powered by Q.ANTUM DUO Z

Q.PEAK DUO BLK ML-G10+

385-405

ENDURING HIGH PERFORMANCE

Quality Controlled PV
TÜVRheinland CERTIFIED
www.tuv.com ID 1111232615

ASSEMBLED IN THE USA

25 YR Warranty
Product & Performance

EUPD RESEARCH TOP BRAND PV MODULES EUROPE 2021

Q CELLS Yield Security

BREAKING THE 20% EFFICIENCY BARRIER

Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 20.9%.

THE MOST THOROUGH TESTING PROGRAMME IN THE INDUSTRY

Q CELLS is the first solar module manufacturer to pass the most comprehensive quality programme in the industry: The new "Quality Controlled PV" of the independent certification institute TÜV Rheinland.

INNOVATIVE ALL-WEATHER TECHNOLOGY

Optimal yields, whatever the weather with excellent low-light and temperature behavior.

ENDURING HIGH PERFORMANCE

Long-term yield security with Anti LID Technology, Anti PID Technology[1], Hot-Spot Protect and Traceable Quality Tra.Q™.

EXTREME WEATHER RATING

High-tech aluminum alloy frame, certified for high snow (5400 Pa) and wind loads (4000 Pa).

A RELIABLE INVESTMENT

25 YEARS

Inclusive 25-year product warranty and 25-year linear performance warranty[2].

6 BUSBAR CELL TECHNOLOGY

12 BUSBAR CELL TECHNOLOGY

[1] APT test conditions according to IEC / TS 62804-1:2015, method A (–1500 V, 96 h)
[2] See data sheet on rear for further information.

THE IDEAL SOLUTION FOR:

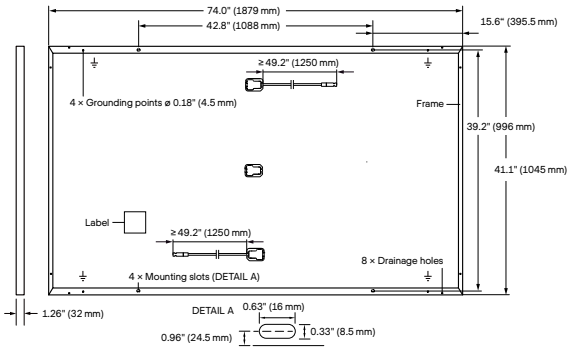
Rooftop arrays on residential buildings

Engineered in Germany

Q CELLS

MECHANICAL SPECIFICATION

Format	74.0 in × 41.1 in × 1.26 in (including frame) (1879 mm × 1045 mm × 32 mm)
Weight	48.5 lbs (22.0 kg)
Front Cover	0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodized aluminum
Cell	6 × 22 monocrystalline Q.ANTUM solar half cells
Junction Box	2.09-3.98 in × 1.26-2.36 in × 0.59-0.71 in (53-101 mm × 32-60 mm × 15-18 mm), IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥49.2 in (1250 mm), (–) ≥49.2 in (1250 mm)
Connector	Stäubli MC4; IP68

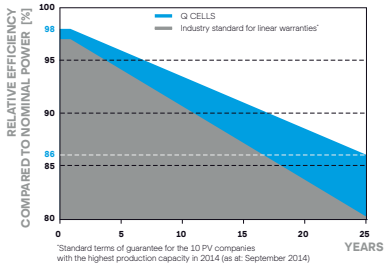


ELECTRICAL CHARACTERISTICS

POWER CLASS				385	390	395	400	405
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / –0 W)								
Minimum	Power at MPP[1]	P_{MPP}	[W]	385	390	395	400	405
	Short Circuit Current[1]	I_{SC}	[A]	11.04	11.07	11.10	11.14	11.17
	Open Circuit Voltage[1]	V_{OC}	[V]	45.19	45.23	45.27	45.30	45.34
	Current at MPP	I_{MPP}	[A]	10.59	10.65	10.71	10.77	10.83
	Voltage at MPP	V_{MPP}	[V]	36.36	36.62	36.88	37.13	37.39
	Efficiency[1]	η	[%]	≥19.6	≥19.9	≥20.1	≥20.4	≥20.6
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]								
Minimum	Power at MPP	P_{MPP}	[W]	288.8	292.6	296.3	300.1	303.8
	Short Circuit Current	I_{SC}	[A]	8.90	8.92	8.95	8.97	9.00
	Open Circuit Voltage	V_{OC}	[V]	42.62	42.65	42.69	42.72	42.76
	Current at MPP	I_{MPP}	[A]	8.35	8.41	8.46	8.51	8.57
	Voltage at MPP	V_{MPP}	[V]	34.59	34.81	35.03	35.25	35.46

[1]Measurement tolerances P_{MPP} ±3%; I_{SC}; V_{OC} ±5% at STC: 1000 W/m², 25±2 °C, AM 1.5 according to IEC 60904-3 • [2]800 W/m², NMOT, spectrum AM 1.5

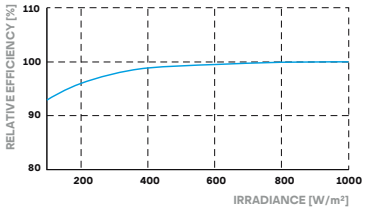
Q CELLS PERFORMANCE WARRANTY



At least 98% of nominal power during first year. Thereafter max. 0.5% degradation per year. At least 93.5% of nominal power up to 10 years. At least 86% of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Q CELLS sales organisation of your respective country.

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²)

TEMPERATURE COEFFICIENTS							
Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	–0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	–0.34	Nominal Module Operating Temperature	NMOT	[°F]	109±5.4 (43±3 °C)

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage V_{SYS}	[V]	1000 (IEC) / 1000 (UL)	PV module classification	Class II
Maximum Series Fuse Rating	[A DC]	20	Fire Rating based on ANSI / UL 61730	TYPE 2
Max. Design Load, Push / Pull[3]	[lbs/ft²]	75 (3600 Pa) / 55 (2660 Pa)	Permitted Module Temperature on Continuous Duty	–40 °F up to +185 °F (–40 °C up to +85 °C)
Max. Test Load, Push / Pull[3]	[lbs/ft²]	113 (5400 Pa) / 84 (4000 Pa)		

[3] See Installation Manual

QUALIFICATIONS AND CERTIFICATES

UL 61730, CE-compliant,
Quality Controlled PV - TÜV Rheinland,
IEC 61215:2016, IEC 61730:2016,
U.S. Patent No. 9,893,215 (solar cells),

C Certified US UL 61730

TÜVRheinland CERTIFIED www.tuv.com ID 1111220277

PACKAGING INFORMATION

Horizontal packaging	76.4 in 1940 mm	43.3 in 1100 mm	48.0 in 1220 mm	1656 lbs 751 kg	24 pallets	24 pallets	32 modules

Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

Hanwha Q CELLS America Inc.
400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | **TEL** +1 949 748 59 96 | **EMAIL** inquiry@us.q-cells.com | **WEB** www.q-cells.us

ENPHASE

DATA SHEET

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.

Enphase 25 year limited warranty

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.

UL CERTIFIED SAFETY

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

IQ8SE-DS-0001-01-EN-US-2022-03-17

* Only when installed with IQ System Controller 2, meets UL 1741. IQ8H-208V operates only in grid-tied mode.

** IQ8 Series Microinverters supports split phase, 240V. IQ8H-208 supports split phase, 208V only.

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-US[1]
Commonly used module pairings[2]	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 current[3] [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-US[1]
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/range[4]	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 circuit[5]		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	
Certifications	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 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.

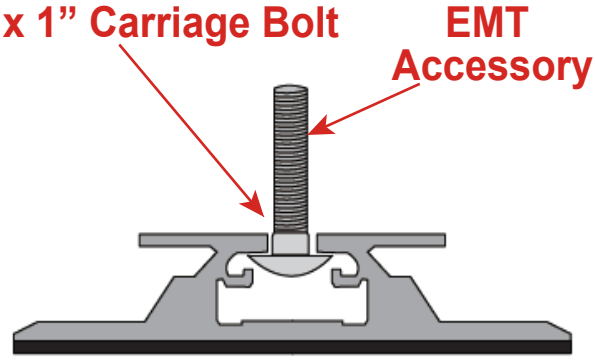
(1) The IQ8H-208 variant will be operating in grid-tied mode only at 208V AC. (2) No enforced DC/AC ratio. See the compatibility calculator at https://link.enphase.com/module-compatibility (3) Maximum continuous input DC current is 10.6A (4) Nominal voltage range can be extended beyond nominal if required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

RT-MINI II

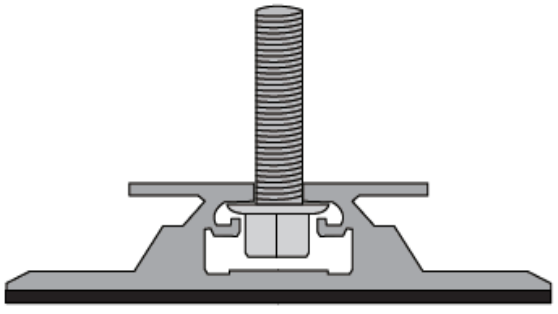
A Self-flashing PV Mount Featuring Roof Tech's AlphaSeal™ Technology

- Less Aluminum
- More Efficient Design
- Additional Mounting Options
- Metal, EPDM, TPO, & Asphalt Roofs

RT-MINI II is suitable for all systems with a conventional L-Foot.



RT Serrated Hex Flange Bolt/Nut: 5/16-18 x 1"



Installation Manual

ICC ESR 3575

Roof Tech
The Standard for Waterproof Flexible Flashing Since 1994
www.roof-tech.us info@roof-tech.us

RT-MINI II

Flexible Flashing Certified by the International Code Council (ICC)

Components

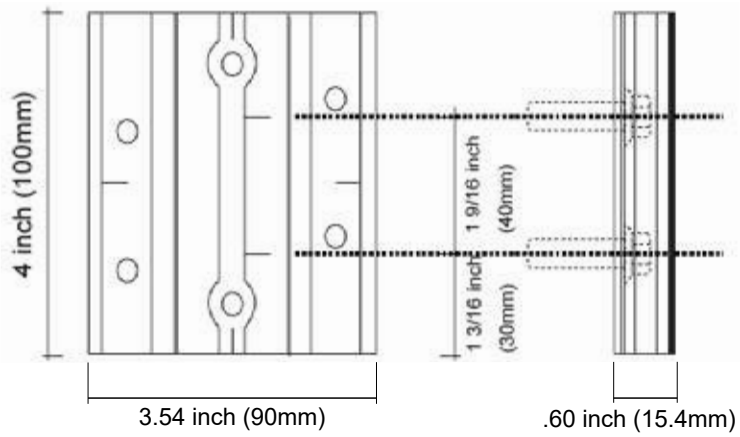
RT2-00-MINIBK2

MINI II base : 20 ea.
Screw : 40 ea.
Extra RT-Butyl : 4 ea.

