



44 Main Street
Alton, NH 03809
Mailing Address:
P.O. Box 372
Alton Bay, NH 03810
603-833-3312

Paul Pannish
Town of Barrington Energy Committee
4 Signature Drive
Barrington, NH 03825

Dear Paul,

Thank you for the opportunity to provide this proposal in response to the RFP for Town Hall Municipal Photovoltaic (PV) Installation issued 12/21/23.

Mains Electric, established in 2016 is a fully licensed electrical installation firm specializing in residential and commercial, roof and ground mount solar electric systems. Mains has substantial experience in all aspects of solar Engineering Procurement and Construction from permitting and excavation through interconnection, commissioning and long-term operations.

We are a 25-employee firm that has the in-house staff and resources to get this project completed in a timely fashion. While we have other projects scheduled there is plenty of room in our schedule to build this project for the Town of Barrington in 2024. We do not know if any conflicts of interest for the town or this project. We offer a 90-day guarantee on our terms.

Attached please find our proposal. We look forward to discussing this project with you.

Sincerely,


Jeremy Mains (Jun 31, 2024 10:59 EST)

Jeremy Mains, President

AUTHORIZATION TO RELEASE INFORMATION

The undersigned hereby authorizes the Town of Barrington to obtain information regarding its performance on other contracts, agreements or other business arrangements, its business reputation, and any other matters pertinent to the evaluation and selection of a successful proposer in response to its Request for a Barrington Town Hall Municipal Photovoltaic Installation.

The undersigned hereby releases, acquits, and forever discharges the Town of Barrington, its Administrators, employees, governing Board members, and agents from any and all liability whatsoever, including all claims, demands and causes of action of every nature and kind affecting the undersigned that it may have or ever claim to have relating to information, data, opinions, and references obtained by the Town of Barrington in the evaluation and selection of a successful proposer in response to its Request for a Barrington Town Hall Municipal Photovoltaic Installation.

The undersigned hereby authorizes representatives of the Town of Barrington to contact any and all of the persons, entities, and references that are, directly or indirectly, listed submitted, or referenced in the undersigned's proposal submitted in response to its Request for a Barrington Town Hall Municipal Photovoltaic Installation.

The undersigned further authorizes any and all persons or entities to provide information, data, and opinions with regard to the undersigned's performance under any contract, agreement, or other business arrangement, the undersigned's ability to perform, the undersigned's business reputation, and any other matter pertinent to the evaluation of the undersigned. The undersigned hereby releases, acquits, and forever discharges any such person or entity, their officers, directors, employees and agents from any and all liability whatsoever, including all claims, demands and causes of action of every nature and kind affecting the undersigned that may have or ever claim to have relating to the evaluation and selection of a successful proposer in response to its Request for a Barrington Town Hall Municipal Photovoltaic Installation.

A photocopy of this signed Authorization is as valid as the original.

Jeremy Mains

Signature

31/01/2024

Date

Mains Electric, LLC

Company

Jeremy Mains

Name

Owner

Title



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)
12/29/2023

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. 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).

PRODUCER THE ROWLEY AGENCY LLC 45 Constitution Avenue P.O. Box 511 Concord NH 03302-0511	CONTACT NAME: Alyssa Woods PHONE (A/C No. Ext): (603) 224-2562 FAX (A/C No): (603) 224-8012	
	E-MAIL ADDRESS: awoods@rowleyagency.com	
INSURER(S) AFFORDING COVERAGE		NAIC #
INSURER A: Acuity Insurance		
INSURER B:		
INSURER C:		
INSURER D:		
INSURER E:		
INSURER F:		

COVERAGES **CERTIFICATE NUMBER:** 24-25 Master **REVISION NUMBER:**

THIS IS TO CERTIFY THAT 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. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:			228649	1/1/2024	1/1/2025	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 300,000 MED EXP (Any one person) \$ 20,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 3,000,000 PRODUCTS - COMP/OP AGG \$ 3,000,000
A	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS			228649	1/1/2024	1/1/2025	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ Medical payments \$ 10,000
A	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED <input checked="" type="checkbox"/> RETENTION \$ 0			228649	1/1/2024	1/1/2025	EACH OCCURRENCE \$ 2,000,000 AGGREGATE \$ 2,000,000
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory In NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N	N/A	3A States: NH, ME Excluded: Jeremy Mains 228650	1/1/2024	1/1/2025	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ 1,000,000 E.L. DISEASE - EA EMPLOYEE \$ 1,000,000 E.L. DISEASE - POLICY LIMIT \$ 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
 Covering operations of the named insured during the policy period.

CERTIFICATE HOLDER	CANCELLATION SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE Alyssa Woods/AW

RFP RESPONSE AND PROPOSAL FOR
DESIGN AND INSTALLATION OF A SOLAR ENERGY SYSTEM FOR
BARRINGTON TOWN HALL MUNICIPAL PHOTOVOLTAIC (PV) INSTALLATION
January 31, 2024



Recent Mains Electric installation at the Bethlehem Public Library

PRESENTED BY



Mains Electric, 44 Main Street, Alton, NH 03809
603-833-3312

CONFIDENTIAL AND PROPRIETARY –This entire proposal is confidential and proprietary and includes significant intellectual property information and shall not be shared with anyone other than town employees or energy committee members who are involved with deciding on a solar partner for this project.

Table of Contents

Executive Summary.....	3
Section 1. Proposed System.....	4
1.1. System specifications and Pricing	4
1.2. Equipment Selection	4
1.3. Design.....	5
Section 2. Maintaining Your Solar Asset: Operations and Maintenance (O&M)	6
Section 3. Turn-key Construction Process.....	7
3.1. Scope of Work.....	7
3.2. Professional Project Management.....	7
3.3. Consistent Communication	7
3.4. Established On-Site Safety Policies	7
3.5. Security	8
3.6. Precise Project Scheduling.....	8
3.7. Successful Interconnection Strategies.....	8
3.8. Commissioning and Warranty.....	8
Section 4. Educational & Instructional Assistance	9
Section 5. Submittal Requirements	9

APPENDICES:

Appendix 1 – Mains Electric Qualifications

Appendix 2 - Specification sheets for Modules, Inverters, Mounting system, Data System

Appendix 3 – Certificate of Insurance

EXECUTIVE SUMMARY

Mains Electric is proud to provide this proposal for a solar energy system to be located on the roof of the Barrington Town Hall. We are an experienced and local company committed to building efficient and robust solar energy systems that integrate with everyday operations and provide maximum long-term benefits.

Mains Electric designs, builds and maintains commercial and residential scale solar electric generating systems for towns, schools, businesses, and non-profit organizations. We have significant experience and expertise with solar projects of this size and type including a 2021 project for the Wolfeboro Municipal Electric Department on their building, a 2022 project on the Bethlehem Public Library, town of Bethlehem Maintenance Garage, 6 rooftop projects for the Town of Meredith, and many more. Please see our attached qualifications document that lists these and additional relevant projects.

Our team includes Ted Vansant who has 23+ years of experience with commercial solar projects. Ted is the project manager and main point of contact for this project. Ted will oversee all aspects of the project including design, permitting, procurement, construction oversight and commissioning and documentation.

Our team has spent considerable time evaluating the RFP as well as the site for optimal configuration of the system. Our proposed design meets the goals of the RFP and our goals of a project that best meets the financial and aesthetic interests of the town.

The 43kW (DC) system fits nicely on the available 3 roof sections and can be reconfigured as needed based on further discussions with the town. We propose to use all black modules as this is typically seen as being more aesthetically pleasing. We expect that snow retention equipment will need to be installed on the roof, especially over the door under the east roof, depending on what the ultimate design is. We have not included the cost of this equipment but are happy to include the installation of the snow retention equipment into our scope of work so the town only has to work with one contractor. We work closely with a roofing contractor who can install this equipment for us as a sub-contractor.

