Mounting system for sloped composite shingle roofs with PV modules in portrait orientation

Original Instructions
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THIS INSTALLATION MANUAL SHOULD BE KEPT IN GOOD CONDITION FOR FUTURE REFERENCE!

This installation manual describes the proper installation procedures of a ClickFit Supra mounting system and provides minimum standards required for product reliability and warranty. Thoroughly understanding of this installation manual is imperative to proper installation; failure to follow the guidelines set forth can result in property damage, bodily injury, or even death. Esdec takes no responsibility in events that are caused by not following the installation manual, please read Esdec’s full “Terms and Conditions” for all information on the subject.

As a result of constant efforts for improvement, it may happen that the product differs in detail from what is described in this manual. For this reason, the instructions given serve only as a guideline for installing the product mentioned in this manual.

This manual has been compiled with the utmost care, but the manufacturer cannot assume responsibility for any errors in this manual or the consequences thereof.

All rights are furthermore reserved and no part of this manual may be reproduced in any way whatsoever.
1. Introduction

This manual describes the installation of the ClickFit Supra mounting system for sloped composite shingle roofs (for solar panels set up in portrait orientation).
Read the manual carefully so that you are fully aware of its contents. Follow the instructions in the manual carefully. Always perform the operations in the correct order.
Keep the manual in a safe and dry place. If the manual should get lost, then you may request a new copy from Esdec.

2. Declaration of Conformity

Manufacturer: Esdec BV
Londestraat 16
7418EE Deventer
The Netherlands
Tel: +31 85 702 000

Declares under our responsibility that the ClickFit Supra mounting system is tested and approved by UL (Underwriters Laboratories) in compliance with the following norms (Pending):

UL (Underwriters Laboratory) Standard 2703:
• Grounding and Bonding (incl grounding lug)
• Mechanical Loading
• Waterproofing of the Flashing

Certification Markings:
The system will be clearly marked with the appropriate certification markings.
3. General installation conditions

General
The information, comments and advice in this document are binding and must be checked for completeness and validity. Any non-compliance with the requirements specified in this document could cause that all warranty and product liability claims to become null and void. Esdec reserves the right to amend this document without further notice.

Standards, prescriptions and regulations
Upon installation of the mounting system, it is important to follow the installation manual and the associated standards and codes to prevent accidents. Keep in mind the following applicable codes including, but not limited to:

- IBC (International Building Code)
- IRC (International Residential Code)
- SBC (State Building Codes)
- NFPA (National Fire Protection Association)
- NEC (National Electrical Code)
- ASCE/SEI-7 (American Society of Civil Engineers)

Supra Mounting and Bonding systems have been tested for bonding with the following Listed Photovoltaic modules: Canadian Solar - CS6K-XXX-M where XXX is 275 to 285.

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.

Supra Mounting System was evaluated assuming a 15 Amp maximum series fuse size.

These systems have been evaluated for module-to-system bonding and mechanical load to the requirements of UL/ANSI 2703.

The system’s fault current ground path components are: L foot, Rail, Rail Splice, PV module, Mid Clamp, End Clamp and Ground Lugs.

The system is a non-separately derived system. The following components have been evaluated for bonding as the fault current ground path: L foot, Rail, Rail Splice, PV module, Mid Clamp, End Clamp and Ground Lugs.

Planning and building works notification
Make sure to notify the applicable bodies in regards to planning and building works.

Stability and the condition of the roof
The roof must be in good condition and sufficiently strong to carry the weight of the PV modules and the mounting system, including additional weight during installation, additional materials, wind and snow loads according to applicable codes, standards and guidelines. Check the stability and condition of the roof and the roofing membrane and adjust or replace the roof/structure/membrane where necessary, engage a specialist roofing contractor when in doubt. Make sure that the load reserve of the roof is not exceeded locally or as a whole.

