



February 1st, 2024

Town of Barrington, NH
Town Hall Municipal Photovoltaic (PV) Installation
Energy Committee Chair
Paul Panish
4 Signature Drive
Barrington, NH 03825

Dear Paul,

Thank you for contacting Granite State Solar! Enclosed in this envelope please find our solar proposal for the Barrington Town Hall.

The proposal consists of a 95-panel rooftop system utilizing the south and west facing roofs. Our analysis found this panel layout will yield the highest energy production, which ultimately provides the Town with the strongest economic return, while also not compromising on aesthetics. The 38.95 kW system is estimated to produce 41,858 kWh annually, which will offset 109% of the building's energy needs based upon an annual energy consumption of 38,000 kWh. Pricing is valid for 90-days.

Installation would be done solely by our in-house team (electrical license #0336C), which includes apprentices, journeymen, and master electricians. The six references provided have systems ranging in size from 31 kW to 90 kW and were all completed by our in-house team of electricians, making this size job a perfect fit for them. With over 16+ years of being in business we have the experience, knowledge and expertise for a seamless installation!

You will find included in the proposal package the specification sheets for the solar panel and inverter. There is also that list of five references I mentioned above should you want to find out about the quality of our work. A copy of our certificate of insurance is also included.

Thank you for considering Granite State Solar for this project and please don't hesitate to reach out with any questions. We look forward to earning your business!

Sunny regards,

Eric Kilens
Senior Solar Advisor



2022 & 2023 Best of Business Winner for Best Solar Company

57 Ryan Road
Bow, NH 03304
Office: (603) 369-4318
Cell: (603) 268-3357
GraniteStateSolar.com

Granitestatesolar.com • 57 Ryan Road • Bow, NH • 03304 • 603-369-4318



System Quote and Investment Details for:
Barrington Town Hall Municipal Photovoltaic (PV)
Installation
4 Signature Drive, Barrington, NH 03825
 Created 2/1/2024 - Valid for 90 Days

Included:

Construction of a 38.95 kW DC roof-mounted solar array consisting of:

- 95) Hanwha Q-Cell 410W black-on-black monocrystalline solar modules
- 5) Tesla string inverters
- Flush-cut aluminium mounting system
- Enphase Envoy installed and configured with My Enlighten monitoring system
- All electrical service from array to service panel / grid
- Building and electrical permitting, fees, and inspections
- 12-year workmanship warranty by Granite State Solar
- 25-year warranty on panels guaranteed by Hanwha Q-Cell
- 12-year warranty on inverters guaranteed by Tesla

**Does not include cost of potential transformer upgrade from utility or potential reinforcement of roof structure if need be.*

System Information	
Annual Usage (kWh)	38,000
Panel Count	95
Array Output (DC Watts)	38,950
Annual Production (kWh)	41,353
Percentage of Electricity Usage Offset	109%
Client-Funded Price	
Gross system cost (Paid to GSS)	\$ 93,674.44
Federal Tax Credit (30%) (Claimed by Client)	\$ 28,102.33
Net cost after recouping incentives	\$ 65,572.11

*Granite State Solar does not offer tax advice. Please consult with your accountant whether these tax benefits may apply to you.

COMMERCIAL CUSTOMER REFERENCES



Cocheco Country Club

42 kW roof-mounted system
Tel: (603) 781-9458
gm@cochechocc.com
145 Gulf Road, Dover, NH 03820

