



CONSTRUCTION PERMIT APPLICATION

C-12-000401

Applicant Completes: Sections I, II, III (optional), IV, VI, and VII

I. IDENTIFICATION

1. Proposed Work Site at: 11416 Forge Pond Road

2. Name of Owner in Fee: Pablo Quisada

Tel. _____ e-mail _____

Address 11416 Forge Pond Road Brick 08724

3. Ownership in Fee: Public _____ Private ☒ Municipality _____ zip code _____

4. Principal Contractor: _____ Tel. (____) _____

Address Roof Diagnostics, Inc. e-mail _____

608 Brighton Avenue

Spring Lake Hts, NJ 07762

License No. OR, if new home, Builder Reg. No. (732) 974-8874 Exp. Date _____

Home Improvement Contractor Registration No. or Exemption Reason (if applicable): _____

Federal Emp. ID No. 13VH00092200 FAX: (____) _____

5. Architect or Engineer _____ Contact _____

Address _____ e-mail _____

Tel. (____) _____ FAX: (____) _____

6. Responsible Person in Charge once Work has Begun Sam Maguire

Tel. (732) 974-8874 FAX: (732) 449-6739

V. FEE SUMMARY (for office use only)

		Update	Update
1. Building	\$ <u>90</u>	☒	
2. Electrical	\$ <u>200</u>	☒	
3. Plumbing			
4. Fire Protection			
5. Elevator Devices			
6. Subtotal			
7. Less 20% for State Plan Review \$			
8. Subtotal	\$ <u>46</u>		
9. State Permit Surcharge Fee			
10. Subtotal			
11. Cert. of Occupancy			
12. Other			
13. TOTAL	\$ <u>336</u>		

VI. BUILDING/SITE CHARACTERISTICS (office use only)

1. Number of Stories	_____
2. Height of Structure	_____ ft.
3. Area — Largest Floor	_____ sq. ft.
4. New Building Area	_____ sq. ft.
5. Volume of New Structure	_____ cu. ft.
6. Max. Live Load	_____
7. Max. Occupancy Load	_____
8. If Industrialized Building: State Approved _____ HUD _____	
9. Total Land Area Disturbed	_____ sq. ft.
10. Flood Hazard Zone	_____
11. Base Flood Elevation	_____ ft.
12. Wetlands yes _____ no _____	

IIa. PROPOSED WORK

☐ Minor Work ☐ New Building ☐ Addition ☐ Demolition

☐ Repair ☐ Alteration ☐ Renovation ☐ Reconstruction

☐ Asbestos Abat. -Subch. 8 ☐ Lead Hazard Abatement ☐ Radon Remediation ☐ Annual Permit

IIb. SUBCODES (Check all that apply)

☐ Building ☐ Electrical ☐ Plumbing ☐ Fire Protection ☐ Elevator

FOR OFFICE USE ONLY (Optional)

Est. Cost	Plans Rec'd by	Date Rec'd	Rejection Date	Approval Date	Re-viewer	Resubmission Dates Approval	Rejection	Re-viewer
	<u>[Signature]</u>	<u>3/1/12</u>	<u>2/16/12</u>	<u>3/8/12</u>	<u>W</u>			
			<u>2/16/12</u>			<u>2-21-12</u>		<u>JS</u>
	<u>Eng</u>	<u>Exempt</u>		<u>2/16/12</u>	<u>eee</u>			

TOTAL COST 27,000

VII. DESCRIPTION OF BUILDING USE

A. RESIDENTIAL (primary use)

1. State Specific Use: _____

2. Use Group, Proposed: _____

3. Change in Use Group, Indicate Present: _____

4. No. of dwelling units: Total Units Income-restricted

Gained, Sale _____

Gained, Rental _____

Lost, Sale _____

Lost, Rental _____

B. NON-RESIDENTIAL (primary use)

1. State Specific Use: _____

2. Use Group, Proposed: _____

3. Change in Use Group, Indicate Present: _____

C. MIXED USE -List secondary use(s): _____

D. Construct. Classification: Present _____ Proposed _____

III. PLAN REVIEW (optional)

DO YOU WANT:

1. ☐ Partial Releases

2. ☐ Prototype Processing

IV. DOES OR WILL YOUR BUILDING CONTAIN ANY OF THE FOLLOWING?

1. ☐ Elevators/Escalators/Lifts/Dumbwaiters/Moving Walks	4. ☐ Refrigeration Systems	8. ☐ Smoke Control Systems in Open Wells	12. ☐ Fire Alarm
2. ☐ High Pressure Boilers	5. ☐ Cross-Connections/Backflow Preventers	9. ☐ Underground Storage Tanks	
3. ☐ Pressure Vessels	6. ☐ Hazardous Uses/Places of Assembly	10. ☐ Swimming Pools, Spas and Hot Tubs	
	7. ☐ Sprinklers/Standpipes	11. ☐ LPGas Tanks	



Brick Township
401 Chambersbridge Rd
Brick, NJ 08723

Date Issued 8/10/2012
Control Number C-12-000401
Permit Number 12-0561
Permit Issue Date 3/14/2012
Certificate Number 12-0561

Certificate
Construction Code Division
(Certificate of Approval)

Identification

Work Site Location: 1646 FORGE POND RD. Brick Township, NJ Block: 833 Lot: 21 Qual: _____
Owner in Fee: QUESADA, POOL & JAMIE
Owner Address: 1646 FORGE POND RD BRICK NJ 08724
Telephone: _____
Contractor ROOF DIAGNOSTICS
Address 608 BRIGHTON AVENUE SPRING LAKE Heights NJ 07762
Telephone: 7329748874 Fax: _____
License Number or Builders Registration Number: 13VH00092200 Federal Emp. Number: 223324927

Home Warranty Number: _____

Type of Warranty Plan: ☐ State ☐ Private

Use Group: R-5 Construction Classification: _____

Maximum Live Load: 0 Maximum Occupancy Load: 0

Description of Work/Use: SOLAR PANELS

Certificate Comments:

☐ **Certificate of Occupancy**

This serves notice that said building or structure has been constructed in accordance with the New Jersey Uniform Construction Code and is approved for occupancy.

☒ **Certificate of Approval**

This serves notice that the work completed has been constructed or installed in accordance with the New Jersey Uniform Construction Code and is approved. If the permit was issued for minor work, this certificate was based upon what was visible at the time of inspection.

☐ **Certificate of Continued Occupancy**

This serves notice that based on a general inspection of the visible parts of the building there are no imminent hazards and the building is approved for continued occupancy.

☐ **Temporary Certificate of Compliance**

The following conditions must be met no later than or the owner will be subject to fine or order to vacate:

This certificate has an expiration date of:

Conditions to be met:

☐ **Certificate of Clearance - Lead Abatement 5:17**

This serves notice that based on written certification, lead abatement was performed as per NJAC5:17 to the following extent.

- ☐ Total removal of lead-based paint hazards in scope of work
☐ Partial or limited time period (years); see file

☐ **Certificate of Clearance - Asbestos Abatement**

This serves notice that based on written certification, asbestos abatement was performed to the following extent.

- ☐ Total removal of asbestos hazards in scope of work
☐ Partial or limited time period (years); see file

☐ **Certificate of Compliance**

This serves notice that said potentially hazardous equipment has been installed and/or maintained in accordance with the New Jersey Uniform Construction Code and is approved for use until

☐ **Temporary Certificate of Occupancy**

The following conditions must be met no later than: or the owner will be subject to fine or order to vacate:

This certificate has an expiration date of:

Conditions to be met:

Daniel Newman Jr

Construction Official

Fee: \$0.00
Check Number: _____
Collected By: _____



CONSTRUCTION PERMIT

Date Issued
Control #
Permit #

3/14/12
C-12-000401
12-0561

IDENTIFICATION Block: 833 Lot: 21 Qualifier
Work Site Location: 1646 FORGE POND RD. Brick Township, NJ Contractor: ROOF DIAGNOSTICS
Address: 608 BRIGHTON AVENUE SPRING LAKE Heights NJ
Owner in Fee: QUESADA, POOL & JAMIE Telephone: (732) 974-8874
1646 FORGE POND RD. BRICK NJ 08724 Lic. No. or Bldrs. Reg. No. 13VH00092200
Telephone: Federal Employee No. 223324927

Is hereby granted permission to perform the following work:

- ☒ BUILDING ☐ PLUMBING ☐ LEAD HAZARD ABATEMENT
☒ ELECTRICAL ☐ FIRE PROTECTION ☐ DEMOLITION
☐ ELEVATOR DEVICES ☐ ASBESTOS ABATEMENT (Subchapter 8 only) ☐ OTHER

DESCRIPTION OF WORK:

SOLAR PANELS

Note: If construction does not commence within one (1) year of date of issuance, or if construction ceases for a period of six (6) months, this permit is void.

Estimated Cost of Work \$27,000

Construction Official

Date

U.C.C. F170
equiv (rev 8/03)

1 WHITE - INSPECTOR

2 CANARY - OFFICE

3 PINK - TAX ASSESSOR

4 GOLD - APPLICANT

PAYMENTS (Office Use Only)

Building	\$90
Electrical	\$200
Plumbing	\$0
Fire Protection	\$0
Elevator Devices	\$0
Other	\$0.00
DCA Training Fee	\$46
CO Fee	
Other	\$0
Total	\$336
Check No.	2168
Cash	\$0
Credit	\$0
Collected By	

REQUIRED INSPECTIONS

Construction work must be inspected in accordance with the State Uniform Construction Code Regulations N.J.A.C. 5:23-2.18. This agency will carry out such periodic inspections during the progress of work as are necessary to insure that the work installed conforms with the requirements of the Uniform Construction Code.

The owner or other responsible person in charge of work must notify this agency when work is ready for any required inspections specified below. Requests for inspections must be made at least 24 hours prior to the time the inspection is desired. Inspections will be performed within three business days of the time for which they are requested. The work must not proceed in a manner which will preclude the inspection until it has been made and approval granted.

- ☒ Required inspections for all subcodes for one- and two-family dwellings are as follows:

- The bottom of footing trenches before placement of footings, except that in cases of pile foundations, inspections shall be made in accordance with the requirements of the building subcode.
- Foundations and all walls up to grade level prior to back filling.
- All structural framing, connections, wall and roof sheathing and insulation; electrical rough wiring, panel and service installation; rough plumbing. The framing inspection shall take place after the rough electrical and plumbing inspections and after the installation of the heating, ventilation and /or air conditioning duct system. The insulation inspection shall be performed after all other subcode rough inspections and prior to the installation of any interior finish material.
- Installation of all finished materials, sealings of exterior joints, plumbing piping, trim and fixtures; electrical wiring, devices and fixtures; mechanical systems equipment.

Additional required inspections for all subcodes of construction, for other than one- and two-family dwellings, are fire suppression systems, heat producing devices and Barrier Free subcode accessibility, if applicable.

- ☒ Required special inspections. The applicant by accepting the permit will be deemed to have consented to these requirements:

A contractor must be onsite with a ladder for inspections.
Rough electrical inspection and a building inspection must be scheduled for the same time.
A final electrical inspection is necessary for a certificate of approval.

- ☒ A final inspection is required for each applicable subcode area before a final Certificate of Occupancy or Approval may be issued. The final inspections include the installation of all interior and exterior finish materials, sealing of exterior joints, mechanical system and other required equipment; electrical wiring, devices and fixtures; plumbing pipes, trim and fixtures; tests required by any provision of the adopted subcodes, Barrier Free accessibility, if applicable; and verification of compliance with NJAC 5:23-3.5, "Posting structures".

- ☐ A complete copy of released plans must be kept on the job site.

If you do not understand any of this information, please ask.



BUILDING SUBCODE TECHNICAL SECTION



A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 833 Lot 21/22/23 Qualification Code _____
Work Site Location 1440 Forge Pond Road

Owner In Care: PAUL ALIASCADA

Tel. _____ e-mail _____

Address 1440 Forge Pond Road BUCK 08724

Contractor: _____ Tel. (_____) _____
Address _____
Peef Diagnostics, Inc. e-mail _____
608 Brighton Avenue
Spring Lake Hts, NJ 07762

Contractor License No. or Builder Reg. # 974-8874 Exp. Date _____

Home Improvement Contractor Registration No. or Exemption Reason (if applicable): _____

Federal Emp. ID No. 13VH00092200 FAX: (_____) _____

JOB SUMMARY (Office Use Only)

PLAN REVIEW

Date _____ Initial _____

Dates (Month/Day)

☒ No Plans Required

Date _____

INSPECTIONS

Failure

Failure

Approval

Initial

☒ All 3/8/12

Date _____

Type

Failure

Failure

Approval

Initial

☒ Footings/Foundations

Date _____

Type

Failure

Failure

Approval

Initial

☒ Structural/Framework

Date _____

Type

Failure

Failure

Approval

Initial

☒ Exterior

Date _____

Type

Failure

Failure

Approval

Initial

☒ Interior

Date _____

Type

Failure

Failure

Approval

Initial

☒ Joint Plan Review Required

Date _____

Type

Failure

Failure

Approval

Initial

☒ Elec. ☒ Plumb. ☒ Fire ☒ Elevator

Date _____

Type

Failure

Failure

Approval

Initial

☒ SUBCODE APPROVAL FOR PERMIT

Date _____

Type

Failure

Failure

Approval

Initial

☒ SUBCODE APPROVAL FOR CERTIFICATE

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Date _____

Type

Failure

Failure

Approval

Initial

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application.

Signature Miguel Plavinski

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK

installation of 'unirac' flush roof mount solar system

Date Received
Control #
Date Issued
Permit #
3/14/12
12-0561

TYPE OF WORK:

- ☐ New Building
- ☐ Addition
- ☐ Rehabilitation
- ☐ Roofing
- ☐ Siding
- ☐ Fence _____ Height (exceeds 6') Sq. Ft.
- ☐ Sign _____ Sq. Ft.
- ☐ Pool
- ☐ Retaining Wall _____ Sq. Ft.
- ☐ Asbestos Abatement Subchapter 8
- ☐ Lead Haz. Abatement NJAC 5:17
- ☐ Radon Remediation
- ☒ Other solar panels
- ☐ Demolition

FEE (Office Use Only)

Administrative Surcharge \$ _____
Minimum Fee \$ _____
State Permit Surcharge Fee \$ _____
TOTAL FEE \$ _____

1 White = Inspector Copy
2 Canary = Office Copy
3 Pink = Office Copy
4 Gold = Applicant Copy

No Plans-

U.C.C. F-110
(rev. 12/07)



ELECTRICAL SUBCODE TECHNICAL SECTION



A. IDENTIFICATION - APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 833 Lot 21 Qualification Code _____

Work Site Location 1444 Forge Pond Road

Owner in Fee: Pauli Cascada

Address 1444 Forge Pond Road Brick 08724

Contractor: Roe Diagnostics Solar + Electric LLC (732) 974-8874

Address 608 Brynron Avenue Springfield Lake Hts, NJ 07162

Contractor License No. 11378A Exp. Date 2013

Home Improvement Contractor Registration No. or Exemption Reason (if applicable): _____

Federal Emp. ID No. _____ FAX: (____) _____

B. ELECTRICAL CHARACTERISTICS

Use Group Present _____ Proposed _____

Building Occupied as Residence [] Temporary [] Other _____

Est. Cost of Elec. Work \$ 29,000 Utility Co. _____

JOB SUMMARY (Office Use Only)

PLAN REVIEW		INSPECTIONS	
	Type:	Failure	Dates (Month/Day)
[] No Plans Required			
[] Partial - Underslab Utilities Approved	Rough		
Date: _____ Approved by: _____	Barrier-Free		
[] Electric Plans Approved	Trench		
Date: <u>8-21-12</u> Approved by: <u>JS</u>	Temp. Serv.		
Joint Plan Review Required:	Const. Serv.		
[] Bldg. [] Plumb. [] Fire. [] Elev.	TCO		
SUBCODE APPROVAL FOR PERMIT	Other		
Date: <u>8-21-12</u>	Service		
Approved by: <u>JS</u>	Final		
	Barrier-Free		
SUBCODE APPROVAL FOR CERTIFICATE	Temp. Cut-in-Card Date Issued		
[] CO [] CCO [] CA	Final Cut-in-Card Date Issued		
Date: <u>8/9/12</u>	Annual Pool Inspection		
Approved by: <u>JS</u>	Date of Grounding and Bonding		
	Certification		

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) _____ and am authorized to make this application and perform the work listed on this application.

