

DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK



CITY OF PORTLAND BUILDING PERMIT



This is to certify that

BLACKBURN SUZANNE E & JOAN P KUNIAN
JTS/Revision Energy LLC

PERMIT ID: 2013-00383

Located at

39 PARSONS RD

CBL: 139 F026001

has permission to **Install 2 Solar electric panels adding onto an existing system**
provided that the person or persons, firm or corporation accepting this permit shall comply with all of the provisions of the Statues of Maine and of the Ordinances of the City of Portland regulating the construction, maintenance and use of the buildings and structures, and of the application on file in the department.

Notification of inspection and written permission procured before this building or part thereof is lathed or otherwise cloed-in. 48 HOUR NOTICE IS REQUIRED.

A final inspection must be completed by owner before this building or part thereof is occupied. If a certificate of occupancy is required, it must be procured prior to occupancy.

Fire Prevention Officer



Code Enforcement Officer / Plan Reviewer

**THIS CARD MUST BE POSTED ON THE STREET SIDE OF THE PROPERTY
THERE IS A PENALTY FOR REMOVING THIS CARD**

PERMIT ID: 2013-00383

Located at: 39 PARSONS RD

CBL: 139 F026001

BUILDING PERMIT INSPECTION PROCEDURES
Please call 874-8703 (ONLY)
or email: buildinginspections@portlandmaine.gov

With the issuance of this permit, the owner, builder or their designee is required to provide adequate notice to the city of Portland Inspections Services for the following inspections. Appointments must be requested 48 to 72 hours in advance of the required inspection. The inspection date will need to be confirmed by this office.

- **Please read the conditions of approval that is attached to this permit!! Contact this office if you have any questions.**
- **Permits expire in 6 months. If the project is not started or ceases for 6 months.**
- **If the inspection requirements are not followed as stated below additional fees may be incurred due to the issuance of a "Stop Work Order" and subsequent release to continue.**

REQUIRED INSPECTIONS:

Close-in Plumbing/Framing

Final Inspection

The project cannot move to the next phase prior to the required inspection and approval to continue, REGARDLESS OF THE NOTICE OF CIRCUMSTANCES.

IF THE PERMIT REQUIRES A CERTIFICATE OF OCCUPANCY, IT MUST BE PAID FOR AND ISSUED TO THE OWNER OR DESIGNEE BEFORE THE SPACE MAY BE OCCUPIED.

City of Portland, Maine - Building or Use Permit

389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

| | | |
|---------------------------------|--|----------------------------|
| Permit No: 2013-00383 | Date Applied For: 02/25/2013 | CBL: 139 F026001 |
|---------------------------------|--|----------------------------|

| | | | |
|---|--|---|--------------------------------|
| Location of Construction: 39 PARSONS RD | Owner Name: BLACKBURN SUZANNE E & JO | Owner Address: 39 PARSONS RD | Phone: |
| Business Name: | Contractor Name: Revision Energy LLC | Contractor Address: 142 Presumpscot street Portland | Phone (207) 323-1805 |
| Lessee/Buyer's Name | Phone: | Permit Type: Additions - Dwellings | |

| | |
|--|--|
| Proposed Use: Single Family Home | Proposed Project Description: Install 2 Solar electric panels adding onto an existing system |
|--|--|

| | | | | |
|---|--------------------------------------|----------------------------------|----------------------------------|---|
| Dept: Zoning | Status: Approved | Reviewer: Marge Schmuckal | Approval Date: 02/26/2013 | Ok to Issue: <input checked="" type="checkbox"/> |
| Note: | | | | |
| Dept: Building | Status: Approved w/Conditions | Reviewer: Tammy Munson | Approval Date: 02/28/2013 | Ok to Issue: <input checked="" type="checkbox"/> |
| Note: | | | | |
| 1) Separate permits are required for any electrical, plumbing, sprinkler, fire alarm, HVAC systems, heating appliances, including pellet/wood stoves, commercial hood exhaust systems and fuel tanks. Separate plans may need to be submitted for approval as a part of this process. | | | | |

