

Inspection Checklist



Address:	Approval ID:	AHJ:	Scope of work:	PV Residential Roof Mount 11.200KW, 32 modules & 1 inverter
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Interconnection at Main Service Panel		Pass
Single Phase Grid Voltage: INPUT Volts	240 V	<input type="checkbox"/>
System Point of Interconnection Compliance Method At Main Service Panel: 705.12 (B) (2) (3) (b), 120% Rule Where two sources, one a primary power source and the other another power source, are located at opposite ends of a busbar that contains loads, the sum of 125 percent of the power source(s) output circuit current and the rating of the overcurrent 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"/>

SAMPLE

Main Service Panel Equipment		Pass
Main Breaker Ampere Rating Size: INPUT AMP	200 AMP	<input type="checkbox"/>
Main Bus Ampere Rating Size: INPUT AMP	200 AMP	<input type="checkbox"/>
Utility Service Rating: INPUT	200	<input type="checkbox"/>
The equipment is connected either directly to the main service panel or in a Supply Side Connection.		<input type="checkbox"/>
If grounding electrode is rod, pipe or plate, then supplemental electrode is properly installed. Exception: If a single rod, pipe, or plate grounding electrode has a resistance to earth of 25 ohms or less, the supplemental electrode shall not be required.		<input type="checkbox"/>
EGC is installed ensuring continuity to all system components and finally to grounding electrode.		<input type="checkbox"/>

Equipment Point of Interconnection		Pass
All power production inverter outputs have the same point of connection.		<input type="checkbox"/>
Connected equipment is within line of sight and closer than 10ft to the point of interconnection or a disconnect/isolation means are installed.		<input type="checkbox"/>
There is no existing Utility interactive power production source connected to the home's electric service. - Only the utility interactive power production sources and/or photovoltaic modules specified on this inspection checklist list are present on site.		<input type="checkbox"/>
DC and AC conductors are copper, Class B or Class C, and THWN-2, NM or PV Wire, or they are a jacketed multiconductor cable assembly listed and identified for the application.		<input type="checkbox"/>
All power terminals are rated to 75°C or greater, labeled for use with Copper Class B or Class C wires, and accept minimum 8 AWG wire.		<input type="checkbox"/>
Conductors are properly terminated and wired according to the code.		<input type="checkbox"/>
Where Equipment Grounding Conductors (EGC) are not routed with circuit conductors, EGC is a minimum of 6 AWG or it's protected from physical damage		<input type="checkbox"/>
There is a minimum of 3' working clearance, according to the code, for all components that may require service.		<input type="checkbox"/>

Inverter	Pass
Inverter architecture:	<input type="checkbox"/> String Inverter with DC-DC Converters
EGC Wire Size Inverter 1: INPUT	10 AWG <input type="checkbox"/>
Overcurrent Protective Device rating: Inverter 1	60 AMP <input type="checkbox"/>
AC Wire size Inverter 1: INPUT	6 AWG <input type="checkbox"/>
Maximum number of THWN-2 conductors in an PV inverter AC output circuit raceway, excluding any equipment grounding conductors.	4 <input type="checkbox"/>
Inverter 1 model number: INPUT	SE7600H-US [240V] <input type="checkbox"/>
Inverter 1 manufacturer: INPUT	SolarEdge Technologies Ltd. <input type="checkbox"/>
Maximum number of THWN-2 DC conductors in raceway, excluding any equipment grounding conductors.	4 wires <input type="checkbox"/>
Maximum number of DC PV wire or USE-2 conductors in raceway, including any equipment grounding conductors.	0 wires <input type="checkbox"/>
Minimum DC Wire Gauge (THWN-2 Wire):	12 AWG <input type="checkbox"/>
DC strings EGC is a minimum of 10 AWG	<input type="checkbox"/>
Presence of Rapid Shutdown switch label per Fire Bulletin	<input type="checkbox"/>

Installation Details	Pass
Conduit sizing to be confirmed at time of inspection. Contractor to provide conduit fill calculations where requested by inspector	<input type="checkbox"/>

Roof and PV Array	Pass
Racking system model number is on list of approved modules to 2703 for grounding and bonding.	<input type="checkbox"/>
Attachment points of the mounting system be staggered: INPUT	No <input type="checkbox"/>
Maximum spacing in inches between adjacent attachment points of the mounting system INPUT	48" <input type="checkbox"/>
Roof penetration sealant method has been installed per the manufacturers instructions.	<input type="checkbox"/>
The roof structure appears to be structurally sound, without signs of alterations or significant structural deterioration or sagging.	<input type="checkbox"/>
Quantity and spacing of structural attachments match the installation instructions per manufacturer.	<input type="checkbox"/>
Array conductors are secured and supported. Installed so as not to damage the cable, at intervals not exceeding 1.4 m (4.6 ft) and within 300 mm (12 in.) of every cable entry into enclosures such as outlet boxes, junction boxes, cabinets, or fittings.	<input type="checkbox"/>
Module 1 model number: INPUT	LR4-60HPB-350M <input type="checkbox"/>
Module 1 manufacturer: INPUT	LONGi Green Energy Technology Co., Ltd. <input type="checkbox"/>
Module 1 quantity: INPUT	32 <input type="checkbox"/>
Method of rapid shutdown compliance Inside the Array	AC module, microinverter, <input type="checkbox"/>

Roof and PV Array

Pass

or DCDC converter installed on each module and listed for UL 1741 or UL 3741 as PVRSS or PVRSE used to comply with requirements for Rapid Shutdown.

All rooftop conduits are mounted at least 7/8" above the roof surface.

All PV Source Circuit conductors installed without raceway are listed as PV Wire or USE-2.