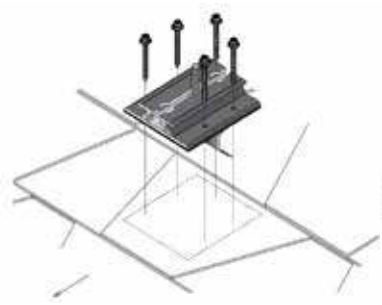
Optional Items:

5 x 60mm Mounting Screw (RT2-04-SD5-60) : 100 ea./Bag
5/16 X 25MM Flange Bolt & Nut (RT2-04-FBN25) : 100 ea./Bag
RT-Butyl (RT2-04-MNBUTYL) : 10 ea./Box

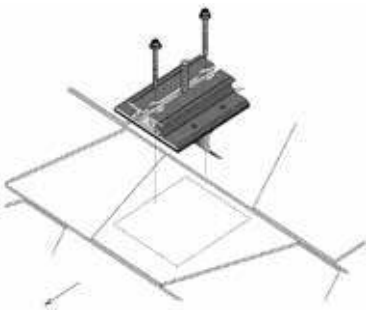
Dimensions in (mm)



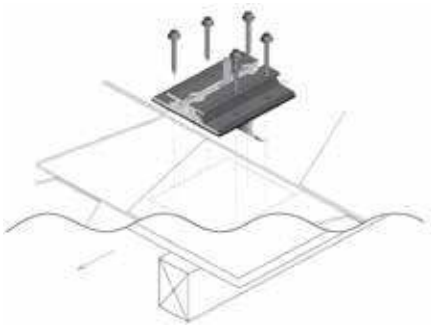
Deck Installation



Rafter Installation

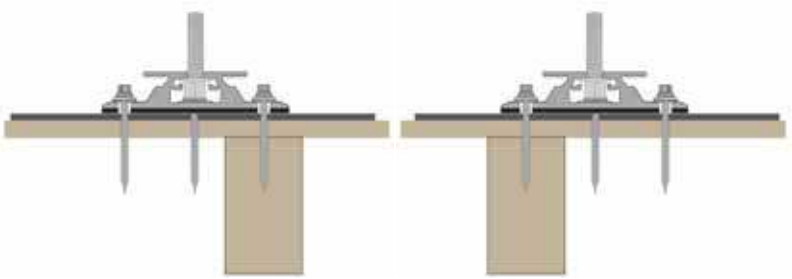


Offset Rafter Installation



RT-Butyl is Roof Tech's flexible flashing used in one million residential PV systems for the last 27 years. It is the first PV mounting system with Flexible Flashing certified by the ICC. Engineered to withstand wind speeds up to 180 mph and ground snow up to 90 psf.

Offset Rafter Attachment Options



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

ICC ESR-3575

ASTM2140 Testing

TAS 100 A on metal and asphalt roof.

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

Metal Flashing Retrofit

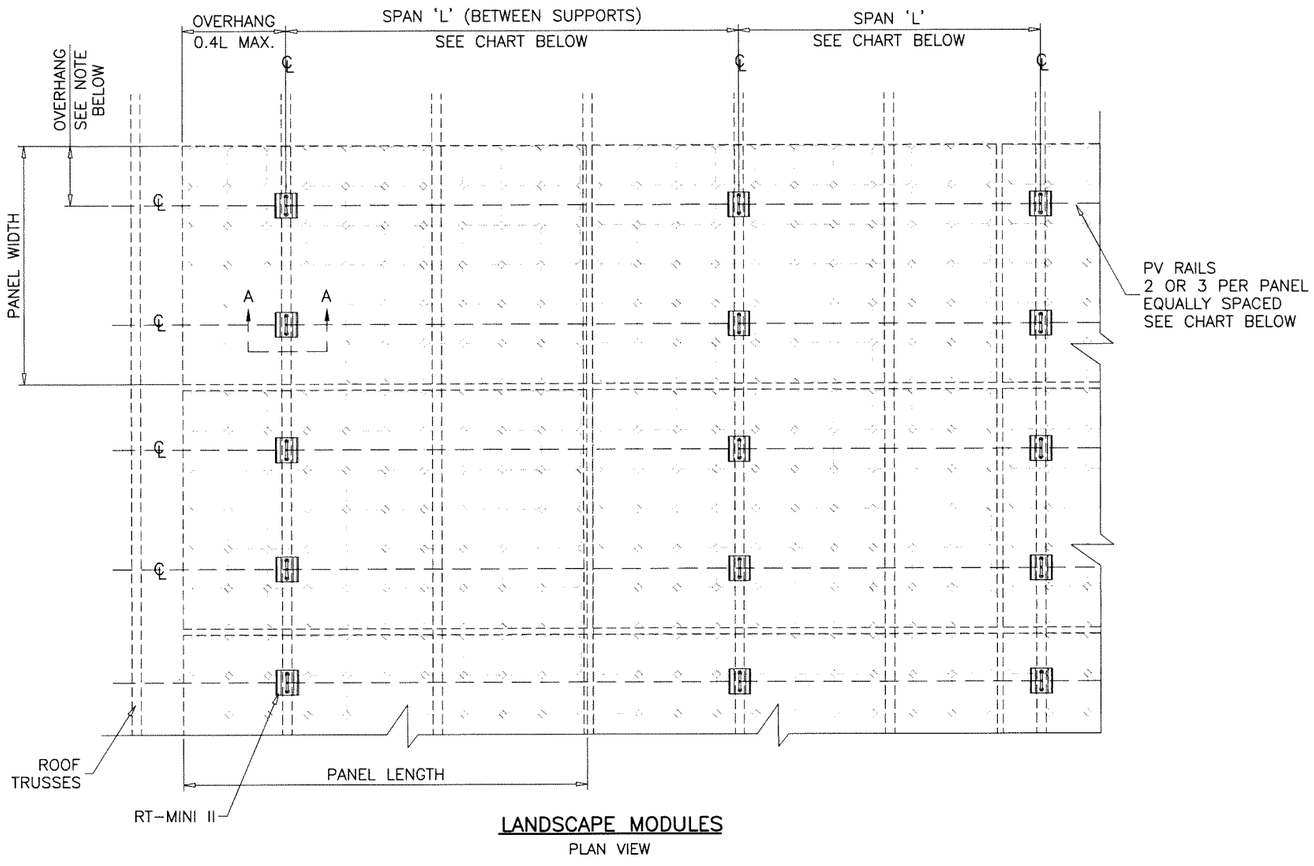
Shedding Water?

Flexible Flashing

100% Waterproof

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

November 2021



LANDSCAPE MODULES

PLAN VIEW

NOTE:
OVERHANG AS PER PANEL MANUFACTURER'S INSTRUCTIONS.
SHOULD BE EQUAL ON BOTH SIDES OF PANELS.

DESIGN LOAD CAPACITY – PSF (LANDSCAPE MODULES)
UP TO 80" PANEL LENGTHS

NUMBER OF RAILS	SPAN 'L'	FLAT ROOFS		ROOF SLOPES UP TO 7°		ROOF SLOPES 8° TO 20°		ROOF SLOPES 21° TO 27°		ROOF SLOPES 28° TO 45°	
		ANCHOR TYPE 'A'	ANCHOR TYPE 'B'	ANCHOR TYPE 'A'	ANCHOR TYPE 'B'	ANCHOR TYPE 'A'	ANCHOR TYPE 'B'	ANCHOR TYPE 'A'	ANCHOR TYPE 'B'	ANCHOR TYPE 'A'	ANCHOR TYPE 'B'
2	16"	230.3	247.8	229.6	247.2	228.2	245.8	227.3	245.0	225.2	243.0
	24"	154.9	166.6	154.2	165.9	152.7	164.5	151.9	163.8	149.7	161.7
	32"	117.2	125.9	116.5	125.3	115.0	123.9	114.2	123.1	112.0	121.1
	48"	79.4	85.3	78.7	84.6	77.3	83.3	76.5	82.5	74.3	80.4
	64"	60.6	65.0	59.9	64.3	58.4	62.9	57.6	62.2	55.4	60.1
	72"	54.3	58.2	53.6	57.5	52.1	56.2	51.3	55.4	49.1	53.3
3	16"	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0
	24"	209.3	225.2	208.6	224.5	207.1	223.1	206.3	222.4	204.1	220.3
	32"	158.0	169.9	157.3	169.2	155.8	167.9	155.0	167.1	152.8	165.0
	48"	106.6	114.6	105.9	113.9	104.5	112.6	103.7	111.8	101.5	109.7
	64"	81.0	86.9	80.3	86.3	78.8	84.9	78.0	84.1	75.8	82.1
	72"	72.4	77.7	71.7	77.1	70.3	75.7	69.4	74.9	67.3	72.9

LOADS SHOWN IN CHARTS ABOVE ARE FOR PANEL WIDTHS UP TO 40"
FOR WIDER PANEL WIDTHS (41" TO 48"), DETERMINE DESIGN LOADS AS FOLLOWS

$$\text{DESIGN LOAD} = \frac{\text{LOAD FROM CHART X 40}}{\text{NEW PANEL WIDTH}}$$

RT-MINI II ROOF TOP PV MOUNTING SYSTEM

THIS PRODUCT HAS BEEN DESIGNED AND TESTED TO COMPLY WITH THE REQUIREMENTS OF THE 2020 (7TH EDITION) FLORIDA BUILDING CODE INCLUDING HIGH VELOCITY HURRICANE ZONE (HVHZ).

THIS PRODUCT APPROVAL IS FOR THE ROOF TOP PV MOUNTING SYSTEM AS SHOWN ON THESE APPROVED DRAWINGS.
ROOF DETAILS, UPLIFT, SLOPE, ROOF TRUSSES AND OTHER ELEMENTS SHALL BE DESIGNED BY A FLORIDA REGISTERED ENGINEER AND REVIEWED BY THE STRUCTURAL PLANS EXAMINER OF THE CORRESPONDING BUILDING DEPARTMENT.
CONDITIONS NOT SHOWN IN THIS DRAWING ARE TO BE ANALYZED SEPARATELY, AND TO BE REVIEWED BY BUILDING OFFICIAL.

INSTALLATION OF PV PANEL ACCESSORIES SHALL BE DONE IN ACCORDANCE WITH THE CURRENT EDITION OF FLORIDA BUILDING CODE AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

ANCHORS SHALL BE CORROSION RESISTANT, SPACED AS SHOWN ON DETAILS AND INSTALLED PER MANUF'S INSTRUCTIONS. SPECIFIED EMBEDMENT TO BASE MATERIAL SHALL BE BEYOND ROOF COVERING.

DESIGN LOADS SHOWN ARE BASED ON 'ALLOWABLE STRESS DESIGN (ASD)'.

SOLAR PANELS TO BE INSTALLED PARALLEL TO THE ROOF SURFACE WITH A TOLERANCE OF 2 DEGREES.

PV PANELS NOT PART OF THIS APPROVAL.
FOR PANEL DETAILS, GENERAL NOTES, COMPONENT SIZES, PANEL RAIL CONNECTION TO RT-MINI II AND INSTALLATION REQUIREMENTS/LIMITATIONS SEE CORRESPONDING FLA. APPROVAL DWGS.

A- CONTRACTOR TO BE RESPONSIBLE FOR THE SELECTION, PURCHASE AND INSTALLATION OF THIS PRODUCT BASED ON THIS PRODUCT EVALUATION PROVIDED HE/SHE DOES NOT DEVIATE FROM THE CONDITIONS DETAILED ON THIS DOCUMENT.

B- THIS PRODUCT EVALUATION DOCUMENT WILL BE CONSIDERED INVALID IF ALTERED BY ANY MEANS.

C- SITE SPECIFIC PROJECTS SHALL BE PREPARED BY A FLORIDA REGISTERED ENGINEER OR ARCHITECT WHICH WILL BECOME THE ENGINEER OF RECORD (E.O.R.) FOR THE PROJECT AND WHO WILL BE RESPONSIBLE FOR THE PROPER USE OF THE P.E.D. ENGINEER OF RECORD, ACTING AS A DELEGATED ENGINEER TO THE P.E.D. ENGINEER SHALL SUBMIT TO THIS LATTER THE SITE SPECIFIC DRAWINGS FOR REVIEW.

D- THIS P.E.D. SHALL BEAR THE DATE AND ORIGINAL SEAL AND SIGNATURE OF THE PROFESSIONAL ENGINEER OF RECORD THAT PREPARED IT.

