Child 20124605 7/12

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: 107 Hersey St		
Total Square Footage of Proposed Structure/Area	Square Footage of Lot	Number of Stories
Tax Assessor's Chart, Block & Lot Chart# 128 Block# C Lot# 10	Applicant *must be owner, Lessee or Buyer* Name ReVision Energy Address 142 Presumpscot St City, State & Zip Portland, ME 04103	Telephone: 221-6342
Lessee/DBA (If Applicable)	Owner (if different from Applicant) Name David Haskell Address 107 Hersey St City, State & Zip Portland, ME	Cost Of Work: $ 30,000 C of O Fee: $ Total Fee: $ 320

Current legal use (i.e. single family) _____ 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: Residence - solar electrical panels on roof

Contractor's name: ReVision Energy
Address: 142 Presumpscot St
City, State & Zip Portland, ME 04103 Telephone: 221-6342
Who should we contact when the permit is ready: Jen Hatch Telephone: _____
Mailing address: above

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: J Hatch Date: 7/12/2012

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

Revised 01-20-10

Professional design, installation and service of renewable energy systems

July 12, 2012

City of Portland
389 Congress Street
Portland, ME 04101

RE: ReVision Energy Solar Installation at 107 Hersey Street

Dear Code Enforcement,

ReVision Energy has been contracted to design and install a solar electric (PV) 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

ROOF ORIENTATION:
180 degrees (true)

ROOF PITCH:
38 degree angle

Collectors to be mounted on south facing roof as shown. Note that the Sunpower modules are all black and because of their exceptional power density the array is somewhat smaller than with a standard efficiency module.

Project Summary

System	Performance	Cost	Incentives	Net Cost
Grid-tied photovoltaic array with premium Sunpower panels and central Sunpower string inverter	• Produce roughly 7,358 kWhrs of clean, renewable energy annually. • Offset roughly 9,566 lbs. of CO2 emissions annually.	$30,448 Installed	-($9,134) 30% Federal Tax Credit -($2,000) Rebate from Efficiency Maine	$19,314

Economic & Environmental Return on Investment

This solar energy system uses a clean, renewable 'fuel' called sunshine. Because it displaces finite, polluting and increasingly expensive fossil fuel, the solar energy system is guaranteed to pay for itself through avoided costs. After you get all of your initial solar investment back, the system will continue to deliver a valuable household revenue stream for years to come. Every time energy costs go up, your financial return on investment improves proportionally.

Plus, the system will be eliminating thousands of pounds of CO2 emissions each year, delivering a powerful environmental benefit for you, your community and future generations. ReVision Energy's experienced team of certified solar professionals delivers the peace of mind that comes from knowing you have the most robust, reliable solar energy system available in northern New England.

Major System Components

Based on a professional evaluation of your available roofspace, site configuration, and energy demand, ReVision Energy proposes a roof-mounted photovoltaic array of 5.52 kilowatts (nominal).

The system features these major components:

- (24) Premium efficiency Sunpower 230-watt solar electric modules with matte black finish
- (1) Sunpower SPR5000m grid-tied photovoltaic inverter
- (130) Feet of Iron Ridge extruded aluminum solar mounting rail with hardware
- (1) Flashed Metallic Junction Box

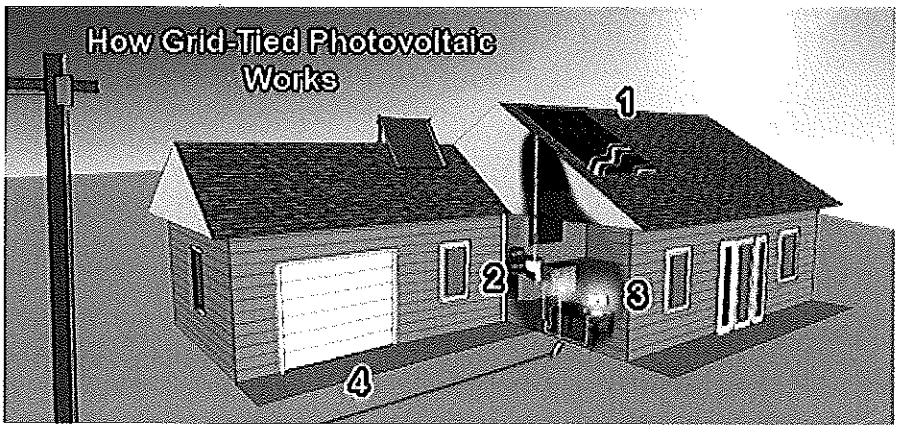
SunPower manufactures the most efficient photovoltaic panels in the world, resulting in roughly 40% more power per square foot of panel area compared to other leading brands. SunPower allow you to maximize solar energy production from your available roof space.

