

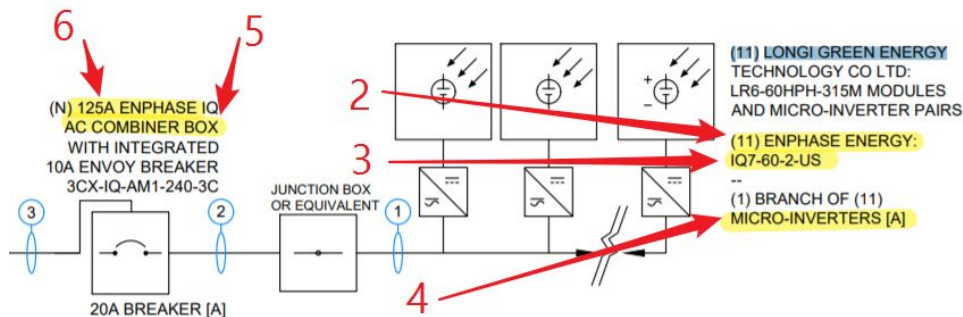


SolarAPP+ Contractor Input Training - Electrical (Microinverters)

Electrical Page

Micro inverters i.e. Enphase

1. Upload datasheets the first time, and then for all future submissions you can select it from the drop-down (if applicable), Select the appropriate model number.
2. Manufacturer = Select from the dropdown list
3. Select the inverter model number
 - o This question is accessing a database of approved equipment based on the manufacturer selection. Model numbers are required to match exactly.
4. Architecture type = Microinverter
5. Combiner panel = YES, per the design of the system.
6. Busbar size of Combiner panel = 125, per the design of system.



SolarAPP Standard Electrical Permit

Equipment: Inverters

Datasheet for Inverter 1 [90.7 ; 110.3(C) ; R106.1]

1607023567187-I9-ENPHASE ENERGY IQ7-60-X-US Combined with Junction Box.pdf 1

Inverter 1 Manufacturer

Enphase Energy Inc. 2

Inverter 1 Model Number (NOTE: For AC Modules, enter the AC Module Model number here.)

IQ7PLUS-72-x-US-8 [240V] 3

Architecture type used for all inverters in this project

Microinverters 4

Will all power production inverter outputs have the same point of connection?

Yes 5

Will inverter outputs be combined in a dedicated PV only combiner panel with no loads? (Note - only three current carrying conductors are allowed in the raceway for the output of the inverter combiner panel)

Yes 6

Busbar size of PV inverter only combiner panel

125 7

Electrical Page

Modules

1. Datasheet = pre-populate from drop down (after first submission), Select the appropriate model number.
2. Manufacturer = Select from the dropdown list
3. Select the inverter model number
 - o This question is accessing a database of approved equipment based on the manufacturer selection. Model numbers are required to match exactly.
4. Module Quantity can be gleaned from the design, single line diagram or the scope of work.

Equipment: Modules

Datasheet for Module 1 [90.7 ; 110.3(C) ; R106.1]

1607633542851-112-[Datasheet] LONGI LR6-60HPB 300-320W.pdf

1

Module 1 Manufacturer

LONGI Green Energy Technology Co., Ltd.

2

Module 1 Model Number (NOTE: For AC Modules, enter the DC modules model number.)

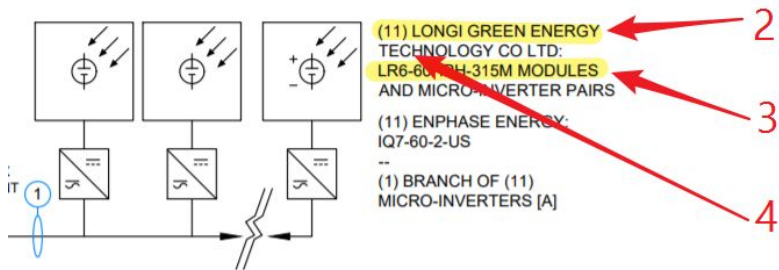
LR6-60HPH-315M

3

Module 1 Quantity

11

4



Electrical Page

Racking/Flashing

1. Datasheet = pre-populate from drop down (after first submission) or upload, select the appropriate model number.
2. Manufacturer = See detail on design data sheet for manufacturer name, SnapNRack, here.
3. Model Number = See detail on design
4. Combination of racking and modules listed to UL 2703 = Yes, per datasheet.
5. Fire Classification = Yes, per datasheet.
6. Flashing = See design details
7. Datasheet = pre-populated (after first submission) or upload. Select the appropriate model number.
8. Flashing installed per manufacturer instruction = Yes.

INFO			ATTACHMENT INFORMATION		
Max Span	OC Spacing	Detail	Max Landscape OC Spacing	Max Landscape Overhang	
11' - 3"	24"	RL UNIVERSAL, SPEEDSEAL TRACK ON COMP, SEE DETAIL SNR-DC-00436	6' - 0"	1' - 6"	

Equipment: Racking/Flashing

Datasheet for Racking System 1 [90.7 ; 110.3(C) ; R106.1] (Ensure your datasheet has the list of approved modules to 2703 for grounding and bonding)

1607635534241-115-SnapNRack_Universal RL_SpeedTrack (1).pdf 1

Racking System 1 Manufacturer

SnapnRack 2

Racking System 1 Model Number

RLU 3

Is Racking System 1 UL 2703 listed for grounding and bonding with the PV module models specified in this SolarAPP project? [90.7 ; 110.3(C) ; 690.43(A)]

Yes 4

Will the combination of modules and racking system have the same fire classification as the roof assembly? R324.4.2

Yes 5

Name of Flashing to be Used

Speedseal 6

Datasheet for Flashing: See attached.

1607633605583-1116-SNAPNRACK, TDS, ULTRA RAIL SPEEDSEAL FOOT_07.07.20.pdf 7

Do you agree to install the flashing per the manufacturer's instructions for the means of accomplishing weather proofing?

