

# RT-MINI

Self-flashing base for asphalt & metal roof-top PV mounting systems

RT-MINI is suitable for mounting any rail system with a conventional L-Foot.

Dual bolt design: M8 or 5/16" for L-Foot & 1/4" for EMC

ICC ESR 3575

Call Now for more details 858-935-6064

## Roof Tech

Smarter PV mounting solutions from top of roof to bottom line.  
www.roof-tech.us info@roof-tech.us

# RT-MINI

Flexible Flashing certified by the International Code Council (ICC)

Engineered to ASTM D 1761 (Standard Test Methods for Mechanical Fasteners in Wood)

Components  
RT2-00-MINIBK  
PAT. PENDING  
MINI base : 20 ea.  
Screw : 40 ea.  
Extra RT-Butyl : 10 ea.

Optional item  
5 x 60mm Mounting screw (RT2-04-SDS-60) : 100 ea./Bag  
5/16" Hex bolt, washer & nut set (RT-04-BHWSL-US) : 100 ea./Bag  
RT-Butyl (RT2-04-BUTYL) : 10 ea./Box

RT-Butyl is Roof Tech's flexible flashing used in 700,000 residential PV systems for the last 24 years. It is the first PV mounting system with Flexible Flashing certified by the ICC.

Metal Flashing Retrofit Flexible Flashing

Shedding water? 100% Waterproof

ICC ESR-3575 ASTM2140 testing UV testing (7500 hrs.)

Rafter installation

Deck installation

P.E. Stamped Letters available at www.roof-tech.us/support

Roof Tech Inc.  
www.roof-tech.us info@roof-tech.us  
10620 Treana Street, Suite 230, San Diego, CA 92131  
858.935.6064

Rev. 03-2020

PRO CUSTOM SOLAR LLC D.B.A. MOMENTUM SOLAR  
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## PROFESSIONAL ENGINEERING

MINA A. MAKAR  
LICENSE  
No PE86753

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## SOLAR CONTRACTOR

CAMERON CHRISTENSEN  
CERTIFIED SOLAR CONTRACTOR LICENSE NUMBER: CVC57036  
MOMENTUM SOLAR  
5728 MAJOR BLVD. SUITE 307, ORLANDO FL. 32819

## CUSTOMER INFORMATION

BRYAN FANNON - MS96415  
243 NORTHWEST FOREST MEADOWS AVENUE  
LAKE CITY, FL 32055  
8078306682

## PV SYSTEM INFORMATION

SYSTEM SIZE (DC) : 15.12 KW  
42 MODULES: HANWHA Q.PEAK DUO BLK-G10+ 360  
42 INVERTERS: ENPHASE IQ7-60-2-US

## PROJECT INFORMATION

INITIAL	DATE: 3/29/2022	DESIGNER: SMMJ
REV:	DATE:	DESIGNER:
REV:	DATE:	DESIGNER:

## ATTACHMENT DETAIL

# PV-1.1



SCALE: 3/32" = 1'-0"

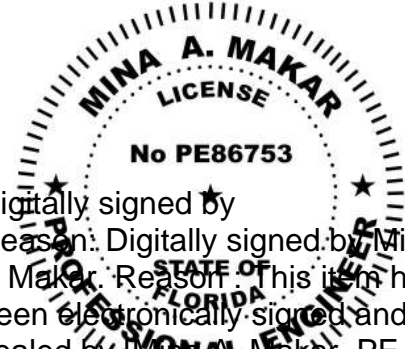


ROOF	PANEL COUNT	TILT	AZIMUTH	SHADING	LANDSCAPE MAX SPAN (ROOF AREA 1/2/3)	PORTRAIT MAX SPAN (ROOF AREA 1/2/3)	LANDSCAPE MAX CANTILEVER	PORTRAIT MAX CANTILEVER
R1	16	27°	197°	87%	48 /32 /32	48 /32 /32	16 /10 /10	16 /10 /10
R2	13	27°	287°	80%	48 /32 /32	48 /32 /32	16 /10 /10	16 /10 /10
R3	13	27°	107°	62%	48 /32 /32	48 /32 /32	16 /10 /10	16 /10 /10



