

***SunModo PV Rail-less
Rack Mounting System
UL2703 Compliant***


Please read carefully before installing

Product is tested to and recognized to UL 2703 standards for safety grounding and bonding equipment.

SunModo PV Rail-less Rack Mounting System can be used to mount photovoltaic (PV) panels in a wide variety of locations. All installations shall be in accordance with NEC requirements in the USA. The self-bonding system is for use with PV modules that have a maximum series fuse rating of 30A. Mechanical design loads per UL 2703: Downward Pressure: 10 psf (478.8 Pa), Upward Pressure: 5 psf (239.4 Pa), Down-Slope: 5 psf (239.4 Pa).

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Installer Responsibility:

Before ordering and installing materials, all system layout dimensions should be confirmed by field measurements. SunModo reserves the right to alter, without notice, any details, proposals or plans. Any inquiries that you may have concerning installation of the PV system should be directed to your SunModo Sales representative. Consult SunModo Sales for any information not contained in this manual. This manual is intended to be used as a guide when installing SunModo's SunDock Standing Seam PV Mounting System on pitched roofs. It is the responsibility of the installer to ensure the safe installation of this product as outline herein.

- Installer shall employ only SunModo products detail herein. The use of non SunModo components can void the warranty and cancel the letters of UL compliance.
- Installer shall guarantee that screws and anchors have adequate pullout strength and shear capacities.
- Installer shall adhere to the torque values specified in this Instruction Manual.
- Installer shall use anti-seize compound, such as Permatex anti-seize, lubricant is recommended for all threaded parts.
- Installer is responsible to install racking system over a Fire Resistant roof covering rated for the application.
- Installer is responsible to determine that the roof, its rafters, connections, and other architectural support components can sustain the array under all code level loading conditions.
- Installer shall adhere to all relevant local or national building codes. This takes account of those that supplant this document's requirements.
- Installer shall guarantee the safe placement of all electrical details of the PV array.
- Installer shall comply with all applicable local, state and national building codes, including periodic re-inspection of the installation for loose components, loose fasteners and any corrosion. If loose components or loose fasteners are found during periodic inspection, re-tighten immediately. If corrosion is found, replace affected components immediately.
- Installer to ensure the structural support members or footings for mounting the array can withstand all code loading conditions. Consult with licensed professional engineer for the appropriate loading conditions.
- Installer to follow all regional safety requirements during installation.
- Installer shall ensure bare copper grounding wire does not contact aluminum and zinc-plated steel components to prevent risk of galvanic corrosion.
- This racking system may be used to ground and/or mount a PV module complying with UL 1703 only when the specific module has been evaluated for grounding and/or mounting in compliance with the included instructions.
- Installer is responsible for and shall provide an appropriate method of direct-to-earth grounding according to the latest edition of the National Electrical Code, including NEC 250: Grounding and Bonding, NEC 690: Solar Photovoltaic Systems, and CSA C22.1, Safety Standard for Electrical Installations, Canadian Electrical Code, Part 1.
- If loose components or loose fasteners are found during periodic inspection, re-tighten immediately. If corrosion is found, replace affected components immediately.

Safety:

Review relevant OSHA and other safety standards before following these instructions. The installation of solar PV systems is a dangerous procedure and should be supervised by trained and experienced personnel.

It is not possible for SunModo to be aware of all the possible job site situations that could cause an unsafe condition to exist. The installer of the roof system is responsible for reading these instructions and determining the safest way to install the roof system. These instructions are provided only as a guide to show a knowledgeable, trained erector the correct part placement one to another. If following any of the installation steps would endanger a worker, the erector should stop work and decide upon a corrective action. Provide required safety railing, netting, or safety lines for crew members working on the roof.

System Components



1" SunDock Standing Seam PV Mounting System Kit includes:
1" Standing Seam Clamp
2X M10 Set Screw
PV Mounting Clamp
May be repositioned until torqued to final value.

K50214-001
For single-use only



2" SunDock Standing Seam PV Mounting System Kit includes:
2" Standing Seam Clamp
2X M10 Set Screw
PV Mounting Clamp
May be repositioned until torqued to final value.

