

Solstice[®] Panel

HALF-CELL 440W SOLAR MODULE

High performance, half-cell N-Type mono-crystalline TOPCon 16BB 440W bifacial all-black modules produced using state of the art automated production lines and made using the highest quality materials and quality control standards.

HALF-CELL MONOCRYSTALLINE TYPE

• CTTC440HC12-08

FEATURES AND BENEFITS

High Quality / High Power

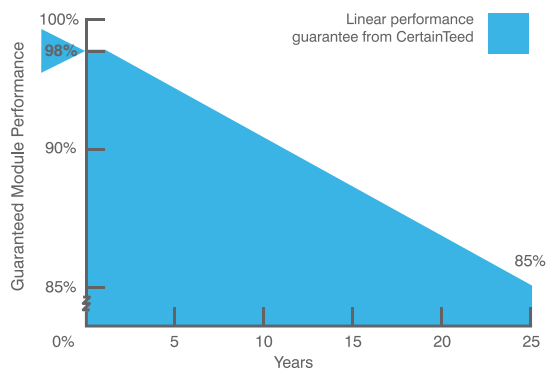
- 440W bifacial with transparent backsheet
- UL listed (61730-1, UL 61730-2)
- Positive power output tolerance

Limited Warranty*

- 25-year linear power output warranty

*See CertainTeed's limited warranty for details

POWER OUTPUT WARRANTY



OPERATING CONDITIONS

Dimensions	1721 x 1133 x 30 mm
Nominal Operating Cell Temperature	45 +/- 2° C
Operating Temperature	-40 to 85° C
Maximum System Voltage	1,500V
Fire Performance	Class C / Type 1
Maximum Wind Load	112 lbs/ft² (5400 Pa)
Maximum Snow Load	112 lbs/ft² (5400 Pa)

ELECTRICAL CHARACTERISTICS

Nominal Output (Pmpp)	W	440
Voltage at Pmax (Vmpp)	V	32.98
Current at Pmax (Impp)	A	13.36
Open Circuit Voltage (Voc)	V	38.63
Short Circuit Current (Isc)	A	14.30
Output Tolerance	W	0-+3%
No. of Cells & Connections		108 half-cells with 3 bypass diodes
Maximum Series Fuse Rating		30A
Cell Type		N-Type Monocrystalline TOPCon
Module Efficiency	%	22.57
Temperature Coefficient of Pmpp	%/C	-0.30
Temperature Coefficient of Voc	%/C	-0.25
Temperature Coefficient of Isc	%/C	+0.046
Bifaciality Ratio	%	80 +/- 5

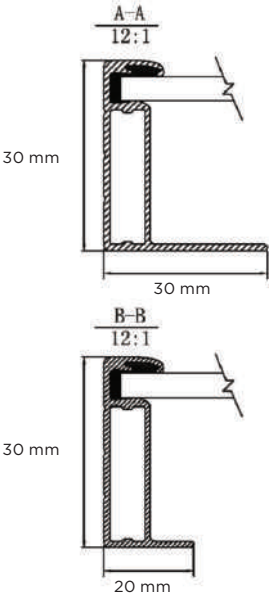
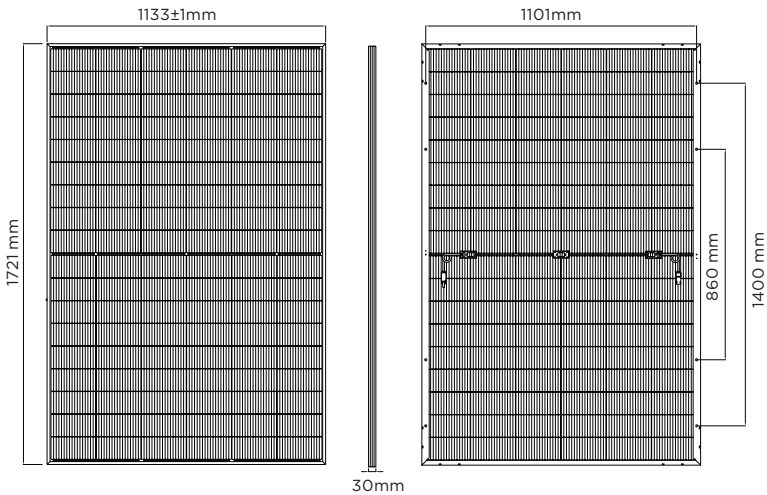
MECHANICAL CHARACTERISTICS