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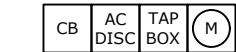
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ROOF LAYOUT

PV-2



ELECTRICAL EQUIPMENT

NORTHWEST  
FOREST MEADOWS  
AVENUE  
FRONT OF RESIDENCE

MSP  
ELECTRICAL EQUIPMENT

DRIVEWAY

CLAMPING MAX SPACING IN ZONE 1 72" O.C  
AND IN ZONE 2 AND ZONE 3 48" O.C

NOTE:  
1. ROOF COVERING MATERIAL IS COMPOSED OF SINGLE LAYER ASPHALT COMPOSITE SHINGLE.  
2. REFER TO LAYOUT DETAIL DRAWING PV-3 FOR ALL ROOFTOP DIMENSIONS.

RAFTER SPACING  
24" O.C. (TYP)

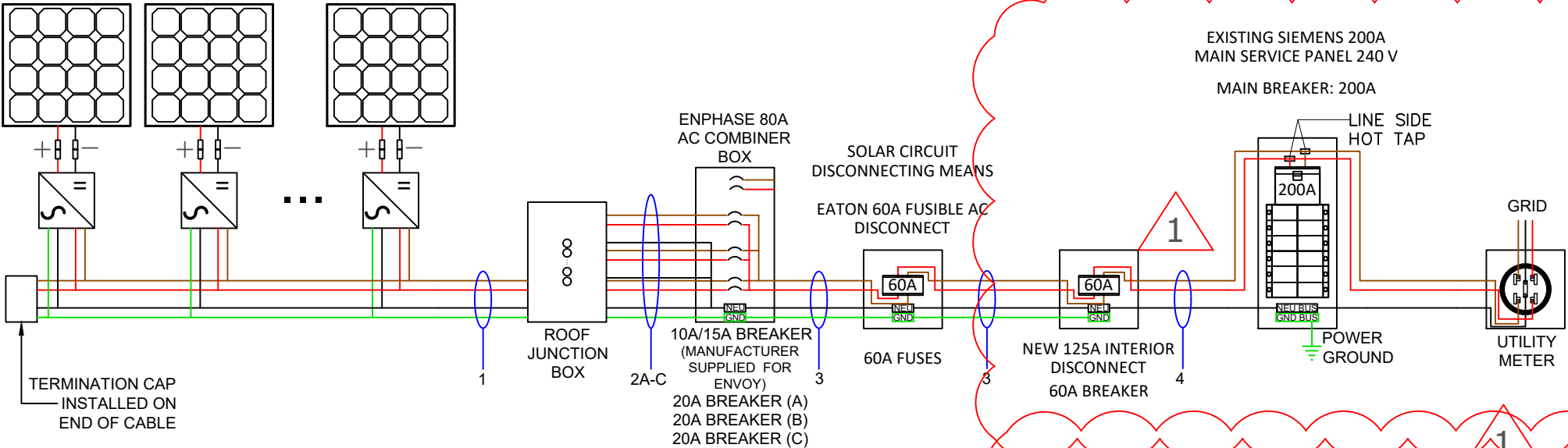
SOLAR INSTALLER NOTES:  
R1 HAS HORIZONTAL RAFTERS

SYMBOL LEGEND			
MSP	MAIN SERVICE PANEL		CHIMNEY
SP	SUB-PANEL		SKYLIGHT
M	UTILITY METER		VENT
AC DISC	AC DISCONNECT		PIPE VENT
UDC	UTILITY DISCONNECT		FAN
LC	LOAD CENTER		SATELLITE DISH
TAP BOX	TAP BOX		FIRE SETBACKS
CB	COMBINER BOX		MIN 3'x3' GROUND ACCESS POINT
	MODULE		PITCH DIRECTION
		WIND PRESSURE ZONE LINES. REFER TO PV-2.2 FOR ADDITIONAL INFO	