Yes 8

SolarAPP+: Racking/Flashing

Electrical Page

Racking/Flashing

1. To specify fire classification for the combination of racking system and modules to UL 2703 the contractor is required to upload the installation manual that clearly lists the approved modules that match the SolarAPP submission.
2. For a SolarAPP project employing the RL Universal Racking system with Longi LR4-60HPH-360M modules, the contractor would upload a copy of the Racking system installation manual containing the specific model numbers for the installed module as shown here..

SnapRack™

Solar Mounting Solutions

RL Universal

Railless Residential Roof Mount System
Installation Manual

snaprack.com

Appendix A

APPROVED MODULE INFORMATION

The following modules have completed the [UL 2703 Listing process for bonding and fire classification](#) and have been approved for use with the RL Universal mounting system by the module manufacturer. Module manufacturer approval letters can be found at www.snaprack.com.

RL Universal has been evaluated for Bonding of the following UL/NRTL Listed PV modules to UL 2703 requirements:

Manufacturer	Model	Wattage
Longi	LR6-60-XXXM	270-300
	LR6-60BK-XXXM	270-300
	LR6-60HV-XXXM	270-300
	LR6-60PB-XXXM	280-320
	LR6-60PE-XXXM	280-320
	LR6-60PH-XXXM	280-320
	LR6-60HIB-XXXM	295-320
	LR6-60HPB-XXXM	295-320
	LR6-60HIH-XXXM	300-330
	LR6-60HPP-XXXM	300-320
	LR4-60HIB-XXXM	335-365
	LR4-60HPB-XXXM	335-365
	LR4-60HIH-XXXM	350-380
	LR4-60HPH-XXXM	350-380
	LR4-60HPH-XXXM	350-380
	LR4-60HPH-XXXM	350-380

SolarAPP+: Racking/Flashing (Continued)

Electrical Pa

UL Product iQ™

QIMS.E485228 - Mounting Systems, Mounting Devices, Clamping Devices and Ground Lugs for Use with Photovoltaic Modules and Panels

Mounting Systems, Mounting Devices, Clamping Devices and Ground Lugs for Use with Photovoltaic Modules and Panels

[See General Information for Mounting Systems, Mounting Devices, Clamping Devices and Ground Lugs for Use with Photovoltaic Modules and Panels](#)

GAF
1 CAMPUS DR
PARSIPPANY, NJ 07054 USA

E485228

Racking/Flashing

- The contractor could also collect this information directly from a NRTL and their product information page, which verifies the 2703 certification of the mounting system with a specific module for bonding, grounding, mechanical loading, and system fire classification.
- Here we show an example using GAF's DecoTech RI 2000 mounting system and an example module: Solaria PowerXT-325R-BX / 330R-PX.

Cat. No.	Investigated for Bonding	Investigated for Mechanical Loading	System Fire Classification (A, B or C)	Tested in Combination With
Photovoltaic mounting system				
DecoTech RI 2000	Y	Y	See Below	NRTL listed UL 1703 laminates 1. Solar World "Sunmodule Plus 270-300 mono black laminate" 2. Solar World "Sunmodule Protect 270-300 mono black laminate" 3. "Stion "STL models" 4. Solaria PowerXT "PowerXT-325R-BX 330R-PX" 5. Silfab Solar "SLA-M300 M310"
DecoTech RI 2000	See Above	See Above	A	Any listed fire performance type 3 modules. And NRTL listed UL 1703 laminates: Solar World "Sunmodule Plus 270-300 mono black laminate" Solaria PowerXT "PowerXT-325R-BX 330R-PX" Silfab Solar "SLA-M300 M310"
GAF Energy Solar System	Y	Y	See Below	NRTL Certified, Solaria PowerXT "PowerXT-360R-PD-L"
GAF Energy Solar System	See Above	See Above	A	NRTL Certified, Solaria PowerXT "PowerXT-360R-PD-L"

Electrical Page

Rapid Shutdown: Know your tech!

1. RSD listed to UL 1741 = **Yes**. Find this info on the datasheet for Microinverters, AC Modules, or Optimizers

For microinverter like an Enphase systems = Yes

Equipment: Rapid Shutdown

Is the AC module, microinverter, or DCDC converter installed on each module listed for UL 1741 PVRSS and used to comply with requirements for Rapid Shutdown both inside and outside the array?

Yes

Electrical Page

Installation details is about the materials we use for install, except...

1. Existing PV systems and energy storage NOT allowed

- 2. Conductor type = **Yes**
- 3. Rooftop Conduit height = **Yes**
- 4. PV wire or Use-2 = **Yes**
- 5. Pv wire diameter = **Yes**
- 6. Terminal rating = **Yes**
- 7. Grounding conductor = **Yes**
- 8. Voltage and current spec within range of connected equipment? = **Yes**

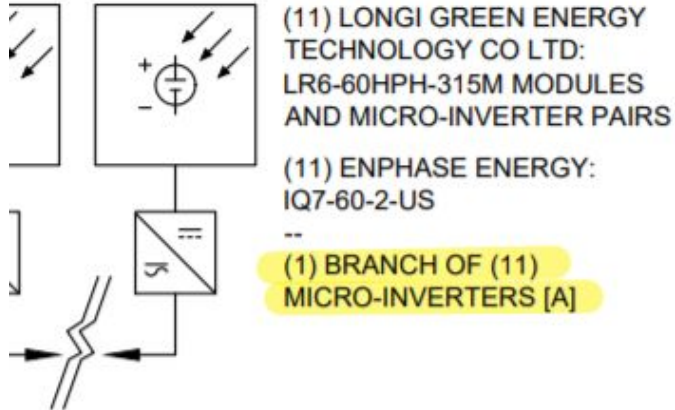
The Installation Details section sets the minimum requirements for installation materials that inform SolarAPP+ code compliance checks. The contractor MUST adhere to these requirements at installation in order to maintain SolarAPP+ eligibility. Diameter, height, and rating contribute to the calculations used for conductor size, conduit fill, and conductor ampacity derating.

