MONTGOMERY COUNTY HISTORIC PRESERVATION COMMISSION  
STAFF REPORT

<table>
<thead>
<tr>
<th>Address:</th>
<th>7224 Carroll Ave., Takoma Park</th>
<th>Meeting Date:</th>
<th>12/4/2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicant:</td>
<td>Depeswar Doley</td>
<td>Public Notice:</td>
<td>11/20/2019</td>
</tr>
<tr>
<td>Review:</td>
<td>HAWP</td>
<td>Tax Credit:</td>
<td>n/a</td>
</tr>
<tr>
<td>Case Number:</td>
<td>37/03-19GGG</td>
<td>Staff:</td>
<td>Dan Bruechert</td>
</tr>
<tr>
<td>Proposal:</td>
<td>Solar Panel Installation</td>
<td></td>
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</tr>
</tbody>
</table>

**RECOMMENDATION**
Staff recommends that the Historic Preservation Commission **approve** the HAWP application.

**PROPERTY DESCRIPTION**
SIGNIFICANCE: Non-Contributing Resource to the Takoma Park Historic District
STYLE: Commercial
DATE: 1970

*Figure 1: 7224 Carroll is an auto repair shop in Takoma Junction.*
PROPOSAL

The applicant proposes to install 36 (thirty-six) solar panels on the existing canopy and an additional 25 (twenty-five) solar panels on the roof.

APPLICABLE GUIDELINES

When reviewing alterations and additions for new construction to Contributing Resources within the Takoma Park Historic District, decisions are guided by the Takoma Park Historic District Design Guidelines (Design Guidelines) and Montgomery County Code Chapter 24A (Chapter 24A) and the Secretary of the Interior’s Standards for Rehabilitation (The Standards).

Takoma Park Historic District Design Guidelines

There are two very general, broad planning and design concepts which apply to all categories. These are:

The design review emphasis will be restricted to changes that are at all visible from the public right-of-way, irrespective of landscaping or vegetation (it is expected that the majority of new additions will be reviewed for their impact on the overall district), and,

The importance of assuring that additions and other changes to existing structures act to reinforce and continue existing streetscape, landscape, and building patterns rather than to impair the character of the district.

Non-Contributing/Out-of-Period Resources should receive the most lenient level of design review. Most alterations and additions to Non-Contributing/Out-of-Period Resources should be approved as a matter of course. The only exceptions would be major additions and alterations to the scale and massing of Non-Contributing/Out-of-Period Resources which affect the surrounding streetscape and/or landscape and could impair character of the district as a whole.

Montgomery County Code, Chapter 24A Historic Resources Preservation

(b) The commission shall instruct the director to issue a permit, or issue a permit subject to such conditions as are found to be necessary to insure conformity with the purposes and requirements of this chapter, if it finds that:

(1) The proposal will not substantially alter the exterior features of an historic site or historic resource within an historic district; or

(2) The proposal is compatible in character and nature with the historical, archeological, architectural or cultural features of the historic site or the historic district in which an historic resource is located and would not be detrimental thereto or to the achievement of the purposes of this chapter; or

(6) In balancing the interests of the public in preserving the historic site or historic resource located within an historic district, with the interests of the public from the use and benefit of the alternative proposal, the general public welfare is better served by granting the permit.

(d) In the case of an application for work on an historic resource located within an historic district, the commission shall be lenient in its judgment of plans for structures of little historical or design significance or for plans involving new construction, unless such plans would seriously impair the historic or architectural value of surrounding historic resources or would impair the character of the historic district. (Ord. No. 9-4, § 1; Ord. No. 11-59.)

Secretary of the Interior’s Standards for Rehabilitation

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work
shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportions, and massing to protect the integrity of the property and its environment.

10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

**STAFF DISCUSSION**

The applicant proposes to install 36 (thirty-six) solar panels on the existing canopy and an additional 25 (twenty-five) solar panels on the roof of the commercial building.

When first constructed in the 1970s, there was a canopy that covered the gas pumps. At some point, a replacement canopy was installed in the same location. It covers the new EV chargers. The existing canopy is a replacement of the non-historic canopy. The applicant proposes to install 36 (thirty-six) solar panels flat to the roof of the canopy.