Glass	Glass: 3.2 high transmission, tempered, anti-reflective
Frame	Anodized aluminum (Black)
Junction Box	IP68
Output Cables	4 mm2 (12AWG) PV Wire, Length 1.2m (47.2")
Connectors	Staubli MC4
Weight	45.2 lbs (20.5 kg)

PACKAGING

Panels Per Pallet	37
Panels Per Container	962

DIMENSIONS



IQ Combiner 4/4C

The **IQ Combiner 4/4C** with IQ Gateway and integrated LTE-M1 cell modem (included only with IQ Combiner 4C) consolidates interconnection equipment into a single enclosure. It streamlines IQ Microinverters and storage installations by providing a consistent, pre-wired solution for residential applications. It offers up to four 2-pole input circuits and Eaton BR series busbar assembly.

Smart

- Includes IQ Gateway for communication and control
- Includes Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), included only with IQ Combiner 4C
- Includes solar shield to match Enphase IQ Battery aesthetics and deflect heat
- Supports Wi-Fi, Ethernet, or cellular connectivity
- Optional AC receptacle available for PLC bridge
- Provides production metering and consumption monitoring

Simple

- Mounts on single stud with centered brackets
- Supports bottom, back and side conduit entry
- Allows up to four 2-pole branch circuits for 240VAC plug-in breakers (not included)
- 80A total PV or storage branch circuits

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year limited warranty
- Two years labor reimbursement program coverage included for both the IQ Combiner SKU's
- UL listed
- X2-IQ-AM1-240-4 and X2-IQ-AM1-240-4C comply with IEEE 1547:2018 (UL 1741-SB, 3rd Ed.)





IQ8 Series Microinverters

Our newest IQ8 Microinverters are the industry's first microgrid-forming, software-defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently. The brain of the semiconductor-based microinverter is our proprietary application-specific integrated circuit (ASIC) which enables the microinverter to operate in grid-tied or off-grid modes. This chip is built in advanced 55nm technology with high speed digital logic and has super-fast response times to changing loads and grid events, alleviating constraints on battery sizing for home energy systems.



Part of the Enphase Energy System, IQ8 Series Microinverters integrate with the Enphase IQ Battery, Enphase IQ Gateway, and the Enphase App monitoring and analysis software.



IQ8 Series Microinverters redefine reliability standards with more than one million cumulative hours of power-on testing, enabling an industry-leading limited warranty of up to 25 years.



Connect PV modules quickly and easily to IQ8 Series Microinverters using the included Q-DCC-2 adapter cable with plug-n-play MC4 connectors.



IQ8 Series Microinverters are UL Listed as PV Rapid Shut Down Equipment and conform with various regulations, when installed according to manufacturer's instructions.

Easy to install

- Lightweight and compact with plug-n-play connectors
- Power Line Communication (PLC) between components
- Faster installation with simple two-wire cabling

High productivity and reliability

- Produce power even when the grid is down*
- More than one million cumulative hours of testing
- Class II double-insulated enclosure
- Optimized for the latest high-powered PV modules

Microgrid-forming

- Complies with the latest advanced grid support**
- Remote automatic updates for the latest grid requirements
- Configurable to support a wide range of grid profiles
- Meets CA Rule 21 (UL 1741-SA) requirements