System Operation

Whenever sun shines on the solar electric panels, they will generate direct current (DC) electricity. That DC electricity is transmitted to an inverter, which then converts it into AC electricity which can be used in your home. Any electric loads (TV, dryer, electronics, etc.) operating while the sun is shining will use available solar electricity. Any excess will flow out to the grid and you will receive a credit for the production.

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 - Sun hits rooftop panels, creating electricity

2 - Inverter turns DC solar power into AC power

3 - Solar powers household loads - lights, TV, etc.

4 - Any excess power sold to the grid for a credit.

Use power as you do now - no need for batteries!

SUNPOWER

E18/230 and E18/225 SOLAR PANELS

18% EFFICIENCY

SunPower's signature black™ panels provide the highest efficiency for their product class and a sleek, black appearance

TRANSFORMERLESS INVERTER COMPATIBILITY

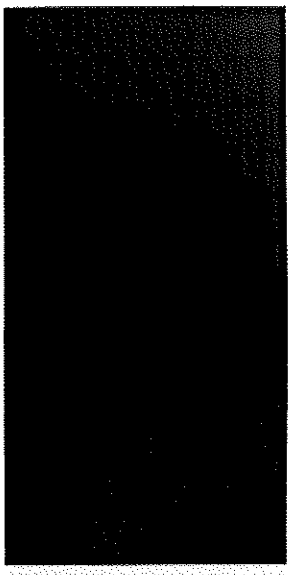
Comprehensive inverter compatibility ensures that customers can pair the highest-efficiency panels with the highest-efficiency inverters, maximizing system output

POSITIVE POWER TOLERANCE

Positive tolerance ensures customers receive the rated power or higher for every panel

RELIABLE AND ROBUST DESIGN

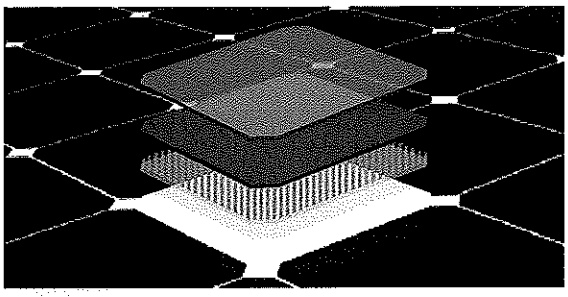
SunPower's unique Maxeon™ cell technology and advanced module design ensure industry-leading reliability



E18 SERIES

THE WORLD'S STANDARD FOR SOLAR™

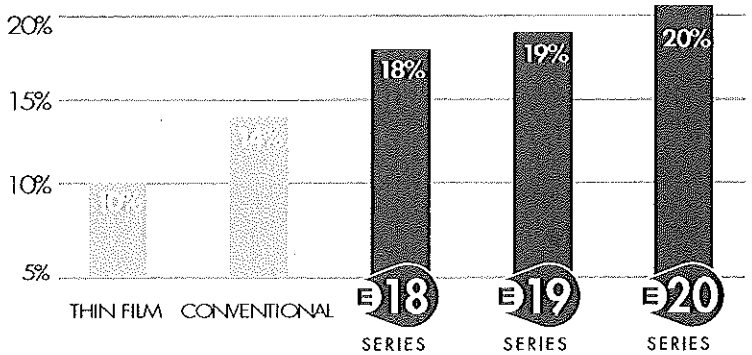
SunPower™ E18 Solar Panels provide today's high efficiency and performance. Powered by SunPower Maxeon™ cell technology, the E18 series provides panel conversion efficiencies of up to 18.5%. The E18's low voltage temperature coefficient and exceptional low-light performance attributes provide outstanding energy delivery per peak power watt.