K50215-001
For single-use only



Grounding Lug Kit with Grounding Spacer and 1/4-20 T-Bolt. ***May be repositioned until torqued to final value.***

K10179-001
For single-use only

List of Compliant PV Modules

UL 2703 Qualified Modules for use with SunModo PV Rail-less Racking Systems

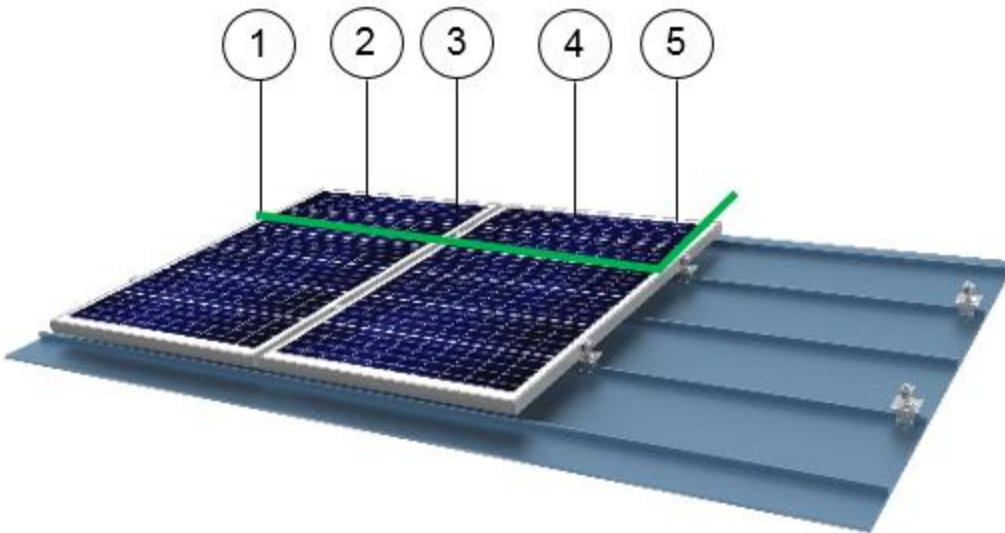
Evaluated PV Modules	
Module manufacturer	Model numbers
Boviet Solar USA	BVM6610M-XXX, "XXX" = 250 to 320 BVM6612M-XXX, "XXX" = 325 to 350 BVM6610P-XXX, "XXX" = 250 to 275 BVM6612P-XXX, "XXX" = 310 to 355
C-Sun	CSUN XXX-72P, "XXX"=290 to 310 CSUN XXX-72M, "XXX"=285 to 320 CSUN XXX-60M, "XXX"=235 to 345 CSUN XXX-60P, "XXX"=240 to 260
Canadian Solar	CS6X-XXXP, "XXX"=300 to 320 CS6P-XXXP, "XXX"=255 to 265 CS6P-XXXM, "XXX"=260 to 265 CS6V-210P, CS6V-215P, CS6V-220M, CS6V-225M, CS6K-265M, CS6K-270M CS6K-XXXMS. XXX" = 290 to 305
ET Solar	ET-P672 XXX WW, "XXX"=300 to 315
Hanwha Q Cells	G3, L-G4 and L-G2, Q.PLUS G4 xxx, Q.PLUS BFR G4.1/TAA xxx, Q.PLUS BFR, G4.1/MAX xxx, Q.PLUS BFR G4.1 xxx, Q.PRO-G4 xxx, Q.PRO EC-G4.4 xxx, Q.PRO BFR G4 xxx, Q.PRO BFR G4.1 xxx, Q.PRO BFR G4.3 xxx, Q.PEAK-G4.1 xxx Q.PEAK- G4.1/MAX xxx, Q.PEAK BLK G4.1 xxx, Q.PEAK-G4.1/TAA xxx Q.PEAK BLK G4.1/TAA xxx, B.LINE PRO BFR G4.1 xxx, B.LINE PLUS BFR G4.1 xxx, B.LINE PRO BFR G4.1 xxx, Q.PEAK DUO-G5-xxx, Q.PEAK DUO-G5.X-xxx and Q.PEAK DUO BLK-G5-xxx Q.PEAK L G4.2, Q.PLUS L G4.2, Q.PLUS L G4.1 -35mm, Q.PLUS L G4 - 35mm, Q.PRO L G4 -35mm, Q.PRO L G4.1 - 35mm, Q.PRO L G4.2 - 35mm, B.LINE PLUS L G4.2 - 35mm, B.LINE PRO L G4.1 - 35mm, B.LINE PRO L G4.2 - 35mm, Q.PLUS LG4.2/TAA-35mm, Q.PEAK DUO L-G5.2, Q.PEAK DUO L-G5.3 (380-395), Q.Peak Duo L-G6 xxx, Q.Peak Duo L-G6.2 xxx, Q.Peak Duo L-G6.3 xxx, Q.Peak Duo G6 xxx, Q.Peak Duo BLK-G6 xxx
Hareon	HR-XXXP-24/Ba, "XXX" = 280 to 310