Application range ClickFit Supra
- Roof height: 10-30ft. If the roof is higher, please contact Esdec directly or your local dealer/distributor.
- Type of roof covering: Bitumen shingles. Check roofing manufacturer for compatibility and suitability.
- Roof pitch: Between 10-60 degrees
- The maximum allowable wind, snow load etc. will be determined by the ClickFit Supra Design Assistant.
- The ClickFit Supra Design Assistant can be found on our website www.esdec.com or can be requested through customer support.

Edge zone
Keep at least 1 foot of clearance from the ridge, gutter and eaves of the roof. Also leave enough room to safely move around the array during installation. Some building codes and fire codes require different clearances around the array, and the installer should check local building code requirements for compliance.
Dimensions
All sizes and dimensions are in inches, feet and/or millimeters, centimeters unless stated otherwise.

Weather tightness of the roof
• Install all components as specified within this installation manual to ensure weather tightness of the roof.
• Refer the roof/roofing manufacturer in regards to the suitability and compatibility of the system.

Storage
Make sure to store all materials dry and properly upon receipt to prevent damage and corrosion and to ensure the quality and durability of the products.

Health, Safety and Responsibility
• Comply with all applicable local or national building and fire codes, electrical codes, building codes, etc including any that may supersede this manual. Please refer to the “Standards, prescriptions and regulations” chapter in this document for more details.
• All appropriate Health and Safety regulations should be followed correctly when installation the PV system.
• Ensure the installation is undertaken by a licensed solar professional with adequate knowledge of working on heights and roofs and in strict accordance to this manual.
• All electrical installation and procedures should be conducted by a licensed and bonded electrician or solar contractor.
• Ensure all products are appropriate for the installation and environment.
• Ensure provided information is accurate. Issues resulting from inaccurate information is the installer’s responsibility.
• Use only Esdec parts or parts recommended by Esdec; Adding, removing or substituting parts may void any applicable warranty.
• Ensure bare copper grounding wire does not contact aluminum and zinc-plated steel components, to prevent risk of galvanic corrosion.
• Refer to the roof/roofing manufacturer in regards to the suitability and compatibility of the system.
• Refer to the PV module, inverter and cable manufacturers installation manuals for details on the handling and installation of their equipment.
• Always wear the correct protective clothing when performing the work, such as but not limited to: gloves goggles, safety shoes and a helmet.
• Always work with fall protection and, if necessary, with safety nets and edge protection when working on roofs.
• The roof must be clean, dry and free from any obstruction including, rodent nests or algae, etc.
• The roof should be in good condition. Please refer to chapter “Stability and the condition of the roof” for more details.
• Never install or access the roof during strong winds or when slippery.
• Always use a lifting aid/hoist installation when moving equipment (mounting system, PV modules, etc.).
• Refer to Esdec’s calculation tool for specific design details including allowable rail spans, rail spacing, L-bracket spacing, splice locations, clamp locations, etc. Installer must cross check the results for compliance with the applicable codes and standards in regards to wind and snow loads.
• Periodic inspection of the PV system should be done frequently. Please refer to the “Maintenance” chapter in this document for more details.

Maintenance
The installation shall be periodically re-inspected for loose components, loose fasteners and corrosion, such that if found, the affected components are to be immediately replaced. When preforming routine maintenance make sure not to break or disturb the bonding path of the system.

The following points need to be checked on a yearly basis and after each storm with wind speeds >9Bft.:

• The tightness of all bolts, nuts and screws.
  o Action: Tighten or replace all bolts, nuts, screws and clamps where necessary according to the installation manual and report it to Esdec including photographs.
  o Overall visual inspection of the system (corrosion of components, etc).
  o Action: replace all bolts, nuts, screws and clamps where necessary according to the installation manual and report it to Esdec including photographs.
**Removal and demounting**
At the end of the life time of the product when removing the system the installer must remove and discard of the products according to local laws and regulations.