Licensed Elec. Contractor [] Certified Landscape Irrigation Contr [] Exempt Applicant

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK
Installation of 'united' flush roof mount solar system

Date Received 3/14/12
Control # 12.0561
Date Issued
Permit #

QTY. SIZE

ITEMS

- Lighting Fixtures
- Receptacles
- Switches
- Detectors
- Light Poles
- Motors—Fract HP
- Emergency & Exit Lights
- Communications Points
- Alarm Devices/F.A.C. Panel

TOTAL NUMBERS

- Pool Permit/with UV Lights
- Storable Pool/Spa/Hot Tub
- KW Elec. Range/Receptacle
- KW Oven/Surface Unit
- KW Elec. Water Heater
- KW Elec. Dryer/Receptacle
- KW Dishwasher/PV/Power
- HP Garbage Disposal
- KW Central A/C Unit
- HP/KW Space Heater/Air Handler
- KW Baseboard Heat
- HP Motors 1/4 HP inverter
- AMP Service 4400
- AMP Subpanels 100A
- AMP Motor Control Center
- KW Elec. Sign/Outline Light
- 2400 solar panels
- 1200 solar system

RECEIVED Bur
SUBCODES Elec
DATES 8/21/12

FEE (Office Use Only)

Administrative Surcharge \$
Minimum Fee \$
State Permit Surcharge Fee \$
TOTAL FEE \$

 *** FAX TX REPORT ***

TRANSMISSION OK

JOB NO. 1368
 DESTINATION ADDRESS 97324496739
 PSWD/SUBADDRESS
 DESTINATION ID
 ST. TIME 08/10 10:11
 USAGE T 00' 30
 PGS. 1
 RESULT OK



Brick Township
 401 Chambersbridge Rd
 Brick, NJ 08723

Date Issued 8/10/2012
 Control Number C-12-000401
 Permit Number 12-0561
 Permit Issue Date 3/14/2012
 Certificate Number 12-0561

Certificate

Construction Code Division
 (Certificate of Approval)

Identification

Work Site Location: 1646 FORGE POND RD. Brick Township, NJ Block: 833 Lot: 21 Qual: _____
 Owner in Fee: QUESADA, POOL & JAMIE
 Owner Address: 1646 FORGE POND RD BRICK NJ 08724
 Telephone: _____
 Contractor ROOF DIAGNOSTICS
 Address 608 BRIGHTON AVENUE SPRING LAKE Heights NJ 07762
 Telephone: 7329748874 Fax: _____
 License Number or Builders Registration Number: 13VH00092200 Federal Emp. Number: 223324927

Home Warranty Number: _____

Type of Warranty Plan: ☐ State ☐ PrivateUse Group: R-5

Construction Classification: _____

Maximum Live Load: 0Maximum Occupancy Load: 0Description of Work/Use: SOLAR PANELS

Certificate Comments:

☐ **Certificate of Occupancy**

This serves notice that said building or structure has been constructed in accordance with the New Jersey Uniform Construction Code and is approved for occupancy.

☒ **Certificate of Approval**

This serves notice that the work completed has been constructed or installed in accordance with the New Jersey Uniform Construction Code and is approved. If the permit was issued for minor work, this certificate was based upon what was visible at the time of inspection.

☐ **Certificate of Continued Occupancy**

This serves notice that based on a general inspection of the visible parts of the building there are no imminent hazards and the building is approved for continued occupancy.

☐ **Temporary Certificate of Compliance**

The following conditions must be met no later than _____ or the owner will be subject to fine or order to vacate:
 This certificate has an expiration date of: _____
 Conditions to be met:

☐ **Certificate of Clearance - Lead Abatement 5:17**

This serves notice that based on written certification, lead abatement was performed as per NJAC5:17 to the following extent.

- ☐ Total removal of lead-based paint hazards in scope of work
☐ Partial or limited time period (_____ years); see file

☐ **Certificate of Clearance - Asbestos Abatement**

This serves notice that based on written certification, asbestos abatement was performed to the following extent.

- ☐ Total removal of asbestos hazards in scope of work
☐ Partial or limited time period (_____ years); see file

☐ **Certificate of Compliance**

This serves notice that said potentially hazardous equipment has been installed and/or maintained in accordance with the New Jersey Uniform Construction Code and is approved for use until _____

☐ **Temporary Certificate of Occupancy**

The following conditions must be met no later than _____ or the owner will be subject to fine or order to vacate:



Brick Township
401 Chambers Bridge Rd.

Brick, NJ 08723
(732) 262-1027

Date Issued: 3/14/12
Application Number: ZA-12-00090
Application Date: 02/14/2012
Project Number:
Permit Number: ZP-12-00048
Fee: \$50

Zoning Permit

Worksite **1646 FORGE POND RD**
Location: **Laurelton Park**
BRICK, NJ 08724

Block: 833
Lot: 21
Qualifier:
Zone: R-10

Owner: **QUESADA, POOL & JAMIE**
Address: **1646 FORGE POND RD**
BRICK, NJ 08724

Applicant: **Rob Beck; Roof Diagnostics Solar**
Address: **608 Brighton Avenue**
Spring Lake Heights, NJ

Application Approved Date: 02/14/2012

This Certifies that an application for the issuance of a Zoning Permit has been examined.

Use is: Single-Family Residential

Nonconforming Use is: _____

Work Description:

Solar Energy System - 27 photovoltaic 240W modules, 6.48KW, mounted on the roof of the house.

Upon review it was determined that:

- ☒ Use is permitted by Ordinance
☐ Use is permitted by Variance approved on: _____
☐ Valid Nonconforming Use is established by
 ☐ Zoning Board of Adjustment
 ☐ Zoning Officer

02/14/12 11:00AM RECEIVED
TOWNSHIP CLERK

NOV 14 2012
TOWNSHIP CLERK

\$50.00

Sean Kinney
Sean Kinney, Zoning Officer

Michael P. Fowler
Michael P. Fowler, Township Planner

02/14/2012

Date

2/15/12
Date

RECEIVING CLERK
DATE REC'D 2-14-12

ZONING PERMIT APPLICATION

PERMIT # 22-12.00148
DATE ISSUED 3/14/12

BLOCK: 833 LOT: 21/22/23 QUALIFIER: — SITE ADDRESS: —

IDENTIFICATION:

1. NAME OF OWNER IN FEE: Paul Guesada
COMPLETE ADDRESS: 16416 Texas Ranch Road
PHONE # [REDACTED] EMAIL: —

2. NAME OF APPLICANT: Roe Diagnostics Solar
APPLICANT ADDRESS: 1008 S. Highway 91E
Spring Grove TX 75072
PHONE # 714 914 8914 EMAIL: sales@roediagnosics.com

3. RESPONSIBLE PERSON FOR WORK: Bob Beal
PHONE # 714 914 8914 FAX # 714 914 6739

4. SIGNATURE OF APPLICANT: [Signature]

PROJECT DESCRIPTION: (PLEASE CHECK APPLICABLE WORK & DESCRIBE)

*NEW BUILDING: — *ADDITION — *ALTERATION Solar Panels *PORCH — *DECK —

POOL: ABOVE GROUND — IN GROUND — FENCE HEIGHT — TYPE —
HEIGHT: — (*APPLICABLE)

OTHER Solar Panels

DESCRIPTION: Installation of 'Unirac' flush roof mount solar system

ZONING REVIEW: 2-14-12

DATE REVIEWED: 2-14-12 DATE DENIED: — DATE APPROVED: 2-14-12 INTLS: NGZ (SEE BACK PAGE)

FOR OFFICE USE ONLY

FEE SUMMARY:

APPLICATION FEE: \$ 50.00
OTHER: \$ —
TOTAL: \$ —

REQUIRED BY APPLICANT

RESIDENTIAL: X
COMMERCIAL: —
EXISTING USE: SFR
PROPOSED USE: SFR

BOARD APPROVAL: — PB — ZB —
RESOLUTION #: —
APPROVAL DATE: —

RECEIVED
FEB 14 2012
5928

DATE REVIEWED: 2-14-12 DATE DENIED: DATE APPROVED: 2-14-12 INTLS: SKZ

[illegible]



Brick Township
401 Chambers Bridge Rd.

Brick, NJ 08723
(732) 262-1027

Date Issued: _____
Application Number: ZA-12-00090
Application Date: 02/14/2012
Project Number: _____
Permit Number: _____
Fee: \$50

Zoning Permit

Worksite **1646 FORGE POND RD**
Location: **Laurelton Park**
BRICK, NJ 08724

Block: 833
Lot: 21
Qualifier: _____
Zone: R-10

Owner: **QUESADA, POOL & JAMIE**
Address: **1646 FORGE POND RD**
BRICK, NJ 08724

Applicant: **Rob Beck; Roof Diagnostics Solar**
Address: **608 Brighton Avenue**
Spring Lake Heights, NJ

Application Approved Date: 02/14/2012

This Certifies that an application for the issuance of a Zoning Permit has been examined.

Use is: Single-Family Residential

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Work Description:

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- ☒ Use is permitted by Ordinance
- ☐ Use is permitted by Variance approved on: _____
- ☐ Valid Nonconforming Use is established by
 - ☐ Zoning Board of Adjustment
 - ☐ Zoning Officer


Sean Kinney, Zoning Officer


Michael P. Fowler, Township Planner

02/14/2012

Date

2/15/12
Date

Photovoltaic Solar Array:

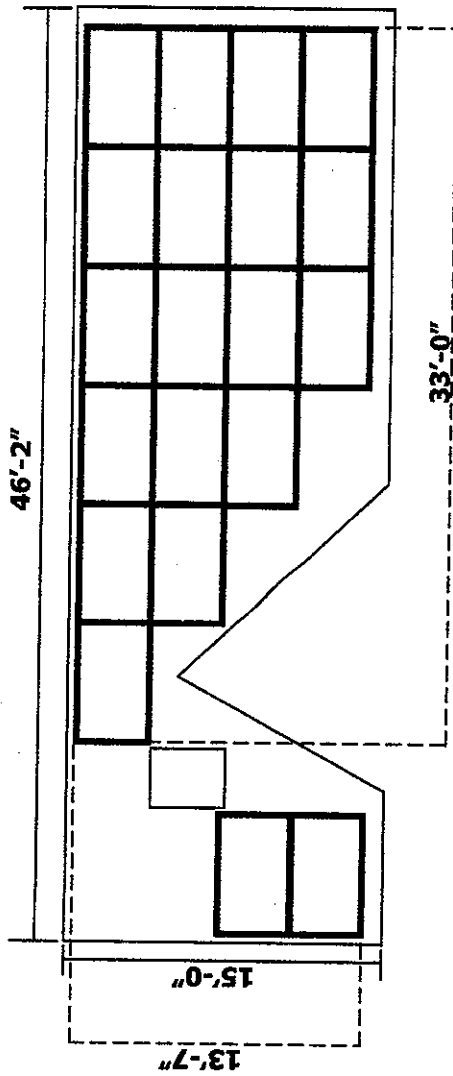
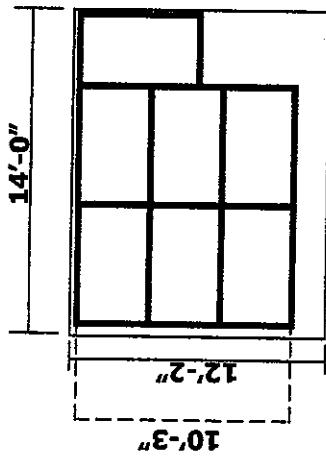
27 Modules Shown @ 240 W per Module

Total System Size: 6.480 kW DC

Panels: Trina TSM-240PA05-240W

66"

41"



APPROVED FOR ZONING ONLY
SEAN KINNEVY ZONING OFFICER

FEB 14 2012

SKV

Roof Pitch: 24°

Roof Azimuth: 230°

Wiring Notes:

3 Strings: 1 String of 13 and 2 strings of 7 going to a

Power One 6000 Inverter

Roof Diagnostics – Solar Site Map

Location: Quesada Residence 1646 Forge Pond Road

Date: 2/6/2012

Drawn by: Samantha Maguire

Drawing # 563



Utility meter, PV disconnect and PV meter located on the West side of home



ELECTRICAL SUBCODE TECHNICAL SECTION



A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 833 Lot 2132123 Qualification Code _____
 Work Site Location 14410 Forge Pond Road

Owner In Fee: Paula Quesada

Tel. _____ e-mail _____

Address 14410 Forge Pond Rd Bldg 08724

Contractor: Good Diagnostics Solar Electric LLC Tel. (732) 974 8874

Address 14410 Forge Pond Rd 08724

Contractor License No. 1037878 Exp. Date 2013

Home Improvement Contractor Registration No. or Exemption Reason (if applicable): _____

Federal Emp. ID No. _____ FAX: _____

B. ELECTRICAL CHARACTERISTICS

Use Group Present Proposed _____

☐ Pole/Pad # _____ ☐ Temporary ☐ Other _____

Building Occupied as Residence Utility Co. JOEEL

Est. Cost of Elec. Work \$ 24,000

JOB SUMMARY (Office Use Only)

PLAN REVIEW	INSPECTIONS	Dates (Month/Day)
☐ No Plans Required	Type: <u>_____</u>	Failure Failure Approval Initial
☐ Partial - Underslab Utilities Approved	Rough	
Date: <u>_____</u> Approved by: <u>_____</u>	Barrier-Free	
☐ Electric Plans Approved	Trench	
Date: <u>_____</u> Approved by: <u>_____</u>	Temp. Serv.	
☐ Joint Plan Review Required:	Constr. Serv.	
☐ Bldg. ☐ Plumb. ☐ Fire ☐ Elev.	TCO	
SUBCODE APPROVAL FOR PERMIT	Other	
Date: <u>_____</u>	Service	
Approved by: <u>_____</u>	Final	
SUBCODE APPROVAL FOR CERTIFICATE	Barrier-Free	
☐ CO ☐ CCO ☐ CA	Temp. Cut-in-Card Date Issued	
Date: <u>_____</u>	Final Cut-in-Card Date Issued	
Approved by: <u>_____</u>	Annual Pool Inspection	
	Date of Grounding and Bonding	
	Certification	

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application and perform the work listed on this application.

Applicant's Signature/Contractor's Seal and Signature

☒ Licensed Elec. Contractor ☐ Certified Landscape Irrigation Contr ☐ Exempt Applicant

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK

installation of 'unirac' flush roof mount solar system

Date Received _____
 Control # _____
 Date Issued _____
 Permit # _____

QTY.	SIZE	ITEMS	FEE (Office Use Only)
		Lighting Fixtures	
		Receptacles	
		Switches	
		Detectors	
		Light Poles	
		Motors—Fract. HP	
		Emergency & Exit Lights	
		Communications Points	
		Alarm Devices/F.A.C. Panel	
		TOTAL NUMBERS	
		Pool Permit/With UW Lights	
		Storable Pool/Spa/Hot Tub	
		KW Elec. Range/Receptacle	
		KW Oven/Surface Unit	
		KW Elec. Water Heater	
		KW Elec. Dryer/Receptacle	
		KW Dishwasher	
		HP Garbage Disposal	
		KW Central A/C Unit	
		HP/KW Space Heater/Air Handler	
		KW Baseboard Heat	
		HP Motors 1/+ HP	
		KW Transformer/Conductor/Inverter	
		AMP Service	
		AMP Subpanels	
		AMP Motor Control Center	
		KW Elec. Sign/Outline Light	
		27 240w Solar Panels	
		1 480w Solar System	

Administrative Surcharge \$	
Minimum Fee \$	
State Permit Surcharge Fee \$	
TOTAL FEE \$	



Brick Township
401 Chambersbridge Rd
Brick, NJ 08723
(732) 262-1027

fax 732-449-6739 2/16/12
resubmit 3/7/12 bldg.