MAXEON™ CELL TECHNOLOGY

Patented all-back-contact solar cell, providing the industry's highest efficiency and reliability.

SUNPOWER'S HIGH EFFICIENCY ADVANTAGE



PV CYCLE MCS

www.sunpowercorp.co.uk

SUNPOWER E18/230 and E18/225 SOLAR PANELS

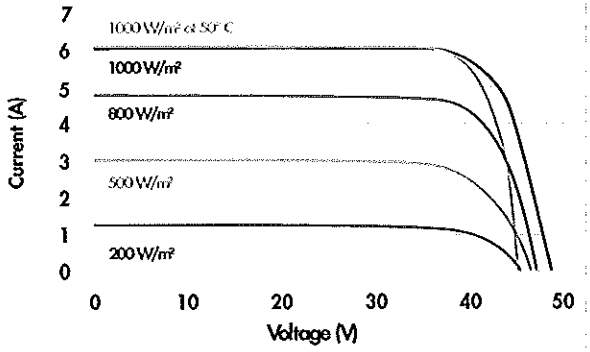
MODELS: SPR-230NE-BLK-D, SPR-225NE-BLK-D

ELECTRICAL DATA

Measured at Standard Test Conditions (STC): Irradiance 1000W/m², AM 1.5, and cell temperature 25° C

Nominal Power (+5/-0%)	P_{nom}	230 W	225 W
Cell Efficiency	η	22.2%	21.7%
Panel Efficiency	η	18.5%	18.1 %
Rated Voltage	V_{mpp}	40.5 V	40.5 V
Rated Current	I_{mpp}	5.68 A	5.55 A
Open-Circuit Voltage	V_{oc}	48.2 V	48.0 V
Short-Circuit Voltage	I_{sc}	6.05 A	5.93 A
Maximum System Voltage	IEC	1000 V	
Temperature Coefficients	Power (P)	-0.38%/K	
	Voltage (V_{oc})	-132.5mV/K	
	Current (I_{sc})	3.5mA/K	
NOCT		46°C +/- 2°C	
Series Fuse Rating		20 A	
Limiting Reverse Current (3 strings)	I_R	15.1 A	14.8 A
Grounding		Positive grounding not required	

I-V CURVE



Current/voltage characteristics with dependence on irradiance and module temperature.

ELECTRICAL DATA

Measured at Nominal Operating Cell Temperature (NOCT): Irradiance 800W/m², 20° C, wind 1 m/s

Nominal Power	P_{nom}	170 W	166 W
Rated Voltage	V_{mpp}	37.2 V	37.2 V
Rated Current	I_{mpp}	4.57 A	4.47 A
Open-Circuit Voltage	V_{oc}	45.0 V	44.8 V
Short-Circuit Voltage	I_{sc}	4.90 A	4.80 A

TESTED OPERATING CONDITIONS

Temperature	-40° C to +85° C
Max load	550 kg/m² (5400 Pa), front (e.g. snow) w/specified mounting configurations
	245 kg/m² (2400 Pa) front and back (e.g. wind)
Impact Resistance	Hail: 25 mm at 23 m/s