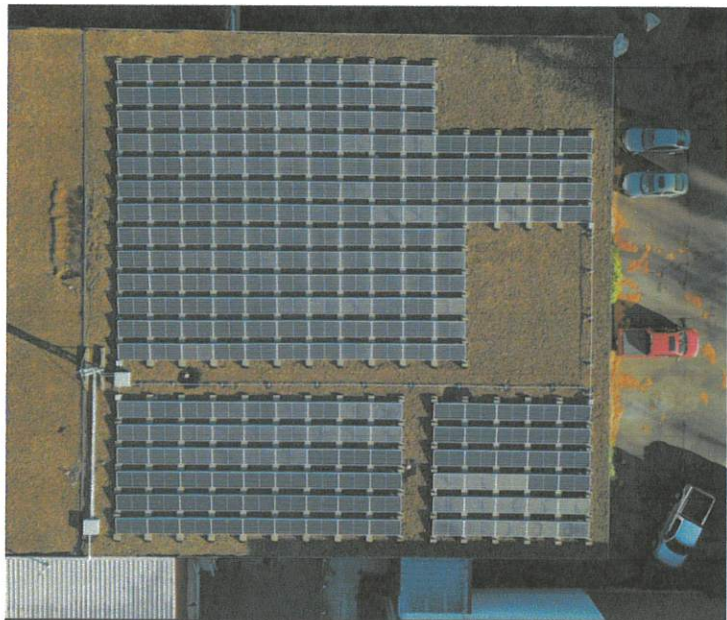


Berube's Truck Accessories

53 kW roof-mounted system
Tel: (508) 451-7821
Email: donberube@comcast.net
2 Tallwood Dr, Bow, NH 03304

Consignment Gallery

31 kW roof-mounted system
Tel: (603) 801-4901
Email: reynolds12@mindspring.com
294 S River Rd, Bedford, NH 03110

