

# Flush Mount Kit



**SUNEARTH** INC.

## SunEarth Flush Mount Kit Installation Manual



***SunEarth Flush Mount Kit  
Asphalt Shingle Roofing***

Thank you for purchasing the SunEarth flush mount kit. The flush mount kit (MTG-EC-FM) is our simplest and least expensive mounting system. It provides a strong durable solution for mounting SunEarth collectors on composition shingle roofs.

The flush kit components consist of 6063-T6 anodized aluminum mounting feet and collectors clips and stainless steel fasteners that can withstand the harshest weather conditions. The components have pre-punched holes to expedite field installation.

SunEarth's flush mount kit has been designed for composition shingle style roofs with a maximum of two (2) layers of shingles and a minimum roof pitch of 2/12 or 10°. Collectors must be installed parallel to the roof surface.

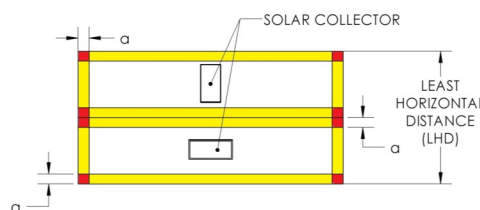
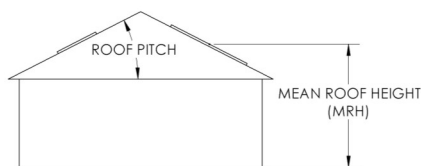
The flush mount kit should not be used in areas that experience positive panel loading (snow) greater than 40 psf or negative panel loading (wind) greater than 30 psf. If expected loading exceeds these values please contact SunEarth for other mounting options.

The use of mounting systems that do not conform to the materials and methods detailed in this or any of SunEarth's other published installation manuals, guidelines, and technical bulletins is not recommended and may void your collector warranty.

# Flush Mount Kit — Location

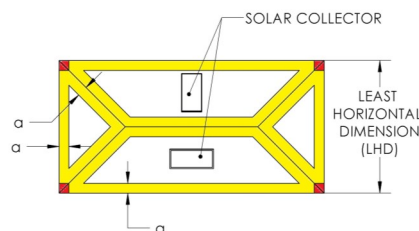
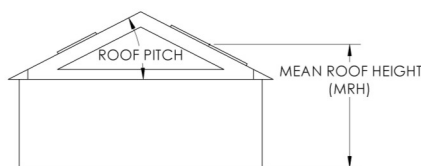


## **GABLE ROOF** $10^\circ < \text{ROOF PITCH} < 45^\circ$



SOLAR COLLECTOR(S) TO BE INSTALLED IN AREA 1 OF ROOF.  
EDGES AND CORNERS (AREA 2 & 3)  
ARE TO BE AVOIDED

## **HIP ROOF** $10^\circ < \text{ROOF PITCH} < 27^\circ$



The optimal siting of the solar collector is facing true south. If this is not possible the annual performance will suffer very little if the collector is oriented no more than  $45^\circ$  east or west of true south.

Warning: The SunEarth flush mount kit is inappropriate for any roof pitch less than 2/12 or  $10^\circ$ , or for tilting (racking) the solar collectors to an angle greater than the pitch of the roof.

The solar collector should be placed on the roof in an area and orientation that minimizes wind and snow loading. It is not advisable to install solar collectors in locations 2 (yellow) and 3 (red).

Note: Roof area (a) : Dimension "a" is 10% of the least horizontal dimension "LHD" or 40% of the mean roof height "MRH" whichever is smaller, but not less than either 4% of the least horizontal dimension or 3 feet of the building as stated in Minimum Design Loads for Buildings and Other Structures, American Society of Civil Engineers (ASCE) 7-05.

