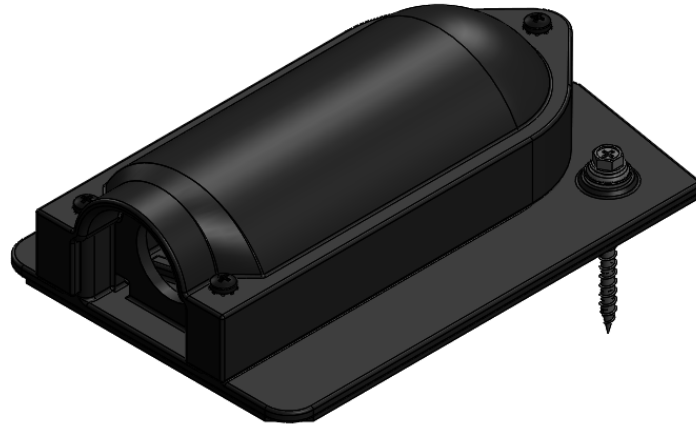


INSTALLATION MANUAL

RT – Roof Entry Bracket



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10620 Treena St. Suite 230

San Diego, California 92131

<http://roof-tech.us/>

Customer Support

If you need assistance at any point of your installation or have suggestions on how can we improve your experience, call Roof-Tech customer support.

TEL:(858) 935-6064

Introduction

Please review this manual thoroughly before installing your Roof-Tech system. Aside from reading this manual. This manual provides supporting documentation for the installation of Roof-Tech's Roof Entry Bracket products.

We recommend installer to carefully review the instructions provided by the PV module manufacturer and become acquainted with OSHA's safety procedures prior to installing the PV system.

The installer is solely responsible for:

- Handling and installing the PV modules according to the manufacturer's instruction, with special attention for the suggested clamping locations on the frame.
- Complying with all applicable local or national building codes, standards and industry best practices including any code that may supersede this manual.
- Ensuring that Roof-Tech's and other products are appropriate for the particular installation and the installation location.
- Ensuring that the roof, its rafters, connections, and other structural support members can support the array under all code level loading conditions.
- Using only Roof-Tech parts and installer-supplied parts as specified by Roof-Tech. (Substitution of parts may void the warranty and invalidate the letters of certification.)
- Verifying the strength of any alternate mounting devices used in lieu of the anchoring screws.
- Maintaining the waterproof integrity of the roof.



Attention

To maintain the flashing performance, avoid installation when the temperature is below 22F or above 176F. RT Butyl must be installed on a dry surface.

- Ensuring safe installation of all electrical and mechanical aspects of the PV array.
- Ensuring correct and appropriate design parameters are used in determining the design loading used for design of the specific installation. Parameters, such as snow loading, wind speed, exposure and topographic factor should be confirmed with the local building official or a licensed professional engineer.

Tools & Supplies Required for Assembly

Tools needed for building the array

- Hex wrench bit socket (8 mm)
- Holesaw (ϕ 45mm、 ϕ 1-3/4 inch)
- Drill and ϕ 3 mm Drill Bit for sheet metal (for Installation on Metal Roof)
- Measuring tape
- Marker pen
- Torque wrench
- Scissors

Item	Torque
4.0x16 Screw	1.5 - 2 N·m (14 - 18 in lbs)
5.0x60 Wood Screw	Fully seat*

Installation Safety

The installation process requires working on sloped and elevated building surfaces, in outdoor weather conditions, using tools and heavy components designed for the generation of electricity.

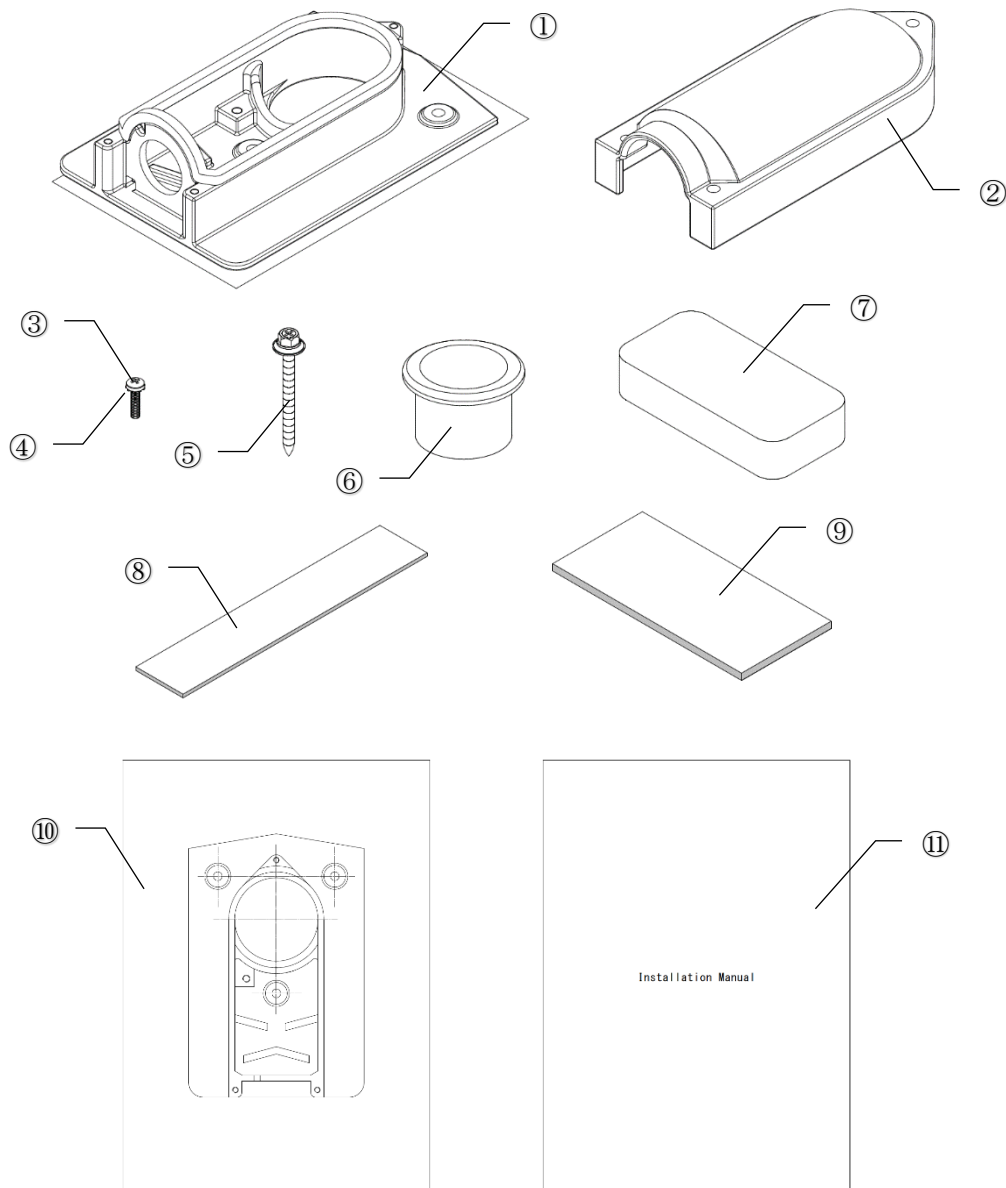
- Use properly anchored fall protection equipment.
- Use caution to prevent objects from falling or dropping off the roof area.
- Cordon off ground areas directly beneath the roof work area when possible.
- Always use personal protection equipment such as safety glasses, gloves, etc.
- Do not perform installation in excessively wet, windy, or inclement weather conditions.
- When working in hot weather, work crews should take care to prevent symptoms of over-heating or dehydration.
- Use proper lifting and carrying techniques when handling heavy components at the job site. If conditions are challenging for moving PV modules to the roof area, use a mechanical lift.
- Follow best practices when working around high-voltage electrical equipment.
- Do not anchor fall protection equipment to roof mounts, or any other inappropriate roof structure

