

RECEIVED
TOWN CLERK
TOWN OF ACTON, MA

2024 JAN 16 AM 11:31

**TOWN OF ACTON
HISTORIC DISTRICT COMMISSION
472 Main Street, Acton, MA 01720**

RE: APPLICATION 2341

Pursuant to Chapter 40C of the General Laws of Massachusetts and the Historic Districts Bylaw of the Town of Acton, the Acton Historic District Commission hereby issues a

**DENIAL OF CERTIFICATE OF APPROPRIATENESS
For certain work described in the Application 2341 requiring approval.**

Applicant: JC Arrone UMADHAY - SUNPOWER CORPORATION SYSTEM
Telephone: 908-894-9679 Email: SPRI.Massachusetts@sunpowercorp.com
Address: 100 South St. Unit 100B, Hopkinton, MA 01748

Owner: Eugenio Fernandez Ventosa Telephone: (787) 536-9679
Email: eugenio.fv@gmail.com
Address: 450 Main Street, Acton, MA 01720

Location of Work: Same District: Center X West South

Description of Proposed Work: Installation of roof-mounted solar panels.

Pertinent Provisions governing Approval of the Application:

Local Historic District Bylaw, Ch. P, Sec. P8. Criteria for Determinations:

8.1 In deliberating on applications for CERTIFICATES, the COMMISSION shall consider, among other things, the historic and architectural value and significance of the site, BUILDING or STRUCTURE; the general design, proportions, detailing, mass, arrangement, texture, and material of the EXTERIOR ARCHITECTURAL FEATURES involved; and the relation of such EXTERIOR ARCHITECTURAL FEATURES to similar features of BUILDINGS and STRUCTURES in the surrounding area.

Acton Historic District GUIDELINES for SOLAR INSTALLATIONS in HISTORIC DISTRICTS

1. Primary factors that the HDC shall consider in determining whether to permit the installation of a solar panel or panels on a building are the building's age, historic significance and/or unique architectural character. The older, more historically significant and/or architecturally unique a building, the less willing the HDC should be to permit any solar panels visible from the governing street on which the building is located.

2. Solar panels shall not be permitted on any building's roof surfaces that front on (that is, face) the governing street on which the building is located.

Massachusetts Historical Commission GUIDEBOOK for HISTORIC DISTRICT COMMISSIONS

Solar Panels

Solar panels include both photovoltaic and domestic hot water heaters. Accommodating any modern equipment, including solar panels, should be done in such a way as to minimize visibility from public ways. This is typically accomplished by locating the panels on rear eels, subordinate wings, secondary massings, accessory outbuildings, or on a free-standing array. Installing the panels behind dormers, chimneys or parapets is important so that the panels do not obscure character-defining features. MHC GUIDEBOOK, pp. 31-32.

Findings:

1. Two of the five members of the Historic District Commission, David Shoemaker and Zachary Taillefer, are owners of property within 300 feet of the property at 450 Main Street. As such, both are ineligible to participate in the deliberations on this matter. See HDC Rules and Regulations, Sec. 3.2.5. Because the Commission has only five members, their ineligibility would deprive the HDC of a quorum to review this application. Therefore, Chair David Honn – acting on the advice of Town Counsel – invoked the “Rule of Necessity” to make both eligible to participate. Because he is a direct abutter, that is, owns property adjacent to 450 Main Street, David Shoemaker chose nevertheless to recuse himself in this matter and did not participate in the proceedings. This recusal left the Commission with four voting members, a quorum to consider this matter. See Bylaw P, Sec. 7.7.
2. The building at 450 Main Street is a stone barn built circa 1907 and subsequently converted to a residence. The converted barn is a large, gable-end building with two shingled roof surfaces, one of which faces in a southerly direction. The roof shingles are architectural asphalt shingles, appropriate for historic buildings in a Local Historic District. See Acton HDC Design Guidelines, Roofs, p. 10 (“While most roofs were originally constructed of wood shingles or slate the vast majority have since been replaced with asphalt shingles.”); See also HDC Rules and Regulations, Sec. 3.2.3.
3. This “unusual stone barn” is one of the only examples of a stone barn in Acton. MACRIS ACT.106, Form B-106 (Form B-106). The barn was built for apple storage by Luke Harry Tuttle, a descendant of Horace Tuttle, who was the original owner of the house located at 446 Main Street, the house behind which this building sits. Form B-106. “The converted barn ... has fieldstone walls and shingled gable peaks. Windows with 2/2 sash have nice large stone lintels. In the wide shingle gable end there are two second story 2/2 windows and one in the gable peak. There is also a hay door at the second story level and the large altered-multi-light center door has a long transom over it. In its

conversion to a residence, only minor changes were made to the exterior of the building.” Form B-106.

4. The property on which this building is located fronts exclusively on Main Street, and Main Street is therefore the governing way in this matter. See Town Bylaw P, Sec. 6.1.
5. The Application, filed on October 25, 2023, seeks a Certificate of Appropriateness to install 41 black photovoltaic solar panels on the southernmost facing roof surface of the house. This roof surface fronts on, that is, faces, Main Street.
6. The converted barn is approximately 168 feet from Main Street, and the roof surface in question is plainly visible with the unaided eye from Main Street at a height of five feet from the surface of Main Street (hereinafter referred to as “visible from Main Street”).
7. From each of the two principal viewpoints on Main Street, there is vegetation, including a tree, between the converted barn and Main Street. Some of that vegetation is on a neighbor’s property located between the converted barn and Main Street. During the months in which the vegetation is in full bloom, from both viewpoints the roof surface facing Main Street is partially obscured by that vegetation. However, even in that circumstance, the roof surface is visible from Main Street.
8. Although the HDC has approved the roof installation of solar panels on some half dozen buildings within its jurisdiction, none have solar panels on a roof surface that fronts on, that is faces, the governing way for that building.
9. There are solar panels on the rear roof surface of the barn at 14 Newtown Road, a property adjacent to the property here in question. These panels are visible from Main Street, albeit from some distance away. Although 14 Newtown Road is in Acton’s Center Historic District, the governing way for that property is Newtown Road, from which the panels on that barn are not visible and thus not within the HDC’s jurisdiction.
10. In the three Local Historic Districts in Acton, there are many buildings that are at least 100 years old, are historically significant and/or exhibit unique architectural characteristics. None of these buildings have solar panels on a roof surface plainly visible from their respective governing ways.

Conclusions:

1. The roof surface of the converted barn at 450 Main Street on which the proposed 41 solar panels would be installed fronts on, and is visible from, Main Street, the governing way in this matter. The HDC thus has jurisdiction concerning the proposed installation of those solar panels on that roof. Town Bylaw P, Sec. 6.1.
2. The fact that during some months of the year vegetation partially obscures the view of the roof surface from Main Street does not deprive the HDC of jurisdiction. First, the HDC does not consider such vegetation in determining its jurisdiction because vegetation – certainly vegetation on a neighboring property – is not permanent in the way that, for

these purposes, buildings are. Second, even when the vegetation is in full bloom, the roof surface in question – although partially obscured – is still visible from Main Street.

3. The proposed installation of solar panels on the building's roof surface that fronts on, that is faces, Main Street, the governing way in this matter, would violate Solar Guideline 2, which provides:

2. Solar panels shall not be permitted on any building's roof surfaces that front on (that is, face) the governing street on which the building is located.

4. Solar Guideline 2's prohibition is categorical. None of the solar panel installations approved by the HDC include panels on a roof surface that fronts on, that is faces, the governing way on which the building is located. To approve the proposed solar installation in this case could not be justified in the face of the plain language of Solar Guideline 2 or the HDC precedents applying that Guideline.
5. Quite apart from Guideline 2's categorical mandate, Solar Guideline 1 independently supports disapproval of the proposed installation. The converted barn is over 100 years old. It is one of the few remaining stone barns left in Acton, and – as described in Finding 3 – it exhibits unusual, if not unique, architecture. Built by a descendant of Horace Tuttle, the original owner and inhabitant of the historic home at 446 Main Street and sitting on the original grounds of that home right off the Town's green, the building has substantial historic significance.
6. The installed panels would almost entirely cover the building's roof visible from Main Street, a character-defining feature of the converted barn. The simple, basic roof shape defines this building. Covering this roof with solar panels would substantially alter, if not destroy, its elemental architecture.

Disapproval of Application for Certificate of Appropriateness:

For the reasons set forth above, by a vote of four to zero at its meeting on November 14, 2023, the Commission DISAPPROVES the Application for a Certificate of Appropriateness for the installation of 41 solar panels on the roof surface of the house at 450 Main Street, which roof surface fronts on, that is faces, Main Street in the Center Historic District of Acton, MA.

Eligibility for Certificate of Hardship:

Pertinent Provisions governing Consideration of Hardship for the Application:

Local Historic District Bylaw, Ch. P, Sec. P7. Procedures for Review of Applications:

Sec. 7.6.1: If the CONSTRUCTION or ALTERATION for which an application for a CERTIFICATE of Appropriateness has been filed shall be determined to be inappropriate and therefore disapproved ... the COMMISSION shall determine whether, owing to conditions especially affecting the BUILDING or STRUCTURE involved, but not affecting the DISTRICT

generally, failure to approve an application will involve a substantial hardship, financial or otherwise, to the applicant and whether such application may be approved without substantial detriment to the public welfare and without substantial derogation from the intent and purposes of this Bylaw. If the Commission determines that owing to such conditions failure to approve an application will involve substantial hardship to the applicant and approval thereof may be made without such substantial detriment or derogation, the COMMISSION shall issue a CERTIFICATE of Hardship,

Local Historic District Bylaw, Ch. P, Sec. P1. Purpose:

The purpose of this bylaw is to aid in the preservation and protection of the distinctive characteristics and architecture of buildings and places significant in the history of the Town of Acton, the maintenance and improvement of their settings and the encouragement of new building designs compatible with the historically significant architecture existing in the Local Historic District(s) when this Bylaw was first adopted in 1990. This Bylaw does not seek to establish an architectural museum, but instead to inform concerning the historical process of architectural growth and adaptation to heighten a sense of educated pride in our heritage.

Findings:

1. The Commission adopts the Findings set forth above in its Disapproval of the application for a Certificate of Appropriateness.
2. In the three Local Historic Districts in Acton, there are many buildings with roof surfaces apparently suitable for solar installation that front (that is, face) the governing way for that building and are thus subject to Solar Guideline Two. Within the Center Historic District on Main Street alone there are several such privately owned buildings (of which the converted barn at 450 Main Street is one) that have unshaded, south-facing roof surfaces that front – that is, face – Main Street. One of these buildings is 460 Main Street, virtually next door to 450 Main Street. In the South and West Historic Districts there are several more privately owned buildings with roof surfaces apparently suitable for solar panels that front on their respective governing ways. None of those buildings have solar installations on those roof surfaces.
3. In the three Local Historic Districts in Acton, there are many privately owned buildings that are at least 100 years old, are historically significant and/or exhibit unique architectural characteristics. The converted barn at 450 Main Street is virtually surrounded by such buildings, all of which are subject to the mandate of both Solar Guideline One and the MHC Guidebook that solar panels be installed so-as to minimize their visibility from the governing way, e.g., “by locating the panels on rear eels, subordinate wings, secondary massings, accessory outbuildings, or on a free-standing array.” MHC GUIDEBOOK, pp. 31-32. None of those buildings have solar installations on roof surfaces plainly visible from their respective governing ways. In one of those

buildings, the Acton Congregational Church at 12 Concord Road, the HDC declined to approve the proposed installation of solar panels on the roof of the historic part of the church, the closest part of the church to Concord Road (the governing way for that building), insisting that the panels instead be installed on a roof surface of a modern accessory building more distant from Concord Road, where the panels are far less visible.

4. The lot at 450 Main Street is just under two acres. The converted barn is located on the front half of the property, and there is ample room to install a free-standing array of solar panels capable of supplying electrical power equal to that supplied by the proposed 41 panel roof-mounted array. Such a free-standing array could be installed, either behind the converted barn or screened from view, so that it is not visible from Main Street. The installation, operation and maintenance of such a free-standing solar array could be substantially equivalent to that of the proposed roof-mounted array. The Owner of 450 Main Street asserts that a free-standing solar array would be substantially more expensive than the proposed roof installation, but he offers no cost comparisons to substantiate that position. The Owner also asserts that a free-standing solar array might create ill will among neighboring property owners. Even if such potential social discomfort might possibly qualify as "a substantial hardship" under Bylaw P, Sec. 7.6.1, which seems unlikely, he again offers no evidence – e.g., photos of free-standing arrays to compare with the photos of the proposed roof-mounted array or conversations he has had with neighbors – to substantiate that possibility.
5. The converted barn is over 100 years old, and its conversion to a residence left its exterior appearance substantially intact. Form B-106. It is one of the few remaining stone barns left in Acton, and it exhibits "unusual," if not unique, architecture. Form B-106. Built by a descendant of Horace Tuttle, the original owner and inhabitant of the historic home at 446 Main Street, and sitting on the original grounds of that home right off the Town's green, Form B-106, the building has substantial historic significance.

Conclusions:

1. The condition which the Owner claims creates a hardship entitling him to a Certificate of Hardship – the disapproval of the proposed installation of 41 solar panels on the south-facing roof of his residence – is not one "especially affecting the BUILDING ... involved, but not affecting the DISTRICT generally." There are two bases for disapproving the requested installation, both of which are broadly applicable to privately owned buildings throughout Acton's three Local Historic Districts.
 - a. First, the proposed installation was disapproved under Guideline Two of Acton Historic District GUIDELINES for SOLAR INSTALLATIONS in HISTORIC DISTRICTS, which provides: "Solar panels shall not be permitted on any building's roof surfaces that front on (that is, face) the governing street on which the building is located." As noted in Finding 2, above, there are many

privately owned, historic buildings in Acton's three Local Historic Districts with roof surfaces apparently suitable for solar installation that front (that is, face) the governing way for that building and are thus subject to Solar Guideline Two's categorical prohibition. There are several such buildings on Main Street alone (of which the converted barn at 450 Main Street is one) that have unshaded, south-facing roof surfaces that front – that is, face – Main Street. One such building, a private residence at 460 Main Street, is a virtual next-door neighbor to 450 Main Street. Like the converted barn at 450 Main Street, the house at 460 Main Street has no other roof surface suitable for solar panels. None of the buildings here referenced, including the ones on Main Street, have solar installations on a roof surface that fronts (that is, face) their respective governing ways.

- b. Second, the proposed installation was disapproved under Guideline One of Acton Historic District GUIDELINES for SOLAR INSTALLATIONS in **HISTORIC DISTRICTS**, which provides: "Primary factors that the HDC shall consider in determining whether to permit the installation of a solar panel or panels on a building are the building's age, historic significance and/or unique architectural character. The older, more historically significant and/or architecturally unique a building, the less willing the HDC should be to permit any solar panels visible from the governing street on which the building is located." In the three Local Historic Districts in Acton, there are many privately owned buildings that, like the converted barn at 450 Main Street, are at least 100 years old, are historically significant and/or exhibit unique architectural characteristics. The converted barn at 450 Main Street is virtually surrounded by such buildings, all of which are subject to the mandate of Solar Guideline One, as well as the MHC Guidebook's prescription that solar panels be installed so as to minimize their visibility from the governing way "by locating the panels on rear eaves, subordinate wings, secondary massings, accessory outbuildings, or on a free-standing array." MHC GUIDEBOOK, pp. 31-32.
2. It is not clear that the "failure to approve [this] application will involve a substantial hardship, financial or otherwise, to the applicant." At least, the Owner has not demonstrated that this is so. The converted barn is located towards the front of a large, almost two-acre lot, which has apparent room for a free-standing solar array either behind the building or otherwise screened from view from Main Street. Such a free-standing array, suggested by the **Massachusetts Historical Commission GUIDEBOOK for HISTORIC DISTRICT COMMISSIONS** as a way to minimize visibility of solar installations (see Guidebook, pp. 31-32), would presumably be substantially equivalent to the proposed roof-mounted array. The Owner asserted that the cost of a free-standing array would be substantially greater than that of the proposed roof-mounted array, and that it could cause social friction with his neighbors, but even if either of these assertions

might possibly constitute a "substantial hardship" under Bylaw P, Sec. 7.6.1, he offered no proof of either assertion.

