solaredge

Smart Modules Installation Guide
MAN-01-00520-2.7
For Europe and APAC
Version 2.7

Disclaimers

Important notice

Note: This product is intended to provide remote shutdown of the SolarEdge PV harvesting system to enable safer access to a building in the event of fire. This product DOES NOT reduce the risk of fire or protect firefighters or others accessing a building in the event of a fire. The images contained in this document are for illustrative purposes only and may vary depending on product models.

Emission compliance

This equipment has been tested and found to comply with the limits applied by the local regulations. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates and radiates radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:
Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance may void the user's authority to operate the equipment.

Revision History

- Version 2.7, March 2024 – Added more clamping options
- Version 2.6, February 2024 – Added additional clamping options
- Version 2.5, November 2023 – Added new models PVxxx-R72PGTL / PVxxx-R72PDTL

Contents

Important safety instructions

SAVE THESE INSTRUCTIONS

General safety

NOTES

- Consult and follow local codes and other applicable laws concerning required permits as well as installation & inspection requirements, rules, and regulations.
- Modules and PV systems should be installed by authorized and qualified personnel.
- Follow all safety precautions for all components used in the system.
- Long periods of shading on the modules surface from the sun can result in cell power dissipation and overheating.
- Do not clean the glass surface with chemicals.
- Do not drop the PV module or drop objects onto the module.
- Do not attempt to disassemble the modules, and do not remove any attached components from the modules.
- Do not scratch or otherwise harm the back sheet, the glass or the junction box. Do not pull or twist the cables or touch them with bare hands.
- Do not drill holes in the frame or scratch the insulating coating of the frame.
- Keep the module packed in the package until installation.
- Do not use modules near equipment or in places where gases, liquids or other flammable materials may be generated.
- External or otherwise artificially concentrated sunlight shall not be directed onto the front or back face of the module

Installation safety

NOTES

- Wear protective head gear, insulating gloves, safety shoes, and insulated tools when installing the modules.
- Do not install the modules in rain, snow, or otherwise wet or windy conditions.
- Modules may be covered with an opaque material during module installation and wiring to reduce risk of charge buildup and electrical shocks or burns.
- When mating connectors, make sure they are firmly connected.
- Due to the risk of electrical shock, do not perform any work if the junction box is wet.
- Do not touch the junction box and the end of output connectors with bare hands.
- Do not unplug the connectors under load. It is recommended not to work alone.
- Wear a safety belt if working far above the ground.
- Do not wear metallic jewelry, which can cause electric shock, while installing or troubleshooting the PV system.
- Follow the safety regulations for any and all other system components, including wires, connectors, charging regulators, batteries, inverters, etc. The cables must be protected from direct sunlight and away from areas of water collection.

- Do not damage the surrounding modules or mounting structure when replacing a module.
- Do not change any module components (diode, junction box, plug connectors, etc.
- When installing the modules on a roof, it is recommended to install over a fireproof and insulating roof covering.
- Do not touch connectors and modules while the system is on. Do not stand, walk, drop or put objects on the module.
- Damaged modules (broken glass, torn back sheet, broken junction box, broken connectors, etc.) can be electrical hazards as well as laceration hazards. Contact with damaged module surfaces or module frame can cause electric shock. In such cases, remove the damaged module from array and contact the supplier for disposal instructions.
- Do not block draining holes. When working above ground level, wear a safety belt.
- Avoid use of sharp objects and tools that might damage the module.

Introduction

This document provides detailed instructions and safety information regarding the installation, electrical connection, and maintenance of SolarEdge smart modules.

Integrated with power optimizers, these high-performance modules are based on Smart Half-cut Cell Mono PERC technology. The module is powered by high-efficiency cells providing an effective solution for lowering the cost of the power produced over time in large and small PV systems.

This document provides installation instructions for the following modules:

Module Type	Model Numbers	Attachment Instructions
Smart 60 cell Mono PERC Module	SPVxxx-60MMJ	See *Clamping smart modules SPVxxx-60MMJ / SPVxxx-R60JWMG / SPVxxx-R54Jxxx*
Smart Half-cut 60 Cell Mono PERC Module	SPVxxx-R60JWMG	See *Clamping smart modules SPVxxx-60MMJ / SPVxxx-R60JWMG / SPVxxx-R54Jxxx*
	SPVxxx-R60LWMG	See *Clamping smart modules SPVxxx-R60LWMG and SPVxxx- R60LBMG*
	SPVxxx-R60LBMG	See *Clamping smart modules SPVxxx-R60LWMG and SPVxxx- R60LBMG*
	SPVxxx-R60DWMG	See *Clamping smart modules SPVxxx-R60DWMG and SPVxxx-R60DBMG*
	SPVxxx-R60DBMG	See *Clamping smart modules SPVxxx-R60DWMG and SPVxxx-R60DBMG*
Smart Half-cut 54 Cell Mono PERC Module - White/Black	SPVxxx-R54JWML	See *Clamping smart modules SPVxxx-60MMJ / SPVxxx-R60JWMG / SPVxxx-R54Jxxx*
	SPVxxx-R54DBML	See *Clamping smart modules SPVxxx-60MMJ / SPVxxx-R60JWMG / SPVxxx-R54Jxxx*
	SPVxxx-R54DWML	See *Clamping smart modules SPVxxx-60MMJ / SPVxxx-R60JWMG / SPVxxx-R54Jxxx*
	SPVxxx-R54JBML	See *Clamping smart modules SPVxxx-60MMJ / SPVxxx-R60JWMG / SPVxxx-R54Jxxx*
High Efficiency Mono-PERC Half-cell (54 cell - 182mm)	SPVxxx-R54PWML / SPVxxx-R54PBML	See *Modules SPVxxx-R54PWML/R54PBML; SPVxxx-R54PGTL/ R54PDTL; PVxxx-R72PGTL/R72PDTL*
High Efficiency N-TOPCON Half-cell (54 cell - 182mm)	SPVxxx-R54PGTL / SPVxxx-R54PDTL	See *Modules SPVxxx-R54PWML/R54PBML; SPVxxx-R54PGTL/ R54PDTL; PVxxx-R72PGTL/R72PDTL*
High Efficiency N-TOPCON Half-cell (72 Cell - 182mm)	PVxxx-R72PGTL / PVxxx-R72PDTL	See *Modules SPVxxx-R54PWML/R54PBML; SPVxxx-R54PGTL/ R54PDTL; PVxxx-R72PGTL/R72PDTL*

All instructions, mechanical and electrical requirements must be read and understood before attempting installation. When installing the module, installers must conform with all safety precautions detailed in this guide.