**Example:** If the installation site has a roof that is 35 feet wide, 60 feet long and has a mean roof height of 30 feet.

$$10\% \text{ of "LHD"} = 0.10 \times 35 = 3.5$$

$$4\% \text{ of "LHD"} = 0.04 \times 35 = 1.4$$

$$40\% \text{ of "MRH"} = 0.40 \times 30 = 12$$

$$\mathbf{a = 6 \text{ feet}}$$
 since  $1.4 < 3 < \mathbf{3.5} < 12$

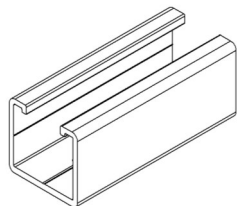
Therefore collectors should not be installed less than 3.5 feet from any roof peak or edge.

# Flush Mount Kit — Components

## Flush Mount Kit

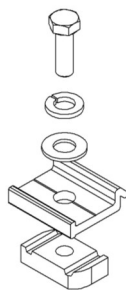
**SunEarth Part # MTG-EFK**

### Includes



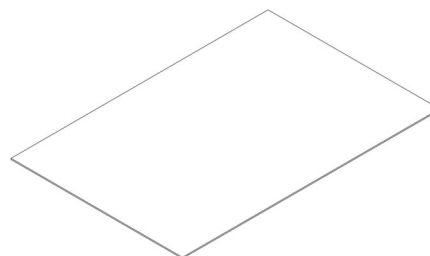
**Flush Mount Foot**

**X 4 each**



**C-SSN**

**X 4 each**



**Galvanized Roof**

**Flashing (8" X 4")**

**X 4 each**

### Additional Required Parts (Not Included in Flush Mount Kit)\*

(8 X Stainless Steel Lag Bolt, 8 X Stainless Steel Flat Washer, Roof Sealant)

### SunEarth Part Number Index

SunEarth Part #	Extension	Description
10110-	384	3/8" X 4" Stainless Steel Lag Bolt
	385	3/8" X 5" Stainless Steel Lag Bolt
	5163.5	5/16" X 3.5" Stainless Steel Lag Bolt
	10	5/16" Stainless Steel Flat Washer
10130-	2	3/8" Stainless Steel Flat Washer
LEXEL		Clear Roof Sealant

Example: PN **10110-385** = 3/8" X 5" Stainless Steel Lag Bolt

The Collector Clip Assembly (C-SSN) attaches the collector to the aluminum flush mount foot.

The stainless steel lag bolts should be no less than 5/16" diameter for standard 2" rafters. The lag bolts should be sufficiently long to ensure that no less than two (2) inches of the lag is embedded into the rafter.

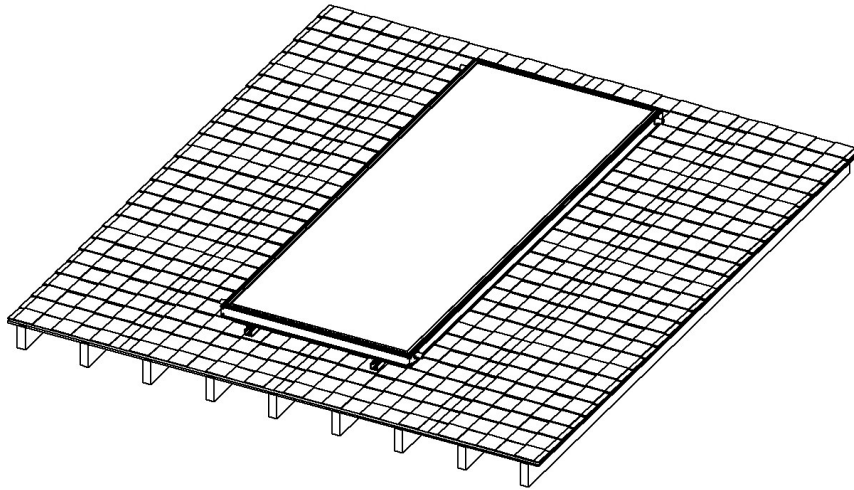
Note: The pilot hole for the lag bolt should be 75% of the bolt diameter and 75% of the embedded depth.

Example: The pilot hole for a 5/16" lag bolt to be embedded 2-1/2" into the rafter should be 15/64" X 1-7/8" in depth.