PART A: Materials

1. Items with RT-Roof Entry Bracket

	Item	quantity
①	Roof Entry Bracket Base	1
②	Roof Entry Bracket Cover	1
③	Screw M4×16	3
④	Star washer M4	3
⑤	Wood Screw 5.0×60 (W · P)	3
⑥	Round hole cap	1

	Item	quantity
⑦	Sealing putty	1
⑧	Butyl tape for roof entry hole	1
⑨	Butyl Spacer	1
⑩	Guid sheet	1
⑪	Installation Manual	1

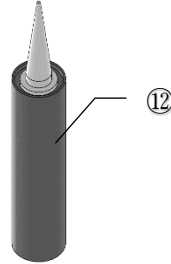


Roof sealant

	Item
⑫	Roof sealant

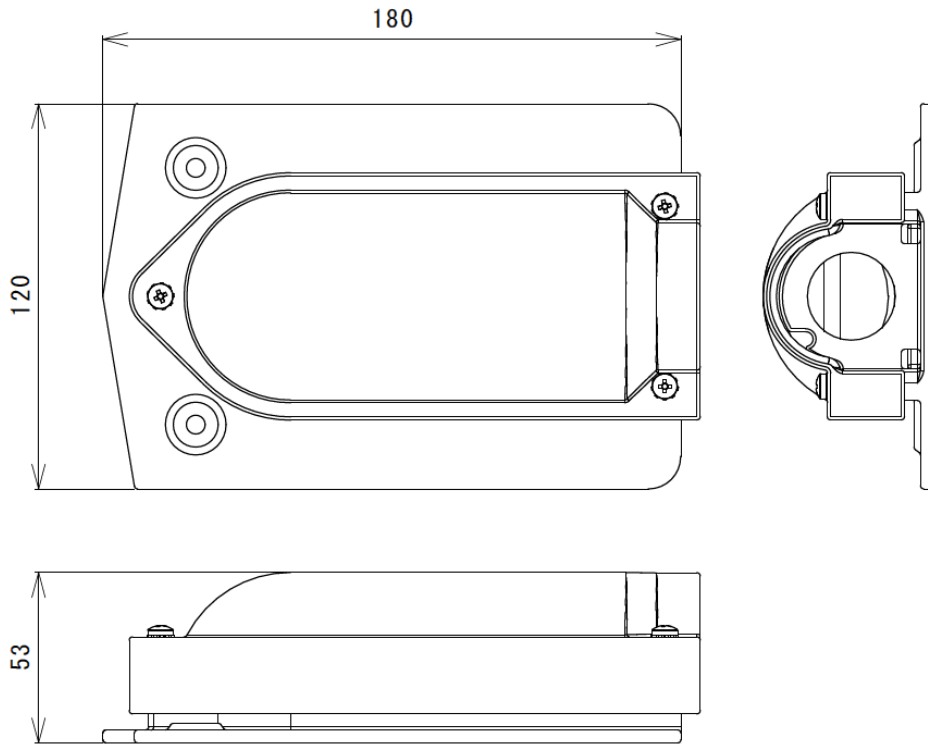
※Recommended Product

- Henry : 208R, 209, 925 (Black)
- Geocel:S2, S4 (Black)
- Sashco : Through the Roof
- Boss : 125 (Black)
- Top Industrial: Rain Buster 850, 900
- Chem Link: M1
- NPC Solar Seal 900
- GE All Purpose 100% Silicone



PART B: Installation condition

1. RT-Roof Entry Bracket dimension



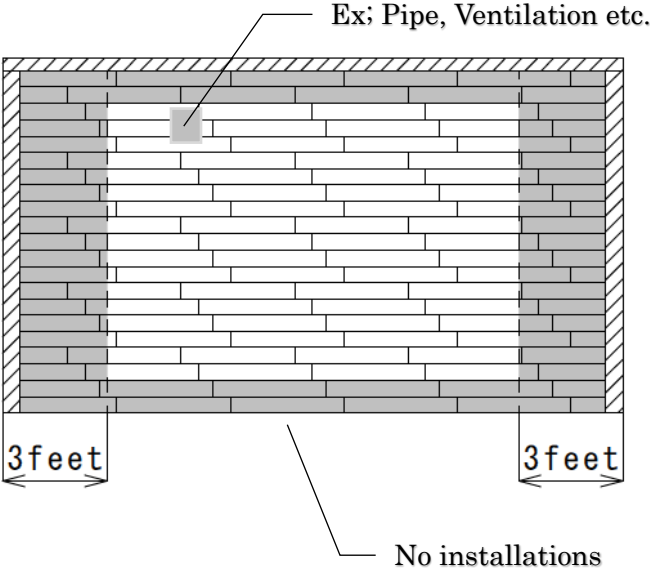
2. Installation condition

Roof material	Asphalt shingle roof, Metal roof
Roof Deck	Plywood / OSB 11mm(7/16")~15mm(19/32")
Feasible roof area	Flat surface area (minimum) W 110mm+, L 125mm+
Slope	11~45 Degree

3. Feasible area to install on roof
RT-Roof Entry Bracket shall be installed above the roof attic.

Note: Avoid installation on:

- ① Exposed Eaves
- ② 2 courses of Shingle roofing
- ③ Within 3 feet from the edge of the roof



PART C: Installation

1. Installation of Brackets

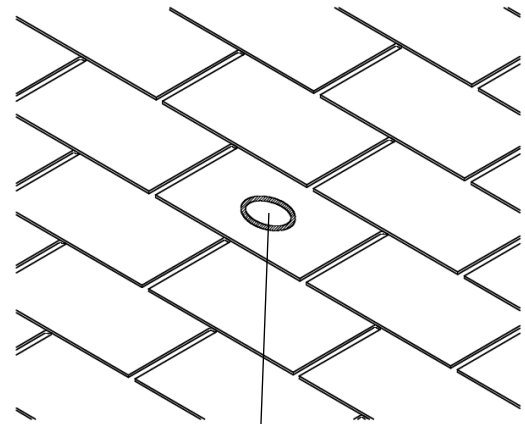
(1) Inspect the location

- ① Once you find where you want to install RT- Roof Entry Bracket, please make sure there are no cables, lights or any objects under roofing and sheading.
- ② Location must be selected following the condition from PART B, installation condition.



Attention

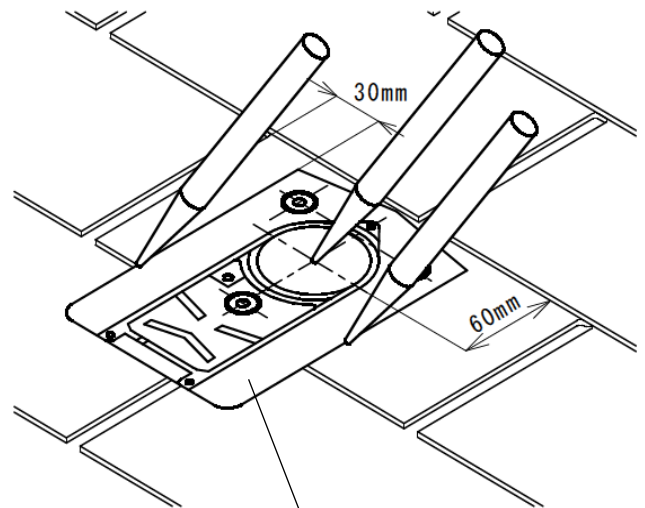
Follow installation requirements to avoid the risk of water leakage.



Hole location

(2) Marking the installation spot

- ① Using the template to mark the location of the base. The base shall be $1 \frac{3}{16}$ inch (30mm) away from the side edge of shingle roofing gap, $2 \frac{3}{8}$ " (60mm) away from upper shingle course. Mark the center of the hole.