The system will interconnect into the existing electrical system and will be "behind the meter" so that as much of the energy produced by the solar energy system as possible will be used by the town hall at the time of production. Any excess energy produced would feed back to the electric grid and would produce credits for the value of this energy. We propose to install the inverters in the utility room and to interconnect in the generator transfer panel.

We have chosen equipment and a design that will maximize energy production at a reasonable cost. Our designs are robust and capable of handling harsh weather and designed to last well past the warranty period on the equipment. Top tier equipment, robust design and rigorous construction standards reduce the risk for the town by ensuring maximum savings.

We are prepared to start design, planning and construction immediately upon receipt of award. Our proposal conforms to all requirements specified in the RFP.

SECTION 1. PROPOSED SYSTEM

1.1. System Specifications and Pricing

DC System size:	43,050 Watts DC (105 modules x 410 watts each)
AC System size:	30,800 Watts AC (4 x 7,700 watts)
Estimated energy production:	38,000 kilowatt hours, year 1
Modules:	Tier 1, ALL BLACK, ZNShine 410-watt modules or equivalent. 25-year warranty
Mounting:	Iron Ridge Mounting system, or equivalent. 25-year warranty
Inverters:	SMA Sunny Boy 120/240V String inverters, or equivalent. 10-year warranty
Data Acquisition System (DAS):	Solar Log or equivalent.
Balance of System Equipment:	Included
System Warranty:	The system will be free from defects in materials and workmanship for a period of five (5) years from the date of installation.

Turnkey not to exceed Project Price: \$106,490

1.2. Equipment Selection

Our proposed designs use equipment that predominates in projects of this scale and type in New England. The proposed modules are commercial grade with all black frames and black back-sheet for a more integrated look.

We propose string inverters because they provide excellent cost efficiency and production efficiency and have a long track record of success. Iron Ridge provides high-quality racking for projects across the US and we have had excellent results with their equipment and service.

We enjoy strong relationships with several industry-leading solar PV equipment manufacturers and distributors, we are not beholden to any one manufacturer, nor restricted by dealer quotas. The components we have proposed are perfectly suited for this site.

All components used for this installation will be UL listed and compliant with all applicable IEEE, local, state and federal standards. This system will utilize only new, unused, equipment.

MONITORING

The Solar Log data acquisition system that we propose provides web accessible data for system performance and production metrics as well as educational use. This data is readily available on any web browser for monitoring by town staff and the general public.

We encourage the use of this data and the system in general to educate the residents about the system and solar energy in general.

Many public facilities choose to place a dedicated monitor in a prominent location that displays the production data and environmental benefits of the use of solar energy that is shown on the home page of this data system.

1.3. Design

We have chosen equipment and a design that will maximize energy production at a reasonable cost. Our designs are robust and capable of handling harsh weather and designed to last well past the warranty period on the equipment. Top tier equipment, robust design and rigorous construction standards reduce the risk for the town by ensuring maximum savings.

The following factors influenced our design methodology. Under each factor are comments on how our design attempts to respond to those factors;

- Make the roof array look as good as possible and integrated into the roof as much as possible
 - By using all black modules the array will stand out as little as possible. Also, by using clean lines and discussing possible layouts with town staff we will ensure an array that looks as good as possible.
- Safety
 - For the roof array we have included a minimum of 18" clear space along the top as well as 36" along each side (required by fire code) to facilitate maintenance and fire safety.
 - All wiring will be done per code and industry standard, or above, safety practices
 - See snow sliding comments below.
- Minimize the danger of snow sliding off the array and onto the ground or sidewalk
 - We expect that snow retention equipment will need to be installed on the roof, especially over the door under the east roof, depending on what the ultimate design is. We have not included the cost of this equipment but are happy to include the installation of the snow retention equipment into our scope of work so the town only has to work with one contractor. We work closely with a roofing contractor who can install this equipment for us as a sub-contractor.
- Design for low-cost maintenance
 - We have selected equipment that we are very familiar with and that has good track record for low-cost of maintenance
- Design for reliability and durability
 - We use ONLY metal conduit for any conduit that is exposed to the sun. Despite the fact that PVC conduit is code compliant we do not use PVC because it warps, leaks and does not last in the sun for the 25-year life of the system. Metal conduit is more costly but it is the only way we will install a system.
 - Iron Ridge Flash Foot allows for secure attachment to the roof while ensuring that water protection is not compromised.
- Interconnecting the solar energy system
 - Based on the size of the solar energy system and the size of the existing electrical system it is our understanding, at this point in the design process that we will be able to safely interconnect the solar energy system into the generator transfer panel. Also, we do not anticipate that the utility will require the existing transformers to be upgraded to larger transformers so we have not included an allowance in our cost for this work.
- Maximize production
 - To meet the requested system size we have included sub-arrays on three different roof sections. Each of these face in different directions but have good solar access so we believe that this system will produce the expected 38,000 kWh annually.

Proposed layout is shown below



Section 2. Maintaining Your Solar Asset: Operations and Maintenance (O&M)

Monitoring and proactive maintenance of a PV system maximizes the production of the array, helps avoid unexpected operating and maintenance costs, and enables the system to achieve the lowest life-cycle cost for solar generation. Mains Electric has the expertise and knowledge and will use trained technicians to provide comprehensive and full-service maintenance for the solar energy system. Reports will be generated to compare actual vs estimated performance. Also, automatic e-mail alerts can be set up so that one or several representatives at the library can be automatically notified of system anomalies.

We estimate the cost for us to provide a basic annual maintenance service will be \$ 500.00, depending on what level of service the town chooses.

The information contained in this proposal is confidential and proprietary. It is intended for, and limited to, the use of specific decision makers for the project during the process of evaluating a solar contractor.

SECTION 3. TURN-KEY CONSTRUCTION PROCESS

The following sections list the various items associated with designing and installing a solar photovoltaic system, with a corresponding explanation of the methodology behind our standard practices.

3.1. Scope of Work

Our scope of work includes all permitting, design, construction, procurement, testing and commissioning of the solar energy system described in this proposal

Excluded from Scope of Work

- A. Internet or data connection for Data Acquisition System data
- B. Any additional protective relay requirement and testing that may be required by the utility.
- C. No provisions for site lighting, telephone or security system are included in the price.
- D. Snow plowing of site is excluded.
- E. Snow retention equipment on the roof.

3.2. Professional Project Management

Each of our professional project managers has years of experience coordinating the on-time and on-budget installation of solar and electrical projects. A senior project manager with significant solar PM experience will oversee the project team for this project. Our teams have successfully implemented projects for utilities, corporate headquarters, airports, colleges and universities, public and private schools, and in numerous other sectors, and take great pride in their work, which is evidenced by the superior craftsmanship of our installations. Our partners and employees are among the most skilled and talented professionals in the Northeast. Our internal standards of excellence ensure that our systems will continue to produce reliable energy savings year after year. From inception to completion, this project will be handled by highly trained designers, engineers, analysts, project managers, and technicians, guaranteeing a high-quality installation.

3.3. Consistent Communication

The Project Manager submits weekly progress reports and maintains regular contact with all relevant parties for the customer through weekly progress meetings to ensure that the system is installed according to the proposed schedule and customer needs.

Project Kick-Off Meeting – The Project Manager will meet with Owner representatives upon successful awarding of the contract to develop a strategy for implementation of the solar installation.

Weekly Progress Meeting – The Project Manager is responsible for scheduling and instituting regular meetings to apprise all relevant parties of the project progress.

Daily Safety Meeting – The Foreman or Project Manager holds daily on-site safety meetings to ensure that all crew members, including subcontractors, are aware of any specific safety hazards, as well as the location of safety equipment.

