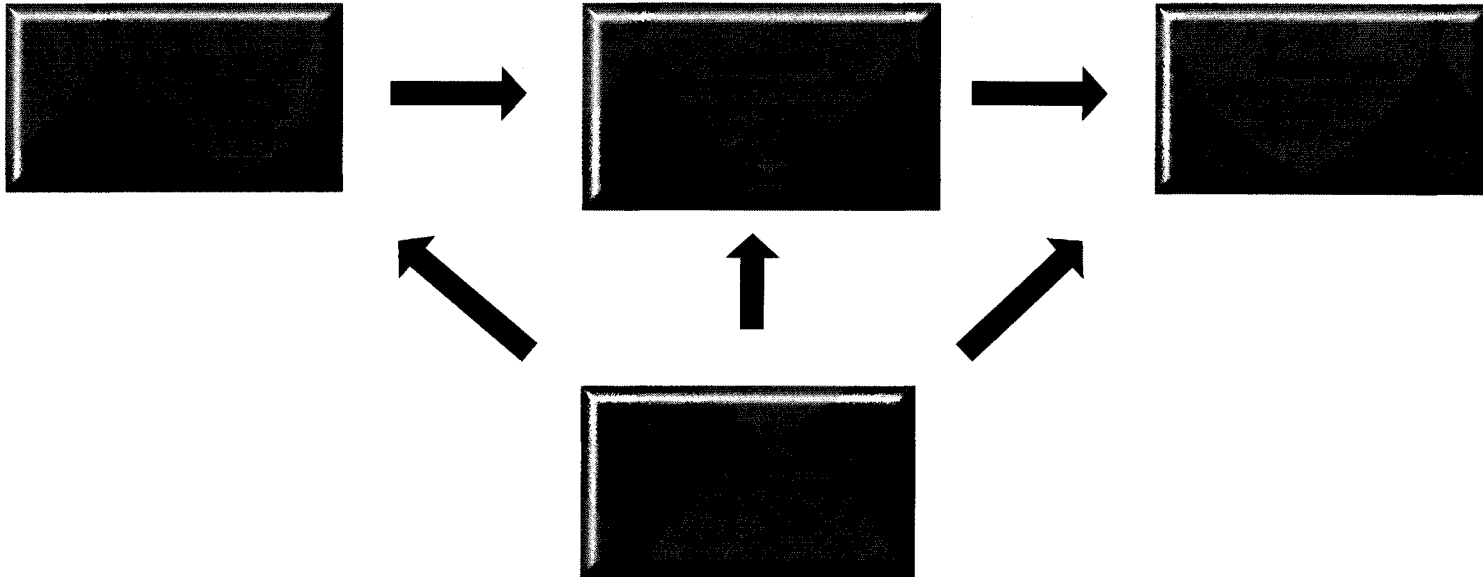
Sunsense recognizes that managers, supervisors, and all other employees share responsibility for a safe and healthful workplace.

- Management is accountable for preventing workplace injuries and illnesses. Management will consider all employee suggestions for achieving a safer, healthier workplace. Management also will keep informed about workplace health and safety hazards and regularly review the safety and health program.
- Supervisors are responsible for supervising and training workers in safe work practices.
- Supervisors must enforce safety rules and ensure that employees follow safe practices during their work.
- Employees are expected to participate in health and safety program activities including, immediately reporting hazards, unsafe work practices, and accidents to supervisors or a safety committee representative, and wearing required personal protective equipment.

Scott Ely, President – Sunsense Inc.