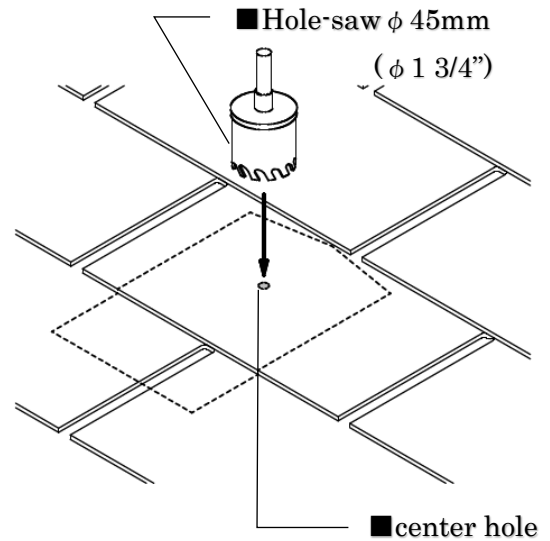


■ Guide sheet

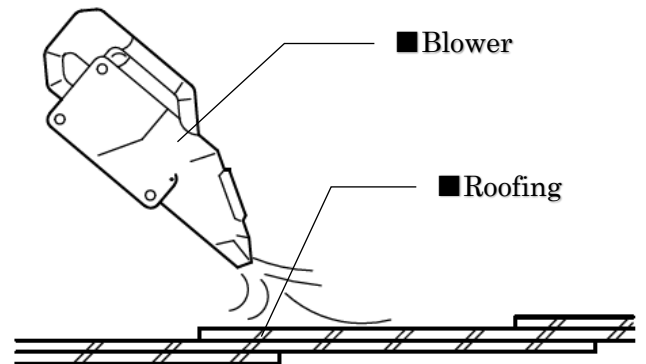
- ② Cutting out roofing and deck.
Use ϕ 1 3/4 inch (ϕ 45mm) Hole saw to cut out penetration hole.

! Attention

Hole-saw shall be ϕ 1 3/4" (ϕ 45mm)



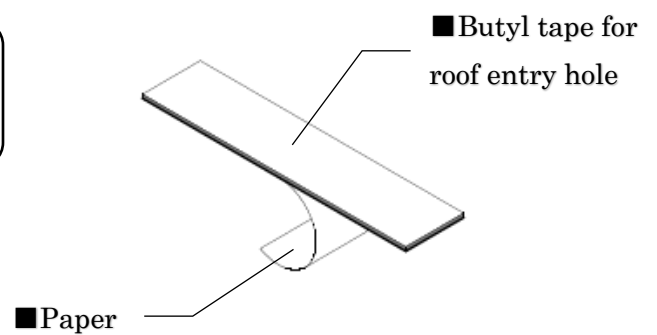
- ③ Use blower to clean roof surface.



- ④ Remove one side cover paper from Butyl for roof entry hole.

! Attention

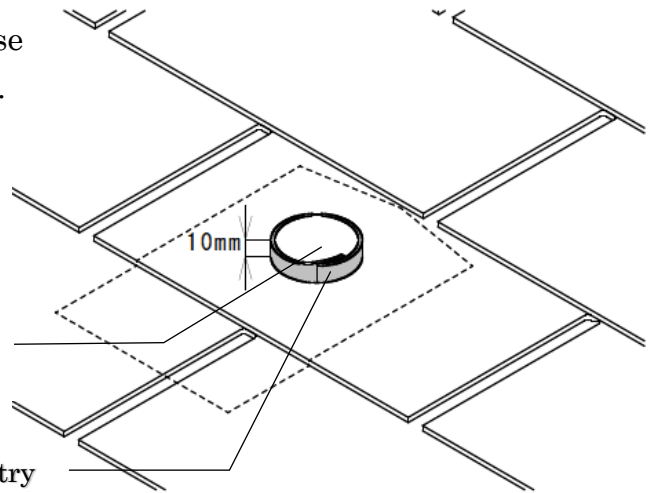
The protective paper is removed from one side only!



- ⑤ Tape the butyl tape around the entry hole on roof. The butyl tape must expose 3/8 inch (10mm) above the roof surface. The butyl tape adheres to the inside of the hole.

■ Butyl with Protective paper (Inside)

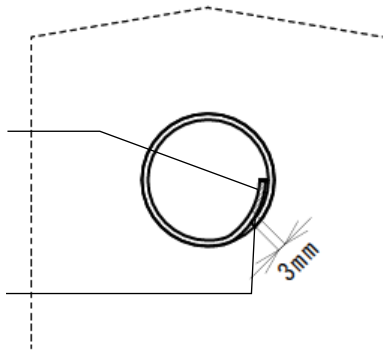
■ Butyl tape for roof entry



- ⑥ Overlap 1/8 inch (3mm) and cut off the extra butyl tape.

■ Cut off the extra part of butyl tape

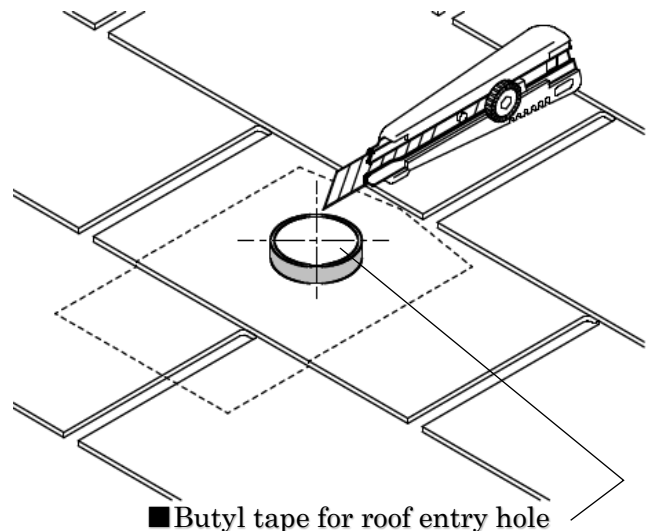
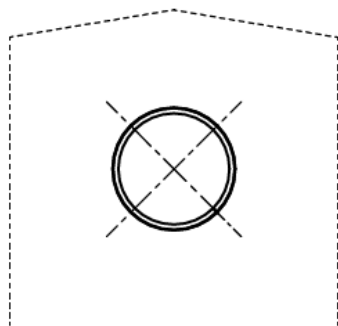
■ Tape shall be started to install from right corner. And over wrap 1/8 inch.



- ⑦ Make a cut in 4 location as it is shown. Please make sure there is no space or gaps between butyl tape and the adhering surface.

! Attention

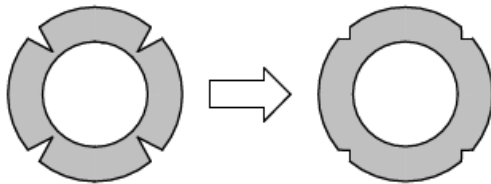
Cut the tape at 90 degrees intervals.