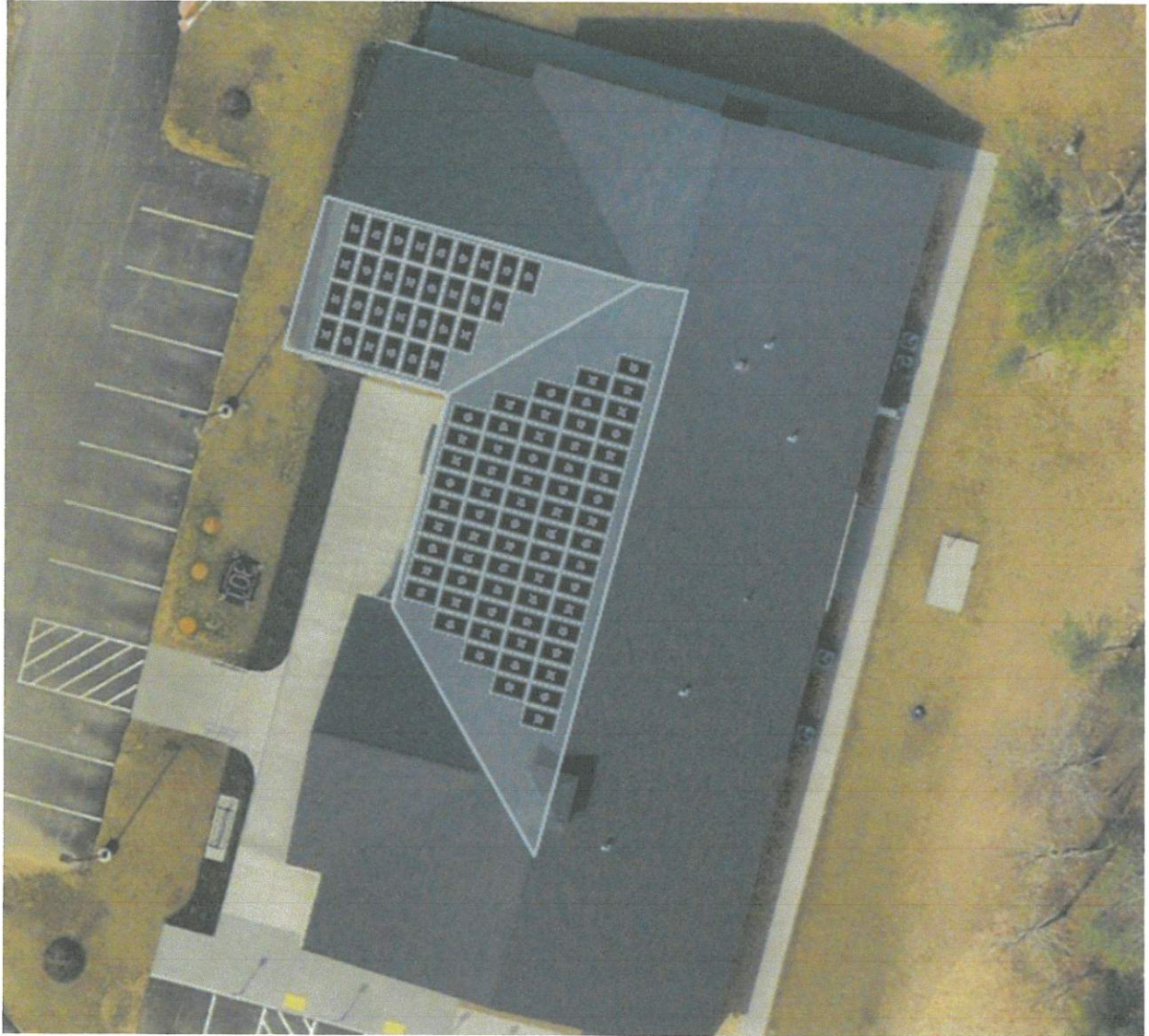


Instock Flooring

52 kW roof-mounted system
Tel: (603) 898-6036
Email: sales@instockflooring.com
32 Lowell Rd, Salem, NH 03079

Argo Cycles

93 kW roof-mounted system
Tel: (603) 494-3644
Email: gma@myump.com
63 Epping St, Raymond, NH 03077



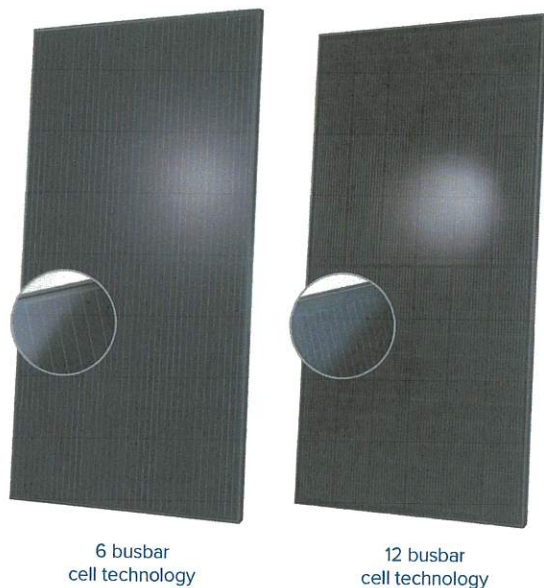
Granite State Solar ▪ (603) 369.4318 ▪ Info@granitestatesolar.com ▪ www.granitestatesolar.com
57 Ryan Rd, Bow, New Hampshire, 03304

Q.PEAK DUO BLK ML-G10+ SERIES



385-410 Wp | 132 Cells
20.9% Maximum Module Efficiency

MODEL Q.PEAK DUO BLK ML-G10+



Breaking the 20% efficiency barrier

Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 20.9%.



A reliable investment

Inclusive 25-year product warranty and 25-year linear performance warranty¹.



Enduring high performance

Long-term yield security with Anti LeTID Technology, Anti PID Technology² and Hot-Spot Protect.



Extreme weather rating

High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (4000 Pa).



Innovative all-weather technology

Optimal yields, whatever the weather with excellent low-light and temperature behaviour.



The most thorough testing programme in the industry

Qcells is the first solar module manufacturer to pass the most comprehensive quality programme in the industry: The new "Quality Controlled PV" of the independent certification institute TÜV Rheinland.

¹ See data sheet on rear for further information.

² APT test conditions according to IEC/TS 62804-1:2015, method A (-1500V, 96h)

The ideal solution for:



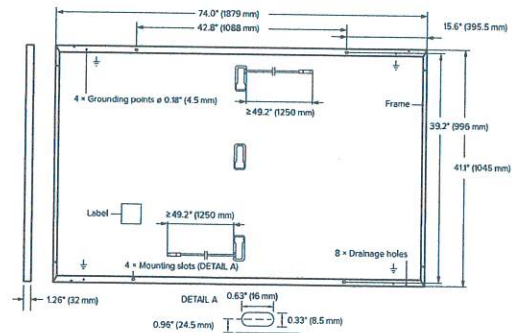
Rooftop arrays on residential buildings



Q.PEAK DUO BLK ML-G10+ SERIES

Mechanical Specification

Format	74.0 in × 41.1 in × 1.26 in (including frame) (1879 mm × 1045 mm × 32 mm)
Weight	48.5 lbs (22.0 kg)
Front Cover	0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodised aluminium
Cell	6 × 22 monocrystalline Q.ANTUM solar half cells
Junction box	2.09-3.98 in × 1.26-2.36 in × 0.59-0.71 in (53-101 mm × 32-60 mm × 15-18 mm), IP67, with bypass diodes
Cable	4 mm ² Solar cable; (+) ≥ 49.2 in (1250 mm), (-) ≥ 49.2 in (1250 mm)
Connector	Stäubli MC4; IP68