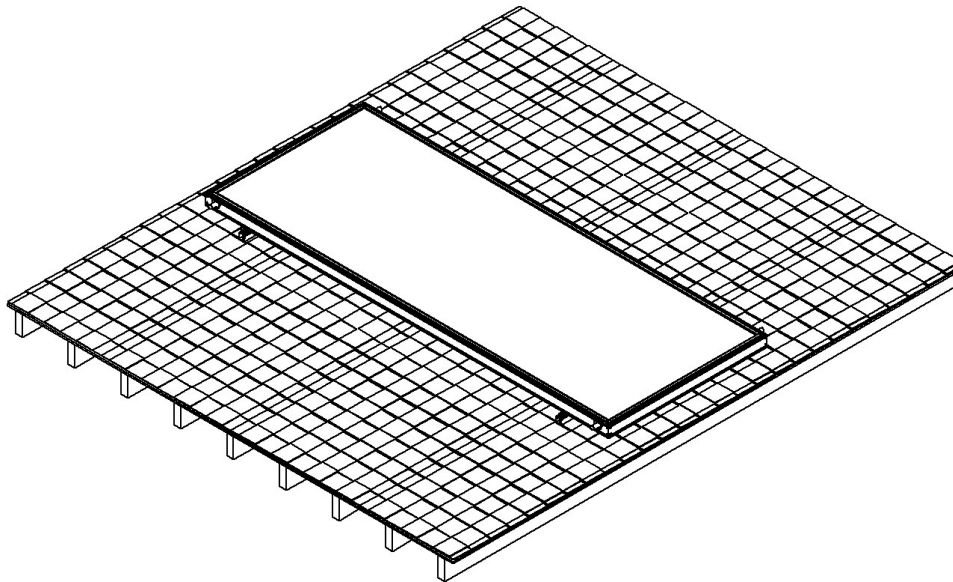
\* Not Supplied with Flush Mount Kit, when ordering specify required size and length.

# Flush Mount Kit — Layout

## ***Portrait Configuration***



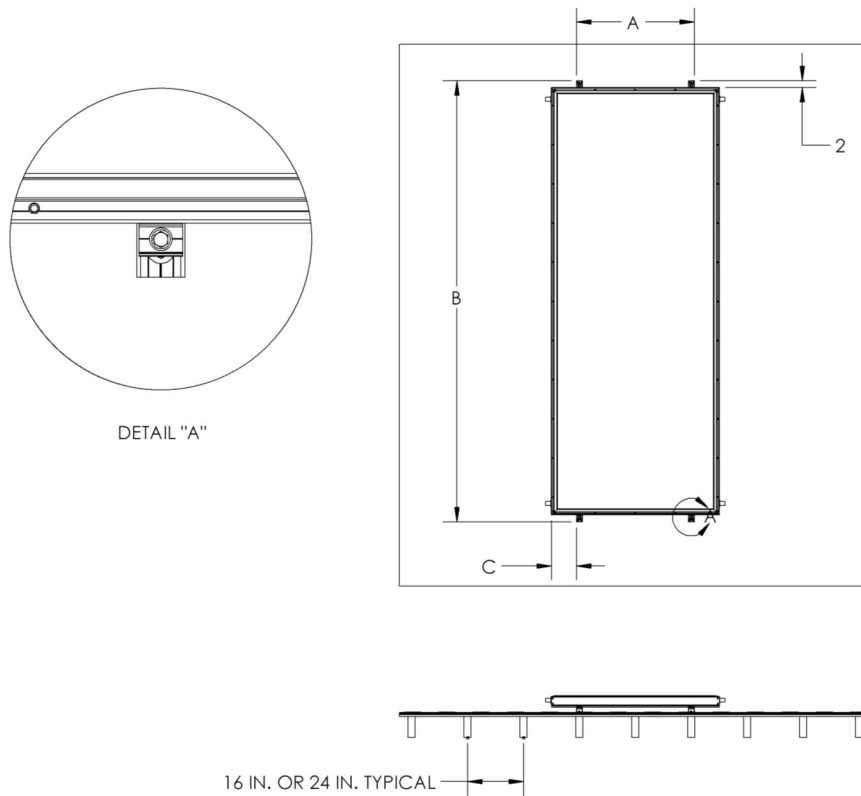
## ***Landscape Configuration***



Select either a portrait or landscape collector(s) orientation. Portrait is generally recommended for arrays of two or more collectors, or if moderate annual snow loads are anticipated.

