



Public Utilities Commission

Online application for Certification
as an Eligible Ohio Renewable
Energy Resource Generating Facility

V61511

Case No.: 13-0777-EL-REN

A. Name of Renewable Generating Facility: Hatch Residence

The name specified will appear on the facility's certificate of eligibility issued by the Public Utilities Commission of Ohio.

Facility Location

Street Address: 7226 Roberts Road

City: Athens State: OH County: Athens Zip Code: 45701

Facility Latitude and Longitude

Latitude: 39 Degrees 18' 57.24"

Longitude: 82 Degrees 09' 27.94"

There are internet mapping tools available to determine the latitude and longitude, if you do not have this information.

If applicable, U.S. Department of Energy, Energy Information Administration Form EIA-860 Plant Name and Plant Code.

EIA-860 Plant Name:

EIA Plant Code:

B. Legal Name of the Facility Owner

Please note that the facility owner name listed will be the name that appears on the certificate. The address provided in this section is where the certificate will be sent.

If the facility has multiple owners, please provide the following information for each on additional sheets.

Legal Name of the Facility Owner: Randall Patrick Hatch

Legal Name of Facility Owner Representative (First Name, MI, Last Name): Randall Patrick Hatch

Title: Home Owner

Organization:

Street Address: 7226 ROBERTS RD

City: ATHENS

State: OH

Zip Code: 45701

Phone: 3302723328

Fax:

Email Address: randioactive@icloud.com

Web Site Address:

C. List the name, address, telephone number and web site address under which the Applicant will do business in Ohio.

Legal Name of Facility Owner Representative (First Name, MI, Last Name): Randall Patrick Hatch

Title: Home Owner

Organization:

Street Address: 7226 ROBERTS RD

City: ATHENS State: OH Zip Code: 45701

Phone: 3302723328 Fax:

Email Address: randioactive@icloud.com

Web Site Address:

D. Name of Generation Facility Operating Company:

Name of Generation Facility Operating Company: Home Owner

Legal Name of Contact Person (First Name, MI, Last Name): Randall Patrick Hatch

Title: Home Owner

Organization:

Street Address: 7226 ROBERTS RD

City: ATHENS State: OH Zip Code: 45701

Phone: 3302723328 Fax: Email Address: randioactive@icloud.com

Web Site Address (if applicable):

E. Regulatory/Emergency contact

Legal Name of Contact Person (First Name, MI, Last Name): Randall Patrick Hatch

Title: Home Owner

Organization:

Street Address: 7226 ROBERTS RD

City: ATHENS State: OH Zip Code: 45701

Phone: 3302723328 Fax:

Email Address: randioactive@icloud.com

Web Site Address:

F. Certification Criteria 1: Deliverability of the Generation into Ohio
Ohio Revised Code (ORC) Sec. 4928.64(B)(3)

The facility must have an interconnection with an electric utility.

Check which of the following applies to the facility's location:

Yes The facility is located in Ohio.

No The facility is located in a state geographically contiguous to Ohio (Indiana, Kentucky, Michigan, Pennsylvania, or West Virginia).

No The facility is located in the following state:

(If the renewable energy resource generation facility is not located in Ohio, Indiana, Kentucky, Michigan, Pennsylvania, or West Virginia, you are required to submit a POWER FLOW study by one of the regional transmission organizations (RTO) operating in Ohio, either PJM or Midwest ISO, demonstrating that the power from the facility is physically deliverable into the state of Ohio. This study must be appended to the application as an exhibit. THE FACILITY MUST BE INTERCONNECTED TO TRANSMISSION LINES. FOR ADDITIONAL INFORMATION ON DELIVERABILITY REQUIREMENTS, PLEASE REFER TO THE COMMISSION FINDING & ORDER of 3/23/11 IN CASE NO. 09-555-EL-REN.)

G. Certification Criteria 2: Qualified Resource or Technology

You should provide information for only one resource or technology on this application; please check and/or fill out only one of the sections below. If you are applying for more than one resource or technology, you will need to complete a separate application for each resource or technology.

G.1. For the resource or technology you identify in Sections G.4 - G.13 below, please provide a written description of the system.

7 56 125
A ~~4.752~~ kWdc utility interactive photovoltaic power system is specified. ~~(33) 144~~ Wdc photovoltaic modules are specified. (1) 5 kWdc utility interactive inverter is specified. See attached site plan and electrical drawings for more information.

G.2. Please include a detailed description of how the output of the facility is going to be measured and verified, including the configuration of the meter(s) and the meter type(s).

The system production will be recorded and displayed via use of an in-line mechanical kWh meter between the inverter and the utility point of connection. The inverter's data interface will also record and display system production. An on-line monitoring system will also record and display system production. See attached site plan and electrical drawings for more information.

G.3. Please submit digital photographs that depict an accurate characterization of the renewable generating facility. Please indicate the date(s) the photographs were taken. For existing facilities, these photographs must be submitted for your application to be reviewed. For proposed facilities or those under construction, photographs will be required to be filed within 30 days of the on-line date of the facility.