Hyundai Solar	HiS-MXXXRG, "XXX" = 250 to 300 HiS-MXXXRI, "XXX" = 300 to 360 HiS-SXXXRG, "XXX" = 250 to 300 HiS-SXXXRI, "XXX" = 330 to 400
Itek Energy	IT XXX HE, "XXX" = 250 to 310 IT XXX SE, "XXX" = 290 to 370
JA Solar	JAM60S01 XXX/PR, "XXX" = 300 to 320 JAM72S01 XXX/PR, "XXX" = 365 to 385 JAP60S01 XXX/SC, "XXX" = 260 to 280 JAP72S01 XXX/SC, "XXX" = 315 to 335 JAM60S03 XXX/PR, "XXX" = 300 to 320 JAM72S03 XXX/PR, "XXX" = 360 to 380 JAP60S03 XXX/SC, "XXX" = 270 to 290 JAP72S03 XXX/SC, "XXX" = 325 to 345 JAP6 72-XXX/3BB, "XXX" = 300 to 320 JAM6 72-XXX/SI, "XXX" = 300 to 320
Jinko Solar	JKMXXXM-60, "XXX" = 280 to 300 JKMXXXM-72, "XXX" = 345 to 365 JKMXXXPP-60, "XXX" = 255 to 270 JKMXXXPP-72, "XXX" = 315 to 320
Kyocera	KU26x-6MCA where x is 0 or 5
LG	MONO X, MONO X 2, Mono X Plus, Mono Neon 2, Mono Neon 2 LG xxx S1C-L4, LG xxx N1C-G4, LG xxx S1C-A5, LG xxx N1C-A5, LGxxxQ1C(Q1K)-A5, LGxxxN1C(N1K)-A5, LGxxxS1C-A5, LGxxxA1C-A5, LGxxxN2T-A4, LGxxxN2T-A5, LGxxxN2W-A5, LGxxxS2W-A5, LGxxxE1C- A5, LGxxxN1C(N1K)-G4, LGxxxN2W-G4, LGxxxS2W-G4, LGxxxS1C-G4, LGxxxE1K-A5
LONGi	LR6-60 (40mm), LR6-72 (40mm), LR6-60 HV (40mm), LR6-72 HV (40mm), LR6-60 PH (40mm), LR6-72 PH (40mm), LR6-60 PE (40mm), LR6-72 PE (45mm), LR6-60 BK (40mm Black frame), LR6-72 BK (40mm Black frame), LR6-60 PB (40mm Black frame), LR6-72 PB (45mm Black frame) Number in parenthesis signifies frame profile height.
Mission Solar	MSE series
Mitsubishi	MJE and MLE series
NSP	D6M and D6P series
Phono Solar	PS XXX M-20/U, "XXX" = 255 to 280 PS XXX P-24T, "XXX" = 300 to 325