**Warranty**
Esdec warrants each new ClickFit Supra mounting system to be free from defects in material and workmanship under normal use and service for a period of 20 year from date of original sale. Please refer to the Esdec general terms and conditions for full details.

**Liability**
The manufacturer accepts no liability for damage or injury caused by not (strictly) adhering to the safety prescription and instructions contained in this manual, or by carelessness during installation of the product specified in this document and the eventual related accessories. Please refer to the Esdec general terms and conditions for full details on liabilities.

**Support**
For technical or customer support please contact:

Esdec BV
Londenstraat 16
7418EE Deventer
The Netherlands

www.esdec.com/clickfitusa
sales@esdec.com
call us at: 1800-374-5551
or contact your local dealer/distributor.

• printing errors may occur, no rights or obligations may be derived from this fact.
4. Product description

The ClickFit Supra mounting system for composite shingle roofs consists of aluminum rails and brackets on which the PV modules are clamped.

The aluminum rails are fixed to L-Brackets which are fastened to the roof (framing member, rafters, trusses). The rail is designed to span 4-8 ft. The distance between the L-Brackets will depend on wind & snow load and the positions of the roof framing member. A flashing plate is needed to create a watertight seal between the L-Bracket and the roof.

The rails can be interconnected using a splice. The splice slides inside the rail. The splice will be fixed and interconnected to the mounting rail using mounting screws which go through the rail and the splice, ensuring a grounding/bonding path.

A grounding lug and grounding wire will be fastened to the mounting rails which will ensure a grounding/bonding path of all the connected components. The modules will be clamped onto the rail. A grounding clip is used between the rail and the PV modules to ensure a grounding/bonding path between the rails and the PV modules.

The PV modules are attached by means of module clamps, end clamps and mounting bolts. End clamps will be mounted on the edges of the PV array. Module clamps will be mounted between the PV modules. The clamps are fastened to the rails using mounting bolts. The mounting bolts are screwed directly into the pre-threaded rail.

Optional cable ties can be used to bind the cables to the mounting system.
Optional end caps can be placed onto the rail ends and optional color caps can cover the mounting bolts for an esthetic look.

A specification sheet of all the materials used can be found in the declaration of performance.

5. Components overview

5.1 Exploded view
5.2 Component list

1. PV module

2. Flashing plate
   Article no.: 100-5063

3. L-Bracket
   Article no.: 100-5040

4. Lag bolt 1/4" x 3"
   (6.5 x 76 mm)
   Article no. 100-5087

4A. Lag bolt 1/4" x 4"
    (6.5 x 101 mm)
    Article no. 100-5089

5. Mounting bolt 1/4"-20 x 3/4"
   (6.5 x 20 mm)
   Article no: 100-5080

6. Mounting rail 7 ft (2130 mm)
   Article no: 100-5001

6A. Mounting rail 14 ft (4265 mm)
    Article no: 100-5002

7. Splice
   Article no. 100-5061

8. Mounting screw 1/4" x 3/4"
   (6.0 x 20 mm)
   Artikel nr: 100-5082

9. Cable ties
   Article no.: 100-5067

10. End cap set black (optional)
    Article no.: 100-5060-B

10A. End cap grey (optional)
    Article no.: 100-5060

11. End clamp rail bonding clip
    Article no. 100-5091

12. End clamp bonding clip
    Article no: 100-5090

13. End clamp CFA
    Article no.: 100-5022

   End clamp CFB
   Article no.: 100-5023
   For type see appendix ch. 8.1

13A. End clamp CFA black
     Article no.: 100-5022-B

     End clamp CFB black
     Article no.: 100-5023-B
     For type see appendix ch. 8.1