IQ8 Series Microinverters

INPUT DATA (DC)		IQ8-60-2-US	IQ8PLUS-72-2-US	IQ8M-72-2-US	IQ8A-72-2-US	IQ8H-240-72-2-US	IQ8H-208-72-2-US¹
Commonly used module pairings²	W	235 – 350	235 – 440	260 – 460	295 – 500	320 – 540+	295 – 500+
Module compatibility		60-cell/120 half-cell	60-cell/120 half-cell, 66-cell/132 half-cell and 72-cell/144 half-cell				
MPPT voltage range	V	27 – 37	29 – 45	33 – 45	36 – 45	38 – 45	38 – 45
Operating range	V	25 – 48	25 – 58				
Min/max start voltage	V	30 / 48	30 / 58				
Max input DC voltage	V	50	60				
Max DC current³ [module Isc]	A	15					
Overvoltage class DC port		II					
DC port backfeed current	mA	0					
PV array configuration		1x1 Ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit					
OUTPUT DATA (AC)		IQ8-60-2-US	IQ8PLUS-72-2-US	IQ8M-72-2-US	IQ8A-72-2-US	IQ8H-240-72-2-US	IQ8H-208-72-2-US¹
Peak output power	VA	245	300	330	366	384	366
Max continuous output power	VA	240	290	325	349	380	360
Nominal (L-L) voltage/range⁴	V	240 / 211 – 264					208 / 183 – 250
Max continuous output current	A	1.0	1.21	1.35	1.45	1.58	1.73
Nominal frequency	Hz	60					
Extended frequency range	Hz	50 – 68					
AC short circuit fault current over 3 cycles	Arms	2					4.4
Max units per 20 A (L-L) branch circuit⁵		16	13	11	11	10	9
Total harmonic distortion		<5%					
Overvoltage class AC port		III					
AC port backfeed current	mA	30					
Power factor setting		1.0					
Grid-tied power factor (adjustable)		0.85 leading – 0.85 lagging					
Peak efficiency	%	97.5	97.6	97.6	97.6	97.6	97.4
CEC weighted efficiency	%	97	97	97	97.5	97	97
Night-time power consumption	mW	60					
MECHANICAL DATA							
Ambient temperature range		-40°C to +60°C (-40°F to +140°F)					
Relative humidity range		4% to 100% (condensing)					
DC Connector type		MC4					
Dimensions (HxWxD)		212 mm (8.3”) x 175 mm (6.9”) x 30.2 mm (1.2”)					
Weight		1.08 kg (2.38 lbs)					
Cooling		Natural convection – no fans					
Approved for wet locations		Yes					
Pollution degree		PD3					
Enclosure		Class II double-insulated, corrosion resistant polymeric enclosure					
Environ. category / UV exposure rating		NEMA Type 6 / outdoor					
COMPLIANCE							
		CA Rule 21 (UL 1741-SA), UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01					
Certifications		This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and C22.1-2018 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer’s instructions.					

(1) The IQ8H-208 variant will be operating in grid-tied mode only at 208V AC. (2) No enforced DC/AC ratio. See the compatibility calculator at <https://link.enphase.com/module-compatibility> (3) Maximum continuous input DC current is 10.6A (4) Nominal voltage range can be extended beyond nominal if required by the utility. (5) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

IQ Combiner 4/4C

MODEL NUMBER

IQ Combiner 4 X-IQ-AM1-240-4 X2-IQ-AM1-240-4 (IEEE 1547:2018)	IQ Combiner 4 with IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 ± 0.5%) and consumption monitoring (± 2.5%). Includes a silver solar shield to match the IQ Battery and IQ System Controller 2 and to deflect heat.
IQ Combiner 4C X-IQ-AM1-240-4C X2-IQ-AM1-240-4C (IEEE 1547:2018)	IQ Combiner 4C with IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 ± 0.5%) and consumption monitoring (± 2.5%). Includes Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), a plug-and-play industrial-grade cell modem for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.) Includes a silver solar shield to match the IQ Battery and IQ System Controller and to deflect heat.

ACCESSORIES AND REPLACEMENT PARTS (not included, order separately)

Supported microinverters	IQ6, IQ7, and IQ8. (Do not mix IQ6/7 Microinverters with IQ8)
Communications Kit COMMS-CELLMODEM-M1-06 CELLMODEM-M1-06-SP-05 CELLMODEM-M1-06-AT-05	- Includes COMMS-KIT-01 and CELLMODEM-M1-06-SP-05 with 5-year Sprint data plan - 4G based LTE-M1 cellular modem with 5-year Sprint data plan - 4G based LTE-M1 cellular modem with 5-year AT&T data plan
Circuit Breakers BRK-10A-2-240V BRK-15A-2-240V BRK-20A-2P-240V BRK-15A-2P-240V-B BRK-20A-2P-240V-B	Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers. Circuit breaker, 2 pole, 10A, Eaton BR210 Circuit breaker, 2 pole, 15A, Eaton BR215 Circuit breaker, 2 pole, 20A, Eaton BR220 Circuit breaker, 2 pole, 15A, Eaton BR215B with hold down kit support Circuit breaker, 2 pole, 20A, Eaton BR220B with hold down kit support
XA-SOLARSHIELD-ES	Replacement solar shield for IQ Combiner 4/4C
XA-PLUG-120-3	Accessory receptacle for Power Line Carrier in IQ Combiner 4/4C (required for EPLC-01)
X-IQ-NA-HD-125A	Hold-down kit for Eaton circuit breaker with screws
Consumption monitoring CT (CT-200-SPLIT/CT-200-CLAMP)	A pair of 200A split core current transformers