3.4. Established On-Site Safety Policies

Training

Our employees recognize safety to be an issue of premier importance. Therefore, all employees working on our projects undergo rigorous safety training to ensure constant awareness of potential hazards and necessary precautions. A Safety Director and on-site Foreman are responsible for ensuring all employees and subcontractors have had the necessary training and carry their OSHA cards on the job site as required.

Internal Safety Audits

The Project Manager and on-site Foreman will be responsible for ensuring that all safety procedures are followed accordingly. To ensure that these standard safety practices are carried out, the Safety Director and members of his team conduct random and unannounced safety audits of installation sites. The auditor checks for several items, including:

- Crew informed of unsafe areas/conditions
- Crew informed of first aid/eyewash stations
- Work area has adequate lighting
- Tools in proper condition
- Proper warning signs and labels posted
- At least one person trained in CPR/First Aid
- Lifts in proper operating condition/inspected
- Guardrails installed/utilized on all lifts

Site-Specific Safety Plans

Our Project Manager will work with the facility representative and other decision makers to develop a site-specific Safety Awareness Plan geared towards keeping the general public and employees safe. The Safety Plan will address standard safety issues, as well as site-specific concerns presented by the site decision makers. All of these issues will be addressed by the Project Manager and facility representative when creating the Safety Plan, ensuring an organized, successful project.

3.5. Security

We will be responsible for maintaining the security of the system equipment during construction. We will determine the best means of securing the modules, inverters, and balance-of-system components to prevent theft or vandalism.

3.6. Precise Project Scheduling

We have significant experience successfully implementing projects that meet our client's desired timeline, including numerous school and municipal projects. The Project Manager will coordinate closely with the owner's representative to ensure smooth schedule coordination.

3.7. Successful Interconnection Strategies

We have successfully worked with numerous utilities throughout New England including Eversource. We believe that early and thorough communication with the utility will ensure a successful and safe system interconnection.

3.8. Commissioning and Warranty

Comprehensive Operation Manual

Upon completion of the system installation, a representative will conduct a thorough system walkthrough, training the facility staff on the proper operation and maintenance of the system. We will provide an Operation and Maintenance Manual, and deliver this manual to the facility staff upon system completion. All relevant maintenance functions will be clearly stated in this manual.

Fine-Tuned Commissioning Process

An in-house employee conducts a detailed testing and commissioning for every system we install. This technician conducts the commissioning with a client representative present, if they wish. We use an industry standard testing and commissioning process that includes notation of all system component information, detailed electrical test results, thorough array performance assessment, and a final walkthrough. This method ensures the quality and reliability of our systems, and an informed client. Items checked include but are not limited to:

- Confirmation that inverter performs in accordance with UL 1741 anti-islanding test
- Assessment of DC and AC circuits at the Max Power Point at available combiners, Line Amps
- Testing of DC source circuits between the combiner and each string

Comprehensive Warranty Coverage

All major components come with a manufacturer’s warranty. This is the warranty that will support any equipment failure. We offer a full workmanship warranty for installation work for the first five (5) years following the commissioning of the system. This warranty coverage includes, but is not limited to, general workmanship, weather-related wiring integrity, and communication between inverter(s) and monitoring equipment.

SECTION 4. EDUCATIONAL AND INSTRUCTIONAL ASSISTANCE

Along with our partner, NEC Solar Services, we offer a educational resource package with each solar PV energy system installed for a town or school. This package includes;

- Solar Energy and Energy Curriculum resources
- Training for teacher(s) on;
 - Use of the Solar Data Acquisition System that is provided with the solar PV energy system,
 - How solar energy works and ways to include solar energy exercises into curriculum.
 - Solar Energy Kit to use in hands-on experiments

SECTION 5. SUBMITTAL REQUIREMENTS

A. Cover Letter : Provide a statement of ability to complete the project with current workload; cite any conflicts of interest; and provide a 90-day guarantee on terms. INCLUDED

B. Contractor Qualifications : Provide an overview of qualifications for the contract team including, but not limited to, type of firm and relevant project experience. INCLUDED

C. References : Authorize release of information (see attachment) INCLUDED and provide firm references from at least three similar projects, including name, address, telephone number, title of project, and description of the work performed.

Mains Electric Solar Project References					
Customer	Project description	Size	Contact	Email	Phone
Wolfeboro Municipal Electric	Maint Bldg Roof mount solar PV	36 kW	Barry Muccio	meddirector@wolfeboronh.us	603-569-8150
Town of Bethlehem, NH	Highway Garage and Library	46 & 11 kW	David Van Houten	davidgvanhouten@gmail.com	603-444-1222
Town of Meredith, NH	6 rooftop projects on town buildings	13 - 90 kW	Troy Brown	tbrown@meredithnh.org	603-677-4209

D. Contact email Address: Ted Vasant, 603-968-7359, ted@necsolarservices.com

E. Cost Proposal : Provide a not-to-exceed cost proposal for all work described under the Scope of Work, broken down by appropriate units. INCLUDED

F. Equipment : Provide details of products and major components (modules, inverters, racking, etc) including standards for modules (Tier 1) and safety and other independent ratings. INCLUDED

G. Warranty and Maintenance : Require information on the warranty for the solar panels and inverters, as well as a proposed maintenance plan. INCLUDED

H. Insurance : Provide a Certificate of Insurance which clearly documents all current coverage limits available to the contractor. Successful contractor will be required to provide a policy endorsement which shows the Town of Barrington to be an additional named insured. INCLUDED

The information contained in this proposal is confidential and proprietary. It is intended for, and limited to, the use of specific decision makers for the project during the process of evaluating a solar contractor.



Mains Electric

Qualifications Statement

January 31, 2024

Company Overview

Mains Electric, established in 2016 and based in Alton, NH, is a fully licensed electrical installation firm specializing in residential and commercial, roof and ground mount solar electric systems. Currently a 25-employee firm that is rapidly growing, Mains has substantial experience in all aspects of solar installations from permitting and design through interconnection, commissioning and long-term operations for towns, schools, businesses, and non-profit organizations.

We have significant experience and expertise with ground and roof mounted solar projects under 1 megawatt in size.

Working closely with Barrington Power, Mains constructed all of the projects shown on the following pages and has been contracted for solar projects for 2024 totaling over \$4 million.

Our team includes three master electricians with vast solar and general electrical knowledge as well as Ted Vansant who has 23+ years of experience with commercial solar projects. Ted is responsible for all aspects of our commercial solar projects including design, permitting, procurement, construction oversight and commissioning and documentation.

Design / Engineering

Much of the preliminary design for project feasibility is done in-house using common design tools. These tools are available to anyone, however, with Mains Electric experience and expertise behind each design we are able to provide highly accurate estimates of cost and energy production.

All final designs and engineering stamps of our projects are done by our experienced engineering partners.

Permitting

We take a proactive approach with project permitting starting with a discussion with the local Authority Having Jurisdiction to discuss project goals and determine what permits are needed. Roof mounted projects typically require a building and electrical permit along with stamped structural drawings. Ground mount projects often also include NH DES approvals, local and/or state wetland assessments and approvals. Mains Electric manages all permitting on behalf of our clients.



Electric utility interconnection

Successful Interconnection Strategies

We have successfully worked with numerous utilities throughout New England including all utilities in NH. We believe that early and thorough communication with the utility will ensure a successful and safe system interconnection.

Equipment procurement

Our designs use equipment that predominates in projects of the scale and type of the proposed project in New England. For most projects we utilize 72/144-cell modules because they are commercial grade with a larger size (more cells) than the 60-cell modules typically used in residential projects.

We typically propose string inverters because they provide excellent cost efficiency and production efficiency and have a long track record of success.

We work directly with several high-quality US racking manufacturers we have had excellent results with their equipment and service.