14. Mounting bolt 1/4"-20 x L
    (6.5 x L mm)
    Article no: 100-508_
    For type see appendix ch. 8.1

15. Color cap black (optional)
    Article no.: 100-5066

16. Module clamp bonding clip
    Article no.: 100-5069

17. Module clamp
    Article no.: 100-5020

17A. Module clamp black
     (optional)
     Article no.: 100-5020-B

18. Grounding lay-in
    WEEB-LUG 6.7
    Article nr: 100-5576

19. Mounting bolt 1/4"-20 x 2"
    (6.5 x 51 mm)
    Article no: 100-5083
6. Mounting preparation

6.1 Control of tools and accessories

The following is a list of the required tools/accessories:

- Felt-tip pen/chalk
- Chalk line
- Tape measure
- Stud Finder
- Iron saw
- Battery-operated impact driver
- Ratchet with hexagon cap
- Brush
- Roofing bar
- Safety gloves
- Safety helmet
- Safety glasses
- Safety clothes
- Safety shoes
- Dust mask
- Ear protection
- Scaffold or stable safe ladder
6.2 Determining position and measuring of PV modules

In determining the location of the PV modules on the roof it is important to pay attention to the amount of sun on the roof throughout the day and throughout the year. Shadow of a chimney, dormer, trees and nearby buildings have a strong negative effect on the yield of the PV modules.

**Measuring and marking out**

The area needed for a PV module array depends on the make and model of the PV module used. Use the ClickFit Supra Design Assistant to determine the exact size of the PV module array.

Make sure to keep out of the edge zone of the roof. Keep at least 1 foot of clearance from the ridge, gutter and eaves of the roof and of obstacles. Please refer to chapter Edge zone for more details.

Mark the outlines of the PV module array on the roof with a chalk or a felt-tip pen.

6.3 Cleaning the roof

Clean the shingles of the roof with a brush.

Remove any debris, gravel, algae, moss, etc. to minimize unevenness during installation and prevent leaks over time!
7. Installation

7.1 Determining the fixation positions

Use the position of the PV module array and keep the position of the roof framing members in mind to determine the exact fixation positions. Please refer to the ClickFit Supra Design Assistant for the location and number of the fixation points needed for the PV module array.

Marking the fixation positions

1. Locate the roof framing member by using a stud finder for example. Select the roof framing member where the PV module array should be fixed to.
   (See ClickFit Supra Design Assistant for the position and maximum distance between the fixation points).

2. Mark the centers of the selected roof framing members.

3. Mark the intended position of the horizontal lines on the roof where the mounting rails will be placed.

Important:

- The roof must be measured and inspected and marked accurately before the installation of the PV module array. The condition of the roof, roofing membrane and selected roof framing members should be good.
- Please refer to annex for limitations and further details.
- Please note the manufacturer's warranty in relation to the position of the module clamps.
7.2 Positioning flashing plates on the roof

1. Carefully lift the composite roof shingles with a roofing bar, at the marked fixation position. Remove nails where required. Slide the flashing plates underneath of shingle.

2. Drill a 0.12” pilot hole into the roof framing member through the hole in the flashing plate. Make sure that the pilot hole is no deeper than 1.5 inch and to drill perpendicular to the roof. Clean off any sawdust and or debris between the flashing plate and the roof.

3. Repeat these steps for all flashing plates.

Important:
- Make sure that all fixation points are positioned in the center of the roof framing member and ensure that the roof framing member is solid. If the roof framing member is not found or is not solid then seal the pilot hole immediately with an appropriate roofing sealant.
- Please refer to annex for limitations and further details.
See ClickFit Supra Design Assistant

roof framing member

2/4H

TOP-VIEW
7.3 Mounting the L-brackets

1. Place the L-brackets on the flashing plates. Make sure that the holes of the L-bracket and the flashing plate are aligned with the pilot hole and that the correct side of the L-bracket is facing upwards. The L-bracket should sit nicely and evenly on the flashing plate. Make sure that there is no sawdust or debris between the L-bracket and the flashing plate.

2. Fasten the L-brackets to the roof with the Lag bolt and tighten the mounting bolt in accordance to the torque values provided in the annex.