ELECTRICAL SPECIFICATIONS

Rating	Continuous duty
System voltage	120/240VAC, 60 Hz
Eaton BR series busbar rating	125A
Max. continuous current rating	65A
Max. continuous current rating (input from PV/storage)	64A
Max. fuse/circuit rating (output)	90A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. total branch circuit breaker rating (input)	80A of distributed generation/95A with IQ Gateway breaker included
IQ Gateway breaker	10A or 15A rating GE/Siemens/Eaton included
Production metering CT	200A solid core pre-installed and wired to IQ Gateway

MECHANICAL DATA

Dimensions (WxHxD)	37.5 cm x 49.5 cm x 16.8 cm (14.75 in x 19.5 in x 6.63 in). Height is 53.5 cm (21.06 in) with mounting brackets.
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40°C to +46°C (-40°F to 115°F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	• 20A to 50A breaker inputs: 14 to 4 AWG copper conductors • 60A breaker branch input: 4 to 1/0 AWG copper conductors • Main lug combined output: 10 to 2/0 AWG copper conductors • Neutral and ground: 14 to 1/0 copper conductors • Always follow local code requirements for conductor sizing.
Altitude	Up to 3,000 meters (9,842 feet)

INTERNET CONNECTION OPTIONS

Integrated Wi-Fi	IEEE 802.11b/g/n
Cellular	CELLMODEM-M1-06-SP-05, CELLMODEM-M1-06-AT-05 (4G based LTE-M1 cellular modem). Note that an Mobile Connect cellular modem is required for all Enphase Energy System installations.
Ethernet	Optional, IEEE 802.3, Cat5E (or Cat6) UTP Ethernet cable (not included)

COMPLIANCE

Compliance, IQ Combiner	CA Rule 21 (UL 1741-SA) IEEE 1547:2018 - UL 1741-SB, 3 rd Ed. (X2-IQ-AM1-240-4 and X2-IQ-AM1-240-4C) CAN/CSA C22.2 No. 107.1, Title 47 CFR, Part 15, Class B, ICES 003 Production metering: ANSI C12.20 accuracy class 0.5 (PV production) Consumption metering: accuracy class 2.5
Compliance, IQ Gateway	UL 60601-1/CANCSA 22.2 No. 61010-1

SnapNrack®

UltraFoot™

The Ultimate Attachment for Ultra Rail



New Flip Clamp Mount that centers load over fastener & creates an easier snap-in experience with UR-45 Rail



Proprietary fastener reduces the number of screws for deck mounting & increases torque-out strength by 600% compared to #14 wood screws



Features **SpeedSeal™+ Technology**, a pre-installed butyl pad for easy peel & stick installation

Start Installing UltraFoot Today

Flexible Rafter & Deck Mounting Options

- UltraFoot available in (3) configurations to accommodate rafter & deck mounting based on DeckAnchor™ or wood screw install preferences
- The only single lag roof attachment with butyl sealing available
- Compatible with pitched roofs and low sloped to flat roofs
- Available in domestic content options, *refer to “-USA” SKUs*



UltraFoot, Rafter

242-10056 & 242-10056-USA

- Installs with (1) Sealing Washer Lag, 242-02168



UltraFoot, Deck

242-10057 & 242-10057-USA

- Installs with (2) Sealing Wood Screws, 242-10010, for rafter mounting or (4) Sealing Wood Screws for deck mounting



UltraFoot, Anchor

242-10058 & 242-10058-USA

- Installs with (1) Sealing Washer Lag, 242-02168, for rafter mounting or (2) DeckAnchors, 242-10035