## City of Grand Junction - Water Treatment Plant

1	Finalize Design / Contract	10				
2	Equipment Procurement / Permitting	11				
3	Mobilization	11				
4	Infrastructure Installation	22				
5	Solar Electric Installation	34				
6	Commissioning / Training	11				
7	Project Completion / Reporting	22				



**PAYMENT BOND**

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned \_\_\_\_\_  
Sunsense, Inc \_\_\_\_\_, a corporation organized under the laws of the State  
of Colorado \_\_\_\_\_, hereinafter referred to as the "Contractor" and AMCO Insurance  
Company \_\_\_\_\_, a corporation organized under the laws of the State of  
Iowa \_\_\_\_\_, and authorized and licensed to transact business in the State of Colorado,  
hereinafter referred to as the "Surety," are held and firmly bound unto the City of Grand  
Junction, Colorado, hereinafter referred to as the "City," in the penal sum of Five hundred  
Three Thousand Thirty Four and no/100 \*\*\*\*\*  
dollars (\$ 503,034.00 ), lawful money of the United States of America, for the  
payment of which sum the Contractor and Surety bind themselves and their heirs, executors,  
administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above Contractor has on the 25th day of June, ~~200~~<sup>2010</sup>,  
entered into a written contract with the City for furnishing all labor, materials, equipment, tools,  
superintendence, and other facilities and accessories for the construction of Water Treatment  
Plant Solar Energy System (the "Project") and Contract  
No. 3114-09, if appropriate, in accordance with the Contract, Special Conditions, Special  
Provisions, General Contract Conditions, Contract Drawings, Specifications and all other  
Contract Documents therefor which are incorporated herein by reference and made a part hereof,  
and are herein referred to as the "Contract".

NOW, THEREFORE, the condition of this payment bond obligation is such that if the  
Contractor shall at all times promptly make payments of all amounts lawfully due to all persons  
supplying or furnishing it or its subcontractors with labor, materials, rental machinery, tools or  
equipment, used or performed in the prosecution of work provided for in the above Contract and  
shall indemnify and save harmless the City to the extent of any and all payments in connection  
with the carrying out of such Contract which the City may be required to make under the law,  
and for all losses, damages, expenses, costs, and attorneys' fees incurred by the City resulting  
from the failure of the Contractor to make the payments discussed above, then this obligation  
shall be null and void, otherwise, it shall remain in full force and effect.

PROVIDE FURTHER, that the said Surety, for value received, hereby stipulates and  
agrees that any and all changes in the Contract Documents, or compliance or noncompliance  
with the formalities in the Contract for making such changes shall not affect the Surety's  
obligations under this bond and the Surety hereby waives notice of any such changes. Further,  
Contractor and Surety acknowledge that the penal sum of this bond shall increase or decrease in

accordance with approved changes to the Contract Documents without obtaining the Surety's consent up to a maximum of 20 percent of the penal sum. Any additional increases in the penal sum shall require the Surety's consent.

IN WITNESS WHEREOF, said Contractor and said Surety have executed these presents as of this 14th day of July, ~~200~~ 2010.

CONTRACTOR: Sunsense, Inc

By: Scott Ely

Title: President

ATTEST: [Signature]  
Secretary Witness

SURETY: AMCO Insurance Company

By: Craig A. Smiley

Title: Attorney-in-Fact

(Accompany this Bond with the attorney-in-fact's authority from the surety to execute this Bond, certified to include the date of the Bond.)

**Power of Attorney**

KNOW ALL MEN BY THESE PRESENTS That AMCO Insurance Company, a corporation organized under the laws of the State of Iowa, with its principal office in the City of Des Moines, Iowa, hereinafter called "Company", does hereby make, constitute and appoint  
**HEIDI A. MCGUIRE**  
**JOHN F. NEIL**  
**CRAIG A. SMILEY**

**GLENWOOD SPRINGS CO**

each in his individual capacity, its true and lawful Attorney-In-Fact with full power and authority to sign, seal, and execute in its behalf any and all bonds and undertakings and other obligatory instruments of similar nature (except bonds guaranteeing the payment of principal and interest of notes, mortgage bonds and mortgages) in penalties not exceeding the sum of

**ONE MILLION AND NO/100 DOLLARS** (\$ 1,000,000.00 )

and to bind the Company thereby, as fully and to the same extent as if such instruments were signed by the duly authorized officers of the Company; and all acts of said Attorney pursuant to the authority hereby given are hereby ratified and confirmed.