Electrical Characteristics

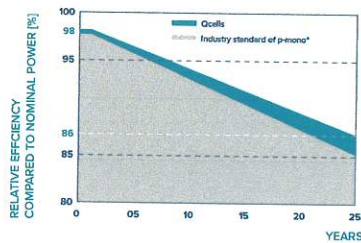
POWER CLASS			385	390	395	400	405	410
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC ¹ (POWER TOLERANCE +5 W/-0 W)								
Minimum	Power at MPP ¹	P_{MPP} [W]	385	390	395	400	405	410
	Short Circuit Current ¹	I_{SC} [A]	11.04	11.07	11.10	11.14	11.17	11.20
	Open Circuit Voltage ¹	V_{OC} [V]	45.19	45.23	45.27	45.30	45.34	45.37
	Current at MPP	I_{MPP} [A]	10.59	10.65	10.71	10.77	10.83	10.89
	Voltage at MPP	V_{MPP} [V]	36.36	36.62	36.88	37.13	37.39	37.64
	Efficiency ¹	η [%]	≥ 19.6	≥ 19.9	≥ 20.1	≥ 20.4	≥ 20.6	≥ 20.9

MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT²

Minimum	Power at MPP	P_{MPP} [W]	288.8	292.6	296.3	300.1	303.8	307.6
	Short Circuit Current	I_{SC} [A]	8.90	8.92	8.95	8.97	9.00	9.03
	Open Circuit Voltage	V_{OC} [V]	42.62	42.65	42.69	42.72	42.76	42.79
	Current at MPP	I_{MPP} [A]	8.35	8.41	8.46	8.51	8.57	8.62
	Voltage at MPP	V_{MPP} [V]	34.59	34.81	35.03	35.25	35.46	35.68

¹Measurement tolerances $P_{MPP} \pm 3\%$; I_{SC} ; $V_{OC} \pm 5\%$ at STC: 1000 W/m², 25 ± 2 °C, AM 1.5 according to IEC 60904-3. ²800 W/m², NMOT, spectrum AM 1.5

Qcells PERFORMANCE WARRANTY

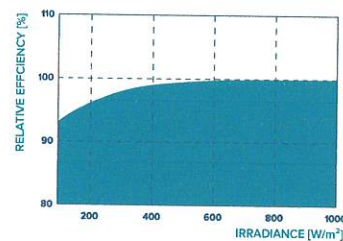


At least 98% of nominal power during first year. Thereafter max. 0.5% degradation per year. At least 93.5% of nominal power up to 10 years. At least 86% of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Qcells sales organisation of your respective country.

*Standard terms of guarantee for the 5 PV companies with the highest production capacity in 2021 (February 2021)

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²).

TEMPERATURE COEFFICIENTS

Temperature Coefficient of I_{SC}	α [%/K]	+0.04	Temperature Coefficient of V_{OC}	β [%/K]	-0.27
Temperature Coefficient of P_{MPP}	γ [%/K]	-0.34	Nominal Module Operating Temperature	NMOT [°F]	109 ± 5.4 (43 ± 3 °C)

Properties for System Design

Maximum System Voltage	V_{SYS} [V]	1000 (IEC)/1000 (UL)	PV module classification	Class II
Maximum Series Fuse Rating	[A DC]	20	Fire Rating based on ANSI/UL 61730	TYPE 2
Max. Design Load, Push/Pull ³	[lbs/ft ²]	75 (3600 Pa)/55 (2660 Pa)	Permitted Module Temperature on Continuous Duty	-40 °F up to +185 °F (-40 °C up to +85 °C)
Max. Test Load, Push/Pull ³	[lbs/ft ²]	113 (5400 Pa)/84 (4000 Pa)		

³ See Installation Manual

Qualifications and Certificates

UL 61730, CE-compliant,
Quality Controlled PV - TÜV Rheinland,
IEC 61215:2016, IEC 61730:2016,
U.S. Patent No. 9,893,215 (solar cells),



Specifications subject to technical changes © Qcells Q.PEAK DUO BLK ML-G10+ series_385-410_2023-01_Rev03_INA

Qcells pursues minimizing paper output in consideration of the global environment.

