

UL 3741 | APPLICATIONS



UNIRAC leads the industry in UL 3741 compliance, offering the most extensive set of certified racking and inverter pairings.

By achieving certification to UL 3741 for 10 of our racking systems and over 100 inverter modules, we're making solar installations across the country easier than ever! UL 3741 has opened the door for a new standard of "PV Hazard Control" that meets the National Electrical Code (NEC) rapid shutdown requirements without module-level rapid shutdown devices. NEC provides two rapid shutdown options for rooftop PV systems: Module-level shutdown with MLPE or UL 3741 PV hazard control system listing.

Systems that qualify for UL 3741 listing must follow these 3 steps

1. Ensure PV racking and inverter models have been certified and listed together.
2. Design the PV array layout according to one of the use cases on the following pages.
3. Ensure wires are managed according to the racking specific install manual.

UNIRAC's UL 3741-Compliant Systems:

FLAT ROOF:

GRIDFLEX 10



ECOFOOT 2+



GRIDFLEX 5



ECOFOOT 5D



RM10 EVO



FLUSH MOUNT AND TILT UP:

RM10



NXT UMOUNT

RESIDENTIAL

COMMERCIAL



RMDT



SOLARMOUNT

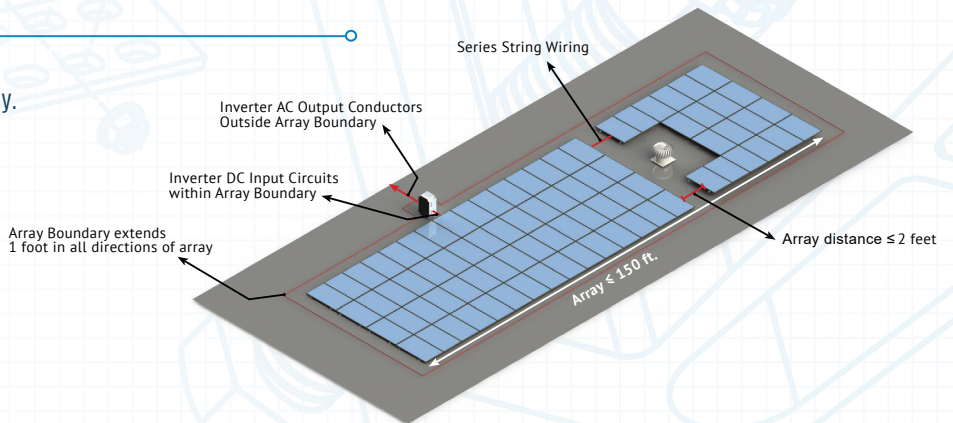


RM5



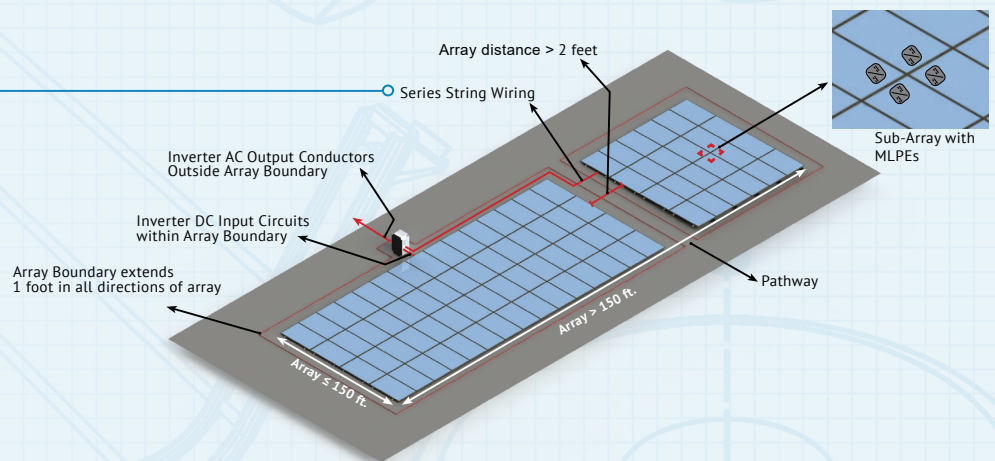
CONFIGURATION 1

- The inverter is placed within the array boundary.
- Maximum 2 ft spacing between all array components ensuring a "single array."



CONFIGURATION 2

- The inverter is placed within the array boundary.
- Sub-array exceeds 2 ft spacing thus making it separated from main array & no string isolation device is used. Sub-array uses MLPEs to meet rapid-shutdown requirements.