Installation Details	
Is there an existing Utility interactive power production source connected to the home's electric service?	No 1
Are DC and AC conductors copper, Class B or Class C, and THWN-2, NM, USE-2, PV Wire, or jacketed multiconductor cable assembly listed and identified for the application? [690.8(B) ; 310.15(A) and (B)]	Yes 2
Are all rooftop conduits mounted at least 7/8" above the roof surface?	Yes 3
Are all PV Source Circuit conductors in free air listed as PV Wire or USE-2?	Yes 4
Does the PV Wire have a maximum outer diameter of 0.24" (6.1 mm)?	Yes 5
Are all power terminals rated to 75°C or greater, labeled for use with Copper Class B or Class C wires, and accept minimum 8 AWG wire?	Yes 6
Where Equipment Grounding Conductors (EGC) are not routed with circuit conductors, will EGC either be minimum 6 AWG or protected from physical damage? [250.120(C)]	Yes 7
Do module voltage and current specifications fall within allowable range of connected equipment?	Yes 8

Electrical Page

For Enphase example

1. Max number of AC CCC in raceway, a function of how many branch strings are on the roof x 2.
2. Max number of micros in a branch = **Branch of (X)**
3. One Micro per module = **Yes**
4. Max OCPD of 20A per Branch = **Yes**



Circuit Requirements

Input the maximum number of AC current carrying THWN-2 conductors in raceway

3

1

What is the maximum number of Microinverters/AC Modules in a single branch?

11

2

Is one microinverter used per module?

Yes

3

Are the microinverters or AC Modules rated for a maximum branch circuit overcurrent protection size of 20A?

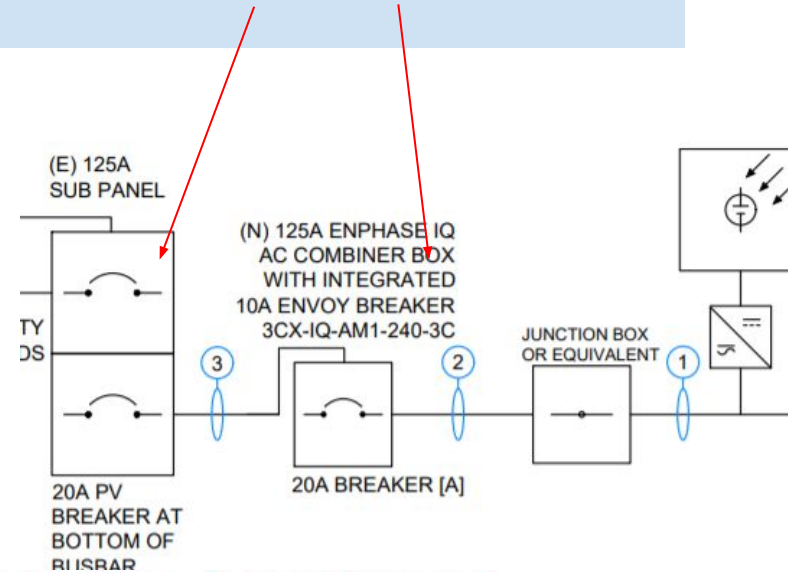
Yes

4

Electrical Page

For Enphase, AC current carrying conductors (CCC) refers to the AC output conductors of microinverter branch circuits. The SolarAPP+ is using this value to calculate conduit and wire size.

- Each branch circuit will have (2) CCC. This value will increase with each subsequent branch circuit of microinverters. A system with 2 branches of microinverters will have (4) CCC.
- The output of the combiner box to the point of interconnection will have (3) CCC by default in SolarAPP+.
- For more information on this topic see the appended slides.



CONDUIT SCHEDULE

AC Current Carrying Conductors

#	CONDUIT	CONDUCTOR	NEUTRAL	GROUND
1	NONE	(2) 12 AWG PER ENPHASE Q CABLE BRANCH	NONE	(1) 10 AWG BARE COPPER
2	3/4" EMT OR EQUIV.	(2) 12 AWG PER ENPHASE Q CABLE BRANCH	NONE	(1) 8 AWG THHN/THWN-2
3	3/4" EMT OR EQUIV.	(2) 10 AWG THHN/THWN-2	(1) 10 AWG THHN/THWN-2	(1) 8 AWG THHN/THWN-2

Branch Circuits >

Combiner box >



SolarAPP+ Contractor Input Training - Electrical (AC Modules)

Electrical Page

AC Module (Inverter section)

1. Datasheet > Upload AC module datasheet
2. Manufacturer > Select AC module manufacturer from the dropdown
3. Select the AC module model number
 - a. Model numbers are required to match CEC listing exactly.
4. Architecture type > AC Module
5. Same point of connection > Select Yes if all AC module branch circuits share same point of connection
6. Combiner panel > Select Yes if AC module branch circuits are being combined.
7. Busbar size of Combiner panel > Enter busbar size of PV combiner panel

SolarAPP Standard Electrical Permit

Equipment: Inverters	
Datasheet for inverter 1 [90.7; 110.3(C); R106.1]	1
<input type="text" value="159182795675449-AC Module A400 Type G Datasheet.pdf"/>	
Inverter 1 Manufacturer	2
<input type="text" value="SunPower"/>	
Inverter 1 Model Number (NOTE: For AC Modules, enter the AC Module Model number here.)	3
<input type="text" value="SPR-A400-G-AC [240V]"/>	
Architecture type used for all inverters in this project	4
<input type="text" value="AC Modules"/>	
Will all power production inverter outputs have the same point of connection?	5
<input type="text" value="Yes"/>	
Will inverter outputs be combined in a dedicated PV only combiner panel with no loads? (Note - only three current carrying conductors are allowed in the raceway for the output of the inverter combiner panel)	6
<input type="text" value="Yes"/>	
Busbar size of PV inverter only combiner panel	7
<input type="text" value="125"/>	

Electrical Page

AC Module (Module section)

1. Datasheet > Upload AC Module datasheet
2. Manufacturer > Search manufacturer in field and select AC Module manufacturer from dropdown
3. **Select DC Module model number as AC module model number.**
 - a. To find the DC variant of AC module, CEC list has DC module model number listed in the AC module listing, then search DC module model number in SolarAPP+ input field and select matching DC module model number.
*For SunPower module (select SunPower as manufacturer, not Sunpower)
4. Enter quantity of module based on system design.