We enjoy strong relationships with several industry-leading solar PV equipment manufacturers, we are not beholden to any one manufacturer, nor restricted by dealer quotas. The components we use are chosen specifically for each project. All components used for our installations are UL listed and compliant with all applicable IEEE, local, state and federal standards. Our projects will utilize only new, unused, equipment.

Construction

The following sections list the various items associated with designing and installing a solar photovoltaic system, with a corresponding explanation of the methodology behind our standard practices.

Professional Project Management

Each of our professional project managers has years of experience coordinating the on-time and on-budget installation of solar and electrical projects. A senior project manager with significant solar PM experience oversees each project. From inception to completion, this project will be handled by highly trained designers, engineers, analysts, project managers, and technicians, guaranteeing a high quality installation.

Consistent Communication

The Project Manager submits weekly progress reports and maintains regular contact with all relevant parties for the customer through weekly progress meetings to ensure that the system is installed according to the proposed schedule and customer needs.

Established On-Site Safety Policies

Our employees recognize safety to be an issue of premier importance. Therefore, all employees working on our projects undergo rigorous safety training to ensure constant awareness of potential hazards and necessary precautions. A Safety



Director and on-site Foreman are responsible for ensuring all employees and subcontractors have had the necessary training and carry their OSHA cards on the job site as required.

Security

We will be responsible for maintaining the security of the system equipment. We will determine the best means of securing the modules, inverters, and balance-of-system components to prevent theft or vandalism.

Project Scheduling

We have significant experience successfully implementing projects that meet our client's desired timeline. The Project Manager will coordinate closely with the owner's representative to ensure smooth schedule coordination.

Commissioning

Comprehensive Operation Manual

Upon completion of the system installation, a representative will conduct a thorough system walkthrough, training the facility staff on the proper operation and maintenance of the system. We will provide an Operation and Maintenance Manual, and deliver this manual to the facility staff upon system completion. All relevant maintenance functions will be clearly stated in this manual.

Fine-Tuned Commissioning Process

An in-house employee conducts a detailed testing and commissioning for every system we install. This technician conducts the commissioning with a client representative present, if they wish. We use an industry standard testing and commissioning process that includes notation of all system component information, detailed electrical test results, thorough array performance assessment, and a final walkthrough. This method ensures the quality and reliability of our systems, and an informed client. Items checked include but are not limited to:

- Confirmation that inverter performs in accordance with UL 1741 anti-islanding test
- Assessment of DC and AC circuits at the Max Power Point at available combiners, Line Amps
- Testing of DC source circuits between the combiner and each string

Insurance and Bonding

We carry all appropriate insurance for contracting with municipalities and commercial scale projects we have the ability to provide Bonding for projects that require it.

Solar Service and Maintenance

Monitoring and proactive maintenance of a PV system maximizes the production of the array, helps avoid unexpected operating and maintenance costs, and enables the system to achieve the lowest life-cycle cost for solar generation. The Solar data acquisition system that we will install provides web accessible data for system performance and production metrics. This data should be regularly monitored to confirm that the system is operating properly.



Mains Electric has the expertise and knowledge and will use trained technicians to provide comprehensive and full-service maintenance for the solar energy system under an annual service agreement. Reports will be generated to compare actual vs estimated performance. Also, automatic e-mail alerts can be set up so that one or several representatives of the owner can be automatically notified of system anomalies if interested. Pricing for Service contracts will reflect the extent to which customers take advantage of either or both Preventative and/or Corrective Maintenance services.

Educational and Instructional Assistance

Many towns and schools choose to place a dedicated monitor in a prominent location that displays the production data and environmental benefits of the use of solar energy that is shown on the home page of this data system. Our price includes installation of a monitor for this purpose.

Mains Electric works with New England Commercial Solar Services to offer a New Hampshire Solar On Schools educational resource package with each solar PV energy system installed for a town or school. This package includes;

- Solar Energy and Energy Curriculum resources
- Training for teacher(s) on;
 - use of the Solar Data Acquisition System that is provided with the solar PV energy system,
 - how solar energy works and ways to include solar energy exercises into curriculum.
 - Solar Energy Kit to use in hands-on experiments
- The Solar data acquisition system that we propose provides web accessible data for system performance and production metrics. This data is readily available on any web browser for monitoring by school staff and teachers and students. We encourage the use of this data and the system in general in the school curriculum and we will help the schools in town with this as part of our Solar On Schools program.



Recent Projects

Town of Bethlehem NH

- Elementary School
- Highway Garage
- Library

Kearsarge Indian Museum - Rooftop

Town of Franconia - Town Hall

Effingham Elementary School

Wolfeboro Electric Department- Rooftop

Town of Meredith NH

- Community Center
- Fire Station
- Recycling Center - 3 buildings
- Skate Park

Mount Washington Auto Road Maintenance Building

Squam Lakes Natural Science Center

Town of Whitefield – Town Hall, Fire Station and Library rooftops

Recent Projects

Completed for
Barrington Power



Town of Meredith
Fire Station
Community Center
Skate House



Town of Bethlehem
Library
Town Garage
Elementary School



Kearsarge Indian Museum
Effingham Elementary



Local Grocer
Vaughan Center



Mt Washington Highway Garage
Wolfeboro Electric

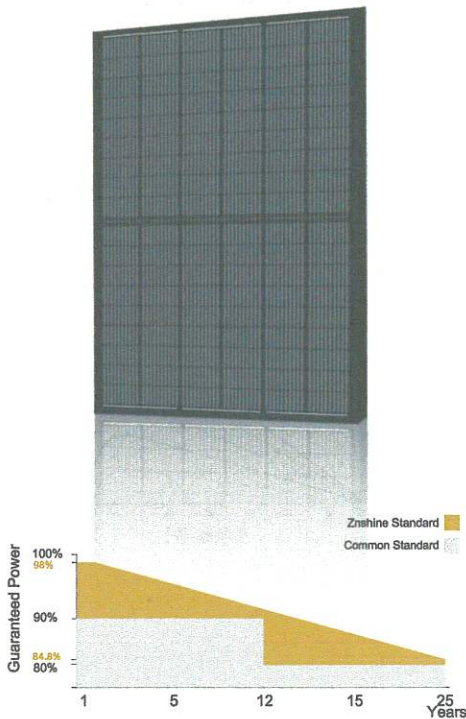


Davison Farm
Brunswick Self Storage



ZXM7-SH108 Series

10BB HALF-CELL Black Monocrystalline PERC PV Module



*Please check the valid version of Limited Product Warranty which is officially released by ZNSHINE PV-TECH Co.,Ltd.

390-410W

POWER RANGE

21.00%

MAXIMUM EFFICIENCY

0.55%

YEARLY DEGRADATION

12 12 YEARS PRODUCT WARRANTY

25 25 YEARS OUTPUT GUARANTEE



IEC 61215/IEC 61730/IEC 61701/IEC 62716/UL6 1730

ISO 14001: Environmental Management System

ISO 9001: Quality Management System

ISO45001: Occupational Health and Safety Management System

*As there are different certification requirements in different markets, please contact your local znshine sales representative for the specific certificates applicable to the products in the region in which the products are to be used.

KEY FEATURES



Excellent Cells Efficiency

MBB technology reduce the distance between busbars and finger grid line which is benefit to power increase.



Better Weak Illumination Response

More power output in weak light condition, such as haze, cloudy, and early morning.



Anti PID

Ensured PID resistance through the quality control of cell manufacturing process and raw materials.



Adapt To Harsh Outdoor Environment

Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity environment.



TIER 1

Global, Tier 1 bankable brand, with independently certified advanced automated manufacturing.