Limitation of liability

Since SolarEdge has no control over the use of this manual and the conditions or methods of installation, operation, use and maintenance of photovoltaic (PV) products, SolarEdge does not accept responsibility and expressly disclaims liability for loss, damage, or expense arising out of or in any way connected with such installation, operation, use or maintenance. SolarEdge reserves the right to change this manual without prior notice.

Modules rated for use in this application class may be used in systems operating at greater than $50V_{DC}$ or 240W, where general contact access is anticipated. Modules qualified for safety through IEC 61730-1 and the part of IEC 61730 within this application class are considered to meet the requirements for safety class II.
Where common grounding hardware (nuts, bolts, star washers, spilt-ring lock washers, flat washers, etc.) is used to attach a listed grounding/bonding device, the attachment must be made in conformance with the grounding device manufacturer's instructions.

Installation requirements

Electrical considerations

The maximum system voltage for Smart Modules is shown in the table below.

P/N	Maximum Panel Voltage
SPVxxx-60MMJ	1500V
SPVxxx-R60LBMG	
SPVxxx-R60DWMG	
SPVxxx-R60JWMG	
SPVxxx-R60DBMG	
SPVxxx-R60LWMG	
SPVxxx-R54JWML	
SPVxxx-R54JBML	
SPVxxx-R54DWML	
SPVxxx-R54DBML	
SPVxxx-R54PWML	1000V
SPVxxx-R54PBML	
SPVxxx-R54PGTL	
SPVxxx-R54PDTL	
PVxxx-R72PGTL	
PVxxx-R72PDTL	

Power Optimizers regulate the string voltage at a constant value regardless of the string length and environmental conditions. Under normal conditions, a module might produce more current and/or voltage than specified at standard test conditions[1]. The requirements of the National Electrical Code (NEC) Article 690 shall be followed to address these increased outputs. In installations where the NEC is not applicable, the values of Isc and Voc marked on the module must be multiplied by a factor of 1.25 when determining component voltage ratings, conductor capacities, over current device ratings, and size of controls connected to the PV output.

Each series-connected string of modules shall be provided with a maximum series overcurrent protective device, specified as follows:

- 15A for the Smart Module 60-cell Mono PERC module with Integrated Power Optimizer series.
- 20A for the Smart Module Half-cut Cell Mono PERC Module with Integrated Power Optimizer series.

Use a cable with a cross section of 4mm^2 (12AWG) that can withstand the maximum possible system open-circuit voltage and make sure that all connections are safe and tight. The cable minimum bending radius is 43mm.

Bypass diodes are included in module junction boxes to avoid decreased module performance. Check the relevant specifications for the specific diodes of the junction box.

For the smart module electrical data and temperature coefficients, refer to the technical specification data sheet.
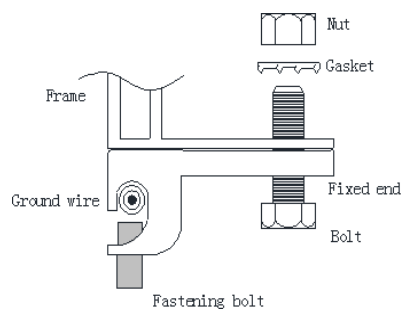
Grounding

Marked 5.5mm grounding holes are provided to ground the anodized aluminum module frame. Use an M5 nut, an M5 gasket, an M5 bolt, a fastening bolt and a ground wire. All nuts, bolts, and gasket must be made of stainless steel.

Secure the ground wire to the rail at the fixed end using the fastening bolt. Note that the copper wire cannot be attached directly to the aluminum.

Insert the bolt through the fixed end and then through the hole in the aluminum frame.

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[1] Standard Test Conditions (STC) are defined as: 1000 W/m² sun irradiance, cell temperature 25°C, sea level air mass (AM) 1.5

Add the gasket and nut on the other side of the bolt and tighten to secure all parts. Tighten to a torque of 2.1±0.1N·m.

Module wiring

When planning PV module installation, consider cable lengths on the roof and other facets, extension cables and branch cables if requested.

Before powering ON the inverter, verify that the wiring cross sections are correct. Ensure that the measured open circuit Voltage (Voc) and short-circuit current (Isc) do not exceed the specifications. If modules have been pre-installed but the string has not been connected to the inverter yet, the module connecters should be connected to each other or kept covered to avoid dust and moisture penetration inside the connectors.

> **NOTE**
> To minimize electromagnetic interference (EMI), keep the distance between the positive and negative DC cables as small as possible.