AC Module Model Number

SunPower	SPR-A400-G-AC	400 W, 66 cell monocrystalline ACPV module, white backsheet. DC Module: SPR-A400, Micro-Inverter: IQ7AS-66-x-ACM-US-y.
----------	---------------	---

DC Module Model Number according to AC Module listing on CEC

SunPower	SPR-A400	400 W, 66 cell monocrystalline module, white backsheet, black frame, 1500V max system Vdc
----------	----------	---

Electrical Page

Racking/Flashing

1. Datasheet > Upload racking system datasheet
2. Manufacturer > Enter racking manufacturer
3. Model Number > Enter racking system module number matching design and datasheet uploaded
4. Confirm racking and modules combination is UL 2703 listed > Select **Yes**
5. Confirm racking and modules combination fire classification with roofing type > Select **Yes**
6. Flashing > Enter flashing matching design
7. Datasheet > Upload flashing datasheet
8. Must agree to install flashing per MFG instruction > Select **Yes**

Equipment: Racking/Flashing

Datasheet for Racking System 1 [90.7 ; 110.3(C) ; R106.1] (Ensure your datasheet has the list of approved modules to 2703 for grounding and bonding) **1**

Racking System 1 Manufacturer **2**

Racking System 1 Model Number **3**

Is Racking System 1 UL 2703 listed for grounding and bonding with the PV module models specified in this SolarAPP project? [90.7 ; 110.3(C) ; 690.43(A)] **4**

Will the combination of modules and racking system have the same fire classification as the roof assembly? R324.4.2 **5**

Name of Flashing to be Used **6**

Datasheet for Flashing: See attached. **7**

Do you agree to install the flashing per the manufacturer's instructions for the means of accomplishing weather proofing? **8**

SolarAPP+: Racking/Flashing

Electrical Page

Racking/Flashing

1. To specify fire classification for the combination of racking system and modules to UL 2703 the contractor is required to upload the installation manual that clearly lists the approved modules that match the SolarAPP submission.
2. For a SolarAPP project employing the RL Universal Racking system with Longi LR4-60HPH-360M modules, the contractor would upload a copy of the Racking system installation manual containing the specific model numbers for the installed module as shown here..

SnapRack™

Solar Mounting Solutions

RL Universal

Railless Residential Roof Mount System
Installation Manual

snaprack.com

Appendix A

APPROVED MODULE INFORMATION

The following modules have completed the [UL 2703 Listing process for bonding and fire classification](#) and have been approved for use with the RL Universal mounting system by the module manufacturer. Module manufacturer approval letters can be found at www.snaprack.com.

RL Universal has been evaluated for Bonding of the following UL/NRTL Listed PV modules to UL 2703 requirements:

Manufacturer	Model	Wattage
Longi	LR6-60-XXXM	270-300
	LR6-60BK-XXXM	270-300
	LR6-60HV-XXXM	270-300
	LR6-60PB-XXXM	280-320
	LR6-60PE-XXXM	280-320
	LR6-60PH-XXXM	280-320
	LR6-60HIB-XXXM	295-320
	LR6-60HPB-XXXM	295-320
	LR6-60HIH-XXXM	300-330
	LR6-60HPP-XXXM	300-320
	LR4-60HIB-XXXM	335-365
	LR4-60HPB-XXXM	335-365
	LR4-60HIH-XXXM	350-380
	LR4-60HPH-XXXM	350-380
	LR4-60HPH-XXXM	350-380
	LR4-60HPH-XXXM	350-380

SolarAPP+: Racking/Flashing (Continued)

Electrical Pa

UL Product iQ™

QIMS.E485228 - Mounting Systems, Mounting Devices, Clamping Devices and Ground Lugs for Use with Photovoltaic Modules and Panels

Mounting Systems, Mounting Devices, Clamping Devices and Ground Lugs for Use with Photovoltaic Modules and Panels

[See General Information for Mounting Systems, Mounting Devices, Clamping Devices and Ground Lugs for Use with Photovoltaic Modules and Panels](#)

GAF
1 CAMPUS DR
PARSIPPANY, NJ 07054 USA

E485228

Racking/Flashing

1. The contractor could also collect this information directly from a NRTL and their product information page, which verifies the 2703 certification of the mounting system with a specific module for bonding, grounding, mechanical loading, and system fire classification.
2. Here we show an example using GAF's DecoTech RI 2000 mounting system and an example module: Solaria PowerXT-325R-BX / 330R-PX.

Cat. No.	Investigated for Bonding	Investigated for Mechanical Loading	System Fire Classification (A, B or C)	Tested in Combination With
Photovoltaic mounting system				
DecoTech RI 2000	Y	Y	See Below	NRTL listed UL 1703 laminates 1. Solar World "Sunmodule Plus 270-300 mono black laminate" 2. Solar World "Sunmodule Protect 270-300 mono black laminate" 3. "Stion "STL models" 4. Solaria PowerXT "PowerXT-325R-BX 330R-PX" 5. Silfab Solar "SLA-M300 M310"
DecoTech RI 2000	See Above	See Above	A	Any listed fire performance type 3 modules. And NRTL listed UL 1703 laminates: Solar World "Sunmodule Plus 270-300 mono black laminate" Solaria PowerXT "PowerXT-325R-BX 330R-PX" Silfab Solar "SLA-M300 M310"
GAF Energy Solar System	Y	Y	See Below	NRTL Certified, Solaria PowerXT "PowerXT-360R-PD-L"
GAF Energy Solar System	See Above	See Above	A	NRTL Certified, Solaria PowerXT "PowerXT-360R-PD-L"

Electrical Page

Rapid Shutdown:

1. Confirm selected AC Module is UL1741 listed on datasheet > Select **Yes** if UL 1741 listed.

For AC Module system = Yes

Equipment: Rapid Shutdown

Is the AC module, microinverter, or DCDC converter installed on each module listed for UL 1741 PVRSS and used to comply with requirements for Rapid Shutdown both inside and outside the array?