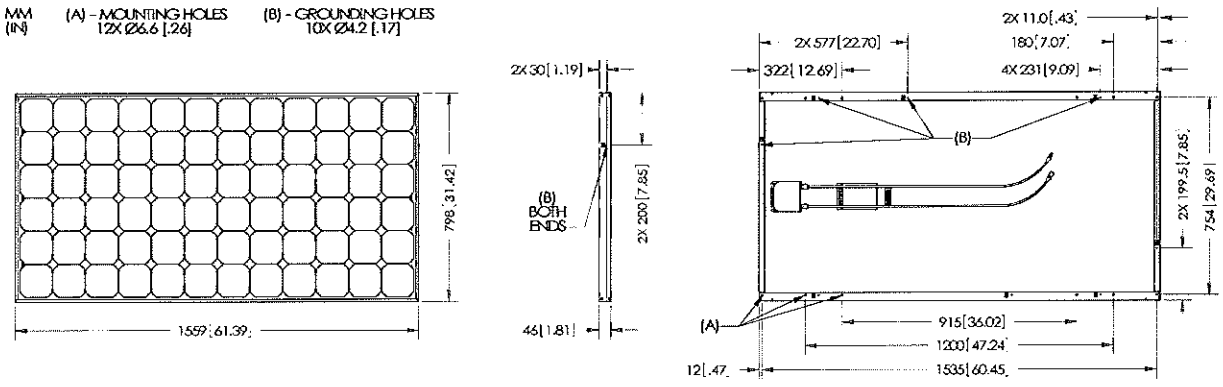
WARRANTIES AND CERTIFICATIONS

Warranties	25-year limited power warranty
	10-year limited product warranty
Certifications	IEC 61215 Ed. 2, IEC 61730 (SCII)

MECHANICAL DATA

Cells	72 SunPower Maxeon™ cells
Front Glass	High-transmission tempered glass
Junction Box	IP-65 rated with 3 bypass diodes
	32 x 155 x 128 mm
Output Cables	1000 mm cables / Multi-Contact (MC4) connectors
Frame	Anodised aluminium alloy type 6063 (black)
Weight	15.0 kg

DIMENSIONS



Please read safety and installation instructions before using this product, visit sunpowercorp.com for more details.

sunpowercorp.com
Document # 001-68203 Rev** / A4_EN
CS 11_267

SUNPOWER

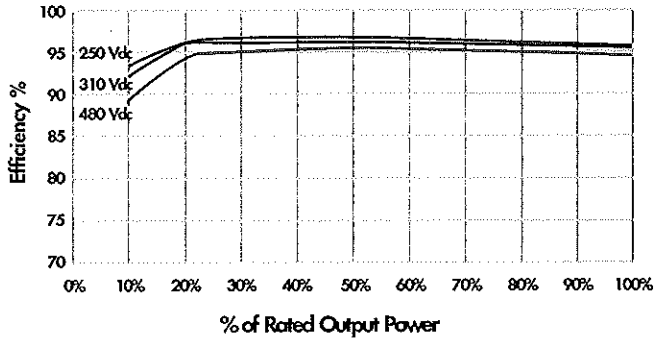
5000m, 6000m & 7000m INVERTERS

EXCEPTIONAL RELIABILITY AND PERFORMANCE

Electrical Data

	SPR-5000m	SPR-6000m	SPR-7000m
AC Power	5000 W	6000 W	7000 W
AC Max Output Current (@ 208V, 240V, 277V):	24A, 20.8A, 18A	29A, 25A, 21.6A	34A, 29A, 25.3A
AC Nominal Voltage / Range	183–229 V@208 VAC 211–264 V@240 VAC 244–305 V@277 VAC	183–229 V@208 VAC 211–264 V@240 VAC 244–305 V@277 VAC	183–229 V@208 VAC 211–264 V@240 VAC 244–305 V@277 VAC
AC Freq / Range	60 Hz / 59.3 Hz – 60.5 Hz	60 Hz / 59.3 Hz – 60.5 Hz	60 Hz / 59.3 Hz – 60.5 Hz
Power Factor	1	1	1
Peak Inverter Efficiency	96.8%	97.0%	97.1%
CEC Weighted Efficiency	95.5 %@208 V 95.5 %@240 V 95.5 %@277 V	95.5 %@208 V 95.5 %@240 V 96.0 %@277 V	96.0 %@208 V 96.0 %@240 V 96.0 %@240V
Recommended Array Input Power (DC @ STC)	5300 W	6400 W	7500 W
DC Input Voltage Range	250 – 600 V	250 – 600 V	250 – 600 V
Peak Power Tracking Voltage	250 – 480 V	250 – 480 V	250 – 480 V
DC Max. Input Current	21 A	25 A	30 A
DC Voltage Ripple	< 5%		
No. of Fused String Inputs	4		
Power Consump: Standby / Nighttime	< 7 W / 0.25 W		
Fused DC & AC Disconnect	Standard; Complies with NEC Standards		
Grounding	Positive Ground		