New! Flip Clamp Mount

- Ships pre-assembled, eliminating T-Bolts
- Allows UR-45 Rail to easily slide & level within the mount.
- Positions the load over the fasteners for a stronger roof attachment



Patented SpeedSeal+ Technology

- 0.25" thick industry-leading pre-applied butyl
- Innovative bottom design features recessed edges with butyl for firm contact with roof & prevents butyl from squeezing out over time
- Creates a watertight seal over all the roof surfaces, including across shingle tabs
- TAS 100A Wind Driven Rain Testing

Proprietary DeckAnchor Fasteners

- Wide threads securely grip the wood deck & significantly reduces the potential for over-tightening
- Reduces the required screw count in half for deck mounting & increases the torque-out strength by 600% compared to a standard #14 wood screw
- ASTM D1761 Screw Capacities
- ½" hex head to maintain the SnapNrack tradition of a single tool install



SnapNrack®

877-732-2860

www.snapnrack.com

contact@snapnrack.com

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THE SNAPNRACK SIMPLE TILT IS A SIMPLE SOLUTION FOR INSTALLATIONS REQUIRING MODULE TILT BEYOND THE EXISTING ROOF SLOPE. IT IS DESIGNED FOR A FIXED 10° TILT ANGLE ABOVE THE HORIZONTAL

REFER TO SNAPNRACK ENGINEERING CHARTS FOR APPLICABLE RAIL SPANS. "BIN" NUMBER ON CHART SHOULD MATCH "BIN" NUMBER ON THIS DRAWING

*ALTERNATE FASTENERS AND STRUCTURAL SUBSTRATES ARE PERMITTED. SNAPNRACK'S STANDARD ENGINEERING REQUIRES MINIMUM FASTENER ALLOWABLE CAPACITIES OF **532 LBS** WITHDRAWAL AND **270 LBS** SHEAR. CAPACITIES LOWER THAN THIS WILL REQUIRE SITE-SPECIFIC ENGINEERING

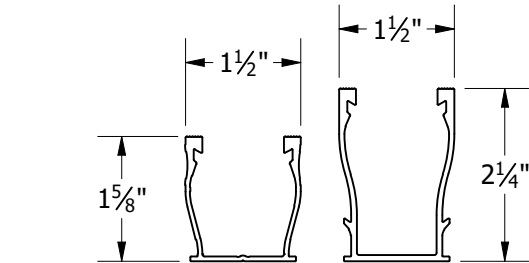
REFER TO THE SNAPNRACK INSTALLATION MANUAL FOR 5/16"Ø HARDWARE TORQUE SPECIFICATIONS

FOR ADDITIONAL SYSTEM REQUIREMENTS, INCLUDING MODULE OVERHANG, SEE "SNR-DC-00329 ULTRA RAIL, SYSTEM OVERVIEW, TYPICAL"