PV MODULE RATINGS				INVERTER RATINGS		VOLTAGE DROP CALCULATIONS									
MODULE MAKE		HANWHA		INVERTER MAKE		ENPHASE		FORMULA USED PER NEC HANDBOOK 215.2(A)(4) WHERE APPLICABLE							
MODEL		Q.PEAK DUO BLK-G10+ 360		MODEL		IQ7-60-2-US		WIRE RUN	V <sub>mp</sub>	I <sub>mp</sub>	R	L (FT)	V <sub>o</sub>	% V <sub>o</sub>	WIRE SIZE
MAX POWER		360W		MAX OUTPUT POWER		240W		BRANCH TO J-BOX	240.00	16	1.98	105.33	6.674	2.78%	12 AWG
OPEN CIRCUIT VOLTAGE		41.18V		OPEN DC VOLTAGE		48V		J-BOX TO LOAD CENTER	240.00	42	1.24	50.00	5.208	2.17%	10 AWG
MPP VOLTAGE		34.31V		NOMINAL AC VOLTAGE		240V		LOAD CENTER TO AC DISCONNECT	240.00	52.5	0.491	3.00	0.155	0.06%	06 AWG
SHORT CIRCUIT CURRENT		11.04A		MAX AC CURRENT		1A		AC DISCONNECT TO INTERCONNECTION	240.00	52.5	0.491	10.00	0.516	0.21%	06 AWG
MPP CURRENT		10.49A		CEC INVERTER EFFICIENCY		97%									
NUMBER OF MODULES		42		NUMBER OF INVERTERS		42									
UL1703 COMPLIANT		YES		UL1703 COMPLIANT		YES									
SUB PANEL BREAKER SIZE	# OF MODULES	PV BREAKER PER BRANCH		THIS SOLAR PHOTOVOLTAIC SYSTEM COMPLIES WITH THE 2020 FLORIDA BUILDING CODE AND THE 2017 NATIONAL ELECTRICAL CODE											
	UP TO 16	20A													
EPEC CERTIFICATION STATEMENT															

42 HANWHA Q.PEAK DUO BLK-G10+ 360 360W MODULES PAIRED WITH  
42 ENPHASE IQ7-60-2-US MICRO-INVERTERS

BRANCH CIRCUIT A  
16 MICRO-INVERTERS  
BRANCH CIRCUIT B  
13 MICRO-INVERTERS  
BRANCH CIRCUIT C  
13 MICRO-INVERTERS



**SOLAR INSTALLER NOTES:**  
**INSTALL NEW 125A INTERIOR DISCONNECT W/ 60A MAIN BREAKER**

Wire Tag	Conduit	Wire Qty	Wire Gauge	Wire Type	Temp. Rating	Wire Ampacity (A)	Temp. Derate	Conduit Fill Derate	Derated Ampacity (A)	Inverter Qty	NOC (A)	NEC Correction	Design Current (A)	Ground Size	Ground Wire Type
1	OPEN AIR	3	12 AWG	Trunk Cable	90°C	30	0.96	1	28.80	16	1	1.25	20.00	12 AWG	Trunk Cable
2A	3/4" PVC	6	10 AWG	THWN-2	75°C	35	0.96	0.8	26.88	16	1	1.25	20.00	08 AWG	THWN-2
2B			10 AWG	THWN-2	75°C	35	0.96		26.88	13	1	1.25	16.25	08 AWG	THWN-2
2C			10 AWG	THWN-2	75°C	35	0.96		26.88	13	1	1.25	16.25	08 AWG	THWN-2
3	3/4" PVC	3 + G	06 AWG	THWN-2	75°C	65	0.96	1	62.40	42	1	1.25	52.50	08 AWG	THWN-2
4	3/4" PVC	3	06 AWG	THWN-2	75°C	65	0.96	1	62.40	42	1	1.25	52.50		THWN-2

NOTE: LETTER "G" IN WIRE QTY TAB STANDS FOR GROUNDING CONDUCTOR.