3. Repeat these steps for all the L-brackets.

Important:
- Make sure the Lag bolt goes straight into the roof framing member. Do not overtighten the bolts, as soon as the rubber ring on the bolts distorts slightly the bolt is fastened correctly and the roof is watertight.
- Make sure that the L-brackets are perfectly aligned.
- Please refer to annex for limitations and further details.
7.4 Pre-mounting the splice in the mounting rail

Multiple mounting rails can be connected to each other using the splice. The splice slides inside the rail.
1. The splice will be fastened to the mounting rail using two mounting screws on the end of the mounting rail. Mark the position of the pilot holes on the mounting rail according to the measurements in the annex. Drill the pilot holes into the mounting rails prior to splice assembly, using a 1/4" drill bit.
2. Align the two rail ends next to each other and slide the splice in both ends of the rails according to measurements in the annex.
3. Fasten the splice to the mounting rail with the mounting screws 1/4" x 3/4" (6.0x20 mm). Tighten the mounting screw in accordance to the torque values provided in the annex.
4. Repeat these steps for all mounting rails that need to be connected.

Important: Please refer to annex for limitations and further details.

7.5 Trimming the final mounting rail

1. Check the total required length of the mounting rail as indicated by the ClickFit Supra Design Assistant.
2. Mark and cut the excess rail at the end of the mounting rail.
3. Repeat these steps for all the other mounting rails that need trimming.

Important: Please refer to annex for limitations and further details.
7.6 Securing mounting rail

1. Place the mounting rail on the L-brackets. Fasten the mounting rail onto the L-brackets, using the Mounting bolts 1/4"-20 x 3/4" (6.5 x 20 mm). Make sure that the mounting rails are aligned and that the mounting rail is positioned correctly on the L-brackets. Tighten the bolts just enough to allow the rail to be adjusted up and down in the slotted hole of the L-bracket.

2. Level all the rails to the desired height.

3. Tighten all the mounting bolts in accordance to the torque values provided in the annex.

Important:
• Please refer to annex for limitations and further details.
7.7 Positioning and mounting cable ties and cables (Optional)

1. Firmly press the fixing pin of the cable ties into the slot at the bottom of the rail.

2. Run the cable and connectors through the open cable ties. Close the cable tie once all cables have been placed and tighten firmly.

3. A recommended distance between the cable ties is 1.5 ft (450 mm).

Important:
- Please refer to annex for limitations and further details.
7.8 Mounting of Grounding Lug

The following grounding lug must be used (field provided):
Type: WEEB-LUG-6.7
Manufacturer: Burndy

1. Assess correct positioning of the grounding lug on the rail.

2. Install grounding lug according to manufacturer’s installation manual.
   a. Drill 1/4” Pilot hole through the rail for Grounding lug assembly mounting bolt
   b. Insert 1/4”-20 x 2” (6.5 x51mm) bolt through the mounting rail
   c. Mount WEEB 6.7 Grounding lug to bolt and attach washers and nut. Torque setting 120 lbs-in / 13.5 Nm
   d. Attach grounding wire to assembly and torque the wire clamp bolt to 90 lbs-in / 10 Nm (grounding wire size and
type to be in accordance with National Electric Code and/or local)
   e. Route grounding cable between rails as shown in the drawing below.
7.9 Bonding and mounting of first PV module on the rails

1. Slide the End clamp rail bonding clip on the mounting rail at the positions where the first PV module will be fastened to the mounting rail.
2. Place the first PV module onto the rail ensuring the bonding clip is in position.
3. Preassemble the Mounting bolt, End clamp bonding clip and End clamp. Ensure not to insert the Mounting bolt too far into the End clamp bonding clip.
4. Slide the End clamp onto the mounting rail. Choose the correct slot in the end clamp, make sure that the end clamp fits the PV module. Fasten the end clamp with the Mounting bolt. Ensure that the Mounting bolt will go through the hole of the End clamp rail bonding clip. Tighten the mounting bolt in accordance to the torque values provided in the annex.
5. Place the color caps over the mounting bolts and press it on firmly (optional for use with black modules and clamps).
6. Slide the end caps onto the mounting rail ends and press it on firmly (optional for use with black modules and clamps).