Roof and PV Array 1

Pass

Plane 1 Roof Covering: INPUT

Clay and concrete tile

The height of the modules, from roof 1 surface to the module backsheet, does not exceed 10"

Roof and PV Array 2

Pass

Plane 2 Roof Covering: INPUT

Clay and concrete tile

The height of the modules, from roof 2 surface to the module backsheet, does not exceed 10"

Roof and PV Array 3

Pass

Plane 3 Roof Covering: INPUT

Clay and concrete tile

The height of the modules, from roof 3 surface to the module backsheet, does not exceed 10"

Roof and PV Array 4

Pass

Plane 4 Roof Covering: INPUT

Clay and concrete tile

The height of the modules, from roof 4 surface to the module backsheet, does not exceed 10"

Roof and PV Array 5

Pass

Plane 5 Roof Covering: INPUT

Clay and concrete tile

The height of the modules, from roof 5 surface to the module backsheet, does not exceed 10"

Fire

Pass

% of the Roof with a Solar Array INPUT

24.49%

Fire Pathways, venting and access in accordance with INPUT

Less Than 33/66

Disconnecting Means are in compliance with the SolarAPP Fire Bulletin

Signage, Placards, Directories and Markings in accordance with the SolarAPP Fire Bulletin

Maximum AC operating current in labels

31.73 A

Maximum AC operating voltage in labels

240 V

Corrections

SAMPLE

FIRE SAFETY CODE REQUIREMENTS

Does the home have sprinkler systems?

No

% of Roof Area covered with PV = Total Array Area/Total Roof Area: $\{C17\}/\{I102\} =$
 $\{C15\}$

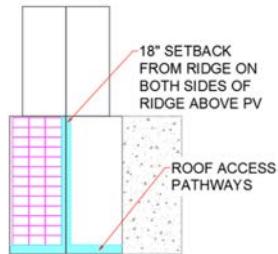
24.49%

Roof Access and Ventilation Diagrams

Fire Safety

Ridge Setbacks

PV Less Than 33% Roof Area (66% for homes with sprinkler systems)



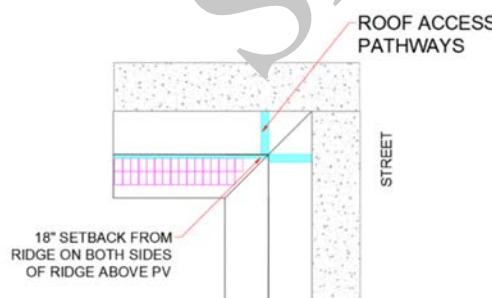
Emergency Escape & Rescue Opening

Minimum 3' Emergency Escape Pathway

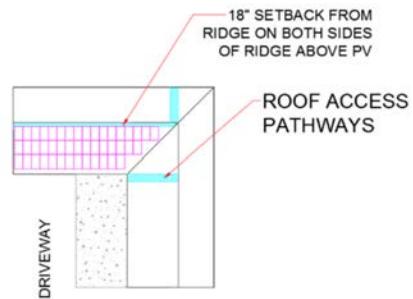


Hips and Valley Setbacks

PV Less Than 33% Roof Area - Street Access (66% for homes with sprinkler systems)



PV Less Than 33% Roof Area - Driveway Access (66% for homes with sprinkler systems)



SolarAPP Fire Bulletin

Disconnecting Means

SolarAPP Fire Bulletin

PV System

PV system disconnecting means shall be provided in accordance with the 2017 National Electrical Code® (NEC), NFPA 70®. [690.13]

A Rapid Shutdown switch shall be provided at a readily accessible location outside the building in accordance with the 2017 National Electrical Code® (NEC), NFPA 70.® [690.12(C)]

Signs, Placards, Directories, and Markings Guidance

SolarAPP Fire Bulletin

General

All labeling shall comply with Section 324 of the 2021 International Residential Code and Articles 690 and 705 of the 2017 National Electrical Code® (NEC), NFPA 70

All labeling shall comply with [NEC 110.21 (B)]

Rapid Shutdown Label

A label shall be installed not greater than 3ft from the electric utility service location that includes the location of all identified Rapid Shutdown switches if not at the same location. [IRC 324]

The label shall indicate which type of Rapid Shutdown system is installed, and include a simple diagram with sections in red designating areas that are not controlled by the rapid shutdown switch. [NEC 690.56(C)(1)]

Buildings with more than one rapid shutdown type:

A detailed plan view diagram showing each PV system and a dotted line around areas that remain energized after the rapid shutdown switch is operated. [NEC 690.56(C)(2)]

Rapid Shutdown Label (continued)

Rapid Shutdown (PV Hazard Control) switch:

This switch shall have a label not greater than 3 feet from the switch that states the following: "RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM" [NEC 690.56(C)(3)]

Roof Access, Egress, and Ventilation

SolarAPP Fire Bulletin

General

Access and minimum spacing shall be provided for access to specific areas of the roof, emergency egress from the roof and opportunities for smoke ventilation in accordance with the 2021 International Residential Code [IRC 324.6]

References

Ridge Setbacks - [IRC R324.6.2]

Sprinklered Occupancies - [IRC R324.6.2.1]

Pathways - [IRC 324.6.1]

Emergency escape and rescue openings - [IRC R324.6.3]

Exceptions

Detached, non-inhabitable structures [IRC R324.6 Ex. 1]

Low-slope roofs with pitch of less than or equal to 2:12; this exception may not be valid depending on the jurisdiction. [IRC R324.6 Ex. 3]

BIPV systems listed in accordance with Section 690.12(B)(2) of NFPA 70, where the removal or cutting away of portions of the BIPV system during fire-fighting operations has been determined to not expose a fire fighter to electrical shock hazards. [IRC R324.6 Ex. 4]

Carbon Monoxide and Smoke Detectors

SolarAPP Fire Bulletin

Guidance

Carbon Monoxide and smoke detectors shall be provided in accordance with the code or an Affidavit has been provided by the customer. 2021 International Residential Code.