Excellent Quality Management System

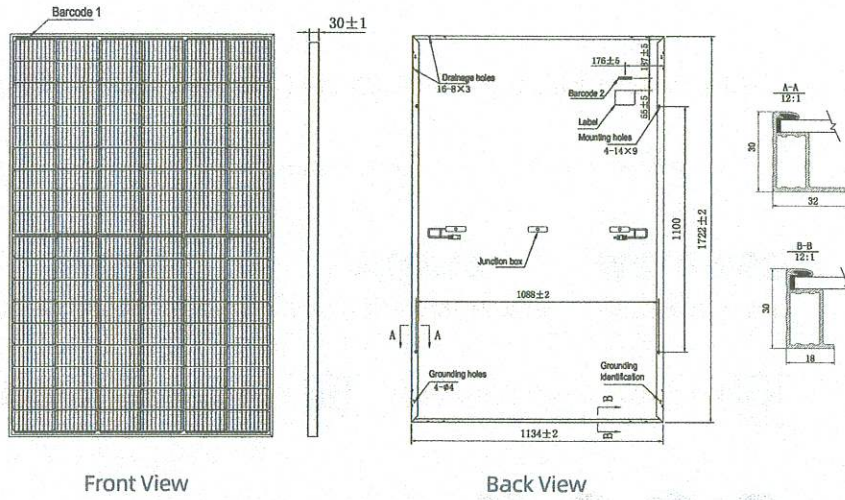
Warranted reliability and stringent quality assurances well beyond certified requirements.



Improved Aesthetics

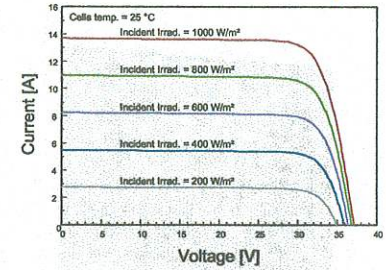
Compared to conventional modules, this full black modules have a more uniform appearance and superior aesthetics.

DIMENSIONS OF PV MODULE(mm)

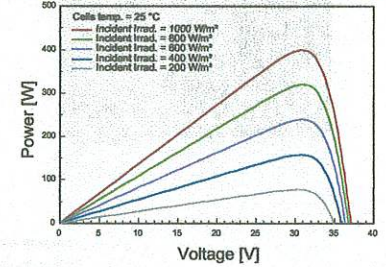


*Remark: customized frame color and cable length available upon request

I-V CURVES OF PV MODULE(400W)



P-V CURVES OF PV MODULE(400W)



ELECTRICAL CHARACTERISTICS | STC*

Nominal Power Watt Pmax(W)*	390	395	400	405	410
Maximum Power Voltage Vmp(V)	30.50	30.70	30.90	31.10	31.30
Maximum Power Current Imp(A)	12.79	12.87	12.95	13.03	13.10
Open Circuit Voltage Voc(V)	36.70	36.90	37.10	37.30	37.50
Short Circuit Current Isc(A)	13.56	13.63	13.70	13.77	13.84
Module Efficiency (%)	19.97	20.23	20.48	20.74	21.00

*The data above is for reference only and the actual data is in accordance with the practical testing
 *STC (Standard Test Condition): Irradiance 1000W/m², Module Temperature 25±2°C, AM 1.5
 *Measuring uncertainty: ±3%, all the electrical characteristics such as Power, Im, Vm and FF are within ±3% tolerance.

MECHANICAL DATA

Solar cells	Mono PERC
Cells orientation	108 (6×18)
Module dimension	1722×1134×30 mm (With Frame)
Weight	20.5±1.0 kg
Glass	3.2mm, High Transmission, AR Coated Tempered Glass
Junction box	IP 68, 3 diodes
Cables	4 mm ² , 1200 mm (With Connectors)
Connectors*	Original MC4

*Please refer to regional datasheet for specified connector

ELECTRICAL CHARACTERISTICS | NMOT

Maximum Power Pmax(Wp)	291.50	295.20	299.00	302.70	306.30
Maximum Power Voltage Vmpp(V)	28.30	28.50	28.70	28.90	29.10
Maximum Power Current Imp(A)	10.29	10.35	10.41	10.47	10.53
Open Circuit Voltage Voc(V)	34.30	34.50	34.70	34.80	35.00
Short Circuit Current Isc(A)	10.95	11.01	11.06	11.12	11.18

*NMOT: Irradiance 800W/m², Ambient Temperature 20°C, AM 1.5, Wind Speed 1m/s

TEMPERATURE RATINGS*

NMOT	44°C ±2°C
Temperature coefficient of Pmax	-0.35%/°C
Temperature coefficient of Voc	-0.29%/°C
Temperature coefficient of Isc	0.05%/°C

WORKING CONDITIONS

Maximum system voltage	1500 V DC
Operating temperature	-40°C~+85°C
Maximum series fuse	25 A
Front Side Maximum Static Loading	Up to 5400 Pa
Rear Side Maximum Static Loading	Up to 2400 Pa

*Remark: Do not connect Fuse in Combiner Box with two or more strings in parallel connection

*Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.

*Caution: Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.

PACKAGING CONFIGURATION*

Piece/Box	36
Piece/Container(40'HQ)	936

*Customized packaging is available upon request.



/ SBSE3.8-US-50 / SBSE4.8-US-50 / SBSE5.8-US-50 / SBSE7.7-US-50 / SBSE9.6-US-50* / SBSE11.5-US-50*

Preliminary

Sunny Boy Smart Energy-US

3.8 / 4.8 / 5.8 / 7.7
9.6* / 11.5*

The perfect solution
for solar installers

powered by
ennexOS



Ultimate flexibility

- 200% DC/AC design capability
- PV, Hybrid and AC coupling in one
- 3 or 4 MPPT optimizing channels
- Larger power classes*

Easy installation

- Smaller and lighter, eases mounting
- 2-in-1 solution saves time, wall space and electrical upgrades
- Rapid commissioning via built-in SunSpec Certified RSD transmitter

Complete reliability

- No need for complex microinverters or optimizers
- 10-year warranty, extendable to 25
- Energy security with or without a battery

New, modern design

- Fresh aesthetic look, with more functional capabilities
- Curved, easy-open cover

Quick commissioning

- SMA 360° app saves installers time and money
- Scan, tap and connect multiple devices from your mobile device or tablet

For over 40 years, SMA has been the leader in solar energy and the new SMA Home Energy Solutions will continue this trajectory. Installers choose SMA for reliability, performance and innovation.

The center of this new home solution is the Sunny Boy Smart Energy (SBSE-US) hybrid inverter. This groundbreaking inverter combines the functions of a PV and battery inverter into a single unit, keeping electrical upgrades to a minimum. SBSE-US features modular add-on options including the new SMA Energy Meter and Backup Secure that enhance the systems' performance and offer peace of mind to the homeowner.

Sunny Boy Smart Energy is packed with new technology, including an integrated system manager, SMA 360° and Energy apps, SunSpec RSD transmitter, ShadeFix optimization (with 3 MPPTs), SMA Arc Fix, SMART Connected and more.

Trust in SMA America, your leader in residential energy - building reliable, high performance and innovative solutions, with support you can depend on.