In addition to the panels on the canopy, the applicant proposes installing 25 (twenty-five) solar panels on the roof of the service station building. The panels installed on the roof will be tilted up at a 10˚ angle. The application did not detail the height of the parapet on this building, however, based on aerial photographs it does not appear to be very tall. It is likely the solar panels may be partially visible from the right of way.

Staff finds that the proposed solar panels will not have an impact on the scale or massing of the property and should be approved under the Design Guidelines. Additionally, 24A-8(d) directs the HPC to be lenient in the review of proposals to structures that have little architectural or design significance, as is the case with this 1970 gas station. Lastly, Staff would like to recognize that the City of Takoma Park and Montgomery County have issued climate emergencies, determining that it is imperative to restore a safe climate and make strides to eliminate greenhouse gas emissions. Staff finds that under these resolutions, approval of the proposal is additionally supported under 24A-8(b)(6).

**STAFF RECOMMENDATION**

Staff recommends that the Commission approve the HAWP application under the Criteria for Issuance in Chapter 24A-8(b)(2) and (6) and 24A-8(d), having found that the proposal will not substantially alter the exterior features of the historic resource and is compatible in character with the district and the purposes of Chapter 24A; and with the Secretary of the Interior’s Standards for Rehabilitation #2, #9, and #10, and with the general condition that the applicant shall present the 3 permit sets of drawings, if applicable, to Historic Preservation Commission (HPC) staff for review and stamping prior to submission for the Montgomery County Department of Permitting Services (DPS) building permits;

and with the general condition that final project design details, not specifically delineated by the Commission, shall be approved by HPC staff or brought back to the Commission as a revised HAWP application at staff’s discretion;

and with the general condition that the applicant shall notify the Historic Preservation Staff if they propose to make any alterations to the approved plans. Once the work is completed the applicant will contact the staff person assigned to this application at 301-563-3400 or dan.bruechert@montgomeryplanning.org to schedule a follow-up site visit.
APPLICATION FOR
HISTORIC AREA WORK PERMIT

Contact Email: Sarah Feit

Tax Account No.: 2040-620-3471

Name of Property Owner: Deepsaw Doley

Address: 724 Carroll Avenue, Takoma Park, MD 20912

Contactor: Revolution Solar

Contractor Registration No.: 10/39

Agent for Owner: Matthew Young

Location of Work: Carroll Avenue

House Number: 724

Street: Carroll Avenue

Town/City: Takoma Park

Nearest Cross Street: Grant Avenue

Lot: 12 Block: 0025 Subdivision: 2035

PART ONE: TYPE OF PERMIT/ACTIVITY AND USE

1A. CHECK ALL APPLICABLE: 
- Construct 
- Extend 
- Alter/Remodel 
- Move 
- Repair 
- Replace 
- Other: $167,710

1B. If this is a revision of a previously approved permit, see Permit #

PART TWO: COMPONENTS FOR NEW CONSTRUCTION AND EXTENSIONS/ADDITIONS

2A. Type of sewage disposal: 
- WSSC 
- Septic 
- Other: N/A

2B. Type of water supply: 
- WSSC 
- Well 
- Other: N/A

PART THREE: COMPONENTS FOR EXISTING WALL

3A. Height: feet inches

3B. Indicate whether the fence or retaining wall is to be constructed on one of the following locations:
- On property line/property line
- Entirely on land of owner
- On public right of way/assessment

I hereby certify that I have the authority to make the foregoing application, that the application is correct, and that the construction will comply with plans approved by all agencies listed and I hereby acknowledge and accept this to be a condition for the issuance of this permit.

Matthew Young
Signature of owner or authorized agent
11/1/19

Approved: 
For Chairperson, Historic Preservation Commission

Disapproved: 
Signature: 
Date:

Applications/Permit No.: 
Date Filed: 
Date Issued:

SEE REVERSE SIDE FOR INSTRUCTIONS
THE FOLLOWING ITEMS MUST BE COMPLETED AND THE REQUIRED DOCUMENTS MUST ACCOMPANY THIS APPLICATION.

1. WRITTEN DESCRIPTION OF PROJECT
   a. Description of existing structure(s) and environmental setting, including their historical features and significance:

   Installing solar panels on canopy and main roof of building.
   Canopy is standing seam.
   Main building is flat roof.

   b. General description of project and its effect on the historic resource(s), the environmental setting, and, where applicable, the historic district:

   We are not changing any of the environmental setting or historic resources. We are not changing the facades. Flat roof panels will not be visible to street. Canopy is tall and should also not impact.