REC Solar	RECXXXNP, "XXX" = 310 to 330 RECXXXTP2 BLK2, "XXX" = 275 to 285 RECXXXPE, "XXX" = 250 to 275 RECXXXTP2S 72, "XXX" = 330 to 366 RECXXXPE72, "XXX" = 300 to 325
Renesola	JC XXX M-24/Bbs, "XXX" = 255 to 270 JC XXX M-24/Bb, "XXX" = 250 to 260 JC XXX M-24/Abs, "XXX" = 305 to 335 JC XXX S-24/Abs, "XXX" = 330 to 345 JC XXX S-24/Bbs, "XXX" = 270 to 285
Sanyo (Panasonic)	HIP-XXXBA3, "XXX" = 190 to 205 HIT-N215A01, HIT-N220A01, HIT-N225A01 (VBHN285J40)
Silfab Solar	SLA-M XXX, "XXX" = 280 to 310 SLA-M-HC XXX, "XXX" = 320 to 350 SLA-MWT, "XXX" = 320 to 350 SLA-X XXX, "XXX" = 290 to 300 SLG-M XXX, "XXX" = 335 to 360 SLG-X XXX, "XXX" = 350 to 370
Solar World	Sunmodule SW series: SW XXX poly, "XXX" = 225 to 235 SW XXX mono, "XXX" = 250 to 270 SW 220 mono and poly, SW 240 mono and poly, SW 245 mono and poly Sunmodule Plus series: XXXW mono, "XXX" = 250 to 285 Sunmodule Pro-Series: SW XXX poly, "XXX" = 245 to 260 Sunmodule Protect 275W mono, Sunmodule Protect 270W mono, Sunmodule Protect 265W mono 315W XL mono, 320W XL mono, 325W XL mono
Solaria Solar	PowerXT-XXX R-AC, "XXX" = 350 to 355 PowerXT-XXX R-PD, "XXX" = 345 to 350 PowerXT-XXX R-BD, "XXX" = 340 to 345 PowerXT-XXX R-PX, "XXX" = 320 to 330 PowerXT-XXX R-BX, "XXX" = 320 to 325
Stion	STO-XXXA, "XXX" = 135 to 150
SunEdison	F XXX EzD, "XXX" = 310 to 335 R XXX EzC, "XXX" = 310 to 355
Suniva Solar	ARTXXX-60-4-8B0, "XXX" = 265 to 275 MVXXXX-60-5-800, "XXX" = 260 to 270

	MVXXX-72-5-800, "XXX" = 310 to 320 OPTXXX-72-4-100, "XXX" = 325 to 340 OPTXXX-60-4-100, "XXX" = 275 to 290 OPTXXX-60-4-1B0, "XXX" = 275 to 290
SunPower	SPR-X21-XXX-BLK-C-AC, "XXX" = 335 SPR-X20-XXX-BLK-C-AC, "XXX" = 327 SPR-X21-XXX-COM, "XXX" = 345 SPR-X20-XXX-COM, "XXX" = 327 SPR-E20-XXX, "XXX" = 327 SPR-E19-XXX, "XXX" = 320
Trina	TSM-XXX PC/PA05, "XXX" = 225 to 245
Yingli	YL XXX P-29b, "XXX" = 230 to 245

Fault Current Path Diagram



Items are listed in the fault current path in order from the PV Panel to the Grounding Lug:

1. SunDock Standing Seam Kit
2. PV Panel
3. SunDock Standing Seam Kit
4. PV Panel
5. Grounding Lug

Fault Current Path 

Tools Required for Installation

Electric Drill or Impact Driver.

Note that the use of an impact driver is strongly discouraged for all stainless nut and bolt hardware.



3/8" Socket wrench



Sockets for 3/8" drive sockets, 7/16", 1/2", 9/16" and 1-1/16"



Torque Wrench 3/8" drive, 0 to 35 ft. lbs.



Anti-seize compound (Permatex 80071 or equivalent).



Tape measure



Chalk line or laser



Torque Values for Pitched Roof System

These values must be adhered to, both for mechanical strength and to insure the performance of the integral grounding and bonding features. It is required that a torque wrench be used to measure the bolt torque during final assembly, and it is recommended that anti-seize compound be applied to the screw threads.

Hardware	Torque lbs.
1/4-20 Ground Lug, Setscrew with 1/8 Allen drive.	4.2 ft. lbs. (50 in. lbs.)
1/4-20 Mid-End Clamp with 7/16" Hex Head Screw	7.5 ft. lbs.
3/8-16 Nuts and Bolts	15 ft. lbs.
M10 Set Screws (for steel panels)	4.5 ft. lbs.
M10 Set Screws (for aluminum panels)	4.5 ft. lbs.

Landscape Panel Configuration

SunModo’s SunDock Standing Seam Kit is the easiest way to install solar panels directly to a SSMR. There is no need to waste time or money on a rail system. All clamps are fully assembled with integrated self-bonding pins; this eliminates separate module grounding hardware and saves installation cost.

Our clamps are mid-clamps and end-clamps all in one. Our clamps are also universal in its solar panel clamping range of 30 to 50mm.



Our SunDock Standing Seam Kit is recognized for mechanical load testing per UL2703 and UL467 grounding.