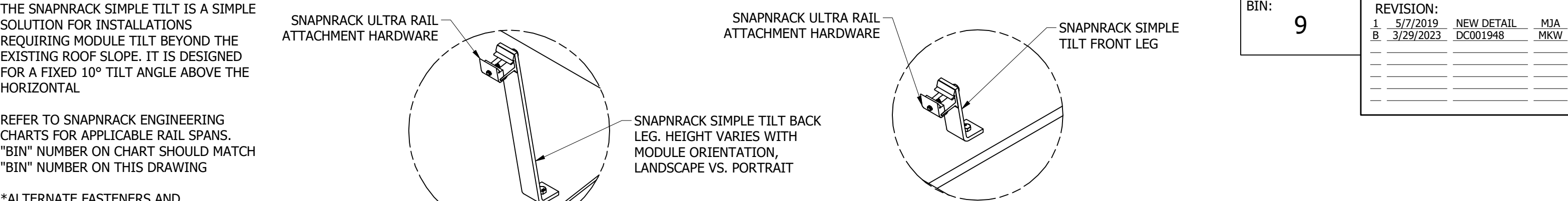
THE SIMPLE TILT FEATURES 1" OF VERTICAL ADJUSTABILITY FOR LEVELING RAILS

RAILS CAN BE MOUNTED UPSLOPE OR DOWNSLOPE OF THE TILT LEGS

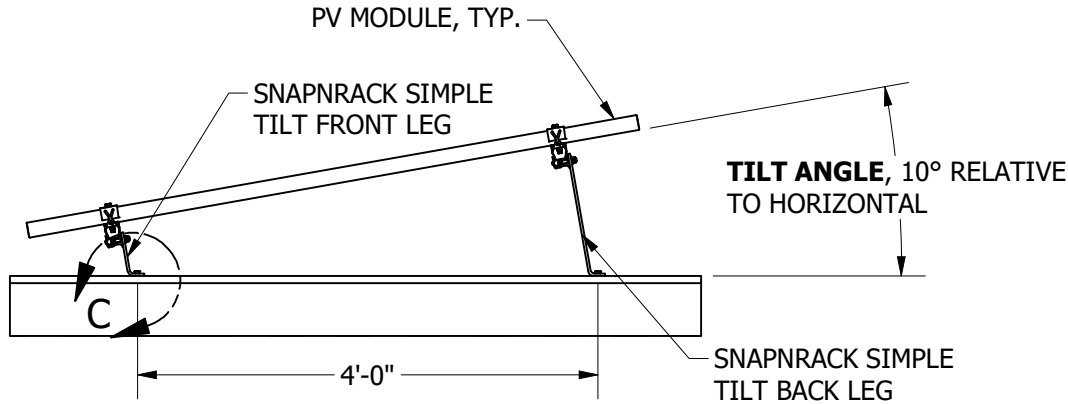
TILT ANGLE MUST ALWAYS BE IN SAME DIRECTION AS ROOF PITCH. REVERSE TILT NOT SUPPORTED



