

Installation Manual TerraRac Residential Roof Mount



SIMPLIFIED RACKING BUILT TO LAST

Introduction

TerraSmart's, TerraRac, provides an inexpensive solar racking system for universally mounting a variety of solar panels. The aluminum and stainless construction provides a long lasting, durable construction that is light-weight and simple to install. The single lag design contributes to minimal roof penetrations and quick attachment to underlying roof trusses. The innovative pilot tube allows for efficient, accurate roof penetrations without the need of seals, washers, and grommets typically required on other roof flashings. The TerraRac produces leak-proof results without the use of caulking or tapes that breakdown over time. The TerraRac is a must for all solar integrators who are installing on roofs,

Professionally engineered and certified, TerraRac Solar Racking offers high value for a low price.

Customer Support

TerraSmart provides professional engineer technical support to ensure your installation goes as smoothly as possible. Please call our technical staff at 877.629.8377 for assistance.

Installer Responsibility

The solar integrator is solely responsible for the following:

- Ensuring that TerraSmart and other products are appropriate for the particular installation, environment, and load condition.
- Ensuring the solar installation meets all state and local code requirements and that component design parameters are not exceeded.
- Complying with all applicable local or national building codes including any that may supersede this manual.
- Using TerraSmart parts and solar integrator supplied parts as specified by TerraSmart. Substitution parts may void the warranty.
- Ensuring safe installation of all electrical aspects of the PV array.
- Ensuring correct and appropriate design parameters are used in determining the design loading used for the specific installation. Parameters such as snow loading, wind load, wind speed, exposure, and topographic factor should be confirmed with local building official or a licensed professional engineer.
- Ensuring analysis has been done supporting the adequacy of pier installation and that installation complies with local regulations.

Tools Required

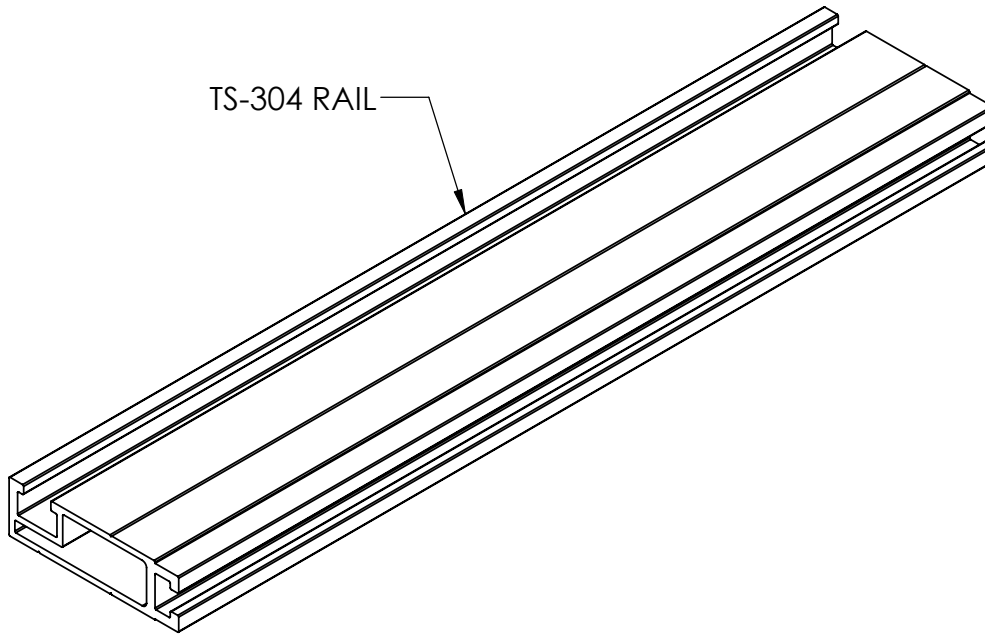
The following commonly available tools are required to assemble the TerraRac System:

- Electrical Drill/Drive
- Chalk Line
- Stud Finder
- Caulking Gun
- Roofing Sealant
- Tape Measure