City of Portland, Maine - Building or Use Permit Application

389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

| | | |
|--------------------------|-------------|---------------------|
| Permit No: 2013-00383 | Issue Date: | CBL: 139 F026001 |
|--------------------------|-------------|---------------------|

| | | | |
|--|--|--|---|
| Location of Construction: 39 PARSONS RD | Owner Name: BLACKBURN SUZANNE E & JOAN P KUNIAN JTS | Owner Address: 39 PARSONS RD PORTLAND , ME 04103 | Phone: |
| Business Name: | Contractor Name: Revision Energy LLC | Contractor Address: 142 Presumpscot street Portland ME 04101 | Phone (207) 323-1805 |
| Lessee/Buyer's Name | Phone: | Permit Type: Additions - Dwellings | Zone: R3 |
| Past Use: Single Family Home | Proposed Use: Single Family Home | Permit Fee: \$50.00 | Cost of Work: \$2,480.00 |
| Proposed Project Description: Install 2 Solar electric panels adding onto an existing system | | FIRE DEPT: <input type="checkbox"/> Approved <input type="checkbox"/> Denied <input checked="" type="checkbox"/> N/A Signature: <i>[Signature]</i> | INSPECTION: Use Group: R-3 Type: 5TB Signature: <i>[Signature]</i> |
| | | PEDESTRIAN ACTIVITIES DISTRICT (P.A.D.) Action: <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions <input type="checkbox"/> Denied Signature: _____ Date: _____ | |

| | | | | |
|---|--|---|---|--|
| Permit Taken By: LDOBSON | Date Applied For: 02/25/2013 | Zoning Approval | | |
| <ol style="list-style-type: none"> This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules. Building permits do not include plumbing, septic or electrical work. Building permits are void if work is not started within six (6) months of the date of issuance. False information may invalidate a building permit and stop all work.. | Special Zone or Reviews <input type="checkbox"/> Shoreland <input type="checkbox"/> Wetland <input type="checkbox"/> Flood Zone <input type="checkbox"/> Subdivision <input type="checkbox"/> Site Plan Maj <input type="checkbox"/> Minor <input type="checkbox"/> MM <input type="checkbox"/> Date: <i>2/26/13</i> | Zoning Appeal <input type="checkbox"/> Variance <input type="checkbox"/> Miscellaneous <input type="checkbox"/> Conditional Use <input type="checkbox"/> Interpretation <input type="checkbox"/> Approved <input type="checkbox"/> Denied Date: _____ | Historic Preservation <input checked="" type="checkbox"/> Not in District or Landmark <input type="checkbox"/> Does Not Require Review <input type="checkbox"/> Requires Review <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions <input type="checkbox"/> Denied Date: <i>[Signature]</i> | |

CERTIFICATION

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

| | | | |
|---|---------|------|-------|
| SIGNATURE OF APPLICANT | ADDRESS | DATE | PHONE |
| RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE | | DATE | PHONE |

2013-00383

General Building Permit Application



If you or the property owner owes real estate or personal property taxes or user charges on any property within the City, payment arrangements must be made before permits of any kind are accepted.

| | | |
|--|---|---|
| Location/Address of Construction: <u>39 Parsons Road</u> | | |
| Total Square Footage of Proposed Structure/Area | Square Footage of Lot | Number of Stories |
| Tax Assessor's Chart, Block & Lot Chart# <u>139</u> Block# <u>F</u> Lot# <u>26</u> | Applicant: (must be owner, lessee or buyer) Name <u>Revision Energy</u> Address <u>42 Presumpscot St</u> City, State & Zip <u>Portland, ME 04103</u> | Telephone: <u>221-6342</u> |
| Lessee/DBA | Owner: (if different from applicant) Name <u>Suzanne Blackburn</u> Address <u>39 Parsons Road</u> City, State & Zip <u>Portland, ME 04102</u> | Cost of Work: \$ <u>2,480</u> C of O Fee: \$ _____ Historic Review: \$ _____ Planning Amin.: \$ _____ Total Fee: \$ _____ |
| Current legal use (i.e. single family) <u>single</u> Number of Residential Units _____ If vacant, what was the previous use? _____ Proposed Specific use: _____ Is property part of a subdivision? _____ If yes, please name _____ Project description: <u>installing 2 solar electric panels; adding onto an existing system.</u> | | |
| Contractor's name: <u>Revision Energy</u> | | Email: <u>jen@revisionenergy.com</u> |
| Address: <u>Applicant</u> | | Telephone: _____ |
| City, State & Zip _____ | | Telephone: <u>221-6342</u> |
| Who should we contact when the permit is ready: <u>Jen</u> | | Telephone: _____ |
| Mailing address: _____ | | |

Please submit all of the information outlined on the applicable checklist. Failure to do so will result in the automatic denial of your permit.

In order to be sure the City fully understands the full scope of the project, the Planning and Development Department may request additional information prior to the issuance of a permit. For further information or to download copies of this form and other applications visit the Inspections Division on-line at www.portlandmaine.gov, or stop by the Inspections Division office, room 315 City Hall or call 874-8703.