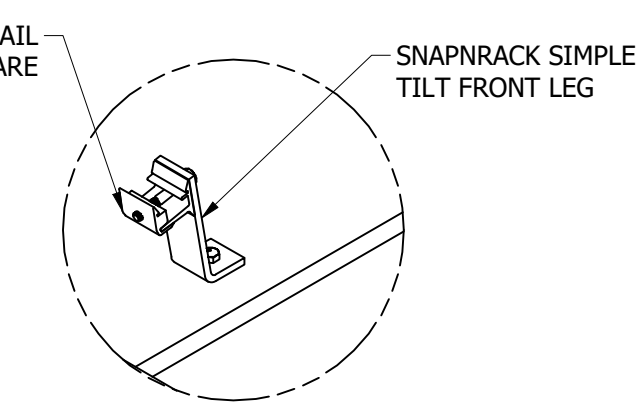
UR-40 RAIL | UR-60 RAIL
FOR USE WITH SNAPNRACK ULTRA SERIES RAILS



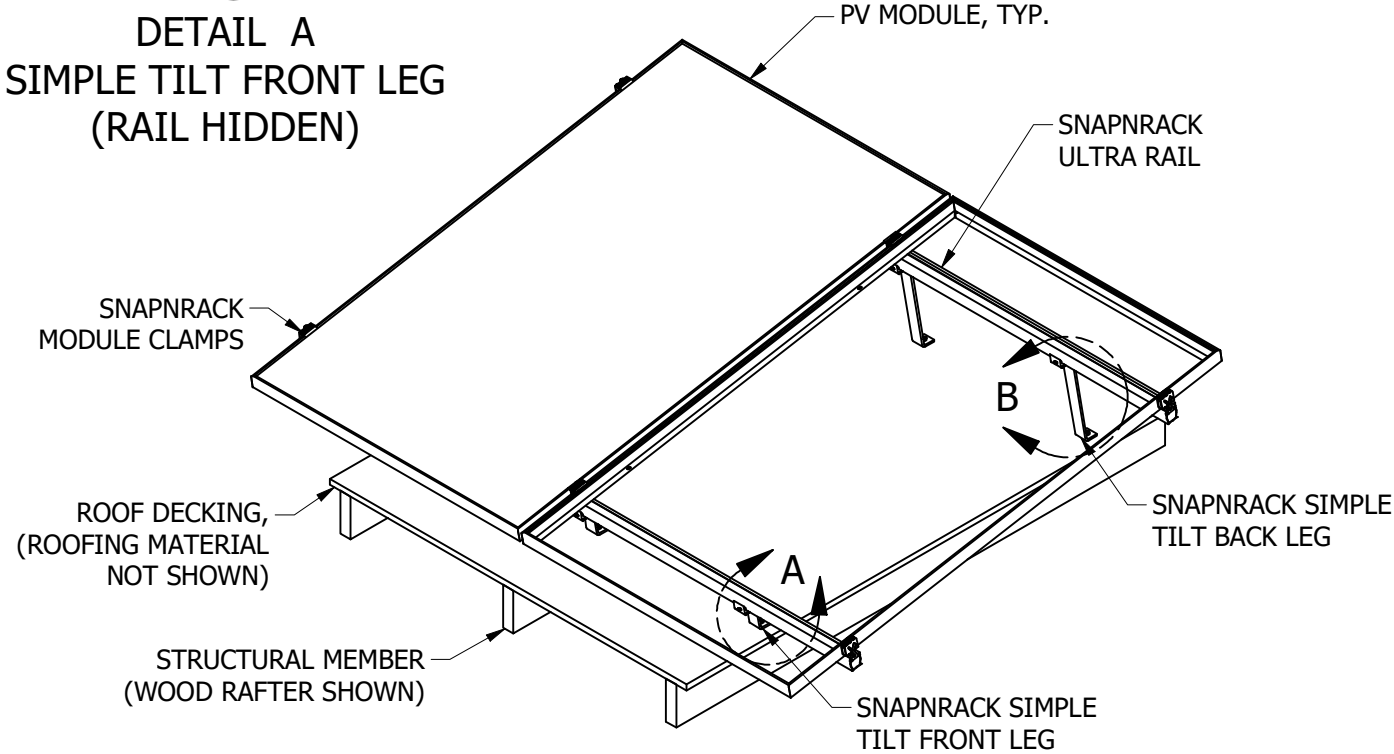
DETAIL B
SIMPLE TILT BACK LEG
(RAIL HIDDEN)



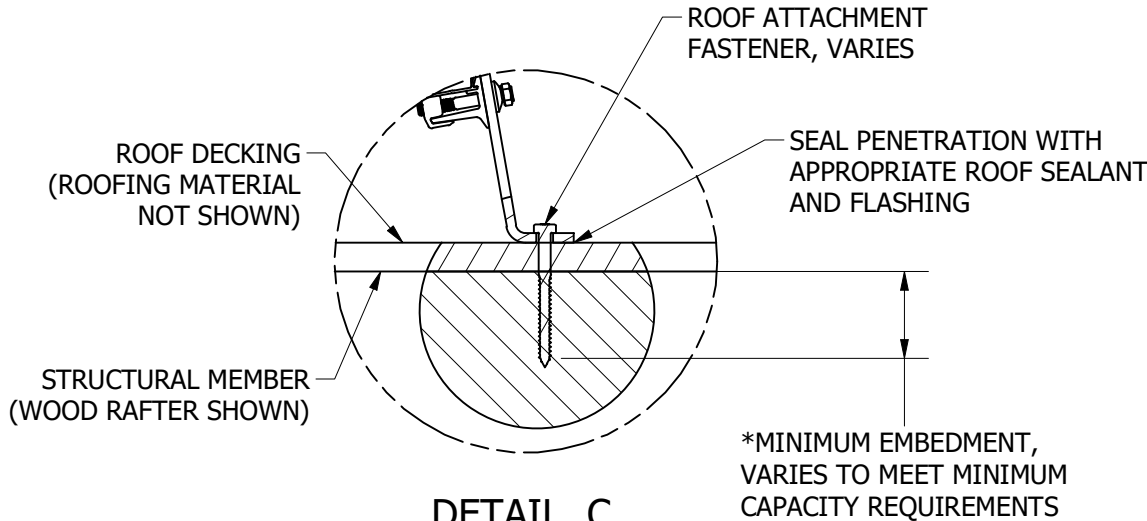
TILT ANGLE
FLAT ROOF ONLY



DETAIL A
SIMPLE TILT FRONT LEG
(RAIL HIDDEN)



FIXED TILT, INSTALLED



DETAIL C
PENETRATION DETAIL

BIN:		REVISION:		
9		1	5/7/2019	NEW DETAIL
		B	3/29/2023	DC001948
				MJA
				MKW