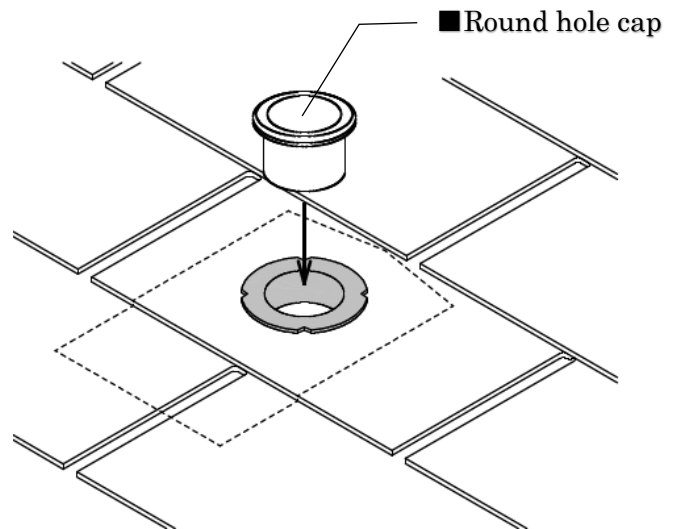
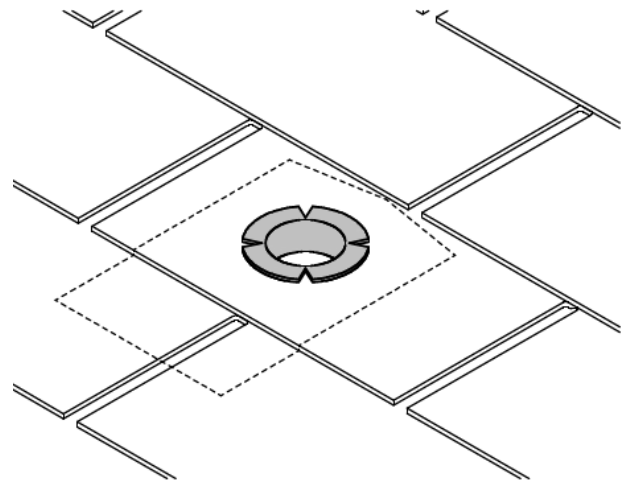
■ Butyl tape for roof entry hole

- ⑧ Remove all protective paper from Butyl tape and fold it around the surface. Apply pressure on the Butyl tape to adhere to the roofing surface.

! Attention
All paper to be removed.

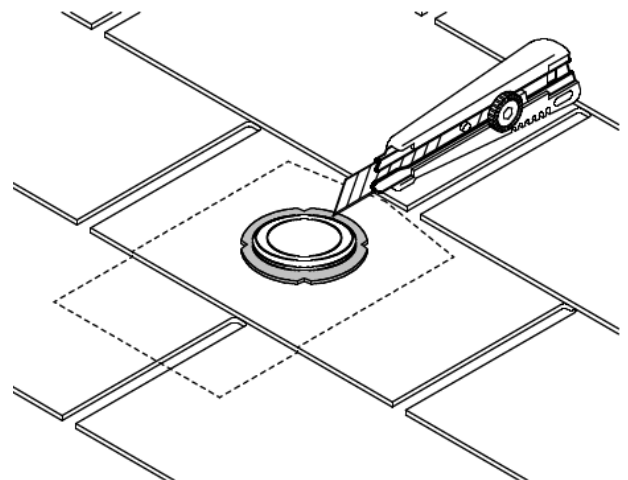


- ⑨ Install Round hole cap. Put good pressure to Round hole cap to seal tight.

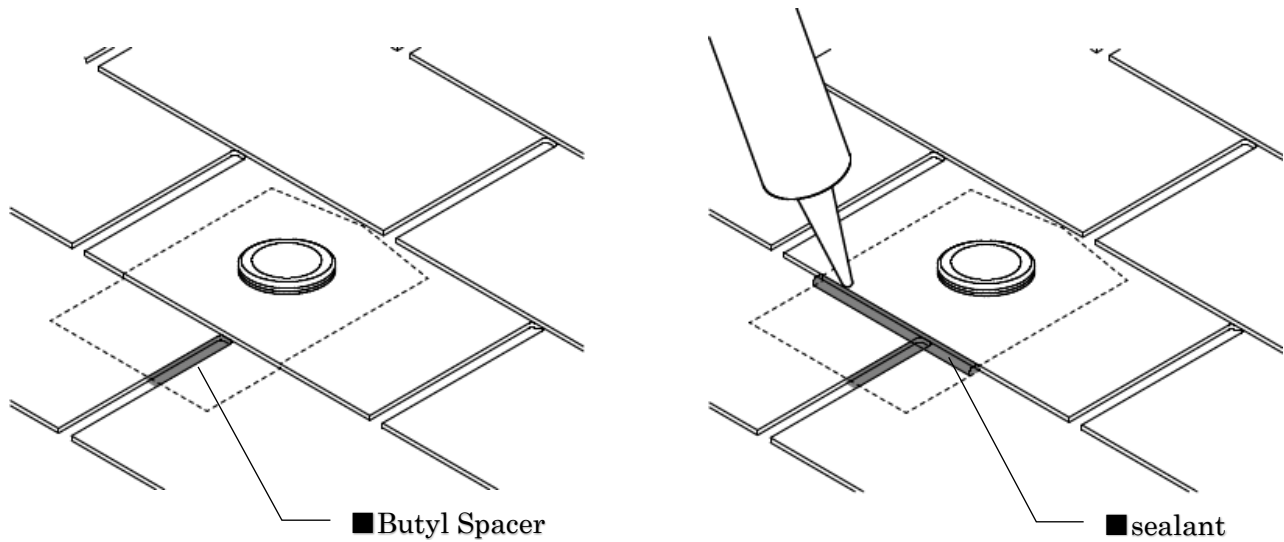


- ⑩ Trim the exposed butyl tape off.

! Attention
The hole cap has a tight fit with the entry hole of the bracket. It is very important to cut extra butyl tape out around the cap.

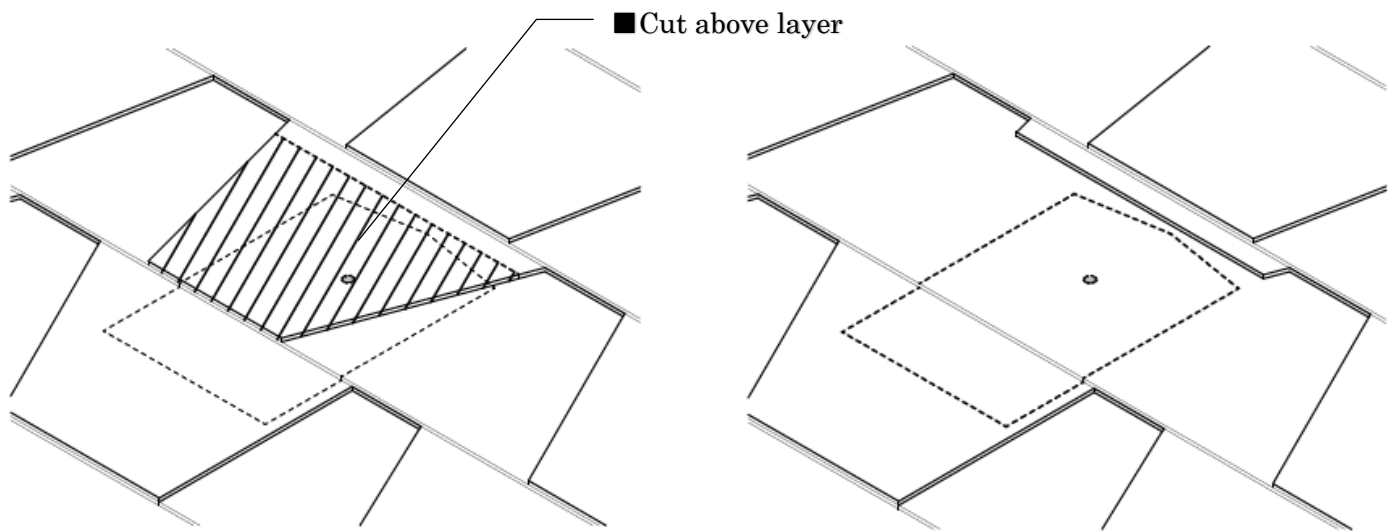


- ⑪ The butyl spacer can be used to fill the gaps under the surface where it is installed. If there is a gap under the base, fill it with butyl spacer, and use sealant to seal between the upper shingle edge and the lower shingle surface.