I hereby certify that I am the Owner of record of the named property, or that the owner of record authorizes the proposed work and that I have been authorized by the owner to make this application as his/her authorized agent. I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in this application is issued, I certify that the Code Official's authorized representative shall have the authority to enter all areas covered by this permit at any reasonable hour to enforce the provisions of the codes applicable to this permit.

Signature: [Handwritten Signature]

Date: 2/25/2013

This is not a permit; you may not commence ANY work until the permit is issued

RECEIVED
FEB 25 2013
INSPECTIONS DIVISION
CITY OF PORTLAND, MAINE



Professional design, installation and service of renewable energy systems

February 25, 2013

City of Portland
389 Congress Street
Portland, ME 04101

RE: ReVision Energy Solar Installation at 39 Parsons Road

Dear Code Enforcement,

ReVision Energy has been contracted to design and install a solar electric system at the above address in Portland. This letter is to confirm that all work will be performed by licensed and qualified installers, expert in the field and in compliance with both manufacturer's recommendations and all applicable local and state codes and standards. This also confirms that the roof structure can handle the weight of the panel load, in addition to snow load. The weight of the panels does not change the structural integrity of the building.

ReVision Energy employs licensed engineers, plumbers, and electricians and carries the solar industries highest certifications (NABCEP) in both solar thermal and photovoltaic installation. We're committed to high quality, code compliant work and look forward to working together with the city and the CEO to ensure that all your requirements and needs are met and that our customer ends up with a system that is beautiful, functional and safe.

Electrical and grounding:

All electrical work to be performed by a licensed ME electrician and will conform to NEC 2011 revision as well as NABCEP standards. Specifically, wiring and grounding of the photovoltaic system will be governed by manufacturer's recommendations and article 690. All installed metal components are grounded via the grounding electrode conductor.

If you have any questions or concerns, we'd like to address them as quickly and completely as possible. Please don't hesitate to call or e mail anytime.

Respectfully,

Fortunat Mueller, P.E.
Co-owner
ReVision Energy
(207) 752-6358
fortunat@revisionenergy.com

Bangor
207-570-4222

Liberty
207-589-4171

Portland
207-221-6342

Portsmouth
603-486-7170

www.revisionenergy.com



Project Summary

| System | Performance | Cost | Incentives | Net Cost |
|--|--|-------------------|-------------------------------|----------|
| Two high quality Suniva 260-watt photovoltaic panels with Enphase microinverters added to existing array | <ul style="list-style-type: none"> Produce roughly 639 kWhrs of clean, renewable energy annually. Offset roughly 830 lbs. of CO2 emissions annually. | \$2,480 Installed | -\$744 30% Federal Tax Credit | \$1,736 |

Economic & Environmental Return on Investment

The system we are proposing is guaranteed to pay for itself by harvesting abundant solar energy to replace finite, polluting and increasingly costly fossil fuels. Once you get 100% of your initial investment returned through government financial incentives and energy savings, the system will continue to deliver a revenue stream for decades to come. Plus, the system will eliminate thousands of pounds of CO2 emissions each year, delivering a powerful environmental benefit.

ReVision Energy's mission is to eliminate over-reliance on fossil fuels and the associated emissions. We are succeeding in this mission by installing solar energy systems that are as robust and reliable as traditional mechanical systems. To ensure maximum performance and longevity in a harsh climate, each system is designed by our in-house engineers (Brown, Dartmouth, MIT, UNH) and installed by our experienced team of certified solar professionals. Please join us in the mission to create a clean energy future--we promise to deliver the peace of mind that comes from knowing you have made one of the best investments of your life.



Based on a professional evaluation of your available roofspace, site configuration, and energy demand, ReVision Energy proposes a roof-mounted photovoltaic array of 0.52 kilowatts (nominal).

The system features these major components:

- (2) Enphase Energy M215 microinverters (<http://enphase.com>)
- (2) American-Made Suniva 260 watt monosilicon photovoltaic panels; Optimus Series: 260-60-4-100 or equivalent (<http://www.suniva.com>)

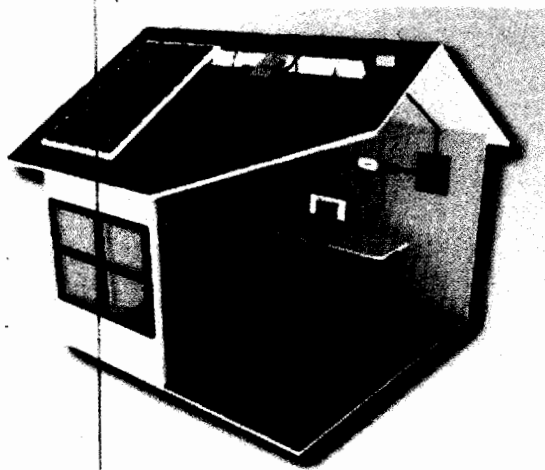
System Operation

Whenever sun shines on the solar electric panels, they will generate direct current (DC) electricity. That DC electricity is converted to AC electricity by individual Enphase inverters, affixed to the underside of each panel. The advantage of microinverters is that the output of the rest of the array is not affected if a portion of panels are shaded.