This Power of Attorney is made and executed pursuant to and by authority of the following By-Laws duly adopted by the Board of Directors of the Company.

**ARTICLE 7 EXECUTION OF CONTRACTS**

"Section 7.4 Instruments Issued by the Corporation. Bonds, undertakings, and other obligatory instruments of similar nature, other than insurance policies and insurance endorsements, issued by the Corporation shall be validly executed and binding on the Corporation when signed by the President or a Vice President or by the Attorney(s)-In-Fact appointed by the President or by a Vice President."

"Section 7.5 Appointment of Agents. The President or a Vice President shall have the power to appoint agents of the Corporation, or other persons, as Attorney(s)-In-Fact to act on behalf of the Corporation in the execution of bonds, undertakings, and other obligatory instruments of similar nature, other than insurance policies and endorsements, with full power to bind the Corporation by their signature and execution of any such instrument. The appointment of such Attorney(s)-In-Fact shall be accomplished by Powers of Attorney signed by the President or the Vice President."

This Power of Attorney is signed and sealed by facsimile under and by the following By-Laws duly adopted by the Board of Directors of the Company.

**ARTICLE 7 EXECUTION OF CONTRACTS**

"Section 7.6 Verifications. The Secretary, or any Assistant Secretary, is authorized to certify that any such Power of Attorney signed is validly executed and binding on the Corporation and to certify that any bond, undertaking, or obligatory instrument of similar nature, other than insurance policies and endorsements, to which the Power of Attorney is attached is and shall continue to be a valid and binding obligation of the Corporation, according to its terms, when executed by Attorney(s)-In-Fact appointed by the President or Vice President."

"Section 7.7 Use of Corporate Seal. It shall not be necessary to the valid execution and binding effect on the Corporation of any bond, undertaking, or obligatory instrument of similar nature, other than insurance policies and endorsements, signed on behalf of the Corporation by the President or a Vice President, or Attorney(s)-In-Fact appointed by the President or a Vice President, or of any Power of Attorney executed on behalf of the Corporation appointing Attorney(s)-In-Fact to act for the Corporation, or of any certificate to be executed by the Secretary or an Assistant Secretary, as hereinabove in Sections 7.4, 7.5, and 7.6 provided, that the corporate seal be affixed to any such instrument, but the person authorized to sign such instrument may affix the corporate seal. A facsimile corporate seal affixed to any such instrument shall be as effective and binding as the original seal."

"Section 7.8 Other Facsimile Signatures. A facsimile signature of the President or of a Vice President affixed to any bond, undertaking, or obligatory instrument of similar nature, other than policies and endorsements, or to a Power of Attorney signed by such President or a Vice President, as herein in Sections 7.4 and 7.5 provided, or a facsimile signature of the Secretary or of an Assistant Secretary to any certificate as herein in Section 7.6 provided, shall be effective and binding upon the Corporation with the same force and effect as the original signatures of any such officers."

"Section 7.9 Former Officers. A facsimile signature of a former officer shall be of the same validity as that of an existing officer, when affixed to any insurance policy or insurance endorsement, any bond or undertaking, any Power of Attorney or certificate, as herein in Sections 7.1, 7.2, 7.4, 7.5, and 7.6 provided."

IN WITNESS WHEREOF, the Company has caused these presents to be signed by its Vice President and its corporate seal to be hereunto affixed this **15** day of **APRIL**, 2008

**AMCO INSURANCE COMPANY**

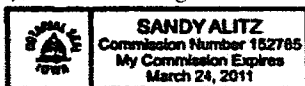
By: *Brett Harman* Vice President

STATE OF IOWA  
COUNTY OF POLK ss



On this **15** day of **APRIL**, 2008 before me personally came Brett Harman, to me known, who, being by me duly sworn, did depose and say that he is Vice President of AMCO Insurance Company, the corporation described in and which executed the above instrument; that he knows the seal of said corporation, that the seal affixed to said instrument is such corporation seal; that it was so affixed pursuant to authority given by the Board of Directors of said corporation and that he has signed his name thereto pursuant to like authority, and acknowledged the same to be the act and deed of said corporation.