Subcode Official Review

To: 1646 FORGE POND RD BRICK, NJ 08724 CC:

RE: Building Subcode
Block: 833 Lot: 21 Qual:
1646 FORGE POND RD.
Permit Number: Control Number: C-12-000401
Last Submit Date: Wednesday, February 15, 2012

Date: Thursday, February 16, 2012

Dear QUESADA, POOL & JAMIE,
Your request is hereby denied based upon the following infractions.

The engineers letter provided does not correlate to the spans indicated on the layout.

The layout shows (2) roofs where the solar panels will be located. Each roof must have its own certification from the engineer. Only one was provided.

NOTE: The span of 15+' shown on the layout is overspanned before any additional loads are imposed.
Provide a comprehensive design for additional support.

Sincerely,

Michael Vecchio, Subcode Official

*** FAX TX REPORT ***

TRANSMISSION OK

JOB NO.	3953
DESTINATION ADDRESS	97324496739
PSWD/SUBADDRESS	
DESTINATION ID	
ST. TIME	02/16 14:57
USAGE T	00' 27
PGS.	2
RESULT	OK



Brick Township
401 Chambersbridge Rd
Brick, NJ 08723
(732) 262-1027

fax 732-449-6739 2/16/12

Subcode Official Review

To: 1646 FORGE POND RD BRICK, NJ 08724 CC:

RE: Building Subcode
Block: 833 Lot: 21 Qual:
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NOTE: The span of 15+' shown on the layout is overspanned before any additional loads are imposed.
Provide a comprehensive design for additional support.

Sincerely,

Michael Vecchio, Subcode Official.

NOW
BUILDING
SMARTER
ROOFS

Brick Township Building Department

401 Chambersbridge Road

Brick, NJ 08723

Attn.: Mr. Ken Anderson

Re: Quesada Residence Solar Permit Application

1646 Forge Pond Road

Enclosed is the revised architect's letter to accompany the Solar Permit Application for the Quesada Residence at 1646 Forge Pond Road.

Thank you,



Samantha Maguire



Roof Diagnostics

608 Brighton Ave
Spring Lake Hts. NJ 07762
ph. 732.974.8874
fax 732.449.6739
web: roofdiagnostics.com/solar

Tom Petersen

Architects • Planners

Mr. Ken Anderson, Building Subcode Official
Brick Township Building Department
401 Chambersbridge Road
Brick, NJ 08723

January 30, 2012

Re: Solar Panel Installation
Quesada Residence
1646 Forge Pond Road
Brick, NJ 08724

Hi Ken,

I've reviewed the proposed solar panel installation at this location to evaluate the existing roof structure and the connection of the panels to the roof.

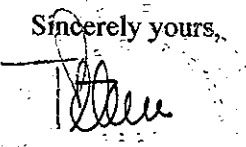
Criteria: Applicable codes: 2009 International Residential Code (New Jersey Edition)
2001 Wood Frame Construction Manual
Design roof load: 20 psf live load, 15 psf dead load, 35 psf total load
Design wind load: 120 mph, 35 psf

My findings are as follows.

1. The new solar panels will imply an additional dead load of 3 psf. The existing roof structure (2x6 rafters @ 16" o.c. with 2x8 ridge, +/- 12'-6" span) is sufficient to bear this additional load.
2. The solar panels are attached to the roof with the SolarMount-1 rack system by UNIRAC. The rack system, roof connections and connection spacing are rated for 120 mph. This project requires the larger Solar Mount I-2.5 beam (2.5" high) and spacing of flange foot connection to roof at 48" o.c. maximum. Flange footing connections to the rail are not required to be staggered. The flange foot connections to the roof are 3/8" diameter x 4" long lag bolts.

I therefore certify that this installation complies with the applicable codes and design loads mentioned above and is acceptable for approval. Please let me know if you have any questions on this information. Thanks!

Sincerely yours,

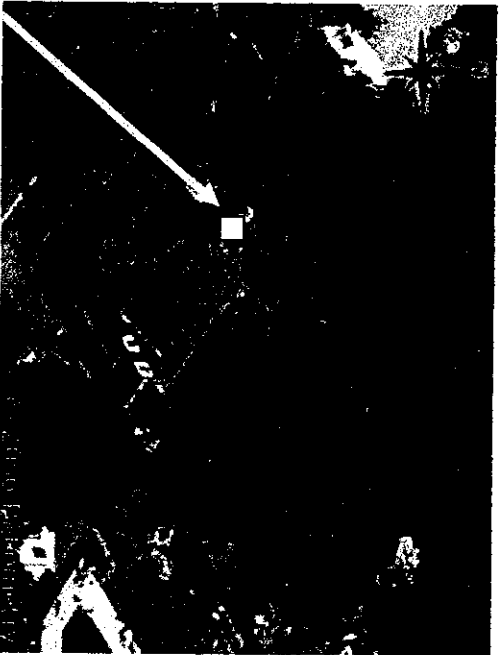
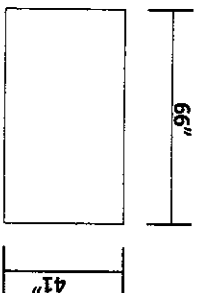
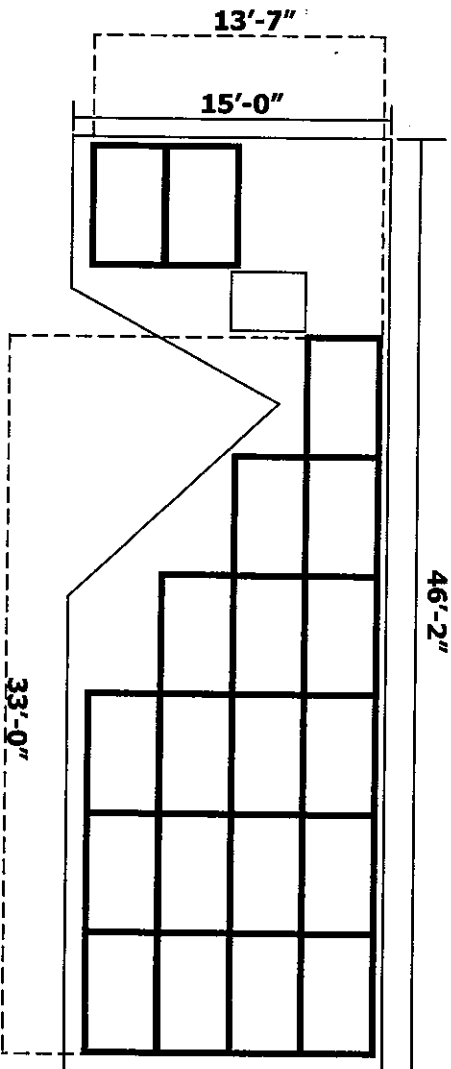
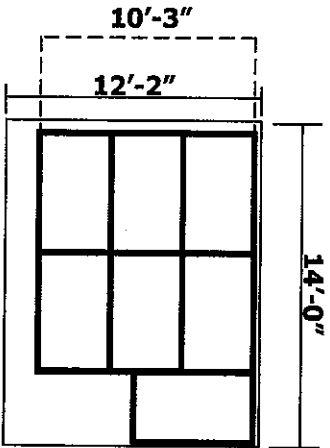

Tom Petersen

Cc: Kelcy Pegler, Roof Diagnostics

Not For
Blog Use

Photovoltaic Solar Array:
 27 Modules Shown @ 240 W per Module
 Total System Size: 6.480 kW DC

Panels: Trina TSM-240PA05-240W



Utility meter, PV disconnect and PV meter located on the West side of home

APPROVED FOR CONSTRUCTION
 SEAN KINNEVEN, ZONING OFFICER

FEB 14 2012

[Signature]

Roof Pitch: 24°
 Roof Azimuth: 230°
 Wiring Notes:
 3 Strings: 1 String of 13 and 2 strings of 7 going to a
 Power One 6000 Inverter

Roof Diagnostics – Solar Site Map

Location: Quesada Residence 1646 Forge Pond Road
 Date: 2/6/2012
 Drawn by: Samantha Maguire
 Drawing # 563



Brick Township
401 Chambersbridge Rd
Brick, NJ 08723
(732) 262-1027

2/16/12

fax 732-449-6139

Subcode Official Review

To: 1646 FORGE POND RD BRICK, NJ 08724 CC:

RE: Electrical Subcode
Block: 833 Lot: 21 Qual:
1646 FORGE POND RD.
Permit Number: Control Number: C-12-000401
Last Submit Date: Thursday, February 16, 2012

Date: Thursday, February 16, 2012

Dear QUESADA, POOL & JAMIE,
Your request is hereby denied based upon the following infractions.

tech card does not match line diagram

Sincerely,

Geoffrey Stahl, Subcode Official

RESUBMIT Electric B.m.p
SUBCODES electric
DATES 2/21/12

Tom Petersen

Architects • Planners

Mr. Ken Anderson, Building Subcode Official
Brick Township Building Department
401 Chambersbridge Road
Brick, NJ 08723

January 30, 2012
February 28, 2012 revised

Re: Solar Panel Installation
Quesada Residence
1646 Forge Pond Road
Brick, NJ 08724

Hi Ken,

I've reviewed the proposed solar panel installation at this location to evaluate the existing roof structure and the connection of the panels to the roof.

Criteria: Applicable codes: 2009 International Residential Code (New Jersey Edition)
2001 Wood Frame Construction Manual
Design roof load: 20 psf live load, 15 psf dead load, 35 psf total load
Design wind load: 110 mph, 35 psf

My findings are as follows.

1. The new solar panels will imply an additional dead load of 3 psf. There are two roof planes receiving new solar panels: main residence roof #1 (2x6 rafters @ 16" o.c. with 2x8 ridge, +/- 11'-0" span) and garage roof #2 (2x6 rafters @ 16" o.c. with 2x8 ridge, +/- 9'-6" span) These existing roof structures are sufficient to bear this additional load.
2. The solar panels are attached to the roof with the SolarMount-1 rack system by UNIRAC. The rack system, roof connections and connection spacing are rated for 120 mph. This project requires the larger Solar Mount I-2.5 beam (2.5" high) and spacing of flange foot connection to roof at 48" o.c. maximum. Flange footing connections to the rail are not required to be staggered. The flange foot connections to the roof are 3/8" diameter x 4" long lag bolts.

I therefore certify that this installation complies with the applicable codes and design loads mentioned above and is acceptable for approval. Please let me know if you have any questions on this information. Thanks!

Sincerely yours,

Tom Petersen

Kelby Pegler, Roof Diagnostics

Office Set
TOWNSHIP OF BRICK
RELEASED FOR PERMIT **3/8/12** INITIAL **W** DATE
Building Subcode _____
Plumbing Subcode _____
Fire Subcode _____
Electrical Subcode _____
Plan Reviewer _____
Plans Released _____
Construction Official _____



CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

New Jersey Office of the Attorney General

Division of Consumer Affairs
Board of Examiners of Electrical Contractors
124 Halsey Street, 6th Floor, Newark, NJ 07102



PAULA T. DOW
Attorney General

THOMAS R. CALCAGNI
Director

Mailing Address:
P.O. Box 45006
Newark, NJ 07101
(973) 504-6410

September 12, 2011

TO WHOM IT MAY CONCERN

Our records indicate that the holder of License and Business Permit No 16378A has applied to the Board of Electrical Contractors for a pressure seal which has not yet been issued to him/her by the vendor.

Please accept this sealed letter as an interim device pending the furnishing of a seal to:

Joseph Doherty
Roof Diagnostics Solar & Electric LLC
608 Brighton Avenue
Spring Lake Hts, NJ 07762

This letter will be rendered invalid 180 days after the date of its issuance.

Sincerely,

Marian R Fiore
Senior Management Assistant

GD:gkb

State Of New Jersey
New Jersey Office of the Attorney General
Division of Consumer Affairs

THIS IS TO CERTIFY THAT THE
Board of Exam. of Electrical Contractors

HAS LICENSED

Roof Diagnostics Solar And Electric LLC
Joseph D Doherty
608 Brighton Avenue
Spring Lake NJ 07762

FOR PRACTICE IN NEW JERSEY AS A(N): Electrical Business Permit

New Jersey Office of the Attorney General
Division of Consumer Affairs
THIS IS TO CERTIFY THAT THE
Board of Exam. of Electrical Contractors
HAS LICENSED
Roof Diagnostics Solar And Electric LLC
Electrical Business Permit

09/07/2011 TO 03/31/2012

VALID

34EB01637800

License/Registration/Certificate #

SIGNATURE

DIRECTOR

09/07/2011 TO 03/31/2012
VALID

34EB01637800
LICENSE/REGISTRATION/CERTIFICATION #

Signature of Licensee/Registrant/Certificate Holder

DIRECTOR

PLEASE DETACH HERE
IF YOUR LICENSE/REGISTRATION/
CERTIFICATE ID CARD IS LOST
PLEASE NOTIFY:

Board of Exam. of Electrical Contractors
P.O. Box 45006
Newark, NJ 07101

PLEASE DETACH HERE

Roof Diagnostics Solar And Electric LLC

EXPIRATION DATE 2012

YOUR LICENSE/REGISTRATION/CERTIFICATE NUMBER IS 34EB 01637800 . PLEASE USE IT IN ALL
CORRESPONDENCE TO THE DIVISION OF CONSUMER AFFAIRS USE THIS SECTION TO REPORT ADDRESS
CHANGES YOU ARE REQUIRED TO REPORT ANY ADDRESS CHANGES IMMEDIATELY TO THE ADDRESS NOTED
BELOW

Board of Exam. of Electrical Contractors
P.O. Box 45006
Newark, NJ 07101

PRINT YOUR NEW ADDRESS OF RECORD BELOW
YOUR ADDRESS OF RECORD IS THE ADDRESS THAT WILL PRINT ON
YOUR LICENSE/REGISTRATION/CERTIFICATE AND IT MAY BE MADE
AVAILABLE TO THE PUBLIC

HOME

BUSINESS

PRINT YOUR NEW MAILING ADDRESS BELOW
YOUR MAILING ADDRESS IS THE ADDRESS THAT WILL BE USED BY THE
DIVISION OF CONSUMER AFFAIRS TO SEND YOU ALL CORRESPONDENCE

HOME

BUSINESS

TELEPHONE
INCLUDE AREA CODE

TELEPHONE
INCLUDE AREA CODE

If the law governing your profession requires the current license/registration/certificate to be displayed, it should be
within reasonable proximity of your original license/registration/certificate at your principal office or place of
business.