SITE PLAN

Site and environmental setting, drawn to scale. You may use your plot. Your site plan must include:

a. The scale, north arrow, and date;

b. Dimensions of all existing and proposed structures;

c. Site features such as walkways, driveways, fences, ponds, streams, trash dumpsters, mechanical equipment, and landscaping.

PLANS AND ELEVATIONS

You must submit 2 copies of plans and elevations in a format no larger than 11" x 17". Plans on 8 1/2" x 11" paper are preferred.

a. Schematic construction plans, with marked dimensions, indicating location, size and general type of walls, window and door openings, and other fixed features of both the existing resource(s) and the proposed work.

b. Elevations (facades), with marked dimensions, clearly indicating proposed work in relation to existing construction and, when appropriate, context. All materials and fixtures proposed for the exterior must be noted on the elevations drawings. An existing and a proposed elevation drawing of each facade affected by the proposed work is required.

MATERIALS SPECIFICATIONS

General description of materials and manufactured items proposed for incorporation in the work of the project. This information may be included on your design drawings.

PHOTOGRAPHS

a. Clearly labeled photographic prints of each facade of existing resource, including details of the affected portions. All labels should be placed on the front of photographs.

b. Clearly label photographic prints of the resource as viewed from the public right-of-way and of the adjoining properties. All labels should be placed on the front of photographs.

TREE SURVEY

If you are proposing construction adjacent to or within the drip line of any tree 6" or larger in diameter (at approximately 4 feet above the ground), you must file an accurate tree survey identifying the size, location, and species of each tree of at least that dimension.

ADDRESS OF ADJACENT AND CONFRONTING PROPERTY OWNERS

For all projects, provide an accurate list of adjacent and confronting property owners (not tenants), including names, addresses, and zip codes. This list should include the owners of all lots or parcels which adjoin the parcel in question, as well as the owner(s) of lot(s) or parcel(s) which lie directly across the street/highway from the parcel in question.

PLEASE PRINT IN BLUE OR BLACK INK OR TYPE THIS INFORMATION ON THE FOLLOWING PAGE.
PLEASE STAY WITHIN THE GUIDES OF THE TEMPLATE, AS THIS WILL BE PHOTOCOPIED DIRECTLY ONTO MAILING LABELS.
### HAWP APPLICATION: MAILING ADDRESSES FOR NOTIFYING
[Owner, Owner's Agent, Adjacent and Confronting Property Owners]

<table>
<thead>
<tr>
<th>Owner's mailing address</th>
<th>Owner's Agent's mailing address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depesmar Doley</td>
<td>Revolution Solar</td>
</tr>
<tr>
<td>7224 Carroll Avenue</td>
<td>10746 Judy Lane</td>
</tr>
<tr>
<td>Takoma Park, MD 20912</td>
<td>Columbia, MD 21044</td>
</tr>
</tbody>
</table>

#### Adjacent and confronting Property Owners mailing addresses

<table>
<thead>
<tr>
<th>Address</th>
<th>Takoma Park, MD 20912</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 Grant Avenue</td>
<td>7330 Carroll Avenue</td>
</tr>
<tr>
<td>Takoma Park, MD 20912</td>
<td>Takoma Park, MD 20912</td>
</tr>
<tr>
<td>7216 Carroll Avenue</td>
<td>7221 Carroll Avenue</td>
</tr>
<tr>
<td>Takoma Park, MD 20912</td>
<td>Takoma Park, MD 20912</td>
</tr>
</tbody>
</table>
STANDING SEAM W/ 4" SJ ROLLER IRON, 1" WALL THICKNESS, 12" ROLL OF 25 FEET.

ACE CLAMP, TYP. FIELD VERIFY EQUAL PROFILE AND SPACING.

6X1/2 STEEL TUBES 7.9" X 2.5" 12" O.C., TYP.

AEROCOMPACT FLAT S 10' RAIL, TYP.

16" X 7.25" 1-BEAM MID SUPPORT, TYP.

4'-0" SET BACK, TYP.

Ironridge XR100, TYP.