The Applicant is applying for certification in Ohio for a facility using one of the following qualified resources or technologies (Sec. 4928.01 ORC):

G.4 SOLAR PHOTOVOLTAIC

G.4a Location of the PV array: Yes Roof No Ground No Other
Description: SE

G.4b Total number of Modules: 33

G.4.1 PV Modules

For each PV module, provide the following information:

G.4.1.a Manufacturer: TSMC
~~UniSolar~~

G.4.1.b Model and Rating: ~~PVL-144~~, 144 Wdc

TS-125C, 125 Wdc

H. Certification Criteria 3: Placed-in-Service Date (Sec. 4928.64. (A)(1) O.R.C.)

The Renewable Energy Facility:

No has a placed-in-service date before January 1, 1998; (month/day/year):

No has a placed-in-service date on or after January 1, 1998; (month/day/year):

No has been modified or retrofitted on or after January 1, 1998; (month/day/year):

Please provide a detailed description of the modifications or retrofits made to the facility that rendered it eligible for consideration as a qualified renewable energy resource. In your description, please include the date of initial operation and the date of modification or retrofit to use a qualified renewable resource. Please include this description as an exhibit attached to your application filing and identify the subject matter in the heading of the exhibit.

Yes Not yet online; projected in-service date (month/day/year): May 31, 2013

H.1 Is the renewable energy facility owner a mercantile customer? No

ORC Sec. 4928.01 (19) "Mercantile customer" means a commercial or industrial customer if the electricity consumed is for nonresidential use and the customer consumes more than seven hundred thousand kilowatt hours per year or is part of a national account involving multiple facilities in one or more states.

Has the mercantile customer facility owner committed to integrate the resource under the provisions of Rule 4901:1-39-08 O.A.C? No

If yes, please insert/submit a copy of your approved application as an exhibit to this filing.

I. Facility Information

I.a The nameplate capacity of the entire facility kilowatts (kW): ~~4.75~~ or in megawatts
(MW): ~~0.004752~~

0.007

I.b If applicable, what is the expected heat rate of resource used per kWh of net generation:
BTU/kWh

I.1 For each generating unit, provide the following information:

<u>Unit In-Service</u> <u>Date</u>	<u>Unit Nameplate</u> <u>Capacity (MW)</u>	<u>Projected Gross</u> <u>Annual Generation</u>	<u>Expected Annual</u> <u>Capacity Factor %</u>	<u>Number of</u> <u>Generating Units</u>
5/31/13	0.004752 0.007	4.752 7	11.4	1
$\text{Capacity Factor \%} = \frac{\text{Projected Annual Generation}}{\text{Nameplate Capacity} \times 8,760} \times 100$				

J. Regional Transmission Organization Information

In which Regional Transmission Organization area is your facility located:

Yes Within Geographic Area of PJM Interconnection, L.L.C.

No Within Geographic Area of Midwest ISO

No Other (specify):

K. Attribute Tracking System Information

Are you currently registered with an attribute tracking system: Yes

In which attribute tracking system are you currently registered or in which do you intend to register (*the tracking system you identify will be the system the PUCO contacts with your eligibility certification*):

Yes GATS (Generation Attribute Tracking System)

No M-RETS (Midwest Renewable Energy Tracking System)

Other (specify):

K.1 Enter the generation ID number you have been assigned by the tracking system: 30554

(If the generation ID number has not yet been assigned, you will need to file this number in the PUCO Case Docket within 15 days of the facility receiving this number from the tracking system).

L. Other State Certification

Is the facility certified by another state as an eligible generating resource to meet the renewable portfolio standards of that state? No

L.1 If yes, for each state, provide the following information:

<u>Name of State</u>	<u>State Certification Agency</u>	<u>State Certification Number</u>	<u>Date Issued</u>
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M. Type of Generating Facility

Please check all of the following that apply to the facility:

No Utility Generating Facility:

No Investor Owned Utility

No Rural Electric Cooperative

No Municipal System

No Electric Services Company (competitive retail electric service provider certified by the PUCO)

Yes Distributed Generation with a net metering and interconnection agreement with a utility.
Identify the utility: AEP Ohio

No Distributed Generation with both on-site use and wholesale sales.
Identify the utility with which the facility is interconnected:

No Distributed Generation, interconnected without net metering.
Identify the utility with which the facility is interconnected:

N. Meter Specifications

Metering Requirements

If the renewable energy resource generating facility is 6 kW or below, the output may be measured with either an inverter meter or a utility grade meter.

All facilities that are larger than 6 kW must measure the output of the facility with a utility grade meter. Facilities that are larger than 6 kW and that are not measuring output with a utility grade meter will not be certified. OAC 4901:1-40-04 (D)(1)

Please only report on the meter or the meters used to measure the output from the facility which will be reported to the attribute tracking system.

N.a The meter(s) that are measuring output from the facility are:

☒ Inverter Meter(s)

☒ Utility Grade Meter(s) (Must meet ANSI 12.1, or demonstrate an accuracy level of $\pm 2\%$)

N.1 Please provide the following information for each meter used in your system.