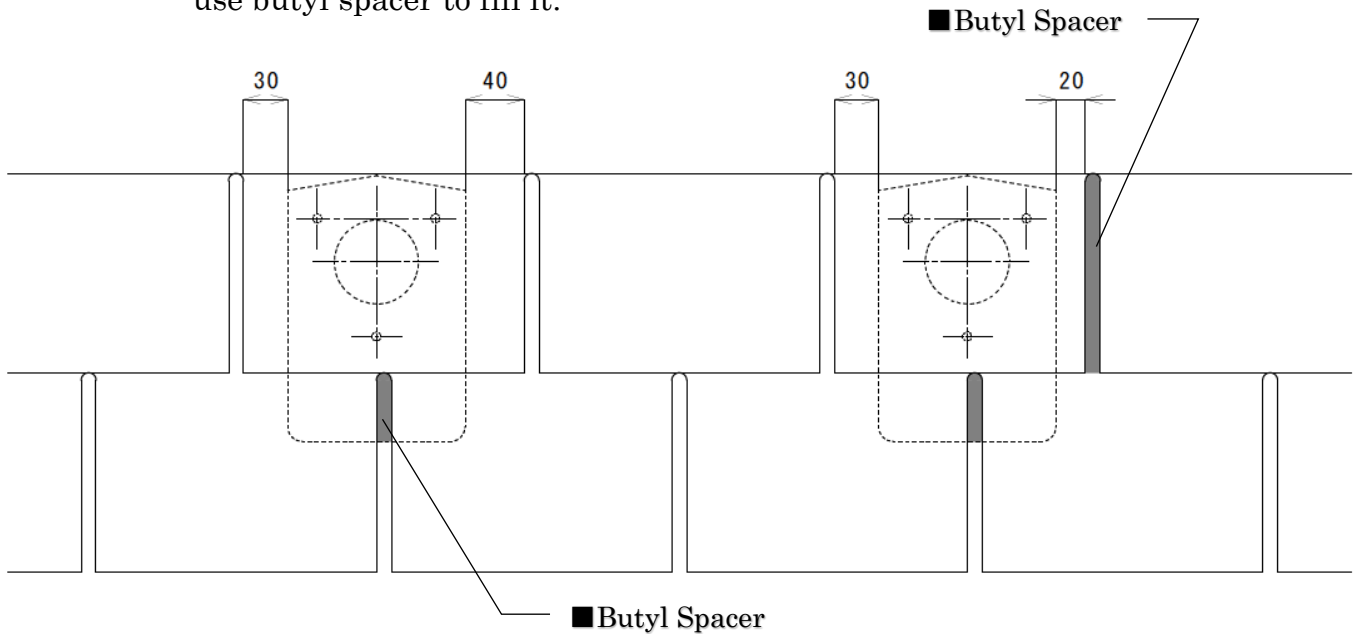


[Multiple shingle layers]

If there isn't a flat surface or space to install the RT-Roof entry bracket, the following PART B in this manual illustrates the cutting of the roof shingle "teeth" layer to create the mounting area.



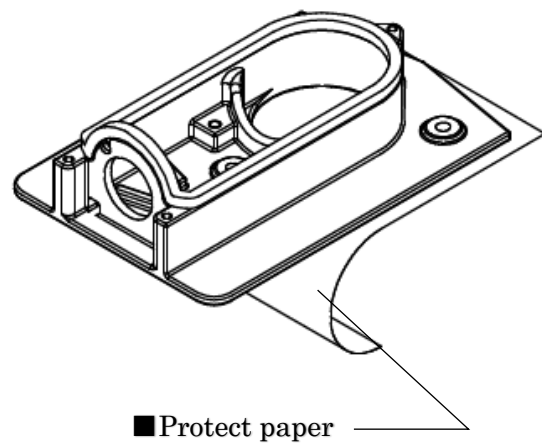
- ⑫ If there is a gap within 1 3/16 inch (30mm), use butyl spacer to fill it.



- ⑬ Remove the protective paper from under the base of the bracket.

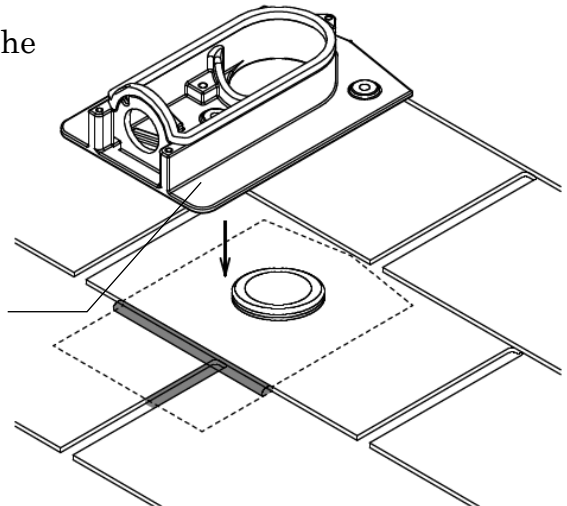
! Attention

Please make sure all paper should be clearly removed.



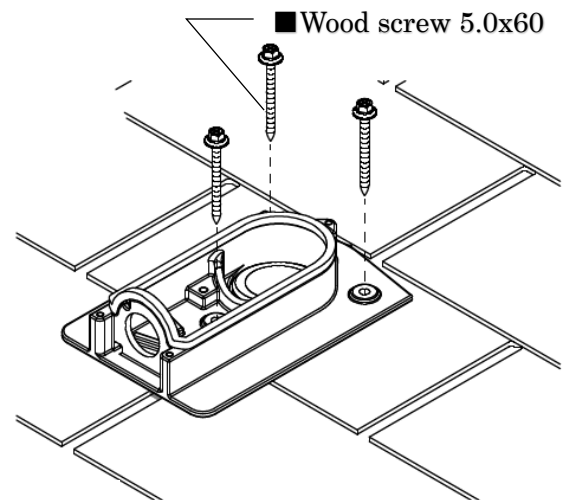
- ⑭ Locate the installing surface and place the Roof Entry Bracket.

■ Roof Entry Bracket base



- ⑮ Install and secure Base with 3 screws
(Wood Screws 5.0×60 (W/P))

■ Wood screw 5.0x60

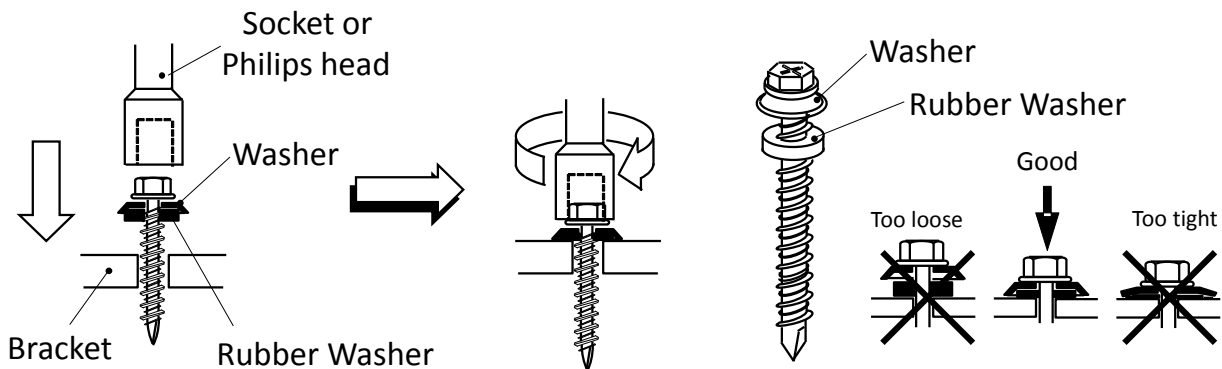


! Attention

Make sure base is tightly sealed to the roof surface. No gaps underneath it.