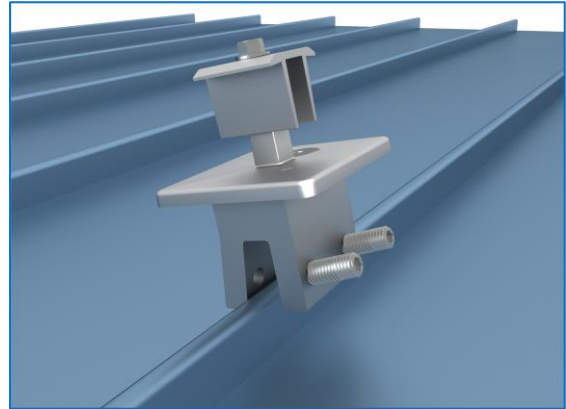
The SunDock Standing Seam Kit can be mounted in a staggered fashion so that the loads are shared across the seams. Consult a structural engineer for attachment frequency and roof construction.

SunModo does not recommend mounting of the Standing Seam Clamps on any steel roofing metal less than 26 ga. or aluminum roofing of less than .032". For thinner metal roofing, a penetration mount such as the EZ Metal Roof Mount or the Ridge Bridge bolted to a rafter or purlin is recommended.

SunDock Standing Seam Kit Installation

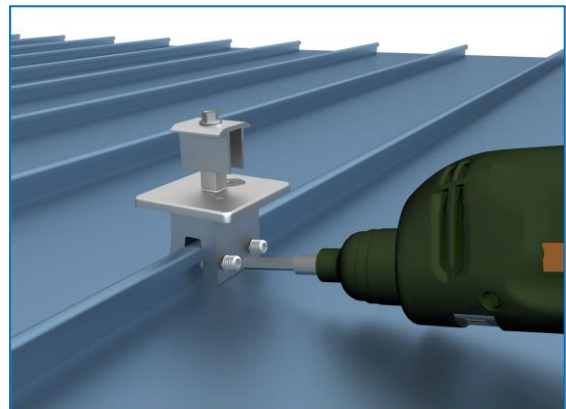
1" SunDock Clamp Kit Installation

Select the correct SunDock Standing Seam kit to fit your roof. Snap a line or use a laser to line up the clamps on the roof panel seams.



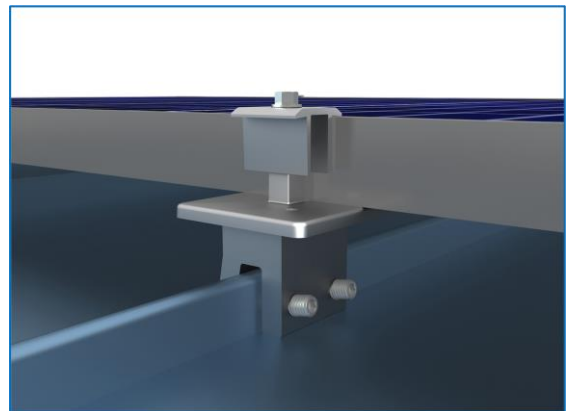
1" SunDock Clamp Kit Attachment

Tighten to 4.5 ft. lbs. of torque for steel or aluminum roof panels.



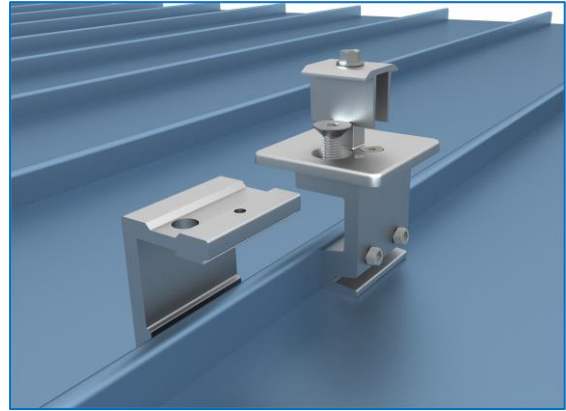
1" SunDock Clamp Kit with Module

Install the module onto the SunDock Kit. Torque to 7.5 ft. lbs.



2" SunDock Clamp Kit Installation

Select the correct SunDock Standing Seam kit to fit your roof. Snap a line or use a laser to line up the clamps on the roof panel seams.