3. Finally, even if Applicant could demonstrate that the failure to approve a Certificate of Hardship in this case would result in a hardship that meets Bylaw P, sec. 7.6.1's dual criteria, for the reasons that justified its Disapproval of the application for a Certificate of Appropriateness, the approval of a Certificate of Hardship would result in "substantial detriment to the public welfare and ...substantial derogation from the intent and purposes of [Bylaw P]." As noted in Finding 5, the converted barn is over 100 years old, and its conversion to a residence left its exterior appearance substantially intact. Form B-106. It is one of the few remaining stone barns left in Acton, and it exhibits "unusual," if not unique, architecture. Form B-106. Built by a descendant of Horace Tuttle, the original owner and inhabitant of the historic home at 446 Main Street, and sitting on the original grounds of that home right off the Town's green, Form B-106, the building has both distinctive architecture and substantial historic significance. The primary purpose of Bylaw P, Acton's Local Historic District Bylaw, is "the preservation and protection of the distinctive characteristics and architecture of buildings and places significant in the history of the Town of Acton." In the circumstances noted above, the approval of a Certificate of Hardship allowing the proposed solar installation on the roof of this converted barn would be in substantial derogation of the intent and purposes of the intent and purposes of Bylaw P and thus of the public welfare.

Denial of Certificates of Hardship and Appropriateness:

For the reasons set forth above, by a vote of four to zero at its meeting on January 9, 2024, the Commission DENIES a Certificate of Hardship and with it DENIES a Certificate of Appropriateness for the installation of 41 solar panels on the roof surface of the house at 450 Main Street.

Any appeal from any part of this decision must be in accordance with the procedures set forth in Bylaw P, Section P12.

Application 2341 received October 25, 2023

Public Hearing: November 14, 2023, cont'd
by agreement with the Owner to January 9,
2024.

Disapproval of Application by HDC vote (4-0)
Denial of Certificates of Hardship and
Appropriateness by HDC vote (4-0)

Date: November 14, 2023

Date: January 9, 2024


David Honn, Chair

RECEIVED
TOWN CLERK
TOWN OF ACTON, MA
1 OCT 25 PM 12:33
Pd \$10

Application # 2341

TOWN OF ACTON
HISTORIC DISTRICT COMMISSION
472 Main Street, Acton, MA 01720

APPLICATION FOR CERTIFICATE

This information will be publicly posted on the Town of Acton website docushare.

Pursuant to Ch. 40C of the General Laws of Massachusetts, application is hereby made for issuance of the following Certificate for work within a Local Historic District (please check one):
Cert. of Appropriateness (Building Alteration/Sign/Fence/Change of Ownership) Fee: \$10 ☒
Cert. of Appropriateness (Building Addition other than deck/New Bldg/Demolition) Fee: \$50 ☐
Cert. of Hardship (for either category of Appropriateness) Fee: \$10 or \$50 (as appropriate) ☐
Cert. of Non-Applicability No Fee ☐

Fees waived for non-profit or municipal applicants.

Applicant:
JC ARNONE UMADHAY - SUNPOWER CORPORATION SYSTEM

Telephone:
908-894-9679

Address:
100 South St Unit 100B Hopkinton MA 01748

E-mail:
SPRI.Massachusetts@sunpowercorp.com

Property owner and address:
(if different from applicant)
450 MAIN ST ACTON MA 01720

Contact information:
(787) 536-7004 / eugenio.fv@gmail.com

Location of Work: 450 MAIN ST ACTON MA 01720
No. Street

District: Center ___ West ___ South ___

Description of Work: (See website Instructions regarding information that is here required)
INSTALLATION OF ROOF-MOUNTED PV SYSTEM - 16.40 KW (41 MODULES) WITH (N)125A LOAD CENTER

The undersigned hereby certifies that the information on this application and any plans submitted herewith are correct, and constitute a complete description of the work proposed. By my signature below, I acknowledge that this application and all its data will be publicly posted on the Town of Acton website docushare.

Signature of applicant  Date: 09/08/2023

Application received by _____ for HDC Date: _____

COA approved/CNA issued by _____ for HDC Date: _____



Acton Building Department
472 Main St
Acton, MA 01720

Acton Historic District Commission
RE: 450 Main St Acton MA

This letter serves as request to the Historic District Commission for the allowance of a photovoltaic solar installation to occur at 450 Main St. The proposed array consists of 41 black panels on the southern most facing roof of the house. As detailed in the data attached, this roof gets the most sun exposure, allowing for the highest benefit from the solar system. The panels are affixed to the roof roughly 3.5" above the roof's surface. The house is not highly visible from the road and does not require any structural modifications to accommodate the planned installation.

Thank you,
SunPower Corporation Systems

Eugenio Fernandez Ventosa
Homeowner

SunPower Corporation Systems
50 Rockwell Rd | Newington CT 0611



Studio umbra

450 Main Street
Acton, MA 01720

o. 617.481.1627
c. 787.536.7004

eugenio.fv@studio-umbra.com
www.studio-umbra.com

October 24, 2023

Acton Historic District Commission
472 Main Street
Acton, MA 01720

Re: Proposed Solar Array
450 Main Street
Acton, MA 01720

Dear Acton Historic District Committee:

By these means, we are requesting approval for our solar array installation at 450 Main Street, Acton, Massachusetts. We are a family of 4, with two young daughters living in a converted barn from 1907. Additionally, I own a small Architecture Firm from my basement, with a focus on commercial work and energy retrofits, and public sector work. As we moved in to this house, besides making the space as comfortable and safe for our daughters, we established 2 main goals during our ownership of the building: 1. Preserve its historical value while differentiating the new items from the existing elements; and 2. Maximizing the sustainability of the home with an eventual goal of energy independence.

With this goal of energy independence and carbon footprint reduction, we are trying to reduce our use of natural gas and switch to more efficient electric systems. As a first step we are looking at installing a solar array that will provide the backbone to the house energy requirements, and eventually plan to replace the natural gas boiler and AC condenser with a geothermal system. This HVAC system will be able to be operated by the solar capacity of the roof and further eliminate any unsightly exterior equipment. We want this house to retain its historic elements and charm, yet still operate efficiently and be as safe as possible for our daughters.

The existing structure consisting of 20" thick stone walls and simple gabled wood truss roof with asphalt shingles stands a significant distance from the street, and is mostly covered by houses or vegetation, the house stands 167 feet away from Main Street directly behind 446 Main Street. The proposed solar array consists of 41 black photovoltaic panels installed using 3.5" brackets. All panels will be installed on the south roof, as it is almost perfectly south facing and would get the most sun exposure. Since the remainder of the site is surrounded by trees, moving the solar array elsewhere would mean a far less efficient system, and an eye sore for the surrounding neighbors. The roof on south facing façade would be the least intrusive location for this assembly; even though it would mean they would face Main Street, the panels would not be significantly apparent due to the significant distance from the street, and the significant amount of vegetation buffer between the house and the street. The roof will be mostly visible only when driving north east on Main Street on the small distance between 438 Main Street and 446 Main Street. We additionally plan on planting evergreen vegetation on this side of the house, with the goal of reducing the street noise from the street, which will also aid in further hiding the roof.

Proposed Solar Array
450 Main Street, Acton, MA 01720
October 24, 2023

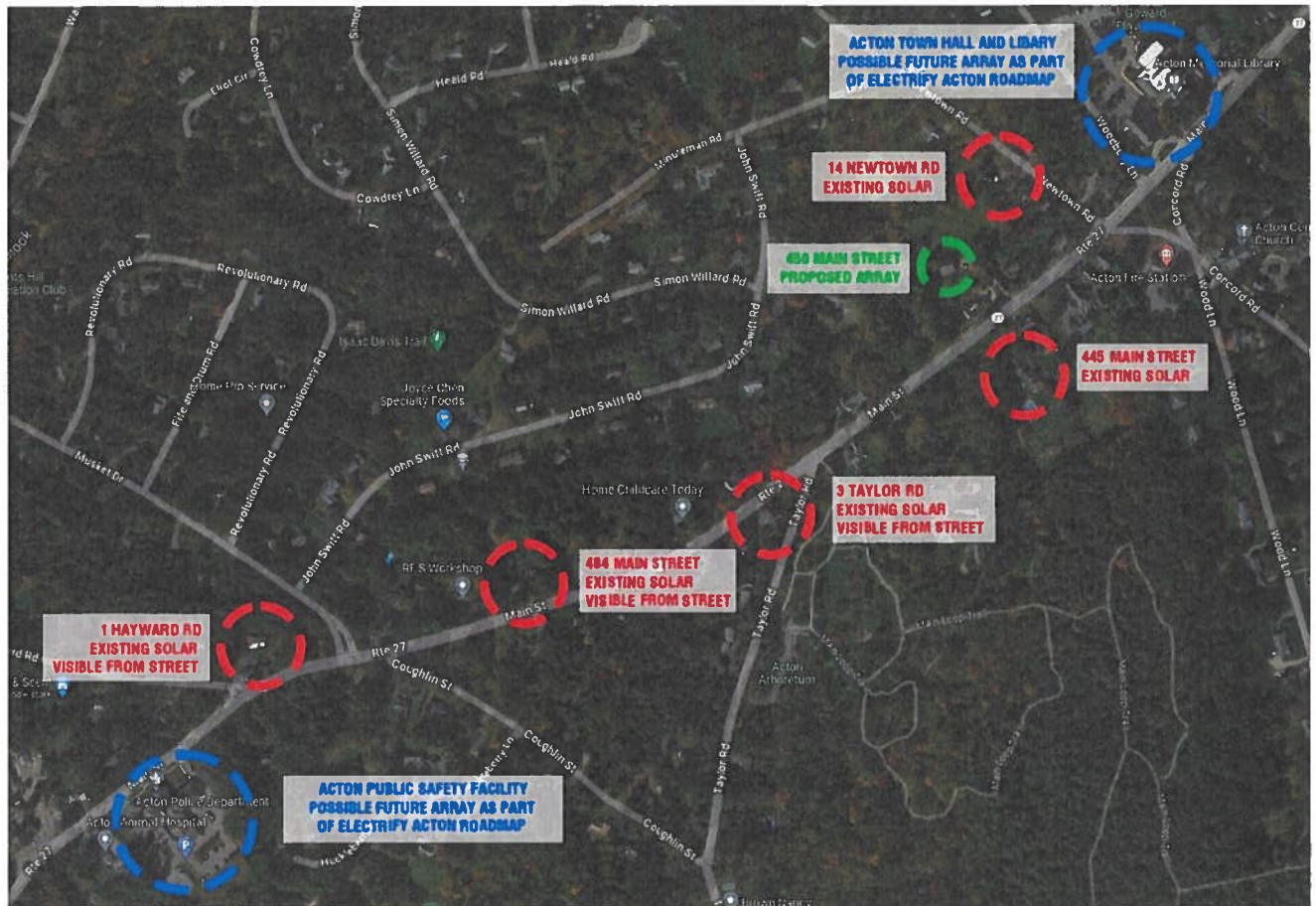


This is the angle from which the roof will be mostly visible, between 438 Main Street and 446 Main Street, behind significant vegetation that mostly obscures the view.

Even though the roof will be partially visible, it will only be so for a small distance when walking or driving northeast on Main Street, between 438 Main Street and 446 Main street, and by that point the viewer will have already been exposed to 3 houses with solar assemblies in their roof in close proximity to 450 Main Street. Additionally, in accordance with the proposed Electrify Acton Roadmap, additional, and significantly larger, solar assemblies pay end up being visible from main Street at the Acton Public Safety Facility and the Acton Town Hall. Because of this, and the fact that the proposed solar assembly will be very well hidden, the proposed project will not significantly affect the fabric of the town and of Main Street.

The solar array will also not detract from the historic elements of the existing house. The current roof was built in 2017 as a replacement to the original slate roof, and the solar array would be different enough from the historic elements to not distract or muddy the historic value, in concordance with current historic preservation efforts and ideas, including the Secretary of the Interior's Standards for the Treatment of Historic Properties.

Proposed Solar Array
450 Main Street, Acton, MA 01720
October 24, 2023



The existing – and proposed – solar arrays system in close proximity to 450 Main Street.

I am passionate of my work as an architect, and feel particular pride in the protection and maintenance of this beautiful house. It is my hope to further its life with the use of energy and weather resilient techniques that will help the house sustain this changing weather patterns and energy requirements, as well as provide the best possible home for my daughters to grow in, by reducing the amount of fossil fuels that would raise the amount of carcinogens in the house.

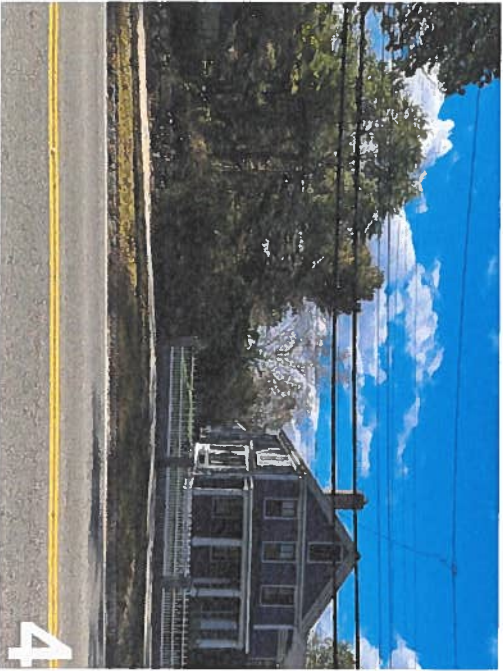
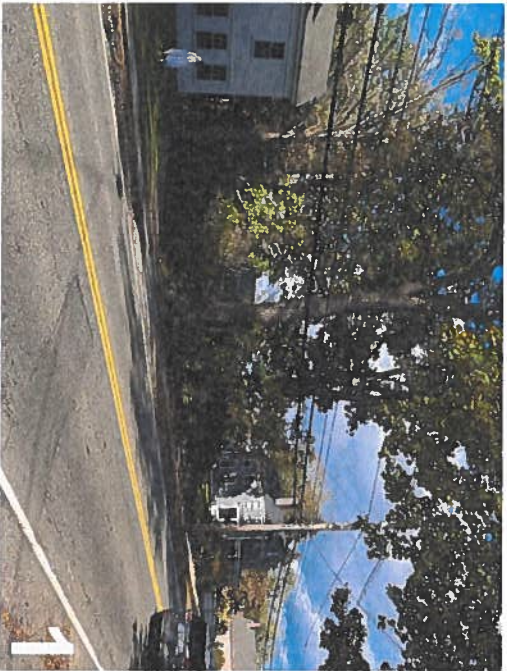
Finally, we feel this proposed project falls in line with the town of Acton Environmental Sustainability Policy, the Department of Energy Resources, and the Commonwealth of Massachusetts policy of expanding access to Solar Generation and Decarbonization. Please contact me anytime to discuss the above. We look forward to the opportunity of working with you on this project.