N.1.a Manufacturer: ~~SMA~~ Centron

N.1.b Serial Number: 56125583

N.1.c Type: ~~Inverter~~ Meter, Utility Grade

N.1.d Date of Last Certification: May 31, 2013

Attach a photograph of the meter(s) with date image taken. The meter reading(s) must be clearly visible in the photograph. ✓

N.1.e Report the total meter reading number at the time the photograph was taken and specify the appropriate unit of generation (e.g., kWh): 0 ✓

O. Start date from which applicant requests to begin reporting generation towards the creation of Renewable Energy Credits (RECs) for Ohio's purposes

The start date from which an attribute tracking system will begin to count generation data toward the creation of renewable energy credits for Ohio's purposes will be the date of certificate issuance in the state of Ohio (i.e. generation prior to the date of certification would not be recognized), unless the facility satisfies one of the criterion established in the Commission's June 17, 2009 Entry on Rehearing issued in Case No. 08-888-EL-ORD.

In that Entry, the Commission found it to be appropriate to recognize the creation of RECs back to July 31, 2008, the date in which the Ohio alternative energy portfolio standard law became effective, provided that "The facility was a participant in an existing attribute tracking system during that time or had a meter in place which can accurately demonstrate generation levels from July 31, 2008 forward." (June 17, 2009 Entry on Rehearing at 34.)

(1) Existing attribute tracking system:

- a. For facilities that are currently participating in an attribute tracking system, it is not sufficient to merely be registered with the tracking system; you also must be reporting generation data.
- b. If the facility was a participant in an existing attribute tracking system, please state the specific start date that will be used to recognize historical RECs.

(2) Meter which can accurately demonstrate generation levels from July 31, 2008:

- a. For facilities which have had a meter in place, accurately demonstrating generation levels must include documentation from an electric remote monitoring and reporting system, from the specified start date, and recorded on at least a monthly basis.
- b. If the facility had a meter that accurately demonstrates generation levels, please state the specific start date, and attach documentation from the remote monitoring and reporting system.

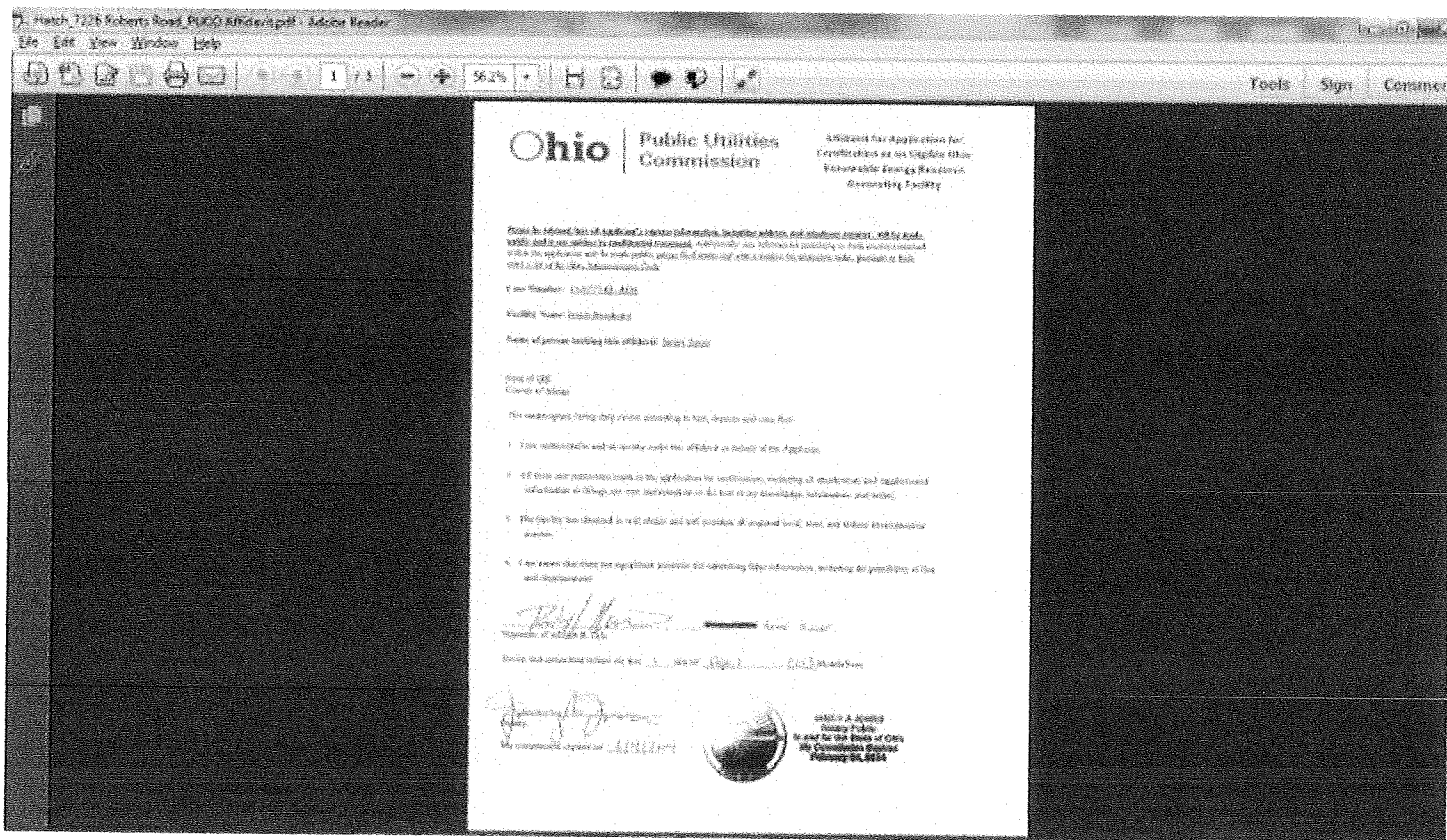
Note: An application that leaves section O blank, or does not include the required documentation, will be assigned a start date for Ohio that corresponds with the date of Ohio certification.