CONFIGURATION 3

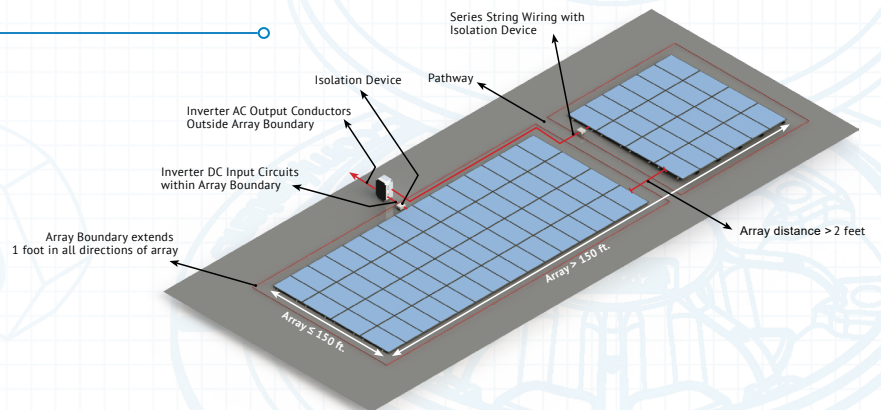
- The inverter is placed within the array boundary.
- Sub-array exceeds 2 ft spacing thus making it separated from the main array – a string isolation device (SID*) is needed (typically offered by inverter manufacturers).

*The UL 3741 standard allows for SID's, but currently the industry does not have a product solution fit.

ELEMENTS OF WIRE MANAGEMENT:

1. Ensure wires are protected when exposed between PV array rows & columns.

2. Wires beneath modules that have passed impact testing must be managed to prevent contact with metallic surfaces.



Detailed methods for each of these two wire management elements are shown in each racking system's installation manual.

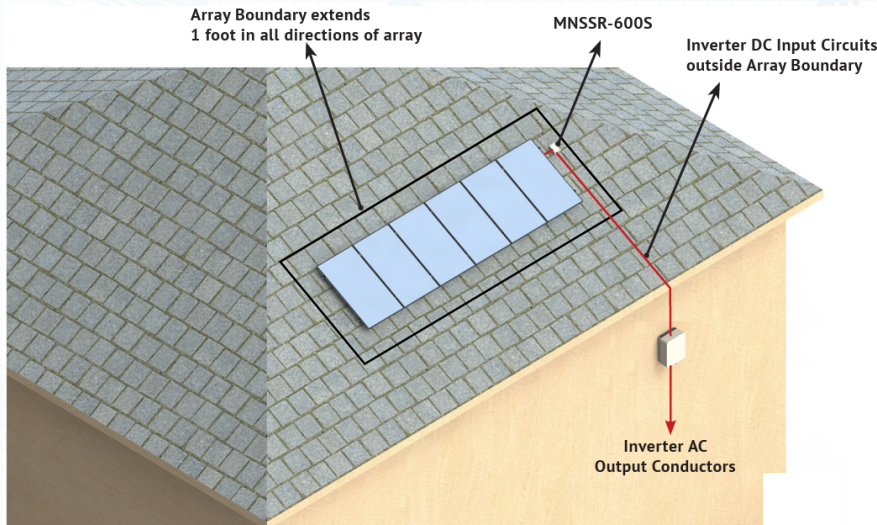
UL 3741 | RESIDENTIAL USE CONFIGURATIONS



UTILIZING MIDNIGHT SOLAR MNSSR-600S WITH SOLIS INVERTERS

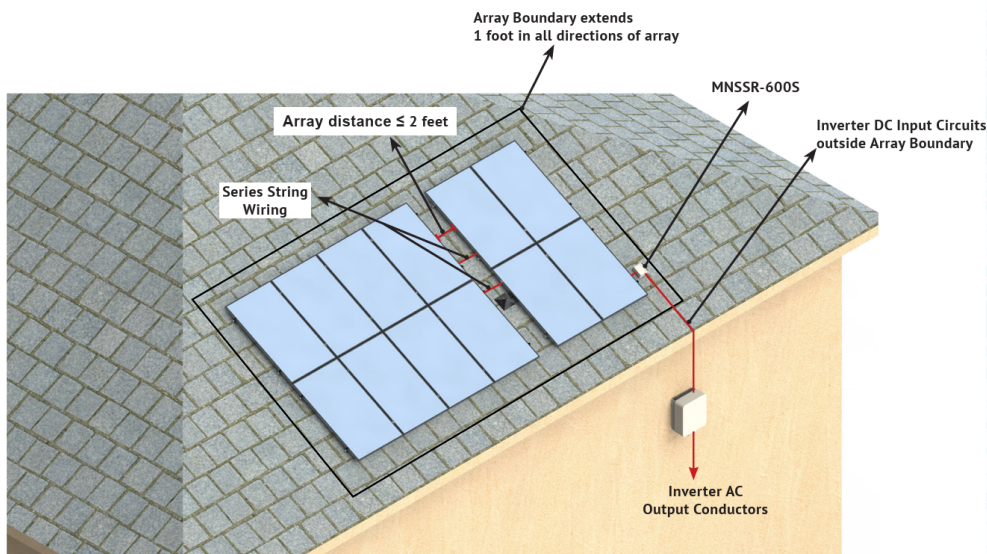
CONFIGURATION-1A ARRAY(S) WITH LISTED UL 3741 PV HAZARD CONTROL SYSTEM AND MNSSR-600S