Important:
- Make sure that the PV modules are aligned correctly before tightening the mounting bolts.
- Please refer to annex for limitations and further details.
7.10 Bonding and mounting of other PV modules on the rails

1. Preassemble the Module clamp bonding clips onto the Module clamps.
2. Place the second PV module on the mounting rail and slide the PV module towards the first one until a gap remains of approximately 0.28 inch (7 mm). Clamp the PV module on to the rail using the Module clamp and the Mounting bolts 1/4" -20 x L (6.5 x L mm). Tighten the mounting bolts in accordance to the torque values provided in the annex.
3. Cover the mounting bolts with the color caps (optional for use with black modules and clamps).

Important:
- Make sure that the PV modules are aligned correctly before tightening the mounting bolts. Repeat these steps for the remaining PV modules in the same row.
- Please refer to annex for limitations and further details.
7.11 Bonding and mounting of the last PV module in a row

1. Slide the End clamp rail bonding clip on the mounting rail at the positions where the first PV module will be fastened to the mounting rail.
2. Place the last PV module of the row on the bonding clips on the mounting rail and slide the PV module towards the penultimate PV module until a gap remains of approximately 0.28 inch (7 mm).
3. Preassemble the Mounting bolt, End clamp bonding clip and End clamp. Ensure not to insert the Mounting bolt too far into the End clamp bonding clip.
4. Slide the End clamp onto the mounting rail. Choose the correct slot in the end clamp, make sure that the end clamp fits the PV module. Fasten the end clamp with the Mounting bolt. Ensure that the Mounting bolt will go through the hole of the End clamp rail bonding clip. Tighten the mounting bolt in accordance to the torque values provided in the annex.
5. Place the end caps onto the rail ends and press it on firmly (optional for use with black modules and clamps).
6. Place the color caps over the mounting bolts and press it on firmly (optional for use with black modules clamps).

Important:
• Make sure that the PV modules are aligned correctly before tightening the mounting clamp bolts.
• Please refer to annex for limitations and further details.
7.12 Final bonding and mounting / multiple rows underneath one another

Repeat the sections 7.9 – 7.11 to place multiple rows of PV modules.

**Note:** Make sure to leave a gap between the separate rows of minimal 0.28 inch (7 mm).
### 8.1 Mounting bolt and End clamps

<table>
<thead>
<tr>
<th>Frame height</th>
<th>End clamp</th>
<th>Mounting bolt</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 mm</td>
<td>CFB</td>
<td>2 ¼” (57 mm)</td>
</tr>
<tr>
<td>32 mm</td>
<td>CFA</td>
<td>2 ¼” (57 mm)</td>
</tr>
<tr>
<td>33 mm</td>
<td>CFA</td>
<td>2 ¼” (57 mm)</td>
</tr>
<tr>
<td>34 mm</td>
<td>CFB</td>
<td>2 ¼” (57 mm)</td>
</tr>
<tr>
<td>35 mm</td>
<td>CFB</td>
<td>2 ¼” (57 mm)</td>
</tr>
<tr>
<td>38 mm</td>
<td>CFB</td>
<td>2 ½” (64 mm)</td>
</tr>
<tr>
<td>39 mm</td>
<td>CFB</td>
<td>2 ½” (64 mm)</td>
</tr>
<tr>
<td>40 mm</td>
<td>CFA</td>
<td>2 ½” (64 mm)</td>
</tr>
<tr>
<td>41 mm</td>
<td>CFA</td>
<td>2 ½” (64 mm)</td>
</tr>
<tr>
<td>44 mm</td>
<td>CFA</td>
<td>2 ¾” (70 mm)</td>
</tr>
<tr>
<td>45 mm</td>
<td>CFA</td>
<td>2 ¾” (70 mm)</td>
</tr>
<tr>
<td>46 mm</td>
<td>CFB</td>
<td>2 ¾” (70 mm)</td>
</tr>
<tr>
<td>47 mm</td>
<td>CFB</td>
<td>2 ¾” (70 mm)</td>
</tr>
</tbody>
</table>