! Attention

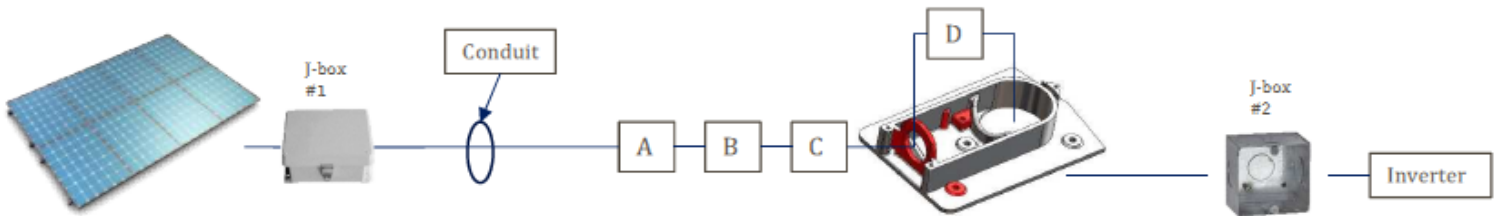
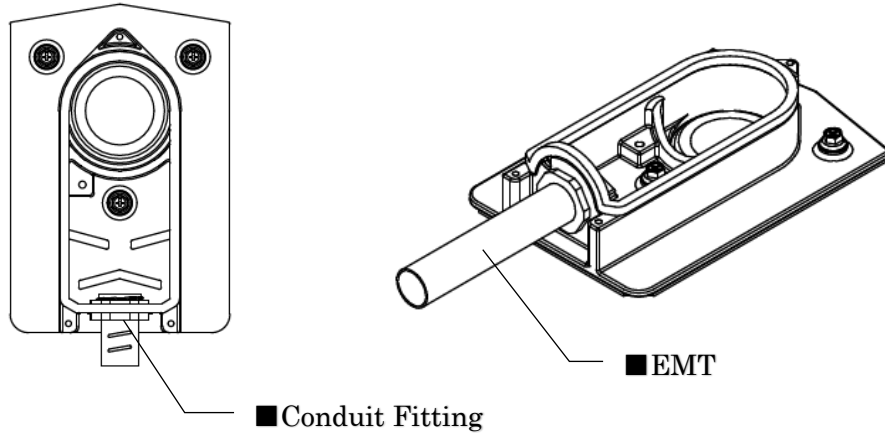
Note: Proper torque values for the 5.0×60 mm screw will vary depending on the rafter and/or deck characteristics; hardness, age, and moisture of the wood. Tighten until the washer just stop rotating easily.



When tightening the screws please tighten all screws equally and avoid using an impact driver as it can over torque the screws, damage the roof deck or even snap off the screw head.

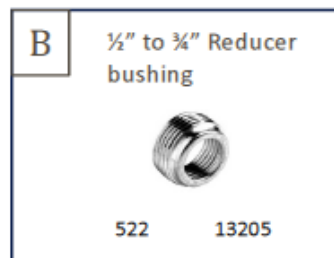
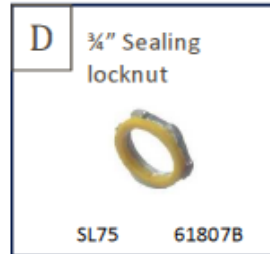
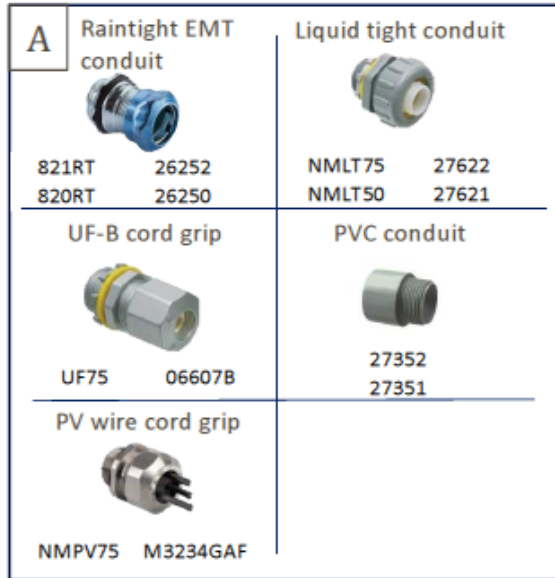
(3) Wire management

① Install Conduit Fitting to base which is the eave side of base wall.

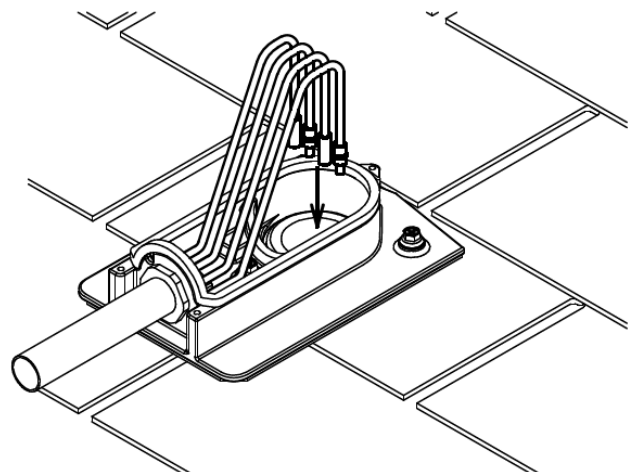


Option	JB 1	Conduit	Wire JB1 – JB2	A - conduit/wire to box fitting		B - 3/4" - 1/2" adapter fitting		C - conduit hub		D - raintight securement nut		JB2	Wire JB2 - Inverter
				Arlington	Halex	Arlington	Halex	Arlington	Halex	Arlington	Halex		
1	-	-	PV wire	NMPV75	M3234GAF	-	-	-	-	-	-	Yes	THHN
2	-	-	PV wire	NMPV75	M3234GAF	-	-	-	-	-	-	-	PV-wire
3	Yes	-	UF-B	UF75	06607B	-	-	-	-	-	-	-	UF-B
4	Yes	3/4 EMT	THWN	821RT	26252	-	-	-	-	-	-	-	THWN
5	Yes	1/2 EMT	THWN	820RT	26250	522	13205	WH2	91632	-	-	-	THWN
6	Yes	3/4 PVC	THWN	-	27352	-	-	-	-	SL75	61807B	-	THWN
7	Yes	1/2 PVC	THWN	-	27351	522	13205	WH2	91632	-	-	-	THWN
8	Yes	3/4 LT	THWN	NMLT75	27622	-	-	-	-	-	-	-	THWN
9	Yes	1/2 LT	THWN	NMLT50	27621	522	13205	WH2	91632	-	-	-	THWN
10	Yes	3/4 EMT	NM-B	821RT	26252	-	-	-	-	-	-	-	NM-B
11	Yes	1/2 EMT	NM-B	820RT	26250	522	13205	WH2	91632	-	-	-	NM-B
12	Yes	3/4 PVC	NM-B	-	27352	-	-	-	-	SL75	61807B	-	NM-B
13	Yes	1/2 PVC	NM-B	-	27351	522	13205	WH2	91632	-	-	-	NM-B
14	Yes	3/4 LT	NM-B	NMLT75	27622	-	-	-	-	-	-	-	NM-B
15	Yes	1/2 LT	NM-B	NMLT50	27621	522	13205	WH2	91632	-	-	-	NM-B
16	Yes	3/4 EMT	MC	821RT	26252	-	-	-	-	-	-	-	MC
17	Yes	1/2 EMT	MC	820RT	26250	522	13205	WH2	91632	-	-	-	MC
18	Yes	3/4 PVC	MC	-	27352	-	-	-	-	SL75	61807B	-	MC
19	Yes	1/2 PVC	MC	-	27351	522	13205	WH2	91632	-	-	-	MC
20	Yes	3/4 LT	MC	NMLT75	27622	-	-	-	-	-	-	-	MC
21	Yes	1/2 LT	MC	NMLT50	27621	522	13205	WH2	91632	-	-	-	MC