The AC electricity created by the inverters will then feed directly into the building's load center. Any electric loads (TV, dryer, electronics, etc.) operating while the sun is shining will use available solar electricity, any excess will be exported to the grid.

Whenever the sun is not out, you will continue to purchase grid electricity as you do now. The local utility company will record electricity you feed into the grid. If at the end of the month your generation is greater than your consumption, you will earn a credit on your next bill. You can bank your surplus from month to month for up to a year.

System Diagram



1 - EnPhase Microinverters

Micro-inverters are installed beneath each rooftop solar panel, maximize energy harvest

2 - Envoy Gateway

Performance of individual panels are send to you as well as ReVision Energy in real-time using the Internet

3 - Enlighten Software

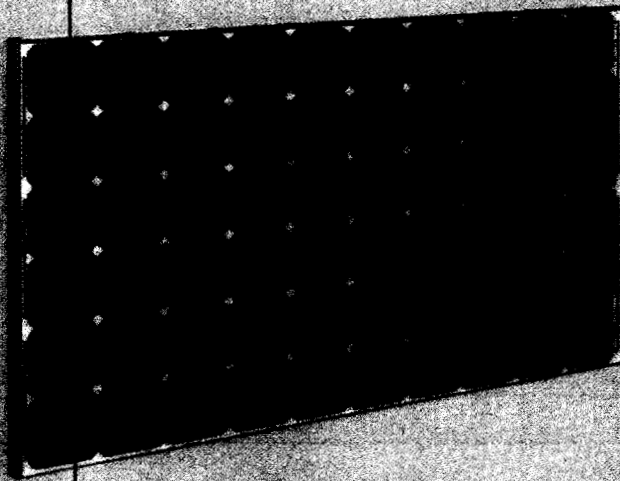
Real-time web based monitoring allows you to evaluate system performance. Also available on mobile devices.





High-quality and high-efficiency
PV yields sensible solar

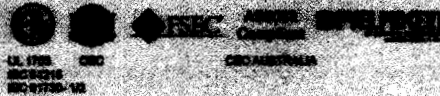
SUNIVA OPTIMUS® SERIES MONOCRYSTALLINE SOLAR MODULES



OPTIMUS-60-4-100 (60 CELL MODULE)

The Optimus® modules consist of Suniva's latest technology: ARTisun® Select. These superior monocrystalline cells are designed and manufactured in the U.S.A. using our proprietary low-cost processing techniques. Engineered with our pioneering ion implantation technology, high power-density Optimus modules provide excellent value, performance and reliability.

Certifications:



Engineering Excellence

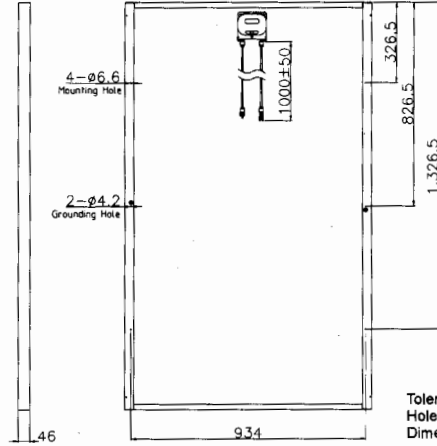
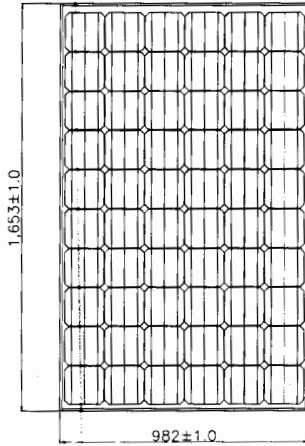
- Built exclusively with Suniva's highest-efficiency ARTisun Select cells, providing one of the highest power outputs per square meter at an affordable manufacturing cost
- Suniva's state-of-the-art manufacturing facility features the most advanced equipment and technology
- Suniva is a U.S.-based company spun out from the Georgia Tech University Center of Excellence in Photovoltaics (one of only two such research centers in the U.S.)