### 8.2 The tightening torque of the screw and bolt connections

<table>
<thead>
<tr>
<th>Connection</th>
<th>Screw or bolt dimensions (inches)</th>
<th>Screw or bolt dimensions (mm)</th>
<th>Torque value</th>
<th>Wrench/socket size (inches / mm)</th>
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<tr>
<td>L-bracket to roof</td>
<td>Lag bolt ¼” x L</td>
<td>6.5 x L mm</td>
<td>40 in-lbs / 4.5Nm</td>
<td>3/8” / S10</td>
</tr>
<tr>
<td>L-bracket to rail</td>
<td>Mounting bolt ¼”-20 x ¾”</td>
<td>6.5 x 20 mm</td>
<td>80 in-lbs / 9Nm</td>
<td>3/8” / S10</td>
</tr>
<tr>
<td>End / Mid clamp to rail</td>
<td>Mounting bolt ¼”-20 x L</td>
<td>6.5 x L mm</td>
<td>80 in-lbs / 9Nm</td>
<td>3/8” / S10</td>
</tr>
<tr>
<td>Splice to rail</td>
<td>Mounting screw ¼” x ¾”</td>
<td>6.0 x 20 mm</td>
<td>40 in-lbs / 4.5Nm</td>
<td>3/8” / S10</td>
</tr>
<tr>
<td>Grounding lug to rail</td>
<td>Mounting bolt 1/4”-20 x 2”</td>
<td>6.5 x 51 mm</td>
<td>120 in-lbs / 13.5Nm</td>
<td>3/8” / S10</td>
</tr>
<tr>
<td>Grounding lug to conductor</td>
<td>Mounting bolt 1/4”-28 x 5/8”</td>
<td>6.5 x 15.5 mm</td>
<td>90 in-lbs / 10Nm</td>
<td>7/16” / S11</td>
</tr>
</tbody>
</table>
8.3 Specifications for installation

8.3 - 01

Line the flashing plate up with the chalk lines on the roof using the markings in the bottom and the sides of the flashing plate.

8.3 - 02

Make sure the raised side of the flashing plate is facing up. The water drain channel should face down.

8.3 - 03

Slide the flashing plate sufficiently under the upper shingle. Make sure that the distance of the fixation point of the flashings plate to the overlying shingle is at least 1 3/16” (30 mm). Make sure that the flashing plate doesn’t overhang the shingle below.

8.3 - 04

Place the L-brackets on the flashing plates. Make sure that the holes of the L-bracket and the flashing plate are aligned with the pilot hole and that the correct side of the L-bracket is facing upwards.
To fasten the splice to the mounting rail:
Mark the positions of the 2 pilot holes at each rail end.
1 inch (25.4 mm) from the end of the rail
2 inch (50.8 mm) between the pilot holes
Pre-drill the 2 pilot holes in each mounting rail end with ¼ inch drill.

Slide the splice 3 ¾” (95 mm) into the mounting rail. Divide the splice evenly over the two rail ends.

The mounting rail should not protrude less than 3 ¾” (95 mm) from the center of the closest L-bracket.

The mounting rail should not protrude more than 1 ½ ft (450 mm) from the center of the closest L-bracket.
The minimum protrusion of the mounting rail should be ¾” (20 mm) from the end of the end clamp.

The minimum protrusion of the mounting rail should be ¾” (20 mm) from the center of the module clamp.