Yes

Electrical Page

Installation Details:

1. Existing PV system and/or energy storage is currently **NOT allowed** by SolarAPP+
2. Confirm conductor types are allowed for PV system > Select Yes
3. Confirm rooftop conduit will have minimum 3/4" from roof surface > Select Yes
4. PV wire or USE-2 > Select Yes
5. PV wire diameter > Select Yes
6. Terminal rating > Select Yes
7. Confirm exposed equipment grounding conductor (EGC) to be minimum 6 AWG or protected > Select Yes

The Installation Details section sets the minimum requirements for installation materials that inform SolarAPP+ code compliance checks. The contractor MUST adhere to these requirements at installation in order to maintain SolarAPP+ eligibility. Diameter, height, and rating contribute to the calculations used for conductor size, conduit fill, and conductor ampacity derating.

Installation Details	
Is there an existing utility interactive power production source connected to the home's electric service?	1
<input type="text" value="No"/>	
Are DC and AC conductors copper, Class B or Class C, and THWN-2, NM, USE-2, PV Wire, or jacketed multiconductor cable assembly listed and identified for the application? [690.8(B); 310.15(A) and (B)]	2
<input type="text" value="Yes"/>	
Are all rooftop conduits mounted at least 3/4" above the roof surface?	3
<input type="text" value="Yes"/>	
Are all PV Source Circuit conductors in free air listed as PV Wire or USE-2?	4
<input type="text" value="Yes"/>	
Does the PV Wire have a maximum outer diameter of 0.24" (6.1 mm)?	5
<input type="text" value="Yes"/>	
Are all power terminals rated to 75°C or greater, labeled for use with Copper Class B or Class C wires, and accept minimum 8 AWG wire?	6
<input type="text" value="Yes"/>	
Where Equipment Grounding Conductors (EGC) are not routed with circuit conductors, will EGC either be minimum 6 AWG or protected from physical damage? [250.120(C)]	7
<input type="text" value="Yes"/>	

Electrical Page

Circuit Requirements:

1. Enter maximum number of AC current carrying conductor in single raceway.
2. Enter maximum number of AC module from the longest single branch.
3. Confirm AC module branch circuit over-current protection device (OCPD):
 - a. If branch circuit will be protected by 20A OCPD regardless of AC module branch length > Select **Yes**
 - b. If branch circuit will be sized according to actual output current and protected by OCPD < 20A > Select **No**
4. Confirm AC Module single branch circuit continuous output is < 16.5A > Select **Yes**
5. Confirm if NM cable will be used for AC module output:
 - a. Select **No** if wire types other than NM cable will be used
 - b. Select **Yes** if NM cable will be used and installed according to applicable NEC code sections.

Circuit Requirements: Inverter Output AC

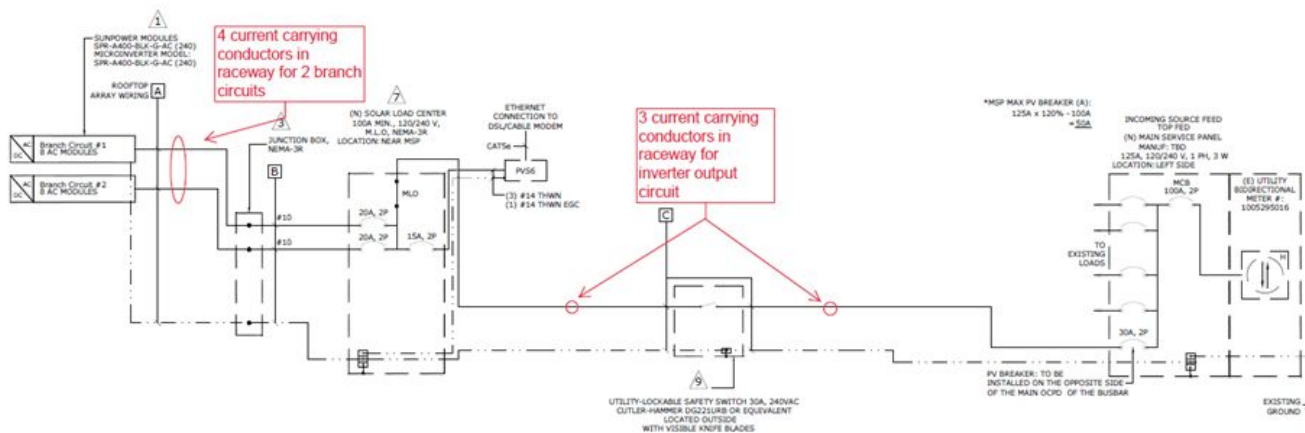
Input the maximum number of AC current carrying THWN-2 conductors in raceway	1
<input type="text" value="2"/>	
What is the maximum number of Microinverters/AC Modules in a single branch?	2
<input type="text" value="11"/>	
Will all individual microinverter or AC Module branch circuits be protected by a 20A OCPD? (Answering "No" will make SolarAPP use a 15A OCPD whenever the branch circuit continuous current is sufficiently low).	3
<input type="text" value="Yes"/>	
Is the maximum quantity of microinverters or AC Modules in a series string rated for a maximum branch circuit continuous inverter output of 16.5 A?	4
<input type="text" value="Yes"/>	
Will NM cable be used for inverter output circuits? (Note: if you install NM cable, it must be installed according to the Code.)	5
<input type="text" value="No"/>	

Electrical Page

Current Carry Conductors:

AC current carrying conductor (CCC) for AC module architecture in SolarAPP applies to branch output circuit. SolarAPP is using this value to calculate conduit and wire size. Number of current carrying in single raceway will increase with each subsequent branch circuit of AC modules if branch output circuits are in single raceway.