The flush mount kit is not an appropriate mounting solution for locations that experience positive panel loading (snow) greater than 40 psf or negative panel loading (wind) greater than 30 psf. If expected loading exceeds these values please contact SunEarth for other mounting options.

# Flush Mount Kit — Portrait Layout



## Portrait Layout Dimensions

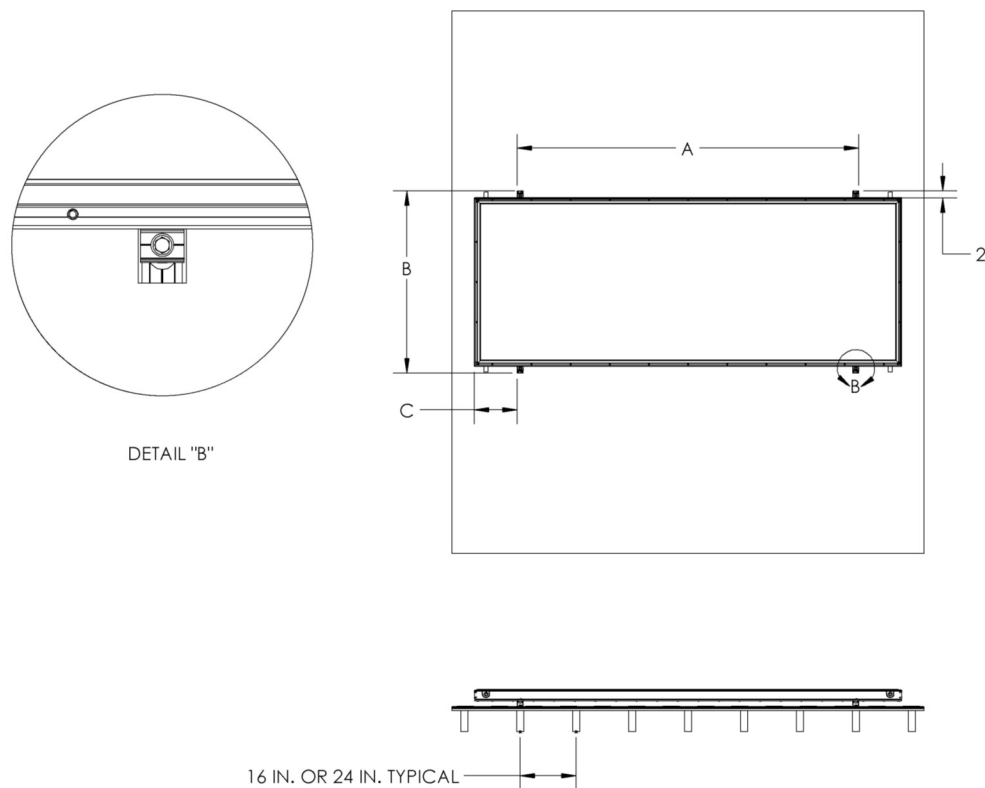
Collector Model	Rafter Spacing Layout					
	Dimension "A"		Dimension "B"		Dimension "C"	
	16"	24"	16"	24"	16"	24"
EP/EC 21	33 3/4	24 3/4	80	80	3 1/8	7 1/8
EP/EC 24	17 3/4	24 3/4	102 1/4	102 1/4	9 1/4	5 1/4
EP/EC 32 & 40	33 3/4	24 3/4	126 1/4	126 1/4	7 1/4	11 1/4

Table 1

Table 1 provides detail on the proper placement of the flush mount feet for various SunEarth collectors mounted in a portrait orientation.

If the rafter spacing is not 16" or 24" on center, position the flush mount feet such that the "overhang" (Dimension "C") is plus or minus 1" of the shown in Table 1.