Sincerely,

Eugenio Fernandez, AIA
Studio Umbra



Sample photo of proposed solar panels to be used



CC:



studio umbra
architecture
10 717 226 7704
P.O. Box 88244
Oakley, MA 01904
www.studio-umbra.com
info@studio-umbra.com

450 MAIN STREET, ACTON
SITE PICTURES

Project number
Date
Scale
Drawn By
Ref AS#
Ref RF#
Re: Drawing #

10/10/23
EFV

P-2



CC:



studio umbra
architecture
117 Oak Street
Acton, MA 01726
P.O. Box 18024
Acton, MA 01726
www.studio-umbra.com
info@studio-umbra.com

450 MAIN STREET, ACTON

SATELLITE IMAGE

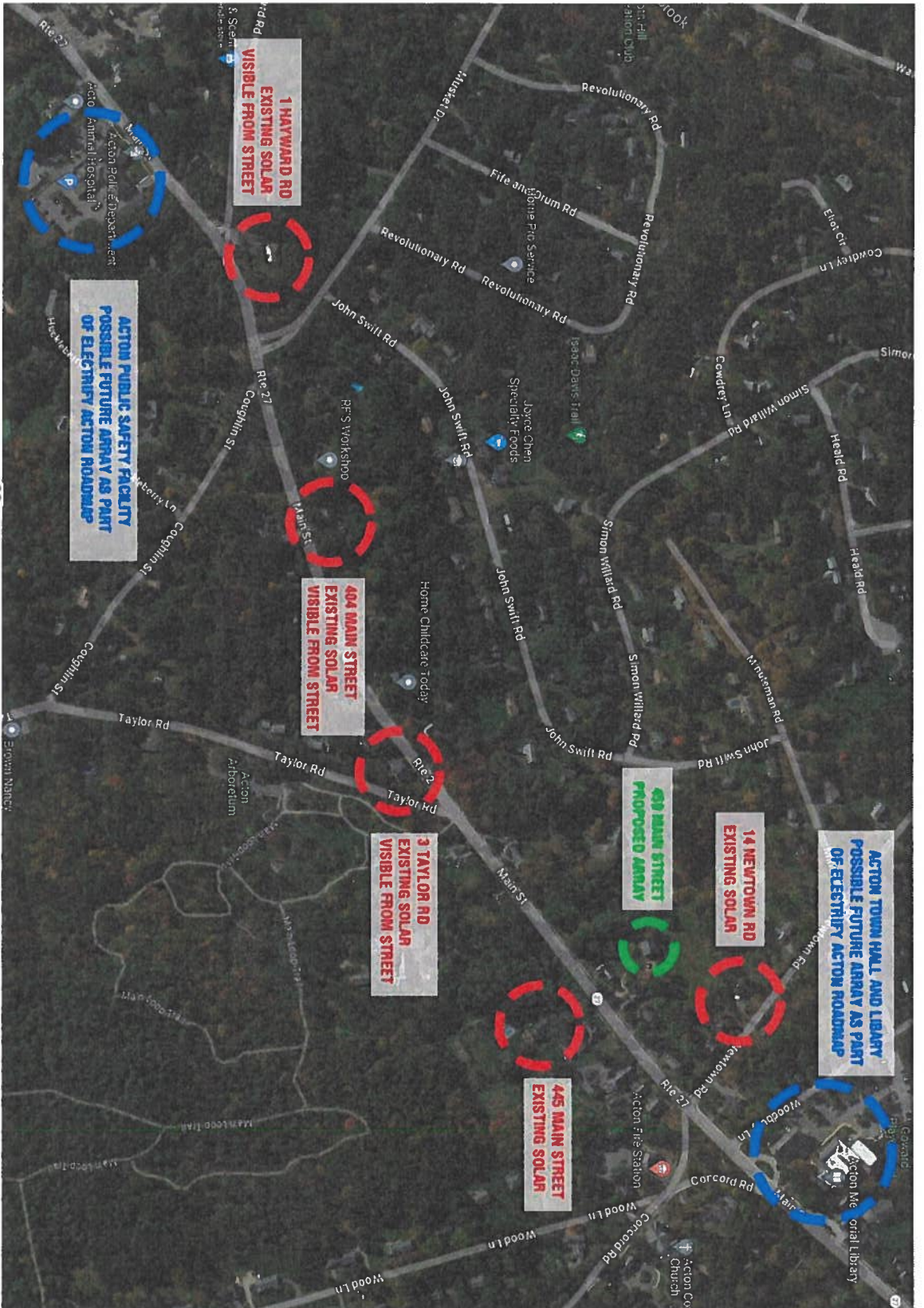


Project number
Date
Scale
Drawn By
Ref AS#
Ref RF#
Re: Drawing #

10/10/23

EFV

P-4



studio umbra
brochure
11 742 548 7004
P.O. Box 60244
Oakland, CA 94620
www.studio-umbra.com
info@studio-umbra.com

SOLAR ASSEMBLIES

450 MAIN STREET, ACTON



Project number
Date
Scale
Drawn By
Ref AS#
Ref RE#
Ref Drawing #

10/24/23

Author

P-5

97 GREAT ROAD
P.O. BOX 666
ACTON, MA 01720
PH. (978) 263-3666
FAX (978) 635-0218
JOB# 6403

Aurora Shade Report

Customer
Eugenio Fernandez
Ventosa
Address
450 Main Street
Acton, MA, 01720

Designer
Ronn Adriel Alabastro
Coordinates
(42.484969, -71.435828)

Organization
SunPower (Integration)
Date
30 June 2023

Annual irradiance



 Summary

Array	Panel Count	Azimuth (deg.)	Pitch (deg.)	Annual TOF (%)	Annual Solar Access (%)	Annual TSRF (%)
1	35	163	40	99	91	90
Weighted average by panel count					91.3	90.3

Monthly solar access (%) across arrays

Array	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	85	90	92	92	92	94	94	93	93	90	89	84

Customer

Eugenio Fernandez

Address

450 Main Street
Acton, MA, 01720

Designer

Ronn Adriel Alabastro

Coordinates

(42.484969, -71.435828)

Organization

SunPower (Integration)

Date

30 June 2023

Zoomed out satellite view



3D model



3D model with LIDAR overlay 57 ft



Customer
Eugenio Fernandez
Ventosa
Address
450 Main Street
Acton, MA, 01720

Designer
Ronn Adriel Alabastro
Coordinates
(42.484969, -71.435828)

Organization
SunPower (Integration)
Date
30 June 2023

Street view and corresponding 3D model



I, **Ronn Adriel Alabastro**, certify that I have generated this shading report to the best of my abilities, and I believe its contents to be accurate.

SOLAR INDIVIDUAL PERMIT PACKAGE

EUGENIO FERNANDEZ VENTOSA

(N) 16.40 kW GRID TIED PHOTOVOLTAIC SYSTEM

(787) 536-7004

450 MAIN ST

ACTON, MASSACHUSETTS 01720

AHJ: ACTON TOWN

UTILITY: EVERSOURCE ENERGY (FORMERLY NSTAR ELECTRIC COMPANY)

NOTES

SCOPE OF WORK

- (N) 16.400 kW PHOTOVOLTAIC SYSTEM
- (41) WAAREE ENERGIES LIMITED WSM-D-400 PV MODULES AND (41) ENPHASE IQ7HS-66-M-US MICROINVERTER
- POINT OF INTERCONNECTION AT MAIN SERVICE PANEL WITH LINE SIDE TAP

CODE INFORMATION

APPLICABLE CODES, LAWS AND REGULATIONS

MA STATE BUILDING CODE, 9TH ED. BASE VOLUME

MA STATE BUILDING CODE, 9TH ED. RESIDENTIAL VOLUME

EXISTING BUILDING CODE OF MASSACHUSETTS

MECHANICAL CODE 2015 OF MASSACHUSETTS

2020 MASSACHUSETTS ENERGY CODE

ENERGY CONSERVATION CODE 2015 OF MASSACHUSETTS

NFPA 1, FIRE CODE, 2021 EDITION

NFPA 70, 2023 MA ELECTRICAL CODE

SATELLITE IMAGE



Avia! Lumagui
Digitally signed by
Lumagui
Date: 2023.07.12
10:44:00-07'



SHEET INDEX

ARCHITECTURAL DRAWINGS

- PVA-0 COVER SHEET
- PVA-1 ARRAY LAYOUT
- PVA-2 LOT DIAGRAM

STRUCTURAL DRAWINGS

- PVS-1 STRUCTURAL INFORMATION & PV MOUNTING DETAILS

ELECTRICAL DRAWINGS

- PVE-1 ELECTRICAL, SINGLE-LINE DIAGRAM & SPECIFICATIONS
- PVE-2 ELECTRICAL CALCULATION
- PVE-3 ELECTRICAL DATA & SPECIFICATIONS
- PVE-4 EQUIPOX GROUNDING DETAILS
- PVE-5 BRANCH DIAGRAM

SUNPOWER®

CORPORATION, SYSTEMS

1414 HARBOUR WAY SOUTH

RICHMOND, CA 94804

(510) 540-0550



STRUCTURAL ONLY

EUGENIO FERNANDEZ VENTOSA

16.40 kW GRID-TIED PHOTOVOLTAIC SYSTEM

450 MAIN ST

ACTON, MASSACHUSETTS 01720

SOLAR INDIVIDUAL PERMIT PACKAGE

COVER SHEET

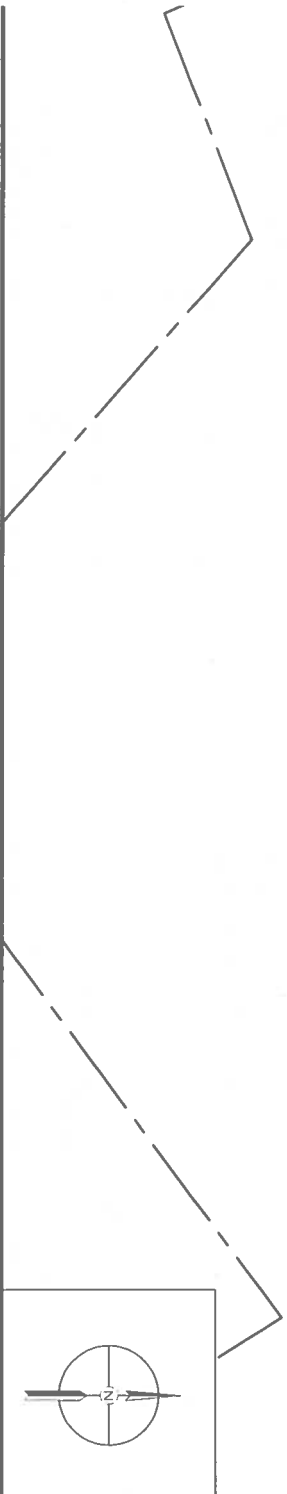
REVISIONS










REV	DESCRIPTION	DATE	BY

DRAWING BY: *Eugenio Fernandez Ventosa*

DATE: 07-11-2023

PROJECT	04-23843
DATE DRAWN	07-11-2023
SCALE	NYS
SHEET	PVA-0



LEGEND	
	JUNCTION BOX
	CONDUIT
	MAIN SERVICE PANEL
	UTILITY METER
	PROPERTY LINE
	FIRE ACCESS PATHWAY
	NEW LOAD CENTER
	AC DISCONNECT
	MA SMART UTILITY REVENUE METER

NOTE:			
1. FIELD ADJUSTMENTS OF FEWER THAN 6" MAY BE ALLOWED BASED ON SITE CONDITIONS AND MEASUREMENTS.			
ROOF TYPE			
ROOF	1		
MODULE	41		
QTY.			
AZIMUTH	163°		
PITCH	10:12		
COMP SHINGLE		NO. OF STONES	
TOTAL ROOF AREA		3 - STORY	
2279 sq.ft.		TOTAL LABBY AREA	
TOTAL % OF ROOF COVERED BY SOLAR		898 sq.ft.	
39%		TOTAL ATTACHMENT COUNT	
		158	
PRODUCT			
WAAVEE ENERGIES LIMITED WSI-MD-400			QTY.
MICROMETER			41
ENPHASE IQ7HS-66-M-US (240)			QTY.
			41

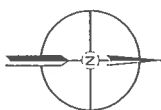
NOTE:
1. FIELD ADJUSTMENTS OF FEWER THAN 6" MAY BE ALLOWED BASED ON SITE CONDITIONS AND MEASUREMENTS.

EUGENIO FERNANDEZ VENTOSA 16.40 kW GRID-TIED PHOTOVOLTAIC SYSTEM
450 MAIN ST ACTON, MASSACHUSETTS 01720
SOLAR INDIVIDUAL PERMIT PACKAGE ARRAY LAYOUT



SUNPOWER®
CORPORATION, SYSTEMS
1414 HARBOUR WAY SOUTH
RICHMOND, CA 94804
(510) 540-0550

PVA-1

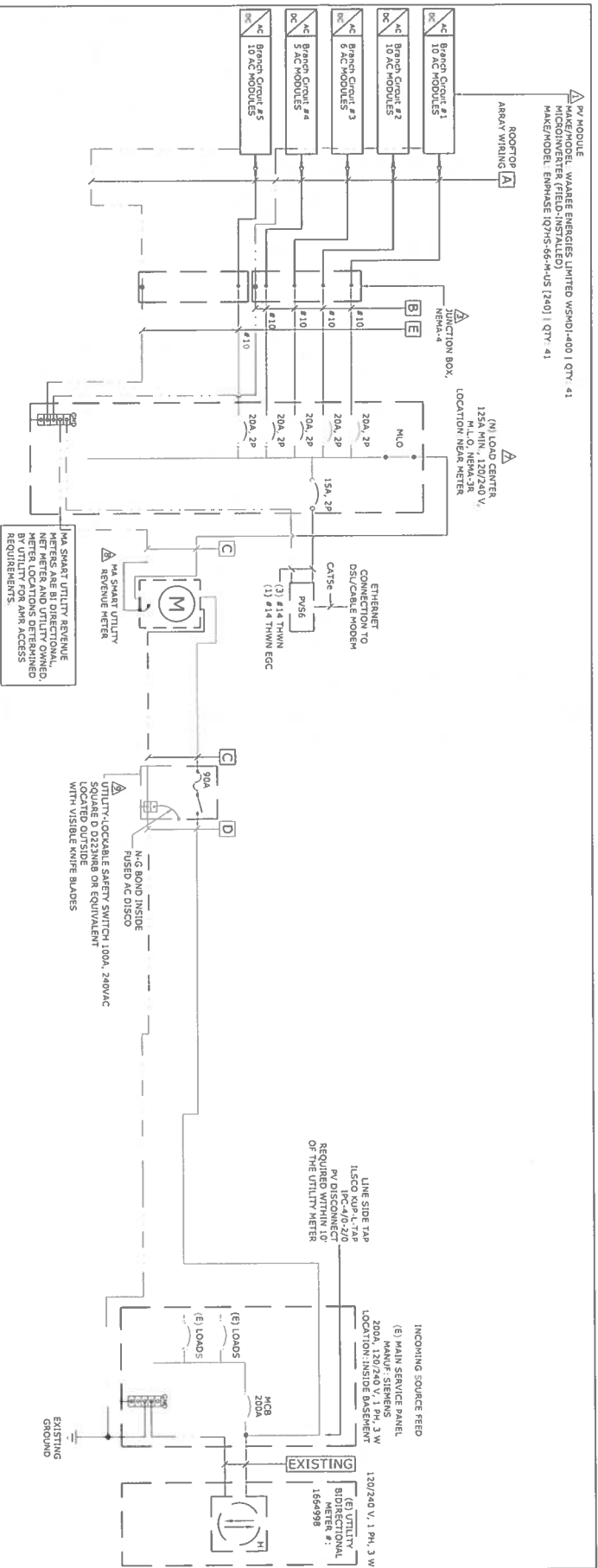


EUGENIO FERNANDEZ VENTOSA 16.40 kW GRID-TIED PHOTOVOLTAIC SYSTEM
450 MAIN ST ACTON, MASSACHUSETTS 01720
SOLAR INDIVIDUAL PERMIT PACKAGE LOT DIAGRAM