Post-combined section from PV combiner to Point of interconnection is always assumed to have 3 CCCs.





SolarAPP+ Contractor Input Training (All Jobs continued)

Electrical Page

For all architectures

1. Max number of AC CCC THWN wire in raceway = **(3)**
per inverter in a single raceway. The output of the combiner panel is default to (3)
2. Will NM cable be used? = **No** (See conduit schedule)
 - o Except: Microinverter Array conductors using NM cable in the attic for new construction =Yes

Circuit Requirements: Inverter Output AC

Input the maximum number of AC current carrying THWN-2 conductors in raceway

Will NM cable be used for inverter output circuits? (Note: If you install NM cable, it must be installed according to the Code.)

Electrical Page

For all architectures

1. Sometimes, interconnection at a panelboard requires that certain circuit breakers be relocated to a new sub-panel to allow space to land the PV overcurrent protective device. See the electrical circuit diagram for new (N) sub-panels and their ratings.

New Panelboard for Relocated Loads

Will a new subpanel be installed with existing loads relocated into the new subpanel?

No

1



Electrical Page

For all architectures

1. When relocating loads from the main panel to a NEW sub panel to make room for the point of interconnection, = **See SLD for details**
2. Properly sized OCPD = **YES**
3. Busbar Ampere rating = **See system design**
4. Relocated loads Overcurrent protective device ampere rating = **See system design**
5. Is the subpanel located adjacent to the panelboard? = **See site plan detail**
6. Current Carrying Conductors includes relocated branch circuits AND Sub panel feeder conductors IF in a single raceway = **See system design**
7. Relocated branch circuits do not require ampacity derates if installed less than 2ft from panelboard. = **See Site plan detail**

New Panelboard for Relocated Loads

Will a new subpanel be installed with existing loads relocated into the new subpanel?

Yes

1

Is The OCPD ampere size supplying the relocated loads subpanel will be selected according to the code? (Verification of load calculation may be required at inspection)

Yes

2

Enter the busbar size of the new subpanel:

125

3

Enter the OCPD rating protecting the new subpanel with relocated loads:

50

4

Electrical Page

For all architectures

1. When Branch Circuit conductors for relocated loads are relocated greater than 2ft = **See site plan** (typically = **NO**)
2. Are relocated branch circuit conductors extended less than 10ft or 10% of total circuit length = **See Site plan** (typically = YES)
3. Current Carrying Conductors includes relocated branch circuit conductors AND Sub panel feeder conductors IF in a single raceway = **See system design**
4. Are branch circuit conductors for relocated loads extended more than 6ft = **See Site plan**
5. Will the raceway size for Sub Panel feeders be sized according to the code = **Yes**
6. Will the raceway size for relocated branch circuit conductors be sized according to the code = **Yes**

Are relocated branch circuit conductors in raceway = < 2'? [Chapter 9]

No 1

Are relocated branch circuits extended = < 10' and = < 10% of total circuit length? [310.15 (A)(2) Ex.]

Yes 2

Maximum quantity of current carrying conductors in raceway with relocated branch circuit conductors?

8 3

Are branch circuits extended > 6'? [210.12 (D)]

Yes 4

Will raceway size for new sub panel feeders be selected according to 300.17 and Chapter 9? YES

Yes 5

Will raceway size for branch circuit conductors be selected according to 300.17 and Chapter 9? YES

Yes 6

Electrical Page

For all architectures

1. When Branch Circuit conductors are relocated greater than 2ft = **NO**
2. Are branch circuit conductors less than = **YES**
3. Busbar Ampere rating = **See system design**
4. Sub Panel feeder breaker ampere rating = **See system design**
5. Is the subpanel located adjacent to the panelboard? = **See site plan detail**
6. Current Carrying Conductors includes relocated branch circuits AND Sub panel feeder conductors IF in a single raceway = **See system design**
7. Relocated branch circuits do not require ampacity derates if installed less than 2ft from panelboard. = **See Site plan detail**

Are relocated branch circuit conductors in raceway = < 2'? [Chapter 9]

No 1

Are relocated branch circuits extended = < 10' and = < 10% of total circuit length? [310.15 (A)(2) Ex.]

2

Maximum quantity of current carrying conductors in raceway with relocated branch circuit conductors?

3

Are branch circuits extended > 6'? [210.12 (D)]

4

Will raceway size for new sub panel feeders be selected according to 300.17 and Chapter 9? YES

5

Will raceway size for branch circuit conductors be selected according to 300.17 and Chapter 9? YES

6

SolarAPP+: Electrical: Point of Connection at Main Panel

Load Side 120% Rule

Electrical Page

For all architectures

- A loadside interconnection using the 120% rule is the most common method of installation for PV only projects. It relies on the maximum inverter output, main breaker and main bus ratings to determine code compliance.
- The method of interconnection will be a listed circuit breaker

Point of Connection at Main Panel

Point of interconnection compliance method at MSP:

Main Bus Ampere Rating (A)

Main Breaker/Service Disconnect Ampere Rating (A)

What is the Utility service feed rated for?

Will power production inverter outputs be connected directly to an existing subpanel?

For example...

1. POI method at MSP = **705.12(B)(2)(3)(b) 120% rule** or **705.12(B)(2)(3)(d) 120% rule on center-fed panels** based on MSP
2. Main bus rating = **see SLD**
3. Main Breaker rating = **See SLD**
4. Utility service feed rated for = **See Main Breaker/Main bus rating**
5. Will inverter outputs be connected directly to a sub-panel = **No** for Meter socket adapter, check the SLD

SolarAPP+: Electrical: Point of Connection at Main Panel Supply Side

Electrical Page

For all architectures

- A supply-side interconnection is when the point of interconnection (POI) is ahead of the service disconnect (aka Main breaker). This can be accomplished through the use of an insulation-piercing connector, multi-port connector, breaker connector, meter lug connector, meter socket adapter, field evaluated supply-side connection, breaker connection at a main lug only (MLO) panel (aka “hot bus”), or a “solar-ready” panel slot.
- Each of these methods will have a specific “allowable backfeed” that SolarAPP+ will evaluate based on the answer to certain questions.