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**THREE LINE DIAGRAM**

**PV-3**



### ELECTRICAL NOTES:

1. ALL CALCULATIONS FOR VOC, VMAX, IMP AND ISC HAVE BEEN CALCULATED USING THE MANUFACTURED STRING CALCULATOR BASED ON ASHRAE 2% HIGH AND EXTREME MINIMUM TEMPERATURE COEFFICIENTS.
2. THE ENTIRE ARRAY IS BONDED ACCORDING TO (NEC 690.46 - 250.120 PARAGRAPH C). THE GROUND IS CARRIED AWAY FROM THE GROUNDING LUG USING #6 BARE COPPER WIRE OR #8 THWN-2 COPPER WIRE.
3. THIS SYSTEM COMPLIES WITH NEC 2017
4. BRANCH CIRCUIT CALCULATION FOR WIRE TAG 1 DISPLAYS THE LARGEST BRANCH CIRCUIT IN SYSTEM. OTHER BRANCH CIRCUITS SHALL HAVE LOWER DESIGN CURRENT THAN THE ONE SHOWN. IN ADDITION, VOLTAGE DROP CALCULATIONS FROM PANELS TO THE COMBINER BOX SHALL BE SHOWN IN A SIMILAR FASHION
5. ALL CONDUCTORS ARE SIZED BASED ON NEC 2017 ARTICLE 310
6. ALL EQUIPMENT INSTALLED IS RATED AT 75°C
7. INVERTER NOC (NOMINAL OPEN CURRENT) OBTAINED FROM EQUIPMENT DATASHEET
8. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL LOCAL AND NATIONAL CODE REQUIREMENTS.
9. EACH MODULE MUST BE GROUNDED ACCORDING TO USER INSTRUCTIONS
10. ALL EQUIPMENT SHALL BE LISTED PER NEC 690.4(B)
11. PER NEC 690.13, 690.15, PROVIDE A WARNING SIGN AT ALL LOCATIONS WHERE TERMINALS OF THE DISCONNECTING MEANS MAY BE ENERGIZED IN THE OPEN POSITION> SIGN SHALL READ \*WARNING - ELECTRIC SHOCK HAZARD - DO NOT TOUCH TERMINALS - OR EQUIVALENT.
12. PER NEC 705.10, PROVIDE A PERMANENT PLAQUE OR DIRECTORY SHOWING ALL ELECTRIC POWER SOURCES ON THE PREMISES AT SERVICE ENTRANCE.
13. INTERCONNECTION METHOD SHALL COMPLY WITH NEC 705.12
14. AND OPTION FOR A SINGLE CIRCUIT BRANCH TO BE SPLIT INTO TWO SUB-CIRCUIT BRANCHES IS ACCEPTABLE.
15. ALL CONDUCTORS MUST BE COPPER.
16. NEUTRAL AND EQUIPMENT GROUNDING CONDUCTOR BONDED AS PER NEC 250.24(C).
17. EQUIPMENT GROUNDING CONDUCTOR IS CONNECTED TO A GROUNDING ELECTRODE SYSTEM PER 250.54(D).
18. FUSES FOR PV DISCONNECT HAVE AIC RATINGS OF 200KA AC AND 20KA DC.
19. SUPPLY SIDE CONNECTION SHALL BE MADE USING ILSKO INSULATION PIERCING CONNECTORS (IPC). MAKE, MODEL, AND RATING OF INTERCONNECTION CAN BE SEEN ON TABLE 1 BELOW.
20. METHOD OF INTERCONNECTION CAN BE SEEN IN FIGURE 1.
21. UTILITY HAS 24-HR UNRESTRICTED ACCESS TO ALL PHOTOVOLTAIC SYSTEM COMPONENTS LOCATED AT THE SERVICE ENTRANCE.