B RACKING DETAIL

1 2 3 4

REVISION HISTORY

Page 9
Digitally signed by David R. Hall
Date: 2019.11.01
11:47:21 -04'00
ELECTRICAL PLAN

STRING A: 9 MODS

STRING B: 13 MODS

STRING C: 10 MODS

STRING A: 16 MODS

STRING B2: 13 MODS

KEYED NOTES:
1. (N) AC DISCONNECT
2. (N) SOLAREDGE SE6KUS (208)
3. (N) PV MODULE
4. (N) SE P400 POWER OPTIMIZER
5. (N) AC PV COMBINER
6. (E) METER
7. (E) SERVICE PANEL

Digitally signed by David R. Hall
Date: 2019.11.01
'11:47:53 -04'00

REVOLUTION SOLAR
10746 JUDY LANE
COLUMBIA, MD 21044
Ph: (443) 265-5039
Contractor 101129

RS AUTO INC.
Residential Building Grid Interactive Solar Installation
7224 CARROLL AVE, TAKOMA PARK, MD 20912
Ph: (240) 520-3471

SYSTEMS TOTAL:
System AC Size @ STC: 92.4 kW
System DC Size @ STC: 92.67 kW

R6A 13M-7000EH (208) PV MODULES & (8) SE P400 POWER OPTIMIZERS

DRAWN BY:
DA

REV. PERMIT SET
Page
PV-3
Q.PEAK DUO BLK-G5 300-320

Q.ANTUM SOLAR MODULE

The new Q.PEAK DUO BLK-G5 solar module from Q CELLS impresses with its outstanding visual appearance and particularly high performance on a small surface thanks to the innovative Q.ANTUM DUO Technology. Q.ANTUM's world-record-holding cell concept has now been combined with state-of-the-art circuitry half cells and a six-busbar design, thus achieving outstanding performance under real conditions — both with low-intensity solar radiation as well as on hot, clear summer days.

Q.ANTUM TECHNOLOGY: LOW LEVELIZED COST OF ELECTRICITY
Higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 19.3%.

INNOVATIVE ALL-WEATHER TECHNOLOGY
Optimal yields, whatever the weather with excellent low-light and temperature behavior.

ENDURING HIGH PERFORMANCE
Long-term yield security with Anti LID Technology, Anti PID Technology, Hot-Spot Protect and Traceable Quality Tra.Q™.

EXTREME WEATHER RATING
High-tech aluminum alloy frame, certified for high snow (5400 Pa) and wind loads (4000 Pa) regarding IEC.

A RELIABLE INVESTMENT
Inclusive 12-year product warranty and 25-year linear performance guarantee².

STATE OF THE ART MODULE TECHNOLOGY
Q.ANTUM DUO combines cutting edge cell separation and innovative wiring with Q.ANTUM Technology.

THE IDEAL SOLUTION FOR:

Engineered in Germany

1 APT test conditions according to IEC61215-1-2015, method B (-1500V, 158h)
2 See data sheet on rear for further information.
**MECHANICAL SPECIFICATION**

- **Format**: 66.3 in x 39.4 in x 1.26 in (including frame)
  - (1685 mm x 1000 mm x 32 mm)
- **Weight**: 41.2 lbs (18.7 kg)
- **Front Cover**: 0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
- **Back Cover**: Composite film
- **Frame**: Black anodized aluminum
- **Cell**: 6 x 20 monocrystalline QANTUM solar half-cells
- ** Junction Box**: 2.76-3.95 in x 1.97-2.76 in x 0.51-0.83 in
  - (70-85 mm x 50-70 mm x 13-21 mm) decentralized, IP67
- **Cable**: 4 mm² Solar cable; (+) ≥ 43.3 in (1100 mm), (-) ≥ 43.3 in (1100 mm)
- **Connector**: Multi-Contact MC4, IP68