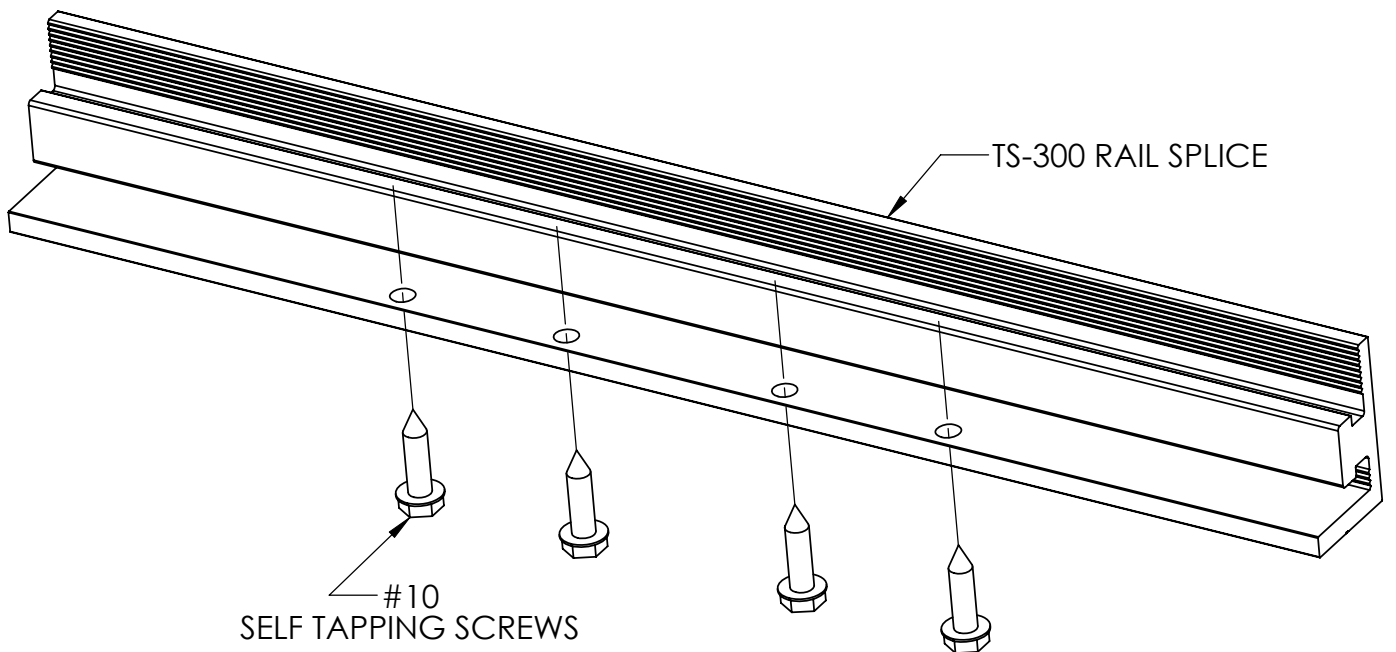
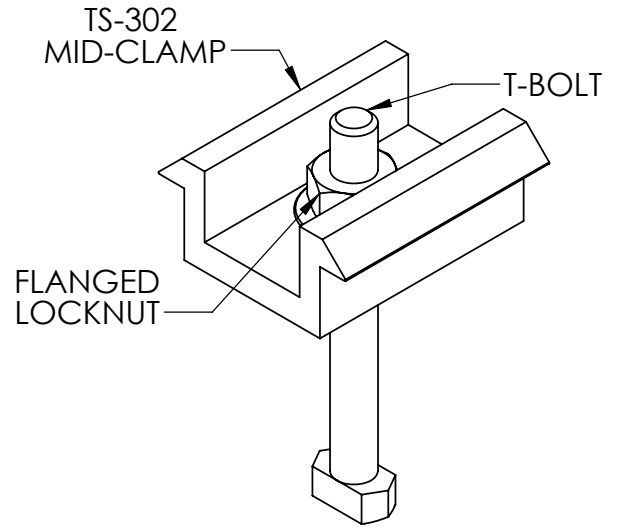
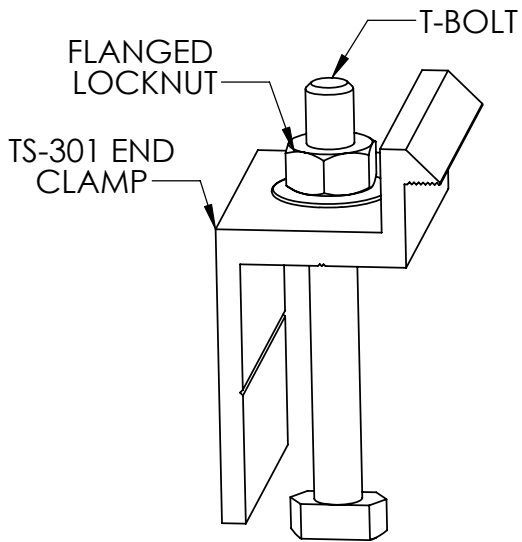
Component List