Note: Installation instructions must be followed. Contact our technical service for further information on approved installation of this product.

Hanwha Q CELLS America Inc. 400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | TEL +1 949 748 59 96 | EMAIL hq-inquiry@qcells.com | WEB www.qcells.com

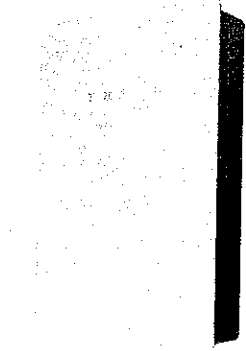
qcells

SOLAR INVERTER

Tesla Solar Inverter provides DC to AC conversion and integrates with the Tesla ecosystem, including Solar Panels, Solar Roof, Powerwall, and vehicle charging, to provide a seamless sustainable energy experience.

KEY FEATURES

- Integrated rapid shutdown, arc fault, and ground fault protection
- No neutral wire simplifies installation
- 2x the standard number of MPPTs for high production on complex roofs



ELECTRICAL SPECIFICATIONS

OUTPUT (AC)	5.5 kW	7.6 kW
Nominal Power	3,800 W	7,600 W
Maximum Apparent Power	3,328 VA at 208 V 3,840 VA at 240 V	6,656 VA at 208 V 7,680 VA at 240 V
Maximum Continuous Current	16 A	32 A
Breaker (Overcurrent Protection)	20 A	40 A
Nominal Power Factor	1 - 0.85 (leading / lagging)	
THD (at Nominal Power)	<5%	
INPUT (DC)		
MPPT	2	4
Input Connectors per MPPT	1-2	1-2-1-2
Maximum Input Voltage	600 VDC	
DC Input Voltage Range	60 - 550 VDC	
DC MPPT Voltage Range ¹	60 - 480 VDC	
Maximum Current per MPPT (I_{mp})	11 A	
Maximum Short Circuit Current per MPPT (I_{sc})	15 A	

PERFORMANCE SPECIFICATIONS

Peak Efficiency ²	97.5%	98.0%
CEC Efficiency ²	97.5%	
Allowable DC/AC Ratio	1.4	
Customer Interface	Tesla Mobile App	
Internet Connectivity	Wi-Fi (2.4 GHz, 802.11 b/g/n), Ethernet, Cellular (LTE/4G) ³	
AC Remote Metering Support	Wi-Fi (2.4 GHz, 802.11 b/g/n), RS-485	
Protections	Integrated arc fault circuit interrupter (AFCI), Rapid Shutdown	
Supported Grid Types	60 Hz, 240 V Split Phase 60 Hz, 208 V Wye	
Required Number of Tesla Solar Shutdown Devices per Solar Module	See <i>Solar Shutdown Device Requirements per Module</i> on page 3	
Warranty	12.5 years	

¹ Maximum current.

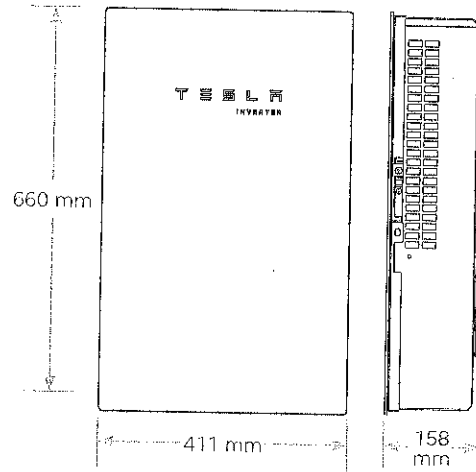
² Expected efficiency pending final CEC listing.

³ Cellular connectivity subject to network operator service coverage and signal strength.