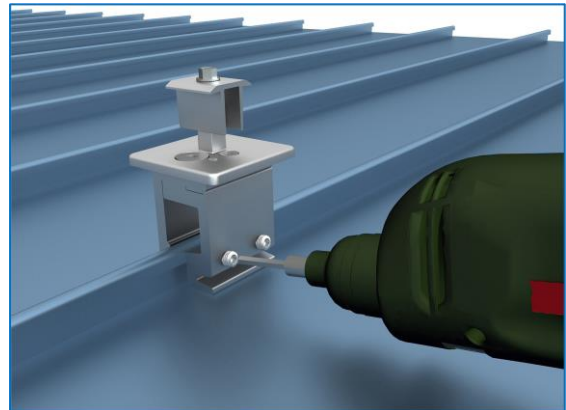


2" SunDock Clamp Kit Attachment

Assemble the SunDock Kit using the 3/8 Flat Head Screw; torque to 15 ft. lbs. Then tighten the M10 Set Screws to 4.5 ft. lbs. of torque for steel or aluminum roof panels.

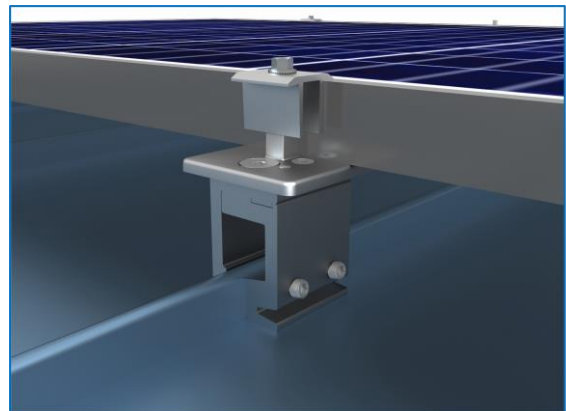
Warning: The 2" Clamp must have the SunDock Kit in place prior to torquing the Set Screws to 4.5 ft lbs.

Avertissement: le kit SunDock doit être en place sur la pince de 2 po avant de serrer les vis de réglage à 4,5 lb-pi.



2" SunDock Clamp Kit with Module

Install the module onto the SunDock Kit. Torque to 7.5 ft. lbs.



Ground Lug Installation

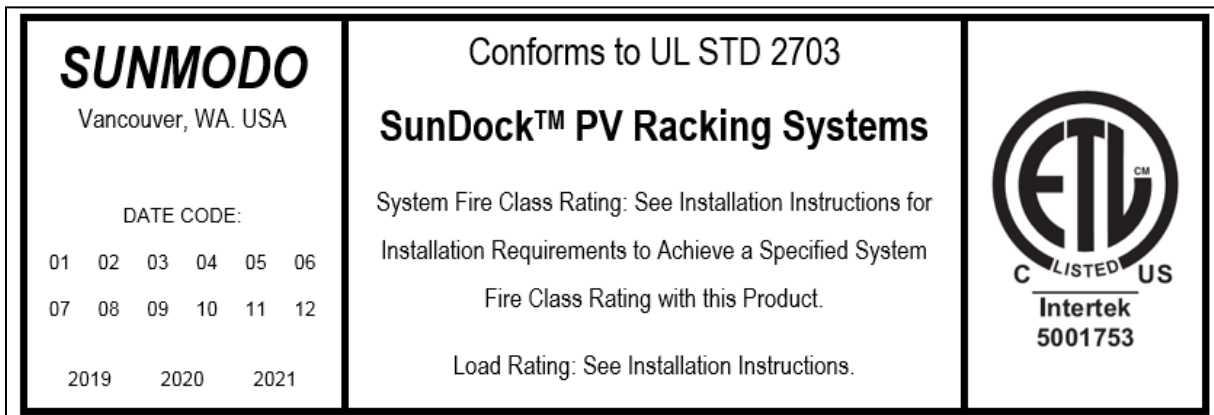
A #6 solid copper grounding wire connecting the Ground Lug to the building ground per NEC 690.47. One Ground Lug is required for fastening the ground conductor to the array.

The Ground Lug is mounted on the module using a special 1/4" T-Bolt, Grounding Spacer, and Flange Nut. Grounding Lugs K10179-001, and detailed installation document D10003 are available from SunModo separately.



UL 2703 Label Placement

When requested the UL 2703 Label can be located on individual roof attachments.



See www.sunmodo.com for current warranty documents and information.

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