1. By using listed UL3741 PVHCS, array(s) complies with NEC 690.12(B)
2. Use MNSSR-600S as shown below to control inverter input circuits (DC) that are outside of the array boundary and comply with NEC 690.12(B)(1).



CONFIGURATION-1B ARRAY(S) AND SUB ARRAY(S) WITH LISTED UL 3741 PV HAZARD CONTROL SYSTEM WITHIN SAME ARRAY BOUNDARY

1. When two or more arrays are located not more than 2 feet apart, this results in a single array boundary.
2. By using listed UL3741 PVHCS, array(s) complies with NEC 690.12(B)
3. Use MNSSR-600S as shown below to control inverter input circuits (DC) that are outside of the array boundary and comply with NEC 690.12(B)(1).



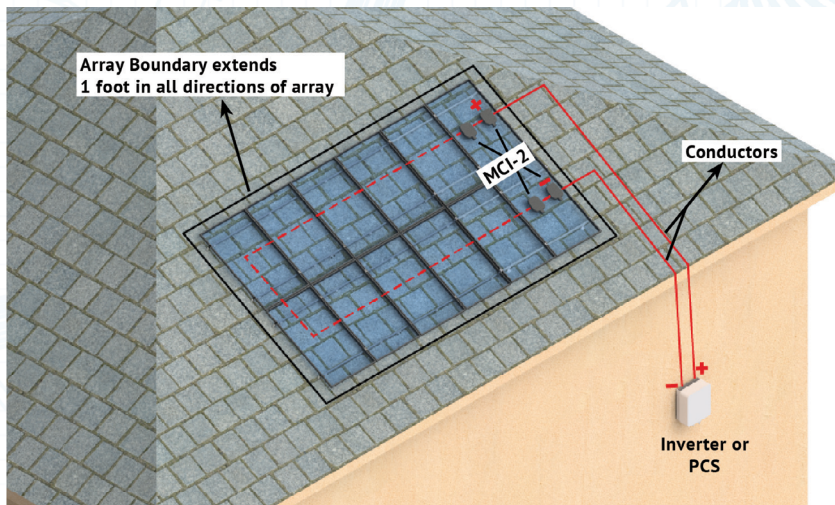
UL 3741 | RESIDENTIAL USE CONFIGURATIONS

UTILIZING MCI-2S WITH TESLA INVERTERS

CONFIGURATION-2A SINGLE SERIES STRING ARRAY WITH TESLA MCI-2S

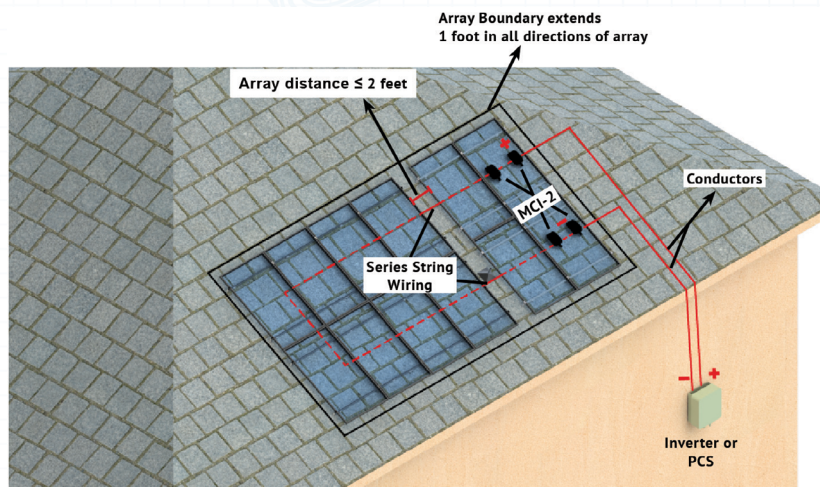
While using MCI-2s:

1. Maintain a maximum two arrays per string*.
2. Place at least one MCI at each end of the string; the other two MCIs can be placed anywhere within the string, preferably close to the ends.
3. Do not connect MCI-2s directly to each other, as this may damage the connectors if rotated.