* Upcoming

Technical data	SBSE 3.8	SBSE 4.8	SBSE 5.8	SBSE 7.7
Input PV (DC)				
Max. PV array power (200% oversizing)	7600 Wp	9600 Wp	11600 Wp	15400 Wp
Max. DC voltage			600 V	
MPP voltage range			60 - 480 V	
Startup input voltage			66 Vdc	
Max. usable current input per MPPT			15 A	
Max. short-circuit current input per MPPT	30 A (the sum at all inputs must not exceed 60A)			
Number of independent MPPT inputs / inputs per MPPT			3 / 1	
Connection of MPPT inputs in parallel			A and B	
Input Battery (DC)				
Battery type	TBD, see SMA List of Approved Batteries			
Voltage range	90 V to 500 V			
Max. charging current / max. discharging current	30 A / 30 A			
Number of independent battery inputs	1			
Max. charging power / max. discharging power	10000 W / 4032 W	10000 W / 5040 W	10000 W / 6084 W	10000 W / 8064 W
Output (AC)				
Max. apparent AC power	3840 VA	4800 VA	5760 VA	7650 VA
AC Rated power (at 240 V, 60 Hz)	3840 W	4800 W	5760 W	7650 W
AC Rated power (at 208 V, 60 Hz)	3328 W	4160 W	4992 W	6656 W
AC voltage rated and range	240 V (211 V to 264 V) or 208 V (183 V to 229 V)			
AC grid frequency / range	60 Hz / 55 Hz to 66 Hz			
Max. rated output current	16 A	20 A	24 A	32 A
Breaker (overcurrent protection)	20 A	25 A	30 A	40 A
Power factor at rated power	1 / adjustable 0.8 overexcited to 0.8 underexcited			
Efficiency				
Max. efficiency / CEC efficiency	97.5% / TBD			
Protective devices				
DC disconnect / DC reverse polarity protection	● / ●			
Arc fault/circuit interrupter (AFCI)	●			
Ground fault monitoring / Grid monitoring	● / ●			
AC short circuit current capability	●			
All-pole-sensitive residual-current monitoring unit	●			
Protection class	I			
Overvoltage category grid / battery / PV	IV / II / II			
General Data				
Dimensions (W / H / D) / Weight	19.7 x 23.1 x 9.3 inches / 38.6 lb			
Operating temperature range	-13 °F to +140 °F (-25 °C to +60 °C) with derating			
Noise emission, typical / Self-consumption (at night)	TBD / TBD			
Topology / cooling method	Transformerless / Natural convection			
Environmental protection rating	IP65 / Type 3S			
Equipment				
AC terminals / Ground Connection (AWG)	10 AWG - 6 AWG / 12 AWG - 6 AWG			
Communication protocols	Modbus (SMA, SunSpec), Speedwire / Webconnect, SMA Battery Interface			
Interfaces: WLAN / Ethernet / BAT-CAN / RS-485	● / ● / ● / ●			
2.4 GHz WLAN	●			
Ethernet ports / Number of outputs	2 / 1 (Multi function relay 30 Vdc / 1 A)			
Warranty: 10 / +5 / +10 / +15 years	● / ○ / ○ / ○			
Certificates and approvals (planned)	UL 62109-1, UL 1998, UL 1699B Ed. 1, UL9540, IEEE1547, FCC Part 15 (Class A & B), CAN CSA-C22.2, CA Rule 21, HECO Rule 14H, PV Rapid Shutdown System Equipment in accordance with UL1741, NEC 2020, NEC 2023 compliant			
SMA Smart Connected	●			
SMA Shadefix (integrated shade optimization)	●			
SunSpec certified transmitter (Rapid Shutdown)	●			
SMA Backup Secure** (grid outage mode, with or without battery)	●			
Rated power (at 120 V, 60 Hz)	1920 W			
Max. apparent AC power	1920 VA			
Nominal AC voltage	120 V			
AC grid frequency	60 Hz			
Activation mode	Manual			
● Standard features ○ Optional features				
Type designation	SBSE3.8-US-50	SBSE4.8-US-50	SBSE5.8-US-50	SBSE7.7-US-50
* Upcoming **Backup Start module required to enable SMA Backup Secure in installations bound by NEC rapid shutdown requirements.				

Accessories



SMA Energy Meter
EMETER-US-50

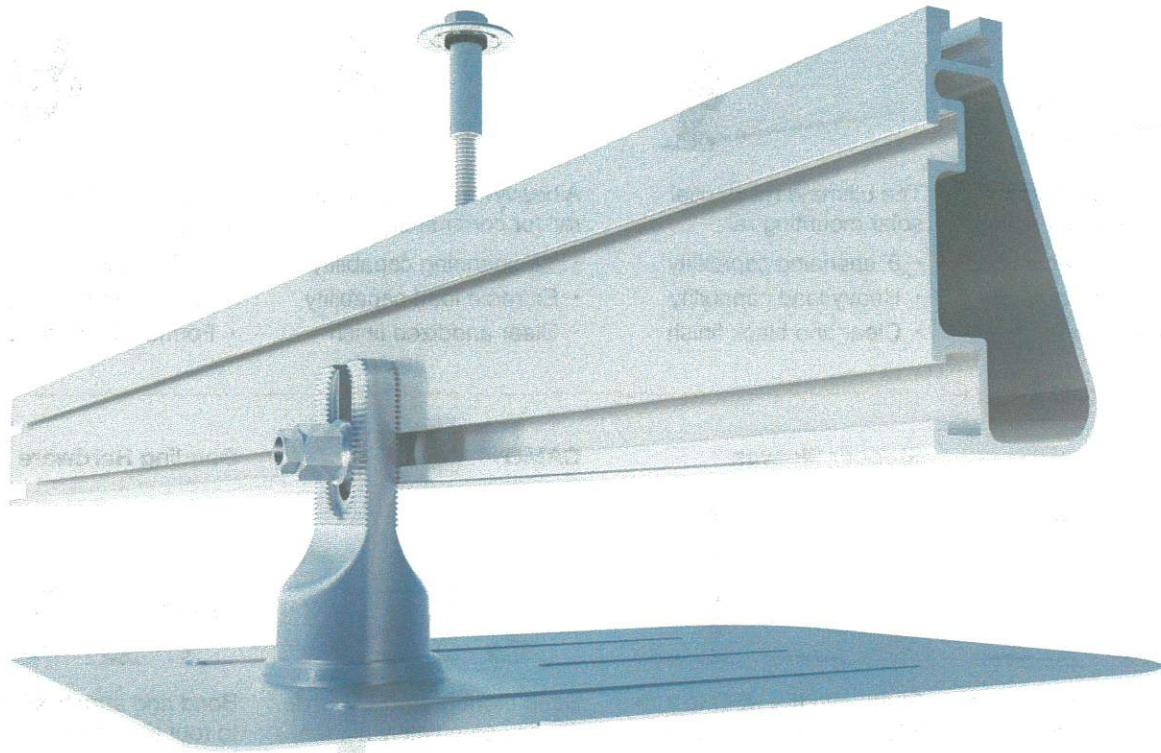


Backup Start
module
BU-STRT-US-50



SMA Shutdown
Initiator
RSH-US-50

SMA and Sunny Tripower are registered trademarks of SMA Solar Technology AG. Approval is a registered trademark of Ampco Power Corporation. All products and services described, as well as technical data, are subject to change, including for reasons of country-specific requirements, at any time without notice. SMA assumes no liability for mistakes or printing errors. For the latest information, please visit www.SMA-Solar.com. Solar Inverter made in Germany by SMA Solar Technology AG.



Built for solar's toughest roofs.

IronRidge builds the strongest mounting system for pitched roofs in solar. Our components have been tested to the limit and proven in extreme environments, including Florida's high-velocity hurricane zones.

Our rigorous approach has led to unique structural features, such as curved rails and reinforced flashings, and is also why our products are fully certified, code compliant and backed by a 25-year warranty.



Strength Tested

All components evaluated for superior structural performance.



PE Certified

Pre-stamped engineering letters available in most states.



Class A Fire Rating

Certified to maintain the fire resistance rating of the existing roof.



Design Assistant

Online software makes it simple to create, share, and price projects.



UL 2703 Listed System

Entire system and components meet newest effective UL 2703 standard.

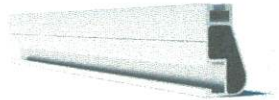


25-Year Warranty

Products guaranteed to be free of impairing defects.

XR Rails ☺

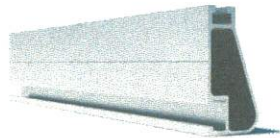
XR10 Rail



A low-profile mounting rail for regions with light snow.