4/20/2021

FL #38617

JALAL FAROOQ LICENSE No. 81223 STATE OF FLORIDA PROFESSIONAL ENGINEER

afc
AL-FAROOQ CORPORATION
ENGINEERS & PRODUCT DEVELOPMENT
9360 SUNSET DRIVE, SUITE 220 (C.A.N. 3538)
MIAMI, FLORIDA 33173
TEL. (305) 264-8100 FAX. (305) 262-6978

SOLAR-RACK\21-27F-RT

RT-MINI II ROOF TOP PV MOUNTING SYSTEM

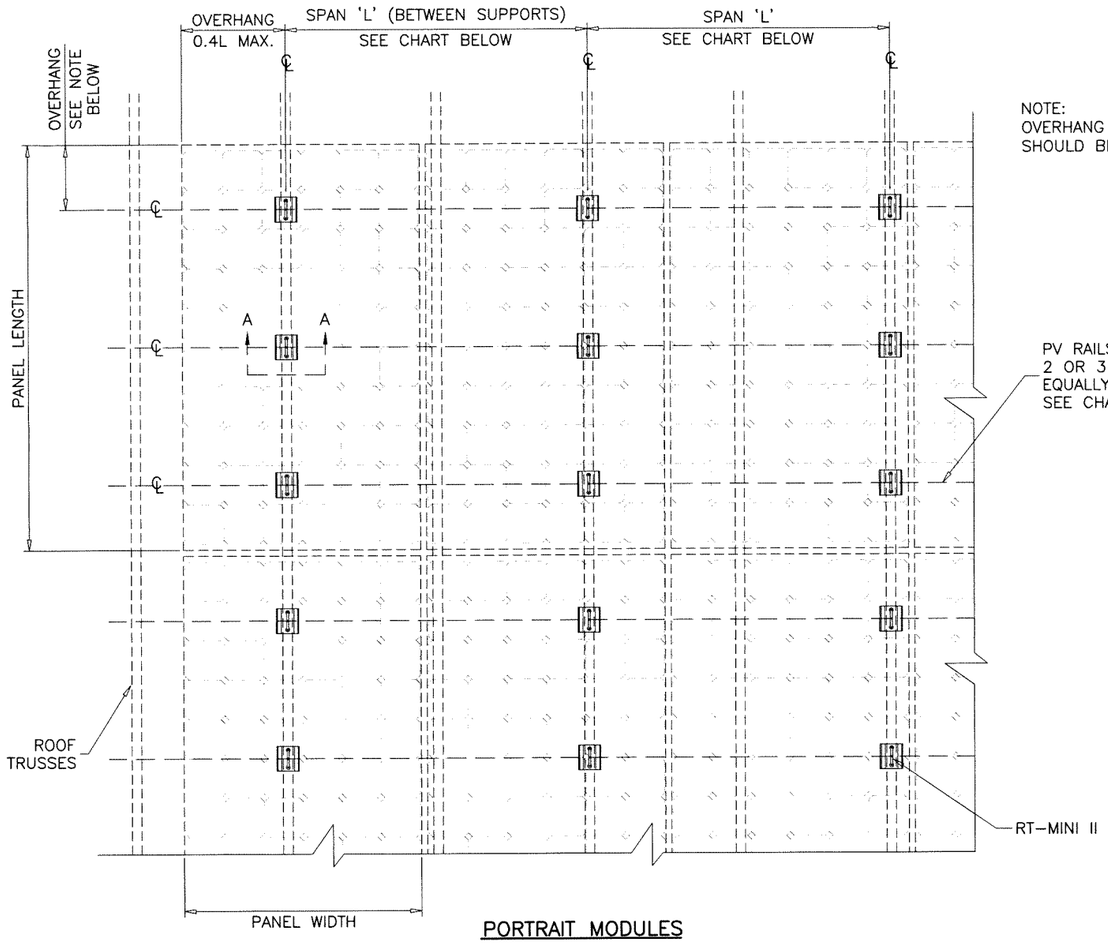
Roof Tech Inc.
10620 Treena Street Suite 230
San Diego, CA. 92131
Phone: (858) 935-6064 Fax:

revisions:

no	date	by	description

date: 03-23-21
scale: 1/2"=1'-0"
dr. by: TARIQ
chk. by:

drawing no. 21-27F



NOTE:
OVERHANG AS PER PANEL MANUFACTURER'S INSTRUCTIONS.
SHOULD BE EQUAL ON BOTH SIDES OF PANELS.

PORTRAIT MODULES
PLAN VIEW

DESIGN LOAD CAPACITY – PSF (PORTRAIT MODULES)
UP TO 68" PANEL LENGTHS

NUMBER OF RAILS	SPAN 'L'	FLAT ROOFS		ROOF SLOPES UP TO 7°		ROOF SLOPES 8° TO 20°		ROOF SLOPES 21° TO 27°		ROOF SLOPES 28° TO 45°	
		ANCHOR TYPE 'A'	ANCHOR TYPE 'B'	ANCHOR TYPE 'A'	ANCHOR TYPE 'B'	ANCHOR TYPE 'A'	ANCHOR TYPE 'B'	ANCHOR TYPE 'A'	ANCHOR TYPE 'B'	ANCHOR TYPE 'A'	ANCHOR TYPE 'B'
2	16"	137.1	147.4	136.4	146.8	135.0	145.4	134.1	144.6	132.0	142.6
	24"	92.8	99.6	92.0	99.0	90.6	97.6	89.8	96.8	87.6	94.8
	32"	70.6	75.7	69.9	75.1	68.4	73.7	67.6	72.9	65.4	70.9
	48"	48.4	51.8	47.7	51.1	46.2	49.8	45.4	49.0	43.2	47.0
	64"	37.3	39.9	36.6	39.2	35.1	37.8	34.3	37.1	32.1	35.0
	72"	33.6	35.9	32.9	35.2	31.4	33.8	30.6	33.1	28.4	31.0
3	16"	175.5	188.7	174.8	188.1	173.3	186.7	172.5	185.9	170.3	183.9
	24"	118.3	127.2	117.6	126.5	116.1	125.1	115.3	124.3	113.2	122.3
	32"	89.7	96.4	89.0	95.7	87.6	94.3	86.7	93.6	84.6	91.5
	48"	61.2	65.6	60.4	64.9	59.0	63.6	58.2	62.8	56.0	60.7
	64"	46.9	50.2	46.2	49.5	44.7	48.2	43.9	47.4	41.7	45.3
	72"	42.1	45.1	41.4	44.4	39.9	43.0	39.1	42.2	36.9	40.2

LOADS SHOWN IN CHARTS ABOVE ARE FOR PANEL LENGTHS UP TO 68"
FOR SHORTER PANEL LENGHTS, DETERMINE DESIGN LOADS AS FOLLOWS

$$\text{DESIGN LOAD} = \frac{\text{LOAD FROM CHART X 68}}{\text{NEW PANEL LENGTH}}$$

DESIGN LOAD CAPACITY – PSF (PORTRAIT MODULES)
UP TO 80" PANEL LENGTHS

NUMBER OF RAILS	SPAN 'L'	FLAT ROOFS		ROOF SLOPES UP TO 7°		ROOF SLOPES 8° TO 20°		ROOF SLOPES 21° TO 27°		ROOF SLOPES 28° TO 45°	
		ANCHOR TYPE 'A'	ANCHOR TYPE 'B'	ANCHOR TYPE 'A'	ANCHOR TYPE 'B'	ANCHOR TYPE 'A'	ANCHOR TYPE 'B'	ANCHOR TYPE 'A'	ANCHOR TYPE 'B'	ANCHOR TYPE 'A'	ANCHOR TYPE 'B'
2	16"	117.2	125.9	116.5	125.3	115.0	123.9	114.2	123.1	112.0	121.1
	24"	79.4	85.3	78.7	84.6	77.3	83.3	76.5	82.5	74.3	80.4
	32"	60.6	65.0	59.9	64.3	58.4	62.9	57.6	62.2	55.4	60.1
	48"	41.7	44.6	41.0	44.0	39.6	42.6	38.7	41.8	36.6	39.8
	64"	32.3	34.5	31.6	33.8	30.1	32.5	29.3	31.7	27.1	29.6
	72"	29.1	31.1	28.4	30.4	27.0	29.1	26.2	28.3	24.0	26.2
3	16"	134.1	144.1	133.4	143.5	131.9	142.1	131.1	141.3	128.9	139.3
	24"	90.7	97.4	90.0	96.8	88.6	95.4	87.7	94.6	85.6	92.6
	32"	69.0	74.1	68.3	73.4	66.9	72.0	66.0	71.3	63.9	69.2
	48"	47.4	50.7	46.6	50.0	45.2	48.7	44.4	47.9	42.2	45.9
	64"	36.5	39.0	35.8	38.4	34.4	37.0	33.5	36.2	31.4	34.2
	72"	32.9	35.1	32.2	34.5	30.7	33.1	29.9	32.3	27.8	30.3

LOADS SHOWN IN CHARTS ABOVE ARE FOR PANEL LENGTHS UP TO 80"
FOR SHORTER PANEL LENGHTS (68" TO 80"), DETERMINE DESIGN LOADS AS FOLLOWS

$$\text{DESIGN LOAD} = \frac{\text{LOAD FROM CHART X 80}}{\text{NEW PANEL LENGTH}}$$

4/20/2021
FL #38617

JALAL FAROOQ
LICENSE
No. 61223
STATE OF FLORIDA
PROFESSIONAL ENGINEER

AL-FAROOQ CORPORATION
ENGINEERS & PRODUCT DEVELOPMENT
9360 SUNSET DRIVE, SUITE 220
MIAMI, FLORIDA 33173 (C.A.N. 3598)
TEL. (305) 264-8100 FAX. (305) 262-6978

SOLAR-RACK\21-27F-RT

RT-MINI II ROOF TOP PV MOUNTING SYSTEM

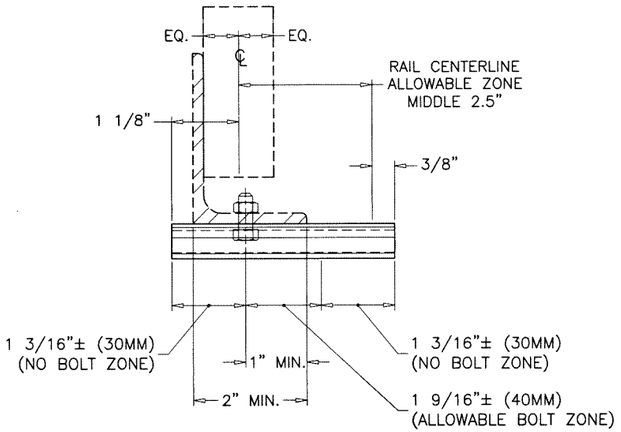
Roof Tech Inc.
10620 Treena Street Suite 230
San Diego, CA. 92131
Phone: (858) 935-6064 Fax:

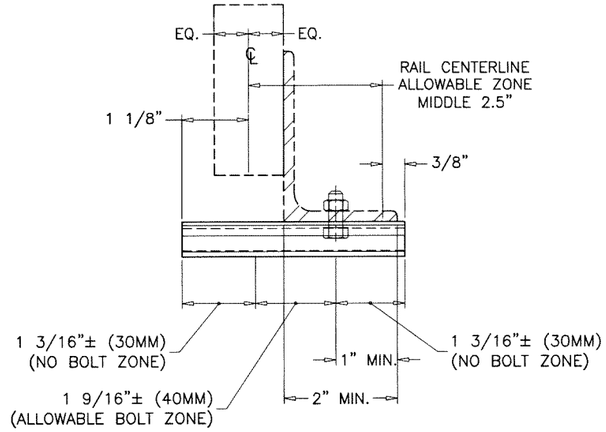
revisions:

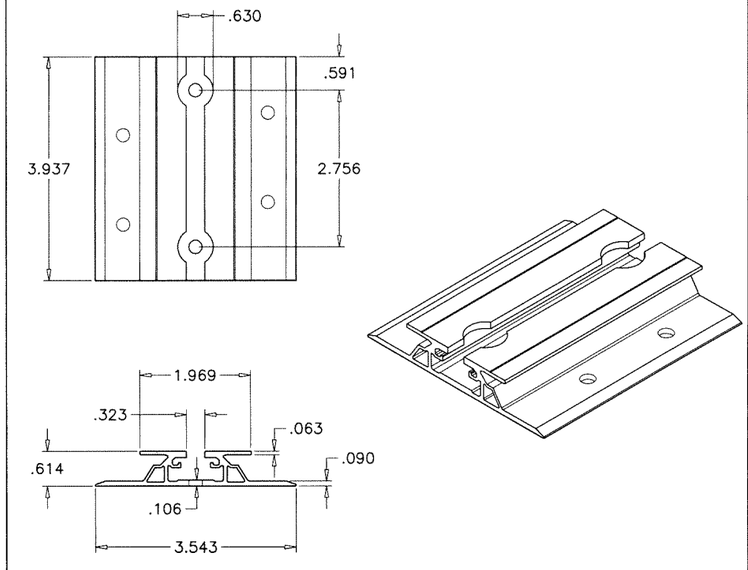
no	date	by	description

date: 03-23-21
scale: 1/2"=1'-0"
dr. by: TARIQ
chk. by:

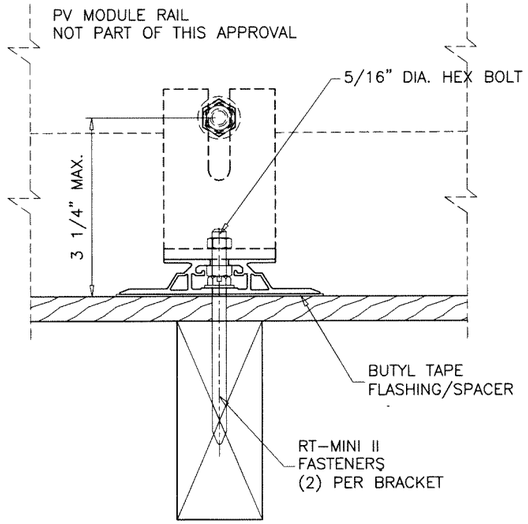
drawing no.
21-27F



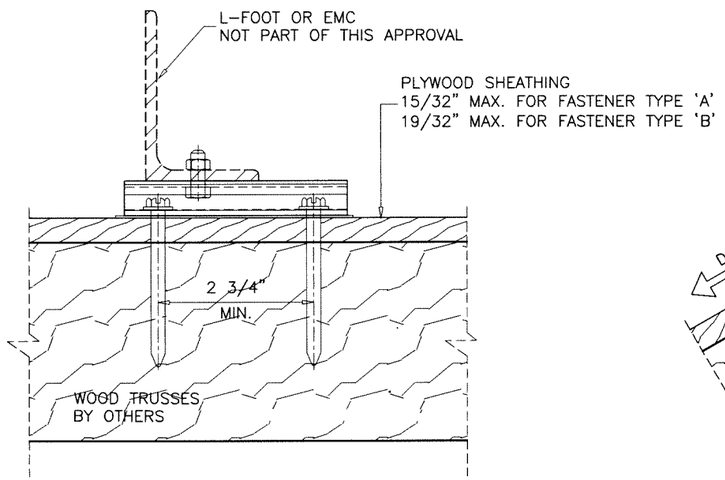


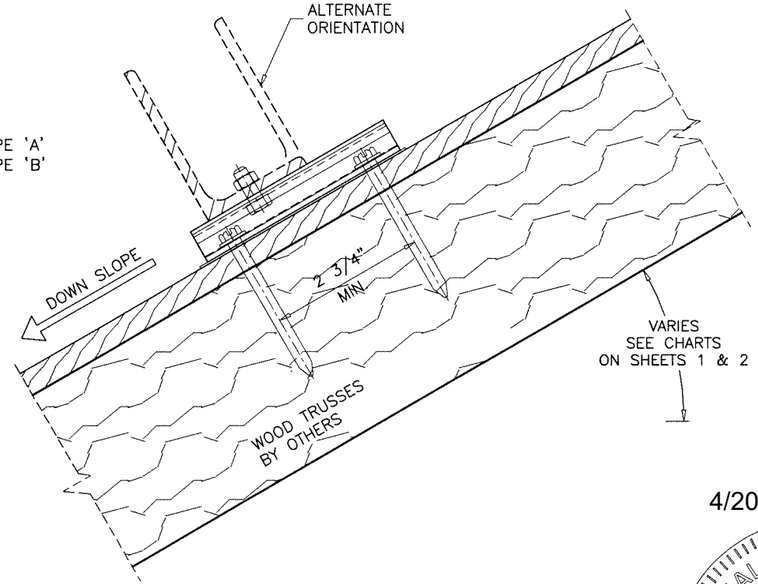


RT–MINI II
6063–T5



SECTION A–A





RT–MINI II FASTENERS: (AT ROOF TRUSSES)

TYPE 'A'– M5 X 60mm SS304 SELF–DRILLING SCREWS (MAX. ALLOW. TENSION = 569 lbf, MAX. ALLOW. SHEAR = 404 lbf)

TYPE 'B'– M5 X 90mm SS304 SELF–DRILLING SCREWS (MAX. ALLOW. TENSION = 613 lbf, MAX. ALLOW. SHEAR = 470 lbf)

CENTERED AT WOOD TRUSSES (SG = 0.50 MIN.)

4/20/2021

JALAL FAROOQ
LICENSE
No. 81223
STATE OF FLORIDA
PROFESSIONAL ENGINEER

FL #38617

AL-FAROOQ CORPORATION
ENGINEERS & PRODUCT DEVELOPMENT
9360 SUNSET DRIVE, SUITE 220 (C.A.N. 3538)
MIAMI, FLORIDA 33173
TEL. (305) 264-8100 FAX. (305) 262-6978

SOLAR–RACK\21–27F–RT

RT–MINI II ROOF TOP PV MOUNTING SYSTEM

Roof Tech Inc.
10620 Treena Street Suite 230
San Diego, CA. 92131
Phone: (858) 935–6064 Fax:

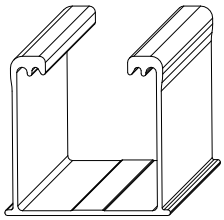
revisions:

no	date	by	description

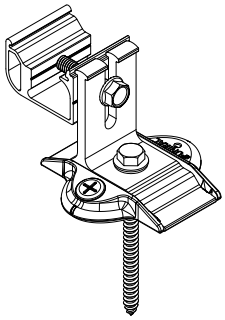
date: 03–23–21
scale: 3/8" = 1"
dr. by: TARIQ
chk. by:

drawing no. 21–27F

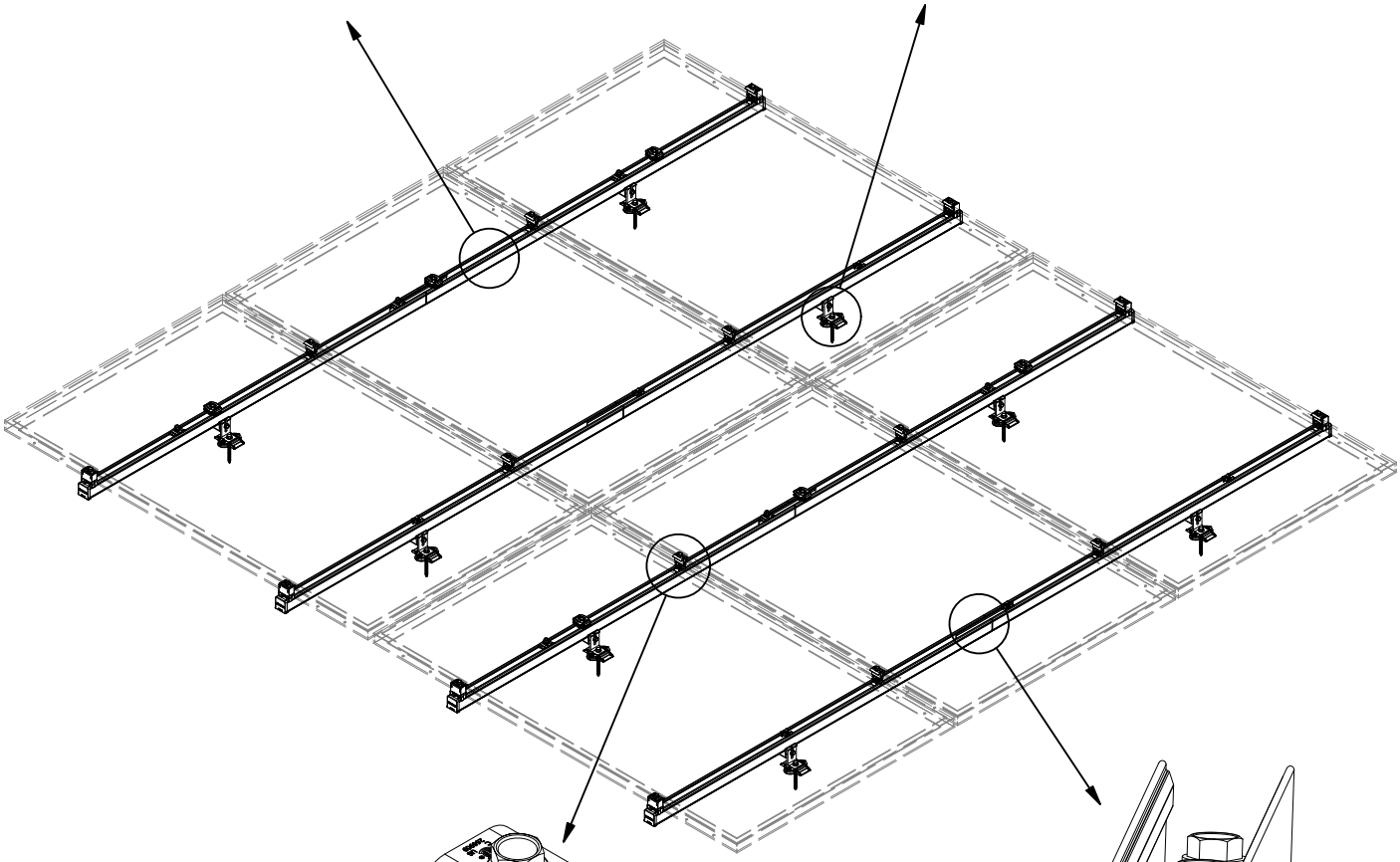
sheet 3 of 3

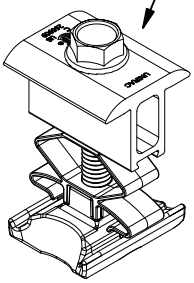


RAIL
SEE PAGE NH-P01

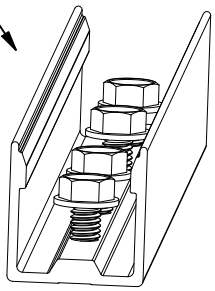


STRONGHOLD ATTACHMENT KIT
SEE PAGE NH-A04





COMBO CLAMP
SEE PAGE NH-A03



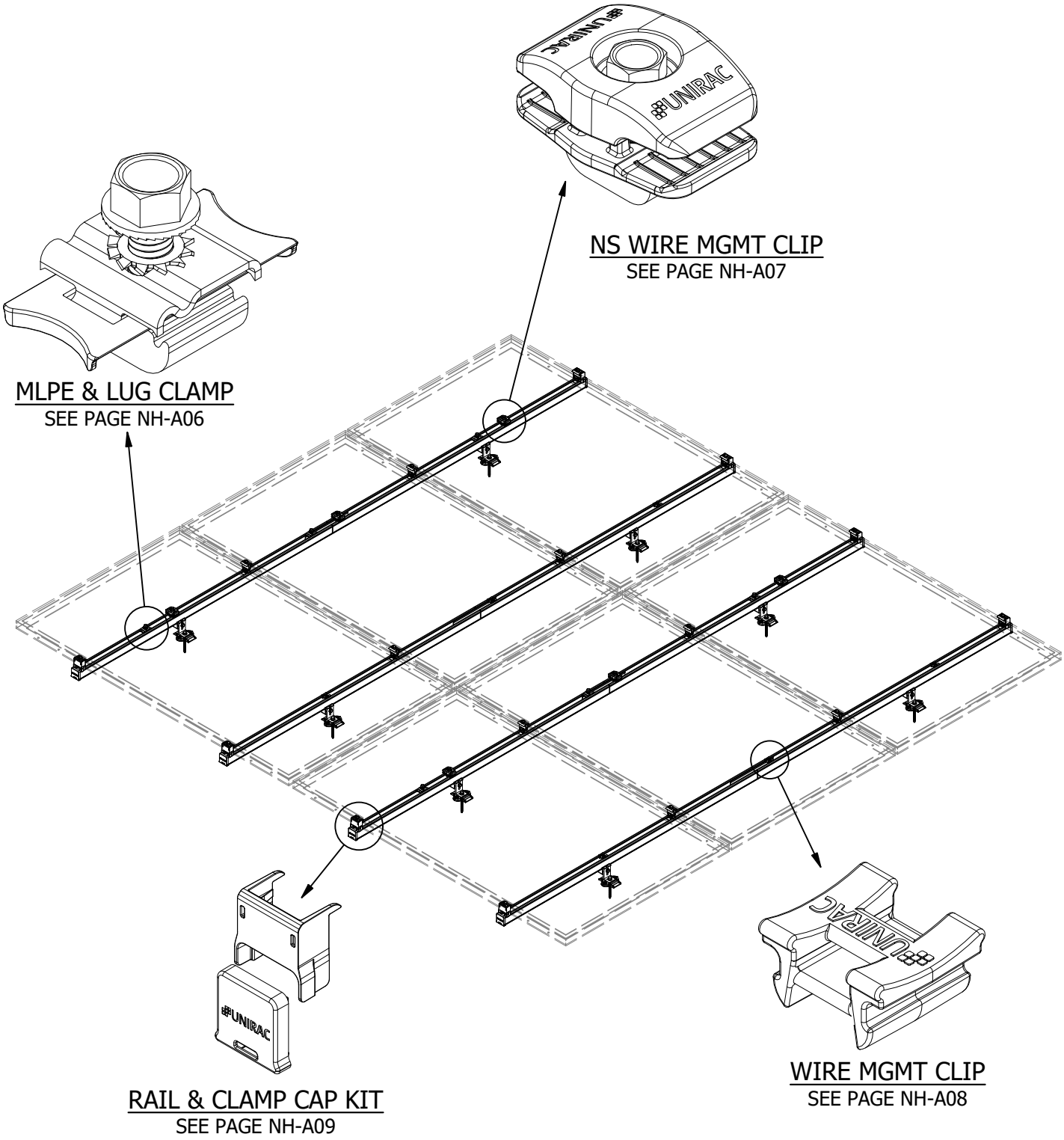
RAIL SPLICE
SEE PAGE NH-P02

UNIRAC
1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE:	NXT HORIZON
DRAWING TYPE:	PART & ASSEMBLY
DESCRIPTION:	MODULE ASSEMBLY
REVISION DATE:	9/30/2021

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

NH-A01
SHEET



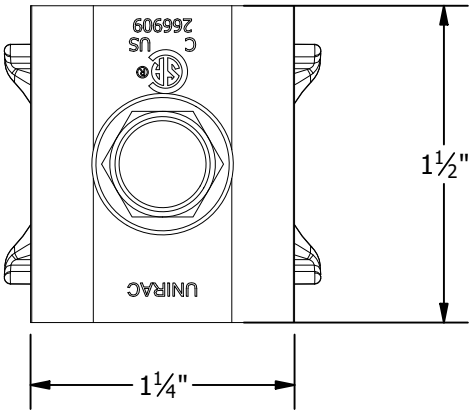
UNIRAC
1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

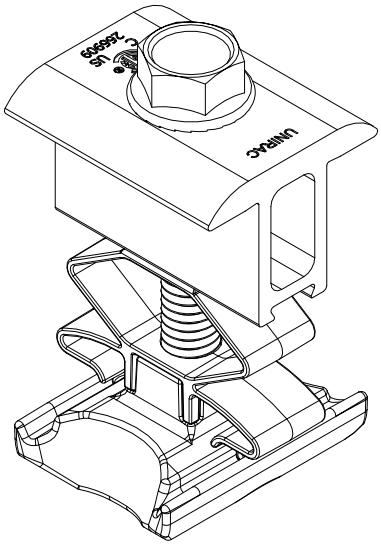
PRODUCT LINE:	NXT HORIZON
DRAWING TYPE:	PART & ASSEMBLY
DESCRIPTION:	MODULE ASSEMBLY
REVISION DATE:	9/30/2021

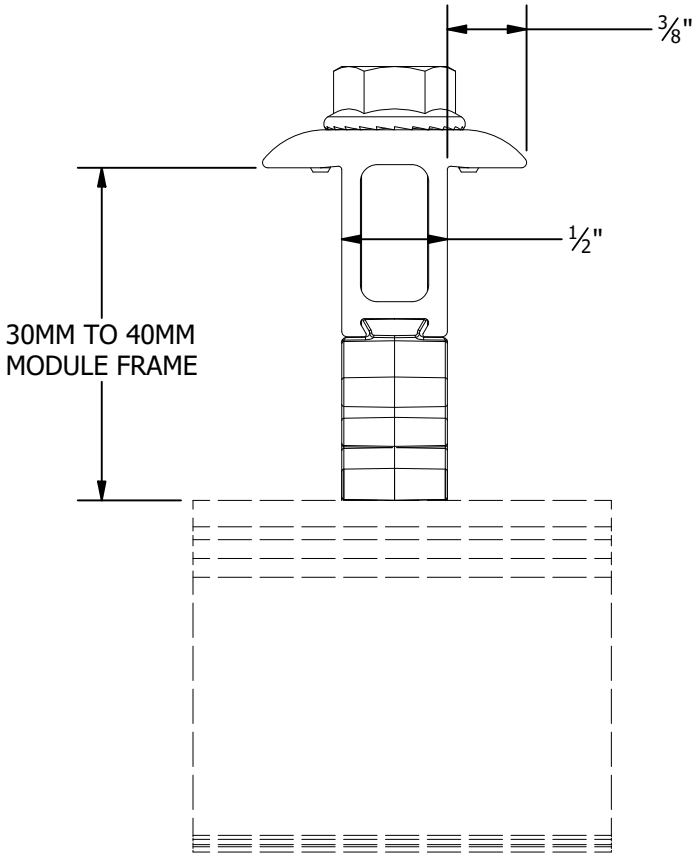
DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

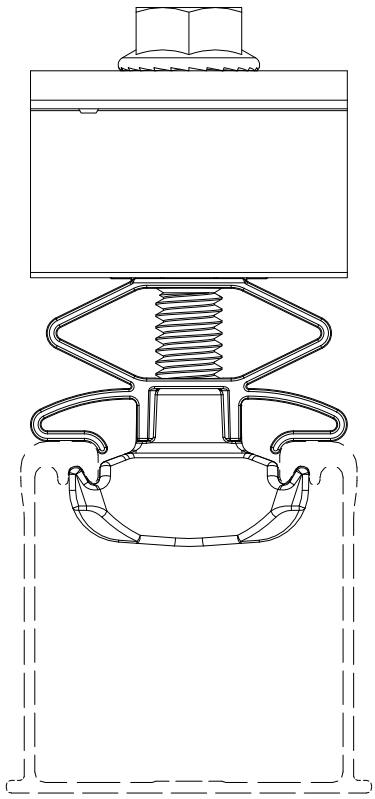
NH-A02
SHEET

PART # TABLE	
P/N	DESCRIPTION
CCLAMPM1	NXT HORIZON COMBO CLAMP - MILL
CCLAMPD1	NXT HORIZON COMBO CLAMP - DARK









UNIRAC
1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE:	NXT HORIZON
DRAWING TYPE:	PART & ASSEMBLY
DESCRIPTION:	COMBO CLAMP
REVISION DATE:	9/30/2021

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

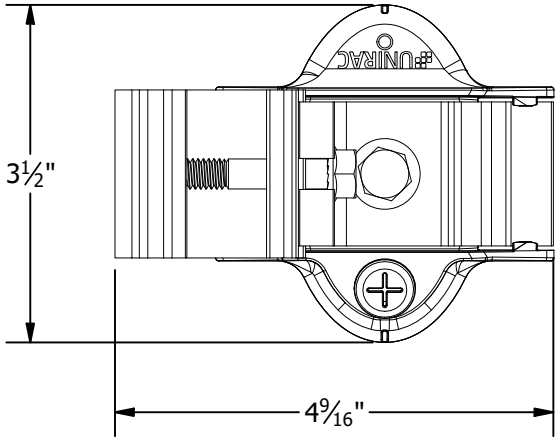
PRODUCT PROTECTED BY ONE OR MORE US PATENTS

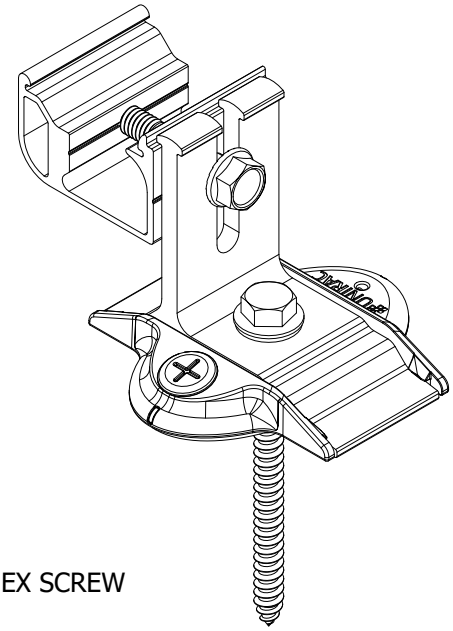
LEGAL NOTICE

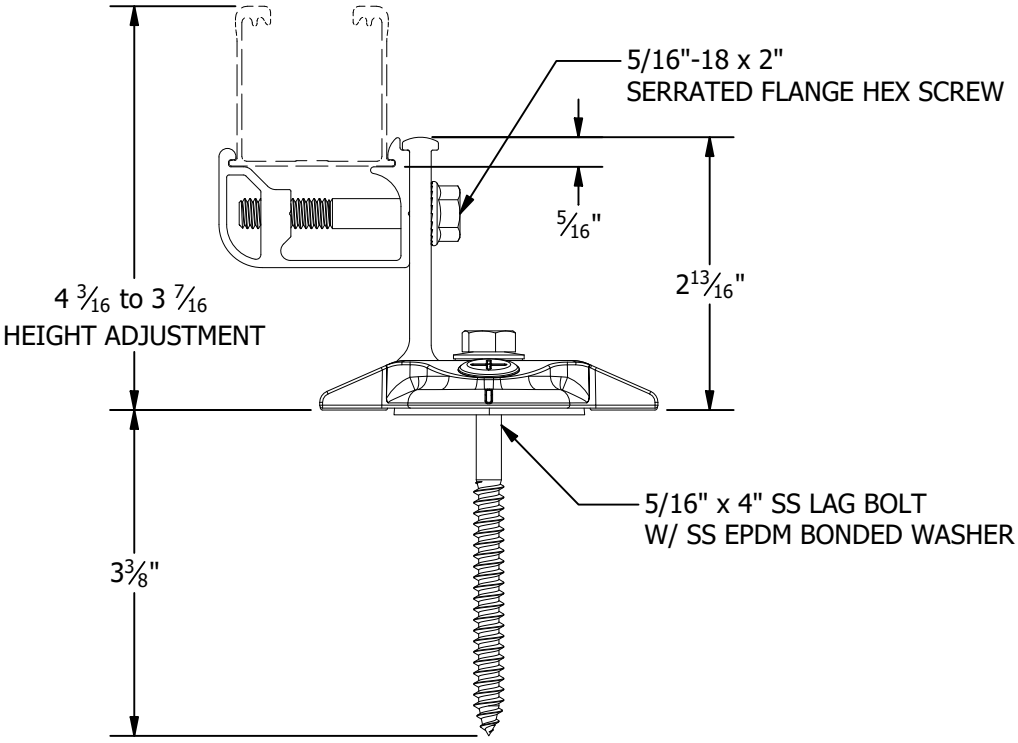
NH-A03

SHEET

PART # TABLE	
P/N	DESCRIPTION
SHCPKTM1	STRONGHOLD ATT KIT COMP MILL
SHCPKTD1	STRONGHOLD ATT KIT COMP DRK
SHCPKTM1-NS	STRONGHOLD ATT COMP MILL (NS)
SHCPKTD1-NS	STRONGHOLD ATT COMP DRK (NS)