# Flush Mount Kit — Landscape Layout



## Landscape Layout Dimensions

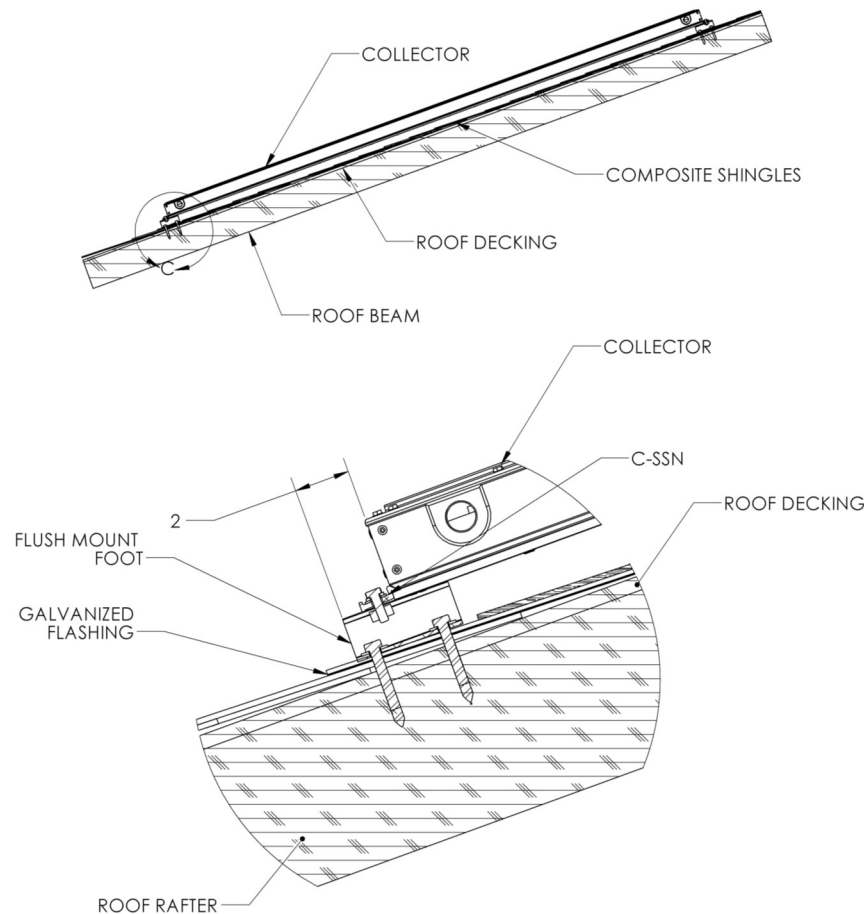
	Rafter Spacing Layout					
	Dimension "A"		Dimension "B"		Dimension "C"	
Collector Model	16"	24"	16"	24"	16"	24"
EP/EC 21	65 3/4	49 3/4	44	44	5 1/8	13 1/8
EP/EC 24 & 32	65 3/4	73 3/4	40 1/8	40 1/8	16 1/4	12 1/4
EP/EC 40	97 3/4	97 3/4	52 1/8	52 1/8	12 1/4	12 1/4

Table 2

Table 2 provides detail on the proper placement of the flush mount feet for various SunEarth collectors mounted in a landscape orientation.

If the rafter spacing is not 16" or 24" on center, position the flush mount feet such that the "overhang" (Dimension "C") is plus or minus 1" of the shown in Table 1.