Landscape Installation Examples   Portrait Installation Examples
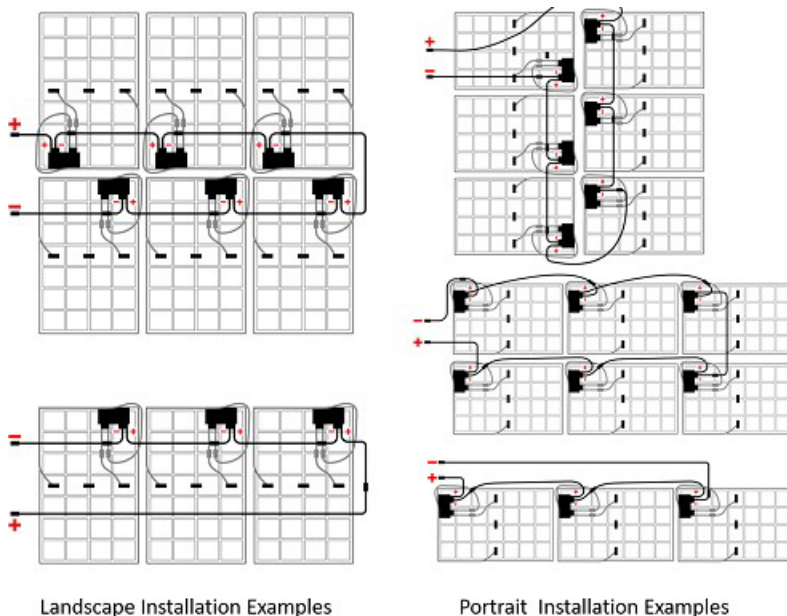
Mechanical installation

Installation considerations and environmental conditions

The Smart Modules shall be installed under the following conditions:

- Ambient temperature: -40 to 85°C.
- Maximum installation altitude: 3000m.
- To maintain the modules' Class C fire rating, the fire class of the roof and building materials should be higher than Class C. The fire safety rating of this module is valid only when mounted in the manner specified in the mechanical mounting instructions.
- Do not install modules at locations that come in direct contact with water collections, salt water or any aggressive environmental condition.

- Modules should be installed no closer than 50m/164ft to the shoreline of the ocean or any other saline environment, as long as there is no direct contact from saltwater, splashes or spray on the module.
- Do not install the modules near flames or flammable materials or locations with hazardous materials.
- You can use the Aelex mounting system for the SPVxxx-R60DWMG and SPVxxx- R60DBMG range of modules. For more information refer to https://aelex.nl/.

Installation guidelines

Use the following guidelines when installing the Smart modules:

- Do not make any modifications to the module frame.
- Clamping material should be anodized aluminum alloy or stainless steel.
- When installing Phono modules using screws, use four (4) screws on each of the long sides of the module frame.
- When installing all modules using clamps, secure each module at a minimum of two points on each side, and the attachment points must be positioned symmetrically.
- Modules placed on rails can either be positioned with the long side of the module frame perpendicular to the rails (portrait orientation) or parallel to the rails (landscape orientation).

Modules SPVxxx-R54PWML/R54PBML; SPVxxx-R54PGTL/ R54PDTL; PVxxx-R72PGTL/R72PDTL

The table below lists the module types, their dimensions, attachment method, clamping range values, and the tested mechanical load thresholds for each module type.

Module type	Series dimensions	Attachment with screws	Clamping range^2 (mm)	Front load (Pa)	Rear load (Pa)
SPVxxx-R54PWML SPVxxx-R54PBML SPVxxx-R54PGTL SPVxxx-R54PDTL	1722x1134x30mm	Use 8 fixing points (supplied)	380⩽S⩽480	5400	2400
PVxxx-R72PGTL PVxxx-R72PDTL	2278x1134x30mm	Use 8 fixing points (supplied)	520⩽S⩽620	5400	2400

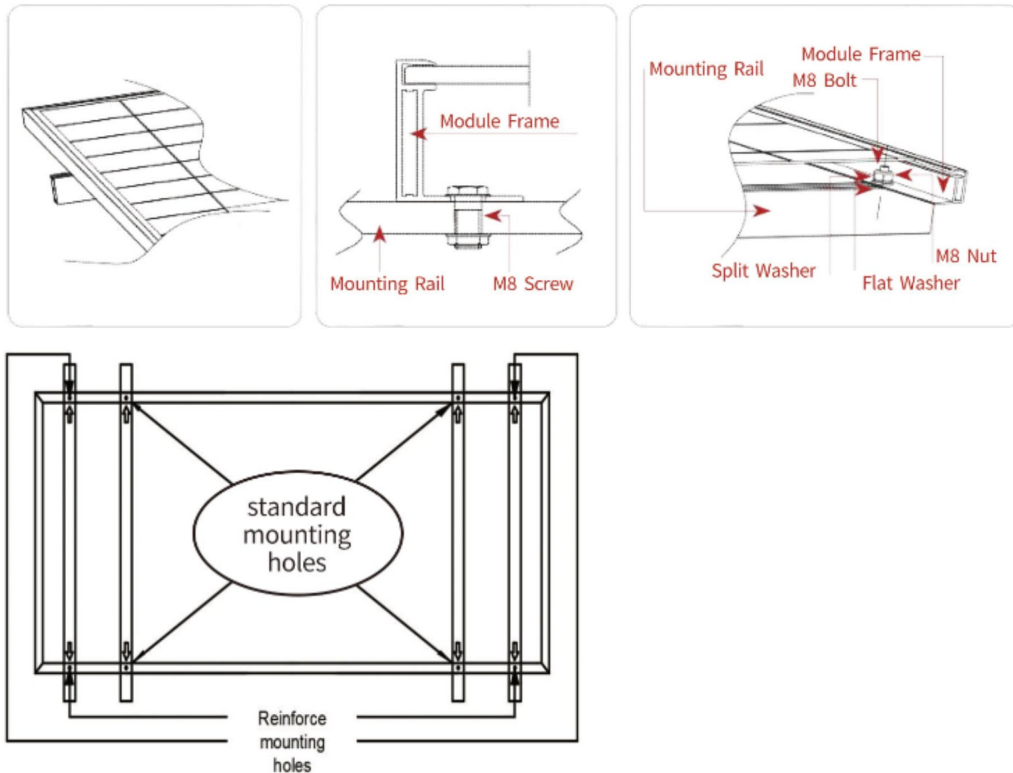### Fixing modules to the frame using screws

💬 NOTES
- Use corrosion-proof screws.
- Use the existing holes in the module frame. Do not drill new holes.

