



**SP-1000**

# The Solar PaQ

*Solar Panel + Inverter + Universal Racking*

**UPC: 861150002609**

## The SP-1000 Solar PaQ.

**Solar Panel, Microinverter, and RAQ Universal Mounting System.**

Generates 295 Watts of DC power at peak performance

Mounts panel landscape or portrait.

Converts the DC power to AC for use in home or business

Meets all codes, wind & snow loads & is UL 2703.

Mounts direct to roof sheathing OR rafters.

All components 'Quick-Connect' to other *Solar PaQs*

**Solar Panel                      Trina 295 Watts                      1**

Width	Height	Depth	Weight
34.1"	65"	1.38"	41 lbs.

**UL 1703**

**Microinverter                      NEP-BDM-250-240A                      1**

Width	Height	Depth	Weight
9.0"	4.3"	1.38"	4.4 lbs

**UL 1741**

**Racking                      The 1-RAQ                      1**

Length	Width	Height	Weight
42"	39.5"	8.5"	18 lbs.

**UL 2703**



### Box Dimensions

Width	Height	Depth	Weight
41"	66.5"	7"	95 lbs.



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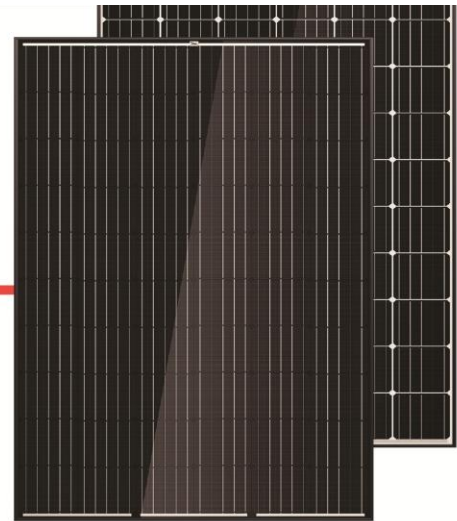
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## The Solar Panel

### THE ALLMAX<sup>M</sup> plus<sup>+</sup> FRAMED 60-CELL MODULE



**60 CELL**  
MONOCRYSTALLINE MODULE

**275-315W**  
POWER OUTPUT RANGE

**19.2%**  
MAXIMUM EFFICIENCY

**0~+5W**  
POSITIVE POWER TOLERANCE

Founded in 1997, Trina Solar is the world's leading comprehensive solutions provider for solar energy. We believe close cooperation with our partners is critical to success. Trina Solar now distributes its PV products to over 60 countries all over the world. Trina is able to provide exceptional service to each customer in each market and supplement our innovative, reliable products with the backing of Trina as a strong, bankable partner. We are committed to building strategic, mutually beneficial collaboration with installers, developers, distributors and other partners.

#### Comprehensive Products And System Certificates

IEC61215/IEC61730/UL1703/IEC61701/IEC62716  
ISO 9001: Quality Management System  
ISO 14001: Environmental Management System  
ISO14064: Greenhouse gases Emissions Verification  
OHSAS 18001: Occupation Health and Safety Management System



**Trinasolar**



#### Maximize limited space with top-end efficiency

- Up to 192W/m<sup>2</sup> power density
- Low thermal coefficients for greater energy production at high operating temperatures



#### Highly reliable due to stringent quality control

- Over 30 in-house tests (UV, TC, HF, and many more)
- In-house testing goes well beyond certification requirements
- PID resistant
- 100% EL double inspection
- Selective emitter, advanced surface texturing