[R3014, R315]

Guidance (continued)

Rooms and areas within dwelling units, basements and attached garages in which ESS are installed shall be protected by smoke alarms in accordance to the code. A heat detector, listed and interconnected to the smoke alarms, shall be installed in locations within dwelling units and attached garages where smoke alarms cannot be installed based on their listing. 2021 International Residential Code. [R314, R315]

Fire Classification

SolarAPP Fire Bulletin

PV System

Rooftop-mounted PV systems shall have the same fire classification as the roof assembly required in 2021 International Residential Code. [R902.4; R324.4.2]

Building-integrated photovoltaic products installed as the roof covering shall be tested, listed, and labeled for fire classification. [IRC 902.3]

Building-integrated photovoltaic products installed as the roof covering shall comply with the minimum requirements for fire classification set by the jurisdiction. [IRC 902.1]

Product Certifications

SolarAPP Fire Bulletin

PV System

PV panels and modules shall be listed and labeled to UL 1703 and/or both UL 61730-1 and UL 61730-2 [NEC 690.4(B)][IRC R324.3.1]

Inverters shall be listed and labeled to UL 1741 [NEC 690.4(B)][IRC R324.3.1]

Hazard Control System

Hazard control system shall be listed and labeled to UL 3741 [NEC 90.7; 110.3(C); 690.4(B) 690.12(D)]

Service Disconnect

SOLAR PV SYSTEM IS EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN CONDUCTORS OUTSIDE THE ARRAY. CONDUCTORS IN ARRAY REMAIN ENERGIZED IN SUNLIGHT

SIMPLE DIAGRAM HERE

Location:

Location: No more than 1 m (3 ft) away from the service disconnecting means. [NEC 690.56(C)(1)(a)]

RSD Initiation Device

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

Location:

Rapid shutdown initiation device. [NEC 690.56(C)(3)]

Point of Interconnection

WARNING:

EQUIPMENT FED BY MULTIPLE SOURCES LOCATION OF DISCONNECTING MEANS

(LAYOUT OR DESCRIPTION)

Location:

At each service equipment location and at the location(s) of the system disconnect(s) for all electric power production sources capable of being interconnected." [NEC 705.10]

WARNING:

DUAL POWER SOURCE SECOND SOURCE IS PV SYSTEM

Location:

Electrical Equipment containing overcurrent devices in circuits supplying power to a busbar or conductor supplied from multiple sources [NEC 705.12(B)(3)]

WARNING:

POWER SOURCE OUTPUT CONNECTION - DO NOT RELOCATE THIS OVERCURRENT DEVICE

Location:

At back-feed breaker if using 120% rule (if applicable) [NEC 705.12(B)(2)(3)(b)]

WARNING:

THIS EQUIPMENT FED BY MULTIPLE SOURCES. TOTAL RATING OF ALL OVERCURRENT DEVICES EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE, SHALL NOT EXCEED AMPACITY OF BUSBAR

Location:

At distribution equipment adjacent to the back-fed breaker from the power source when using this "sum of breakers" code compliance rule. [NEC 705.12(B)(2)(3)(c)]

PHOTOVOLTAIC POINT OF INTERCONNECTION

MAXIMUM AC OPERATING CURRENT:

MAXIMUM AC OPERATING VOLTAGE:

Location:

All interactive system(s) points of interconnection. [NEC 690.54]

DC Circuit Raceways and Enclosures

PHOTOVOLTAIC POWER SOURCE

Location:

DC Circuit Raceways and Enclosures, conduit, and combiner/junction boxes. [NEC 690.31(G)(3)]

PV System Disconnect

WARNING:

ELECTRIC SHOCK HAZARD TERMINALS ON LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

Location:

DC Disconnecting Means where terminals on both line and load side may remain energized. Example language or equivalent. [NEC 690.13(B)]

PV SYSTEM DISCONNECT

Location:

Each PV System Disconnect (May be AC or DC) [NEC 690.13(B)]

DC String Inverters Equipment Disconnects

WARNING:

ELECTRIC SHOCK HAZARD TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

Location:

Each PV system disconnecting means where line and load may be energized in the open position. [NEC 690.13(B)]

PHOTOVOLTAIC DC DISCONNECT

Location:

Location: Each PV system disconnecting means. [NEC 690.13(B)]

Maximum Voltage:

Maximum Circuit Current:

Maximum rated output current of the charge controller or dc-to-dc converter (if installed):

Location:

At each DC PV system disconnecting means. [NEC 690.53]

FIRE SAFETY CODE REQUIREMENTS

Roof Access and Ventilation Diagrams

Fire Safety

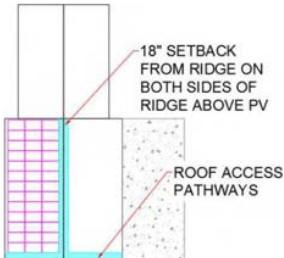
The following setbacks will be applicable to your PV system if either of the following statements are true:

Your PV Array coverage is less than 66% of the Roof Area and you have a sprinkler system.

Your PV Array coverage is less than 33% of the Roof Area and you do not have a sprinkler system.

Ridge Setbacks

PV Less Than 33% Roof Area (66% for homes with sprinkler systems) [IRC R324.6.2]



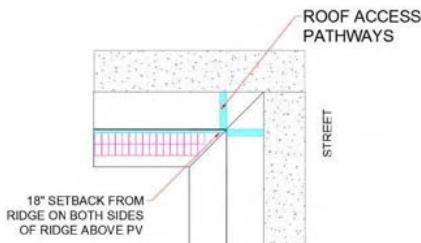
Emergency Escape & Rescue Opening

Minimum 3' Emergency Escape Pathway [IRC R324.6.2.2]

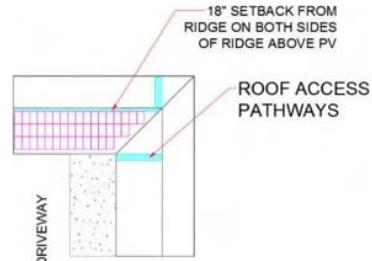


Hips and Valley Setbacks

PV Less Than 33% Roof Area - Street Access (66% for homes with sprinkler systems) [IRC R324.6.1]



PV Less Than 33% Roof Area - Driveway Access (66% for homes with sprinkler systems) [IRC R324.6.1]



FIRE SAFETY CODE REQUIREMENTS

Roof Access and Ventilation Diagrams

Fire Safety

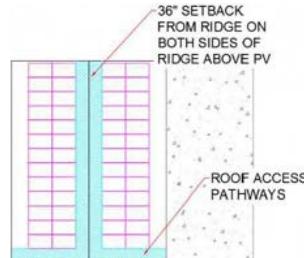
The following setbacks will be applicable to your PV system if either of the following statements are true:

Your PV Array coverage is greater than 66% of the Roof Area and you have a sprinkler system.