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^{2} Refer to Fixing modules to the frame using clamps

Each module has eight (8) mounting holes for securing the module to the frame. These must all be used with this fixing method. Use M8 screws with spring washers and flat washers in symmetrical positions on the module. Tighten the screws to a torque between 16N·m and 20N·m.

See detailed screw fixing illustrations below.

The modules are installed with their long side perpendicular to the mounting rails.

## Fixing modules to the frame using clamps

NOTES

- Clamps must not contact the glass of the module.
- Clamps must not deform the frame of the module.
- Do not modify the frame in any way.
- Use at least 4 clamps per PV module.
- The screws used to hold the clamp to the frame must be corrosion-proof.
- Tighten the screw holding the clamp to the frame with a torque of between 16N·m and 20N·m.
- The minimum recommended clamp length is 60mm.

See detailed clamp fixing illustrations below.
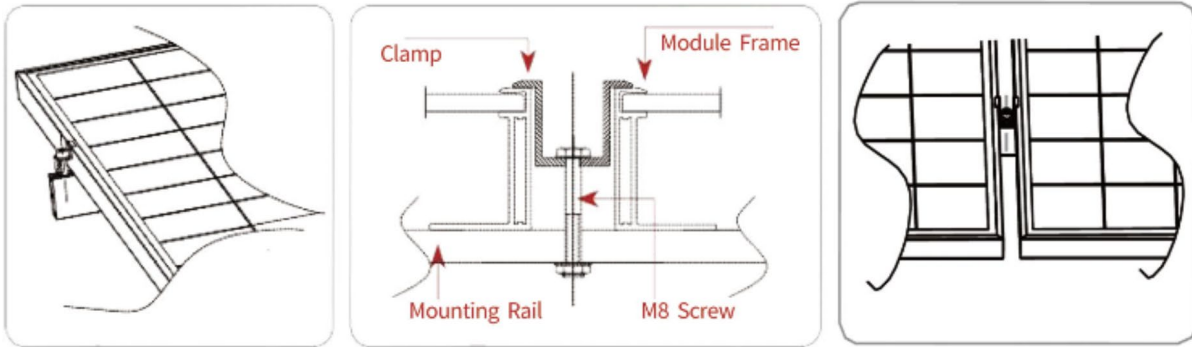
For clamping on the long side of the module frame:
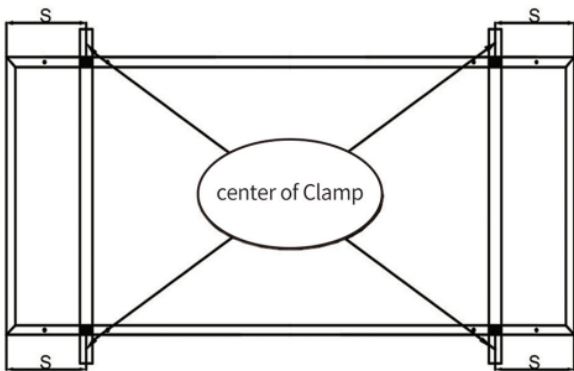
... NOTES

- Use at least four (4) clamps.
- "S" is the permissible clamping range: **380mm<S<480mm** from the short side of the module.
- The modules are installed with their long side perpendicular to the mounting rails.

... IMPORTANT NOTE

An additional two (2) clamps (total of six (6) clamps) may be used and adjusted for additional support of the module positioning as needed.

For clamping on the short side of the module frame:
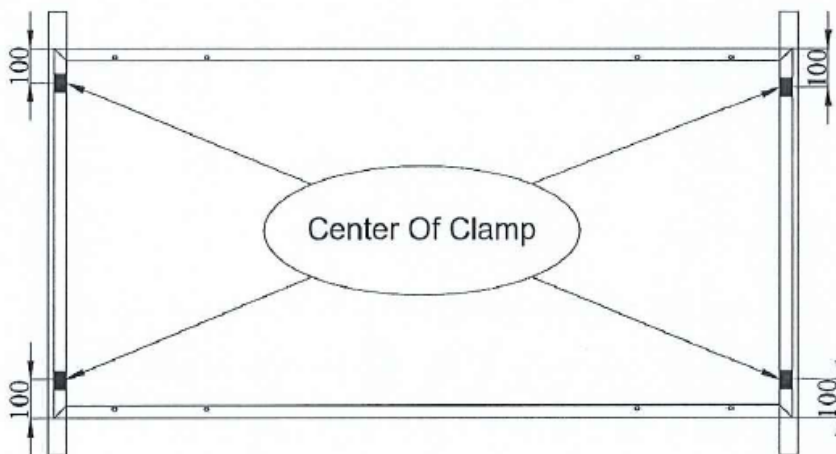
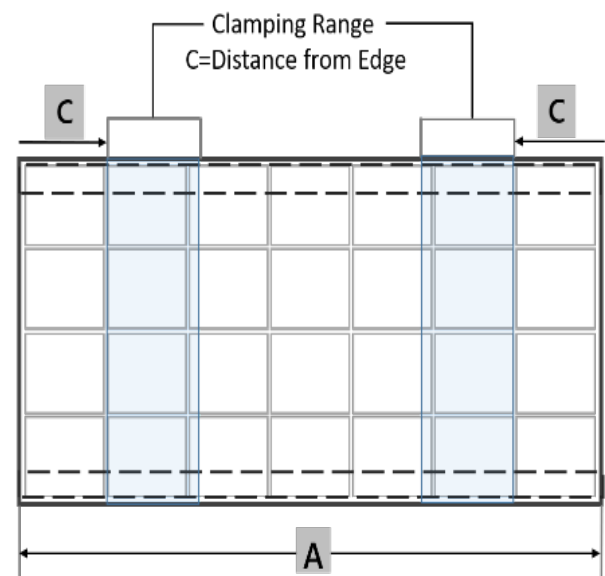| Module type	Series dimensions	Attachment with screws	Clamping range[3] (mm)	Front load (Pa)	Rear load (Pa)
SPVxxx-R54PWML SPVxxx-R54PBML SPVxxx-R54PGTL SPVxxx-R54PDTL	1722x1134x30mm	Use 8 fixing points (supplied)	0⩽S⩽100	2000	1600
PVxxx-R72PGTL PVxxx-R72PDTL	2278x1134x30mm	Use 8 fixing points (supplied)	0⩽S⩽100	1100	1100