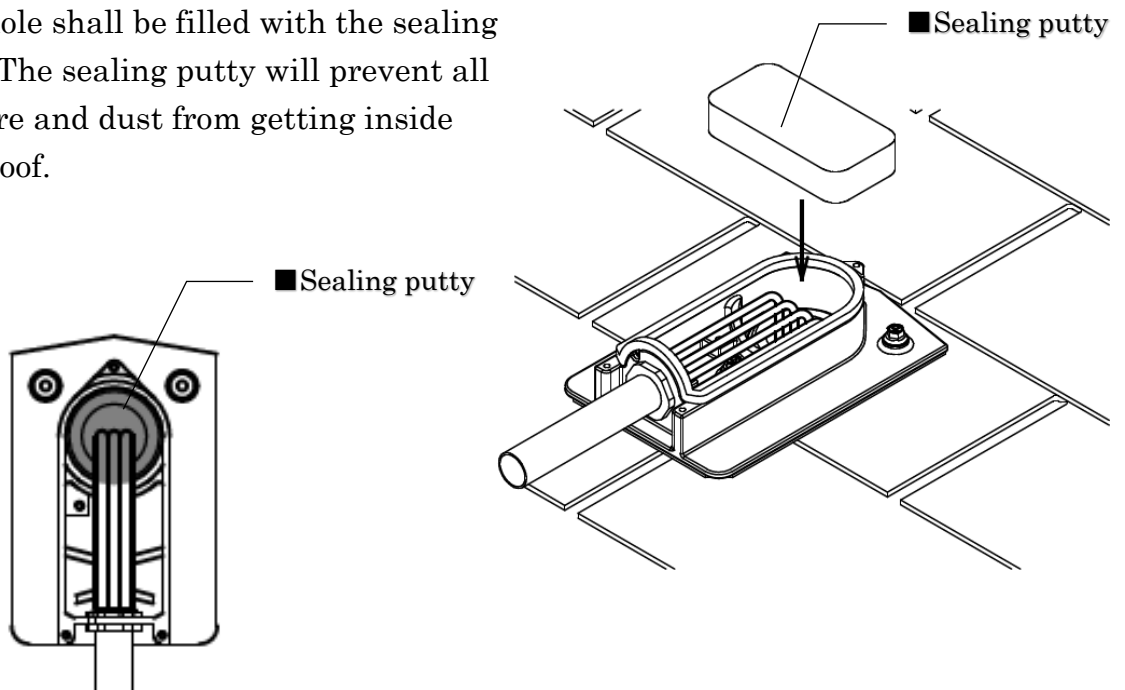
*Heyco PN



② Push the wires through the bracket.



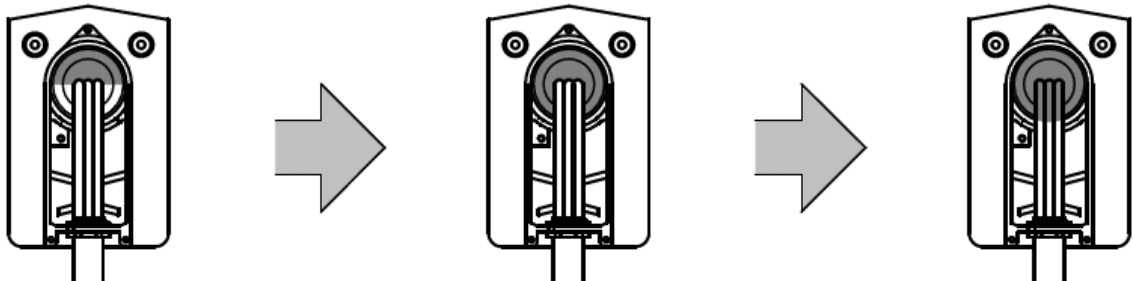
- ③ Once all the wires are installed, the entry hole shall be filled with the sealing putty. The sealing putty will prevent all moisture and dust from getting inside of the roof.



Point

Sealing putty can be installed in 3 steps.

- (1) Fill the sealing putty from the ridge side of the hole.
- (2) Fill the edge side and under the wires.
- (3) Place the rest of the putty on top of the wires to cover.



※To make the best waterproof, Sealing putty shall be installed between the wires.

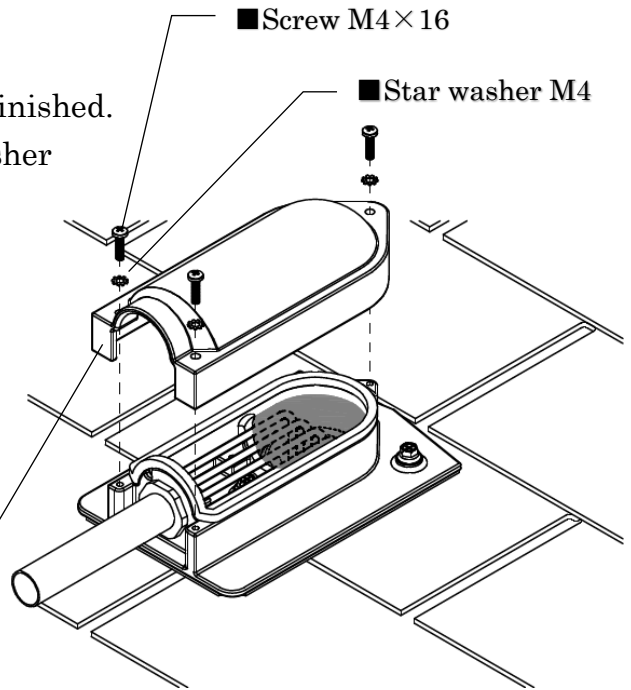
(4) Install Roof Entry Bracket Cover

- ① Roof Entry Bracket Cover is installed once all wiring or cable installation is finished. Use the 3 Screw M4×16 with Star washer provided to secure the cap.

! Attention

Screw M4x16 must be installed hand tight, do not use drills or any electrical tools.

■ Roof Entry Bracket cover

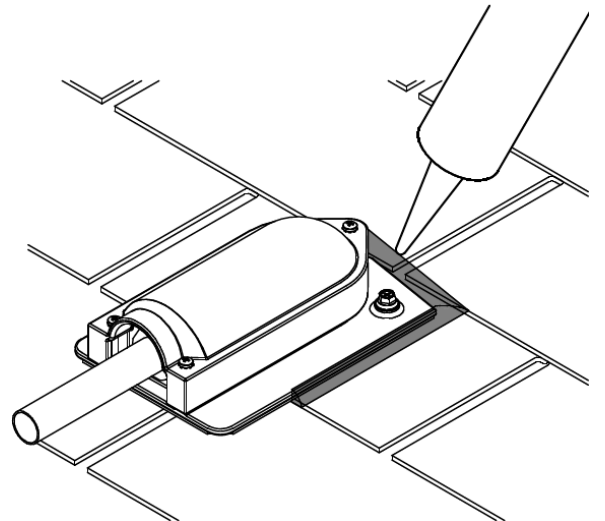
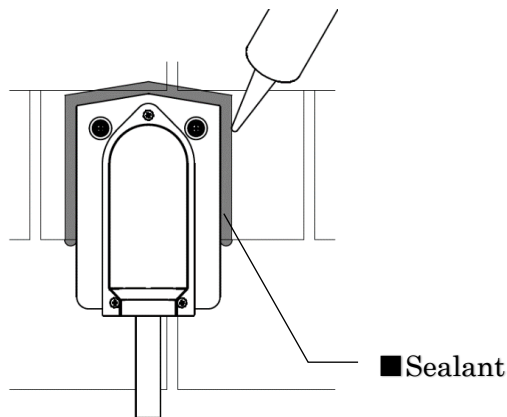


(5) Apply the sealant around the base

- ① Seal around the base after the cover is installed. Sealant shall be installed side and ridge side only. No sealant needed on the eaves side.