CA-20

THIS DOCUMENT IS PRINTED ON WATERMARKED PAPER WITH A PULVERIZED BACKGROUND AND MULTIPLE SECURITY FEATURES. PLEASE VERIFY AUTHENTICITY.
NOT AN ELECTRICIAN'S OR PLUMBER'S LICENSE

State Of New Jersey
New Jersey Office of the Attorney General
Division of Consumer Affairs

THIS IS TO CERTIFY THAT THE
Division of Consumer Affairs

HAS REGISTERED

Roof Diagnostics Solar and Electric, LLC
Kelcy Fogler
608 Brighton Avenue
Spring Lake Heights NJ 07762

FOR PRACTICE IN NEW JERSEY AS AN: Home Improvement Contractor

10/03/2011 TO 12/31/2012
VALID

13VH06478300
LICENSE/REGISTRATION/CERTIFICATION #

Signature of Licensee/Registrant/Certificate Holder


DIRECTOR

New Jersey Office of the Attorney General
Division of Consumer Affairs
THIS IS TO CERTIFY THAT THE
Division of Consumer Affairs
HAS REGISTERED
Roof Diagnostics Solar and Electric, LLC
Home Improvement Contractor

NOT AN ELECTRICIAN'S OR PLUMBER'S LICENSE
10/03/2011 TO 12/31/2012

VALID
13VH06478300

SIGNATURE

DIRECTOR

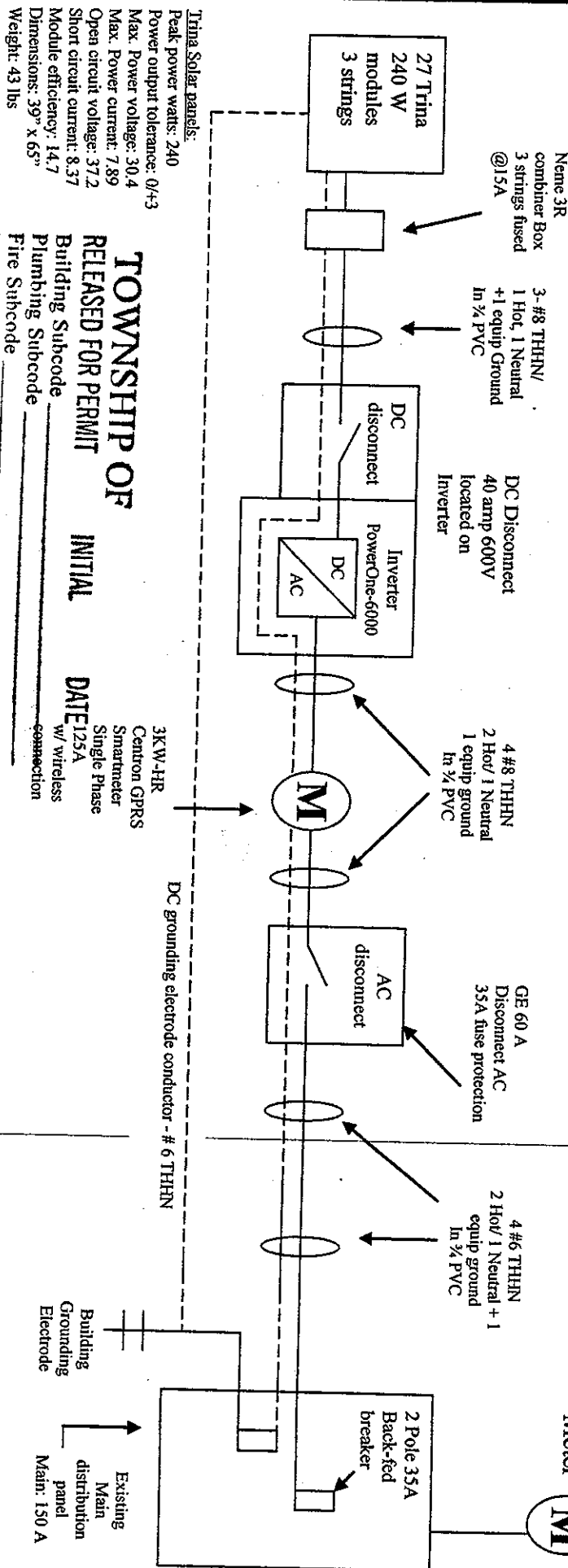
PLEASE DETACH HERE
IF YOUR LICENSE/REGISTRATION
CERTIFICATE ID CARD IS LOST
PLEASE NOTIFY:
Division of Consumer Affairs
P.O. Box 46016
Newark, NJ 07101

PLEASE DETACH HERE

TOTALS:
 Modules 27 Trina TSM-240-PA05
 1 String of 13 - VDC: 484
 2 Strings of 7 - VDC: 260
 VOC: 580

PV system specifications:
 NEC 690.53
 Rated operating current: 25.11A
 Rated operating voltage: 240V
 Max. System voltage: 580
 Rated short-circuit current: 30A
 Polarity of grounded conductor: Negative
 Max. Voltage: 334 V

Roof Mounted PV Array - 6.480 kW DC



Trina Solar panels:

Peak power watts: 240
 Power output tolerance: 0/+3
 Max. Power voltage: 30.4
 Max. Power current: 7.89
 Open circuit voltage: 37.2
 Short circuit current: 8.37
 Module efficiency: 14.7
 Dimensions: 39" x 65"
 Weight: 43 lbs

TOWNSHIP OF RELEASED FOR PERMIT INITIAL

3KW-HR
 Centron GPRS
 Smartmeter
 Single Phase
 DATE 12/25/12
 w/ wireless connection

NEC 690.8
 Continuous = 125%
 Ambient Temp = 83+40 = 123 ° F
 Series Isc = 8.31A x 125% = 10.4A / 76 = 13.7
 Using # 8 THHN (194 ° F)

Building Subcode _____
 Plumbing Subcode _____
 Fire Subcode _____
 Electrical Subcode U5
 Plan Reviewer 2-27-12
 Plans Released _____

NEC 690.7 - Based on -12 ° F, the correction factor is 1.20 x 37.2 VOC X 13 = 580 VDC < 600 VDC max

All work to comply with NEC2008.
 All equipment is UL listed for use.
 Conduit for DC will be PVC outside and Metal inside wherever necessary.
 Ambient record low: -12 degrees F.
 Ambient record low high: 83 degrees F

Roof Diagnostics, Inc
 One Line Diagram
 Solar Installation

Drawing: RD-SK-560
 Name: Quesada Residence
 Address: 1646 Forge Pond Road
 Installer: Roof Diagnostics Inc.
 Phone: 732.449.9589

[Handwritten signature]

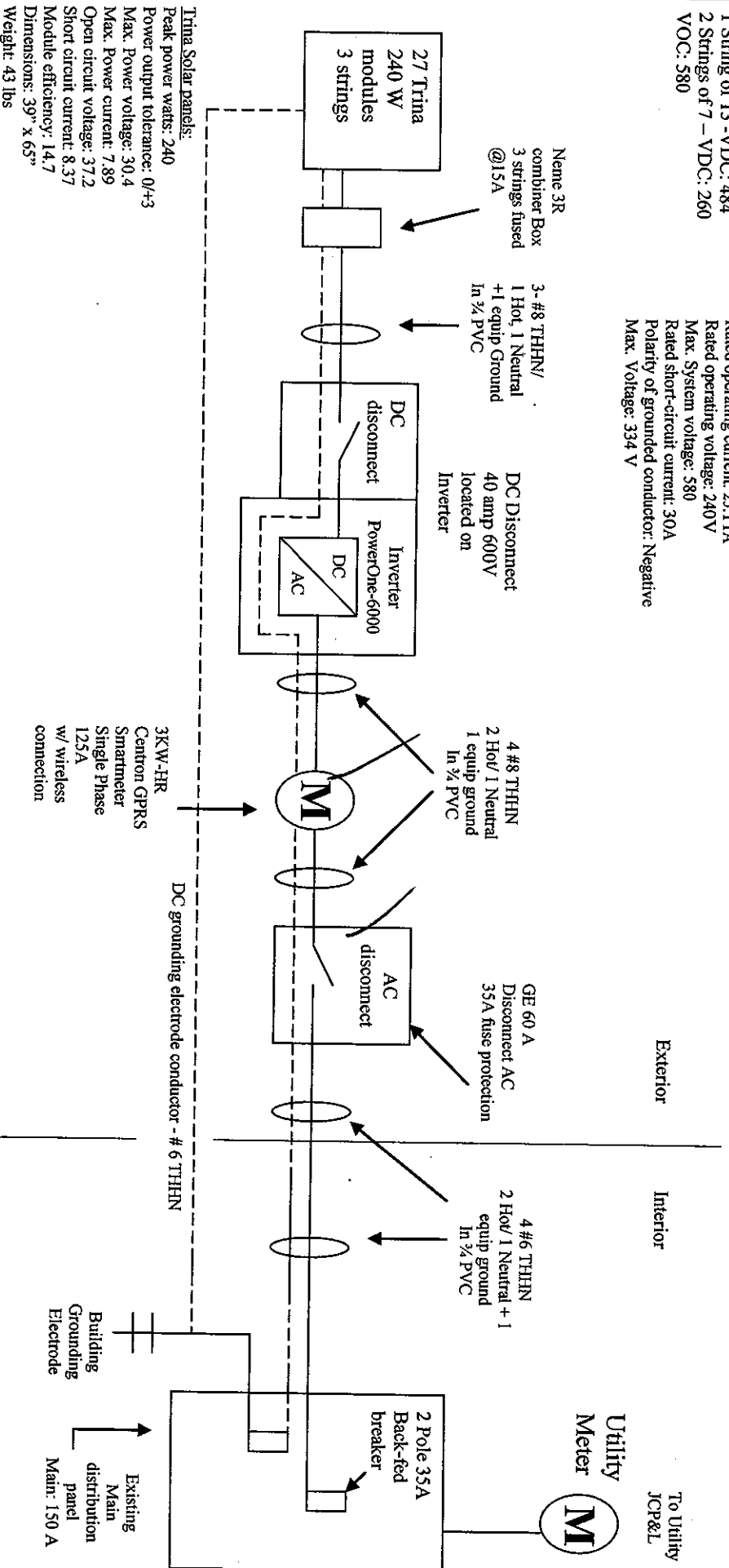
Roof Mounted PV Array -6,480 kW DC

TOTALS:

Modules 27 Trina TSM-240-PA05
 1 String of 13 - VDC: 484
 2 Strings of 7 - VDC: 260
 VOC: 580

PV system specifications

NEC 690.53
 Rated operating current: 25.11A
 Rated operating voltage: 240V
 Max. System voltage: 580
 Rated short-circuit current: 30A
 Polarity of grounded conductor: Negative
 Max. Voltage: 334 V



Roof Diagnostics, Inc
One Line Diagram
Solar Installation

Drawing: RD-SK-560
 Name: Quesada Residence
 Address: 1646 Forge Pond Road
 Installer: Roof Diagnostics Inc.
 Phone: 732.449.9589

All work to comply with NEC2008.
 All equipment is UL listed for use.
 Conduit for DC will be PVC outside and Metal
 inside wherever necessary.
 Ambient record low: -12 degrees F.
 Ambient record low high: 83 degrees F

[Handwritten signature]

SolarMount-I™ Roof Mount Technical Datasheet

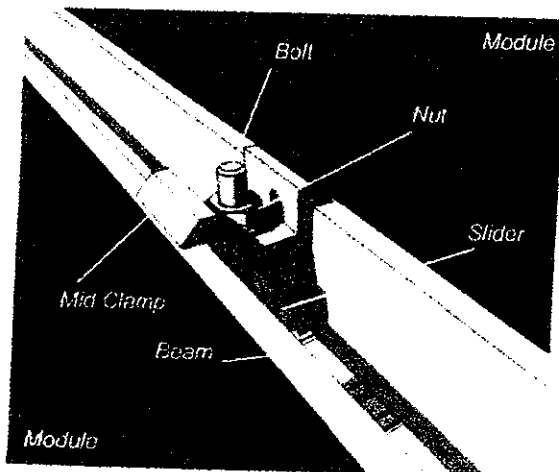
Pub 101109-1td V1.1 November 2010

SolarMount-I Module Connection Hardware	
Slider and Mid Clamp.....	1
Slider and End Clamp.....	2
SolarMount-I Series Accessory Mount.....	2
SolarMount-I Beam Connection Hardware	
1- Flange Foot.....	3
2- Flange Foot.....	3
Beam Splice.....	4
SolarMount-I Beam	
SolarMount-I Beams.....	5
SolarMount-I Engineering Reports	
SolarMount-I 1.0 Beams.....	6
SolarMount-I 2.5 Beams.....	8

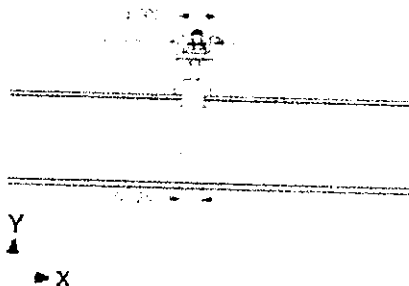
SolarMount-I Module Connection Hardware

SolarMount-I Series Slider with Mid Clamp

Part No. 02027C, 02028C, 02029C, 02030C



- **Slider and Mid Clamp Material:** One of the following mill finished extruded aluminum alloys: 6005-T5, 6105-T5, 6061-T6
Ultimate Tensile: 38ksi, **Yield:** 35 ksi
- **Slider Weight:** 0.026 lbs (12g), **Mid Clamp Weight:** 0.050 lbs (23g)
- Allowable and design loads are valid when components are assembled with SolarMount-I Beams according to authorized UNIRAC documents
- Sliders are compatible with SolarMount-I Beams
- Assemble with one ¼-20 ASTM F593 bolt and one ¼-20 ASTM F594 serrated flange nut
- Use anti-seize and tighten to 10 ft-lbs of torque
- Resistance factors and safety factors are determined according to part 1 section 9 of the 2005 Aluminum Design Manual



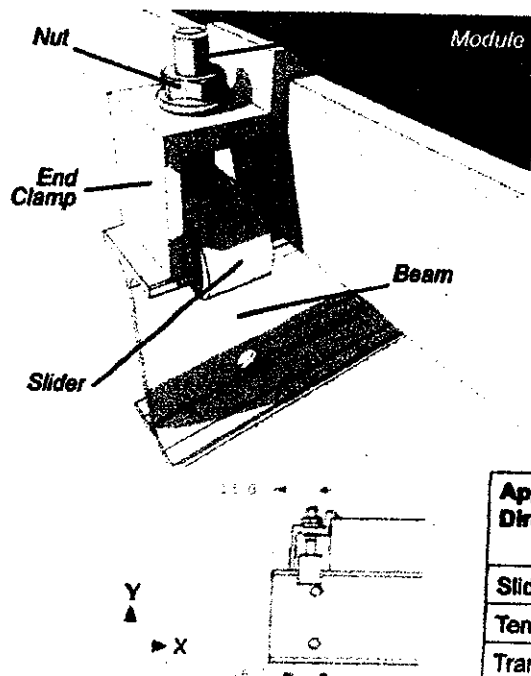
Applied Load Direction	Average Ultimate lbs (N)	Allowable Load lbs (N)	Safety Factor, FS	Design Load lbs (N)	Resistance Factor, ϕ
Sliding, X±	1194 (5311)	490 (2180)	2.44	741 (3296)	0.620
Tension, Y+	1503 (6686)	677 (3011)	2.22	1024 (4555)	0.682
Transverse, Z±	2080 (9252)	915 (4070)	2.27	1383 (6152)	0.665

Dimensions specified in inches unless noted

SolarMount-I Module Connection Hardware

SolarMount-I Slider with End Clamp

Part No. 02001C through 02006C, 02009C, 02010C



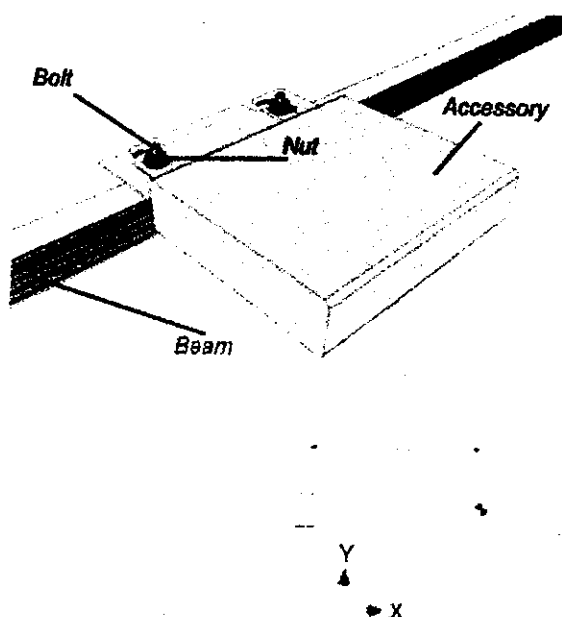
Dimensions specified in inches unless noted

- **Slider and End Clamp Material:** One of the following mill finished extruded aluminum alloys: 6005-T5, 6105-T5, 6061-T6
Ultimate Tensile: 38 ksi, Yield: 35 ksi
- **Slider Weight:** 0.026 lbs (12g), end clamp weight varies based on height: ~0.058 lbs (26g)
- Allowable and design loads are valid when components are assembled with SolarMount-I 1.0 or 2.5 Beams according to authorized UNIRAC documents
- Sliders are compatible with SolarMount-I Beams
- Assemble with one ¼-20 ASTM F593 bolt and one ¼-20 ASTM F594 serrated flange nut
- Use anti-seize and tighten to 10 ft-lbs of torque
- Resistance factors and safety factors are determined according to part 1 section 9 of the 2005 Aluminum Design Manual
- Modules must be installed at least 1.5" from either end of a beam