SOLAR INDIVIDUAL PERMIT PACKAGE
LOT DIAGRAM

STRUCTURAL ONLY

CORPORATION, SYSTEMS
1414 HARBOUR WAY SOUTH
RICHMOND, CA 94804
(510) 540-0550



DESCRIPTION	CONDUCTOR / CONDUIT SCHEDULE	ELECTRICAL NOTES	INSTALLATION NOTES
1. PV MODULE			
2. PV INVERTER (FIELD INSTALLED)			
3. MAKE/MODEL: ENPHASE IQ7H5-66-M-US (240) QTY: 41			
4. ROOFTOP ARRAY WINDING			
5. JUNCTION BOX, NEMA-4			
6. (M) LOAD CENTER, 125A MIN., 120/240V, N.L.O., NEMA-3R			
7. LOCATION: NEAR METER			
8. BRANCH CIRCUIT #1, 10 AC MODULES			
9. BRANCH CIRCUIT #2, 10 AC MODULES			
10. BRANCH CIRCUIT #3, 10 AC MODULES			
11. BRANCH CIRCUIT #4, 10 AC MODULES			
12. BRANCH CIRCUIT #5, 10 AC MODULES			
13. MAIN SERVICE PANEL (E), 120/240V, 1 ph, 3 w			
14. MAIN DISCONNECT			
15. BIDIRECTIONAL METER #1, 1666998			
16. UTILITY METER #1, 1666998			
17. EXISTING GROUND			
18. N-G BOND INSIDE			
19. RIGID AC DISCO			
20. UTILITY-LOCKABLE SAFETY SWITCH 100A, 240VAC			
21. SQUARE D D232WB OR EQUIVALENT			
22. LOCATED OUTSIDE			
23. WITH VISIBLE KNIFE BLADES			
24. MA SMART UTILITY			
25. METER ARE BI-DIRECTIONAL			
26. METER LOCATION DETERMINED			
27. BY MA SMART UTILITY			
28. PER MA SMART UTILITY			
29. REQUIREMENTS			
30. CHECK BOX FOR WHETHER SYSTEM IS GROUNDED			
31. ON UNGROUNDED SYSTEM, USE GEC OF UNGROUNDED			
32. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
33. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
34. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
35. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
36. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
37. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
38. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
39. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
40. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
41. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
42. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
43. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
44. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
45. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
46. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
47. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
48. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
49. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
50. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
51. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
52. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
53. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
54. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
55. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
56. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
57. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
58. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
59. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
60. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
61. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
62. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
63. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
64. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
65. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
66. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
67. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
68. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
69. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
70. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
71. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
72. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
73. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
74. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
75. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
76. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
77. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
78. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
79. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
80. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
81. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
82. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
83. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
84. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
85. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
86. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
87. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
88. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
89. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
90. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
91. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
92. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
93. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
94. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
95. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
96. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
97. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
98. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
99. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			
100. ON GROUNDED SYSTEM, USE GEC OF GROUNDED			