Sandy Alitz *Sandy Alitz*  
Notary Public in and for the State of Iowa



**CERTIFICATE**

I, the undersigned, Assistant Secretary of AMCO Insurance Company, a corporation organized under the laws of the State of Iowa, do hereby certify that the foregoing Power of Attorney is still in force, and further certify that Sections 7.4 through 7.9 inclusion of Article 7 of the By-Laws of the Company set forth in said Power of Attorney are still in force.

IN TESTIMONY WHEREOF, I have subscribed my name and affixed the seal of the company this **14th** day of **July**, 2010

07239

This Power of Attorney expires  
**04/15/11**



*John P. Delaney*  
Assistant Secretary

**PERFORMANCE BOND**

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned \_\_\_\_\_  
Sunsense, Inc, a corporation organized under the laws of the State  
of Colorado, hereinafter referred to as the "Contractor" and AMCO Insurance  
Company, a corporation organized under the laws of the State of  
Iowa, and authorized and licensed to transact business in the State of Colorado,  
hereinafter referred to as the "Surety," are held and firmly bound unto the City of Grand  
Junction, Colorado, hereinafter referred to as the "City", in the penal sum of Five Hundred  
Three Thousand Thirty Four and no/100 \*\*\*\*\*  
dollars (\$ 503,034.00 ), lawful money of the United States of America, for the  
payment of which sum the Contractor and Surety bind themselves and their heirs, executors,  
administrators, successors and assigns, jointly and severally by these presents.

WHEREAS, the above Contractor has on the 25th day of June, <sup>2010</sup>~~2009~~,  
entered into a written contract with the City for furnishing all labor, materials, equipment, tools,  
superintendence, and other facilities and accessories for the construction of Water Treatment  
Plant Solar Energy System (the "Project") and Contract  
No. 3114-09, if appropriate, in accordance with the Contract, Special Conditions, Special  
Provisions, General Contract Conditions, Contract Drawings, Specifications and all other  
Contract Documents therefor which are incorporated herein by reference and made a part hereof,  
and are herein referred to as the "Contract".

NOW, THEREFORE, the conditions of this performance bond are such that if the  
Contractor:

1. Promptly and faithfully observes, abides by and performs each and every covenant, condition and part of said Contract, including, but not limited to, its warranty provisions, in the time and manner prescribed in the Contract, and
2. Pays the City all losses, damages (liquidated or actual, including, but not limited to, damages caused by delays in performance of the Contract), expenses, costs and attorneys' fees, that the City sustains resulting from any breach or default by the Contractor under the Contract,

then this bond is void; otherwise, it shall remain in full force and effect.

IN ADDITION, if said Contractor fails to duly pay for any labor, materials, team hire, sustenance, provisions, provender, or any other supplies used or consumed by said Contractor or its subcontractors in its performance of the Work contracted to be done or fails to pay any person who supplies rental machinery, tools, or equipment, all amounts due as the result of the use of such machinery, tools or equipment in the prosecution of the work, the Surety shall pay the same in an amount not exceeding the amount of this obligation, together with interest at the rate of eight percent per annum.

PROVIDED FURTHER, that the said Surety, for value received, hereby stipulates and agrees that any and all changes in the Contract or compliance or noncompliance with the formalities in the Contract for making such changes shall not affect the Surety's obligations under this bond and the Surety hereby waives notice of any such changes. Further, Contractor and Surety acknowledge that the penal sum of this bond shall increase in accordance with approved changes to the Contract Documents without obtaining the Surety's consent up to a maximum of 20 percent of the penal sum. Any additional increases in the penal sum shall require the Surety's consent.

IN WITNESS WHEREOF, said Contractor and said Surety have executed these presents as of this 14th day of July, ~~2001~~ 2010.