- 6' spanning capability
- Moderate load capability
- Clear and black finish

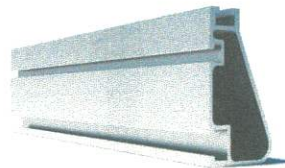
XR100 Rail



The ultimate residential solar mounting rail.

- 8' spanning capability
- Heavy load capability
- Clear and black finish

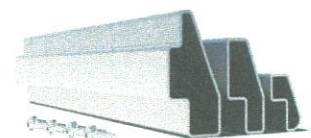
XR1000 Rail



A heavyweight mounting rail for commercial projects.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish

Bonded Splices

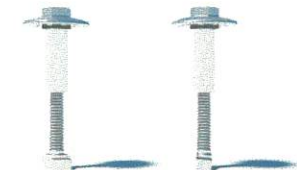


All rails use internal splices for seamless connections.

- Self-drilling screws
- Varying versions for rails
- Forms secure bonding

Clamps & Grounding ☺

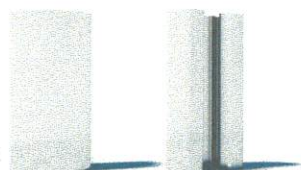
UFOs



Universal Fastening Objects bond modules to rails.

- Fully assembled & lubed
- Single, universal size
- Clear and black finish

Stopper Sleeves



Snap onto the UFO to turn into a bonded end clamp.

- Bonds modules to rails
- Sized to match modules
- Clear and black finish

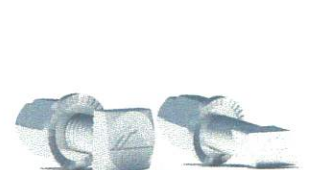
CAMO



Bond modules to rails while staying completely hidden.

- Universal end-cam clamp
- Tool-less installation
- Fully assembled

Bonding Hardware



Bond and attach XR Rails to roof attachments.

- T & Square Bolt options
- Nut uses 7/16" socket
- Assembled and lubricated

Attachments ☺

FlashFoot2



Flash and mount XR Rails with superior waterproofing.

- Twist-on Cap eases install
- Wind-driven rain tested
- Mill and black finish

Conduit Mount



Flash and mount conduit, strut, or junction boxes.

- Twist-on Cap eases install
- Wind-driven rain tested
- Secures 3/4" or 1" conduit

Knockout Tile



Replace tiles and ensure superior waterproofing.

- Flat, S, & W tile profiles
- Form-fit compression seal
- Single-lag universal base

All Tile Hook



Mount on tile roofs with a simple, adjustable hook.

- Works on flat, S, & W tiles
- Single-socket installation
- Optional deck flashing

Resources



Design Assistant

Go from rough layout to fully engineered system. For free.

Go to IronRidge.com/design



Endorsed by FL Building Commission

Flush Mount is the first mounting system to receive Florida Product approval for 2017 Florida Building Code compliance.

Learn More at bit.ly/floridacert



Raising the bar in innovative DC MLPE solar power systems

RSD-D

- Meets NEC 2017, 2020&2023 (690.12) requirements
- Executes rapid shutdown of system when Transmitter signal is absent
- Meets SunSpec requirements
- Dual-input channel

RSD-D meets SunSpec requirements, maintaining normal function by continually receiving a heartbeat signal from the APsmart Transmitter. The RSD-D executes rapid system shutdown when the Transmitter signal is absent. Users can manually execute rapid shutdown using Transmitter breaker switch.*⁽¹⁾⁽²⁾

> RSD-D TECHNICAL DATA

MODEL

RSD-D-15

RSD-D-20

INPUT DATA (DC)

Range of Input Operating Voltage

8-65V Per Channel

Maximum Cont. Input Current (Imax)

15A Per Channel

20A Per Channel

Maximum Short Circuit Current (Isc)

25A

OUTPUT DATA (DC)

Range of Output Operating Voltage

16-130V

Maximum Cont. Output Current

15A

20A

Maximum System Voltage

1000V/1500V

Maximum Series Fuse Rating

30A

MECHANICAL DATA

Operating Ambient Temperature Range

-40 oF to +167 oF (-40 °C to + 75 °C)

Dimensions (without cable & connectors)

5.5" x 2" x 0.8"(140 mm x 50.6 mm x 20 mm)

Cable Length

Input 500mm/Output 2400mm

Cable Cross Section Size

TUV:4mm²/UL:12AWG

Connector

Input: Stäubli MC4 PV-KBT4&KST4 or Customize

Output: APsystems specified or Customized

Enclosure Rating

NEMA Type 6P/IP68

Protection Temperature

100°C

FEATURES & COMPLIANCE

Communication Compliance

PLC

Safety Compliance

NEC 2017, 2020&2023 (690.12); UL1741;

CSA C22.2 No. 330-17; IEC/EN62109-1

EMC Compliance

FCC Part15; ICES-003



© All Rights Reserved

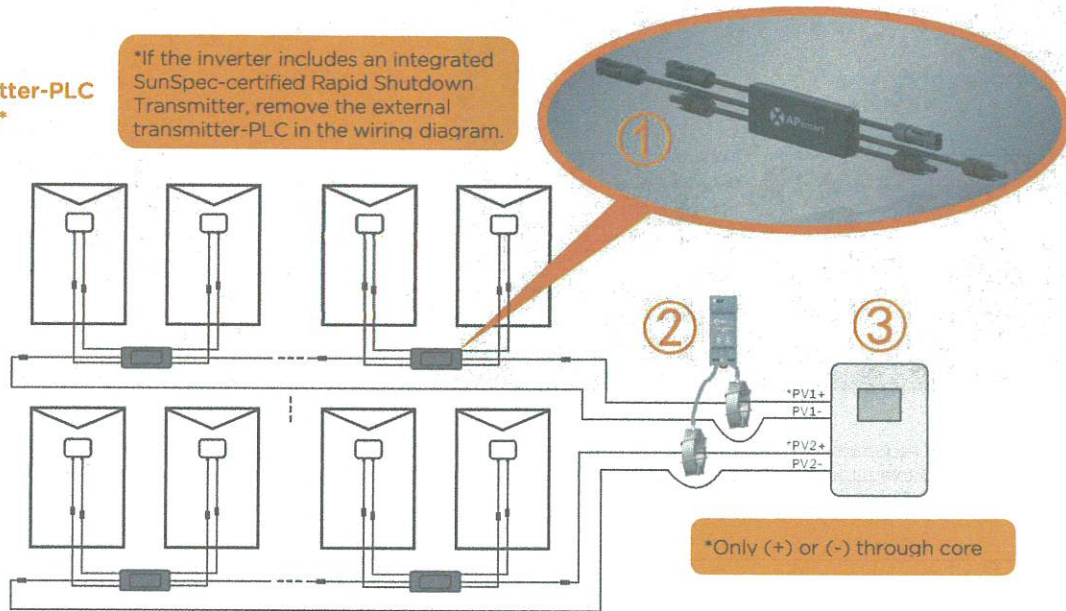
*⁽¹⁾ RSD-D does not have automatic shutdown function for arc detection. When the system is abnormal, the transmitter signal is cut off by pulling the gate, which triggers shutdown.

*⁽²⁾ RSD-D is designed to reduce the risk of fire suppression but does not solve the risk of a arc fire.

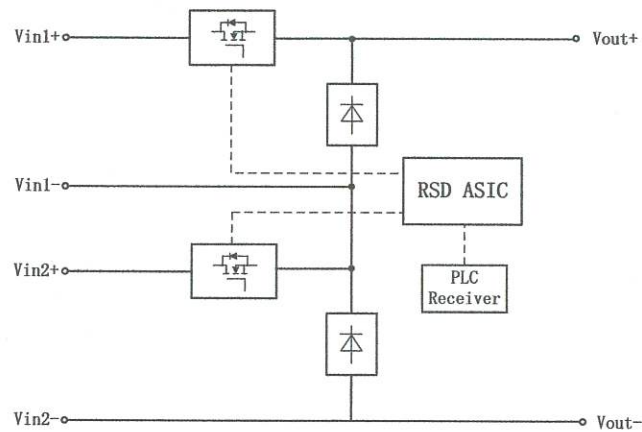
> RSD-D WIRING DIAGRAM

- ① RSD-D
- ② Transmitter-PLC
- ③ Inverter*

*If the inverter includes an integrated SunSpec-certified Rapid Shutdown Transmitter, remove the external transmitter-PLC in the wiring diagram.