If the facility was a participant in an existing attribute tracking system, please state the specific start date, in accordance with the tracking system's rules, that will be used to recognize historical RECs:

If the facility had a meter that accurately demonstrates generation levels, please state the specific start date, and below insert documentation from the remote monitoring and reporting system:

Also, in the Commission's Entry on Rehearing, the Commission explained that consistent with its policy on double counting, the Commission "will not retroactively recognize any past RECs which have been sold or otherwise consumed." (June 17, 2009 Entry on Rehearing at 34.)

Has any of the generation of the facility been tracked as RECS that have been sold or otherwise consumed? No



The Public Utilities Commission of Ohio reserves the right to verify the accuracy of the data reported to the tracking system and to the PUCO.

Version: June 15, 2011

This foregoing document was electronically filed with the Public Utilities

Commission of Ohio Docketing Information System on

4/1/2013 4:10:13 PM

in

Case No(s). 13-0777-EL-REN

Summary: Application electronically filed by Mr. Randall P Hatch on behalf of Mr. Randall Patrick Hatch

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kW h

CL200 240V 3W FM2S TYPE C1S 30TA 1.0Kh

Third Sun Solar & Wind Power



56125583

04/03/13
VISION

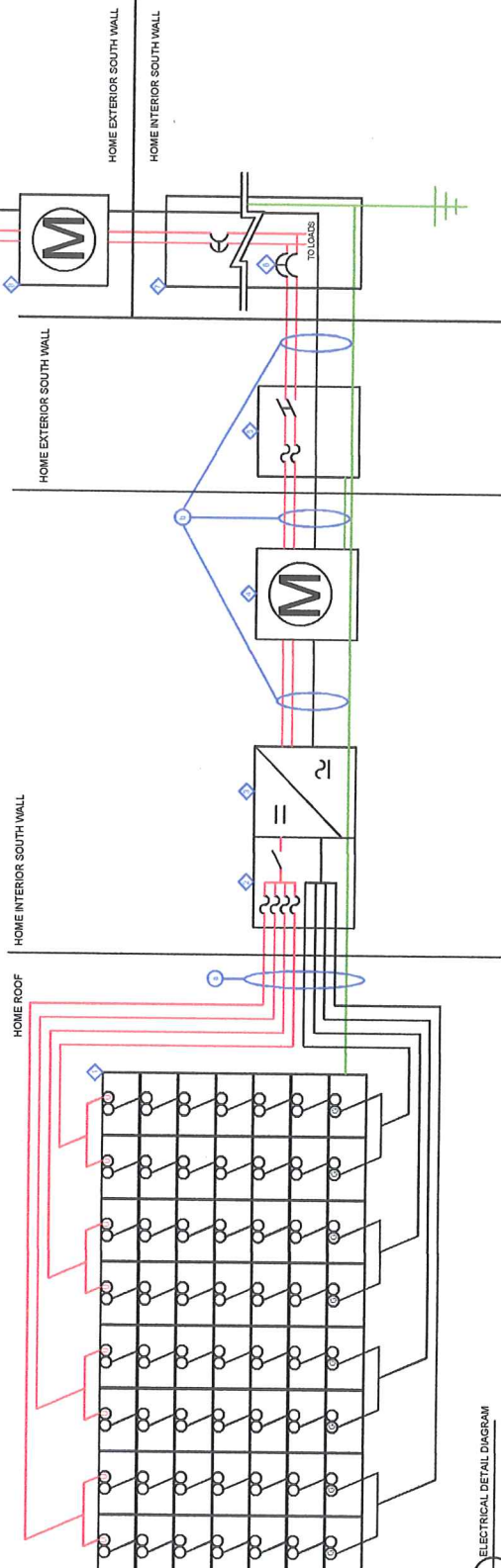
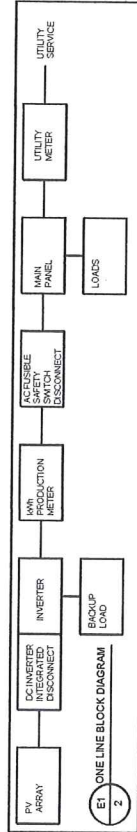