MECHANICAL SPECIFICATIONS

Dimensions	660 mm x 411 mm x 158 mm (26 in x 16 in x 6 in)
Weight	52 lb ⁴
Mounting options	Wall mount (bracket)

⁴ Door and bracket can be removed for a mounting weight of 37 lb.



ENVIRONMENTAL SPECIFICATIONS

Operating Temperature ⁵	-30°C to 45°C (-22°F to 113°F)
Operating Humidity (RH)	Up to 100%, condensing
Storage Temperature	-30°C to 70°C (-22°F to 158°F)
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Rating	Type 3R
Ingress Rating	IP55 (Wiring compartment)
Pollution Rating	PD2 for power electronics and terminal wiring compartment, PD3 for all other components
Operating Noise @ 1 m	< 40 db(A) nominal, < 50 db(A) maximum

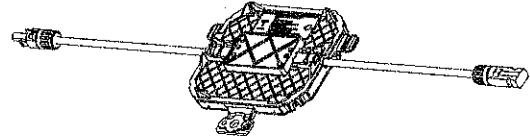
⁵ For the 7.6 kW Solar Inverter, performance may be de-rated to 6.2 kW at 240 V or 5.57 kW at 208 V when operating at temperatures greater than 45°C.

COMPLIANCE INFORMATION

Grid Certifications	UL 1741, UL 1741 SA, IEEE 1547, IEEE 1547.1
Safety Certifications	UL 1699B, UL 1741, UL 1998 (US)
Emissions	EN 61000-6-3 (Residential), FCC 47CFR15.109 (a)

SOLAR SHUTDOWN DEVICE

The Tesla Solar Shutdown Device is part of the PV system rapid shutdown (RSD) function in accordance with Article 690 of the applicable NEC. When paired with the Tesla Solar Inverter, the PVRSS is initiated by any loss of AC power.



ELECTRICAL SPECIFICATIONS

Nominal Input DC Current Rating (I_{mp})	12 A
Maximum Input Short Circuit Current (I_{sc})	15 A
Maximum System Voltage	600 V DC

RSD MODULE PERFORMANCE

Maximum Number of Devices per String	5
Control	Power Line Excitation
Passive State	Normally open
Maximum Power Consumption	7 W
Warranty	25 years

COMPLIANCE INFORMATION

Certifications	UL 1741 PVRSS PVRSA (Photovoltaic Rapid Shutdown Array)
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PVRSS

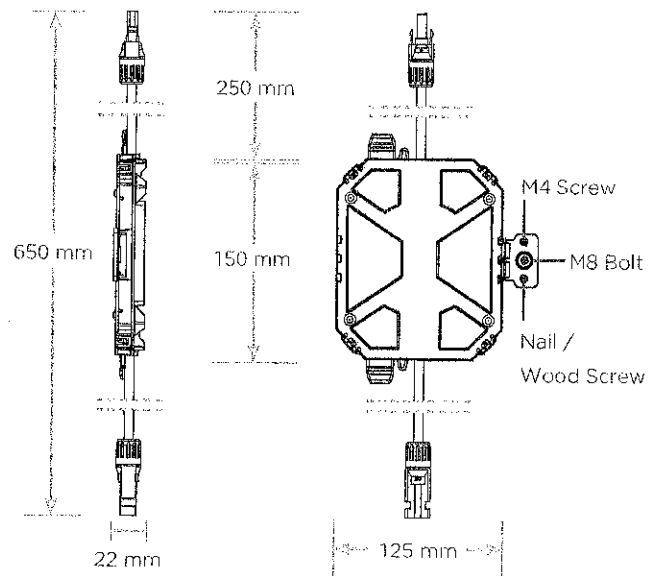
RSD Initiation Method	Loss of AC power
Compatible Equipment	Tesla Solar Inverter

ENVIRONMENTAL SPECIFICATIONS

Ambient Temperature	-40°C to 50°C (-40°F to 122°F)
Storage Temperature	-30°C to 70°C (-22°F to 158°F)
Enclosure Rating	NEMA 4 / IP65

MECHANICAL SPECIFICATIONS

Electrical Connections	MC4 Connector
Housing	Plastic
Dimensions	125 mm x 150 mm x 22 mm (5 in x 6 in x 1 in)
Weight	350 g (0.77 lb)
Mounting Options	ZEP Home Run Clip M4 Screw (#10) M8 Bolt (5/16") Nail / Wood screw



SOLAR SHUTDOWN DEVICE REQUIREMENTS PER MODULE

The following modules have been certified as part of a PV Rapid Shutdown Array (PVRSA) when installed together with the Tesla Solar Inverter and Tesla Solar Shutdown Devices. See the Tesla Solar Inverter Installation Manual for guidance on installing Tesla Solar Inverter and Solar Shutdown Devices with other modules.