#### Certified to withstand the most challenging environmental conditions

- 2400 Pa wind load
- 5400 Pa snow load
- 35 mm hail stones at 97 km/h

#### LINEAR PERFORMANCE WARRANTY

10 Year Product Warranty · 25 Year Linear Power Warranty







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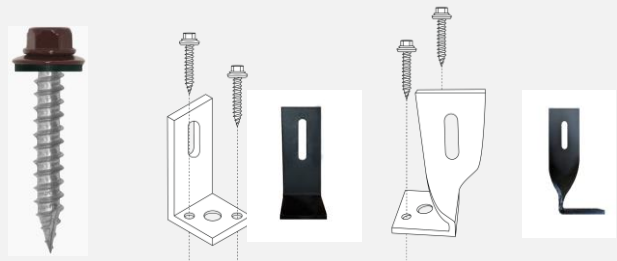
## The RAQ One Panel Universal Racking System



### RB-1000 BI-FOLD FOLDED

LENGTH	42"	1066.8 MM
WIDTH	8"	203.2 MM
HEIGHT	8.5"	215.9 MM
WEIGHT	18 LBS.	8.2 KG

### #10 Deck Screw 1 1/2"

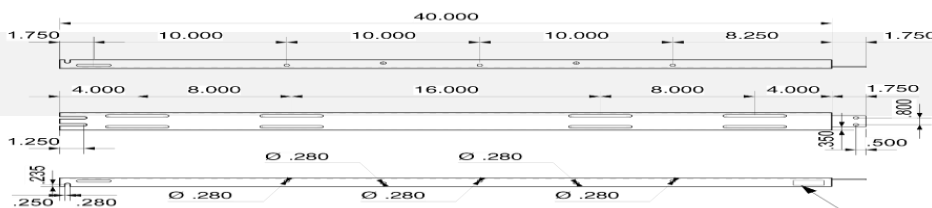


### RB-1000 UNFOLDED DIMENSIONS

LENGTH	42"	1066.8 MM
WIDTH	39.5"	215.9 MM
WEIGHT	18 LBS.	8.2 KG
HEIGHT	8.25"	76.2 MM

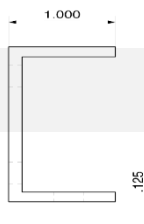
### RB-1000 CERTIFICATIONS

UL MECHANICAL	US & CA 2703	E353639
UL ELECTRICAL	US & CA 2703	E353639
UL FIRE TYPE I	US & CA 2703	E353639
UL FIRE TYPE 2	US & CA 2703	E353639



SPATIAL DIMENSIONS

FINISH



RAIL SECTION



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<b>RAFTER SPACING</b>	12", 16", 24", 48", 72", 96'	TEXTURED BLACK POWDER COAT	1-3 MM
<b>PV PANEL WIDTH</b>	38.66" - 39.37"	982-1000 MM	
<b>PANEL THICKNESS</b>	1.22"-1.73"	31-45 MM	

## LAG BOLT OPTION

WINDZONE		SNOW LOAD	
72" spacing of anchors	90 mph	72" spacing of anchors	60 lbs.
48" spacing of anchors	160 mph (Standard)	48" spacing of anchors	90 lbs.
24" Spacing of anchors	190 mph	24" spacing of anchors	120 lbs.

PLACEMENT		MATERIALS
<b>PORTRAIT /LANDSCAPE STAGGER ANCHOR BASES</b>	<b>YES / YES 4</b>	<b>STEEL AR36-GS120 12 GAUGE</b>
<b>CANTILEVER</b>	<b>UP TO 16"</b>	<b>ALUMINUM T6</b>
<b>RAIL ASSEMBLY WITH PANEL CLAMPS</b>	<b>2 UNITS 2 PANEL CLAMPS</b>	
<b>ANCHOR BASES/ FEET</b>	<b>4</b>	
<b>START BRACKETS W/PANEL CLAMPS</b>	<b>2</b>	
<b>MECHANICAL FLASHING</b>	<b>4</b>	
<b>CROSS BRACE/ INVERTER BOLT T23</b>	<b>2</b>	
<b>UV ZIP TIE</b>	<b>1</b>	