SPRm Efficiency Curves

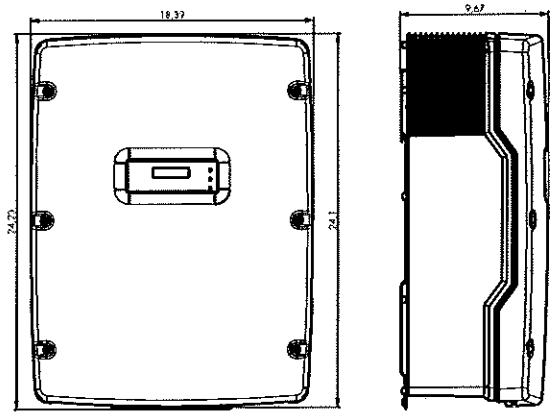


Mechanical Data

Shipping Dimensions W x H x D inches	23.5" x 31.0" x 16.0"
Unit Dimensions W x H x D inches	18.4" x 24.1" x 9.5"
Inverter Weight	143 lbs
Shipping Weight	154 lbs
Cooling	Forced Air / Sealed Electronics Enclosure
Enclosure	NEMA 3R
Mounting	Wall Mount Bracket Standard
Ambient Temperature Range	–13 to +113 °F

Warranty and Certifications

Warranty	10 year limited warranty
Certifications	Compliance: IEEE-929, IEEE-1547, UL 1741-2005, UL 1998, FCC Part 15 A & B



About SunPower

SunPower designs, manufactures and delivers high-performance solar electric technology worldwide. Our high-efficiency solar cells generate up to 50 percent more power than conventional solar cells. Our high-performance solar panels, roof tiles and trackers deliver significantly more energy than competing systems.

Document # 001-16967 Rev **

www.sunpowercorp.com

SUNPOWER

5000m, 6000m & 7000m INVERTERS

EXCEPTIONAL RELIABILITY AND PERFORMANCE

BENEFITS

Reliable and Robust Design
Proven track record for durability and longevity

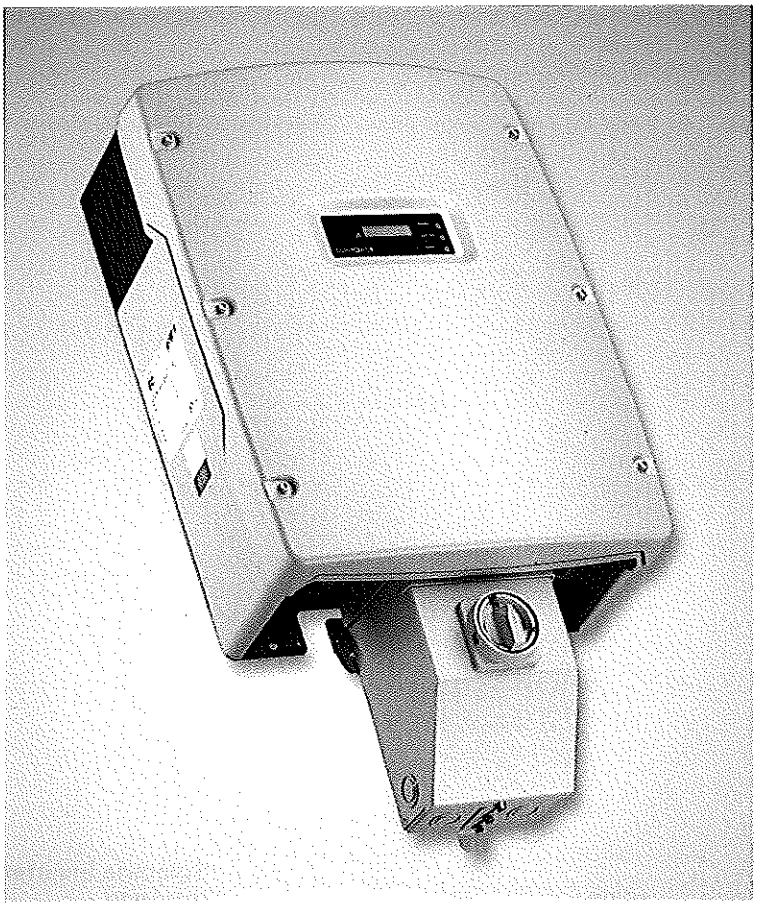
Effective Power Range
Enables most systems to use a single inverter rather than multiple units