Your PV Array coverage is greater than 33% of the Roof Area and you do not have a sprinkler system.

Ridge Setbacks

PV More Than 33% Roof Area (66% for homes with sprinkler systems) [IRC R324.6.2.1]



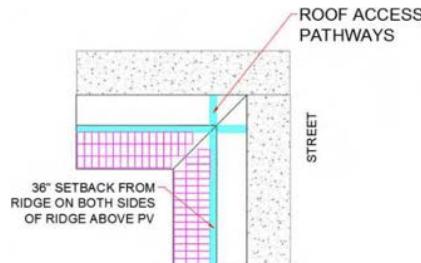
Emergency Escape & Rescue Opening

Minimum 3' Emergency Escape Pathway [IRC R324.6.3]

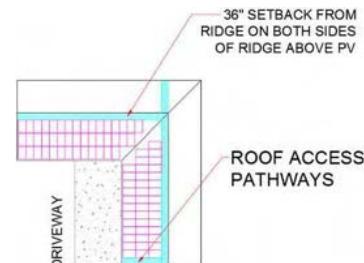


Hips and Valley Setbacks

PV More Than 33% Roof Area - Street Access (66% for homes with sprinkler systems) [IRC R324.6.1]



PV More Than 33% Roof Area - Driveway Access (66% for homes with sprinkler systems) [IRC R324.6.1]



INPUTS

Permit Details [80.19(H) ; R105.3]

GENERAL

Project Information

Project Title

Address

AHJ

Project Type

Scope of Work

PV System Size AC (kW):

Confirm you have reviewed SolarAPP eligibility:

PV

*PV Residential Roof Mount
11.200KW, 32 modules & 1
inverter*

7.616 kW

Yes

Contractor Information

Installation Applicability and Compliance

All work will comply with the 2017 National Electrical Code® (NFPA 70), the International Code Council 2021 I-Codes, Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE/SEI 7-16), UL Standards, Manufacturer's instructions, and Municipal requirements.

State License

Type *state*

Number *1029644*

Type *city*

Number *37087*

FIRE

Does the home have sprinkler systems? INPUT

No

What is the total array area? ($\{I20\} \rightarrow ((\{CEC:L\}) * (\{I11\}) = \{C16\})$) square meters
 $(\{C16\}) * (10.764) = \{C17\}$ square feet

609.67 sqft

The total roof area: INPUT

2489 sqft

% of Roof Area covered with PV = $\{C17\}$ Array Area/Total Roof Area: ($\{C17\}/\{I102\}$) = $\{C15\}$

24.49%

See INPUT Fire Setback Diagram attached.

Less Than 33/66

STRUCTURAL DETAILS

General

The weight of the PV system in lbs/sq ft: INPUT *2.77 psf*

The ground snow load is INPUT *0 lb/sqft*

Proposed maximum spacing in inches between adjacent attachment points of the mounting system INPUT *48"*

Will attachment points of the mounting system be staggered? INPUT

No

The number of roof surfaces at different slopes and/or orientations that will be used for installation are: INPUT. Note: 1 means all roofs used have the same orientation.

5

Type of mounting for the PV system

Flush mount

Mounting Planes

Mounting Plane Type 1

The maximum height of the module above the roof surface is INPUT inches

5"

The current roof covering is INPUT

Clay and concrete tile

The pitch of the roof surface is INPUT

5/12

Mounting Plane Type 2

The maximum height of the module above the roof surface is INPUT inches

5"

The current roof covering is INPUT

Clay and concrete tile

The pitch of the roof surface is INPUT

5/12

Mounting Plane Type 3

The maximum height of the module above the roof surface is INPUT inches

5"

The current roof covering is INPUT

Clay and concrete tile

The pitch of the roof surface is INPUT

5/12

Mounting Plane Type 4

The maximum height of the module above the roof surface is INPUT inches

5"

The current roof covering is INPUT

Clay and concrete tile

The pitch of the roof surface is INPUT

5/12

Mounting Plane Type 5

The maximum height of the module above the roof surface is INPUT inches

5"

The current roof covering is INPUT

Clay and concrete tile

The pitch of the roof surface is INPUT

5/12

Wind Speed

Is the solar module and mounting system rated by the manufacturer to withstand the upward force of the local wind speed and evenly distribute load into the supporting structure at the proposed maximum spacing, and confirmed in UL 1703 or 61730 (Part 1 & 2), and 2703 listings?

Yes, 110 MPH

Roof Condition

Does the roof structure appear to be structurally sound, without signs of alterations or significant structural deterioration or sagging? YES

Yes

ELECTRICAL DETAILS

Equipment

Architecture type used for all inverters in this project:

String Inverter with DC-DC
Converters

Inverter 1

Inverter 1 Model Number: INPUT

SE7600H-US [240V]

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

1622137111425-I9-SE7600_SPE
C_SHEET.pdf

Inverter 1 Manufacturer: INPUT

SolarEdge Technologies Ltd.

Is Inverter 1 UL 1741 listed? [110.3(C) ; 690.4(B) ; R324.3.1] YES

Yes

Modules

Module 1 Model Number: INPUT

LR4-60HPB-350M

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

1627401243434-I12-LONG_SOL
AR_LR4_60HPB_350M.pdf

Module 1 Manufacturer: INPUT

LONGi Green Energy Technology
Co., Ltd.

Is Module 1 UL 1703 or UL 61730 (Part 1 & 2) listed? [110.3(C) ; 690.4(B) ;
R324.3.1] YES

Yes

Module 1 quantity: INPUT

32

Module open circuit voltage with record low temperature correction

42.98 V

Module short circuit current with average high temperature correction

11.24 A

Racking System 1/Flashing

Racking System 1 Model Number: INPUT

UNIRAC SOLARMOUNT LIGHT RAIL

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): See attached.