For meter socket adapter example...

1. POI method at MSP = **705.12(A) Supply-side**
2. Main bus rating = **see SLD**
3. Main Breaker rating = **See SLD**
4. Utility service feed rated for = **See Main Breaker/Main bus rating**
5. Service Equipment used = **Meter Socket Adapter as an example**
6. Enter the AMP rating of the equipment = As an example **60A**
7. Datasheet
8. Ampacity of the conductors fed by the SST = **Same as utility service rating**
9. Supply-side conductor length less than 10ft = **Yes**
10. Is the equipment used UL listed = **Yes**
11. Will inverter outputs be connected directly to a sub-panel = **No** for Meter socket adapter, check the SLD

Point of Connection at Main Panel

Point of Interconnection compliance method at MSP:

705.12 (A) Supply Side 1

Main Bus Ampere Rating (A)

100 2

Main Breaker/Service Disconnect Ampere Rating (A)

100 3

What is the Utility service feed rated for?

100 4

Select equipment used to make supply side connection:

Meter Socket Adapter 5

Enter the ampere rating of the equipment used to make the supply side connection?

60 6

Upload datasheet for the equipment used to make the supply side connection:

1620241480831-1202-12371_RMA_Flyer.08.pdf 7

What is the ampacity of the conductors that will be directly fed by the Supply Side connection? (In some cases this might be different from the utility service feeder ampacity, in most it will just be the utility service feeder ampacity)

100 8

Will the OCPD of the Supply Side Connection be installed within 10 ft of conductor length from it?

Yes 9

Is the equipment used to make the Supply Side Connection UL Listed?

Yes 10

Will power production inverter outputs be connected directly to an existing subpanel?

No 11

SolarAPP+: Electrical: Point of Connection at Main Panel Load Side Sum of Breakers Rule

Electrical Page

For all architectures

- A loadside interconnection using the Sum of Breakers rule is the most common method of installation for PV + Storage projects. It weighs the sum of breaker ratings on the bus plus the rating of the OCPD against the rating of the main bus. Design may relocate loads to a new subpanel to make this condition true.
- The method of interconnection will be a listed circuit breaker
- The sum of breakers will be validated at inspection by the AHJ.

Point of Connection at Main Panel

Point of Interconnection compliance method at MSP:

705.12 (B) (2) (3) (b) 120% rule 1

Main Bus Ampere Rating (A)

100 2

Main Breaker/Service Disconnect Ampere Rating (A)

100 3

What is the Utility service feed rated for?

100 4

Will power production inverter outputs be connected directly to an existing subpanel?

No 5

For example...

1. POI method at MSP = **705.12(B)(2)(3)(c) Sum of Breakers rule**
2. Main bus rating = **see SLD**
3. Main Breaker rating = **See SLD**
4. Utility service feed rated for = **See Main Breaker/Main bus rating**
5. Will inverter outputs be connected directly to a sub-panel = **Check the SLD for a sub-panel interconnection**

Electrical Page

For all architectures

- A loadside interconnection may occur at a sub-panel. Specific compliance methods can be chosen at both the sub-panel and main panel boards.
- The method of interconnection will be a listed circuit breaker
- The sum of breakers will be validated at inspection by the AHJ.
- Interconnection rules must be maintained for all panelboards and conductors that carry the system backfeed to the utility grid.

Will power production inverter outputs be connected directly to an existing subpanel?

Yes 1 ▼

What is the subpanel busbar Amp rating?

125 2

What is the subpanel over current protection (breaker) Amp rating?

60 3

Point of interconnection compliance method at Subpanel:

705.12 (B) (2) (3) (b) 120% rule 4 ▼

For example, when applicable...

1. Interconnection at sub-panel = **Yes**
2. Main bus rating = **see SLD**
3. Main Breaker rating = **See SLD**
4. POI method at MSP = **705.12(B)(2)(3)(c) Sum of Breakers rule**

Standard Certifications

Workers' Comp

1. Agree to the terms and conditions and submit the project.

SolarAPP Standard Certifications

Standard Certifications.

Workers' Comp Information

By applying for this permit, you represent and warrant that you (i) have (and will have during the performance of the work) all valid approvals, certifications, and licenses required for the performance of the work for which this permit is issued, (ii) carry (and will carry during the performance of the work) all necessary insurance required by law or governmental authority in the jurisdiction and (iii) will comply with all applicable laws required in the performance of the work.

I agree to these terms and conditions.

Previous

[Save as a draft](#)

Submit Project

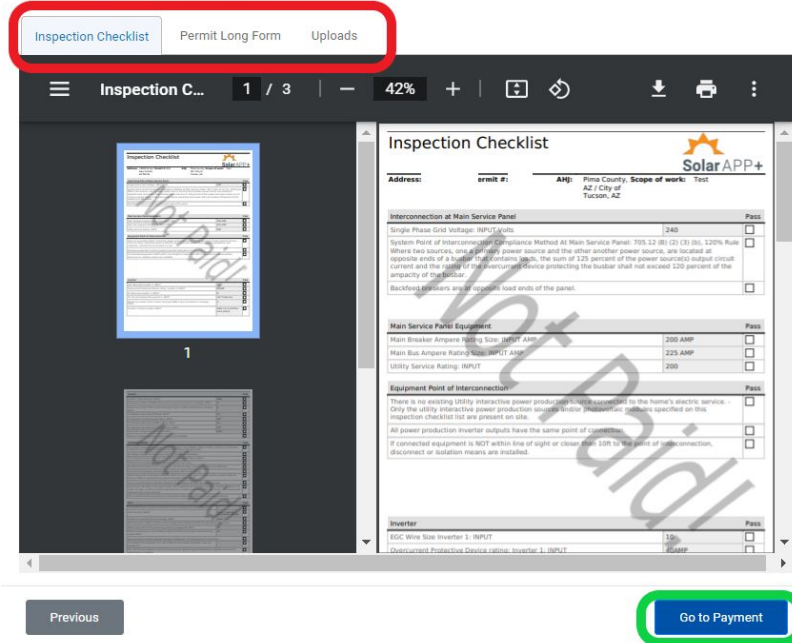
Review your Project Details

Review Your Project Details

1. Review Inspection checklist and Permit Long form for accuracy
2. Go to payment.

Review Your Project Details

Your project design meets all requirements for SolarAPP approval. Please review your project details below to ensure they are accurate and proceed to pay for your SolarAPP approval.