! Attention

The sealant adds a layer of UV protection and sheds water away.

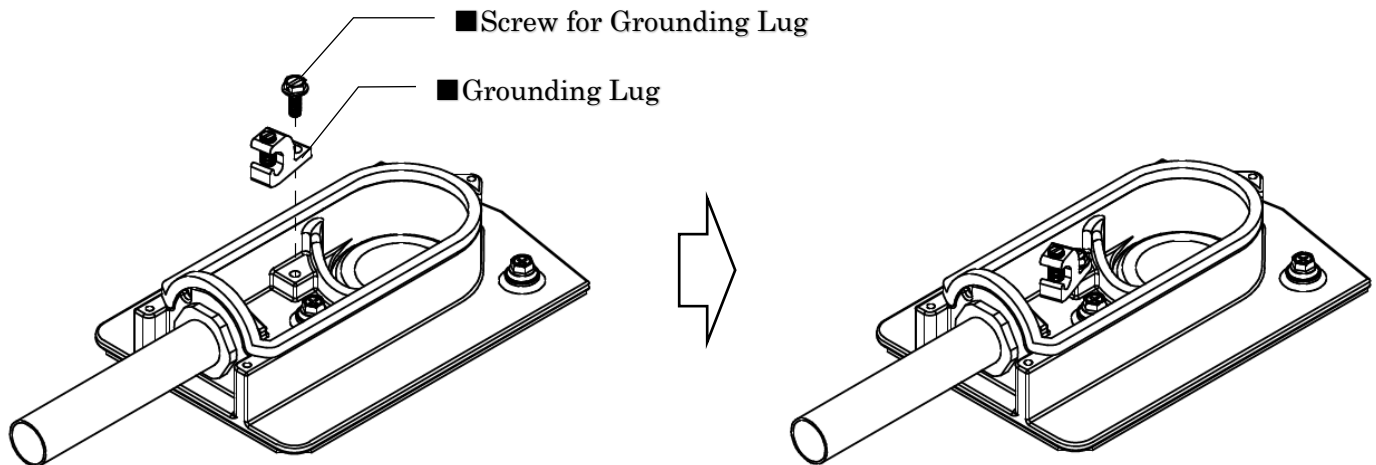


- ② Use sealant finishing tool to fill well between sealant and base. Make sure there is no gaps.

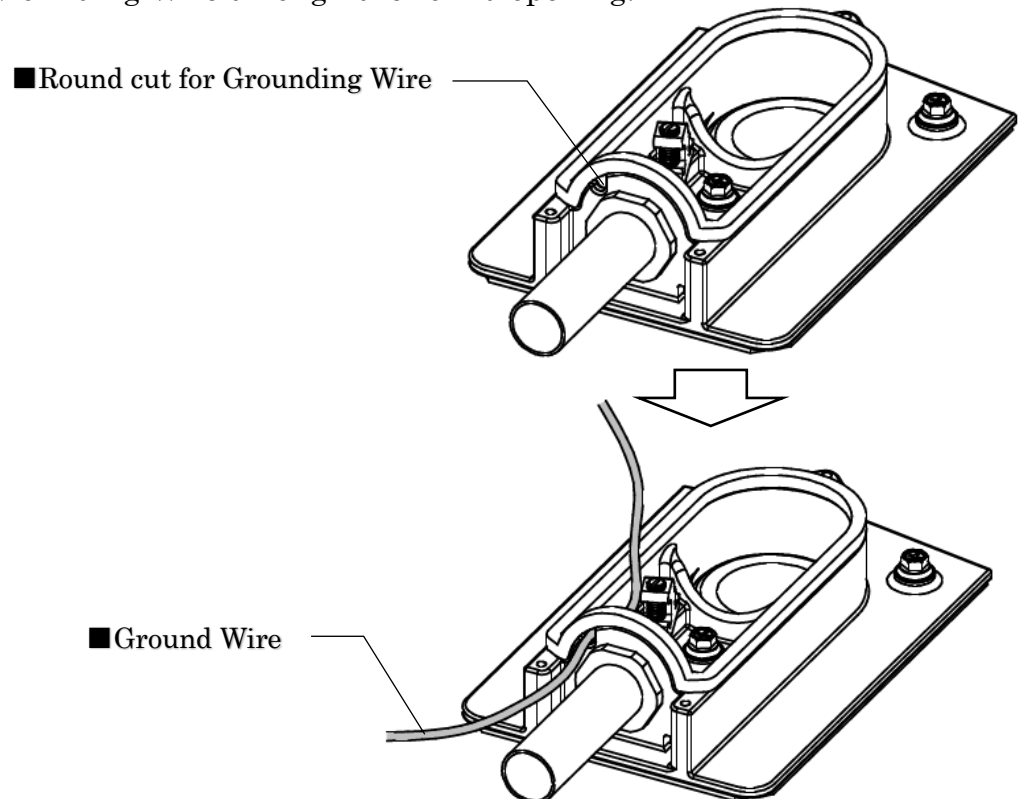
PART D: Appendix

(1) Ground Wire installation

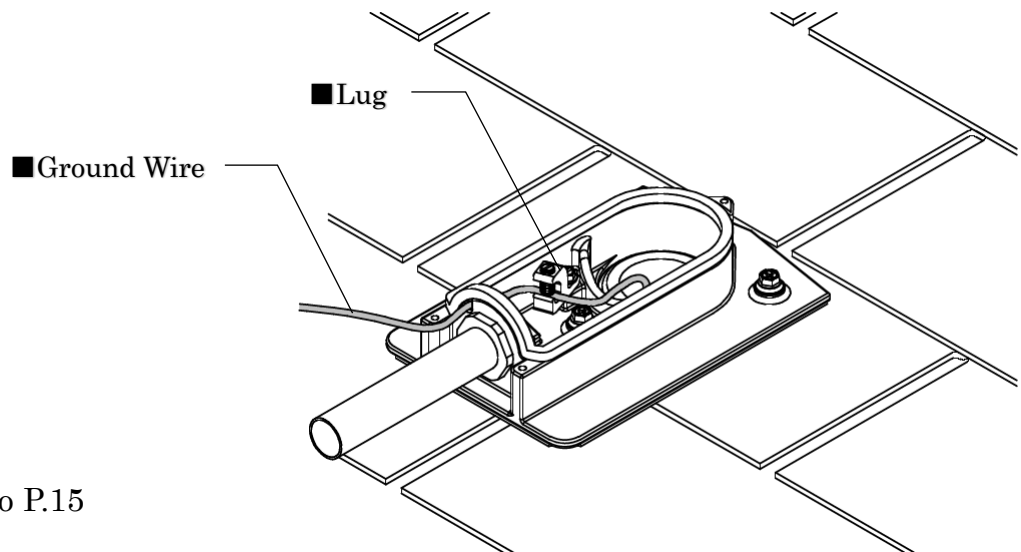
- ① Install Grounding Lug to the base. (Grounding Lug and screw are not included)



- ② Set the Grounding Wire through the round opening.



- ③ Use Grounding lug to fix grounding wire.



- ④ Go back to P.15

(2) Grounding Setup

All electrical installation and procedures should be conducted by skilled, licensed and bonded electricians. Installer is responsible for and shall provide an appropriate method of direct-to-earth grounding in accordance with the latest edition of the Canadian Electrical Code Part 1, CSA 22.1 Safety Standard for Electrical Installations or the National Building Code, including NEC 250: Grounding and Bonding, and NEC 690: Solar Photovoltaic Systems.

Please refer to your local Building and Electrical Codes.

Note: **Grounding, Bonding Lugs and Straps are not provided by Roof Tech Inc.**

We recommend the use of IlSCO or Burndy GBL-4DBT Grounding lug with a minimum 10 AWG solid copper grounding conductor.

- ① GBL-4DBT