Brand	Model	Required Solar Shutdown Devices
Tesla	Solar Roof V3	1 Solar Shutdown Device per 10 modules
Hanwha	Q.PEAK DUO BLK-G5	1 Solar Shutdown Device per 3 modules
Hanwha	Q.PEAK DUO BLK-G6+	1 Solar Shutdown Device per 3 modules



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)
1/16/2024

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 have ADDITIONAL INSURED provisions or 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 Eaton & Berube Insurance Agency, Inc. 11 Concord Street Nashua NH 03064	CONTACT NAME: Debbie Rioux		
	PHONE (A/C, No, Ext): 603-882-2766	FAX (A/C, No): 603-886-4230	
	E-MAIL ADDRESS: drioux@eatonberube.com		
	INSURER(S) AFFORDING COVERAGE		NAIC #
	INSURER A: Acuity Insurance		14184
	INSURER B: Granite State Workers Comp Mfg. Trust		
INSURER C:			
INSURER D:			
INSURER E:			
INSURER F:			

COVERAGES	CERTIFICATE NUMBER: 1918262230	REVISION NUMBER:
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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 CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: POLICY <input checked="" type="checkbox"/> PRO-JECT <input checked="" type="checkbox"/> LOC OTHER:	Y	Y	ZG1367	7/1/2023	7/1/2024	EACH OCCURRENCE	\$ 1,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	\$ 300,000
							MED EXP (Any one person)	\$ 10,000
							PERSONAL & ADV INJURY	\$ 1,000,000
							GENERAL AGGREGATE	\$ 3,000,000
							PRODUCTS - COMP/OP AGG	\$ 3,000,000
								\$
A	<input checked="" type="checkbox"/> AUTOMOBILE LIABILITY ANY AUTO <input checked="" type="checkbox"/> OWNED AUTOS ONLY <input checked="" type="checkbox"/> Hired AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS ONLY	Y	Y	ZG1367	7/1/2023	7/1/2024	COMBINED SINGLE LIMIT (Ea accident)	\$ 1,000,000
							BODILY INJURY (Per person)	\$
							BODILY INJURY (Per accident)	\$
							PROPERTY DAMAGE (Per accident)	\$
								\$
A	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> EXCESS LIAB DED RETENTION \$	Y	Y	ZG1367	7/1/2023	7/1/2024	EACH OCCURRENCE	\$ 1,000,000
							AGGREGATE	\$ 1,000,000
								\$
B	<input checked="" type="checkbox"/> WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below			WC0120242000027	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
A	Non-owned Tools & Equipment			ZG1367	7/1/2023	7/1/2024	Limit Deductible	\$50,000 \$500

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
Additional Insured is granted on General Liability, if required by written contract per Acuity Insurance Additional Insured - Automatic Status form CG-2033R (6/13).
Workers Compensation Covered State: NH
Workers Compensation Named Insured Only: Granite State Solar, LLC
Town of Barrington is listed as additional insured per written contract.

CERTIFICATE HOLDER	CANCELLATION 30 Days/ 10 Days Non-Payment
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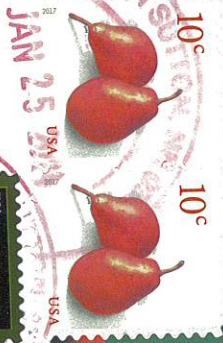
Town of Barrington	<p>SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.</p> <p>AUTHORIZED REPRESENTATIVE <i>Anna Berube</i></p>
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Granite State Solar
57 Ryan Road
Bow, NH 03304

RECEIVED
JAN 29 2024
TOWN OF BARRINGTON

Town of Barrington
Proposal for Barrington Town Hall
Solar PV Installation
P6 Box 660
Barrington, NH 03825

03825390660 8001



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