Applied Load Direction	Average Ultimate lbs (N)	Allowable Load lbs (N)	Safety Factor, FS	Design Loads lbs (N)	Resistance Factor, ϕ
Sliding, X±	283 (1259)	104 (463)	2.72	157 (698)	0.555
Tension, Y+	332 (1477)	88 (391)	3.77	133 (592)	0.401
Transverse, Z±	1367 (6081)	533 (2371)	2.56	806 (3585)	0.590

SolarMount-I Accessory Mount

Part No. 08010M



Dimensions specified in inches unless noted

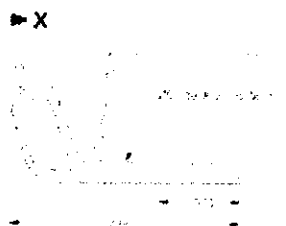
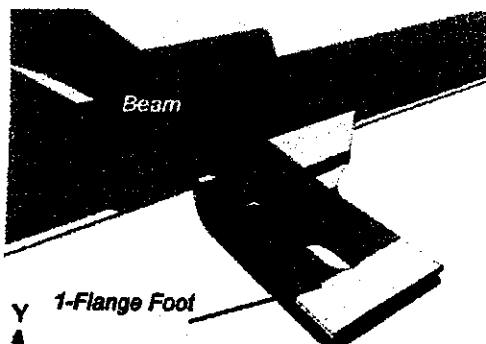
- **Slider Material:** One of the following mill finished extruded aluminum alloys: 6005-T5, 6105-T5, 6061-T6
Ultimate Tensile: 38 ksi, Yield: 35 ksi
- **Slider Weight:** 0.026 lbs (12g)
- Allowable and design loads are valid when components are assembled with SolarMount-I 1.0 or 2.5 Beams according to authorized UNIRAC documents
- SolarMount-I Series Accessory Mounts are compatible with SolarMount-I Beams
- Use two Accessory Mounts per accessory
- **Assemble each pair of clamps with the following stainless steel hardware:** two ¼-20 set screws, two ¼-20 heavy hex jam nuts, and two ¼-20 F594 serrated flange nuts
- Use anti-seize and tighten to 5-10 ft-lbs of torque
- Resistance factors and safety factors are determined according to calculations and UNIRAC testing

Maximum distance of accessory center of gravity from beam center in (mm)	Maximum weight of accessory lbs (kg)
7 (178)	32 (14.5)

SolarMount-I Beam Connection Hardware

SolarMount-I 1- Flange Foot

Part No. 04011M



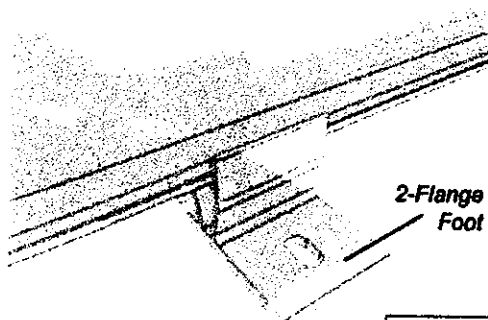
Dimensions specified in inches unless noted

- **1-Flange Foot Material:** One of the following mill finished extruded aluminum alloys: 6005-T5, 6105-T5, 6061-T6
Ultimate Tensile: 38 ksi, Yield: 35 ksi
- **1-Flange Foot Weight:** 0.101 lbs (46 g)
- Allowable and design loads are valid when components are assembled with SolarMount-I 1.0 or 2.5 Beams according to authorized UNIRAC documents
- 1-Flange feet are compatible with SolarMount-I Beams
- Resistance factors and safety factors are determined according to part 1 section 9 of the 2005 Aluminum Design Manual
- Design and allowable loads are for the beam to foot connection
- **Be sure to check load limits for roof attachments and standoffs**

Applied Load Direction	Average Ultimate lbs (N)	Allowable Load lbs (N)	Safety Factor, FS	Design Load lbs (N)	Resistance Factor, Φ
Tension, Y+					
SolarMount-I 1.0 Beam	1388 (5952)	591 (2629)	2.26	894 (3977)	0.668
SolarMount-I 2.5 Beam	1514 (6735)	648 (2882)	2.34	960 (4359)	0.647
Compression, Y-					
SolarMount-I 1.0 Beam	2931 (13038)	1288 (5729)	2.28	1948 (8665)	0.664
SolarMount-I 2.5 Beam	2750 (12233)	1223 (5440)	2.25	1849 (8225)	0.672
Transverse, X-, downhill	635 (2825)	313 (1392)	2.03	473 (2104)	0.745
Transverse, X+, uphill	42 (187)	20 (89)	2.15	30 (133)	0.705
Sliding, Z±	(see Beam Splice)				

SolarMount-I 2 - Flange Foot

Part No. 04002M, 04003M



2-Flange Foot

- **2-Flange Foot Material:** One of the following mill finished extruded aluminum alloys: 6005-T5, 6105-T5, 6061-T6
Ultimate Tensile: 38 ksi, Yield: 35 ksi
- **2-Flange Foot Weight:** 0.103 lbs (47 g)
- Allowable and design loads are valid when components are assembled with SolarMount-I 1.0 or 2.5 Beams according to authorized UNIRAC documents
- 2-Flange Feet are compatible with SolarMount-I Beams
- Resistance factors and safety factors are determined according to part 1 section 9 of the 2005 Aluminum Design Manual
- Design and allowable loads are for the beam to foot connection
- **Be sure to check load limits for roof attachments and standoffs**

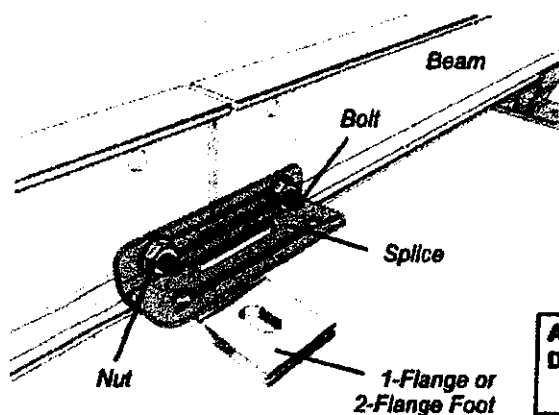
Applied Load Direction	Average Ultimate lbs (N)	Allowable Load lbs (N)	Safety Factor, FS	Design Load lbs (N)	Resistance Factor, Φ
Tension, Y+					
SolarMount-I 1.0 Beam	1931 (8950)	864 (3843)	2.23	1307 (5814)	0.667
SolarMount-I 2.5 Beam	2478 (11023)	1111 (4942)	2.23	1661 (7477)	0.678
Compression, Y-					
SolarMount-I 1.0 Beam	3788 (16850)	1708 (7589)	2.22	2581 (11481)	0.681
SolarMount-I 2.5 Beam	3694 (16432)	1562 (6948)	2.36	2363 (10511)	0.640
Transverse, X-, downhill	635 (2825)	313 (1392)	2.03	473 (2104)	0.745
Transverse, X+, uphill	42 (187)	20 (89)	2.15	30 (133)	0.705
Sliding, Z±	(see Beam Splice)				

Dimensions specified in inches unless noted

SolarMount-I Beam Connection Hardware

SolarMount-I Beam Splice

Part No. 03020M, 03021M



- **Beam Splice Material:** Aluminum 5052-H32
Ultimate Tensile: 31 ksi, Yield: 23 ksi
- **Beam Splice Weight:** 0.053 lbs (24 g)
- Allowable and design loads are valid when components are assembled according to authorized UNIRAC documents
- Beam Splices are compatible with SolarMount-I Beams when used with 1-Flange or 2-Flange feet
- Resistance factors and safety factors are determined according to part 1 section 9 of the 2005 Aluminum Design Manual

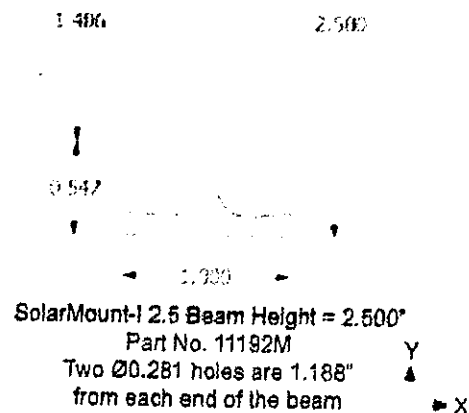
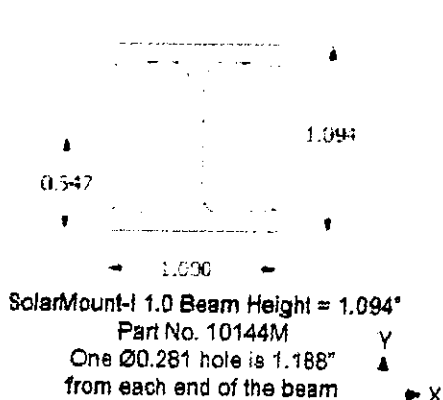
Applied Load Direction	Average Ultimate lbs (N)	Allowable Load lbs (N)	Safety Factor, FS	Design Load lbs (N)	Resistance Factor, ϕ
Sliding, $\pm$	1428 (6352)	620 (2758)	2.30	938 (4172)	0.657

Y
▲
► X

Dimensions specified in inches unless noted

SolarMount-I Beam

MATERIAL: One of the following extruded aluminum alloys: 6005-T5, 6105-T5, or 6061-T6, Mill Finish			
Properties	Units	Beam Height (in)	
		1.094	2.500
Approximate Weight (per linear ft)	plf	0.356	0.548
Total Cross Sectional Area	in ²	0.3037	0.4665
Section Modulus (X-Axis)	in ³	0.1101	0.3687
Section Modulus (Y-Axis)	in ³	0.0390	0.0422
Moment of Inertia (X-Axis)	in ⁴	0.0602	0.4609
Moment of Inertia (Y-Axis)	in ⁴	0.0195	0.0211
Radius of Gyration (X-Axis)	in	0.4453	0.9940
Radius of Gyration (Y-Axis)	in	0.2536	0.2127



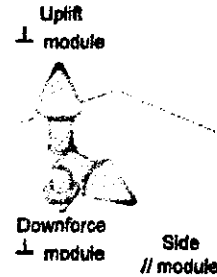
Dimensions specified in inches unless noted



UNIRAC SolarMount-1.0 Engineering Report, Page 1 of 2

90 mph Wind Chart

Module Size	Max Span (Inches)			
	Ground Snow	Point Loads (pounds): Up/ Down/ Side		
	0	20	30	40
52" x 35"	56 229/ 262/ 54	52 211/ 305/ 96	48 197/ 327/ 123	44 177/ 364/ 140
85" x 40"	49 250/ 286/ 58	44 222/ 321/ 101	41 207/ 345/ 129	37 186/ 384/ 148
77" x 51"	40 238/ 273/ 56	35 212/ 307/ 96	33 198/ 329/ 123	30 178/ 366/ 141



110 mph Wind Chart

Module Size	Max Span (Inches)			
	Ground Snow	Point Loads (pounds): Up/ Down/ Side		
	0	20	30	40
52" x 35"	49 305/ 323/ 47	48 295/ 334/ 88	45 277/ 356/ 113	42 261/ 377/ 136
65" x 40"	41 321/ 340/ 49	40 311/ 352/ 92	38 292/ 376/ 119	36 275/ 397/ 143
77" x 51"	33 306/ 325/ 47	32 297/ 336/ 88	30 278/ 358/ 113	29 263/ 379/ 136

Know your limits!
Check attachment
load limits.

120 mph Wind Chart

Module Size	Max Span (Inches)			
	Ground Snow	Point Loads (pounds): Up/ Down/ Side		
	0	20	30	40
52" x 35"	45 337/ 350/ 43	45 334/ 353/ 83	42 315/ 374/ 107	40 298/ 394/ 130
65" x 40"	38 355/ 369/ 45	38 352/ 372/ 87	36 332/ 394/ 113	34 315/ 415/ 137
77" x 51"	31 339/ 352/ 43	30 336/ 355/ 83	29 317/ 376/ 108	27 301/ 396/ 130

150 mph Wind Chart

Module Size	Max Span (Inches)			
	Ground Snow	Point Loads (pounds): Up/ Down/ Side		
	0	20	30	40
52" x 35"	37 432/ 427/ 36	37 432/ 427/ 68	37 432/ 432/ 93	35 415/ 449/ 114
65" x 40"	31 455/ 450/ 37	31 455/ 450/ 71	31 455/ 455/ 98	30 438/ 473/ 120
77" x 51"	25 434/ 428/ 35	25 434/ 429/ 68	25 434/ 434/ 93	24 418/ 452/ 114

Installation of products related to this engineering report is subject to the requirements below:

- Flush roof installations only; modules must be < 10" from roof surface
- The building has either a flat roof, a gable roof ≤ 45°, or a hip roof ≤ 27°
- The roof has a minimum slope of 1.2°
- Installation must have at least 4 modules grouped together (minimum 50 ft²)
- Surrounding ground area must not slope more than 10 degrees
- Location must fall into Wind Exposure Category B or C
- Building height must be less than or equal to 30 feet
- For roof zones 2 and 3 use 1/2 Max Span
- Max cantilever = 1/3 Max Span
- Ground snow loads are adjusted for roof slope and temperature based on ASCE 7-05
- Long edge of module must be perpendicular to the beam
- The installer must comply with the responsibilities and instructions described in the install manual
- The installer must confirm that the method of attachment (components and hardware) and structure can handle the given point loads
- In regions with ground snow loads less than 20 psf but not zero, the roof angle in degrees must be greater than the horizontal distance from eave to ridge / 50
- System dead load, including modules and mounting hardware, must be between 2 and 3.6 psf.
- Importance factors are equal to 1.0 in all cases.
- Unbalanced and drift snow loads have not been considered.
- Installations must be in seismic site class A, B, C, or D
- Spectral response acceleration, S_B , is ≤ 1.5 (and ≤ 0.35 if snow loads are ≥ 30 psf).



UNIRAC SolarMount-I 1.0 Engineering Report, Page 2 of 2

Engineering Variables

Description	Variable	Value	Units
Building Height	h	30	ft
Roof Pitch		0-45	degrees
Wind Exposure Category		C	
Importance Factor	I	1	
Effective Wind Area		50+	ft ²
Topographic Factor	Kzt	1	
Roof Zone		1	(use 1/2 span for zones 2 and 3)

Design Wind Loads

Basic Wind Speed (mph)	90	110	120	150
Max Design Wind Load, Pnet; Uplift (psf)	-19.2	-28.7	-34.2	-53.3
Max Design Wind Load, Pnet; Downforce (psf)	17.5	26.0	31.1	48.4

Dead, Snow, and Earthquake Loads

Dead Load; min/ max	2 / 3.5	psf		
Earthquake Load	2.8	psf		
Ground Snow Load, Pg. (pounds/ ft2)	0	20	30	40
Max Sloped roof snow load (psf)	0.0	20.0	25.2	33.6
Max Distance between splices (inches, feet)	653, 54	336, 28	245, 20	193, 16

Distributed Loads for 65" x 40" module, pounds/ inch (smaller modules -20%, larger modules +18%)

		Ground Snow Load (psf)				
Wind Load (mph)		0	20	30	40	
	90	4.06	4.06	4.06	4.06	Uplift, ⊥ to module
		4.65	5.87	6.75	8.37	Downforce, ⊥ to module
		0.95	1.84	2.53	3.22	Side, // module
	110	6.21	6.21	6.21	6.21	Uplift, ⊥ to module
		6.57	7.02	7.98	8.94	Downforce, ⊥ to module
		0.95	1.84	2.53	3.22	Side, // module
	120	7.44	7.44	7.44	7.44	Uplift, ⊥ to module
		7.71	7.88	8.83	9.79	Downforce, ⊥ to module
		0.95	1.84	2.53	3.22	Side, // module
	150	11.77	11.77	11.77	11.77	Uplift, ⊥ to module
		11.63	11.63	11.77	12.73	Downforce, ⊥ to module
		0.95	1.84	2.53	3.22	Side, // module

⊥ : perpendicular/ normal
// : parallel

For installations that do not comply with the limitations on page 1, refer to www.unirac.com for an engineering design guide to manually calculate loads or contact your distributor.