SUNPOWER®

CORPORATION, SYSTEMS

1414 HARBOUR WAY SOUTH

RICHMOND, CA 94804

(510) 540-0550

COMMONWEALTH OF MASSACHUSETTS

REGISTERED PROFESSIONAL ENGINEER

CHI FUNG

LEUNG

ELECTRICAL

No. 55136

155016-0700

Leung

Date: 2023.07.17

Signature

EUGENIO FERNANDEZ VENTOSA

16.40 kW GRID-TIED PHOTOVOLTAIC SYSTEM

450 MAIN ST

ACTION, MASSACHUSETTS 01720

SOLAR INDIVIDUAL PERMIT PACKAGE

ELECTRICAL SINGLE-LINE DIAGRAM

& SPECIFICATIONS

REVISIONS

REV

DESCRIPTION

DATE

1

DESCRIPTION

DATE

2

DESCRIPTION

DATE

3

DESCRIPTION

DATE

4

DESCRIPTION

DATE

5

DESCRIPTION

DATE

6

DESCRIPTION

DATE

7

DESCRIPTION

DATE

8

DESCRIPTION

DATE

9

DESCRIPTION

DATE

10

DESCRIPTION

DATE

11

DESCRIPTION

DATE

12

DESCRIPTION

DATE

13

DESCRIPTION

DATE

14

DESCRIPTION

DATE

15

DESCRIPTION

DATE

16

DESCRIPTION

DATE

17

DESCRIPTION

DATE

18

DESCRIPTION

DATE

19

DESCRIPTION

DATE

20

DESCRIPTION

DATE

21

DESCRIPTION

DATE

22

DESCRIPTION

DATE

23

DESCRIPTION

DATE

24

DESCRIPTION

DATE

25

DESCRIPTION

DATE

26

DESCRIPTION

DATE

27

DESCRIPTION

DATE

28

DESCRIPTION

DATE

29

DESCRIPTION

DATE

30

DESCRIPTION

DATE

31

DESCRIPTION

DATE

32

DESCRIPTION

DATE

33

DESCRIPTION

DATE

34

DESCRIPTION

DATE

35

DESCRIPTION

DATE

36

DESCRIPTION

DATE

37

DESCRIPTION

DATE

38

DESCRIPTION

DATE

39

DESCRIPTION

DATE

40

DESCRIPTION

DATE

41

DESCRIPTION

DATE

42

DESCRIPTION

DATE

43

DESCRIPTION

DATE

44

DESCRIPTION

DATE

45

DESCRIPTION

DATE

46

DESCRIPTION

DATE

47

DESCRIPTION

DATE

48

DESCRIPTION

DATE

49

DESCRIPTION

DATE

50

DESCRIPTION

DATE

51

DESCRIPTION

DATE

52

DESCRIPTION

DATE

53

DESCRIPTION

DATE

54

DESCRIPTION

DATE

55

DESCRIPTION

DATE

56

DESCRIPTION

DATE

57

DESCRIPTION

DATE

58

DESCRIPTION

DATE

59

DESCRIPTION

DATE

60

DESCRIPTION

DATE

61

DESCRIPTION

DATE

62

DESCRIPTION

DATE

63

DESCRIPTION

DATE

64

DESCRIPTION

DATE

65

DESCRIPTION

DATE

66

DESCRIPTION

DATE

67

DESCRIPTION

DATE

68

DESCRIPTION

DATE

69

DESCRIPTION

DATE

70

DESCRIPTION

DATE

71

DESCRIPTION

DATE

72

DESCRIPTION

DATE

73

DESCRIPTION

DATE

74

DESCRIPTION

DATE

75

DESCRIPTION

DATE

76

DESCRIPTION

DATE

77

DESCRIPTION

DATE

78

DESCRIPTION

DATE

79

DESCRIPTION

DATE

80

DESCRIPTION

DATE

81

DESCRIPTION

DATE

82

DESCRIPTION

DATE

83

DESCRIPTION

DATE

84

DESCRIPTION

DATE

85

DESCRIPTION

DATE

86

DESCRIPTION

DATE

87

DESCRIPTION

DATE

88

DESCRIPTION

DATE

89

DESCRIPTION

DATE

90

DESCRIPTION

DATE

91

DESCRIPTION

DATE

92

DESCRIPTION

DATE

93

DESCRIPTION

DATE

94

DESCRIPTION

DATE

95

DESCRIPTION

DATE

96

DESCRIPTION

DATE

97

DESCRIPTION

DATE

98

DESCRIPTION

DATE

99

DESCRIPTION

DATE

100

DESCRIPTION

DATE

101

DESCRIPTION

DATE

102

DESCRIPTION

DATE

103

DESCRIPTION

DATE

104

DESCRIPTION

DATE

105

DESCRIPTION

DATE

106

DESCRIPTION

DATE

107

DESCRIPTION

DATE

108

DESCRIPTION

DATE

109

DESCRIPTION

DATE

110

DESCRIPTION

DATE

111

DESCRIPTION

DATE

112

DESCRIPTION

DATE

113

DESCRIPTION

DATE

114

DESCRIPTION

DATE

115

DESCRIPTION

DATE

116

DESCRIPTION

DATE

117

DESCRIPTION

DATE

118

DESCRIPTION

DATE

119

DESCRIPTION

DATE

120

DESCRIPTION

DATE

121

DESCRIPTION

DATE

122

DESCRIPTION

DATE

123

DESCRIPTION

DATE

124

DESCRIPTION

DATE

125

DESCRIPTION

DATE

126

DESCRIPTION

DATE

127

DESCRIPTION

DATE

128

DESCRIPTION

DATE

129

DESCRIPTION

DATE

130

DESCRIPTION

DATE

131

DESCRIPTION

DATE

132

DESCRIPTION

DATE

133

DESCRIPTION

DATE

134

DESCRIPTION

DATE

135

DESCRIPTION

DATE

136

DESCRIPTION

DATE

137

DESCRIPTION

DATE

138

DESCRIPTION

DATE

139

DESCRIPTION

DATE

140

DESCRIPTION

DATE

141

DESCRIPTION

DATE

142

DESCRIPTION

DATE

143

DESCRIPTION

DATE

144

DESCRIPTION

DATE

145

DESCRIPTION

DATE

146

DESCRIPTION

DATE

147

DESCRIPTION

DATE

148

DESCRIPTION

DATE

149

DESCRIPTION

DATE

150

DESCRIPTION

DATE

151

DESCRIPTION

DATE

152

DESCRIPTION

DATE

153

DESCRIPTION

DATE

154

DESCRIPTION

DATE

155

DESCRIPTION

DATE

156

DESCRIPTION

DATE

157

DESCRIPTION

DATE

158

DESCRIPTION

DATE

159

DESCRIPTION

DATE

160

DESCRIPTION

DATE

161

DESCRIPTION

DATE

162

DESCRIPTION

DATE

163

DESCRIPTION

DATE

164

DESCRIPTION

DATE

165

DESCRIPTION

DATE

166

DESCRIPTION

DATE

167

DESCRIPTION

DATE

168

DESCRIPTION

DATE

169

DESCRIPTION

DATE

170

DESCRIPTION

DATE

171

DESCRIPTION

DATE

172

DESCRIPTION

DATE

173

DESCRIPTION

DATE

174

DESCRIPTION

DATE

175

DESCRIPTION

DATE

176

DESCRIPTION

DATE

177

DESCRIPTION

DATE

178

DESCRIPTION

DATE

179

DESCRIPTION

DATE

180

DESCRIPTION

DATE

181

DESCRIPTION

DATE

182

DESCRIPTION

DATE

183

DESCRIPTION

DATE

184

DESCRIPTION

DATE

185

DESCRIPTION

DATE

186

DESCRIPTION

DATE

187

DESCRIPTION

DATE

188

DESCRIPTION

DATE

189

DESCRIPTION

DATE

190

DESCRIPTION

DATE

191

DESCRIPTION

DATE

192

DESCRIPTION

DATE

193

DESCRIPTION

DATE

194

DESCRIPTION

DATE

195

DESCRIPTION

DATE

196

DESCRIPTION

DATE

197

DESCRIPTION

DATE

198

DESCRIPTION

DATE

199

DESCRIPTION

DATE

200

DESCRIPTION

DATE

201

DESCRIPTION

DATE

202

DESCRIPTION

DATE

203

DESCRIPTION

DATE

204

DESCRIPTION

DATE

205

DESCRIPTION

DATE

206

DESCRIPTION

DATE

207

DESCRIPTION

DATE

208

DESCRIPTION

DATE

209

DESCRIPTION

DATE

210

DESCRIPTION

DATE

211

DESCRIPTION

DATE

212

DESCRIPTION

DATE

213

DESCRIPTION

DATE

214

DESCRIPTION

DATE

215

DESCRIPTION

DATE

216

DESCRIPTION

DATE

217

DESCRIPTION

DATE

218

DESCRIPTION

DATE

219

DESCRIPTION

DATE

220

DESCRIPTION

DATE

221

DESCRIPTION

DATE

222

DESCRIPTION

DATE

223

DESCRIPTION

DATE

224

DESCRIPTION

DATE

225

DESCRIPTION

DATE

226

DESCRIPTION

DATE

227

DESCRIPTION

DATE

228

DESCRIPTION

DATE

229

DESCRIPTION

DATE

230

DESCRIPTION

DATE

231

DESCRIPTION

DATE

232

DESCRIPTION

DATE

233

DESCRIPTION

DATE

234

DESCRIPTION

DATE

235

DESCRIPTION

DATE

236

DESCRIPTION

DATE

237

DESCRIPTION

DATE

238

DESCRIPTION

DATE

239

DESCRIPTION

DATE

240

DESCRIPTION

DATE

241

DESCRIPTION

DATE

242

DESCRIPTION

DATE

243

DESCRIPTION

DATE

244

DESCRIPTION

DATE

245

DESCRIPTION

DATE

246

DESCRIPTION

DATE

247

DESCRIPTION

DATE

248

DESCRIPTION

DATE

249

DESCRIPTION

DATE

250

DESCRIPTION

DATE

251

DESCRIPTION

DATE

252

DESCRIPTION

DATE

253

DESCRIPTION

DATE

254

DESCRIPTION

DATE

255

DESCRIPTION

DATE

256

DESCRIPTION

DATE

257

DESCRIPTION

DATE

258

DESCRIPTION

DATE

259

DESCRIPTION

DATE

260

DESCRIPTION

DATE

261

DESCRIPTION

DATE

262

DESCRIPTION

DATE

263

DESCRIPTION

DATE

264

DESCRIPTION

DATE

265

DESCRIPTION

DATE

266

DESCRIPTION

DATE

267

DESCRIPTION

DATE

268

DESCRIPTION

DATE

269

DESCRIPTION

DATE

270

DESCRIPTION

DATE

271

DESCRIPTION

DATE

272

DESCRIPTION

DATE

273

DESCRIPTION

DATE

274

DESCRIPTION

DATE

275

DESCRIPTION

DATE

276

DESCRIPTION

DATE

277

DESCRIPTION

DATE

278

DESCRIPTION

DATE

279

DESCRIPTION

DATE

280

DESCRIPTION

DATE

281

DESCRIPTION

DATE

282

DESCRIPTION

DATE

283

DESCRIPTION

DATE

284

DESCRIPTION

DATE

285

DESCRIPTION

DATE

286

DESCRIPTION

DATE

287

DESCRIPTION

DATE

288

DESCRIPTION

DATE

289

DESCRIPTION

DATE

290

DESCRIPTION

DATE

291

DESCRIPTION

DATE

292

DESCRIPTION

DATE

293

DESCRIPTION

DATE

294

DESCRIPTION

DATE

295

DESCRIPTION

DATE

296

DESCRIPTION

DATE

297

DESCRIPTION

DATE

298

DESCRIPTION

DATE

299

DESCRIPTION

DATE

300

DESCRIPTION

DATE

301

DESCRIPTION

DATE

302

DESCRIPTION

DATE

303

DESCRIPTION

DATE

304

DESCRIPTION

DATE

305

DESCRIPTION

DATE

306

DESCRIPTION

DATE

307

DESCRIPTION

DATE

308

DESCRIPTION

DATE

309

DESCRIPTION

DATE

310

DESCRIPTION

DATE

311

DESCRIPTION

DATE

312

DESCRIPTION

DATE

313

DESCRIPTION

DATE

314

DESCRIPTION

DATE

315

DESCRIPTION

DATE

316

DESCRIPTION

DATE

317

DESCRIPTION

DATE

318

DESCRIPTION

DATE

319

DESCRIPTION

DATE

320

DESCRIPTION

DATE

321

DESCRIPTION

DATE

322

DESCRIPTION

DATE

323

DESCRIPTION

DATE

324

DESCRIPTION

DATE

325

DESCRIPTION

DATE

326

DESCRIPTION

DATE

327

DESCRIPTION

DATE

328

DESCRIPTION

DATE

329

DESCRIPTION

DATE

330

DESCRIPTION

DATE

331

DESCRIPTION

DATE

332

DESCRIPTION

DATE

333

DESCRIPTION

DATE

334

DESCRIPTION

DATE

335

DESCRIPTION

DATE

336

DESCRIPTION

DATE

337

DESCRIPTION

DATE

338

DESCRIPTION

DATE

339

DESCRIPTION

DATE

340

DESCRIPTION

DATE

341

DESCRIPTION

DATE

342

DESCRIPTION

DATE

343

DESCRIPTION

DATE

344

DESCRIPTION

DATE

345

DESCRIPTION

DATE

346

DESCRIPTION

DATE

347

DESCRIPTION

DATE

348

DESCRIPTION

DATE

349

DESCRIPTION

DATE

350

DESCRIPTION

DATE

351

DESCRIPTION

DATE

352

DESCRIPTION

DATE

353

DESCRIPTION

DATE

354

DESCRIPTION

DATE

355

DESCRIPTION

DATE

356

DESCRIPTION

DATE

357

DESCRIPTION

DATE

358

DESCRIPTION

DATE

359

DESCRIPTION

DATE

360

DESCRIPTION

DATE

361

DESCRIPTION

DATE

362

DESCRIPTION

DATE

363

DESCRIPTION

DATE

364

DESCRIPTION

DATE

365

DESCRIPTION

DATE

366

DESCRIPTION

DATE

367

DESCRIPTION

DATE

368

DESCRIPTION

DATE

369

DESCRIPTION

DATE

370

DESCRIPTION

DATE

371

DESCRIPTION

DATE

372

DESCRIPTION

DATE

373

DESCRIPTION

DATE

374

DESCRIPTION

DATE

375

DESCRIPTION

DATE

376

DESCRIPTION

DATE

377

DESCRIPTION

DATE

378

DESCRIPTION

DATE

379

DESCRIPTION

DATE

380

DESCRIPTION

DATE

381

DESCRIPTION

DATE

382

DESCRIPTION

DATE

383

DESCRIPTION

DATE

384

DESCRIPTION

DATE

385

DESCRIPTION

DATE

386

DESCRIPTION

DATE

387

DESCRIPTION

DATE

388

DESCRIPTION

DATE

389

DESCRIPTION

DATE

390

DESCRIPTION

DATE

391

DESCRIPTION

DATE

392

DESCRIPTION

DATE

393

DESCRIPTION

DATE

394

DESCRIPTION

DATE

395

DESCRIPTION

DATE

396

DESCRIPTION

DATE

397

DESCRIPTION

DATE

398

DESCRIPTION

DATE

399

DESCRIPTION

DATE

400

DESCRIPTION

DATE

401

DESCRIPTION

ELECTRICAL CALCULATIONS

	BRANCH 1	BRANCH 2	BRANCH 3	BRANCH 4	BRANCH 5
ROOF JCT BOX TO SUPAPANEL WIRING	#10	#10	#10	#10	#10
NUMBER OF MODULES	10	10	6	5	10
VOLTAGE	240 V	240 V	240 V	240 V	240 V
RATED AC OUTPUT CURRENT: $I_{OUT} =$	16 A	16 A	9.6 A	8 A	16 A
MINIMUM WIRE AMPACITY: $I_{WIR} = I_{OUT} \times 1.25$	20.00 A	20.00 A	12.00 A	10.00 A	20.00 A
CONDUCTOR DE-RATING					
MAXIMUM AMBIENT TEMPERATURE	34 °C	34 °C	34 °C	34 °C	34 °C
TEMPERATURE USED FOR AMPACITY DE-RATING	34 °C	34 °C	34 °C	34 °C	34 °C
TEMPERATURE DE-RATING COEFFICIENT	0.96	0.96	0.96	0.96	0.96
FILL DE-RATING COEFFICIENT	0.5	0.5	0.5	0.5	0.5
$I_{WIREBIN} = I_{OUT} / TEMP_COEFF / FILL_COEFF$	33.33 A	33.33 A	20.00 A	16.67 A	33.33 A
WIRE SIZE AMPACITY	40 A	40 A	40 A	40 A	40 A
CONDUCTOR SIZE	#10	#10	#10	#10	#10
CONDUCTOR SIZE ADJUSTED FOR VOLTAGE DROP	#10	#10	#10	#10	#10
ONE WAY CIRCUIT LENGTH	75 FT.	75 FT.	75 FT.	75 FT.	50 FT.
CALCULATED VOLTAGE DROP	1.24%	1.24%	0.74%	0.62%	0.83%
OVERCURRENT PROTECTION	20A, 2P	20A, 2P	20A, 2P	20A, 2P	20A, 2P
MINIMUM OCPD = $I_{OUT} \times 1.25$	20.00 A	20.00 A	12.00 A	10.00 A	20.00 A

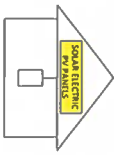
NOTE: DISTANCE ABOVE ROOF TO BOTTOM OF CONDUIT: >23mm (7/8")

<p>SUBPANELS TO GRID-TIE WIRING</p>	#3	<p>VOLTAGE</p> <p>SUM OF BRANCHES: $I_{br_TOTAL} =$</p> <p>MINIMUM WIRE AMPACITY: $I_{WIRE} = I_{OUT} \times 1.25$</p> <p>CONDUCTOR DE-RATING</p> <p>MAXIMUM AMBIENT TEMPERATURE</p> <p>TEMPERATURE USED FOR AMPACITY DE-RATING</p> <p>TEMPERATURE DE-RATING COEFFICIENT</p> <p>FILL DE-RATING COEFFICIENT</p> <p>$I_{WIREMIN} = I_{OUT} / TEMP_COEFF / FILL_COEFF$</p> <p>WIRE SIZE AMPACITY</p> <p>CONDUCTOR SIZE</p> <p>CONDUCTOR SIZE ADJUSTED FOR VOLTAGE DROP</p> <p>ONE WAY CIRCUIT LENGTH</p> <p>VOLTAGE DROP</p> <p>OVERCURRENT PROTECTION</p> <p>MINIMUM OCPD = $I_{br} \times 1.25$</p>
	#3	<p>240 V</p> <p>56.6 A</p> <p>82.00 A</p> <p>34 °C</p> <p>34 °C</p> <p>0.96</p> <p>1.00</p> <p>68.33 A</p> <p>115 A</p> <p>#3</p> <p>#3</p> <p>10 FT.</p> <p>0.13%</p> <p>90A, 2P</p> <p>82.00 A</p>

PROJECT		EUGENIO FERNANDEZ VENTOSA 16.40 kW GRID-TIED PHOTOVOLTAIC SYSTEM	
DATE DRAWN		450 MAIN ST ACTON, MASSACHUSETTS 01720	
SCALE		SOLAR INDIVIDUAL PERMIT PACKAGE ELECTRICAL CALCULATION	
DRAWN BY		REVISIONS	
<i>Eugenio Fernandez</i>		REV.	DESCRIPTION DATE
CHECKED	JAMPER LODI		
PROJECT			
DATE DRAWN		07-11-2012	
SCALE		NYS	



ELECTRICAL DATA & SPECIFICATIONS

<div><div>PHOTOVOLTAIC POINT OF INTERCONNECTION</div><div>WARNING: DUAL POWER SOURCE. SECOND SOURCE IS PHOTOVOLTAIC SYSTEM</div><table><tr><td>MAIN SERVICE PANEL</td><td>65.6 A</td><td>AMPS</td></tr><tr><td>MAIN SERVICE PANEL</td><td>240 V</td><td>VOLTS</td></tr></table><div>SIGNAGE LOCATIONS:<ul style="list-style-type: none">MAIN SERVICE PANELINDOOR / OUTDOOR SUBPANEL</div></div>	MAIN SERVICE PANEL	65.6 A	AMPS	MAIN SERVICE PANEL	240 V	VOLTS	<div><div>PV SOLAR BREAKER</div><div>DO NOT RELOCATE THIS OVERCURRENT DEVICE</div><div>NEC 706.1(10)(3)(2)</div><div>SIGNAGE LOCATIONS:<ul style="list-style-type: none">MAIN SERVICE PANELINDOOR / OUTDOOR LOAD CENTERINDOOR / OUTDOOR SUBPANEL</div></div>	<div><div>RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM</div><div>SIGNAGE LOCATIONS:<ul style="list-style-type: none">LABEL SHALL BE LOCATED ON OR NO MORE THAN 1M (3FT) FROM THE SWITCH</div></div>	
MAIN SERVICE PANEL	65.6 A	AMPS							
MAIN SERVICE PANEL	240 V	VOLTS							
<div><div>SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN</div><div>TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN AND REDUCE SHOCK HAZARD IN THE ARRAY</div><div></div><div>SIGNAGE LOCATIONS:<ul style="list-style-type: none">SHALL BE LOCATED ON OR NO MORE THAN 1 M (3 FT) FROM THE SERVICE DISCONNECTING MEANS TO WHICH THE PV SYSTEMS ARE CONNECTED.</div></div>	<div><div>PHOTOVOLTAIC SYSTEM AC DISCONNECT</div><table><tr><td>RAPIED AC OUTPUT CURRENT</td><td>65.6 A</td><td>AMPS</td></tr><tr><td>NOMINAL OPERATING AC VOLTAGE</td><td>240 V</td><td>VOLTS</td></tr></table><div>SIGNAGE LOCATIONS:<ul style="list-style-type: none">INDOOR / OUTDOOR AC DISCONNECT</div></div>	RAPIED AC OUTPUT CURRENT	65.6 A	AMPS	NOMINAL OPERATING AC VOLTAGE	240 V	VOLTS		<div><div>SIGNAGE NOTES</div><div><div>1. MATERIAL USED FOR THE SIGNAGE SHALL BE REFLECTIVE, WEATHER RESISTANT AND SUITABLE FOR THE ENVIRONMENT.</div><div>2. ALL SIGNAGE SHALL HAVE ALL CAPITAL LETTERS WITH MINIMUM 3⁄8" LETTER HEIGHT, WHITE ON RED BACKGROUND.</div><div>3. MAIN SERVICE DISCONNECT MARKING SHALL BE PLACED ADJACENT TO MAIN SERVICE DISCONNECT IN A LOCATION CLEARLY VISIBLE FROM THE LOCATION WHERE THE LEVER IS OPERATED.</div><div>4. MARKING IS REQUIRED ON ALL INTERIOR AND EXTERIOR DC CONDUIT, RACEWAYS, ENCLOSURES, CABLE ASSEMBLIES, AND JUNCTION BOXES TO ALERT THE FIRE SERVICE TO AVOID CUTTING THEM. MARKINGS SHALL BE PLACED EVERY 10', AT TURNS AND ABOVE AND/OR BELOW PENETRATIONS, AND AT ALL DC COMBINER AND JUNCTION BOXES.</div><div>5. DO NOT USE SCREWS FOR SIGNAGE ATTACHMENT. USE ONLY APPROVED ADHESIVE.</div></div></div>
RAPIED AC OUTPUT CURRENT	65.6 A	AMPS							
NOMINAL OPERATING AC VOLTAGE	240 V	VOLTS							

REVISIONS	
REV	DATE
01	08-11-2013
02	07-11-2013
03	07-11-2013
04	07-11-2013
05	07-11-2013
06	07-11-2013
07	07-11-2013
08	07-11-2013
09	07-11-2013
10	07-11-2013
11	07-11-2013
12	07-11-2013
13	07-11-2013
14	07-11-2013
15	07-11-2013
16	07-11-2013
17	07-11-2013
18	07-11-2013
19	07-11-2013
20	07-11-2013
21	07-11-2013
22	07-11-2013
23	07-11-2013
24	07-11-2013
25	07-11-2013
26	07-11-2013
27	07-11-2013
28	07-11-2013
29	07-11-2013
30	07-11-2013
31	07-11-2013
32	07-11-2013
33	07-11-2013
34	07-11-2013
35	07-11-2013
36	07-11-2013
37	07-11-2013
38	07-11-2013
39	07-11-2013
40	07-11-2013
41	07-11-2013
42	07-11-2013
43	07-11-2013
44	07-11-2013
45	07-11-2013
46	07-11-2013
47	07-11-2013
48	07-11-2013
49	07-11-2013
50	07-11-2013
51	07-11-2013
52	07-11-2013
53	07-11-2013
54	07-11-2013
55	07-11-2013
56	07-11-2013
57	07-11-2013
58	07-11-2013
59	07-11-2013
60	07-11-2013
61	07-11-2013
62	07-11-2013
63	07-11-2013
64	07-11-2013
65	07-11-2013
66	07-11-2013
67	07-11-2013
68	07-11-2013
69	07-11-2013
70	07-11-2013
71	07-11-2013
72	07-11-2013
73	07-11-2013
74	07-11-2013
75	07-11-2013
76	07-11-2013
77	07-11-2013
78	07-11-2013
79	07-11-2013
80	07-11-2013
81	07-11-2013
82	07-11-2013
83	07-11-2013
84	07-11-2013
85	07-11-2013
86	07-11-2013
87	07-11-2013
88	07-11-2013
89	07-11-2013
90	07-11-2013
91	07-11-2013
92	07-11-2013
93	07-11-2013
94	07-11-2013
95	07-11-2013
96	07-11-2013
97	07-11-2013
98	07-11-2013
99	07-11-2013
100	07-11-2013

EUGENIO FERNANDEZ VENTOSA 16.40 KW GRID-TIED PHOTOVOLTAIC SYSTEM
450 MAIN ST ACTON, MASSACHUSETTS 01720
SOLAR INDIVIDUAL PERMIT PACKAGE ELECTRICAL DATA & SPECIFICATIONS



SUNPOWER®
CORPORATION, SYSTEMS
1414 HARBOUR WAY SOUTH
RICHMOND, CA 94804
(510) 540-0550

The diagram illustrates the assembly of a 1000V cable joint. It shows a cross-section of the joint with various components labeled 1 through 8. A dashed line indicates the assembly sequence. The components are:

- 1. Grounding Patch
- 2. Bending Point
- 3. Anti-oxidant Paste
- 4. Mid Clamp
- 5. Insulation
- 6. K2R Jumper
- 7. End Clamp
- 8. Splice + Screw

The assembly sequence is indicated by a dashed line starting from the Grounding Patch (1) and proceeding through the Bending Point (2), Anti-oxidant Paste (3), Mid Clamp (4), Insulation (5), K2R Jumper (6), End Clamp (7), and finally the Splice + Screw (8).

Bonding Components		Compliance	
		NEC	UL
1	Grounding Electrode to Service Panel	(90.47(A)) (90.47(B))	n/a
2	EGC from Service Panel to Array	(90.43(C)) (90.45) (90.43(D))	1741
3	EGC to Rooftop Junction Box	(90.45)	2703
4	Rail to Mid Clamp to Module Frame	(90.43(A))	2703
5	Module Frame	n/a	1703
6	Module Frame to Module Frame Between Rows	(90.43(A))	2703
7	End Clamp to Rail*	(90.43(A))	2703
8	*Note that end clamp does not bond module to rail-and clamp bonds module to rail. Rail to Splice	(90.43(A))	2703

*Code references are NEC 2020 Edition. References to other Editions may differ.

CAUTION:

POWER TO THIS BUILDING IS ALSO
SUPPLIED FROM THE FOLLOWING
SOURCES WITH DISCONNECT(S)
LOCATED AS SHOWN:

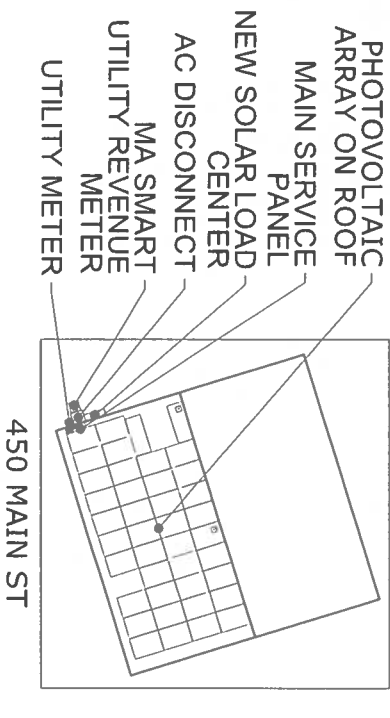


FIGURE 2: PLACARD IDENTIFYING LOCATION OF DISCONNECTS AND POWER SOURCES



EUGENIO FERNANDEZ VENTOSA 16.40 kW GRID-TIED PHOTOVOLTAIC SYSTEM
450 MAIN ST ACTON, MASSACHUSETTS 01720
SOLAR INDIVIDUAL PERMIT PACKAGE PLACARD / SUNPOWER EQUINOX GROUNDING DETAILS

[illegible]

PROJECT	RD-428643
DATE DRAWN	07-31-2023
SCALE	MTS
SHEET	



PRINT NAME OF CREW LEAD ON SITE

CREW LEAD SIGNATURE:

BRANCH VOLTAGES:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.