# Flush Mount Kit – Flush Mount Foot Installation

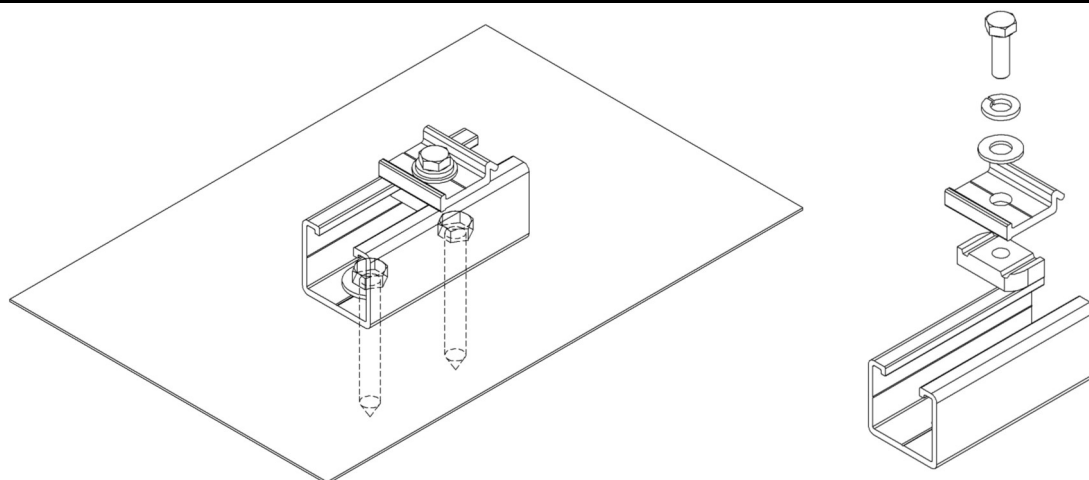


## ***Flush Mount Foot Detail***

1. Position galvanized roof flashing by tucking flashing under nearest upper shingle.
2. Drill pilot holes that are 75% of the lag bolt diameter through the flashing, shingles, and decking 75% of the full embedded depth into the rafter.
3. Apply roof sealant between the flashing and shingles on both sides.
4. Fill pilot holes with roof sealant.
5. Apply sealant to underside of flush mount foot and position flush mount foot.
6. Drive stainless steel lag bolts with flat washers a minimum of 2 inches into roof beam.
7. Apply roof sealant over lag bolts.
8. Apply roof sealant around parameter of fastened flush mount foot.

Warning: Always follow all local building codes, ordinances and regulations when creating roof penetrations as well as standard roofing trade practices.

# Flush Mount Kit – Collector Placement and Anchoring



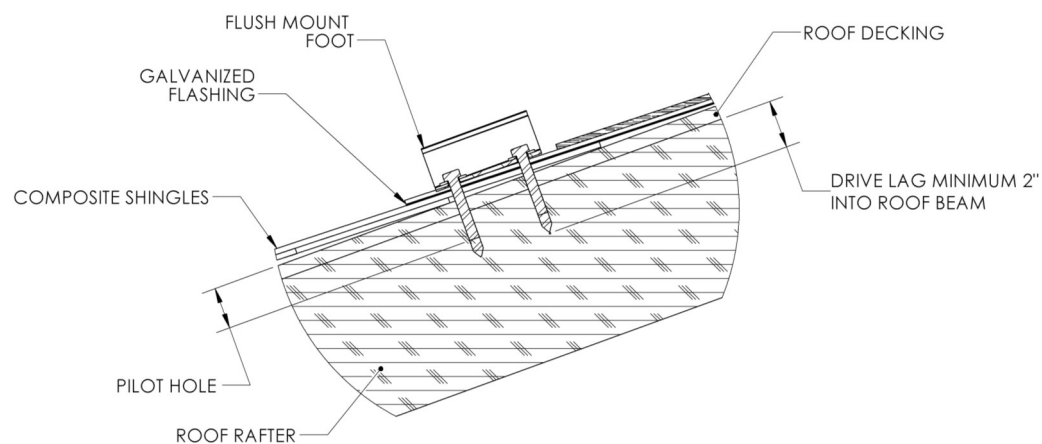
## C-SSN Torque Specifications

FASTENER SIZE	IN*LB	FT*LB
3/8" X 16	230	19

Table 3

Position the collector(s) on the flush mount feet as shown on pages 5 and 6.

Insert four (4) collector clip assemblies (C-SSN) per collector and tighten to specification shown in *Table 3*.



Note: Do **NOT** over tighten the mounting hardware. Over tightening can damage the fasteners and affect mounting stability. There should be no visible deflection of the mounting clip attached to the collector after tightening.