The design is based on and in compliance with the following codes/standards:

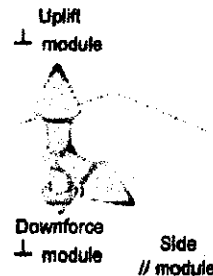
1. 2003 International Building Code, by International Code Council, Inc., 2003.
2. 2006 International Building Code, by International Code Council, Inc., 2006.
3. Aluminum Design Manual: Specifications and Guidelines for Aluminum Structures, by The Aluminum Association, Washington, D.C., 2005.
4. 2007 California Building Code (CBC), based on the 2006 International Building Code, by International Code Council, Inc., 2006.



UNIRAC SolarMount-I 2.5 Engineering Report, Page 1 of 2

90 mph Wind Chart

Module Size	Max Span (inches)			
	Ground Snow	Point Loads (pounds): Up/ Down/ Side		
	0	20	30	40
52" x 35"	76 310/ 355/ 73	67 271/ 392/ 123	57 231/ 385/ 144	51 205/ 423/ 163
65" x 40"	63 319/ 365/ 75	56 284/ 410/ 129	51 259/ 430/ 161	45 229/ 473/ 182
77" x 51"	50 300/ 344/ 70	44 267/ 386/ 121	41 249/ 414/ 155	37 224/ 461/ 177



110 mph Wind Chart

Module Size	Max Span (inches)			
	Ground Snow	Point Loads (pounds): Up/ Down/ Side		
	0	20	30	40
52" x 35"	64 399/ 423/ 61	62 386/ 437/ 115	57 354/ 455/ 144	51 314/ 452/ 163
65" x 40"	53 410/ 434/ 63	51 397/ 449/ 118	48 372/ 479/ 152	45 351/ 505/ 182
77" x 51"	42 386/ 409/ 59	41 373/ 422/ 111	38 350/ 450/ 143	36 331/ 477/ 172

Know your limits!

Check attachment load limits.

120 mph Wind Chart

Module Size	Max Span (inches)			
	Ground Snow	Point Loads (pounds): Up/ Down/ Side		
	0	20	30	40
52" x 35"	59 442/ 458/ 56	59 437/ 463/ 108	55 413/ 490/ 140	51 376/ 495/ 163
65" x 40"	49 454/ 470/ 58	48 449/ 475/ 111	46 424/ 503/ 144	43 403/ 530/ 174
77" x 51"	39 427/ 443/ 55	38 423/ 447/ 105	36 399/ 474/ 136	34 379/ 499/ 164

150 mph Wind Chart

Module Size	Max Span (inches)			
	Ground Snow	Point Loads (pounds): Up/ Down/ Side		
	0	20	30	40
52" x 35"	48 566/ 559/ 46	48 566/ 559/ 89	48 566/ 566/ 122	46 544/ 588/ 149
65" x 40"	40 581/ 574/ 47	40 581/ 574/ 91	39 581/ 581/ 125	38 559/ 604/ 153
77" x 51"	31 547/ 540/ 44	31 547/ 540/ 86	31 547/ 547/ 118	30 526/ 569/ 144

Installation of products related to this engineering report is subject to the requirements below:

- Flush roof installations only; modules must be < 10" from roof surface
- The building has either a flat roof, a gable roof ≤ 45°, or a hip roof ≤ 27°
- The roof has a minimum slope of 1.2°
- Installation must have at least 4 modules grouped together (minimum 50 ft²)
- Surrounding ground area must not slope more than 10 degrees
- Location must fall into Wind Exposure Category B or C
- Building height must be less than or equal to 30 feet
- For roof zones 2 and 3 use 1/2 Max Span
- Max cantilever = 1/3 Max Span
- Ground snow loads are adjusted for roof slope and temperature based on ASCE 7-05
- Long edge of modules must be perpendicular to the beam
- The installer must comply with the responsibilities and instructions described in the install manual
- The installer must confirm that the method of attachment (components and hardware) and structure can handle the given point loads
- In regions with ground snow loads less than 20 psf but not zero, the roof angle in degrees must be greater than the horizontal distance from eave to ridge / 50
- System dead load, including modules and mounting hardware, must be between 2 and 3.5 psf.
- Importance factors are equal to 1.0 in all cases.
- Unbalanced and drift snow loads have not been considered.
- Installations must be in seismic site class A, B, C, or D
- Spectral response acceleration, S_g , is ≤ 1.5 (and ≤ 0.35 if snow loads are ≥ 30 psf).



UNIRAC SolarMount-I 2.5 Engineering Report, Page 2 of 2

Engineering Variables

Description	Variable	Value	Units
Building Height	h	30	ft
Roof Pitch		0-45	degrees
Wind Exposure Category		C	
Importance Factor	I	1	
Effective Wind Area		50+	ft ²
Topographic Factor	Kzt	1	
Roof Zone		1	(use 1/2 span for zones 2 and 3)

Design Wind Loads

Basic Wind Speed (mph)	90	110	120	150
Max Design Wind Load, Pnet; Uplift (psf)	-19.2	-28.7	-34.2	-53.3
Max Design Wind Load, Pnet; Downforce (psf)	17.5	26.0	31.1	48.4

Dead, Snow, and Earthquake Loads

Dead Load; min/ max	2 / 3.5	psf		
Earthquake Load	2.8	psf		
Ground Snow Load, Pg, (pounds/ ft ²)	0	20	30	40
Max Sloped roof snow load (psf)	0.0	20.0	25.2	33.6
Max Distance between splices (inches, feet)	653, 54	336, 28	245, 20	193, 16

Distributed Loads for 65" x 40" module, pounds/ inch (smaller modules -20%, larger modules +18%)

Ground Snow Load (psf)

Wind Load (mph)	0	20	30	40	
90	4.06	4.06	4.06	4.06	Uplift, ⊥ to module
	4.65	5.87	6.75	8.37	Downforce, ⊥ to module
	0.95	1.84	2.53	3.22	Side, // module
110	6.21	6.21	6.21	6.21	Uplift, ⊥ to module
	6.57	7.02	7.98	8.94	Downforce, ⊥ to module
	0.95	1.84	2.53	3.22	Side, // module
120	7.44	7.44	7.44	7.44	Uplift, ⊥ to module
	7.71	7.88	8.83	9.79	Downforce, ⊥ to module
	0.95	1.84	2.53	3.22	Side, // module
150	11.77	11.77	11.77	11.77	Uplift, ⊥ to module
	11.63	11.63	11.77	12.73	Downforce, ⊥ to module
	0.95	1.84	2.53	3.22	Side, // module

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// : parallel

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4. 2007 California Building Code (CBC), based on the 2006 International Building Code, by International Code Council, Inc., 2006.

TSM-PC05

The Universal Solution



Module can bear snow loads up to 5400Pa and wind loads up to 2400Pa



Guaranteed power output (0~+3%)



High performance under low light conditions
(Cloudy days, mornings and evenings)



Independently certified by international certification bodies*



Manufactured according to International Quality and Environment Management System (ISO9001, ISO14001)



Currently Trina Solar's most popular panel. Versatile and adaptable, with power output ranging from 220 to 240Wp, the TSM-PC05 is perfect for large-scale installations, particularly ground-mounted and commercial rooftop systems. Using reliable and carefully selected components that are tested at the Trina Solar Center of Excellence, this panel comes with a 25-year performance guarantee of 80% power production.

Trina Solar, the best \$/kWh value under the sun



Trina Solar Limited
No. 2 Trina Road, Trina PV
Industrial Park, New District,
Changzhou, Jiangsu, 213031,
China

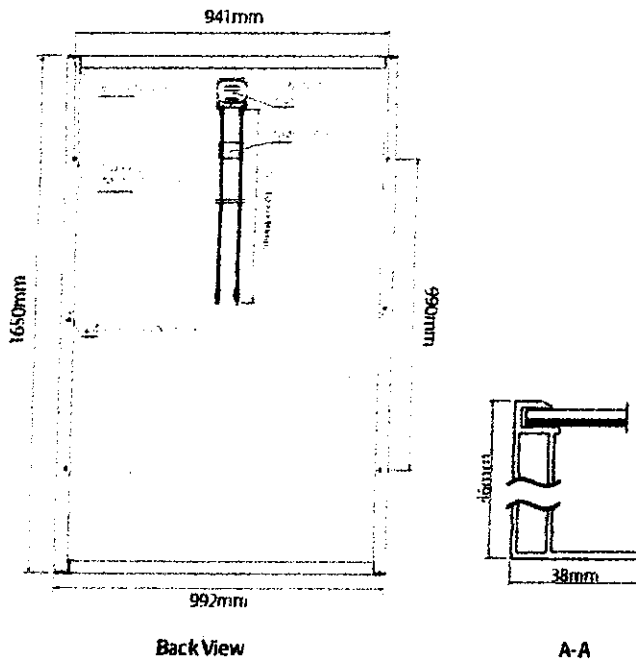
T +86 519 8548 2008
F +86 519 8517 6021
E sales@trinasolar.com

Founded in 1997, Trina Solar is a vertically integrated PV manufacturer, producing everything from ingots to modules. Using both mono and multicrystalline technologies. At the end of 2011, the company had a nameplate module capacity of 1.7GW. Trina Solar's wide range of products are used in residential, commercial, industrial and public utility applications throughout the world.

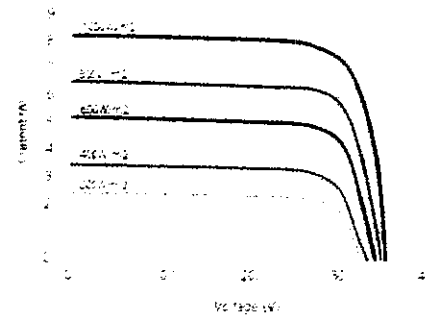
Only by matching an efficient cost-structure with proven performance will we, as an industry, achieve grid parity. And at Trina Solar, we have both.

TSM-PC05 The Universal Solution

Dimensions of PV module TSM-PC05



I-V Curves of PV module TSM-230PC05



Efficiency up to 14.7%
Wattage up to 240W
Years warranty 25

Certification



Electrical Data @ STC	TSM-220PC05	TSM-225PC05	TSM-230PC05	TSM-235PC05	TSM-240PC05
Peak Power Watts P_{max} (W)	220	225	230	235	240
Power Output Tolerance P_{max} (%)	0/+3	0/+3	0/+3	0/+3	0/+3
Maximum Power Voltage V_{mp} (V)	29.0	29.4	29.8	30.1	30.4
Maximum Power Current I_{mp} (A)	7.60	7.66	7.72	7.81	7.89
Open Circuit Voltage V_{oc} (V)	36.8	36.9	37.0	37.1	37.2
Short Circuit Current I_{sc} (A)	8.15	8.20	8.26	8.31	8.37
Module Efficiency η (%)	13.4	13.7	14.1	14.4	14.7

Values at Standard Test Conditions STC (Air Mass AM1.5, irradiance 1000W/m², Cell Temperature 25°C)

Mechanical Data

Solar cells	Multicrystalline 156 x 156mm (6 inches)
Cells orientation	60 cells (6x10)
Module dimension	1650 x 992 x 46mm (64.95 x 39.05 x 1.81 inches)
Weight	19.5kg (43.0lb)
Glass	High transparency solar glass 3.2mm (0.125 inches)
Frame	Anodized aluminum alloy
Box	IP65 rated
Cables/connector	Photovoltaic Technology cable 4.0mm ² (0.006 inches ²), 1000mm (39.4 inches), MC4

Temperature Ratings

Nominal Operating Cell Temperature (NOCT)	47°C (117°F)
Temperature Coefficient of P_{max}	-0.45%/°C
Temperature Coefficient of V_{oc}	-0.35%/°C
Temperature Coefficient of I_{sc}	0.05%/°C

Maximum Ratings

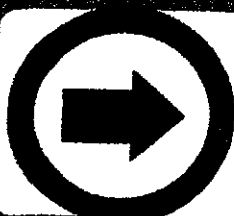
Operational Temperature	-40° to +85°C
Maximum System Voltage	1000VDC
Max Series Fuse Rating	14A

Warranty

5 years workmanship warranty
10 years warranty 90% power output
25 years warranty 80% power output

Packaging Configuration

Modules per box	20 pcs
Modules per 40' container	520 pcs



SmartSynch
the smart grid intelligence company



Itron

CENTRON® GPRS SmartMeter

SmartSynch's AMI Intelligence™ metering solution features a communications module that is integrated into the Itron CENTRON electricity meter. The CENTRON SmartMeter communicates with a server running SmartSynch's Transaction Management System™ (TMS) and complies with ANSI C12.19 protocols for data storage and transmission.

This solution delivers actionable intelligence (critical usage and rate data) over secure public wireless networks (such as AT&T and Rogers Wireless) and the Internet – in lieu of cumbersome and expensive private networks. This makes mass deployments quicker, easier, and more scalable, providing a significantly greater Return on Resources (RoR) for utilities.

Unlike proprietary, closed-architecture solutions, the CENTRON SmartMeter is essentially a future-proof investment in technology. Its standards-based IP connectivity makes it adaptable and field-upgradable to support today's sensing and communications needs, as well as tomorrow's opportunities, better than any alternative.

Functions & Features

Wireless Networks

- GPRS

Advanced Metering Functionality

- Flexible Two-Way Data Retrieval
- Scheduled and On-Demand Reads
- Interval Reads (5, 15, 30, 60 minutes)
- Real-Time Interval Reads
- Automated Register, Self-Read & TOU Retrieval
- Demand Resets
- Real-Time Meter Event and Alarm Retrieval
- Real-Time Power Outage and Power Restoration
- Service Diagnostics and Tamper Detection
- Tilt Detection
- Meter Clock Synchronization
- SmartMeter Status Display
- Automated Meter Registration
- Secure and Encrypted Data Transmissions
- Bi-Directional Metering
- Over-The-Air SmartMeter Module Firmware Upgrade

Supported Meter Forms

- Class 20: 3S 4S
- Class 100: 1S
- Class 200: 2S 12S 25S
- Class 320: 2S

Hardware Components

- Radio Control Module Board (RCM)
- Capacitor Storage Bank (CSB)
- GSM/GPRS Modem
- Internal Antenna
- Tilt Detector
- Temperature Sensor

Operating Ranges

Temperature

- Operating: [-40°C +85°C]
- Transmission (GPRS): [-40°C +85°C]

Humidity

- 0% to 95% non-condensing

Accuracy

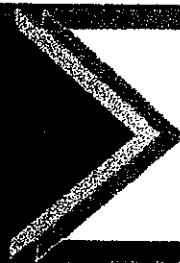
- Meets ANSI 12.20 for accuracy class 0.5%

Regulatory & Industry Specifications

- FCC Part 15 Class B
- ANSI C37.90.1 – 1989 (SWC)
- ANSI C12.20 (Class 0.5) – 1998
- PTCRB Certified
- Network Carrier Certified
- Measurement Canada Certified

SmartSynch, Inc.
4400 Old Canton Road
Jackson, Mississippi 39211
1-888-362-1780

Circle 10 on Reader Service



Hardware Specifications



Hardware Component

Description

Radio Control Module Board (RCM)

32-bit ARM processor, 256K RAM, 512K flash

Capacitor Storage Bank (CSB)

Supplies peak power for data transmissions and all functions during power outages—no batteries required

GSM/GPRS Modem

GSM modem communicates with head-end using GPRS and SMS services

Internal Antenna

Flexible dual frequency GSM antenna for the modem

Tilt Detector

Detects unauthorised movement or removal of the device

Temperature Sensor

Monitors all temperatures to ensure correct radio operation

Temperature Ranges

Operating: -40°C , $+85^{\circ}\text{C}$

Transmission (wireless): -40°C , $+85^{\circ}\text{C}$

Humidity Range

0% to 95% non-condensing

Accuracy

Meets ANSI 12.20 for accuracy class 0.5%

Supported Meter Forms

Class 20: 3S, 4S

Class 100: 1S

Class 200: 2S, 12S, 25S

Class 320: 2S

Regulatory & Industry Certification:

FCC Part 15 Class B

ANSI C37.90.1 – 1989, Surge Withstand Capability (SWC)

ANSI C12.20 (Class 0.5) – 1998

PTCRB Certified

Measurement Canada Certified

Network Carrier Certified

Input/Output Signal or Interface Definition/Values

Module Power Input Voltage

120 VAC

Meter Serial Interface

3.3V / TTL compatible asynchronous

Integration

The SmartMeter module is a fully integrated, under-the-cover option inside the CENTRON meter. The CENTRON GPRS SmartMeter is shipped as one complete unit, ready for field deployment.