The following components make up the TerraRac Solar Racking System.

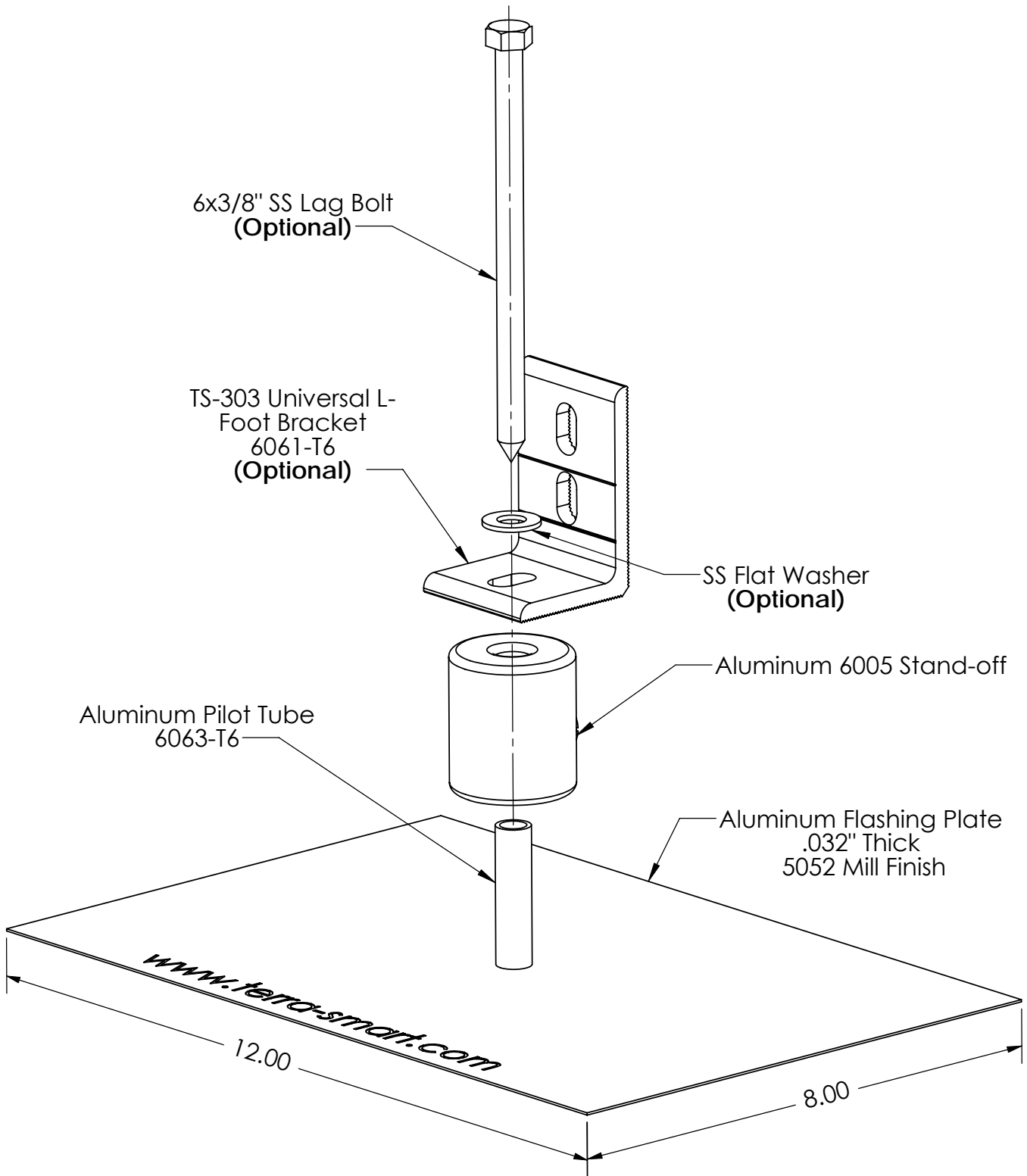
Note: The component list indicated here is for reference only. The actual component quantities will vary according to the quantity and make of modules the mount is configured for. Please check the packing list that ships with every mount for a confirmation of the items that are intended to ship with the specific product on your order.