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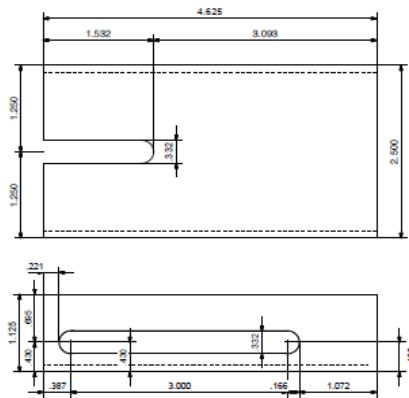
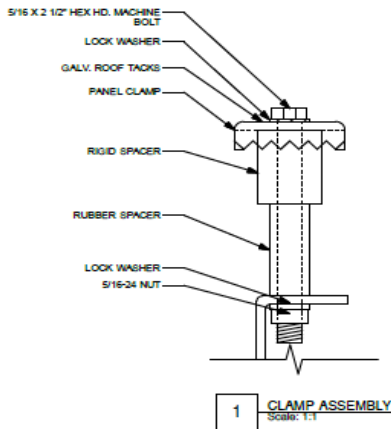
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## The RAQ Start Bracket Kit

**\*THE START BRACKET KIT IS A NECESSARY COMPONENT FOR STAND ALONE UNITS AND/ OR TO START A ROW**



### SR-0700 START BRACKET WITH ASSEMBLY DIMENSIONS

Length	4 1/2 "	114.3 mm
Width	1 1/8"	28.575 mm
Height	4 7/8"	123.825 mm
Weight	1.75 lbs..	.79 mm

### SR-0700 START BRACKET WITHOUT ASSEMBLY DIMENSIONS

Length	4 1/2 "	114.3 mm
Width	1 1/8"	28.575 mm
Height	2 5/8"	66.675 mm
Weight	8 oz. ea.	.227 kg



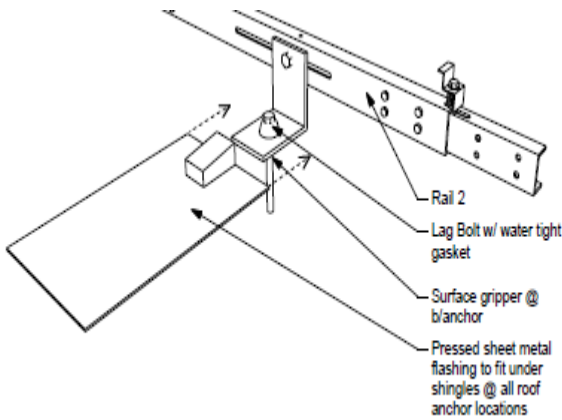
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## Mechanical Flashing



The RAQ, LLC: Flashing Base, No-Caulk Roof Flashings can be used in commercial and residential applications where a watertight seal for roof penetrations around the solar racking mounting foot is required. G-120 Roof Flashing slides over SR-300 foot for roof pitch above 14°.

*Made of stamped Steel  
Non-fading Powder Coat finish  
Approved for UL 790 & Fire Type I-II  
Not for hot-mopped or built-up roofs  
Do not use paint or petroleum based products on flashing*

Type: ASTM

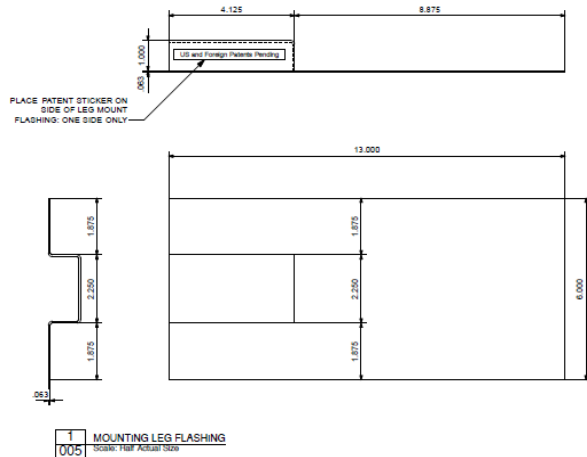
Powder Coat: TEXTURED BLACK 1-3 mm

Disc.: D3451-06

A653 SS 50 CLASS 1 G120 CO

### UL CERTIFICATIONS

MECHANICAL	US & CA 2703	E353639
ELECTRICAL	US & CA 2703	E353639
FIRE TYPE I	US & CA 2703	E353639
FIRE TYPE 2	US & CA 2703	E353639