Version and Compatibility Information

CENTRON Meter Hardware:

Supported meter forms, classes, and types equipped with battery

CENTRON Meter Firmware:

1.8D

SmartModule:

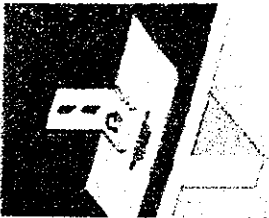
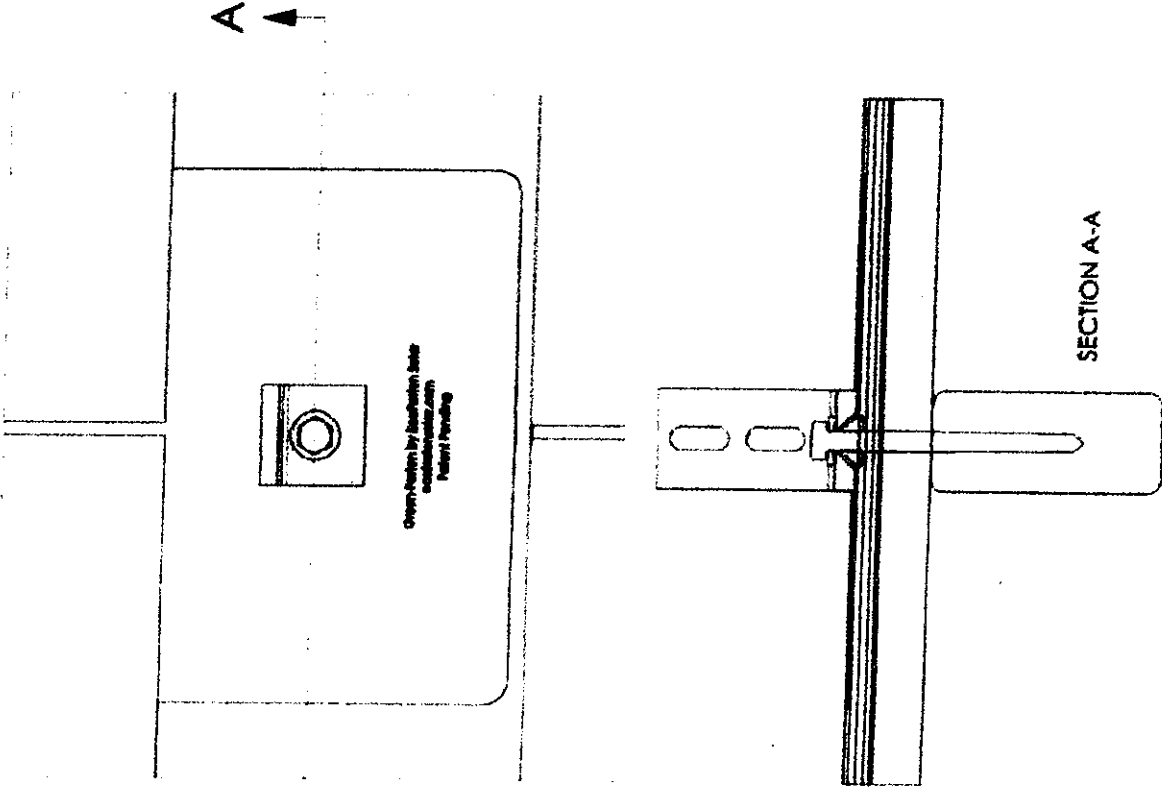
CENTRON GPRS SmartMeter Module

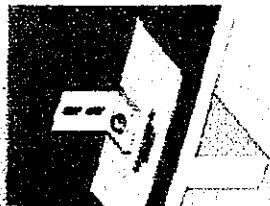
SmartSynch TMS:

Version 7.20 or higher

About SmartSynch: Headquartered in Jackson, Miss., SmartSynch has been developing successful Smart Grid intelligence solutions for the utility industry since 2000. The company's clean-tech innovations in the two-way delivery of real-time energy usage data over public wireless networks (AT&T, Rogers, etc.), in lieu of private network build-outs, have made simplified SmartMeter deployments for 100 major North American utilities while enabling green-energy initiatives and delivering significantly higher Returns on Resources.

Unlike proprietary, closed-architecture solutions, SmartSynch's SmartMeters represent future-proof investments in technology. The standards-based IP connectivity enabled in every SmartMeter deployed makes them adaptable and remotely upgradable to support today's sensor and communications needs as well as tomorrow's opportunities better than any alternative.

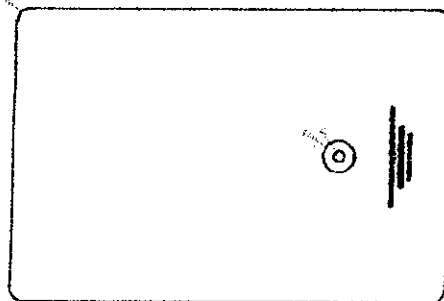




EcoFasten Solar

EcoFasten Solar® 877-859-3947 Committed to the Support of Renewable Energy

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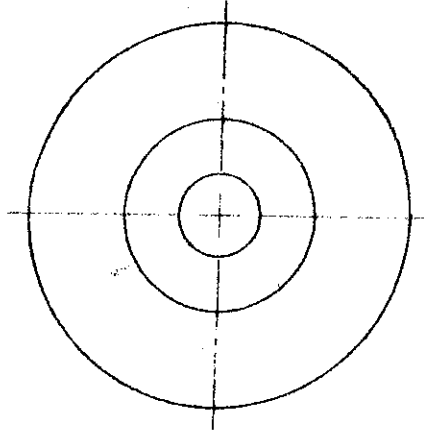
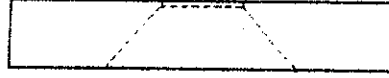


Finish Options
BLK = Matte Black
BRZ = Medium Bronze
MLL = Mill Finish

Sec 4-2

GREENFASTEN™ PRODUCT GUIDE – GF-1

Bracket Options - CP Round



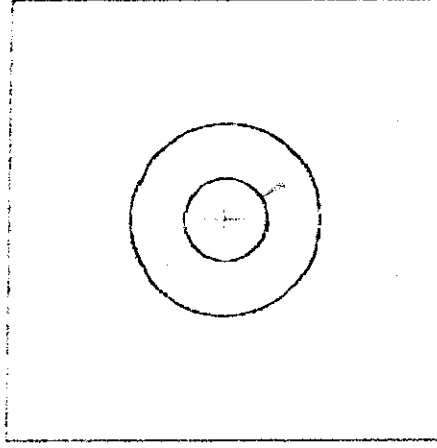
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EcoFasten Solar

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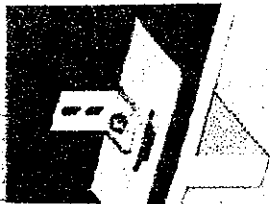
GREENFASTEN™ PRODUCT GUIDE – GF-I

Bracket Options - CP-SQ



Compression Plate 2" X 2" Mill Aluminum

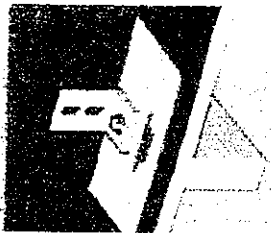
Sec 4-1



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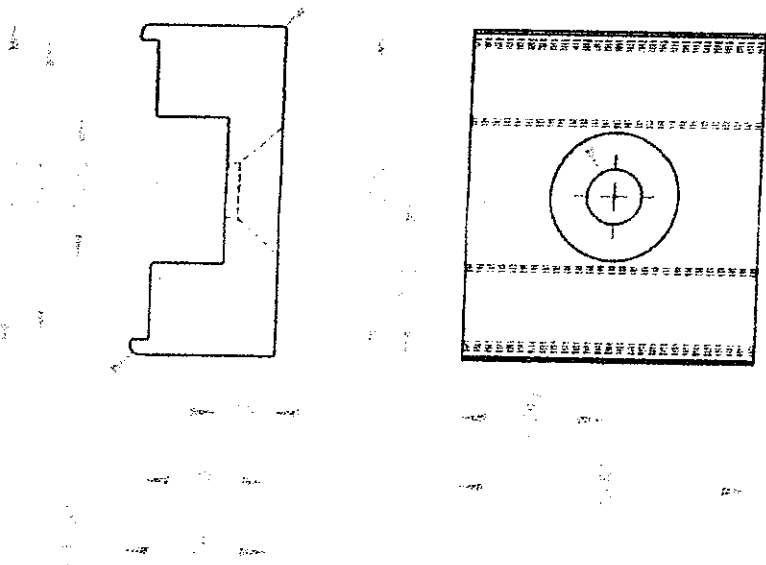
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GREENFASTEN™ PRODUCT GUIDE -- GF-I Bracket Options - F-111



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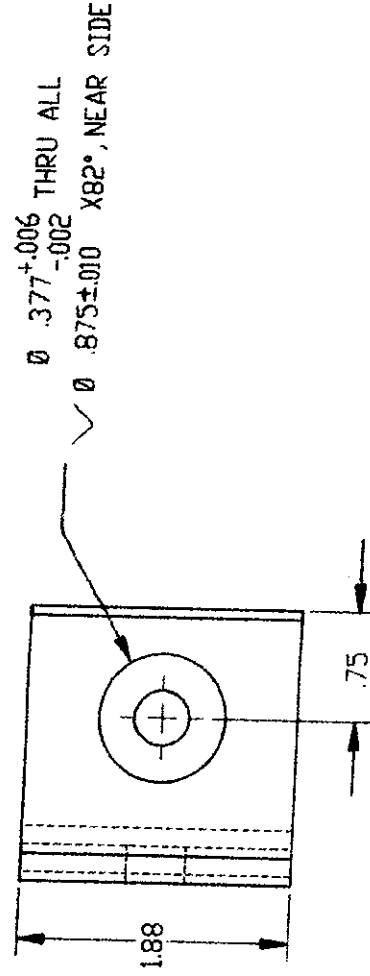
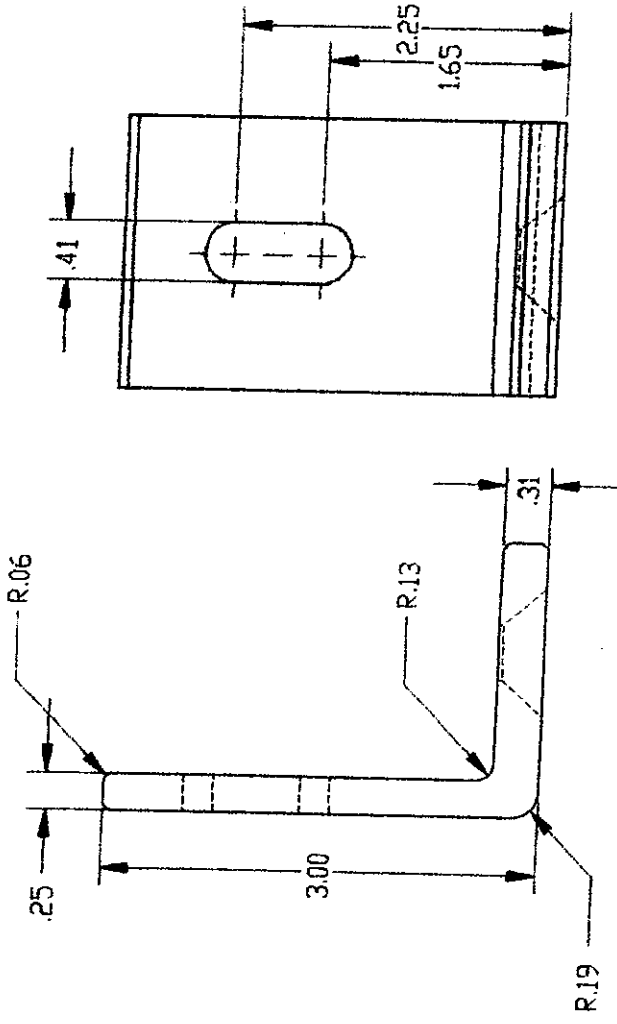


GREENFASTEN™
877-859-3947
www.ecofastensolar.com

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GREENFASTEN™ PRODUCT GUIDE – GF-1

Bracket Options - L-101-3"

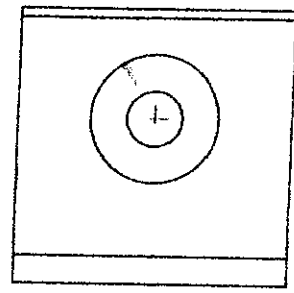
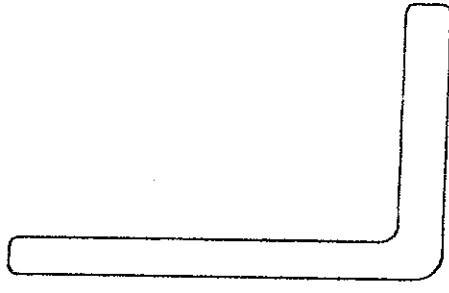
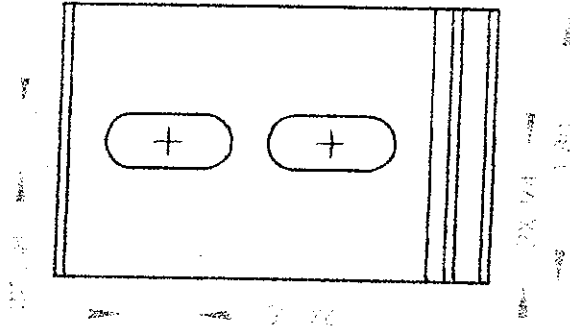


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EcoFasten Solar

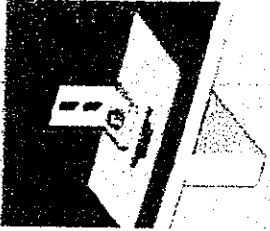
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GREENFASTEN™ PRODUCT GUIDE – GF-1 Bracket Options - L-102-3"



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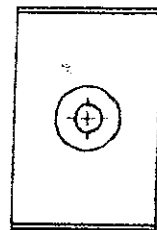
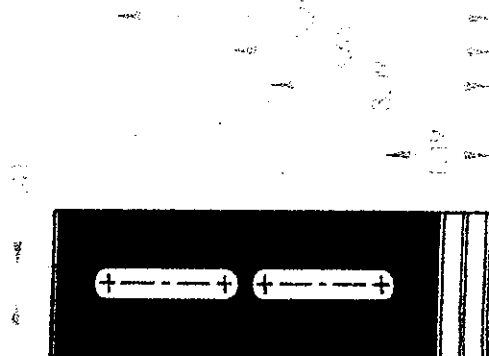
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GREENFASTEN™ PRODUCT GUIDE – GF-1

Bracket Options - L-102-6"



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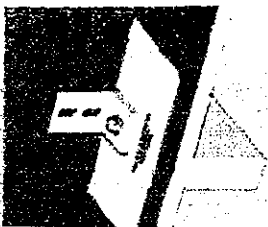
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COFFSTEEN SOLAR

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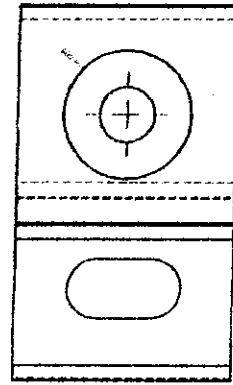
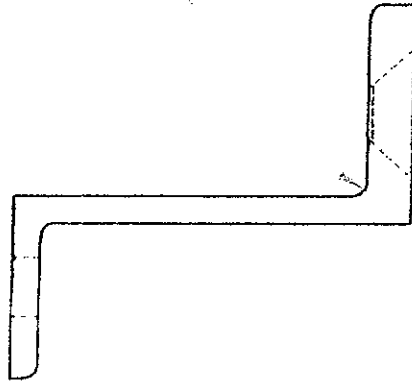
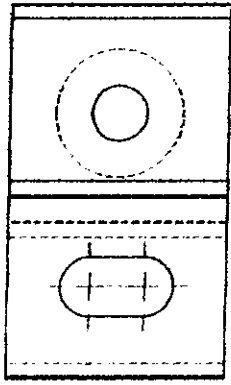
Bracket Options - Z-101



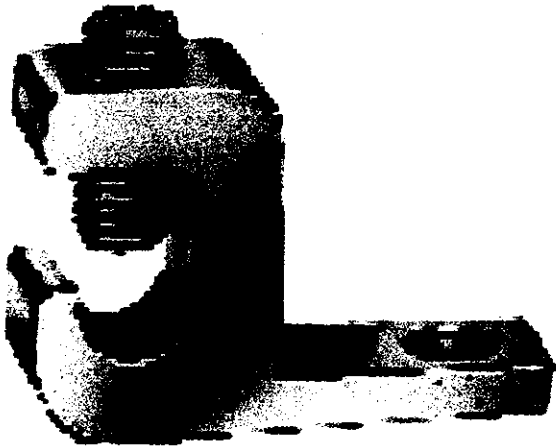
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Ground Method



**832 screw
Starwashers**

General Specifications Outdoor Models

PVI-5000-OUTD-US
PVI-6000-OUTD-US

High-Efficiency, 5kW to 6kW Inverters

Aurora® grid-tie transformerless inverters offer a unique combination of ultra-high efficiencies, installer-friendly designs, long service life, and competitive initial acquisition costs; significantly increasing return on investment in solar-power installations.