**ELECTRICAL CHARACTERISTICS**

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<thead>
<tr>
<th>POWER CLASS</th>
<th>300</th>
<th>305</th>
<th>310</th>
<th>315</th>
<th>320</th>
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</thead>
<tbody>
<tr>
<td><strong>MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC</strong> (POWER TOLERANCE +0 W / -0 W)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power at MPP</td>
<td>$P_{pp}$ (W)</td>
<td>300</td>
<td>305</td>
<td>310</td>
<td>315</td>
</tr>
<tr>
<td>Short Circuit Current</td>
<td>$I_{sc}$ (A)</td>
<td>9.72</td>
<td>9.78</td>
<td>9.83</td>
<td>9.89</td>
</tr>
<tr>
<td>Open Circuit Voltage</td>
<td>$V_{oc}$ (V)</td>
<td>39.48</td>
<td>39.75</td>
<td>40.02</td>
<td>40.29</td>
</tr>
<tr>
<td>Current at MPP</td>
<td>$I_{mp}$ (A)</td>
<td>9.25</td>
<td>9.31</td>
<td>9.36</td>
<td>9.41</td>
</tr>
<tr>
<td>Voltage at MPP</td>
<td>$V_{mp}$ (V)</td>
<td>32.43</td>
<td>32.78</td>
<td>33.12</td>
<td>33.46</td>
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<tr>
<td>Efficiency</td>
<td>$\eta$ (%)</td>
<td>≥ 17.8</td>
<td>≥ 18.1</td>
<td>≥ 18.4</td>
<td>≥ 18.7</td>
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**MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NOMT**

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<tr>
<th>POWER LEVEL</th>
<th>224.1</th>
<th>227.8</th>
<th>231.6</th>
<th>235.3</th>
<th>239.1</th>
</tr>
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<tbody>
<tr>
<td><strong>MINIMUM PERFORMANCE AT LOW IRRADIANCE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power at MPP</td>
<td>$P_{pp}$ (W)</td>
<td>224.1</td>
<td>227.8</td>
<td>231.6</td>
<td>235.3</td>
</tr>
<tr>
<td>Short Circuit Current</td>
<td>$I_{sc}$ (A)</td>
<td>7.83</td>
<td>7.88</td>
<td>7.92</td>
<td>7.97</td>
</tr>
<tr>
<td>Open Circuit Voltage</td>
<td>$V_{oc}$ (V)</td>
<td>37.15</td>
<td>37.40</td>
<td>37.66</td>
<td>37.91</td>
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<tr>
<td>Current at MPP</td>
<td>$I_{mp}$ (A)</td>
<td>7.28</td>
<td>7.32</td>
<td>7.37</td>
<td>7.41</td>
</tr>
<tr>
<td>Voltage at MPP</td>
<td>$V_{mp}$ (V)</td>
<td>30.78</td>
<td>31.11</td>
<td>31.44</td>
<td>31.76</td>
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</table>

**Q CELLS PERFORMANCE WARRANTY**

- At least 90% of nominal power during first year. Thereafter, max. 0.54% degradation per year.
- At least 93.1% of nominal power up to 10 years.
- At least 85.0% of nominal power up to 25 years.
- All data within measurement tolerances.
- Full warranties in accordance with the warranty terms of the Q CELLS sales organization of your respective country.

**Q CELLS PERFORMANCE WARRANTY**

**TEMPERATURE COEFFICIENTS**

<table>
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<tr>
<th>Parameter</th>
<th>$\alpha$ (%) / K</th>
<th>$\beta$ (%) / K</th>
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</thead>
<tbody>
<tr>
<td>$I_{pp}$</td>
<td>$-0.04$</td>
<td>$-0.28$</td>
</tr>
<tr>
<td>$V_{mp}$</td>
<td>$-0.37$</td>
<td></td>
</tr>
</tbody>
</table>

**PROPERTIES FOR SYSTEM DESIGN**

- **Minimum System Voltage**: $V_{min} = 1000$ (IEC) / 1000 (UL)
- **Maximum Series Current Rating**: A (DC)
- **Maximum Load**: (UL)
- **Maximum Test Load**: (UL)

**QUALIFICATIONS AND CERTIFICATIONS**

- UL 1703; VDE Quality Tested; CE-compliant
- IEC 61215:2016; IEC 61730:2016, Application class A

**PACKAGING INFORMATION**

- **Number of Modules per Pallet**: 32
- **Weight**: 1415 lbs (642 kg)

**NOTE**: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

Harman B CELLS America Inc.
360 Spectrum Center Drive, Suite 1250, Irvine, CA 92618, USA | TEL: +1 949 748 59 96 | EMAIL: inquiry@b-cells.com | WEB: www.b-cells.us
Enphase IQ 7 and IQ 7+ Microinverters

The high-powered smart grid-ready Enphase IQ 7 Micro™ and Enphase IQ 7+ Micro™ dramatically simplify the installation process while achieving the highest system efficiency.