1625151942184-I15-UNIRAC_R00FMOUNT_RM10.pdf

Racking System 1 Manufacturer: INPUT

unirac

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

Yes

The combination of modules and racking system shall have the same fire classification as the roof assembly. R324.4.2: YES

Yes

Name/description of roof penetration sealant method to be used.

Geocell + Mechanical Flashing

You have agreed to install the flashing per the manufacturers instructions for the means of accomplishing weather proofing: YES.

Yes

Rapid Shutdown

The AC module, microinverter, or DCDC converter installed on each module is listed for UL 1741 or UL 3741 as PVRSS or PVRSE and used to comply with requirements for Rapid Shutdown both inside and outside the array.[690.12(B)(2)(2)]

Site Conditions

Ambient Dry Bulb Extreme Record Low Temperature (°C) [690.7(A)]: INPUT

1 °C

Ambient Dry Bulb Average High Temperature (°C): INPUT

42 °C

Single Phase Grid Voltage

240 V

Installation Details

Is there an existing Utility interactive power production source connected to the home's electric service? NO

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)]: YES

Yes

NM cable is used for inverter output circuits and installed in locations and uses according to the Code [334.10]

No

Are all rooftop conduits mounted at least 7/8" above the roof surface.[310.15(B)(3)(c)]:[310.15(B)(2)]

Yes

Are all PV Source Circuit conductors installed without raceway listed as PV Wire or USE-2?: [690.31(C)][690.31(C)(1)]

Yes

Are all power terminals rated to 75°C, labeled for use with Copper Class B or Class C wires, and accept minimum 8 AWG wire?[110.14]

Yes

Where Equipment Grounding Conductors (EGC) are not routed with circuit conductors, EGC is a minimum of 6 AWG or it is protected from physical damage [250.120(C)]

Yes

DC strings EGC is a minimum of 10 AWG

Yes

Module voltage and current DC specifications fall within allowable range of connected equipment: YES

Yes

All ancillary equipment is listed for the application, rated equal to or greater than the connected overcurrent device and installed per the manufacturer's instructions. Documentation shall be provided upon request.

Yes

String Inverter with DC-DC Converters [690.7(B)]

Maximum PV Source Circuit Voltage

Does the quantity of series connected DC-DC converters exceed the manufacturers instructions to ensure a maximum string voltage of 600V? NO

No

Max quantity modules in DC series string: INPUT

16 modules

Datasheet for DCDC converter See attached.

1622137736049-I70-SE_OPTIMIZER_DATA_SHEET.pdf

PV Source Circuit

See Table 6 for selection of the minimum DC wire size.

Input maximum number of current carrying PV Wire or USE-2 conductors in raceway
INPUT

0

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

4

The minimum DC THWN-2 wire size is based on the Table 6 below.

12AWG

Table 6

Current Carrying Conductors (CCC) in raceway	Site Average High Temperature	2 series strings in parallel	Single series string
<=3 CCC	=< 35	10 AWG	12 AWG
	=< 40	10 AWG	12 AWG
	=< 45	10 AWG	12 AWG
	=< 50	10 AWG	12 AWG
4 - 6 CCC	=< 35	10 AWG	12 AWG
	=< 40	8 AWG	12 AWG
	=< 45	8 AWG	12 AWG
	=< 50	8 AWG	12 AWG
7 - 9 CCC	=< 35	8 AWG	12 AWG
	=< 40	8 AWG	12 AWG
	=< 45	8 AWG	12 AWG
	=< 50	8 AWG	12 AWG

[Table 310.15(B)(3)(a) ; Table 310.15(B)(2)(b) ; Table 310.15(B)(16) ; 690.8(A)(1) ; 690.8(B)]

Inverter Output Circuit

See Table 3 below for selection of minimum Inverter output wire size and inverter output overcurrent protection size.

Inverter 1: Inverter Continuous Output Current = Power / Site Voltage: (I18 →
INV:CEC:K:["Maximum Continuous Output Power at Unity Power Factor"]) W / C14
V = C5 A

31.73 A

Table 3

Table 3

Continuous Output Current	12.5	16.5	20.5	24.5	28.5	32.5	36.5	40.5	48.5	56.5	64.5	72.5	80.5	88.5	100.5	120.5	140.5	160.5
OCPD amperage size	15	20	25	30	35	40	45	50	60	70	80	90	100	110	125	150	175	200
AWG wire size for <=3 CCC in raceway	12	12	10	10	8	8	8	8	6	4	4	3	3	2	1	1/0	2/0	3/0
AWG wire size for 4 - 6 CCC in raceway	12	12	10	10	8	8	8	8	6	4	4	3	3	2	1	1/0	2/0	3/0
AWG wire size for 7 - 9 CCC in raceway	12	12	10	10	8	8	8	6	6	4	4	3	3	2	1	2/0	3/0	4/0
NM wire	12	12	10	10	8	8	8	6	6	4	4	3	2	1	1	1/0	N/A	N/A

[240.4(D); Table 310.15(B)(3)(a) ; Table 310.15(B)(2)(b) ; Table 310.15(B)(16) ; 690.8; 690.9; 705.30]

Inverter 1 - See Table 3 for the minimum Overcurrent Protection Device rating.[690.9(A) ; 690.9(B)]

40 AMP

Inverter 1 Overcurrent Protection Device rating [NEC 690.9(A); 690.9(B)]

60 A

Input maximum number of AC current carrying THHN-2 conductors in raceway:
INPUT

4

Inverter 1 - See Table 3 for selection of the AC wire size in raceway

6AWG

Grounding & Bonding

See Table 5 for selection of Equipment Grounding Conductor wire gauge.