More SPV module series

The illustrations below show the positioning of modules relative to mounting rails for clamping these modules to the frame. Modules can be mounted with the long side of their frame perpendicular to the mounting rail structure, or in some cases, with the long side of their frame parallel to the mounting rail structure. The schematics also indicate the clamping range, B, C and H for each arrangement, as well as the preferred spacing between the rails of the mounting frame structure for certain modules (S). The tables below list the module types, their dimensions, clamping range values, and the tested mechanical load thresholds for each module type.

For clamping on the long side of the module frame:
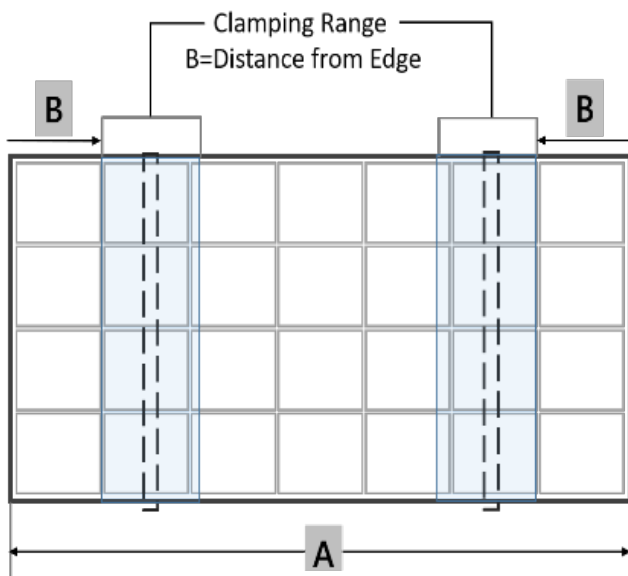
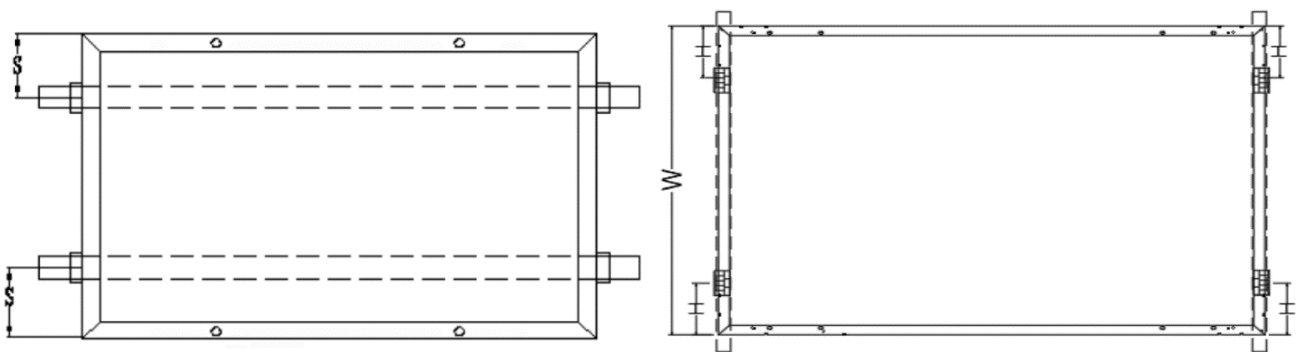

Long side of frame perpendicular to the rails   Long side of frame parallel to the rails

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[3] Refer to Fixing modules to the frame using clamps

Module type	Series dimensions	A	Clamping range (mm)		Front load (Pa)	Rear load (Pa)
			Long side of module frame perpendicular to structure	Long side of module frame parallel to structure		
SPVxxx-60MMJ	1650x992x40mm	1650mm	200 ⩽ B ⩽ 410	N/A	5400	3600
SPVxxx-R60JWMG	1755x1038x40mm	1755mm	284 ⩽ B ⩽ 594	N/A	3600	2400
SPVxxx-R60LWMG	1776x1052x40mm	1776mm	340 ⩽ B ⩽ 550	410 ⩽ C ⩽ 490	5400	2400
SPVxxx-R60LBMG	1776x1052x40mm	1776mm	340 ⩽ B ⩽ 550	410 ⩽ C ⩽ 490	5400	2400
SPVxxx-R60DWMG	1755x1038x40mm	1755mm	284⩽B⩽594	N/A	3600	2400
SPVxxx-R60DBMG	1755x1038x40mm	1755mm	284⩽B⩽594	N/A	3600	2400
SPVxxx-R54JWML	1722x1134x30mm	1722mm	380⩽B⩽480	N/A	5400	2400
SPVxxx-R54JBML	1722x1134x30mm	1722mm	380⩽B⩽480	N/A	5400	2400
SPVxxx-R54DWML	1708x1134x30mm	1708mm	292⩽B⩽391	N/A	5400	2400
SPVxxx-R54DBML	1708x1134x30mm	1708mm	292⩽B⩽391	N/A	5400	2400