22. WORKING CLEARANCES AROUND THE EXISTING AND NEW ELECTRICAL EQUIPMENT WILL BE MAINTAINED IN ACCORDANCE WITH NEC ARTICLE 110.26.
23. CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC ARTICLE 300.6 (C)(1) AND ARTICLE 310.8 (D).
24. CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC ARTICLE 310.10 (C).
25. TOTAL AREA OF ALL CONDUCTORS, SPLICES, AND TAPS INSTALLED AT ANY CROSS SECTION OF THE WIRING DOES NOT EXCEED 75% OF THE CROSS SECTIONAL AREA OF THE SPACE. NEC 312.8(A)(2).
26. SYSTEM IS CONSIDERED AN AC MODULE SYSTEM. NO DC CONDUCTORS ARE PRESENT IN CONDUIT, COMBINER, JUNCTION BOX, DISCONNECT. AND COMPLIES WITH 690.6 - NO DC DISCONNECT AND ASSOCIATED DC LABELING ARE REQUIRED.
27. SYSTEM COMPLIES WITH 690.12 RAPID SHUTDOWN AND ASSOCIATED LABELING AS PER 690.56(C). AC VOLTAGE AND SYSTEM OPERATING CURRENT SHALL BE PROVIDED 690.52.
28. CONDUCTORS IN CONDUIT ARE AC CONDUCTORS BRANCH CIRCUITS AND NOT PV SOURCE CIRCUITS. 690.6.
29. ALL GROUNDING SHALL COMPLY WITH 690.47(A) IN THAT THE AC MODULES WILL COMPLY WITH 250.64.
30. NO TERMINALS SHALL BE ENERGIZED IN THE OPEN POSITION IN THIS AC MODULE SYSTEM 690.13, 690.15, 690.6.
31. WHERE APPLICABLE: INTERCONNECTION SHALL COMPLY WITH 705.12(A) OR 705.12(B)
32. ALL WARNING SIGN(S) OR LABEL(S) SHALL COMPLY WITH 2017 NEC ARTICLE 110.21(B). LABEL WARNINGS SHALL ADEQUATELY WARN OF THE HAZARD. LABELS SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT, AND LABELS REQUIRED SHALL BE SUITABLE FOR THE ENVIRONMENT.
33. PV POWER CIRCUIT LABELS SHALL APPEAR ON EVERY SECTION OF THE WIRING SYSTEM THAT IS SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILINGS, OR FLOORS.

**TABLE 1:**

MAKE	MODEL	VOLTAGE RATING	CONDUCTOR RANGE MAIN	CONDUCTOR RANGE TAP
ILSCO	IPC 4006	600 V	4/0-4 AWG	6-14 AWG
ILSCO	IPC 4020	600 V	4/0-2 AWG	2/0-6 AWG

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ILSCO	IPC 4006	600 V	4/0-4 AWG	6-14 AWG
ILSCO	IPC 4020	600 V	4/0-2 AWG	2/0-6 AWG

## INSTRUCTIONS FOR LINE TAPS

**FIGURE 1:**

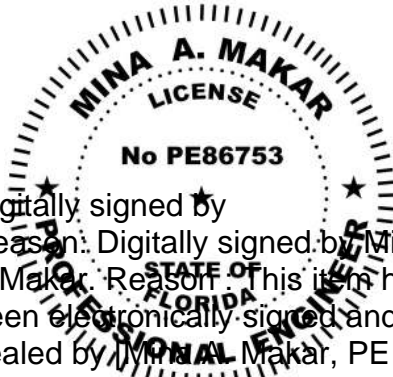
1. ADJUST THE CONNECTOR NUT TO SUITABLE LOCATION
2. PUT THE BRANCH WIRE INTO THE CAP SHEATH FULLY
3. INSERT THE MAIN WIRE, IF THERE ARE TWO LAYS OF INSULATED LAY IN THE MAIN CABLE, SHOULD STRIP A CERTAIN LENGTH OF THE FIRST INSULATED LAY FROM INSERTED END
4. TURN THE NUT BY HAND, AND FIX THE CONNECTOR IN SUITABLE LOCATION.
5. SCREW THE NUT WITH THE SLEEVE SPANNER.
6. SCREW THE NUT CONTINUALLY UNTIL THE TOP PART IS CRACKED AND DROPPED DOWN

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## ELECTRICAL CONT.

## PV-3.1