EQUIPMENT SCHEDULE

EQUIPMENT SCHEDULE					
ITEM	QTY	DESCRIPTION	MANUFACTURER	MANUFACTURER PART #	NOTES
1	56	PV MODULE	TSMC SOLAR	TS-12SC	125Wdc
2	1	DC DISCONNECT	SMA	SB-6000T-LUS INTEGRATED	INCLUDING (3) TERMINAL BUS (UNGROUND, GROUND, GROUND)
3	1	INVERTER	SMA	SB-5000T-LUS	5000Wdc, INCLUDING (3) 15Ade PVSC KLKD FUSE, & (1) 1A GFFD KLKD FUSE
4	1	AWN PRODUCTION METER & METER BASE	ABB OR EQUAL & MILBANK OR EQUAL	ABB SR4BAB1-FM25 240V & MILBANK MC-MB-U7021-DL OR EQUAL	1PH, 200Ade, NEMA3R
5	1	FUSIBLE SAFETY SWITCH DISCONNECT	SQUARE-D OR EQUAL	D221NR8 OR EQUAL	
6	1	CIRCUIT BREAKER	SQUARE-D OR EQUAL	30Ade, 2 POLE	240Vdc, 60Ade, INCLUDING (2) 30Ade CLASS L FUSE & (2) TERMINAL BUS (NEUTRAL, GROUND)
7	1	MAIN PANEL	EXISTING EQUIPMENT	EXISTING EQUIPMENT	30Ade, 2 POLE CIRCUIT BREAKER
8	1	UTILITY METER	EXISTING EQUIPMENT	EXISTING EQUIPMENT	MAIN PANEL, 240Vdc, 200Ade
					UTILITY METER NAME: MAIN , UTILITY ACCOUNT NAME: MAIN , PROVIDED BY CUSTOMER

CONDUCTOR & CONDUIT SCHEDULE

TAG	DESCRIPTION	CONDUIT TYPE/SIZE	CONDUCTOR SIZE/TYPE	ROUGHLY ESTIMATED RUN LENGTH (FT)	RUN LENGTH (FT), NOT TO EXCEED
a	PV SOURCE CIRCUIT & EQUIPMENT GROUNDING CONDUCTOR (WITHIN PV ARRAY FOOTPRINT)	FREE AIR OR IN RACEWAY IF READILY ACCESSIBLE) & 1/2" EMT	(1) #10 PVSCC #14 PV WIRE PVSCC & (1) SHARED #6 BARE SOLID EGC THW-2 EGC	100	100
b	INVERTER SOURCE CIRCUIT & MULTIPLE FUNCTION GROUNDING CONDUCTOR	3/4" EMT OR RMC WHERE SUBJECT TO CORROSION OR SEVERE PHYSICAL DAMAGE, OR PVC IF UNDERGROUND	(3) (PER INVERTER) #6 THWN-2 ISCC & (1) #6 THWN-2 AGCE/CDCE/EGC	100	100
c	EXISTING SUB PANEL FEED	EXISTING SUB PANEL FEED	EXISTING SUB PANEL FEED	N/A	N/A



E1 ELECTRICAL DETAIL DIAGRAM

Consent Notes

NOT FOR CONSTRUCTION

No.	Module & Size Change	Revisions/Notes	Date
A			

PROJECT: HATCH RESIDENCE
 7224 ROBERTS ROAD
 ATLANTA, GA 30328
 404-527-3328
 HATCHRESIDENCE.COM
 HATCHRESIDENCE.COM
 HATCHRESIDENCE.COM
 HATCHRESIDENCE.COM

PROJECT: HATCH RESIDENCE
 7224 ROBERTS ROAD
 ATLANTA, GA 30328

Sheet	Notes	Scale
HATCH RESIDENCE		
03-31-13		
E-1.0		

General Notes
-SHOP DRAWING. NOT FOR CONSTRUCTION.

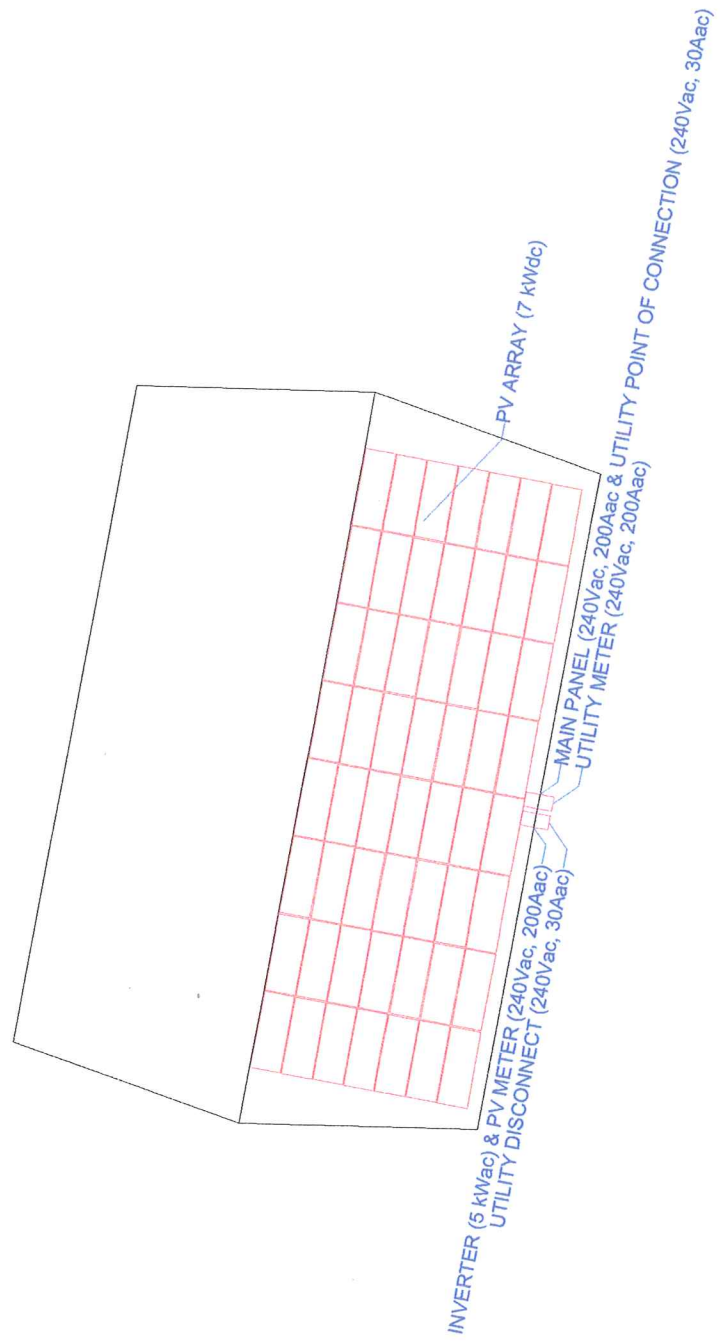
A		MODULE & SIZE CHANGE	DATE
No.	Revision/Issue		