Part of the Enphase IQ System, the IQ 7 and IQ 7+ Microinverters integrate with the Enphase IQ Envoy™, Enphase IQ Battery™, and the Enphase Enlighten™ monitoring and analysis software.

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)

Productive and Reliable

- Optimized for high powered 60-cell and 72-cell* modules
- More than a million hours of testing
- Class II double-insulated enclosure
- UL listed

Smart Grid Ready

- Complies with advanced grid support, voltage and frequency ride-through requirements
- Remotely updates to respond to changing grid requirements
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL 1741-SA)

* The IQ 7+ Micro is required to support 72 cell modules

To learn more about Enphase offerings, visit enphase.com
## Enphase IQ 7 and IQ 7+ Microinverters

### Input Data (DC)

<table>
<thead>
<tr>
<th>Feature</th>
<th>IQ-7-60-2-US</th>
<th>IQ7PLUS-72-2-US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commonly used module pairings¹</td>
<td>235 W - 350 W+</td>
<td>235 W - 440 W+</td>
</tr>
<tr>
<td>Module compatibility</td>
<td>60-cell PV modules only</td>
<td>60-cell and 72-cell PV modules</td>
</tr>
<tr>
<td>Maximum input DC voltage</td>
<td>48 V</td>
<td>60 V</td>
</tr>
<tr>
<td>Peak power tracking voltage</td>
<td>27 V - 37 V</td>
<td>27 V - 45 V</td>
</tr>
<tr>
<td>Operating range</td>
<td>16 V - 48 V</td>
<td>16 V - 60 V</td>
</tr>
<tr>
<td>Min/Max start voltage</td>
<td>22 V / 48 V</td>
<td>22 V / 50 V</td>
</tr>
<tr>
<td>Max DC short circuit current  (module Isc)</td>
<td>15 A</td>
<td>15 A</td>
</tr>
<tr>
<td>Overvoltage class DC port</td>
<td>II</td>
<td>II</td>
</tr>
<tr>
<td>DC port backfeed current</td>
<td>0 A</td>
<td>0 A</td>
</tr>
<tr>
<td>PV array configuration</td>
<td>1 x 1 ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit</td>
<td></td>
</tr>
</tbody>
</table>

### Output Data (AC)

<table>
<thead>
<tr>
<th>Feature</th>
<th>IQ 7 Microinverter</th>
<th>IQ 7+ Microinverter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak output power</td>
<td>250 VA</td>
<td>255 VA</td>
</tr>
<tr>
<td>Maximum continuous output power</td>
<td>240 VA</td>
<td>250 VA</td>
</tr>
<tr>
<td>Nominal (L-L) voltage/Range²</td>
<td>240 V / 211-254 V</td>
<td>208 V / 211-264 V</td>
</tr>
<tr>
<td></td>
<td>183-229 V</td>
<td>183-229 V</td>
</tr>
<tr>
<td>Maximum continuous output current</td>
<td>1.0 A (240 V)</td>
<td>1.15 A (208 V)</td>
</tr>
<tr>
<td></td>
<td>1.21 A (240 V)</td>
<td>1.39 A (208 V)</td>
</tr>
<tr>
<td>Nominal frequency</td>
<td>60 Hz</td>
<td>60 Hz</td>
</tr>
<tr>
<td>Extended frequency range</td>
<td>47 - 68 Hz</td>
<td>47 - 68 Hz</td>
</tr>
<tr>
<td>AC short circuit fault current</td>
<td>5.8 Arms</td>
<td>5.8 Arms</td>
</tr>
<tr>
<td>Maximum units per 20 A (L-L) branch circuit³</td>
<td>16 (240 VAC)</td>
<td>13 (208 VAC)</td>
</tr>
<tr>
<td></td>
<td>13 (208 VAC)</td>
<td>11 (208 VAC)</td>
</tr>
<tr>
<td>Overvoltage class AC port</td>
<td>III</td>
<td>III</td>
</tr>
<tr>
<td>AC port backfeed current</td>
<td>0 A</td>
<td>0 A</td>
</tr>
<tr>
<td>Power factor setting</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Power factor (adjustable)</td>
<td>0.85 leading ... 0.85 lagging</td>
<td>0.85 leading ... 0.85 lagging</td>
</tr>
</tbody>
</table>