Component List cont'd



Component List cont'd



Assembly

1. Locate the underlying rafter using the stud finder and snap a chalk line on the roof surface. Make sure your spacing meets local building code standards.
2. Locate your vertical locations for the TerraFlash Flashing.
3. Using drill with 1/4" long bit, drill pilot hole through roof and rafter, making sure to drill square to the roof.
4. Lift the composition roof tile with roofers flat bar, directly above the location of the flashing.
5. Slide one edge of the TerraFlash under the lifted tile, position the flashing, with the standoff in place, so that the flashing pilot tube is directly in line with the pilot hole in the roof.
6. *Note:* Though not required, you may inject some roof caulking into the flashing pilot tube at this time as additional assurance against leakage.
7. Slip an L-Foot bracket over a lag screw and drop the screw into the pilot tube of the pre-positioned flashing and drive the screw securely into the roof and underlying rafter.
8. Install rail horizontally onto the L-Foot angles. Use TS-300 Rail Splices when necessary.
9. Install your panels as per manufacturers specifications using the TS-301 End Clamps and the TS-302 Mid-Clamps.

Professional Engineer's Certification Letter

3327 Railroad St.
Ft. Myers, FL 33916



Office: 239-303-4778
Cell: 864-915-4995

August 4, 2010

TerraSmart
17484 Old Harmony Drive
Unit 202
Fort Myers, FL. 33908

Re: Suitability for TerraSmart roof mounting system for solar panels in high wind and other areas.

Dear Sir,

Please be advised that I have reviewed the above mentioned roof mounting system for solar panels in a 150 mph, exposure "C" wind load, and have incorporated suggestions for improving its stability. Please note that the basic wind speed used (150 mph exposure "C") is the most severe in the continental United States. This design may be used in areas with less substantial wind speeds.

The analysis and design was accomplished using wind loads generated from ASCE 7-05 "Minimum Design Loads For Buildings and Other Structures". Member stresses were derived with the aid of a computer frame analysis program, along with the application of basic structural mechanics. Member allowable stresses were derived using methods and specifications outlined in The Aluminum Association "2005 Aluminum Design Manual".

Professional Engineer's Certification Letter, cont'd

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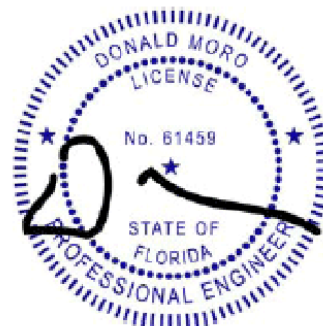
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Kindly accept this letter as certification that the TerraSmart roof mounting system (which includes TerraRac and TerraFlash) will perform adequately under these load conditions, given the following constraints:

1. Installation is in accordance with the TerraSmart installation manual.
2. Panels are not subjected to wind borne debris.
3. The mounting roof and substructure is capable of sustaining the design loads with the additional weight and loads imposed by the Solar panels and mounting system.
4. The mean roof height is 30 feet or less (this is measured from grade to the average of the roof eave height and the roof peak).
5. The mounting roof is not exposed to the wind effects of being near an escarpment.