For clamping on the short side of the module frame:


Long side of frame parallel to the rails   Long side of frame perpendicular to the rails

| Module type	Series dimensions	A	Clamping range (mm) when clamps are on the short side		Front load (Pa)	Rear load (Pa)
			Long side of module frame perpendicular to structure	Long side of module frame parallel to structure		
SPVxxx-R60JWMG	1755x1038x40mm	1755mm	N/A	0<S<260	2000	2000
SPVxxx-R60DWMG	1755x1038x40mm	1755mm	0<H<1/4W	N/A	2400	1600
SPVxxx-R60DBMG	1755x1038x40mm	1755mm	0<H<1/4W	N/A	2400	1600
SPVxxx-R54JWML	1722x1134x30mm	1722mm	N/A	S=300 ±10	2000	1400
SPVxxx-R54JBML	1722x1134x30mm	1722mm	N/A	S=300±10	2000	1400

Specific clamping details

Clamping smart modules SPVxxx-60MMJ / SPVxxx-R60JWMG / SPVxxx-R54Jxxx
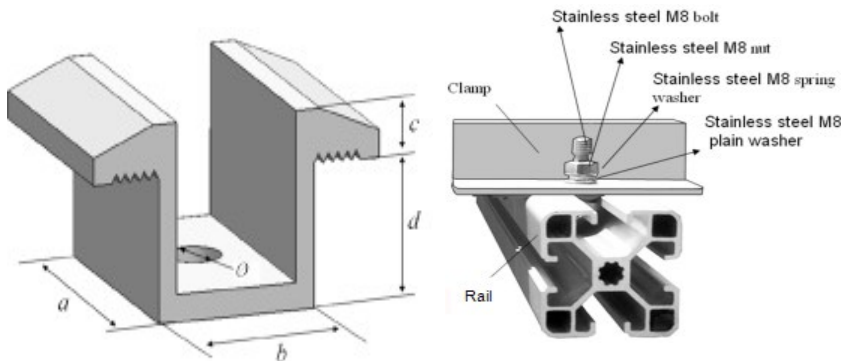
Using clamps on the long side of the module:
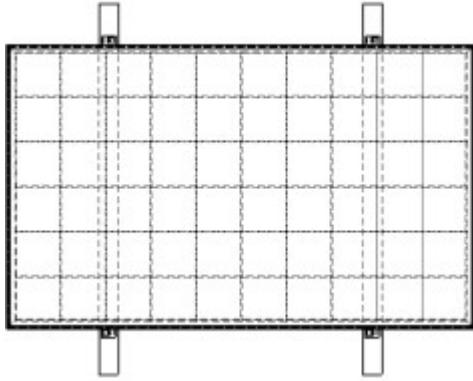
Using clamps on the short side of the module:
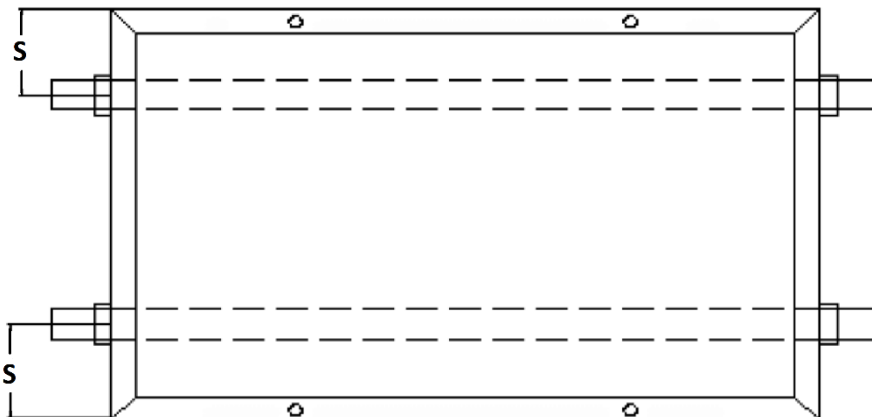
Attach the clamps using an M8 bolt, a plain (flat) washer, a spring washer, and an M8 nut. Use at least four (4) clamps (two clamps per side).

Use clamps with the following properties:

The dimensions for the middle clamps are: a ≥ 40mm, b ≥ 26mm, c = 8mm, d≥ 28mm, and Ø = 9mm.

The recommended torque for tightening the bolts and nuts is 28N·m for Class 8.8 bolts and nuts.

Fastening the module:

1. Place the module on two or three supporting rails (not provided).
2. Slide M8 bolts through the rail grooves next to the 4 clamp locations.

   NOTES

   - The rails must be made from stainless steel material or treated with an anti-corrosion process (e.g. anodic oxidation treatment).
   - If the rail does not have grooves compatible with M8 bolts, drill suitable holes.

3. Secure the clamps using the bolts, plain washers, spring washers, and nuts, in that order. The clamp must overlap the module frame by at least 5mm.