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MILL STEEL COMPANY 1000  
CERTIFICATION

Shipper: 814020207  
Truck: HADDAD INTERNATIONAL  
SCAC: HITI  
Move: 314016019-1

Ship-To: (3331)  
ROLLER DIE & FORMING  
1172 INDUSTRIAL BLVD  
LOUISVILLE, KY 40219

Page: 2

Ordered By: (3331)  
ROLLER DIE & FORMING  
1172 INDUSTRIAL BLVD  
LOUISVILLE, KY 40219

Bill-To: (3331)  
ROLLER DIE & FORMING  
1172 INDUSTRIAL BLVD  
LOUISVILLE, KY 40219

<u>Order</u>	<u>R</u>	<u>F</u>	<u>Customer P.O.</u>	<u>Gauge</u>	<u>Tolerance</u>	<u>Quality</u>
413212036	5	DEL	0025517	.09900	+.00600	HDCOHS
<u>Date</u>	<u>Time</u>	<u>Customer Part#</u>	<u>Width</u>	<u>Tolerance</u>	<u>L</u>	<u>#Lifts</u>
1/20/14	12:50:45	M-2374	4.3590	+/- .0050		3

Coated Weight: G-120

713288042-12	size:	wt:	4,087	lbs	size:	50	lbs	Gross:	4,087	lbs			
C:	.320	wt:	.760	F:	.013	G:	.007	H:	.013	I:	.007	J:	.002
K:	.014	L:	.023	M:	.001	N:	.002	O:	.004	P:	.000	Q:	.002
tenale:	84.3	wt:	yield:	59.3	wt:	size:	20-6.0	wt:	.164	tenale11(m)	23	wt:	
						size:		wt:		wt:			
						size:	0134305						
*** TOTAL ***		wt:	20,185	lbs	size:	150	lbs	Gross:	20,335	lbs			

Lift Summary

size:	014103	Cnt:	2	wt:	8,074	lbs	size:	50	lbs	Gross:	8,124	lbs
size:	014102	Cnt:	2	wt:	8,074	lbs	size:	50	lbs	Gross:	8,124	lbs
size:	713288042-12	Cnt:	1	wt:	4,037	lbs	size:	50	lbs	Gross:	4,087	lbs

Data is subject to Manufacture tolerances





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## Universal Roof Mount Racking Product Description

The 1-RAQ is UL rated 2703; integrated structural & electrical grounding holding one solar panel in portrait or landscape position. It is self-aligning, self-squaring, and designed to be installed quickly. The RAQ technology has "vastly reduced installation times" by a proven factor of 76% (NREL). A patented mounting system that unfolds from a compact shipping state. Providing pre-positioned anchoring hardware and it universally mounts to the majority of 60 or 72 cell Solar Panels, on the market today.

Up to 18, 1 Panel RAQ's can be connected in a single row using only 1 grounding point per rail. Designed for rafter spacing of 12", 16", 24" without modifications the 1 Panel RAQ is rated for 190 mph winds and 120lbs snow loads with roof anchors at 24" using lag bolts in portrait position.

### Structural Joints

All joining connections points are UL rated for structural, mechanical and electrical; allowing anchor location adjustments in the field.

### Integrated Grounding

All connection points are UL rated for grounding. Only one grounding point for each rail on the stand- alone unit or on a single row is needed. Grounding lugs are provided with the Power PaQ 2400 & 4800. The grounding lug will also enable you to ground to any additional rows, using a 10-gauge copper wire; which will ground the entire unit. When using an inverter that requires grounding please follow manufactures suggestions. A stainless steel "Type 23" self-tapping bolt is provided for each inverter connection point, to mount inverter.