> WORKING SCHEMATIC DIAGRAM



ORDERING INFORMATION

426101	1500V UL/1000V TUV, 15A, 2.4m cable, Stäubli MC4 PV-KBT4&KST4
446101	1500V UL/1000V TUV, 20A, 2.4m cable, Stäubli MC4 PV-KBT4&KST4
4261xx*	15A, 2.4m cable, Customize connector
4461xx*	20A, 2.4m cable, Customize connector

*please see the RSD Series Ordering Information

Solar-Log Base

Our Most Powerful PV Energy Management System Ever



Your added Value and Benefits

The new revolutionary Solar-Log™ generation combines smart functionality with greater flexibility for more efficient control, management and monitoring* of PV plants. For you, this means:

- **Security**
Easily and effectively implement regulations for feed-in management.
- **Valuable time savings**
Easily DIN rail mounted for simple installation.
- **Optimal price**
You only have to purchase the functions you need for your plant requirements.

Models	Plant size	Article Number
Solar-Log Base 15	15 kWp	256325
Solar-Log Base 100	100 kWp	256326
Solar-Log Base 2000	2000 kWp	256327

*PV Monitoring works with Solar-Log WEB Enerest™ 4 Monitoring Plattform

Function

The Innovative Bus Analysis Function Replaces the Oscilloscope

Measure and evaluate the signal quality of the inverter communication (RS485).

Modular Design – Tailored to your Needs

Depending on the requirements, the functions for each PV plant can be individually selected. Interface elements and various software licenses can be purchased to add functions as needed.

Installation License – Easily Determine which Licenses are Required

With Solar-Log Base devices, the required licenses are activated free-of-charge during the installation for 30 days. During this time, you can purchase the licenses from the License Portal and register remotely from the comforts of your office.

Solar-Log™ – EnBW Direct Marketing Solution

We offer the complete solution from our partner EnBW from the Solar-Log™ Website "Solutions & Service / Direct Marketing." Install Solar-Log Base and register for direct marketing within 5 minutes.

Solar-Log Base Direct Marketing – VPN Function

Previously, an external router was required to transmit data to the direct marketer. It is possible to make secure VPN data transfers without any additional hardware. This integration not only saves money from the hardware, but also the installation.

Smart Energy - More Self-sufficiency than Ever Before

Recording and presentation of self-consumption control and visualization of individual appliances for the optimization of self-consumption.

Feed-in Management – Guarantees Compliance with the Legal Requirements

Reduction of feed-in power with a dynamic allowance for self-consumption.

Display Options

Solar-Log WEB Enerest™ 4 - High Performance Error Analysis

The new online portal features an attractive new design and numerous features. The new features include, a function for the self-learning detection of plant errors, optimized processes and quick diagnostics.

App for the Solar-Log WEB Enerest™* Portal – Intuitive and Free of Charge

This app offers users comfort and security with its structured operating concept, intuitive controls, modern features and interactive graphics. The app is available for free from the Apple App store and Google Play Store.

*Only in combination with Solar-Log WEB Enerest™ 3

Installation

	Solar-Log Base 15	Solar-Log Base 100	Solar-Log Base 2000
Installation wizard	●	●	●
Network detection / DHCP	●	●	●
Name resolution solar-log	●	●	●

Feed-in Management

	Solar-Log Base 15	Solar-Log Base 100	Solar-Log Base 2000
Reduction to X percent (with and without the calculation of self-consumption)	●	●	●
Remote controlled active and reactive power reductions (with the calculation of self-consumption)		● optional PM package	

Plant Monitoring

	Solar-Log Base 15	Solar-Log Base 100	Solar-Log Base 2000
Inverter Failure, Status, Error and Performance Deviation notifications in the portal	●	●	●
Yield forecast	●	●	●
MPP Tracker Comparison	●	●	●
Sensor system connection (irradiation / temp. / wind)	●	●	●
Self-produced energy consumption; Digital electricity meter	●	●	●
Self-produced energy consumption: Managing external appliances	●	●	●

General Data

Device voltage/ Device output	12 - 24 Volt (+-10%) / typ. 2,4W
Ambient temperature	-20°C to +50°C (without condensation)
Ambient temperature Storage/ transport	-20°C to +60°C
Dimensions (WxHxD)	53,6mm (3TE) x 90mm x 60mm
Mounting	Top hat rails TH 35 / 7,5 or TH 35 / 15 by IEC/EN 60715
Protection level according to EN 60529	IP 20
Weight	110g
Multi-lingual (DE, EN, ES, FR, IT, CN)	●
Storage	4 GB internal
Warranty	2 years
Recording length: Day, month and year values	> 10 years
No power supply included	

Solar-Log™ Pinboard & Slideshow

With the Solar-Log™ pinboard, Solar-Log WEB Enerest™ 4 dynamically displays all important information about the plant such as the yield and performance. For this purpose the pinboard can be individually configured with various widgets. All existing pinboards can be displayed with the slideshow.

Large external display (RS485) – Present your PV Plant Data

A large external display used in combination with the Solar-Log™ can visually present live data from a PV plant. You can also add personalized advertisements. Large external displays can be connected via the RS485 interface.

Connections

Inverters

The new generation Solar-Log™ Base is compatible with inverters from all the major manufacturers.

1 x S₀, 2 x RS485 or 1 x RS422

To connect components.

USB Connection

A USB stick can be connected for safe and quick manual installations of new firmware updates, configurations, and backups.

Ethernet

The Solar-Log Base can be connected directly to compatible inverters via Ethernet.

Licenses

Expandable Licenses *	Solar-Log Base 15	Solar-Log Base 100	Solar-Log Base 2000
Solar-Log Base Expandable License	from 15 kWp to 30 kWp	from 100 kWp to 250 kWp	-
Article number	256328	256329	-

* With additional costs

Basic Functions

Maximum plant size	15 kWp	100 kWp	2 MWp
Inverter connection options	Ethernet, 2x RS485 or 1x RS422		
Battery storage: visualization, charging time shifts	●	●	●
Smart Energy	●	●	●
Powermanagement	●	●	●
Direct Marketing	●	●	●
Bus Analysis Function	●	●	●
Maximum cable length*	max. 1000 m		

Licenses

Expandable license for max. plant size	up to 30 kWp	up to 250 kWp	-
Solar-Log™ direct marketing license	●	●	●

Interfaces

RS485/RS422	2 x RS485 or 1 x RS422		
Ethernet network**	2 x 100 Mbit/s		
USB	2 x USB 2.0		
S ₀ in	1 x S ₀		

Additional Function Interfaces

Digital control outputs	via an additional module
Digital control inputs	via an additional module
Interface for a ripple control receiver (PM+)	via an additional module

Visualization

Integrated web servers	●	●	●
Graphic visualization	local and portal		
TFT-Display	●	●	●
Display on the unit	●	●	●
Data transfer to external portals	API, ftps, ftp***		
HTTP data transfers to Solar-Log WEB Enerest™ for low data volumes	●	●	●
Compatible with large external display (RS485 and Modbus TCP)	●	●	●

*Depending on the electrical constraints

**No switch function

***With additional costs

Town of Barrington NH
Town Hall Solar Proposal

Mains Electric
44 Main Street
PO Box 372
Alton Bay NH 03810
603-833-3312