Middle clamps and side clamp attachments are shown below.
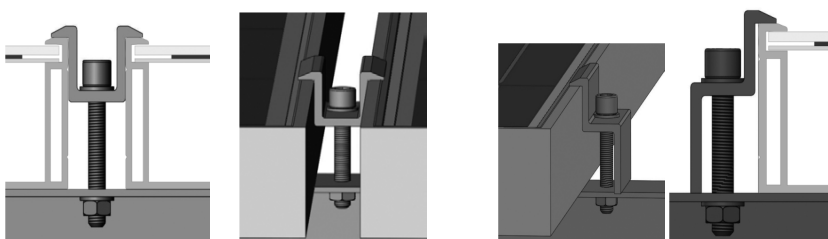
Middle clamp installation   Side clamp installation

The module may be clamped only in the permitted clamping range, as shown in *More module types.*

Clamping smart modules SPVxxx-R60LWMG and SPVxxx- R60LBMG

Modules may be placed with their long side perpendicular to the frame or parallel with the frame, as shown below.
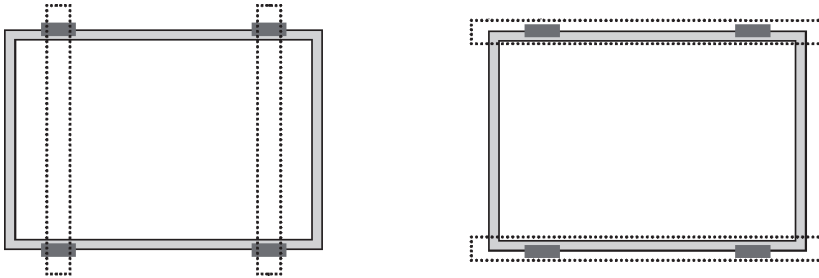
Slide M8 bolts through the rail grooves at the four clamp locations.

Attach each aluminum mounting clamp with an M8 (5/16") bolt and an M8 (5/16") nut. Tighten the nuts to a torque of between 17N·m to 23N·m (12.5lbf·ft to 17.0lbf·ft) for coarse thread bolts. Secure each clamp with a plain washer, spring washer, and nut, in that order.
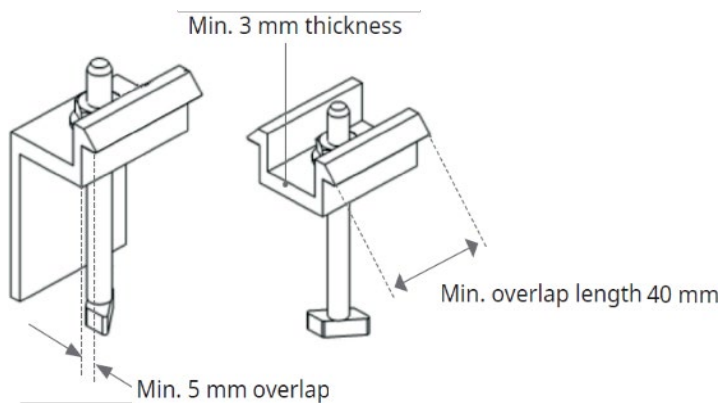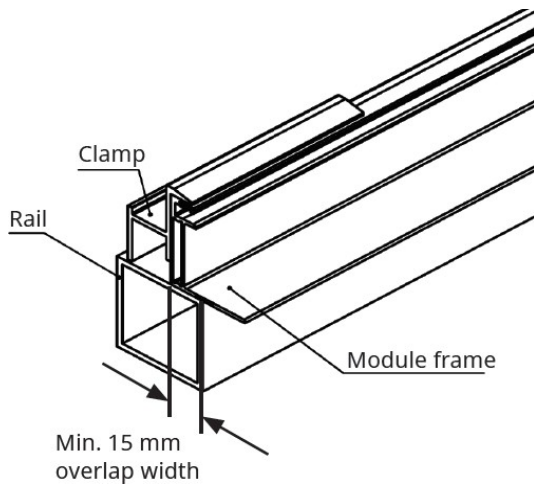

The clamps must overlap the module frame by at least 5mm (0.2in). Ensure that the clamps' length is at least 40mm (1.57in). The clamp's thickness must at least 3mm (0.12in).

> **NOTE**
> For configurations where the long side of the module runs parallel to the frame, take precautions to ensure that the bottom flange of the module frame overlaps the rail by at least 15mm (0.59in).

Fastening the module

1. Place the module on two supporting rails (not provided).

    ... NOTES

    - The rails must be made from stainless steel material or treated with an anti-corrosion process (e.g. anodic oxidation treatment).
    - If the rail does not have grooves compatible with M8 bolts, drill suitable holes.

2. Secure the clamps using the bolts, plain washers, spring washers, and nuts, in that order.

The clamp positions are of crucial importance for the reliability of the installation. The clamp center lines must only be positioned within the ranges indicated in *More module types*, depending on the configuration and load.

Clamping smart modules SPVxxx-R60DWMG and SPVxxx-R60DBMG

Modules may be placed with their long side perpendicular to the frame or parallel with the frame.

Attach each aluminum mounting clamp with an M8 bolt, flat washers and a spring washer. At least 4 clamps must be used to fasten the modules to the supporting rails.

Fastening the module

1. Place the module on two supporting rails (not provided).
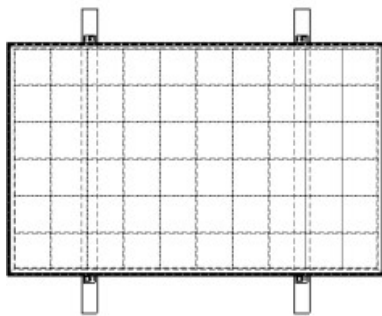
    ... NOTES

    - The rails must be made from stainless steel material or treated with an anti-corrosion process (e.g. anodic oxidation treatment).
    - If the rail does not have grooves compatible with M8 bolts, drill suitable holes.

2. Slide M8 bolts through the rail grooves at the 4 clamp locations.

3. Secure each clamp by placing a flat washer under the bolt head and a flat and spring washer under the nut.

The clamp must overlap the module frame by at least 7mm but not more than 12mm.
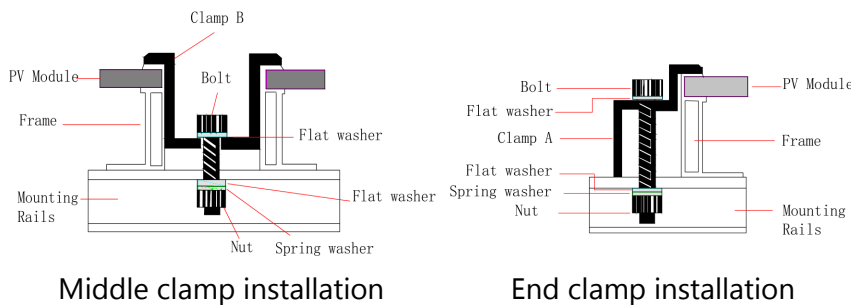
     Middle clamp installation   End clamp installation

The modules may be clamped only in the permitted clamping range. For the permitted location of the clamps on the long side of module frame, refer to *More module types.*

Electrical Requirements

The electrical installation details are based on the requirements specified in IEC61730-1.