PVE-5



SUNPOWER®
CORPORATION, SYSTEMS
1414 HARBOUR WAY SOUTH
RICHMOND, CA 94804
(510) 540-0550

ARKA SERIES

WSMDI-395 to WSMDI-415

WAAREE

One with the Sun



Highest reliability & enhanced crack tolerance 398 module



Better performance under all climatic conditions



Solid junction box



Reduced power losses up to 11.4 times



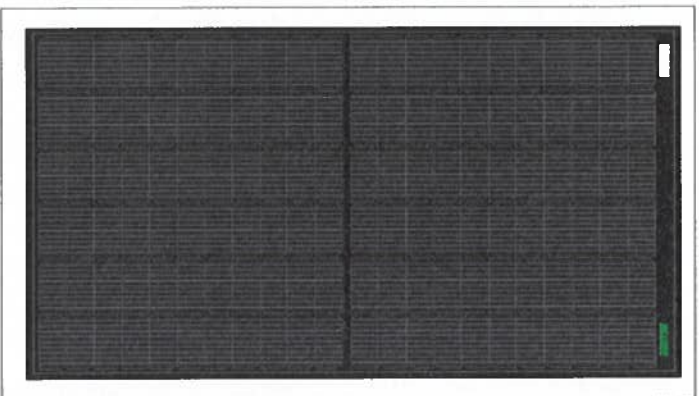
PID resistant with long term reliability



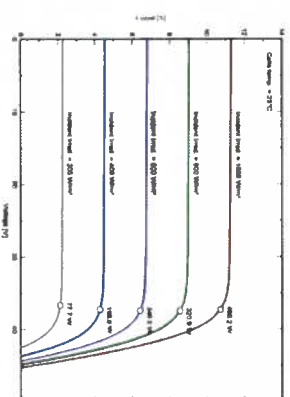
Sustain heavy wind & snow loads (2400 m/s & 5400 m/s)



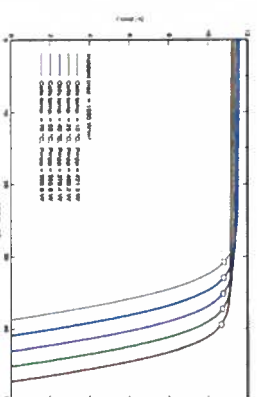
M6 Mono PERC cells



I-V VARIATION WITH IRRADIANCE



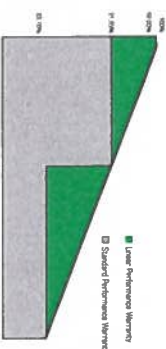
I-V VARIATION WITH TEMPERATURE



The Graphs are for reference purpose only. Please consult Waaree technical team for further clarifications.

INTERNATIONAL & NATIONAL CERTIFICATIONS

IEC 61215 | IEC 61730 | UL1730
IEC TS 62804-1



ISO 9001:2015 | ISO 14001:2015 | ISO 45001:2018
Independent assessment of factories by BLACK & VEATCH

ARKA SERIES

WSMDI-395 to WSMDI-415

WAAREE

One with the Sun

ELECTRICAL CHARACTERISTICS

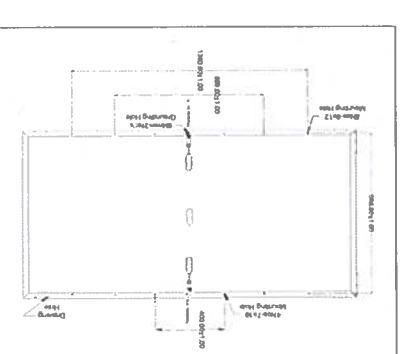
Models	Pmax (W)		Vmp (V)		Imp (A)		Isr (A)		Voc (V)		Module Eff. (%)
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	
WSMDI-395	395	296.8	31.77	34.70	10.47	8.55	11.24	9.08	45.00	42.10	19.78
WSMDI-400	400	300.6	38.00	34.90	10.54	8.62	11.32	9.14	45.22	42.30	20.03
WSMDI-405	405	304.4	38.22	35.10	10.61	8.68	11.40	9.21	45.44	42.50	20.28
WSMDI-410	410	308.2	38.44	35.30	10.68	8.74	11.48	9.27	45.66	42.70	20.53
WSMDI-415	415	312.1	38.66	35.40	10.75	8.81	11.57	9.34	45.88	42.90	20.78

*Standard Test Conditions (STC) - 1000 W/m² irradiance, Air Mass 1.5 and 25°C cell temperature. Nominal Open-circuit Cell Temperature = 40°C, 600 W/m² irradiance, Air Mass 1.5. Ambient temperature at 20°C and Wind speed 1 m/s. Average power reduction at 35°C is 2.0% (NOCT 35°C is 35.1°C). Maximum temperature = 75°C.

MECHANICAL CHARACTERISTICS

System Voltage	1500 V	Series Fuse Rating	22 A
Length x Width x Thickness (L x W x T)	1924 mm (L) x 1038 mm (W) x 35 mm (T)		
Weight	22 kgs		
Solar Cables per Module (Unins) / Arrangement	132 cells / (11x6 11x6)		
Solar Cell Type & Size	Mono PERC, 83 x 166 mm		
Front Glass	3.2 mm Low Iron and Tempered glass with ARC coating		
Encapsulate	PID Free & UV Resistant		
Junction Box (Protection degree / Material)	IP68 / Weatherproof PPO		
Cable & Connector (Protection degree / Type)	IP68 rated / Staubsil MCA Connector		
Cable cross - section & length	4 mm² & 1200mm		
Frame	Anodized Aluminium Alloy, Anodization thickness ≥ 15 micron		
Fire rating	Type 2		

DESIGN SPECIFICATIONS



THERMAL CHARACTERISTICS

Temperature coefficient of Current (Isc), α (%/°C)	0.055
Temperature coefficient of Voltage (Voc), β (%/°C)	-0.285
Temperature coefficient of Power (Pm), γ (%/°C)	-0.365
NOCT (°C)	43 ± 2
Operating temperature range (°C)	-40 to 85

Waaree Energies Ltd is amongst the top Solar Energy Companies and has the country's largest Solar PV Module manufacturing capacity of 5 GW. In addition, it is committed to provide top notch EPC services, project development, rooftop solutions, solar water pumps and also in an independent Power Producer. Waaree has its presence in over 325+ locations nationally and 68 countries globally.

12 Years Product Warranty • 27 Years Power Output Warranty

- The electrical data given here is for reference purpose only.
- Do not connect the solar panel to the grid without the necessary safety precautions.
- Refer installation Manual/Instructions & Waaree warranty statement for terms & conditions.
- Waaree reserves the right to change the specifications without prior notice.

*You need Specific ground connections and if module installations are to distance from any existing structure in the installation, you will please consult with Waaree sales and technical representatives.

IQ7HS Microinverter

The high-powered smart grid-ready **IQ7HS Microinverter** with integrated MC4 connectors dramatically **simplifies** the installation process while achieving the highest system efficiency.

The IQ Series Microinverters extend the reliability standards set forth by previous generations and undergo over a million hours of power-on testing, enabling Enphase to provide an industry-leading warranty of up to 25 years.

Easy to Install

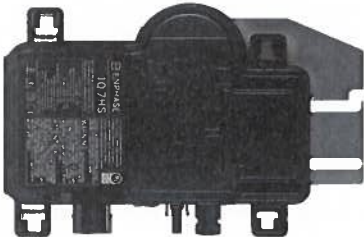
- Lightweight and simple
- Faster installation with improved, lighter two-wire cabling
- Built-in rapid shutdown compliant (NEC 2014, 2017 & 2020)

Efficient and Reliable

- Highest CEC efficiency of 97.0%
- More than a million hours of power-on testing
- Class II double-insulated enclosure
- UL listed

Smart Grid-Ready

- Complies with advanced grid support, voltage and frequency ride-through requirements
- Remotely updates and responds to changing grid-requirements
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL1741-SA) and IEEE 1547 2018 (UL1741-SB)



To learn more about Enphase offerings, visit enphase.com



IQ7HS Microinverter

INPUT DATA (DC)		IQ7HS-66-M-US
Commonly used module pairings ¹		320W - 460W
Module compatibility ²		66 cell 120 half-cell/ 132 half-cell
Maximum input DC voltage		59V
Peak power tracking voltage		38V - 43V
Operating range		20V - 59V
Min/Max start voltage		30V/55V
Max DC short circuit current (module Isc)		15A
Overvoltage class DC port		II
DC port backfed current		0A
PV array configuration		1 x 1 ungrounded array, No additional DC side protection required AC side protection requires max 20A per branch circuit
OUTPUT DATA (AC)		@240 VAC @208 VAC
Peak output power		384 VA 369 VA
Maximum continuous output power		384 VA 369 VA
Nominal (L-L) voltage/range ³		240V/211-264V 208V/183-229V
Maximum continuous output current		1.60A (240V) 1.77A (208V)
Nominal frequency		60 Hz 60 Hz
Extended frequency range		47 Hz to 68 Hz 47 Hz to 68 Hz
AC short circuit fault current over 3 cycles		4.82A 4.82A
Maximum units per 20 A (L-L) branch circuit ⁴		10 9
Overvoltage class AC port		III III
AC port backfed current		18 mA 18 mA
Power factor setting		1.0 1.0
Power factor (adjustable)		0.85 leading 0.85 lagging 0.85 leading 0.85 lagging
EFFICIENCY		@240V @208V
CEC weighted efficiency		97.0 % 96.5 %

MECHANICAL DATA

Ambient temperature range	-40°C to +60°C
Relative humidity range	4% to 100% (condensing)
Connector type	Staubli made MC4
Dimensions (WxHxD)	212 mm x 175 mm x 30.2 mm (without bracket)
Weight	1.08 kg (2.38 lbs)
Cooling	Natural convection - No fans
Approved for wet locations	Yes
Pollution degree	PD3
Enclosure	Class II, corrosion resistant polymeric enclosure
Environmental category/UV exposure rating	NEMA type 6/outdoor
Altitude	2000 m
FEATURES	
Communication	Power Line Communication (PLC)
Disconnecting means	The AC and DC connectors have been evaluated and approved by UL for use as the load-break disconnect means required by NEC 690 and C22.1-2018 Rule 64-220
Compliance	CA Rule 21 (UL1741-SA), IEEE 1547-2018 (UL1741-SB), UL 62109-1, FCC Part 15 Class B, HECO v1.1, IEC6S-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01 This product is UL listed as PV Rapid Shutdown Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and C22.1-2018 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions

1. No entered DC/AC ratio. See the compatibility calculator at <https://enphase.com/en-us/support/module-compatibility>
2. Provided the module is compatible with all other parameters in the datasheet
3. Nominal voltage range can be extended beyond nominal if required by the utility
4. Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area

To learn more about Enphase offerings, visit enphase.com

© 2020 Enphase Energy. All rights reserved. All trademarks or brands used are the property of Enphase Energy Inc. 12-15-2022





July 29, 2022

To whom it may concern,

This letter confirms and attests that:

SPWR-A5 is equivalent to Enphase Models:

IQ7HS-66-ACM-US, 369 VA, 208Vac Grid Support Utility Interactive Inverter
IQ7HS-66-E-ACM-US, 369 VA, 208Vac Grid Support Utility Interactive Inverter
IQ7HS-66-M-US, 369 VA, 208Vac Grid Support Utility Interactive Inverter
IQ7HS-66-ACM-US, 384 VA, 240Vac Grid Support Utility Interactive Inverter
IQ7HS-66-E-ACM-US, 384 VA, 240Vac Grid Support Utility Interactive Inverter
IQ7HS-66-M-US, 384 VA, 240Vac Grid Support Utility Interactive Inverter

Regards,

A handwritten signature in blue ink, appearing to read 'Aranjit Sangha'.

Aranjit Sangha
Senior Staff Engineer
Enphase Energy Inc.
1420 North McDowell Blvd.
Petaluma, CA 94954
v: (707) 763-4784 x7098
asangha@enphaseenergy.com

FLASH LOC



FLASH LOC

INSTALLATION GUIDE



FLASH LOC is the ultimate attachment for composition shingle and rolled comp roofs. The all-in-one mount installs fast — no kneeling on hot roofs to install flashing, no prying or cutting shingles, no pulling nails. Simply drive the lag bolt and inject sealant into the base. **FLASH LOC's** patented **TRIPLE SEAL** technology preserves the roof and protects the penetration with a permanent pressure seal. Kitted with lag bolts, sealant, and hardware for maximum convenience. Don't just divert water, **LOC** it out!



TESTED TO TAS-100
WIND DRIVEN RAIN TEST
AND U141 RAIN TEST

JUNE2021_FLASHLOC.MP.Y2



PROTECT THE ROOF

Install a high-strength waterproof attachment without lifting, prying or damaging shingles.



LOC OUT WATER

With an outer shield **1**, contour-conforming gasket **2** and pressurized sealant chamber **3**, the Triple Seal technology delivers a 100% watertight connection.



HIGH-SPEED INSTALL

Simply drive lag bolt and inject sealant into the port **4** to create a permanent pressure seal.

FASTER INSTALLATION. 25-YEAR WARRANTY.

FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702



PRE-INSTALL

Snap chalk lines for attachment rows. On shingle roofs, snap lines 1-3/4" below upslope edge of shingle course. Locate rafters and mark attachment locations.

At each location, drill a 7/32" pilot hole. Clean roof surface of dirt, debris, snow, and ice.

Next, **BACKFILL ALL PILOT HOLES WITH SEALANT.**

NOTE: Space mounts per racking system install specifications.

STEP 1: SECURE

Place **FLASH LOC** over pilot hole with lag on down-slope side. Align indicator marks on sides of mount with chalk line. Pass included lag bolt and sealing washer through **FLASH LOC** into pilot hole. Drive lag bolt until mount is held firmly in place.

NOTE: The EPDM in the sealing washer will expand beyond the edge of the metal washer when proper torque is applied.

STEP 2: SEAL

Insert tip of **UNIRAC** provided sealant into port. Inject until sealant exits both vents. Follow sealant manufacturer's instructions. Follow sealant manufacturer's cold weather application guidelines, if applicable.

Continue array installation, attaching rails to mounts with provided T-bolts.



NOTE: When **FLASH LOC** is installed over gap between shingle tabs or vertical joints.

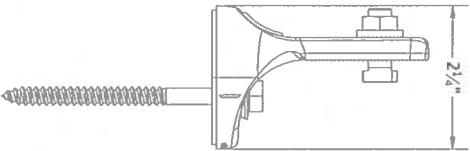
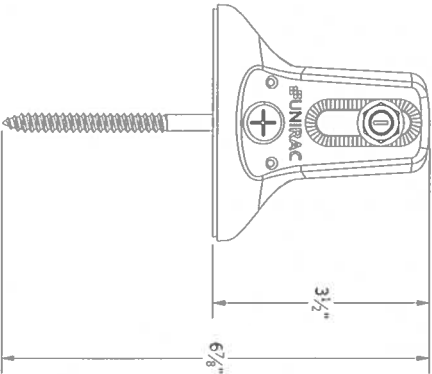
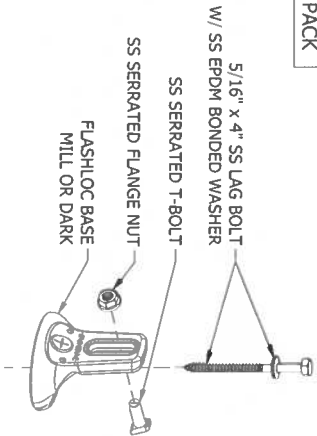
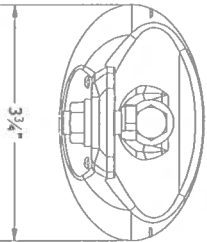
fill gap/joint with sealant between mount and upslope edge of shingle course.


USE ONLY **UNIRAC APPROVED SEALANTS:** Chemlink Duxone 50, Chemlink A-1, General 4500, or Flexseal S-4

FASTER INSTALLATION. 25-YEAR WARRANTY.

FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702

PART TABLE	
P/N	DESCRIPTION
004085M	FLASHLOC COMP KIT MILL, 20 PACK
004085D	FLASHLOC COMP KIT DARK, 20 PACK





1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE:	SOLARMOUNT	DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL	DRAWING FL-A01
DRAWING TYPE:	PART DRAWING		
DESCRIPTION:	FLASHLOC COMP KIT		
REVISION DATE:	4/28/2020	PRODUCT PROTECTED BY ONE OR MORE US PATENTS	LEGAL NOTICE
			SHEET



SunPower® InvisiMount™ | Residential Mounting System

SunPower® InvisiMount™ | Residential Mounting System

InvisiMount Components

Simple and Fast Installation

- Integrated module-to-rail grounding
 - Pre-assembled mid and end clamps
 - Levitating mid clamp for easy placement
 - Mid clamp width facilitates consistent, even module spacing
- UL 2703 Listed integrated grounding

Flexible Design

- Addresses sloped and low-sloped residential roofs

- Design in landscape and portrait with up to 10m rail span
- Pre-drilled rails and rail splice
- Rails enable easy obstacle management

Customer-Preferred Aesthetics

- Best-in-class system aesthetics
- Black anodized components
- Low-profile mid clamps and capped, flush end clamps

Part of Superior System

- Best-in-class system reliability and aesthetics
- Optional rooftop transition flashing, rail-mounted j-box, and wire management rail (class 1)
- Combine with SunPower modules and mySunPower[®] monitoring app



Elegant Simplicity

SunPower InvisiMount™ is a SunPower-designed all-based mounting system. The InvisiMount system addresses residential sloped roofs and combines faster installation time, design flexibility, and superior aesthetics. Classic InvisiMount is specifically envisioned and engineered to pair with SunPower modules. Universal InvisiMount is compatible with a wide range of modules. The resulting system-level approach amplifies the installation and aesthetic benefits—for homeowners and for installers.

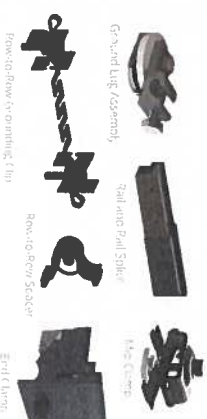
sunpower.com



SUNPOWER



Classic Invisi'cure



Universal InvisiMount



InvisiMount Component Details

[illegible]

- **Involvement**: Comp Single Asia team with S&PUS
- **Insufficient** Flg: the Panel agreed Australia with P&SUS
- **Insufficient** S-III: Replacement Agreement with P&SUS
- **Insufficient** W&TIE: Replacement AUA: meet with P&SUS

Variables	Control Groups
• 25-year product warranty • 5-year first-year warranty	• 11, 271 ² L. Scott • Close-A-Fix 2-year

InvisiMount Operating Conditions	Temperature, °F
	-40 to 140 (-40 to 56 °C)

Roof Attachment Hardware Warranties

UnvisMount Component LRFD Capacities

Classic	Unit	564 lbs
Mid Classic	Shelf	540 lbs
Universal	14" H	441 lbs
Mid Classic	Shelf	437 lbs
Classic	Unit	397 lbs
Elite 14" H	Shelf	216 lbs
Universal	Unit	205 lbs
Eco clamp	Shelf	222 lbs
Pool	Maximum unaided	513 lbs*
	Maximum device/care	590 lbs**
Pool table	Maximum unaided	543 lbs**
	Maximum device/care	530 lbs**
Lift	Unit	1000 lbs
	Shelf	560 lbs

Test Verification of Conformity

Verification Number: 105370452-LAX-VOC1

On the basis of the tests undertaken, the samples of the below product have been found to comply with the requirements of the referenced specification/standard at the time the tests were carried out. This verification is part of the full test report 105208800LAX-001, and should be read in conjunction with it. This verification replaces previous verification number 105208800LAX-001-LAX-VOC1 dated: 30-12-2022. Additional information in Appendix.

Applicant Name & Address:
SunPower Corporation
1414 Harbour Way South
Suite 1901
Richmond, CA 94804 USA

Product Description:
Photovoltaic Racking System installed using the SunPower InvisiMount Installation Guide 508988 Rev O

Ratings & Principle Characteristics:
Fire Class Rating:
Class A for Type 1 and Type 2
Fuse Rating: 20 A
Mechanical Load Testing:
Mechanical Load Rating: 10PSF Downward, 5PSF Upward, 5PSF Sloped Load
Module Orientation: Portrait or Landscape
Classic InvisiMount, Universal InvisiMount

Models/Type References:
SUNPOWER ; InvisiMount
Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels [UL 2703:2015 Ed.1+R:24Mar2021]

Brand Name:
SunPower ; InvisiMount

Relevant Standards:
Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels [UL 2703:2015 Ed.1+R:24Mar2021]

Verification Issuing Office Name & Address:
Intertek Testing Services NA, Inc.
25800 Commerce Drive
Lake Forest, CA 92630 USA

Date of Tests:
September-27-2022 to October-11-2022

Test Report Number(s):
105208800LAX-001

Signature

Name: Abdullah Alharbi
Position: PV Engineer
Date: 12 April 2023

This Verification is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client, in accordance with the agreement, for any loss, expense or damage occasioned by the use of this product or service and/or for any loss, expense or damage occasioned by the use of this product or service. The Client is authorized to permit copying or distribution of this Verification for use of the Intertek e-mail for the sale or advertisement of the tested material. Verification by Intertek does not imply that the material, product, or service is or has ever been under an Intertek certification program.

This is an Appendix to Test Verification of Conformity Number: 105370452-LAX-VOC1.

APPENDIX: Test Verification of Conformity

Approved Module list

Module Manufacturer	Model
SunPower Corporation	SPR-XYX-###-(COM), where X can be "E" or "A" denoting cell type, where YY represents numbers 18, 19, 20, 21, or blanks and ### represents any number from 450 to 310 and 274 to 233;
	SPR-EYY-###, where YY represents numbers 18, 19, 20 or 21, and ### represents any number from 345 to 285 and 250 to 225.
	SPR-MXXX & SPR-MAXE-XXX, may be followed by -BLK, where XXX is 385-440.
	SPR-E or SPR-X followed by 18, 19, 20, 21, 22, followed by -XXX where XXX is 320-370, may be followed by -BLK, followed by C, D, E, may be followed by -AC
	SPR-XXXE/NE-WHT/BLK-U-VYYACPV and SPR-V-WW-XXX-Y-Z-G-AC, where "XXX" is the wattage of the panel and ranges from 250 to 225, and where "YYY" indicates the inverter voltage used in the module, and can be blank, 240 or 208/240.
	SPR-AXXX-G-AC or SPR-AXXXBLK-G-AC where "XXX" denotes output power, "G" denotes inverters, "BLK" represents backsheet color, "AC" indicates AC module.
	SPR-AXXX-H-AC where "XXX" is the wattage range of 350 to 425, "H" Denotes the inverter, and "AC" indicates AC modules.
	SPR-MXXX-VYY-Z-AC, where XXX is 380-440
	All models identified must have the Gen 5 frame and have a module fire performance, Type 2

SunPower Corporation	72-cell model with Gen 4.2 frame only: SPR-AXXX-COM or SPR-MAXS-XXX-COM, may be followed by BLK, where XXX is 380-460
	66-cell model with Gen 4.2 frame only: SPR-AXXX, may be followed by -COM, and/or -300V, followed by MLSD, where XXX is 350-425.
	72-cell model with Gen 4.2 frame only: SPR-AXXX, may be followed by -COM, and/or -300V, followed by MLSD, where XXX is 430-60
	SPR-UXXX-BLK, where XXX is 395-415
	Q.PEAK DUO BLK ML-G10+ XXX, where XXX is 370-425
Hanwha	Q.PEAK DUO BLK-G10+ XXX, where XXX is 350-370
	Q.PEAK DUO BLK ML-G10+ XXX, where XXX is 385-405
	RECxxxNP2, may be followed by Black, where xxx is 350-380.
REC	RECxxxTP4, may be followed by Black, where xxx is 355-380.
	RECxxxAA Black, where xxx is 340-385.

This Verification is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client, in accordance with the agreement, for any loss, expense or damage occasioned by the use of this product or service and/or for any loss, expense or damage occasioned by the use of this product or service. The Client is authorized to permit copying or distribution of this Verification for use of the Intertek e-mail for the sale or advertisement of the tested material. Verification by Intertek does not imply that the material, product, or service is or has ever been under an Intertek certification program.

	RECxxxxA PURE, where xxx is 380-415.
Trina	TSM-xxxxDE06X.05(II), where xxx is 355-380
Canadian Solar	CS3N-xxxxM5, xxx is 375-435
Waaree	WSMDI-XXX, XXX is 360-380, 395-415
Jinko	WSMDI8-XXX, XXX is 360-380, 395-455 JFMxxxxM-6RL3-B, where xxx is 365-400
Aptos Solar	DNA-108-BF10-xxxxW, xxx is 385-410. DNA-120-BF26-xxxxW, where xxx is 350-370. DNA-120-MF26-xxxxW, where xxx is 360-370
The Universal InvisiMount System was evaluated for fire rating with Type 1 and Type 2 modules.	



Signature

Name: Abdullah Alharbi
Position: PV Engineer
Date: 12 April 2023



Improve Support, Reduce Costs

An intuitive monitoring website enables you to:

- See a visual map of customer sites
- Remotely manage hundreds of sites
- Remotely diagnose and troubleshoot system issues
- Drill down for the status of individual devices

Add Value for Customers

With mySunPower™ monitoring customers can:

- Track their energy production by day, month, year and in different weather conditions
- See their energy use and estimated bill savings
- Maximize their savings with automatic system alerts and tips
- Customize storage settings and easily monitor and track available battery power
- Receive elective system reports

SunPower® Monitoring— Plug-and-Play Installation

This complete solution for residential monitoring and control includes the SunPower® PV Supervisor (PVS) which improves the installation process, overall system reliability, and customer experience:

- Compact footprint for improved aesthetics
- Robust cloud connectivity and comprehensive local connectivity
- Flexible configuration of devices during installation
- Consumption metering
- Revenue-quality production metering
- Web-based commissioning
- Remote diagnostics of PVS and inverters
- Durable UL Type 3R enclosure helps reduce maintenance costs
- Easy integration with SunPower eBOS

Robust Cloud Connectivity

Multiple options to maintain optimal connectivity:

- Hardwired Ethernet
- WiFi
- Cellular backup



sunpower.com

SUNPOWER®

**SunPower® Pro Fleet
Management for Installers**

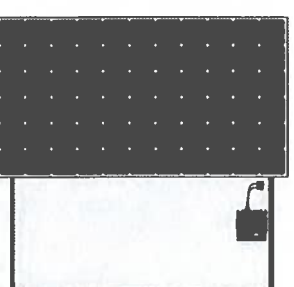
**mySunPower™ for
Homeowners**



PVS



SunPower® AC Modules



Site Requirements	
Number of modules supported per PVS	• 85 (SunPower AC modules)
Internet access	• High-speed internet access via accessible router or switch
Power	• 100-240 VAC (L-N), 50 or 60 Hz • 208 VAC (L-L, in phase 3), 60 Hz
Mechanical	
Weight	• 5.5 lb (2.5 kg)
Dimensions	• 11.8 x 8.0 x 4.2 in (30.5 x 20.5 x 10.8 cm)
Enclosure rating	• UL 50E Type 3R
Operating Conditions	
Temperature	• -22°F to +140°F (-30°C to +60°C)
Humidity (max.)	• 95%, non-condensing
Warranty and Certifications	
Warranty	• 10-year Limited Warranty
Certifications	• UL, CUL, CE, UL 61010-1 and -2, FCC Part 15 (Class B)
Communication	
RS-485	• Supports string inverters, external meters, and other auxiliary devices
Integrated metering	• One channel of revenue-quality production metering • Two channels of consumption metering
Ethernet	• 1 LAN (or optional WAN) port
PLC	• Supports SunPower AC modules
WiFi	• 802.11b/g/n 2.4 GHz and 5 GHz
Cellular	• LTE Cat-M1/3G UMTS
ZigBee	• IEEE 802.15.4 MAC, 2.4 GHz ISM band
Data storage	• 60 days
Upgrades	• Automatic, firmware upgrades
Web and Mobile Device Support	
Customer site	• mysunpower.com
Partner site	• monitor.sunpower.com
Browsers	• Firefox, Safari, and Chrome
Mobile devices	• iPhone®, iPad®, and Android™
Customer app	<ol style="list-style-type: none"> 1 Create account online at mysunpower.com 2 Or on a mobile device, download the SunPower Monitoring app from Apple App Store or Google Play™ Store 3 Sign in using account email and password



SUNPOWER®

© 2015 SunPower Corporation. All rights reserved. SUNPOWER, the SunPower logo and mySunPower are trademarks or registered trademarks of SunPower Corporation in the U.S. and other countries, as well as other countries, as well as trademarks of their respective owners.

SP0520 Rev D



InvisiMount™ Rail-Mounted Junction Box (RMJ) v2

70% larger than original InvisiMount J-box. Integrated grounding to InvisiMount rail, replacing grounding lug assembly. Snap-on attachment for fast and secure installation.



Composition Shingle Roof Transition Junction Box

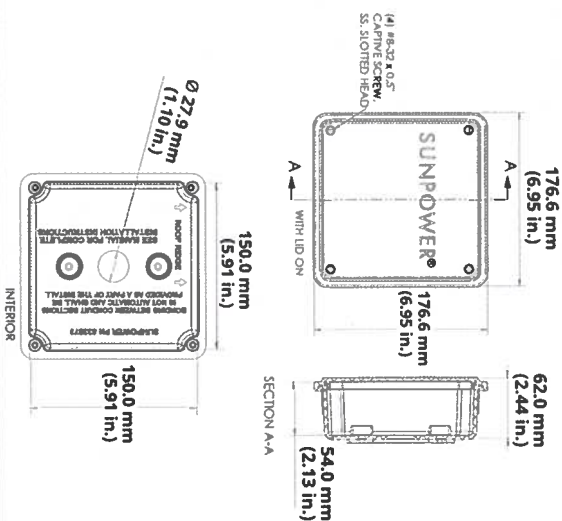
- Enables transitioning conductors directly through the roof.
- Integrated flashing for peace of mind.
- Compatible with composition shingle roofs.