Commercial Use
Flexible AC voltage output and scalable building blocks create an easy solution for commercial applications

High Efficiency
Weighted CEC efficiency over 95.5% and peak efficiency over 97%

Reduced Installation Cost
Integrated AC-DC disconnect with fuses lowers material costs and labor requirements

Attractive Aesthetics
Integrated disconnect eliminates need for visible conduits to inverter



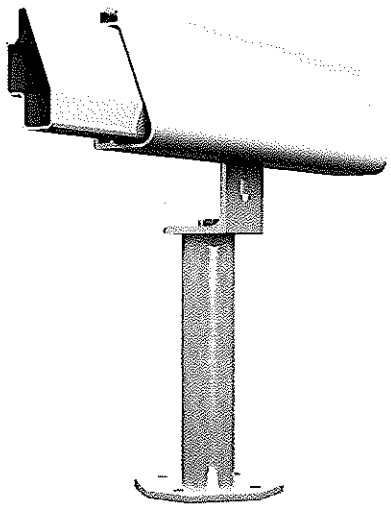
The SunPower inverters 5000m, 6000m & 7000m provide exceptional reliability and market-leading design flexibility. The SPRm line of Solar Inverters can be easily applied in residential or commercial installations. All models come with a 10-year warranty.

PRODUCT DATA SHEET

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.

IRONRIDGE

707-459-9523
sales@ironridge.com
www.ironridge.com

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

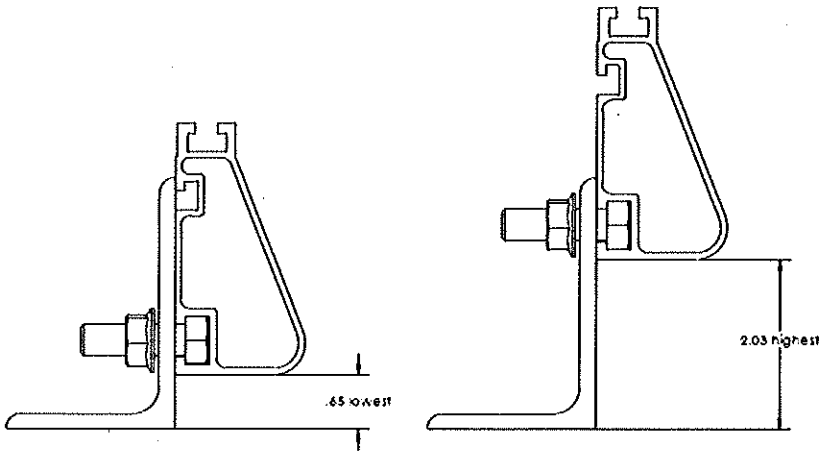
XRS PROPERTIES

- Area = .807136 inches^2
- 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 = 1.0252^4
- 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
Footing Attachments & Flashings		
Part Number	**Description**	**Weight**
29-7000-017	L-feet Kit (4)	0.872 lbs
51-600x-500	3"-7" Standoffs – Specify L-feet 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



IRONRIDGE

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