### Vertical Adjustable Anchor Points

Each anchor of the racking is adjustable in height 1.5" to its connection to the rail to allow for variances in levels of the roof. This allows the installation of a flat array accounting for condition of roof surface

### Lag Bolt Option

**Lag bolts Not Provided: Recommended 5/16 x 4.5 18-8, Stainless Steel 100--- 125,000 psi nominal**

While the anchors of the racking are preset at 24" rafter spacing in portrait, they can be adjusted to 12",16" and 24", spacing. Each connection point of anchor to rail allows a 3" tolerance for rafter misalignment. In the event of a misaligned rafter of greater than 3" the anchor can be removed and a hole can be drilled anywhere in the panel rail with the use of cold-rolled drill bit.

### Adjustable panel clamp locations

Mounting position for all the panel clamps, have a 3" range of adjustment for variable width of solar panels. See installation instructions for details.

### Adjustable panel spacers

Each panel clamp is adjustable by rotating it 90 degrees, this spacing between panels to be adjusted to compensate for panel width changes

### Bi-fold type cross brace

The Bi-Fold squaring arm requires an additional "Type 23" self- tapping bolt which is provided to secure the unit square

### **Suggested to use in conjunction with**

Solar PaQ-Power PaQ 2400 or 4800, Ground Mount Conversion, Ballast Mount Conversion

### **Suggested 3rd party providers of**

SS or common metal roof clamps. Tile roof clamps.





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# The Solar PaQ

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## The Microinverter

### NEP-BDM-240-250A- Microinverter

- Designed to connect PV modules and perform DC to AC conversion
- High efficiency with 96.3% max
- Very simple installation with built in cables and connectors
- NEMA-6 IP-66/IP-67 enclosure rating
- Integrated monitoring and power line communication with BDG -256 gateway
  
- **Globally certified for:**
  - C-ELT-US
  - SAA
  - TUV
  - VDE-AR-N 4105
  - VDE 0126
  - G83/2,
  - EN50438
  
- **Compliances**
  - UL1741
  - CSA-C22.2 No.107.1 /
  - FCC Part 15 Class B , AS4777.2 , AS4777.3

### Detail Specifications

• Rated Power Output [W]	225
• Length [mm (in)]	138 mm (5.44 in)
• Width [mm (in)]	230 mm (9.06 in)
• Depth [mm (in)]	35 mm (1.38 in)
• Weight [kg (lb)]	2.0 kg (4.4 lb)
• Warranty [Years]	25

### Characteristics

Inverter Type	Grid-Tie Microinverter
Maximum/Peak Efficiency [%]	96.3%
CEC weighted efficiency [%]	95.0%
DC Power Rating [W]	250
Nom. DC Voltage [V]	55
Voltage Lower Limit for MPP Range [V]	22
Voltage Upper Limit for MPP Range [V]	45
Nominal AC Power [W]	225
AC voltage range [V]	211 ~ 264
AC grid frequency [Hz]	60
Nominal AC Voltage [V]	240
Max. AC Line Current [A]	1
AC Current Distortion [THD%]	<4%
Max Microinverters Units per xA string	15
Sleep (Night) Consumption [W]	<0.17W
Ambient Temperature Range [°C(°F)]	-40°C ~ +65°C
Operating Humidity [%]	0 ~ 95%
Display LED	Indicator
Communication	PLC (Power Line Communication)
Basic Warranty [Years]	25
AC grid range [Hz]	59.3 ~ 60.5
Max. recommended PV power (@ module STC)	270

### Other Characteristics

Over / Under Voltage Protection	YES
Over / Under Frequency Protection	YES
Anti-Islanding Protection	YES
Over Current Protection	YES
Reverse DC Polarity Protection	YES
Overload Protection	YES
MPPT Efficiency	>99.5%