Industry-Leading Features and Performance

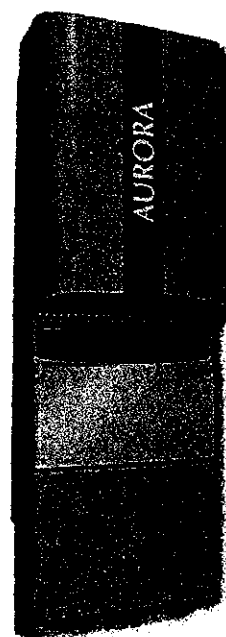
- High efficiencies deliver more energy – up to 97% (96.5 CEC).
- Two inputs with independent MPPTs, optimize power from multiple arrays oriented in different directions.
- Compact size and high power density: 6000W max of output power in a box just 38 5/8" x 12 13/16 x 7 11/16"

Unmatched Applications Flexibility

- Full-rated power available up to 50°C ambient temperature.
- Dual input sections with parallel option, with independent high-speed MPPTs, optimize energy harvesting from multiple arrays oriented in different directions.
- Wide MPPT operating range: 90 to 580VDC

Field-Proven Reliability

- IP65 (NEMA 4) rated enclosure withstands the harshest environmental conditions.
- Front-mounted heat sink resists contamination, enhancing cooling and increasing reliability and long-term efficiency.
- Grid-connected operation according to international standards, UL1741/IEEE1547 & CSA-C22.2 N.107.1-01
- Ten-year warranty, optionally extendable to fifteen and twenty years.



Installer Friendly

- Reverse-polarity protection minimizes potential damage caused by miswiring during installation.
- Front-panel mounted LCD display provides real-time updates for all critical operating parameters.
- RS-485 and USB communications interfaces.
- Integrated DC switch available in compliance with NEC Standard, Article 690 "Solar Photovoltaic System" (USA)
- Anti-islanding protection

Models	AC Power
PVI-5000-OUTD	5kW
PVI-6000-OUTD	6kW
Options	
Aurora Communicator software simplifies monitoring via PC. Aurora Easy Control datalogger is available for remote control via Internet, modem or GSM	

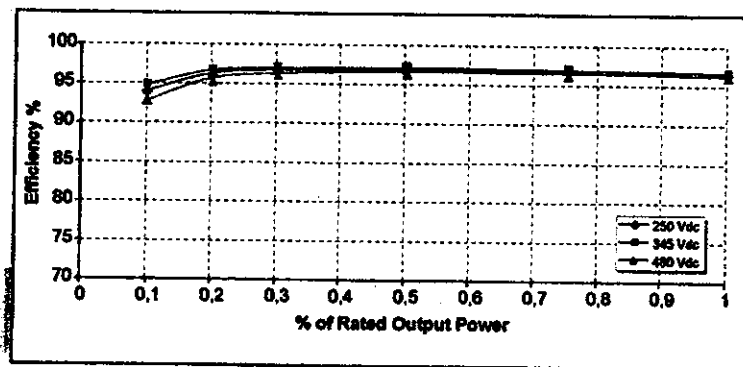
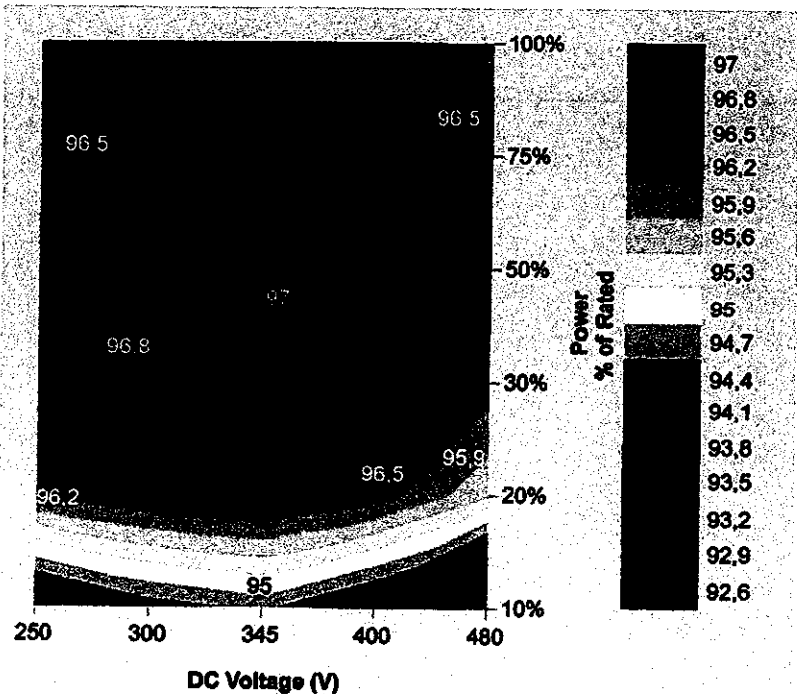


AURORA[®]

Photovoltaic Inverter

High Efficiencies Across a Broad Range of Operating Conditions

PVI-5000 and PVI-6000 inverters provide 208/240/277 Vac selectable outputs, at up to 97% efficiency (CEC 96.5). The graph to the right demonstrates the high efficiencies, across a continuous range of input voltages and load conditions, for the PVI-6000. The graphs below depict the industry-leading performance of all models at three discrete MPPT-voltage reference points, and a continuous range of load conditions.





AURORA[®]

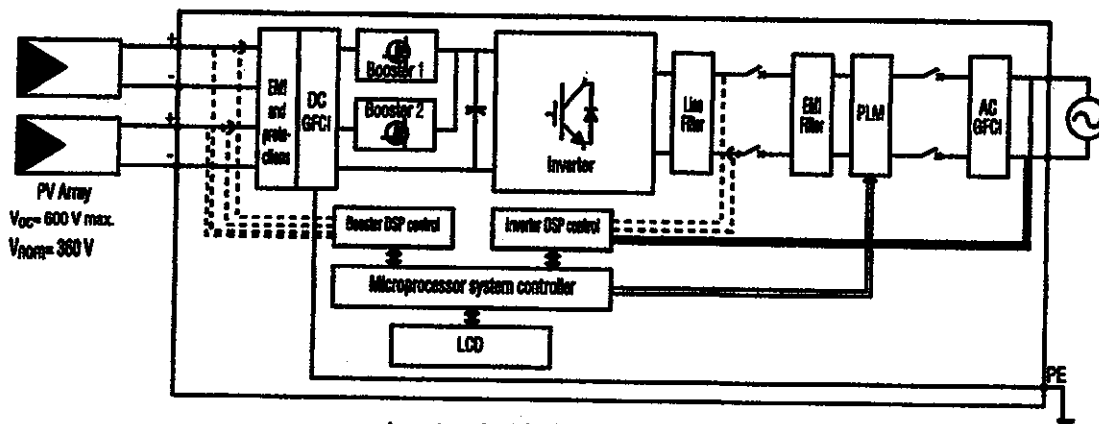
Photovoltaic Inverter

SPECIFICATIONS		PVI-5000-OUTD	PVI-6000-OUTD
INPUT PARAMETERS (DC Side)			
Nominal DC Power [kW]		5.15	6.18
Total Max. Recommended DC Power [kW]		5.3	6.4
Operating MPPT Input Voltage Range [V]		90 to 580 (360 nominal)	
Full Power MPPT Range [V]		140-530	170-530
Max. Input Voltage [V]		600	
Activation Voltage [V]		200 nominal (adjustable within 120-350)	
No Of Independent MPPT Trackers		2	
Max. Input Power, Each MPPT [kW]		4	4
No. Of DC Inputs		2 (1 each MPPT)	2 (1 each MPPT)
Max. DC Current, Each MPPT [A]		18 (22 short circuit)	18 (22 short circuit)
Thermally Protected DC Side Varistor		4 (2 for each MPPT)	
DC Switch		Integrated (Rating: 600Vdc/25A)	
DC Connections		4 (2 POSITIVE, 2 NEGATIVE)	
		SCREW TERMINAL BLOCK	
		3 KNOCK-OUTS: G1&1/2" or G1" (using ring reduction)	
		CONDUCTOR CROSS SECTION : MAX AWG4	
OUTPUT PARAMETERS (AC Side)			
Nominal AC Power [kW]		5000	6000
Max. AC Power [kW]		5000	6000
AC Grid Connection		single phase / split phase	
Nominal AC Voltage Range [V]		Default : 240V split phase Optional : 208 or 277 single phase (setting required)	
Maximum AC Voltage Range [V]		187.2-224.6 ; 216-259.2 ; 249.3-299.2	
Nominal AC Frequency [Hz]		60	
Max. AC Line Current [A]		24; 20; 18 (30 short circuit)	29; 25; 21.6 (30 short circuit)
AC Side Varistor		2 (Live - Neutral / Live - PE)	
AC Connection		SCREW TERMINAL BLOCK	
		3 KNOCK-OUTS: G1&1/2" or G1" (using ring reduction)	
		CONDUCTOR CROSS SECTION : AWG4/8	
Line Power Factor		1	
AC Current Distortion (THD)		<2% at rated power with sine wave voltage	
Max. Efficiency		97%	
CEC Efficiency		96.5%	
Feed In Power Threshold [W]		20	
Night Time Consumption [W]		< 2	
Isolation		Transformer-less	
ENVIRONMENTAL PARAMETERS			
Cooling		Natural cooling	
Ambient Temp. Range [°C]		-25 / + 60 (output power derating above 50°C)	
Operating Altitude [ft]		6,000	
Acoustical Noise [dBA]		< 50 @ 1mt	
Environmental IP Rating		IP65	
Relative Humidity		0-100% condensing	
MECHANICAL			
Dimensions (HxWxD) [Inches]		38 5/8" x 12 13/16" x 7 11/16"	
Weight [lbs]		66	
OTHER			
Display		YES (Alphanumeric 2 lines)	
Communication		RS485 (Spring terminal block - Conductor cross section: 0.08-1.5mm²/AWG28-16)	
		USB connection (Service)	
		"Aurora Easy-Control" system for remote control (Optional)	

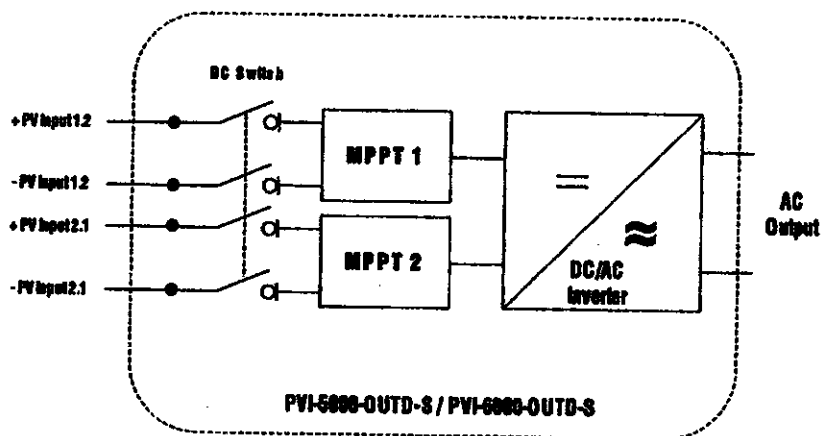
Standards and Codes

Aurora inverters comply with standards set for grid-tied operation, safety, and electromagnetic compatibility including: UL1741/IEEE1547 & CSA-C22.2 N.107.1-01, VDE0126, CEI 11-20, DK5940, CEI64-8, IEC 61683, IEC 61727, EN50081, EN50082, EN61000, CE certification, El Real Decreto RD1663/2000 de España.

Block Diagram and Operating Configurations



Inverter electrical block diagram



Rev.1.1 June.10, 2009

CERTIFICATION IN LIEU OF OATH

I. OWNER SECTION (to be completed if the applicant is the owner in fee)

I hereby certify that I am the owner in fee of the property listed on Page 1.

Mark the following applicable boxes:

- A. ☐ I further certify that a new home (private residence) will be constructed on this property for my own use and occupancy. This dwelling is to be occupied by myself and is not to be used for any purpose other than single family residential use. I attest that all construction, plumbing, or electrical work will be done, in whole or in part, by me or by subcontractors under my supervision, in accordance with all applicable laws; and, I further acknowledge that said new home is not covered under the New Home Warranty and Builders Registration Act (N.J.S.A. 46:3B-1 et seq.) and that such fact shall be disclosed to any person purchasing this property within ten years of the date of issuance of a certificate of occupancy.

I UNDERSTAND THAT IN MARKING BOX A, I ACKNOWLEDGE THAT I AM ASSUMING RESPONSIBILITY FOR THE WORK DONE ON SAID PROPERTY, THE CONDITION OF THE PROPERTY PRIOR TO, DURING, AND AFTER ANY WORK PERFORMED, AND FOR THE PERFORMANCE OF THE SUBCONTRACTORS I HIRE, EMPLOY, OR OTHERWISE CONTRACT OR WITH WHOM I MAKE AGREEMENTS TO PERFORM WORK. I AM VOLUNTARILY AND KNOWINGLY ASSUMING THIS RESPONSIBILITY.

- B. ☐ I further certify the following as required by the New Jersey Uniform Construction Code, N.J.A.C. 5:23-2.15(f)1.ix:

I personally prepared the plans submitted for: 1) the new home referred to in A.; or 2) an addition, alteration, renovation, or repair to an existing single family residence owned and occupied by myself and located on the property listed on Page 1; or 3) a new structure that will be physically separate from, but that will be deemed part of, an existing single family residence that is owned and occupied by myself and located on the property listed on Page 1.

- C. ☐ I further certify that I will perform or supervise the following work:

C.1. ☐ Building C.2. ☐ Fire Protection

I further certify that I will perform the following work:

C.3. ☐ Electrical C.4. ☐ Plumbing

- D. ☐ I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require.

I understand that if any of the above statements are willfully false, I am subject to punishment.

Signature _____ Date _____

II. AGENT SECTION (to be completed if the applicant is not the owner in fee)

I hereby certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(d): the proposed work is authorized by the owner in fee; and I have been authorized by the owner in fee to make this application as his agent.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require.

I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I understand that if any of the above statements are willfully false, I am subject to punishment.

☒ Check if contractor.

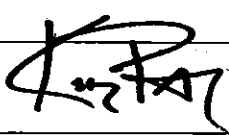
Agent Name Roof Diagnostics, Inc.

Address 608 Brighton Avenue

Spring Lake Hts, NJ 07762

(732) 974-8874

Telephone () 13VH00092200

Signature 

III. ☐ LEAD HAZARD ABATEMENT: Include Homeowner or Building Owner Affidavit as per N.J.A.C. 5:17.