Features

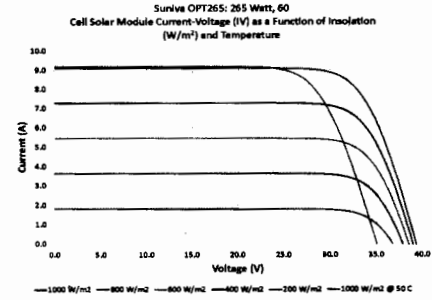
- Contains the latest ARTisun Select cell technology - over 19%
- Positive only power tolerance ensures predictable output
- Marine grade aluminum frame with hard anodized coating
- Industry leading linear warranty (10 year warranty on workmanship and materials, 25 year linear performance warranty delivering 80% power at STC)
- Buy America compliant upon request
- Qualifies for U.S. EXIM financing
- System and design services available

Quality & Reliability

- Suniva Optimus modules are manufactured and warranted to our specifications assuring consistent high performance and quality worldwide.
- Rigorous quality management
 - Performance longevity with advanced polymer backsheet
 - Produced in an ISO 9001:2008 certified facility
 - Passed the most stringent salt spray test (Severity 6) based on IEC 61701
 - Passed enhanced stress tests based on IEC 61215 conducted at Fraunhofer ISE
 - Certified PID free
 - Ask about our validated PAN files



Tolerances ± 1 mm
Hole Tolerances Vary
Dimensions in mm



ELECTRICAL DATA (NOMINAL)

The rated power may only vary by $-0/+4.99$ Wp and all other electrical parameters by $\pm 5\%$

| Power Classification | Pmax (W) | 250 | 255 | 260 | 265 |
|-----------------------------|----------|--------------|--------------|--------------|--------------|
| Module efficiency | % | 15.40 | 15.71 | 16.02 | 16.33 |
| Model Number | OPT | 250-60-4-100 | 255-60-4-100 | 260-60-4-100 | 265-60-4-100 |
| Voltage at Max. Power Point | Vmp (V) | 29.60 | 30.00 | 30.20 | 30.70 |
| Current at Max. Power Point | Imp (A) | 8.44 | 8.50 | 8.60 | 8.64 |
| Open Circuit Voltage | Voc (V) | 37.70 | 37.90 | 38.10 | 38.30 |
| Short Circuit Current | Isc (A) | 8.98 | 9.05 | 9.08 | 9.12 |

The electrical data apply to standard test conditions (STC): Irradiance of 1000 W/m^2 with AM 1.5 spectra at 25°C .

DIMENSIONS AND WEIGHT

| | |
|--------------------------|-----------------------------------|
| Cells / Module | 60 (6x10) |
| Module Dimensions | 1653 x 982 mm (65.08 x 38.66 in.) |
| Module Thickness (Depth) | 46 mm (1.81 in.) |
| Approximate Weight | 18.69 kg (41.22 lbs.) |

CHARACTERISTIC DATA

| | |
|-----------------------------------|--|
| Type of Solar Cell | High-efficiency ARTisun® Select monocrystalline cells of 156 x 156 mm (6 in.) |
| Frame | Silver anodized aluminum alloy; black frame available by custom order |
| Glass | Tempered (low-iron), anti-reflective coating |
| Junction Box | Tyco; NEMA IP65 rated; 3 internal bypass diodes |
| Cable & Connectors | 4.0 mm ² cable with Tyco SolarLok connectors; cable length approximately 1000 mm |
| Hardware (Available Upon Request) | Grounding screws: (2) #10-32 12.7 mm (#10-32 x 0.5 in.) Stainless steel flat washers: (4) 5 x 10 x 1 mm (0.2 in. ID x 0.394 in. OD x 0.030 in.) |

TEMPERATURE COEFFICIENTS

| | | |
|----------|---|--------|
| Voltage | $\beta, \text{Voc} (\%/^\circ\text{C})$ | -0.335 |
| Current | $\alpha, \text{Isc} (\%/^\circ\text{C})$ | +0.047 |
| Power | $\gamma, \text{Pmax} (\%/^\circ\text{C})$ | -0.450 |
| NOCT Avg | ($\pm 2^\circ\text{C}$) | 46.0 |

LIMITS

| | |
|------------------------------|--|
| Max. System Voltage | 1000 VDC for IEC (600 VDC for UL) |
| Operating Module Temperature | -40°C to $+85^\circ\text{C}$ |
| Storm Resistance/Static Load | Tested to IEC 61215 for loads up to 5400 Pa; hail and wind resistant |

Suniva® reserves the right to change the data at any time. View manual at suniva.com.
*UV 90 kWh, TC 400, DH 2000. *Tests were conducted on module type OPT 60.