Inspection Checklist Permit Long Form Uploads

Inspection C... 1 / 3 42%

Inspection Checklist

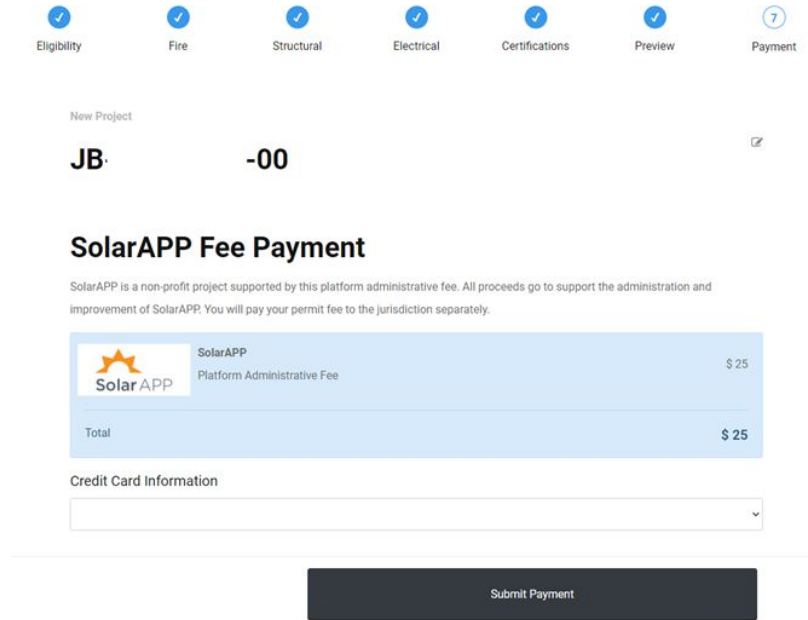
Address: **Permit #:** **AHJ:** Pima County, Scope of work: Test
AZ, City of Tucson, AZ

Section	Item	Value	Pass
Interconnection at Main Service Panel	Single Phase Grid Voltage- INPUT/Output	240	<input type="checkbox"/>
	System Point of Interconnection Compliance Method At Main Service Panel: 705.12 (B) (2) (1) (b), 120% Rule		<input type="checkbox"/>
	When two sources, one primary power source and the other another power source, are located at opposite ends of a busbar that contains both, the sum of 125 percent of the power (output) output circuit current and the output of the inverter device protecting the busbar shall not exceed 120 percent of the ampacity of the busbar.		<input type="checkbox"/>
	Backfeed breakers are at opposite load ends of the panel.		<input type="checkbox"/>
Main Service Panel Equipment	Main Breaker Ampere Rating Size- INPUT/ Amp	200 AMP	<input type="checkbox"/>
	Main Bus Ampere Rating Size- INPUT/ Amp	225 AMP	<input type="checkbox"/>
	Utility Service Rating- INPUT	200	<input type="checkbox"/>
Equipment Point of Interconnection	There is no existing utility interactive power production system connected to the home's electric service - Only the utility interactive power production system (generator, photovoltaic, etc.) specified on this inspection checklist list are present on site.		<input type="checkbox"/>
	All power production inverter outputs have the same point of connection.		<input type="checkbox"/>
	If connected equipment is NOT within line of sight or clear view, SOG to the point of interconnection, disconnect or isolation means are installed.		<input type="checkbox"/>
Inverter	IEC Wire Size Inverter 1- INPUT	10	<input type="checkbox"/>
	Disconnect/Protective Device rating- Inverter 1- INPUT	60AMP	<input type="checkbox"/>

Previous Go to Payment

Review Your Project Details

1. Enter card information and submit payment.
2. If permit approval is also required via AHJ website, SolarAPP+ will prompt and provide direct link to AHJ permit submittal page.
3. Complete permit application through AHJ website and upload SolarAPP+ approval documents and uploads (per instructions from AHJ).



The screenshot shows a progress bar at the top with seven steps: Eligibility, Fire, Structural, Electrical, Certifications, Preview, and Payment. The Payment step is highlighted with a '7' in a circle. Below the progress bar, the project name 'JB' and a value '-00' are displayed. A 'New Project' checkbox is checked. The main heading is 'SolarAPP Fee Payment'. Below it, a note states: 'SolarAPP is a non-profit project supported by this platform administrative fee. All proceeds go to support the administration and improvement of SolarAPP. You will pay your permit fee to the jurisdiction separately.' A table shows a 'SolarAPP Platform Administrative Fee' of \$25 and a 'Total' of \$25. Below the table is a 'Credit Card Information' dropdown menu. At the bottom right is a dark grey 'Submit Payment' button.


Eligibility	✓
Fire	✓
Structural	✓
Electrical	✓
Certifications	✓
Preview	✓
Payment	7

New Project

JB -00

SolarAPP Fee Payment

SolarAPP is a non-profit project supported by this platform administrative fee. All proceeds go to support the administration and improvement of SolarAPP. You will pay your permit fee to the jurisdiction separately.

 SolarAPP Platform Administrative Fee	\$25
Total	\$25

Credit Card Information

Submit Payment