### Efficiency

<table>
<thead>
<tr>
<th>Feature</th>
<th>@240 V</th>
<th>@208 V</th>
<th>@240 V</th>
<th>@208 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak efficiency</td>
<td>97.6 %</td>
<td>97.6 %</td>
<td>97.5 %</td>
<td>97.3 %</td>
</tr>
<tr>
<td>CEC weighted efficiency</td>
<td>97.0 %</td>
<td>97.0 %</td>
<td>97.0 %</td>
<td>97.0 %</td>
</tr>
</tbody>
</table>

### Mechanical Data

- Ambient temperature range: -40°C to +65°C
- Relative humidity range: 4% to 100% (condensing)
- Connectors type: IQ7-60-2-US & IQ7PLUS-72-2-US
- Connection type: MC4 (or Amphenol H4 UTU with additional Q-DCC-5 adapter)
- 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 double-insulated, corrosion resistant polymeric enclosure
- Environmental category / UV exposure rating: NEMA Type 5 / outdoor

### 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 required by NEC 690.

¹ No enforced DC/AC ratio. See the compatibility calculator at [https://enphase.com/en-us/support/module-compatibility](https://enphase.com/en-us/support/module-compatibility)

² Nominal voltage range can be extended beyond nominal if required by the utility

³ 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](http://enphase.com)

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Built for solar's toughest roofs.

IronRidge builds the strongest roof mounting system in solar. Every component has been tested to the limit and proven in extreme environments.

Our rigorous approach has led to unique structural features, such as curved rails and reinforced flashings, and is also why our products are fully certified, code compliant and backed by a 20-year warranty.

- **Strength Tested**
  All components evaluated for superior structural performance.

- **Class A Fire Rating**
  Certified to maintain the fire resistance rating of the existing roof.

- **Integrated Grounding**
  UL 2703 system eliminates separate module grounding components.

- **PE Certified**
  Pre-stamped engineering letters available in most states.

- **Design Software**
  Online tool generates a complete bill of materials in minutes.

- **20 Year Warranty**
  Twice the protection offered by competitors.
XR Rails

XR10 Rail
- A low-profile mounting rail for regions with light snow.
  - 6' spanning capability
  - Moderate load capability
  - Clear & black anod. finish

XR100 Rail
- The ultimate residential solar mounting rail.
  - 8' spanning capability
  - Heavy load capability
  - Clear & black anod. finish

XR1000 Rail
- A heavyweight mounting rail for commercial projects.
  - 12' spanning capability
  - Extreme load capability
  - Clear anodized finish

Internal Splices
- All rails use internal splices for seamless connections.
  - Self-tapping screws
  - Varying versions for rails
  - Grounding Straps offered

Attachments

FlashFoot
- Anchor, flash, and mount with all-in-one attachments.
  - Ships with all hardware
  - IBC & IRC compliant
  - Certified with XR Rails

Slotted L-Feet
- Drop-in design for rapid rail attachment.
  - High-friction serrated face
  - Heavy-duty profile shape
  - Clear & black anod. finish

Standoffs
- Raise flush or tilted systems to various heights.
  - Works with vent flashing
  - Ships pre-assembled
  - 4" and 7" Lengths

Tilt Legs
- Tilt assembly to desired angle, up to 45 degrees.
  - Attaches directly to rail
  - Ships with all hardware
  - Fixed and adjustable

Clamps & Grounding

End Clamps
- Slide in clamps and secure modules at ends of rails.
  - Mill finish & black anod.
  - Sizes from 1.22" to 2.3"
  - Optional Under Clamps

Grounding Mid Clamps
- Attach and ground modules in the middle of the rail.
  - Parallel bonding T-bolt
  - Reusable up to 10 times
  - Mill & black stainless

T-Bolt Grounding Lugs
- Ground system using the rail's top slot.
  - Easy top-slot mounting
  - Eliminates pre-drilling
  - Swivels in any direction

Accessories
- Provide a finished and organized look for rails.
  - Snap-in Wire Clips
  - Perfected End Caps
  - UV-protected polymer

Free Resources

Design Assistant
Go from rough layout to fully engineered system. For free.
Go to IronRidge.com/rm

NABCEP Certified Training
Earn free continuing education credits, while learning more about our systems.
Go to IronRidge.com/training

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View From South