Headquarters
5765 Peachtree Industrial Blvd.,
Norcross, Georgia 30092 USA
Tel: +1 404 477 2700

www.suniva.com



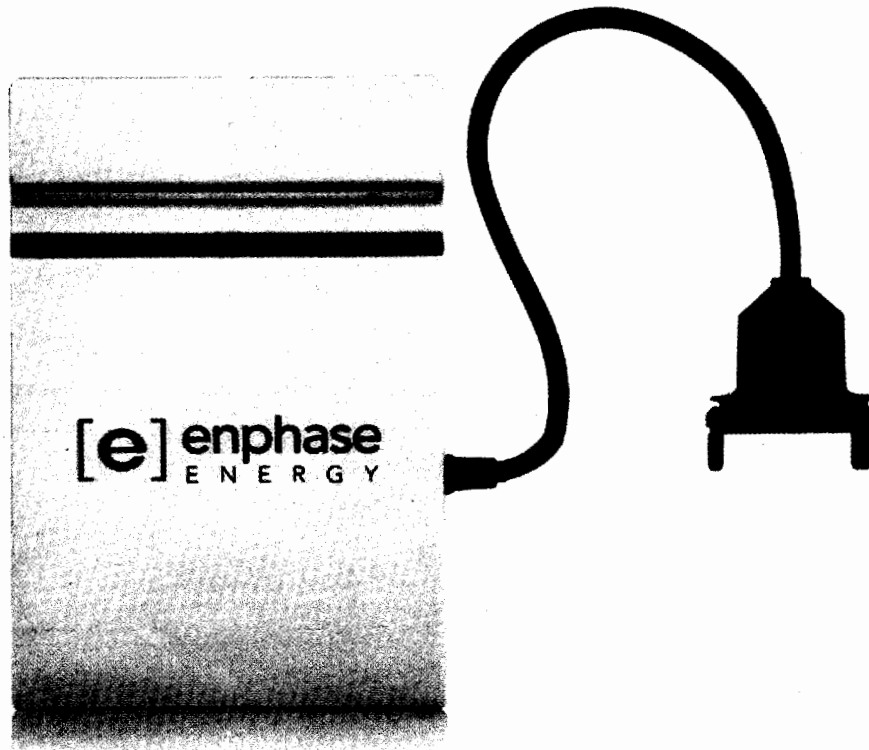
Please recycle.

Suniva
The Brilliance of Solar Made Sensible®



ENPHASE MICROINVERTER

M215



The Enphase Energy Microinverter System improves energy harvest, increases reliability, and dramatically simplifies design, installation and management of solar power systems. The Enphase System includes the microinverter, the Envoy Communications Gateway, and Enlighten, Enphase's monitoring and analysis website.

PRODUCTIVE [- Maximum energy production
- Resilient to dust, debris and shading
- Performance monitoring per module

RELIABLE [- System availability greater than 99.8%
- No single point of system failure

SMART [- Quick & simple design, installation and management
- 24/7 monitoring and analysis