Reporting and monitoring installation data

The monitoring platform

The monitoring platform provides enhanced monitoring of PV performance and yield assurance through immediate fault detection and alerts at the module, string and system level.

You can use the platform to:

- View the most recent performance of specific components.
- Investigate under-performing modules by comparing their performance to that of other modules in the same location.
- Pinpoint the location of modules producing an alert using the physical layout.

The monitoring platform enables access to up-to-date site information, viewed in a physical or logical view:

- The Logical Layout shows a schematic tree-layout of the components in the system, such as inverters, strings, modules, meters, and sensors, as well as their electrical connectivity. This view enables you to see which modules are connected in each string, which strings are connected to each inverter, and so on.
- The Physical Layout provides a bird's eye view of the actual placement of modules at the site and provides the ability to pinpoint issues to the exact location of each module on a virtual site map.

If the mapping of the installed power optimizers is not added in the monitoring software, the platform shows the logical layout of Power Optimizers connected to a specific inverter but does not show the strings or the physical location of the Power Optimizers.

The monitoring platform includes a built-in help system, that guides you through the monitoring functionality.

For more information, refer to
https://www.solaredge.com/products/pv-monitoring#/

Creating logical and physical layouts

To display a logical layout after installing the inverter, insert the inverter serial number in the new site created in the monitoring platform. When the communication between the inverter and the monitoring server is established, the logical layout displays.

To display a physical layout, you need to map the locations of the installed modules or Power Optimizers. To map the locations, use one of the methods described in the next sections.

Designer

Designer recommends inverter and Power Optimizer selection per site and enables report generation. You can create a project in Designer and export the site design with the string layout to the monitoring platform.

For more information, refer to
https://www.solaredge.com/products/installer-tools/designer#/

Mapper application

Use the Mapper smart phone application to create a virtual map of a PV site for enhanced monitoring and easier maintenance. To create a virtual map, scan the smart module's 2D bar-code located on the front of the module.

The Mapper application is integrated with the monitoring platform and enables:

- Simple on-site registration of new systems.
- Creating, editing and verifying system physical layout.
- Scanning and assigning the module and Power Optimizer serial numbers in the system physical layout.

For detailed information, refer to the Mapper demo movies:

Scanning a smart panel using the SolarEdge Mapper App

After scanning the smart module or the Power Optimizer, the Mapper activates a dedicated mapping process to ensure that the Power Optimizer inputs are assigned to their module(s). You can approve each input assignment separately.

Physical layout editor

If you are a registered installer, access the monitoring platform site creation page at https://monitoring.solaredge.com/solaredge-web/p/home#createSites

If you have not yet signed up, go to https://monitoring.solaredge.com/solaredge-web/p/createSelfNewInstaller

Fill out all required information in the screen, which includes information about your installation, as well as details about its logical and physical mapping.

Fill out the Physical Layout Template (downloadable from the SolarEdge website http://www.solaredge.com/files/pdfs/physical-layout-template.pdf) using the detachable 2D barcode stickers on each power optimizer.

When you have completed the form, use Mapper to scan the 2D codes and create the map in the monitoring platform. Alternatively, you can send the sticker sheet to SolarEdge Support for physical layout creation.

Maintenance

Solar PV modules are cleaned naturally by rain. In particularly dry areas or where panel tilt is minimal, dust and other substances, such as bird droppings, can build up over time and affect the amount of electricity generated by a module.

NOTE

Dirt can cause a 7.5% to 10% degradation in performance. Cleaning the modules regularly results in better system performance.

- Regularly carry out a visual inspection for dirt, dust, bird dropping, leaves, and other detritus covering the module. Inspection frequency will be determined according to the environmental conditions in your area.
- If there is a build-up of dirt or dust on the module surface, wash the module with clean non-heated water and a gentle implement (a sponge for example).
- If there is snow, use a soft-bristled brush to clean the surface of the modules. Regular dish soap is allowed.
- Clean your PV modules on an overcast day, early in the morning or in the evening. If the sun is beating down on the panels, any water used can quickly evaporate and dirt will become smeared.

- To remove oil stains, use isopropyl alcohol as a spot-cleaning substance.
- Use safety gear if the modules are being washed from the roof and not from the ground.
- Never use harsh chemicals (e.g. bleach) on the surface of the module.
- Never use high pressure stream of water to avoid damaging the PV module surface.
- Never use abrasive tools or metal objects that could scratch PV glass.
- Do not step on the PV modules.
- Regular electrical and mechanical inspection by a licensed professional will keep the system safe and operating at optimal efficiency.

NOTE

Performing a regular electrical and mechanical inspection by a licensed professional will keep the system safe and operating at optimal efficiency.

Support contact information

If you have technical problems concerning SolarEdge products, please contact us:

https://www.solaredge.com/service/support

Before contacting support, have the following information at hand:

- Model and serial number of the product in question.
- The error indicated on the SetApp mobile application, LCD screen, on the monitoring platform, or by the LEDs, if there is such an indication.
- System configuration information, including the type and number of modules connected and the number and length of strings.
- The communication method to the SolarEdge server, if the site is connected.
- The product's software version as it appears in the ID status screen.