PROJECT NAME, SITE, AND ADDRESS
RANDY HATCH
7226 ROBERTS ROAD
ATHENS, OH 43701
330-272-3328
HATCHPV@GMAIL.COM
HATCHPV PHOTOGRAPHY (PHOTOGRAPHY, VIDEO)
HATCHPV 201.206-28.10000 (PHOTOGRAPHY, VIDEO)

PROJECT NAME AND ADDRESS
BETHANY & RANDY HATCH RESIDENCE
7226 ROBERTS ROAD
ATHENS, OH 43701

PROJECT	DATE
HATCH RESIDENCE	05-31-13
DATE	05-31-13
DATE	05-31-13
DATE	05-31-13

S-1.0



tsmc solar

New Power.
New Thinking.

TS CIGS SERIES HIGH-EFFICIENCY CIGS SOLAR MODULE

125 W / 130 W / 135 W

Features

- Advanced proprietary CIGS thin-film technology
- Plus sorting at +5 W to -0 W
- Up to 5% additional energy yield due to light soaking effect
- Low temperature coefficient provides energy yield benefits
- Aesthetically appealing all-black appearance
- Framed module designed for easy use with industry-standard mounting systems
- Etched, unchangeable serial numbers for full traceability of each module

Quality and Safety

- UL and IEC certified
- California Energy Commission (CEC) listed
- Rated for snow and wind loads up to 2,400 Pa
- Free of potential induced degradation (PID) effects
- Salt mist corrosion test certification
- Manufactured at an ISO 9001:2008, ISO 14001 and OHSAS 18001 certified facility

Warranty

- Product warranty*: 10 years for material and workmanship
- Power output warranty*: 90% at 10 years and 80% at 25 years of minimum rated power output



A TSMC Company

www.tsmc-solar.com

*This disclaimer is for informational purposes only. No rights can be derived from the information contained herein. For detailed warranty information, please consult TSMC Solar's module warranty, which is available upon request.

Technical data

TS CIGS SERIES HIGH-EFFICIENCY CIGS SOLAR MODULE

Electrical Characteristics Standard Test Conditions (STC)

TS CIGS Series	TS-125C	TS-130C	TS-135C
Maximum power	125	130	135
Factory binning	+5/-0	+5/-0	+5/-0
Open-circuit voltage	58.8	60.3	60.3
Short-circuit current	3.33	3.34	3.34
Maximum power voltage	43.3	44.5	45.7
Maximum power current	2.89	2.92	2.95
Module efficiency	11.5	12.0	12.4
Power tolerance	±1.5%		
Maximum reverse current	8 A		
Maximum system voltage	1000 Vdc (IEC), 600 Vdc (UL)		
Operating temperature	-40°C to 85°C		

*) Operating temperature at STC: 1000 W/m², module temperature 25°C, AM1.5 after factory light soaking. All IV ratings are ±1.0%.

*) System design must accommodate relative increases of P_{max}, V_{oc} & V_{mp} values due to light soaking in the field. P_{max} and V_{mp} up to 10%, V_{oc} up to 2%.

*) Pre-binning power tolerance as certified by UL/UL-SUD, TSMC Solar only delivers modules with greater than or equal to minimum power.