Inverter 1 - Equipment Grounding Conductor (EGC) based on overcurrent protective device:

10 AWG

Table 5

Table 5

OCPD rating (amperes)	EGC wire gauge (AWG)
=< 15	14
=< 20	12
=< 30	10
=< 40	10
=< 60	10
=< 100	8
=< 200	6

[Table 250.122]

String Inverter with DC-DC Converters

Maximum PV Source Circuit Voltage

DC-DC converter Manufacturer:

Solaredge

DC-DC converter Model Number:

P401

Module open circuit voltage is below the DC-DC converter maximum DC input voltage. The maximum DC input voltage for the equipment in question is

60 V

Module short circuit current is below the DC-DC converter maximum DC input current. The maximum DC input current for the equipment in question is

11.75 A

PV Source Circuit

PV module series strings from solar arrays to the PV inverter are combined in parallel

No

New Panelboard for Relocated Loads

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

No

Equipment Point of Interconnection

Point of Connection

125% of the sum of power production sources continuous output current.

40 A

At the time of inspection, it will be verified that if connected equipment is NOT within line of sight or closer than 10ft to the point of interconnection, disconnect or isolation means are installed.[NEC 690.15 (A)]

Point of Connection at Subpanel

Existing Subpanel

Will power production inverter outputs be connected directly to an existing subpanel?
____ (I75) ____

No

Point of Connection at Main Panel

System Point of Interconnection Compliance Method at MSP

INPUT

705.12 (B) (2) (3) (b)

Main Service Panel Equipment

Main Bus Ampere Rating: INPUT AMP

200 A

Main Breaker/Service Disconnect Ampere Rating: INPUT AMP

200 A

Since no connection was indicated at a subpanel or at a subpanel feeder, power production sources are connected either directly to the main service panel or in a Supply Side Connection.

Point of Connection

Main Service Panel Equipment

What is the Utility service feed rated for? (200 AMP)

200 AMP

Point of Connection at Subpanel Feeders

Load Side Tap

Power production sources are connected to a subpanel feeder. A subpanel feeder connection, may be a connection directly to a conductor, or using lug terminations in equipment such as an Microgrid Interconnection Device (MID).

No

Electrical Work

Main Panel Upgrades and Main Breaker Derates

A Main Panel Upgrade is being performed.

No

A Main Breaker Derate is being performed.

No

Interconnection at Main Service Panel

Where two sources, one a primary power source and the other another power source, are located at opposite ends of a busbar that contains loads, the sum of 125 percent of the power source(s) output circuit current and the rating of the overcurrent device protecting the busbar shall not exceed 120 percent of the ampacity of the busbar. Enter the service disconnect ampere rating ____(I39)____A Enter the main bus ampere rating ____(I38)____A Enter the sum of power production source overcurrent protective device ampere rating ____C8____A (calculated from architecture specific design section above) Since $(I38*120\%) - I39 \geq C8$, then YES Compatible with SolarAPP

Yes

WORKERS' COMP

By applying for this permit, you represent and warrant that you 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.

SAMPLE

System

New Rooftop Residential Retrofit PV Systems

Installed by contractor with all licenses required by jurisdiction

Electrical

Limited to 2017 NEC

600V Max per DC System Size

Single phase only

No Aluminum Wires

Must Use 600V rated PV wire (due to outer diameter > 0.24" (6.1mm))

Must use 90 deg C rated insulated wire

Max 2 DC strings in parallel

Max 9 current carrying conductors in a raceway

Inverter output circuit conductors must be THWN-2, or listed NM

Terminals must be rated to 75 deg C, labeled for use with Cu wires, and accept minimum 8 AWG wire

If using microinverter, 1 module per microinverter

Permitted to install on up to or equal to 400A Service

Permitted to install on up to or equal to 225A Service Disconnect

Permitted to install on up to or equal to 225A busbars

No existing PV or ESS

May install only 1 module type

May install up to 2 Inverters for String Inverters, up to 1 inverter type for Micro-inverters and AC modules Systems

Conduit may not be Schedule 80 PVC

Single Family Dwelling Only

Modules and Inverters must be listed on CEC

Rapid Shutdown cannot be satisfied using the method: No exposed wiring or conductive parts [690.12(B)(2)(3)]

No trenching allowed

All power production inverter outputs have the same point of connection

All equipment is assumed to be non-continuous rated

May install only 1 racking system type

Height of rooftop conduit > = 7/8"

Flat Plate PV Modules Only

Structural

Applicable International Residential Code

PV system + hardware weight is less than or equal to 4psf

No ground mounted systems

No carports or non-permanent structures

No wood shake or wood shingle roofing

Limit of 10" above the roof for pitched (>2/12) roof systems

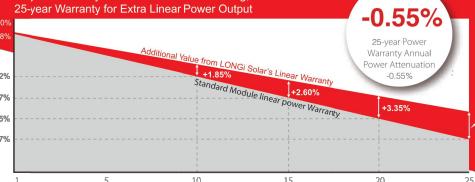
No metal roof or low-slope roof in areas with > 15psf snow load

Fire

Applicable International Residential Code



10-year Warranty for Materials and Processing;
25-year Warranty for Extra Linear Power Output



Complete System and Product Certifications

IEC 61215, IEC61730, UL61730

ISO 9001:2008: ISO Quality Management System

ISO 14001:2004: ISO Environmental Management System

TS62741: Guideline for module design qualification and type approval

OHESAS 18001: 2007 Occupational Health and Safety



* Specifications subject to technical changes and tests. LONGi Solar reserves the right of interpretation.

LR4-60HPB 345~365M

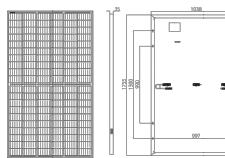
High Efficiency
Low LID Mono PERC with
Half-cut Technology



LR4-60HPB 345~365M

Mechanical Parameters

Operating Parameters



Cell Orientation: 120 (6x20)	Operational temperature: -40°C ~ +85°C
Junction Box: IP68, three diodes	Power Output Tolerance: 0~+5 W
Output Cable: 4mm ² , 300mm in length, length can be customized	Voc and Isc Tolerance: ±5%
Glass: Single glass, 3.2mm coated tempered glass	Maximum System Voltage: DC1000V (IEC61
Frame: Anodized aluminum alloy frame	Maximum Series Fuse Rating: 20A
Weight: 13.5kg	Nominal Operating Cell Temperature: 45±2°C
Dimensions: 1750*1008*35mm	Safety Class: Class II
Packaging: 30pcs per pallet	Fire Rating: UL type 1 or 2
180pcs per 20GP	
780pcs per 40HC	