UNIRAC
1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

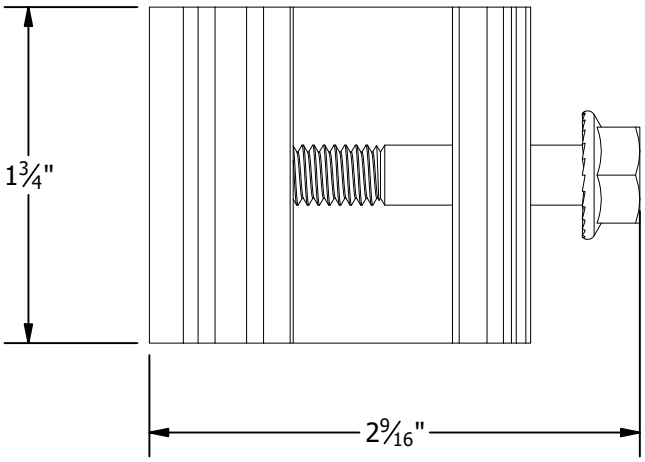
PRODUCT LINE:	NXT HORIZON
DRAWING TYPE:	PARTS ASSEMBLY
DESCRIPTION:	STRONGHOLD ATTACHMENT
REVISION DATE:	9/22/2021

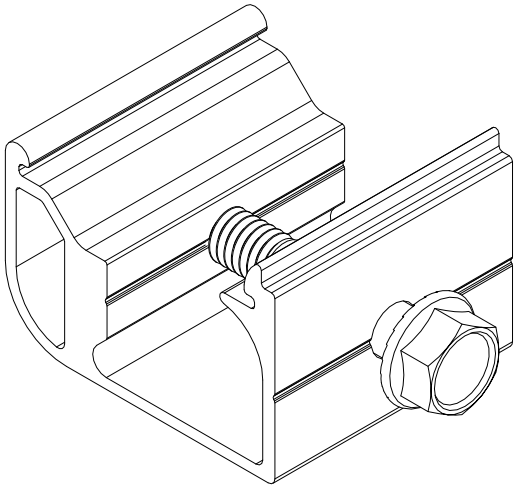
DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

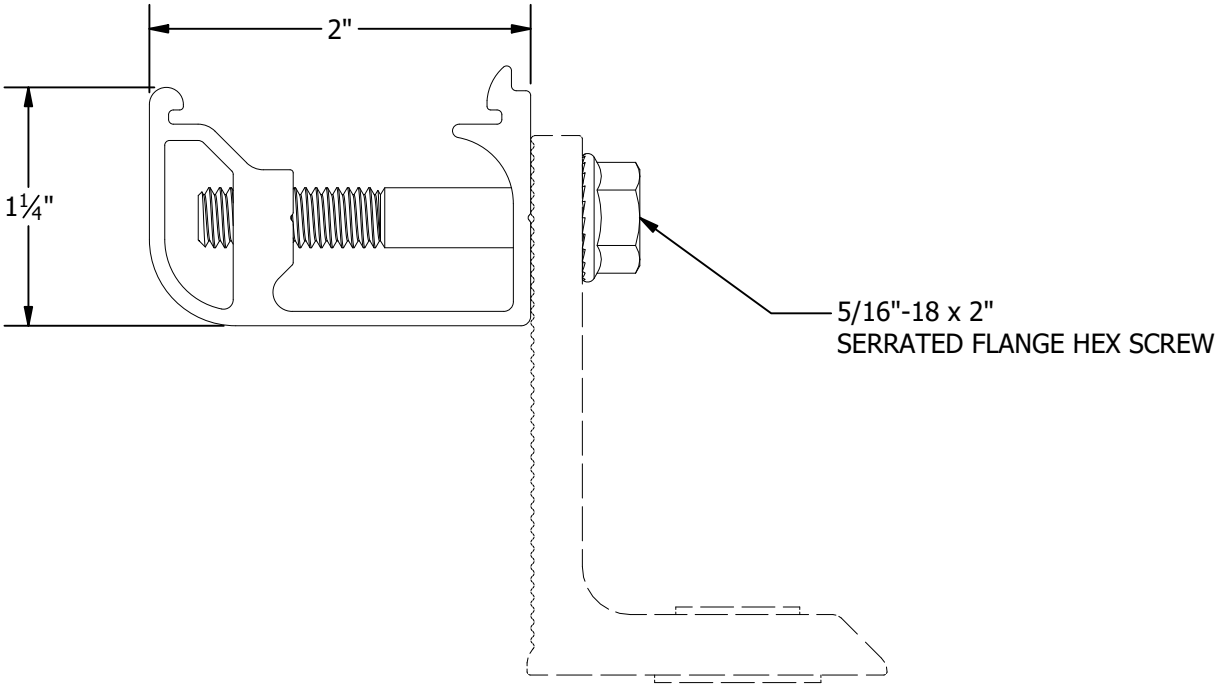
NH-A04

SHEET

PART # TABLE	
P/N	DESCRIPTION
SHCLMPM1	STRONGHOLD RAIL CLAMP MILL
SHCLMPD1	STRONGHOLD RAIL CLAMP DRK







UNIRAC
1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE:	NXT HORIZON
DRAWING TYPE:	PARTS ASSEMBLY
DESCRIPTION:	STRONGHOLD RAIL CLAMP
REVISION DATE:	9/22/2021

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

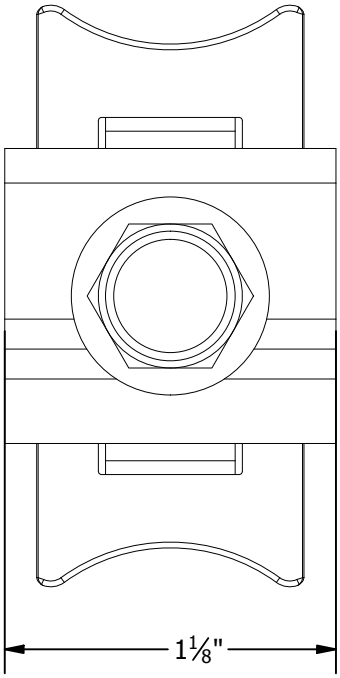
PRODUCT PROTECTED BY ONE OR MORE US PATENTS

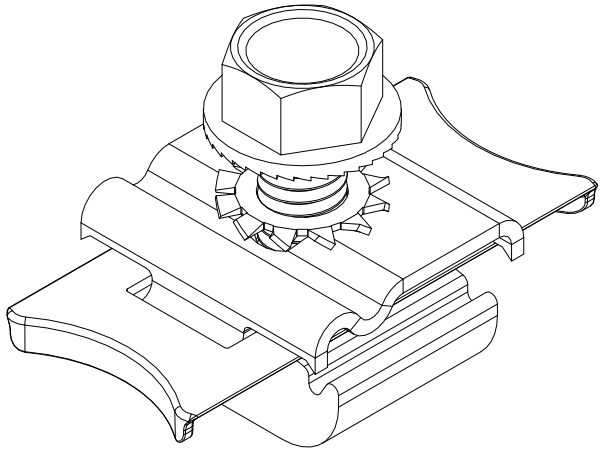
LEGAL NOTICE

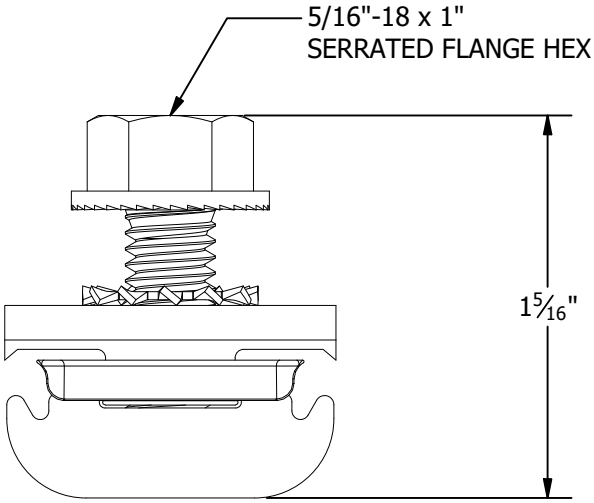
NH-A05

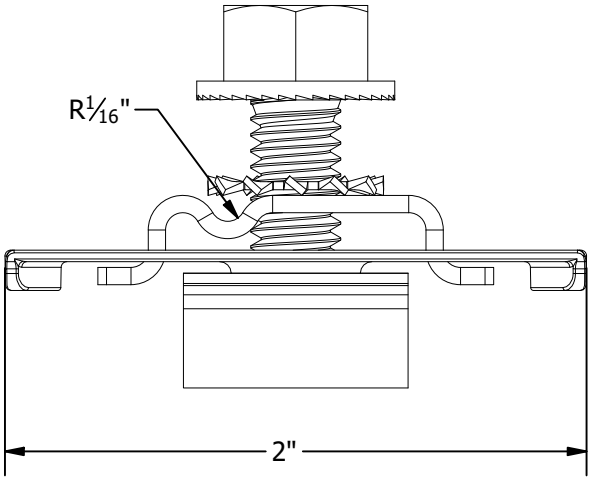
SHEET

PART # TABLE	
P/N	DESCRIPTION
LUGMLPE1	NXT HORIZON MLPE & LUG CLAMP









UNIRAC
1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE:	NXT HORIZON
DRAWING TYPE:	PARTS ASSEMBLY
DESCRIPTION:	MLPE & LUG CLAMP
REVISION DATE:	9/22/2021