Normal Operating Cell Temperature Conditions (NOCT)

Maximum power	P _{max}	93.6	97.3	101.1
Open-circuit voltage	V _{oc}	54.1	54.6	55.4
Short-circuit current	I _{sc}	2.66	2.67	2.67
Maximum power voltage	V _{mp}	40.7	41.8	42.9
Maximum power current	I _{mp}	2.30	2.33	2.36

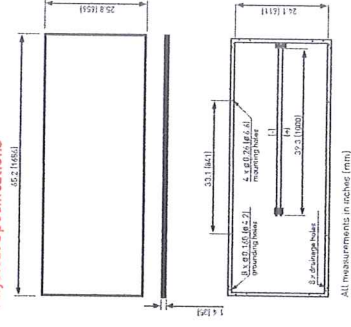
Conditions: NOCT: 800 W/m², ambient temperature 20°C, AM1.5

Mechanical Characteristics

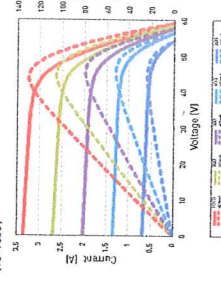
Snow/wind load (IEC)	50 lb/ft ² (2,400 Pa)
Snow/wind load (UL)	35 lb/ft ² (1,695 Pa) design load
Dimensions in inches (mm)	65.2 (1,653) x 25.8 (653) x 1.4 (35)
Weight in lbs (kg)	36.6 (16.6)
Frame	Black anodized aluminum
Front cover	Textured, white tempered front glass
Junction box, connector	Yutaka (IP 67), MC-4 compatible
Output cable in inches (mm)	14 AWG (2.5 mm ²), 39.3 (1,000)
Cell type	100 CIGS cells
Safety class	II
Fire rating	Class C

*)UL testing applies loading 50% above design load (i.e. x 2,500 Pa) was applied to achieve 1,625 Pa design load rating. The information contained herein is subject to change without notice. Caution: Read the installation guidelines before using, handling, or operating TSMC Solar modules.

Physical Specifications



I-V and P-V Curve (TS-130C)



Thermal Characteristics

NOCT	46 ± 2°C
Temperature Coefficient of P _{max}	-0.35% / °C
Temperature Coefficient of V _{oc}	-0.35% / °C
Temperature Coefficient of I _{sc}	0.01% / °C

Performance at Low Irradiance

Typical relative efficiency reduction of maximum power from an irradiance of 1,000 W/m² to 200 W/m² at 25°C is 10%.

Certifications



tsmc solar

Get in contact with us!
We look forward to your call or your e-mail!



EUROPE

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Doc: TS-13A-0397-2-11



SUNNY BOY 3000TL-US / 4000TL-US / 5000TL-US



Certified

- UL 1741 and 1699B compliant
- Integrated AFCI meets the requirements of NEC 2011 690.11

Innovative

- Secure Power Supply provides daytime power in case of grid outage

Powerful

- 97.2% maximum efficiency
- Wide input voltage range
- Shade management with OptiTrac Global Peak MPP tracking

Flexible

- Two MPP trackers provide numerous design options
- Extended operating temperature range

SUNNY BOY 3000TL-US / 4000TL-US / 5000TL-US

Setting new heights in residential inverter performance

The Sunny Boy 3000TL-US/4000TL-US/5000TL-US represents the next step in performance for UL certified inverters. Its transformerless design means high efficiency and reduced weight. Maximum power production is derived from wide input voltage and operating temperature ranges. Multiple MPP trackers and OptiTrac™ Global Peak mitigate the effect of shade and allow for installation at challenging sites. The unique Secure Power Supply feature provides daytime power in the event of a grid outage. High performance, flexible design and innovative features make the Sunny Boy TL-US series the first choice among solar professionals.



A NEW GENERATION OF INNOVATION

THE NEW SUNNY BOY TL-US RESIDENTIAL SERIES HAS YET AGAIN REDEFINED THE CATEGORY.

Transformerless design

The Sunny Boy 3000TL-US / 4000TL-US / 5000TL-US are transformerless inverters, which means owners and installers benefit from high efficiency and lower weight. A wide input voltage range also means the inverters will produce high amounts of power under a number of conditions.

Additionally, transformerless inverters have been shown to be among the safest string inverters on the market. An industry first, the TL-US series has been tested to UL 1741 and UL 1699B and is in compliance with the arc fault requirements of NEC 2011.

Increased energy production

OptiTrac™ Global Peak, SMA's shade-tolerant MPP tracking algorithm, quickly adjusts to changes in solar irradiation, which mitigates the effects of shade and results in higher total power output. And, with two MPP trackers, the TL-US series can ably handle complex roofs with multiple orientations or string lengths.

An extended operating temperature range of -40 °F to +140 °F ensures power is produced in all types of climates and for longer periods of time than with most traditional string inverters.

Secure Power Supply

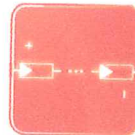
One of many unique features of the TLUS residential series is its innovative Secure Power Supply ability. With most grid-tied inverters, when the grid goes down, so does the solar-powered home. SMA's solution provides daytime energy to a dedicated power outlet during prolonged grid outages, providing homeowners with access to power as long as the sun shines.

Simple installation

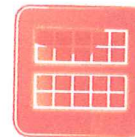
As a transformerless inverter, the TLUS residential series is lighter in weight than it's transformer-based counterparts, which makes lifting and transporting the new inverter easier than before. A new wall mounting plate features anti-theft security and makes hanging the inverter quick and easy. A simplified DC wiring concept allows the DC Disconnect to be used as a wire raceway, saving labor and materials.

Leading monitoring and control solutions

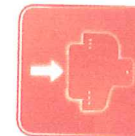
The new TLUS residential line features more than high performance and a large graphic display. The monitoring and control options provide users with an outstanding degree of flexibility. Integrated ZigBee®, a wireless communications standard often used for home energy management, and numerous wired options allows for a highly controllable inverter and one that can be monitored on Sunny Portal from anywhere on the planet via an Internet connection. Whether communicating through ZigBee®, RS485, or SMA's new wired, plug-and-play WebConnect, installers can find an optimal solution to their monitoring needs.