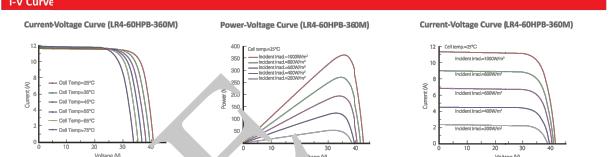
Electrical Characteristics

Model Number	LR4-60HPB-345M	LR4-60HPB-350M	LR4-60HPB-355M	LR4-60HPB-360M	LR4-60HPB-365M
Testing Condition	STC	NOCT	STC	NOCT	STC
Maximum Power (Pmax/W)	345	255.6	350	259.3	355
Open Circuit Voltage (Voc/V)	40.2	37.5	40.4	37.7	40.6
Short Circuit Current (Isc/A)	11.05	8.92	11.16	8.99	11.25
Voltage at Maximum Power (Vm/V)	34.2	31.6	34.4	31.8	34.6
Current at Maximum Power (Imp/A)	10.09	8.09	10.18	8.16	10.27
Module Efficiency(%)	18.9		19.2		19.5
					19.8
STC (Standard Testing Conditions): Irradiance 1000W/m ² , Cell Temperature 25°C, Spectra at AM1.5					
NOCT (Nominal Operating Cell Temperature): Irradiance 800W/m ² , Ambient Temperature 20°C, Spectra at AM1.5, Wind at 1m/s					

Temperature Ratings (STC)

Temperature Coefficient of Isc	-0.057%/°C	Front Side Maximum Static Loading	5400Pa
Temperature Coefficient of Voc	-0.286%/°C	Rear Side Maximum Static Loading	2400Pa
Temperature Coefficient of Pmax	-0.570%/°C	Hailstone Test	25mm Hailstone at the speed of 23m/s

I-V Curve



LONGI

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Note: Due to continuous technical innovation, R&D and improvement, technical data above mentioned may be of modification accordingly. LONGi have the sole right to make such modification at any time without further notice; Demanding party shall request for the latest datasheet for such as contract need, and make it a consulting and binding part of law and documentation duly signed by both parties.

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20200106-Draft



ROOFMOUNT | RM10

SOUTH FACING 10 DEGREE TILT



UNIRAC
BETTER SOLAR STARTS HERE

RM10 introduced the Power of Speed & Simplicity to the ballasted flat roof solar industry. The system consists of only two major components, minimizing installation time. Quickly design around roof obstacles and bond the system with just the turn of a wrench. Optional roof attachments, roof pads, and MLPE mount provide a complete solution. UNIRAC's unmatched commercial project support makes construction easy, from permitting through installation, and **RM10** is supported by North America's largest distribution network. Plus, enjoy peace of mind with UNIRAC's industry-leading 25-year warranty.

FEWER PARTS • FASTER INSTALLATION

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

25
YEAR
FULL SYSTEM
WARRANTY

ROOFMOUNT | RM10

SOUTH FACING 10 DEGREE TILT



UNIRAC
BETTER SOLAR STARTS HERE

SIMPLE DESIGN
TWO MAJOR COMPONENTS. ONE TOOL
RM10 supports most framed PV modules at 10 degree tilt. The component list consists of only two major components – a fully assembled ballast bay and a universal module clip. Our engineers specified a chemical locking hex bolt, providing a UL2703 certified grounding path from module to ballast bay, with just the turn of a wrench. **RM10** is designed to conveniently work with off the shelf wire management products. A snap into place, membrane-friendly, rubber roof pad is also available as a low-cost option for roof protection.

AVAILABILITY
NATIONWIDE NETWORK
UNIRAC maintains the largest network of stocking distributors for our racking solutions. Our partners have distinguished their level of customer support, availability, and overall value, thereby providing the highest level of service to users of UNIRAC products. Count on our partners for fast and accurate delivery to meet your project needs. Visit unirac.com for a list of distributors.

AUTOMATED DESIGN TOOL
DESIGN PLATFORM AT YOUR SERVICE
Creating a bill of materials is just a few clicks away with **U-Builder**, a powerful online tool that streamlines the process of designing a code compliant solar mounting system. Save time by creating a user profile, and recall preferences and projects automatically when you log in. You will enjoy the ability to share projects with customers: there's no need to print results and send to a distributor, just click and share.

LISTED **UL2703** BONDING & GROUNDING
MECHANICAL LOADING
SYSTEM FIRE CLASSIFICATION

UNIRAC CUSTOMER SERVICE MEANS THE HIGHEST LEVEL OF PRODUCT SUPPORT

TECHNICAL SUPPORT
UNIRAC's technical support team is dedicated to answering questions & addressing issues in real time. An online library of documents including engineering reports, stamped letters and technical data sheets greatly simplifies your permitting and project review process.

THEIR QUALITY PROVIDER
UNIRAC is the only PV mounting vendor with ISO certification: 9001:2008, 14001:2005 and OHSAS 18001:2007. Through these, we deliver the highest standards for R&D, design, and production. These certifications demonstrate our excellence and commitment to first class business practices.

BANKABLE WARRANTY
Don't leave your project to chance. UNIRAC has the financial strength to back our products and reduce your risk. Have peace of mind knowing you are receiving products of exceptional quality. **ROOFMOUNT** is covered by a twenty-five (25) year limited product warranty.