I hereby certify that the TerraSmart solar panel roof mounting system will meet the requirements imposed by the given design loads. I also certify that the design is in compliance with the 2007 Florida Building Code, with The 2009 Amendments, and The 1999 SBCCI Standard (Southern) Building Code.

Donald Moro
FL. P. E. #61459



TerraRac Warranty

TERRASMART SOLAR MOUNTING COMPONENTS 10-YEAR LIMITED WARRANTY

TerraSmart LLC, a Florida limited liability company ("TerraSmart"), warrants that the party purchasing ("Purchaser") TerraSmart's mounting solution components (the "Products") is purchasing the Products free and clear of all liens and encumbrances. TerraSmart further warrants that the Products will be free from defects in material or workmanship under normal use and service for a period of ten (10) years from the date of delivery. Tampering, modification, misuse or negligence in handling or use of Product renders this warranty void. Further, this warranty is void if, at any time, any party attempts to make any internal changes to any of the Product's components; if at any time the power supplied to any part of the Product exceeds the rated tolerance; or if any external device attached by any party creates conditions exceeding the tolerance of the Products. USE OF THE PRODUCTS THAT RENDER THIS WARRANTY VOID WILL BE DEFINED TO INCLUDE ALL OF THE POSSIBILITIES DESCRIBED IN THIS PARAGRAPH, TOGETHER WITH ANY PRACTICE WHICH RESULTS IN CONDITIONS EXCEEDING THE DESIGN TOLERANCE OF THE PRODUCTS. Claims found to be within this scope of this warranty will be replaced or credited by TerraSmart and all charges for material, will be borne by TerraSmart. If it is determined that either no fault exists in TerraSmart, or the damage was caused by negligence of any other party other than TerraSmart, its agents, employees or customers, Purchaser agrees to pay all associated charges. This warranty shall be void if installation of the Products have been modified, negligently installed, abnormal service or handling, repaired, moved from its original installation, or reworked in a manner not authorized by TerraSmart in writing, or if the Products are installed in an environmental conditions including but not limited to acid rain and chemical buildup for which the Products were not designed. Abnormal external corrosion, discoloration, or other cosmetic changes that do not affect the Products structural integrity is not covered under the warranty. Furthermore, TerraSmart will not warrant Products which serial number or model number has been altered, tampered with, defaced, or removed. TerraSmart will not be liable for consequential, contingent, or incidental damages arising out of use of the Products.

THIS CONSTITUTES THE SOLE WARRANTY MADE BY TERRASMART EITHER EXPRESSED OR IMPLIED. THERE ARE NO OTHER WARRANTIES EXPRESSED OR IMPLIED WHICH EXTEND BEYOND THE FACE HEREOF, HEREIN, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT WILL TERRASMART LLC BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES AND PURCHASER'S REMEDIES WILL BE LIMITED TO REPAIR OR REPLACEMENT OF NONCONFORMING UNITS OR PARTS.

If the product is found to be defective, TerraSmart will, at TerraSmart's sole option, repair the Product or replace the Product with a new or remanufactured equivalent at no charge to the Purchaser during the warranty period. Such repair and replacement services will be rendered by TerraSmart or its authorized agents during normal business hours. Parts used for replacement are warranted only for the remainder of the original warranty period.

Replacement Products will be as closely compatible with or equivalent to the Product as possible from TerraSmart's then-existing product line or inventory. The repair or replacement of the Product, or the supply of additional Product does not cause the beginning of new warranty terms, nor shall the original terms of this limited warranty be extended. Any Product delivered to TerraSmart for replacement will become TerraSmart's property.

Call TerraSmart toll free at 877.629.8377 with proof of purchase to begin the return merchandise authorization process. You may be required to ship your product to TerraSmart. If you ship the Product, be sure it is prepaid, insured and packaged securely. This limited warranty does not include the costs of de-installation or reinstallation for product being repaired or replaced under this limited warranty.