SAFE [- Low voltage DC
- Reduced fire risk



MICROINVERTER TECHNICAL DATA

| Input Data (DC) | | M215-60-2LL-S22/S23 M215-60-2LL-S22-NA/S23-NA (Ontario) | |
|--|---|--|---------------------------|
| Recommended maximum input power (STC) | 260W | | |
| Maximum input DC voltage | 45V | | |
| Peak power tracking range | 22V – 36V | | |
| Operating range | 16V – 36V | | |
| Min./Max. start voltage | 26.4V/45V | | |
| Max. DC short circuit current | 15A | | |
| Max. input current | 10.5A | | |
| Output Data (AC) | | @208 Vac | @240 Vac |
| Maximum output power | 215W | 215W | |
| Nominal output current | 1.0 A* | 0.9 A* | |
| Nominal voltage/range | 208V/183V-229V | 240V/211V-264V | |
| Extended voltage/range | 208V/179V-232V | 240V/206V-269V | |
| Nominal frequency/range | 60.0/59.3-60.5 | 60.0/59.3-60.5 | |
| Extended frequency/range | 60.0/59.2-60.6 | 60.0/59.2-60.6 | |
| Power factor | >0.95 | >0.95 | |
| Maximum units per 20A branch circuit | 26 (three phase) | 17 (single phase) | |
| Maximum output fault current | 1.05 Arms, over 3 cycles; 25.2 Apeak, 1.74ms duration | | |
| | | | *Arms at nominal voltage |
| Efficiency | | | |
| CEC weighted efficiency | | 96.0% | |
| Peak inverter efficiency | | 96.3% | |
| Static MPPT efficiency (weighted, reference EN 50530) | | 99.8% | |
| Dynamic MPPT efficiency (fast irradiation changes, reference EN 50530) | | 99.9% | |
| Night time power consumption | | 46mW | |
| Mechanical Data | | | |
| Operating temperature range | -40°C to +65°C | | |
| Dimensions (WxHxD) | 17.3 cm x 16.4 cm x 2.5 cm (6.8" x 6.45" x 1.0")* | | |
| Weight | 1.6 kg (3.5 lbs) | | |
| Cooling | Natural convection – no fans | | |
| Enclosure environmental rating | Outdoor – NEMA 6 | | |
| | | | *without mounting bracket |
| Features | | | |
| Compatibility | Pairs with most 60-cell PV modules | | |
| Communication | Power line | | |
| Warranty | 25 years, limited | | |
| Compliance | UL1741/IEEE1547, FCC Part 15 Class B CAN/CSA-C22.2 NO. 0-M91, 0.4-04, and 107.1-01 | | |

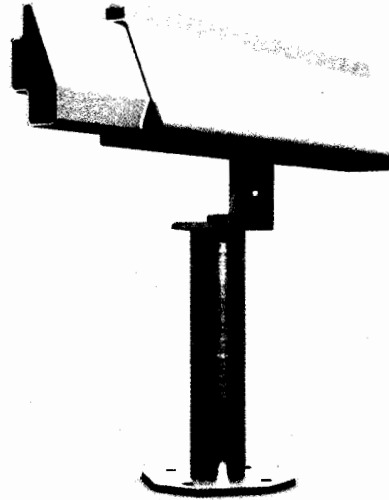
Enphase Energy, Inc.

201 1st Street, Petaluma, CA 94952
877 797 4743 www.enphase.com

IRONRIDGE XR ROOF MOUNT PLATFORM

KEY FEATURES

- ◆ Extruded aluminum components are lightweight for easy handling yet strong enough for most roof mount applications
- ◆ Choice of XRL (lightweight) and XRS (standard) rails
- ◆ Both XRL and XRS rails come with slots for attaching L-feet and top slots for attaching panel clamps
- ◆ XRS rails has slot for bottom mounting clamps
- ◆ Hidden internal splice bars are aesthetically pleasing
- ◆ Internal splices provide superior strength and flexibility with L-feet placement
- ◆ Adjustable L-feet have vertical extension slots for easy adjustability of up to 1-3/8"
- ◆ Standoffs provide increased airflow and ventilation and enable precise placement of flashings
- ◆ Standoffs come in four standard heights: 3", 4", 6", and 7"
- ◆ XR platform compatible with popular flashings including QuickMount and Oatey
- ◆ Panel clamps for both top and bottom mounting
- ◆ Panel clamps for most popular photovoltaic modules
- ◆ Mid-clamp design maximizes panel density
- ◆ Ground clips eliminate the need for copper wire between modules
- ◆ The XR Roof Mount components are covered with an industry-leading 10 year limited product warranty and a 5 year limited finish warranty
- ◆ All XR Roof Mount components are PE certified



The IronRidge XR platform is a reliable, comprehensive, and feature rich photovoltaic mounting solution. Anchored by the XRS (Standard) and XRL (Light) rails, the XR platform includes all of the components necessary for supporting virtually any commercial or residential roof mount installation, regardless of surface material or roof grade.

The XRS and XRL rails are manufactured from extruded aluminum to maximize spans while minimizing weight for improved handling. The graceful curves of the XRS rail will please even the most aesthetically demanding customers. Rails can be extended with the IronRidge patent-pending internal splice bars, providing a strong support connection and ultimate flexibility in footing attachment locations. Installers have a variety of options in attaching IronRidge rails to the roof, including adjustable L-feet, aluminum standoffs, and tilt legs for optimizing power. In addition, IronRidge accommodates modules from most major manufacturers. Top-down panel clamps securely grip the outside frame of the module, freeing the installer from the constraints of panel mounting holes. The XRS rail has an additional side slot to enable the option of bottom mounting. Lastly, grounding clips pierce the anodized rails, creating a ground path through the equipment and eliminating the need to run copper wire between every module.