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

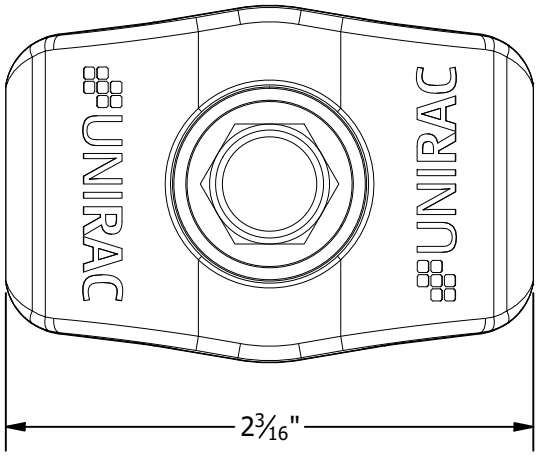
PRODUCT PROTECTED BY ONE OR MORE US PATENTS

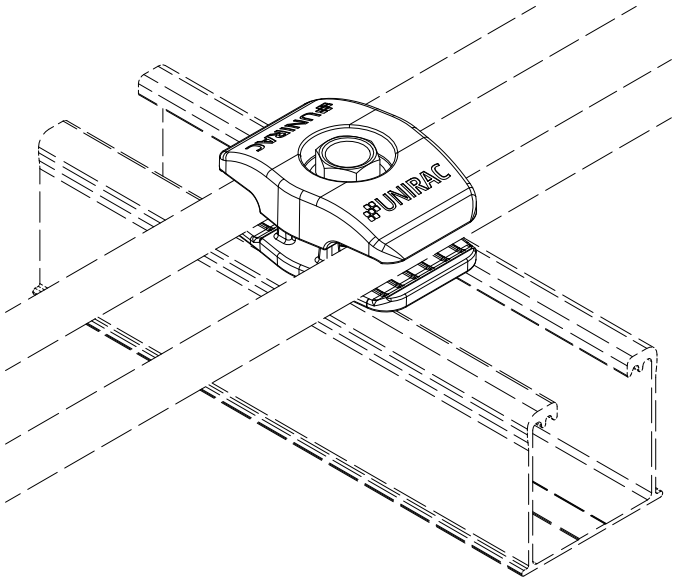
LEGAL NOTICE

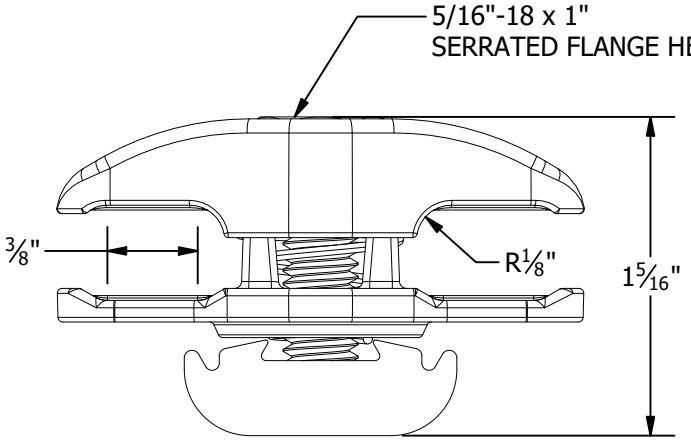
NH-A06

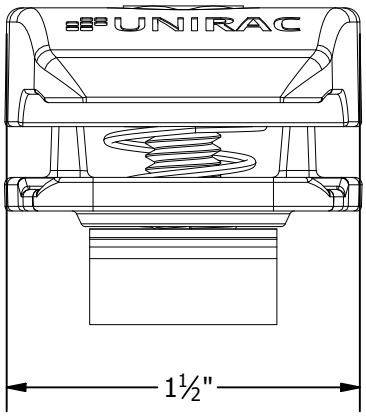
SHEET

PART # TABLE	
P/N	DESCRIPTION
WRMCNSD1	NXT HORIZON NS WIRE MGMT CLIP









UNIRAC
1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE:	NXT HORIZON
DRAWING TYPE:	PARTS ASSEMBLY
DESCRIPTION:	NS WIRE MGMT CLIP
REVISION DATE:	9/22/2021

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

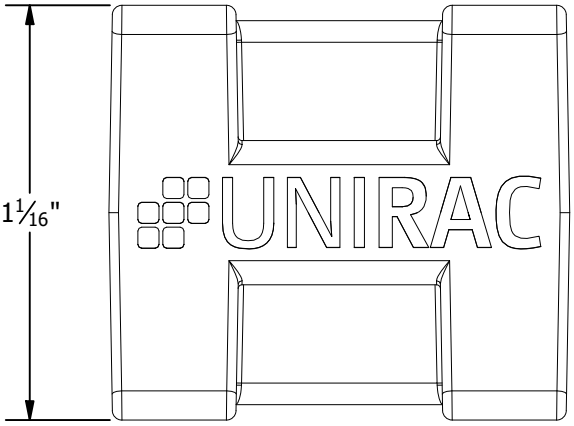
PRODUCT PROTECTED BY ONE OR MORE US PATENTS

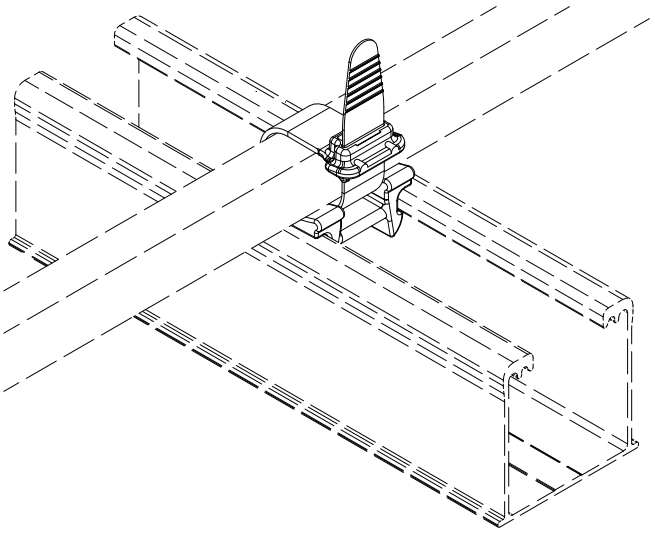
LEGAL NOTICE

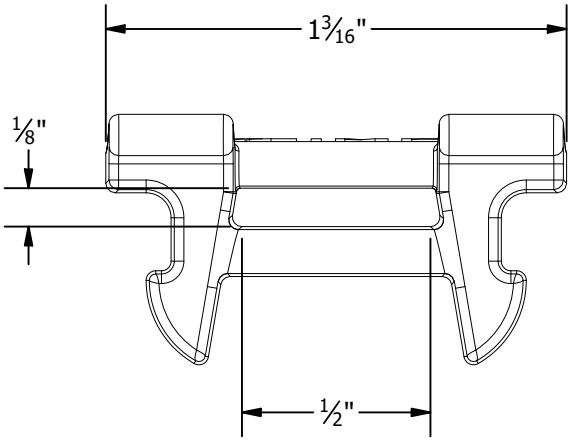
NH-A07

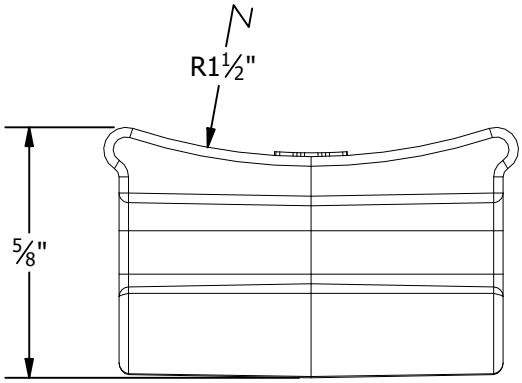
SHEET

PART # TABLE	
P/N	DESCRIPTION
WRMCLPD1	NXT HORIZON WIRE MGMT CLIP









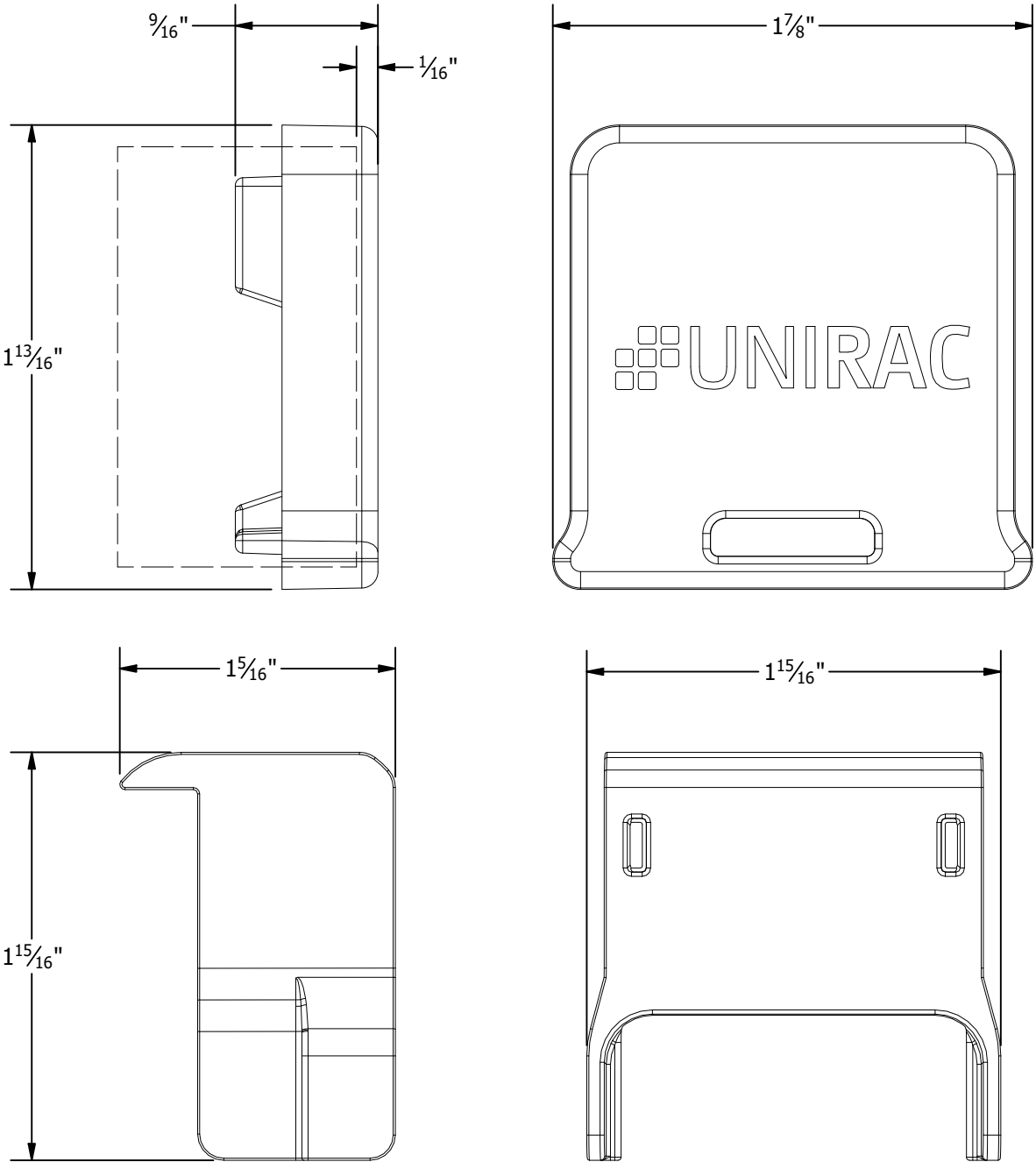
UNIRAC
1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE:	NXT HORIZON
DRAWING TYPE:	PARTS
DESCRIPTION:	WIRE MGMT CLIP
REVISION DATE:	10/27/2021

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

NH-A08
SHEET

PART # TABLE	
P/N	DESCRIPTION
ENDCAPD1	NXT HORIZON RL & CLMP CAP KIT



UNIRAC
1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE:	NXT HORIZON
DRAWING TYPE:	PARTS
DESCRIPTION:	RAIL & CLAMP CAP
REVISION DATE:	9/15/2021