SPECIFICATIONS

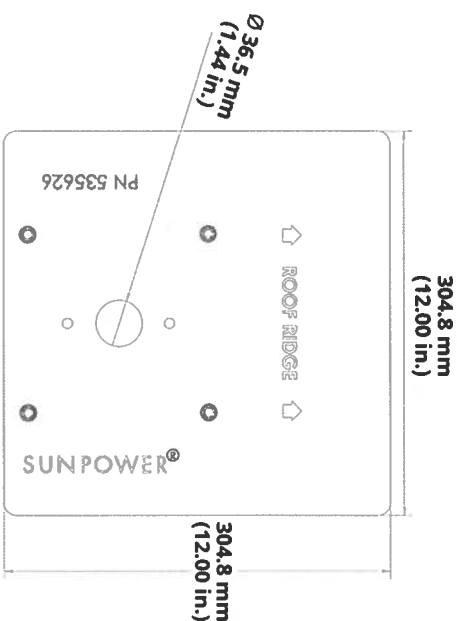
Model	RMJ v2	Comp Shingle Transition J-Box
Kit Part Number	530167	530168
Max. Voltage Rating	600 V (AC or DC)	
Ambient Temp. Range	-35°C to 75°C (-31°F to 167°F)	
Enclosure Material	Flame-retardant, UV-resistant, high-impact resistant resin	
Attachment/Flashing Material	304 stainless steel	Steel w/zinc-aluminum coating
cavity Dimensions	150 x 150 x 62 mm (5.91" x 5.91" x 2.13")	
Enclosure Volume	1150 cc (70 in³)	
Attachment/Flashing Finish	Black oxide	Black powder coat
Compatibility	InvisiMount rail	Comp shingle roofs
Assembled Weight	0.78 kg (1.7 lb)	1.27 kg (2.8 lb)
Certifications & Ratings	<ul style="list-style-type: none"> • Watertight, UL Type 4 • UL 94 5VA • UL 1741 • UL 2703 (with InvisiMount) 	<ul style="list-style-type: none"> • Watertight, UL Type 4 • UL 94 5VA • UL 1741
Additional Hardware Included	<ul style="list-style-type: none"> • 3/4" cord grip • Lay-in lug 	<ul style="list-style-type: none"> • 3/4" cord grip • #12 screws with EPDM washer

COMPONENT DIMENSIONS

J-Box Enclosure (used in both RMJ and Transition J-box)



Flashing (used only with Transition J-Box)



Product data sheet

Characteristics

DU323RB

Safety switch, general duty, non fusible, 100A, 3 poles, 30 hp, 240 VAC, NEMA 3R, bolt-on provision

Product availability : Stock - Normally stocked in distribution facility



Price* : 816,00 USD



Main

Product	Single Throw Safety Switch
Current Rating	100 A
Certifications	UL listed file E2875
Enclosure Rating	NEMA 3R
Disconnect Type	Non-fusible disconnect switch
Factory Installed Neutral	None
Mounting Type	Surface
Number of Poles	3
Electrical Connection	Lugs
Duty Rating	General duty
Voltage Rating	240 V AC
Wire Size	AWG 14...AWG 1 copper AWG 12...AWG 1 aluminum

Complementary

Short-circuit withstand	200 kA
Maximum Horse Power Rating	15 hp 240 V AC 60 Hz 1 phase NEC 430.52 30 hp 240 V AC 60 Hz 3 phase NEC 430.52
Tightening torque	35 lbf.in (3.95 N.m) 0.00... 0.01 in ² (2.08...5.26 mm ²) AWG 14...AWG 10) 40 lbf.in (4.52 N.m) 0.01 in ² (8.37 mm ²) AWG 8) 45 lbf.in (5.08 N.m) 0.02...0.03 in ² (12.3...21.12 mm ²) AWG 6...AWG 4) 50 lbf.in (5.65 N.m) AWG 3...AWG 1)
Height	17.5 in (444.50 mm)
Width	10.5 in (266.70 mm)

* Price is "List Price" and may be subject to a trade discount - check with your local distributor or retailer for actual price

Mar 28, 2021



1

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

Product data sheet

Characteristics

D223NRB

Safety switch, general duty, fusible, 100A, 2 poles, 30 hp, 120 VAC, NEMA 3R, bolt-on provision, neutral factory installed

Product availability : Stock - Normally stocked in distribution facility

SQUARE D



Price* : 480,00 USD



Main

Product	Single Throw Safety Switch
Current Rating	100 A
Certifications	UL listed file E2875
Enclosure Rating	NEMA 3R
Disconnect Type	Fusible disconnect switch
Factory Installed Neutral	Neutral (factory installed)
Short Circuit Current Rating	100 kA maximum depending on fuse H, K or R
Mounting Type	Surface
Number of Poles	2
Electrical Connection	Lugs
Duty Rating	General duty
Voltage Rating	240 V AC
Wire Size	AWG 14...AWG 1 copper AWG 12...AWG 1 aluminum

Complementary

Maximum Horse Power Rating	7.5 hp 240 V AC 60 Hz 1 phase NEC 240.6 15 hp 240 V AC 60 Hz 3 phase NEC 240.6 30 hp 240 V AC 60 Hz 3 phase NEC 430.52
Tightening torque	35 lbf.in (3.95 N.m) 0.00... 0.01 in ² (2.08...5.26 mm ²) AWG 14...AWG 10) 40 lbf.in (4.52 N.m) 0.01 in ² (8.37 mm ²) AWG 8) 35 lbf.in (3.95 N.m) AWG 14...AWG 10) 45 lbf.in (5.08 N.m) 0.02... 0.03 in ² (12.3...21.12 mm ²) AWG 6...AWG 4) 50 lbf.in (5.65 N.m) AWG 3...AWG 1)
Height	17.5 in (444.50 mm)

* Price is "List Price" and may be subject to a trade discount - check with your local distributor or retailer for actual price

Mar 28, 2021



1

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

KUP-L-Tap® Insulation Piercing Connectors Dual Rated

ROHS
Compliant

UL
LISTED
8201

CSA
143399

TYPE IPC



- Features**
- Body molded from tough, resilient glass-filled nylon
 - Copper plated
 - Tin plated copper contact teeth
 - Insulation piercing
 - Perforated end tabs
 - Pre-filled with silicone lubricant
 - Versatile
 - Increased safety
 - Horizontal line grid
 - Temperature rating 90° C

- Benefits**
- Provides high degree of breakage resistance and long dependable use
 - Easily penetrates most types of insulation
 - No need to strip the conductor which saves installation time
 - Break out easily by hand
 - Prevents oxidation and moisture from entering the contact area
 - Can be used as a splice or tap connector
 - Contains no external energized parts. Can be installed "hot" on energized conductors providing tap conductor is not under load.
 - Provides a visual guide for proper installation of conductors

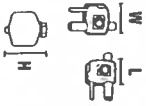


Fig. 1



Fig. 2



Fig. 3



Fig. 4

Catalog Number	Figure Number	Wire Range		Vents	Current Rating			Dimensions		Torque Ft. Lbs.	Bolt Head Size
		Main	Tap		CU	AL	L	W	H		
IPC-10-2	3	10-8	2-8	300 (480 Grounded V System)	130	100	1-7/8	1-15/32	2-5/16	16	1/2
IPC-40-6	2	40-4	6-14	600	75	60	1-27/64	1	1-7/8	13	1/2
IPC-40-20		40-2	20-6	600	195	150	1-21/32	1-7/8	2-7/8	25	1/2
IPC-250-40		250cmil-1	40-6	600	260	205	1-7/8	2-11/32	3-11/32	30	5/8
IPC-350-40		350cmil-40	40-10	300 (480 Grounded V System)	280	205	1-43/64	2-7/16	3-1/8	25	5/8
IPC-350-350		350cmil-40	350cmil-40	300 (480 Grounded V System)	350	280	2-43/64	2-23/32	3-1/4	25	5/8
IPC-500-12		500cmil-250cmil	10-12	300 (480 Grounded V System)	40	35	1-43/64	2-7/16	3-1/4	25	5/8
IPC-500-250		500cmil-250cmil	250cmil-4	600	290	230	2-27/64	2-29/32	3-3/4	55	58-11/16
IPC-500-500		500cmil-300cmil	500cmil-250cmil	600	430	350	3-3/16	3-5/8	5	75	708-7/8
IPC-750-500		750cmil-500cmil	500cmil-350cmil	600	430	350	3-3/16	3-5/8	5	75	708-7/8

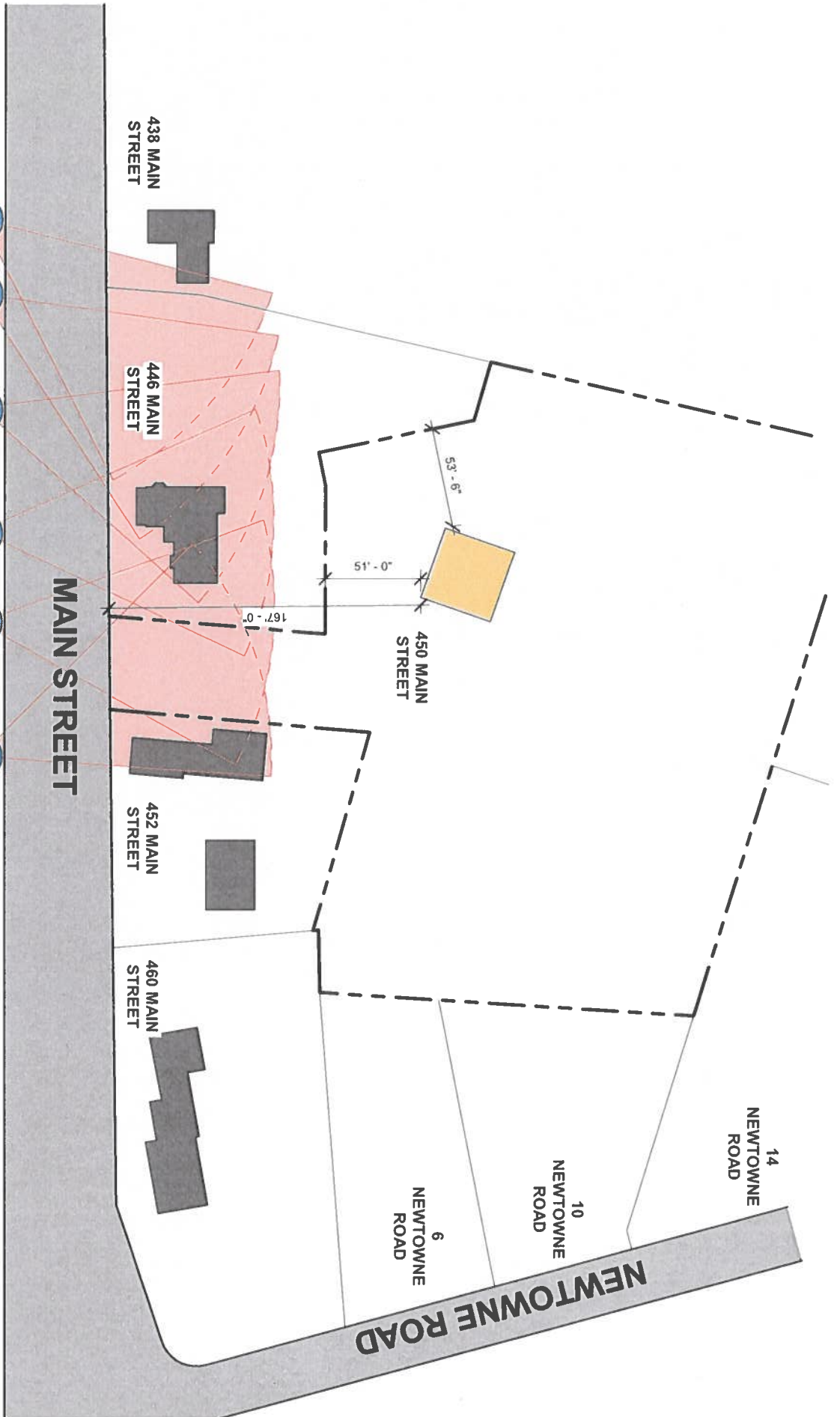
All wire sizes, unless noted otherwise, are American Wire Gauge (AWG)

Tested to UL 488A/B, UL File E5207

E



4730 Madison Road, Cincinnati, Ohio 45227-1426 Phone 513 533-6200 Fax 513 871-4084 Web site www.ilSCO.com
Canada 1050 Lakeshore Road East, Mississauga, Ontario, Canada L5E1E4 Phone 905 274-2341 Fax 905 274-8763



- 1
- 2
- 3
- 4
- 5
- 6

1 SITE PLAN
1" = 50'-0"



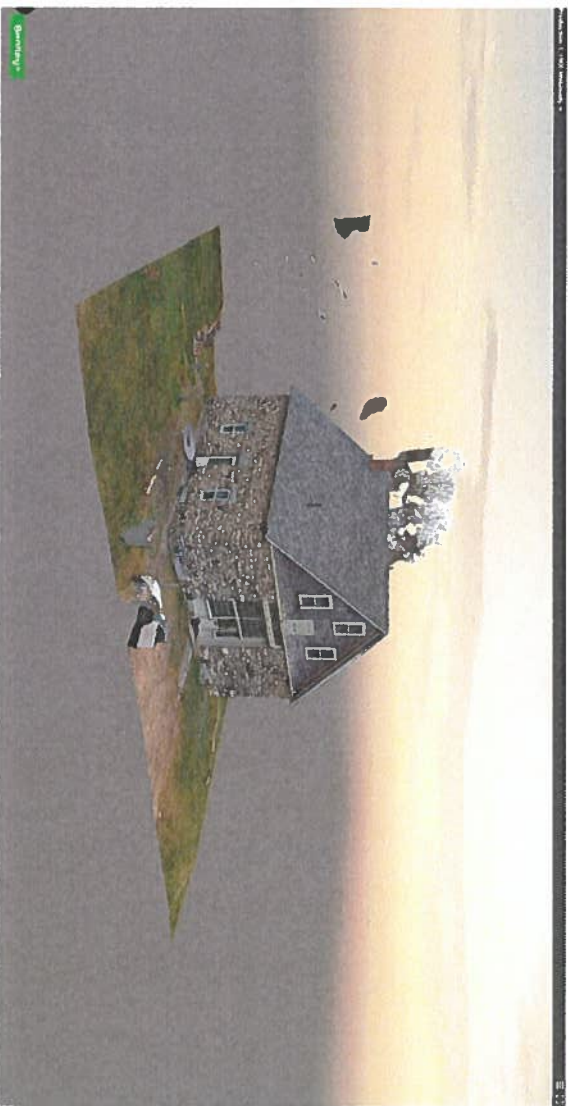
studio umbra
architecture
10 111 1st Ave N
PO Box 8000
Newtowne, VA 22640
www.studio-umbra.com
info@studio-umbra.com

450 MAIN STREET, ACTION
SITE PLAN



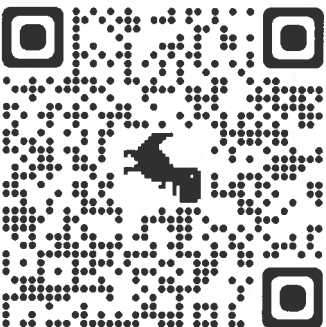
Project number
Date
Scale
Drawn By
Ref/ASJ#
Re: Drawing #

10/10/23
1" = 50'-0"
Author



PHOTOGRAMMETRY MODEL NOTES

<https://hosting.studio-umbra.com/450%20Main/App>



450 MAIN STREET
PHOTOGRAMMETRY MODEL
QR LINK CODE

1. REFER TO INCLUDED QR CODE FOR PHOTOGRAMMETRIC MODEL SHOWING EXISTING CONDITIONS OF THE BUILDING AND OF THE EXTERIOR WORK AREA. GC SHALL BECOME FAMILIAR WITH EXISTING CONDITIONS OF THE BUILDING AND FULL EXTENT OF THE SCOPE OF WORK PRIOR TO SUBMITTING A BID OR COMMENCEMENT OF WORK. PHOTOGRAMMETRY MODEL CONSISTS OF A 3D SCAN OF THE CURRENT CONDITION OF THE BUILDING USING AN AERIAL DRONE.
2. PHOTOGRAMMETRY MODEL IS FOR REFERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR FULL SCOPE OF WORK. EXISTING CONDITIONS AS SHOWN IN MODEL MAY HAVE CHANGED AND BE DIFFERENT THAN CURRENTLY PRESENT.
3. PHOTOGRAMMETRY MODEL CAN BE MEASURED, HOWEVER ALL MEASUREMENTS TAKEN FROM MODEL MUST BE FIELD VERIFIED. NO MEASUREMENTS TAKEN OFF OF PHOTOGRAMMETRIC MODEL SHALL BE DEEMED VALID UNLESS CONFIRMED IN FIELD.
4. REFER TO TOP RIGHT MENU SELECTION WITHIN BENTLEY UI FOR NAVIGATION CONTROLS.
5. REFER TO TOP RIGHT MENU SELECTION WITHIN BENTLEY UI FOR MEASURING TOOLS. NOTE ALL MEASUREMENTS GIVEN IN METRIC UNITS.

CC:

studio umbra



studio umbra
architecture

171 SAN JOSE
AVENUE, SUITE 100
P.O. BOX 80004
SAN JOSE, CA 95181
www.studio-umbra.com
engineers@studio-umbra.com

450 MAIN STREET, ACTON
PHOTOGRAMMETRY MODEL

Project number

Date

Scale

Drawn By

Revised By

Revised By

Revised By

10/10/23

1/4" = 1'-0"

EFV