IronRidge provides a complete technical support system that includes step-by-step installation guides, engineering certification documentation, easy-to-read span charts, and on-line configurator software.

See reverse for product specifications and ordering information. Please contact your local distributor for configuration assistance.

SPECIFICATIONS

- ◆ XRL/XRS Rail – 6105-T5 extruded anodized aluminum
- ◆ XRL/XRS Splice Bars – 6105-T5 extruded aluminum
- ◆ Standoffs – 6105-T5 extruded aluminum
- ◆ L-feet: 6105-T5 extruded aluminum
- ◆ Clamps: 5052-H32 aluminum
- ◆ Hardware: 18-8 Stainless Steel

XRS PROPERTIES

- ◆ Area = .807136 inches²
- ◆ Centroid relative to output coordinate system origin
 - ◆ X = 0.5556
 - ◆ Y = 1.4097
 - ◆ Z = 120.000
- ◆ Moments of Inertia of the area (at the centroid)
 - ◆ Lxx = 0.8430
 - ◆ Lxy = 0.1117
 - ◆ Lxz = 0.0000
 - ◆ Lyx = 0.1117
 - ◆ Lyy = 0.1822
 - ◆ Lyz = 0.0000
 - ◆ Lzx = 0.0000
 - ◆ Lzy = 0.0000
 - ◆ Lzz = 1.0252
- ◆ Polar Moment of Inertia
 - ◆ At Centroid = 1.0252⁴
- ◆ Principal Moments of Inertia
 - ◆ Ix = 0.1638
 - ◆ Iy = 0.8614
- ◆ Principal-Part Axes
 - ◆ Angle = 99.343 degrees
- ◆ Moments of Inertia (output)
 - ◆ LXX = 11625.205
 - ◆ LXY = 0.5204
 - ◆ LXZ = 53.8153
 - ◆ LYX = 0.5204
 - ◆ LYY = 11623.1909
 - ◆ LYZ = 136.5369
 - ◆ LZX = 53.8153
 - ◆ LZY = 136.5369
 - ◆ LZZ = 2.8784

ORDERING INFORMATION

| XR Rails | | |
|----------------------------------|--|----------------|
| Part Number | Description | Weight |
| 51-7000-144a | XRS Standard Rail (1) – 12 feet | 11.364 lbs |
| 51-7000-168a | XRS Standard Rail (1) – 14 feet | 13.258 lbs |
| 51-7000-192a | XRS Standard Rail (1) – 16 feet | 15.152 lbs |
| 51-7000-216a | XRS Standard Rail (1) – 18 feet | 17.046 lbs |
| 51-6000-144a | XRL Light Rail (1) – 12 feet | 6.288 lbs |
| 51-6000-168a | XRL Light Rail (1) – 14 feet | 7.336 lbs |
| 51-6000-192a | XRL Light Rail (1) – 16 feet | 8.384 lbs |
| 51-6000-216a | XRL Light Rail (1) – 18 feet | 9.432 lbs |
| 29-7000-010 | XRS Splice Kit (1) | 0.442 lbs |
| 29-7000-000 | XRL Splice Kit (1) | 0.151 lbs |
| Panel Clamps | | |
| Part Number | Description | Weight |
| 29-7000-xxx | End Clamps (4) – depends on panel | .251-.290 lbs |
| 29-7000-10x | Mid Clamps (4) – depends on panel | .213-.251 lbs |
| 29-7000-117 | Under Clamps (4) | 0.324 lbs |
| Footings Attachments & Flashings | | |
| Part Number | Description | Weight |
| 29-7000-017 | L-foot Kit (4) | 0.872 lbs |
| 51-600x-500 | 3"-7" Standoffs – Specify L-foot or Tilt leg | .533-.710 lbs |
| 31-1000-001 | Oatey Galvanized Flashing 11830 (12) | 8.750 lbs |
| 31-1000-000 | QuickMount QMSCA12 (12) | 13.390 lbs |
| 51-7200-0XX | Tilt Legs (7" – 40") | .0658 lbs/inch |
| 51-7210-000 | Tilt Leg Bracket | 1.576 lbs |
| Grounding | | |
| Part Number | Description | Weight |
| 29-4000-001 | WEEB DMC-Clip (100) | 0.258 lbs |
| 29-4000-002 | WEEB Grounding Lug (100) | 12.356 lbs |
| 29-4000-003 | WEEB Bonding Jumper (100) | 17.614 lbs |
| 29-4000-006 | WEEB ACC-PV Wire Clip (100) | 0.625 lbs |

L-FOOT DIMENSIONS