More efficient



Shade management



Easier



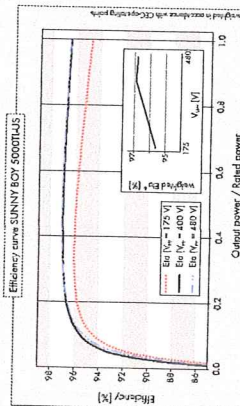
Broad temperature range



Secure Power Supply



Flexible communications



Technical data

Input [DC]	Sunny Boy 3000TL-US 208 V AC	240 V AC	Sunny Boy 4000TL-US 208 V AC	240 V AC	Sunny Boy 5000TL-US 208 V AC	240 V AC
Max. DC power [at cos φ = 1]	3200 W	600 V	4200 W	600 V	5300 W	600 V
MPP voltage range	175 - 480 V	125 / 150 V	175 - 480 V	125 / 150 V	175 - 480 V	125 / 150 V
Mix. DC voltage / start voltage	125 / 150 V	24 A / 15 A	125 / 150 V	24 A / 15 A	125 / 150 V	30 A / 15 A
Max. input current / per MPP tracker	18 A / 15 A	2 / 2	18 A / 15 A	2 / 2	18 A / 15 A	2 / 2
Number of MPP trackers / strings per MPP tracker	1	1	1	1	1	1
Output [AC]						
AC nominal power	3000 W	3000 VA	4000 W	4000 VA	4550 W	5000 VA
Max. AC apparent power	3000 VA	3000 VA	4000 VA	4000 VA	4550 VA	5000 VA
Nominal AC voltage / adjustable	208 V / ●	240 V / ●	208 V / ●	240 V / ●	208 V / ●	240 V / ●
AC voltage range	183 - 229 V	211 - 264 V	183 - 229 V	211 - 264 V	183 - 229 V	211 - 264 V
AC grid frequency range	60 Hz / 59.3 - 60.5 Hz	60 Hz / 59.3 - 60.5 Hz	60 Hz / 59.3 - 60.5 Hz	60 Hz / 59.3 - 60.5 Hz	60 Hz / 59.3 - 60.5 Hz	60 Hz / 59.3 - 60.5 Hz
Max. output current	15 A	20 A	15 A	20 A	15 A	22 A
Power factor (cos φ)	1	1	1	1	1	1
Output phase / line connections	1 / 2	1 / 2	1 / 2	1 / 2	1 / 2	1 / 2
Harmonics	< 4%	< 4%	< 4%	< 4%	< 4%	< 4%
Efficiency						
Max. efficiency	96.8%	97.1%	96.8%	97.2%	96.8%	97.1%
CEC efficiency	96%	96.5%	96%	96.5%	96%	96.5%
Protection devices						
DC disconnect device	●	●	●	●	●	●
DC reverse-polarity protection	●	●	●	●	●	●
Ground fault monitoring / Grid monitoring	●	●	●	●	●	●
AC short circuit protection	●	●	●	●	●	●
AC start circuit protection	●	●	●	●	●	●
All-pole sensitive residual current monitoring unit	●	●	●	●	●	●
AC fault circuit interrupter (AFCI) compliant to UL 1699B	●	●	●	●	●	●
Protection class / overvoltage category	II	II	II	II	II	II

General data	490 / 519 / 185 (19.3 / 20.5 / 7.3)	187 / 297 / 190 (17.4 / 11.7 / 7.5)	617 / 597 / 266 (24.3 / 23.5 / 10.5)	370 / 240 / 280 (14.6 / 9.4 / 11.0)	24 kg (53 lb) / 3.5 kg (8 lb)	22 kg (49 lb) / 3.5 kg (8 lb)
Dimensions [W / H / D] in mm (in)						
DC Disconnect dimensions [W / H / D] in mm (in)						
Packing dimensions [W / H / D] in mm (in)						
DC Disconnect packing dimensions [W / H / D] in mm (in)						
Weight / DC Disconnect weight						
Packing weight / DC Disconnect packing weight						
Operating temperature range						
Noise emission (typical)						
Internal consumption at night						
Topology						
Cooling concept						
Electronics protection rating						
Features						
Secure Power Supply	●	●	●	●	●	●
Display: graphic	●	●	●	●	●	●
Interface: RS485 / Webconnect	●	●	●	●	●	●
Interface: ZigBee	●	●	●	●	●	●
Warranty: 10 / 15 / 20 years	●	●	●	●	●	●
Certificates and permits (more available on request)	●	●	●	●	●	●

NOTE: US Inverters ship with gray lids.

Type designation

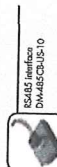
Accessories



Sunny Boy Webconnect interface
SWM-US-10



Fan kit
FANKIT23-10



RS485 interface
DMAS-CDUS-10

● Standard feature ○ Optional feature — Not available
Data at nominal conditions

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Summary: Reply electronically filed by Mr. Mark C Bellamy on behalf of Randall Hatch