PROTECT YOUR INVESTMENT WITH UNIRAC'S RACKING SOLUTIONS BACKED BY ENGINEERING EXCELLENCE AND A SUPERIOR SUPPLY CHAIN

SAMPLE

Single Phase Inverter with HD-Wave Technology

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US



Optimized installation with HD-Wave technology

- ✓ Specifically designed to work with power optimizers
- ✓ Record-breaking efficiency
- ✓ Fixed voltage inverter for longer strings
- ✓ Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12
- ✓ UL1741 SA certified, for CPUC Rule 21 grid compliance
- ✓ Extremely small
- ✓ Built-in module-level monitoring
- ✓ Outdoor and indoor installation
- ✓ Optional: Revenue grade data, ANSI C12.20 Class 0.5 (0.5% accuracy)

solaredge.com

solaredge

INVERTERS

Single Phase Inverter with HD-Wave Technology for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US

	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US
OUTPUT							
Rated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V
Maximum AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V
AC Output Voltage Min. / Nom. / Max. (271 - 240 - 264)	✓	✓	✓	✓	✓	✓	✓
AC Output Voltage Min. / Nom. / Max. (208 - 240 - 264)	✓	✓	-	✓	-	-	✓
AC Frequency (Nominal)				59.3 - 60 - 60.5			Hz
Maximum Continuous Output Current (240V)	12.5	16	21	25	32	42	47.5
Maximum Continuous Output Current (208V)	-	16	-	24	-	-	48.5
Current Threshold				1			A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds				Yes			
INPUT							
Maximum DC Power @240V	4650	5900	7750	9300	11800	15500	17650
Maximum DC Power @208V	-	5100	-	7750	-	-	15500
Transformerless, Ungrounded				Yes			
Maximum Input Voltage				480			Vol.
Nominal DC Input Voltage				380			Vol.
Maximum Input Current @240V ¹¹	8.5	10.5	13.5	16.5	20	27	30.5
Maximum Input Current @208V ¹¹	-	9	-	13.5	-	-	27
Max. Input Short Circuit Current				45			Adc.
Reverse-Polarity Protection				Yes			Adc.
Ground-Fault Isolation Detection				600mA Sensitivity			
Maximum Inverter Efficiency	99				99.2		%
CEC Weighted Efficiency				99		99 @ 240V 98.5 @ 208V	%
Nighttime Power Consumption					2.5		W
ADDITIONAL FEATURES							
Supported Communication Interfaces					RS485, Ethernet, Zigbee (optional), Cellular (optional)		
Relay Control Data, ANSI C12.20					Optional ¹²		
Rapid Shutdown - NEC 2014 and 2017 690.12					Automatic Rapid Shutdown upon AC Grid Disconnect		
STANDARD COMPLIANCE							
Safety					UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07		
Grid Connection Standards					IEEE1547, Rule 21, Rule 14 (H)		
Emissions					FCC Part 15 Class B		
INSTALLATION SPECIFICATIONS							
AC Output Conduit Size / AWG Range					1" Maximum / 14-6 AWG		
DC Input Conduit Size / # of Strings / AWG Range					1" Maximum / 1-2 strings / 14-6 AWG		
Dimensions with Safety Switch (HxWxD)					17.7 x 14.6 x 6.8 / 400 x 370 x 174		17.3 x 14.6 x 7.3 / 540 x 370 x 185
Weight with Safety Switch					22 / 10	31.4	26.2 / 11.9
Noise					- < 20	-	< 50
Cooling							dB(A)
Operating Temperature Range							-10 to +40°C (Natural Convection)
Electrostatic Discharge							-10 to +40°C (-40° / -40°C option) ¹³
<small>¹¹For more information, please contact SolarEdge. ¹²For higher current strings may be used, the inverter must be connected to a central monitoring and control system. ¹³Revenue grade inverter P/N: SE5000H-US-40 and SE6000H-US-40. ¹⁴version P/N: SE10000H-US2000NNH4. © SolarEdge Technologies, Inc. All rights reserved. All other trademarks mentioned herein are the property of their respective owners. ¹⁵SE10000H-US-40 and SE11400H-US-40 are trademarks or registered trademarks of SolarEdge Technologies, Inc. All rights reserved. ¹⁶SE10000H-US-40 and SE11400H-US-40 are trademarks or registered trademarks of SolarEdge Technologies, Inc. All rights reserved. ¹⁷Subject to change without notice.</small>							

RoHS





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Subject: ETL Evaluation of SolarEdge Products to NEC 2017 Rapid Shutdown Requirements

To, whom it may concern

This letter represents the testing results of the below listed products to the requirements contained in the following standards:

National Electric Code, 2017, Section 690.12 requirement for rapid shutdown.

UL 1741, UL 1741 CRD for rapid shutdown

The evaluation was done on the PV Rapid Shutdown System (PVRSS), and covers installations consisting of optimizers and inverters with part numbers listed below.

The testing done has verified that controlled conductors are limited to:

- Not more than 30 volts and 240 voltamperes within 30 seconds of rapid shutdown initiation outside the array.
- Not more than 80 volts and 240 voltamperes within 30 seconds of rapid shutdown initiation inside the array.

The rapid shutdown initiation is performed by either disconnecting the AC feed to the inverter, or – if the inverter DC Safety switch is readily accessible – by turning off the DC Safety switch.

Applicable products:

- Power optimizers:
 - PB followed by 001 to 350; followed by -AOB or -TFI.
 - OP followed by 001 to 500; followed by -LV, -MV, -IV or -EV.
 - P followed by 001 to 850.
 - SP followed by 001 to 350.

*When optimizers are connected to 2 or more modules in series, the max input voltage may exceed 80V. Following the implementation of the NEC 2017 rapid shutdown value of 80V max inside of the array at the beginning of 2019, modules exceeding this combined input max voltage will be required to use optimizers with parallel inputs.
- 1-ph inverters:

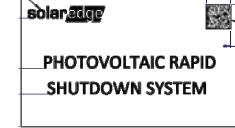
- SE3000A-US / SE3800A-US / SE5000A-US / SE6000A-US / SE7600A-US / SE10000A-US / SE11400A-US / SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US when the following label is labeled on the side of the inverter:



Inverter part number may be followed by a suffix

- 3-ph inverters:

- SE9KUS / SE10KUS / SE14.4KUS / SE20KUS / SE30KUS / SE33.3KUS / SE43.2KUS / SE66.6KUS / SE100KUS ; when the following label is labeled on the side of the inverter:



Inverter part number may be followed by a suffix

If there are any questions regarding the results contained in this report, or any of the other services offered by Intertek, please do not hesitate to contact the undersigned.

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Version: 8-September-2016

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