CONFIGURATION-2B MULTIPLE ARRAYS WITH DISTINCT ARRAY BOUNDARIES USING MCI-2S

1. When two or more arrays are located not more than 2 feet apart, this results in a single array boundary



*Rule created for simplicity. For rare design cases with 3 arrays per string, use Tesla's 165V inside-the-array PVHCS listing.

UL 3741 | RESIDENTIAL USE CONFIGURATIONS



UTILIZING MCI-2S WITH TESLA INVERTERS

CONFIGURATION-2C **MULTIPLE ARRAYS WITH DISTINCT ARRAY BOUNDARIES USING MCI-2S**

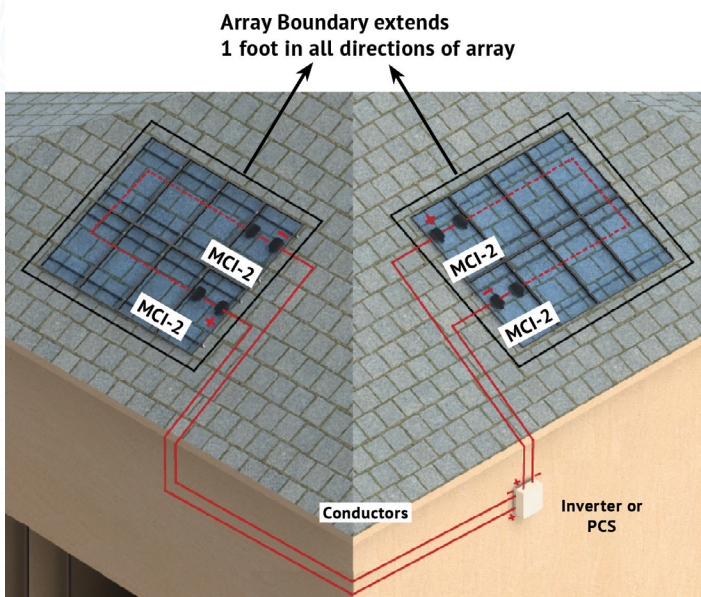
When two or more arrays are located more than 2 feet apart, this results in a separate array boundary

While using MCI-2s:

1. Maintain a maximum two arrays per string*.
2. Place at least one MCI at each end of the string; the other two MCIs can be placed anywhere within the string, preferably close to the ends.
3. Do not connect MCI-2s directly to each other, as this may damage the connectors if rotated.

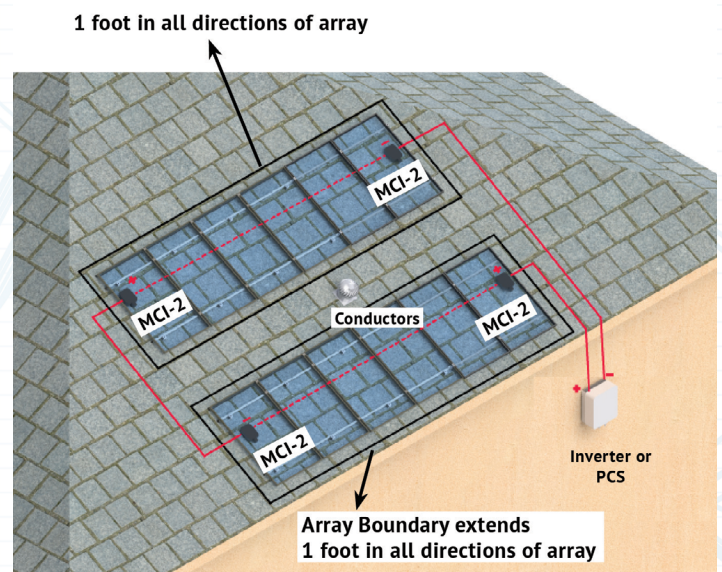
2C OPTION 1

- a. Distinct Arrays without String Sharing



2C OPTION 2

- a. Distinct Arrays with String Sharing



*Rule created for simplicity. For rare design cases with 3 arrays per string, use Tesla's 165V inside-the-array PVHCS listing.