CONTRACTOR: Sunsense, Inc

By: Don Gay

Title: President

ATTEST: Archieley  
Secretary Witness

SURETY: AMCO Insurance Company

By: Craig A. Smiley

Title: Attorney-in-Fact

(Accompany this Bond with the attorney-in-fact's authority from the surety to execute this Bond, certified to include the date of the Bond.)





**Power of Attorney**

KNOW ALL MEN BY THESE PRESENTS That AMCO Insurance Company, a corporation organized under the laws of the State of Iowa, with its principal office in the City of Des Moines, Iowa, hereinafter called "Company", does hereby make, constitute and appoint  
**HEIDI A. MCGUIRE** **CRAIG A. SMILEY**  
**JOHN F. NEIL**

**GLENWOOD SPRINGS CO**

each in his individual capacity, its true and lawful Attorney-In-Fact with full power and authority to sign, seal, and execute in its behalf any and all bonds and undertakings and other obligatory instruments of similar nature (except bonds guaranteeing the payment of principal and interest of notes, mortgage bonds and mortgages) in penalties not exceeding the sum of

**ONE MILLION AND NO/100 DOLLARS** (**\$ 1,000,000.00** )

and to bind the Company thereby, as fully and to the same extent as if such instruments were signed by the duly authorized officers of the Company; and all acts of said Attorney pursuant to the authority hereby given are hereby ratified and confirmed.

This Power of Attorney is made and executed pursuant to and by authority of the following By-Laws duly adopted by the Board of Directors of the Company.

**ARTICLE 7 EXECUTION OF CONTRACTS**

"Section 7.4 Instruments Issued by the Corporation. Bonds, undertakings, and other obligatory instruments of similar nature, other than insurance policies and insurance endorsements, issued by the Corporation shall be validly executed and binding on the Corporation when signed by the President or a Vice President or by the Attorney(s)-In-Fact appointed by the President or by a Vice President."

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"Section 7.8 Other Facsimile Signatures. A facsimile signature of the President or of a Vice President affixed to any bond, undertaking, or obligatory instrument of similar nature, other than policies and endorsements, or to a Power of Attorney signed by such President or a Vice President, as herein in Sections 7.4 and 7.5 provided, or a facsimile signature of the Secretary or of an Assistant Secretary to any certificate as herein in Section 7.6 provided, shall be effective and binding upon the Corporation with the same force and effect as the original signatures of any such officers."

"Section 7.9 Former Officers. A facsimile signature of a former officer shall be of the same validity as that of an existing officer, when affixed to any insurance policy or insurance endorsement, any bond or undertaking, any Power of Attorney or certificate, as herein in Sections 7.1, 7.2, 7.4, 7.5, and 7.6 provided."

IN WITNESS WHEREOF, the Company has caused these presents to be signed by its Vice President and its corporate seal to be hereunto affixed this 15 day of **APRIL**, 2008

**AMCO INSURANCE COMPANY**

By: *Brett E. Harman* Vice President



STATE OF IOWA  
COUNTY OF POLK ss

On this 15 day of **APRIL**, 2008 before me personally came Brett Harman, to me known, who, being by me duly sworn, did depose and say that he is Vice President of AMCO Insurance Company, the corporation described in and which executed the above instrument; that he knows the seal of said corporation, that the seal affixed to said instrument is such corporation seal; that it was so affixed pursuant to authority given by the Board of Directors of said corporation and that he has signed his name thereto pursuant to like authority, and acknowledged the same to be the act and deed of said corporation.



Sandy Alitz *Sandy Alitz*  
Notary Public in and for the State of Iowa

**CERTIFICATE**

I, the undersigned, Assistant Secretary of AMCO Insurance Company, a corporation organized under the laws of the State of Iowa, do hereby certify that the foregoing Power of Attorney is still in force, and further certify that Sections 7.4 through 7.9 inclusion of Article 7 of the By-Laws of the Company set forth in said Power of Attorney are still in force.

IN TESTIMONY WHEREOF, I have subscribed my name and affixed the seal of the company  
this 14th day of July, 2010

*John F. Delaney*  
Assistant Secretary

07239

This Power of Attorney expire  
**04/15/11**