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

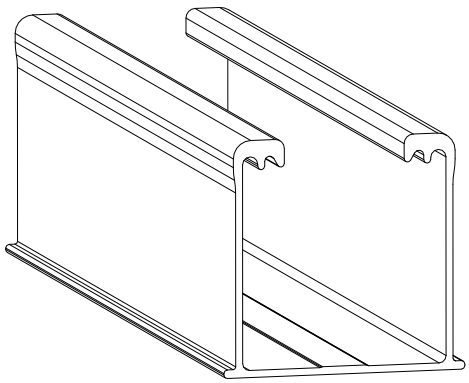
PRODUCT PROTECTED BY ONE OR MORE US PATENTS

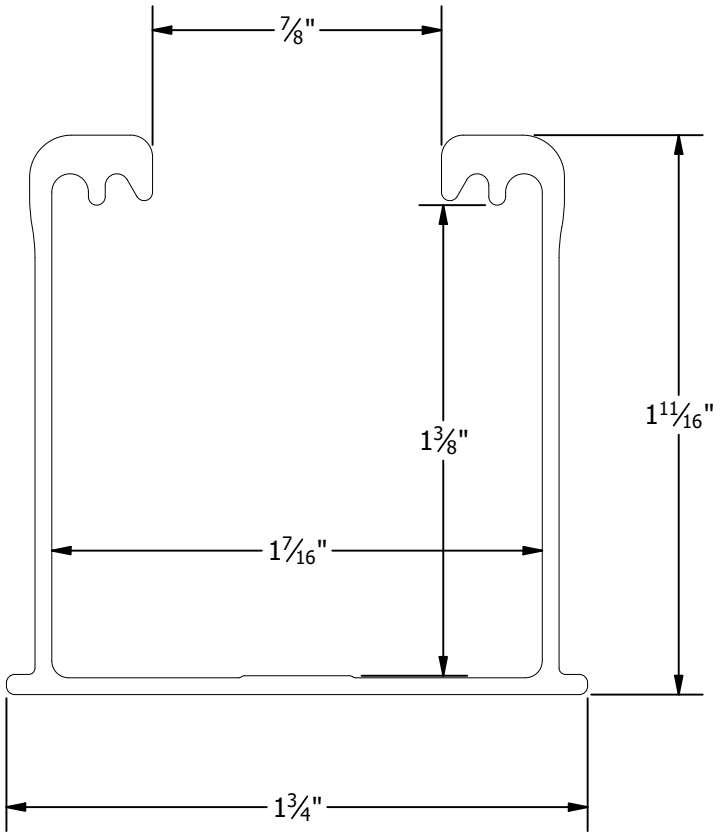
LEGAL NOTICE

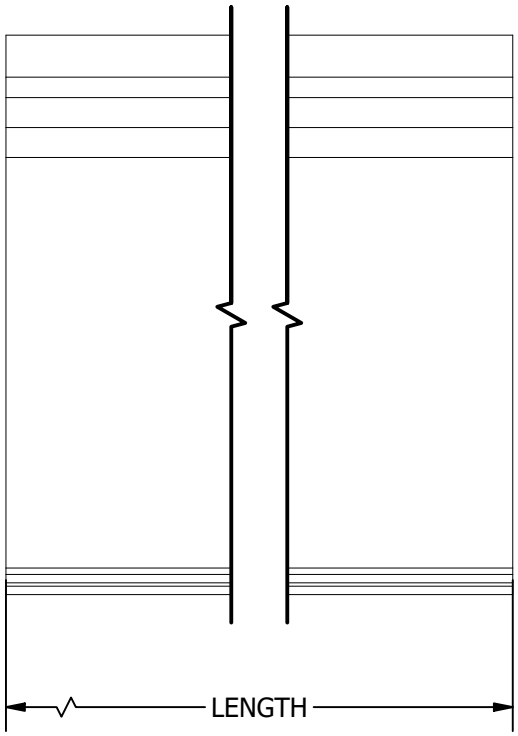
NH-A09

SHEET

PART # TABLE		
P/N	DESCRIPTION	LENGTH
084RLM1	NXT HORIZON RAIL 84" MILL	84"
084RLD1	NXT HORIZON RAIL 84" DARK	84"
168RLM1	NXT HORIZON RAIL 168" MILL	168"
168RLD1	NXT HORIZON RAIL 168" DARK	168"
208RLM1	NXT HORIZON RAIL 208" MILL	208"
208RLD1	NXT HORIZON RAIL 208" DARK	208"
246RLM1	NXT HORIZON RAIL 246" MILL	246"
246RLD1	NXT HORIZON RAIL 246" DARK	246"







UNIRAC
1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE:	NXT HORIZON
DRAWING TYPE:	PART DETAIL
DESCRIPTION:	RAIL
REVISION DATE:	9/13/2021

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

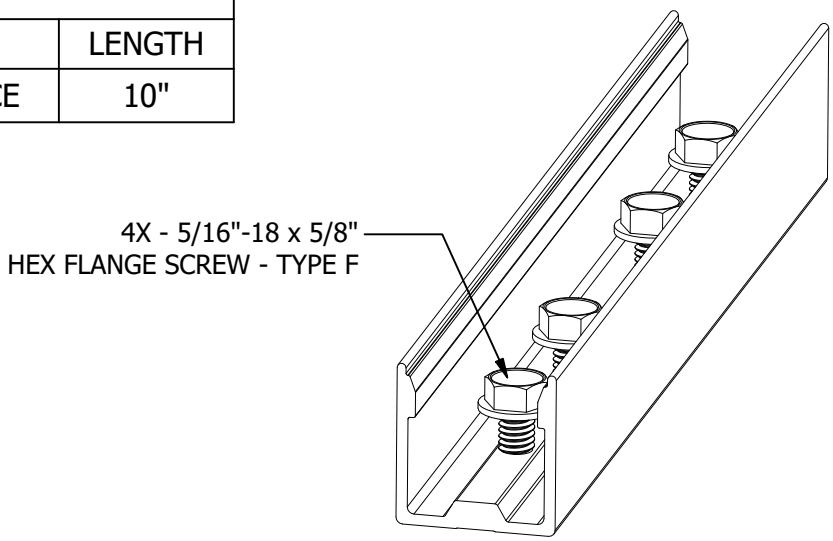
PRODUCT PROTECTED BY ONE OR MORE US PATENTS

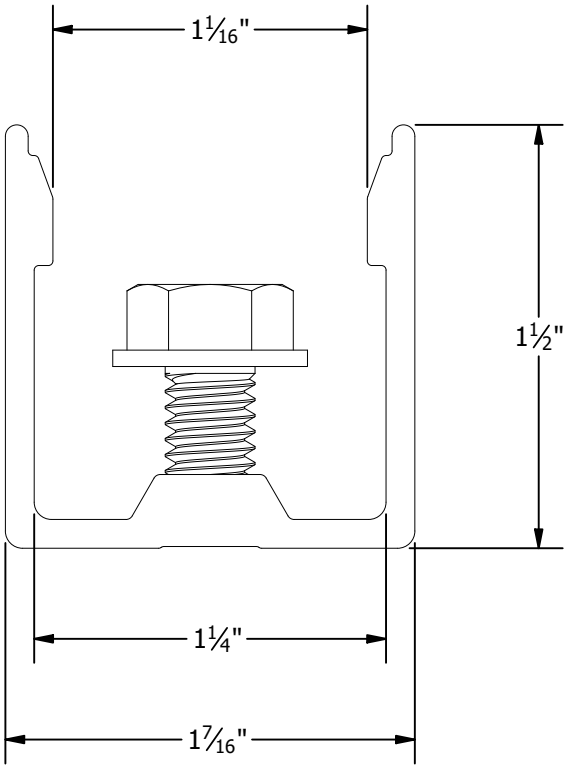
LEGAL NOTICE

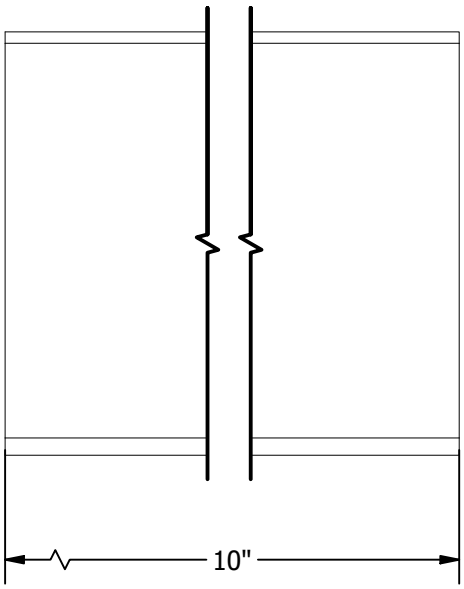
NH-P01

SHEET

PART # TABLE		
P/N	DESCRIPTION	LENGTH
RLSPLCM1	NXT HORIZON RAIL SPLICE	10"







UNIRAC
1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE:	NXT HORIZON
DRAWING TYPE:	PART DETAIL
DESCRIPTION:	RAIL SPLICE
REVISION DATE:	9/22/2021

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE OR MORE US PATENTS

LEGAL NOTICE

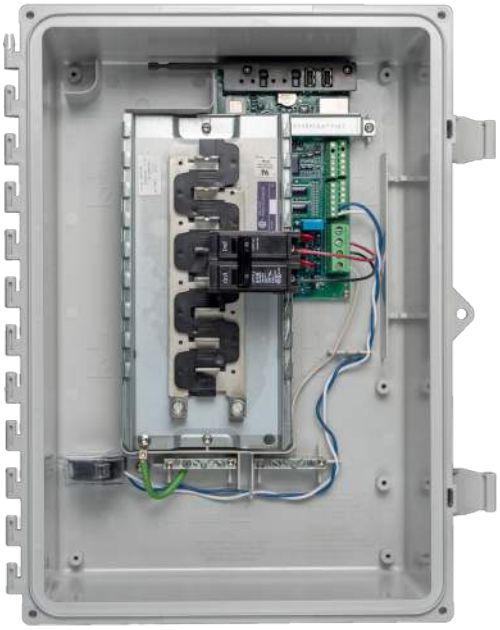
NH-P02

SHEET

Enphase IQ Combiner 3

(X-IQ-AM1-240-3)

The **Enphase IQ Combiner 3**™ with Enphase IQ Envoy™ consolidates interconnection equipment into a single enclosure and streamlines PV 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 Envoy for communication and control
- Flexible networking supports Wi-Fi, Ethernet, or cellular
- Optional AC receptacle available for PLC bridge
- Provides production metering and optional consumption monitoring

Simple

- Reduced size from previous combiner
- Centered mounting brackets support single stud mounting
- Supports back and side conduit entry
- Up to four 2-pole branch circuits for 240 VAC plug-in breakers (not included)
- 80 A total PV or storage branch circuits

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year warranty
- UL listed

UL LISTED

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE.

Enphase IQ Combiner 3

MODEL NUMBER	
IQ Combiner 3 X-IQ-AM1-240-3	IQ Combiner 3 with Enphase IQ Envoy™ printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and optional* consumption monitoring (+/- 2.5%).
ACCESSORIES and **REPLACEMENT PARTS** (not included, order separately)	
Enphase Mobile Connect™ CELLMODEM-03 (4G / 12-year data plan) CELLMODEM-01 (3G / 5-year data plan) CELLMODEM-M1 (4G based LTE-M / 5-year data plan)	Plug and play industrial grade cellular modem with data plan 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.)
Consumption Monitoring* CT CT-200-SPLIT	Split core current transformers enable whole home consumption metering (+/- 2.5%).
Circuit Breakers BRK-10A-2-240 BRK-15A-2-240 BRK-20A-2P-240	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
EPLC-01	Power line carrier (communication bridge pair), quantity 2
XA-PLUG-120-3	Accessory receptacle for Power Line Carrier in IQ Combiner 3 (required for EPLC-01)
XA-ENV-PCBA-3	Replacement IQ Envoy printed circuit board (PCB) for Combiner 3
ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	120/240 VAC, 60 Hz
Eaton BR series busbar rating	125 A
Max. continuous current rating (output to grid)	65 A
Max. fuse/circuit rating (output)	90 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. continuous current rating (input from PV)	64 A
Max. total branch circuit breaker rating (input)	80A of distributed generation / 90A with IQ Envoy breaker included
Production Metering CT	200 A solid core pre-installed and wired to IQ Envoy
MECHANICAL DATA	
Dimensions (WxHxD)	49.5 x 37.5 x 16.8 cm (19.5” x 14.75” x 6.63”). Height is 21.06" (53.5 cm with mounting brackets).
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40° C to +46° C (-40° to 115° F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	• 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors • 60 A 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	To 2000 meters (6,560 feet)
INTERNET CONNECTION OPTIONS	
Integrated Wi-Fi	802.11b/g/n
Ethernet	Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included)
Cellular	Optional, CELLMODEM-01 (3G) or CELLMODEM-03 (4G) or CELLMODEM-M1 (4G based LTE-M) (not included)
COMPLIANCE	
Compliance, Combiner	UL 1741 CAN/CSA C22.2 No. 107.1 47 CFR, Part 15, Class B, ICES 003 Production metering: ANSI C12.20 accuracy class 0.5 (PV production)
Compliance, IQ Envoy	UL 60601-1/CANCSA 22.2 No. 61010-1

* Consumption monitoring is required for Enphase Storage Systems.

To learn more about Enphase offerings, visit **enphase.com**

2018-09-13

ENPHASE.