

Drop GO Stacking



V9 24Nov2010

1 Day installation with Pre-Cast concrete ballast
Minimum Site Prep
Lowest Life-Cycle-Cost of any tracker



Up to
3.8kW
per tower

Seasonal
Adjustable
Acquires >95%
of dual axis with
Lower cost
Lower power
(no 120v AC)

Less maintenance

LOWER Life-Cycle Cost



PS 8,10,12,15,16 or 18 panel Strongback
7-8.5ft above grade



SunpointGPS Tracker Retrofit
1.5ft tall self-aware self-powered
(optional - can be added anytime)



5 ft Galvanized post (6.5ft for without SunpointGPS)



Base Mount
Galvanized



Ballast 1..2- 1.65ft high
above grade



Built-in
Conduit



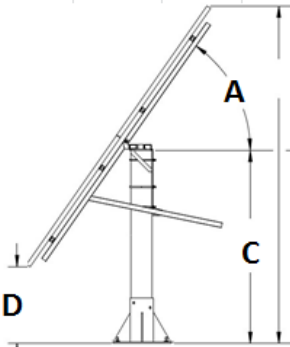
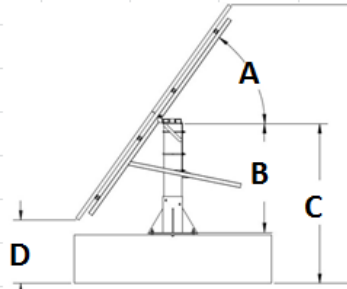
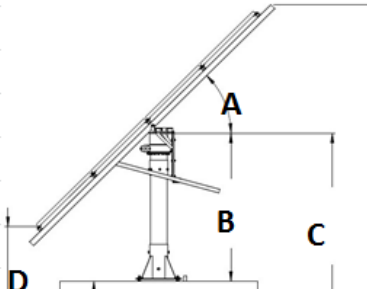
Mounts 15x
180-240w
PV panel
any make

Up to 18
<180w panels

Full PS3000 Drop N Go Stack

Drop N GO Stacking

V95 Feb 2011

		Array Panel/Orientation	10 Panel 5x2 Portrait	12 Panel 6x2 Portrait	15 Panel 5x3 Portrait	16 Panel 4x4 Landscape	18 Panel 6x3 Portrait		
		IN-GROUND PEDESTAL	PS2000P	PS2400P	PS3000P	PS3200L	PS3600		
		Post Length	12' (3.66m)	12' (3.66m)	15' (4.6m)	15' (4.6m)	15' (4.6m)		
		Array Angle	A	55° Tilt From Horizontal				45° Tilt	
		Top Of Pole Above Grade	C	8ft (2.44m)	8ft (2.44m)	8ft (2.44m)	8ft (2.44m)	8ft (2.44m)	
		Ground Clearance	D	49.6" (1.26m)	49.6" (1.26m)	25.5" (.66m)	29.9" (.76m)	25.5" (.66m)	
		In-ground Concrete	Local Design only						
		DropNGo	PS2000	PS2400	PS3000	PS3200	PS3600		
		Post Length	5Ft	5Ft	6.5ft	6.5ft	5Ft		
		Array Angle	A	45° Tilt From Horizontal				45° Tilt	
		Array Center	Above Ballast	B	5' (1.52m)	5' (1.52m)	6.5' (2m)	6.5' (2m)	7.23' (2.21m)
			Above Grade	C	6.4' (1.95m)	6.4' (1.95m)	8.3' (2.53m)	8.3' (2.53m)	8.9' (2.7m)
		Panel Ground Clearance	D	36.9" (.94m)	37.6" (.96m)	37.4" (.95m)	50.4" (1.28m)	40.84'(1.04m)	
		8.6ft Diameter Ballast	1.2ft thick ~10,780lbs	1.67ft thick ~14,450lbs	2ft thick ~17,400lbs				
		DropNGo with SunpointGPS	PS2000	PS2400	PS3000	PS3200	PS3600		
		Post Length	5Ft	5Ft	5Ft	5Ft	5Ft		
		Array Angle	A	45° Tilt From Horizontal				45° Tilt	
		Array Center	Above Ballast	B	5' (1.52m)	5' (1.52m)	5' (1.52m)	5' (1.52m)	7.6' (2.3m)
			Above Grade	C	7.8' (2.38m)	7.8' (2.38m)	8.2' (2.5m)	8.2' (2.5m)	9.6' (2.9m)
		Panel Ground Clearance	D	53.4" (1.36m)	53.4" (1.36m)	35.9" (.91m)	48.9" (1.24m)	47.8'(1.2m)	
		8.6ft Diameter Ballast	1.2ft thick ~10,780lbs	1.67ft thick ~14,450lbs	2ft thick ~17,400lbs				

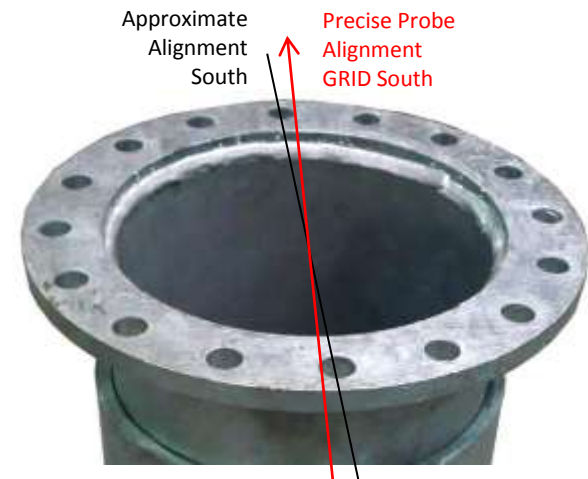
SunpointGPS is self-powered, self-contained and self-aware. It uses its own 10W solar panel and charging system to keep a 12v AGM sealed battery charged. When full this battery contains at least 3 days of operation and after a further number of cloudy days it may be more than half depleted. If this happens it simply commands the array to face south and waits for the sun.

Each day, the SunpointGPS controller moves the array in several discrete "steps" from horizon to horizon and when not actually moving it goes to sleep (powers down) and waits. This method means the unit uses less than 40/1000ths of a kWhr of it's own power a day to operate. It spends more than 95% of it's life asleep in a "powered down" configuration. When the power is turned on initially it determines it's position and time from an internal GPS clock, points in azimuth just ahead of the sun and waits for the sun to go by, sleeping while it waits. Then, at the end of the day, it will moves back east to a known EAST Reference Point, recalibrates and goes to sleep again until just before dawn. Two additional limit switches will stop all motion should the motor somehow ignore software commands. You can restart the program at any time to recalibrate it's position. Simply remove the fuse on the POS battery terminal wire, wait a few seconds and reconnect.

The system will restart, recalibrate it's location and pointing angles and then move to the current sun position.

NOTE

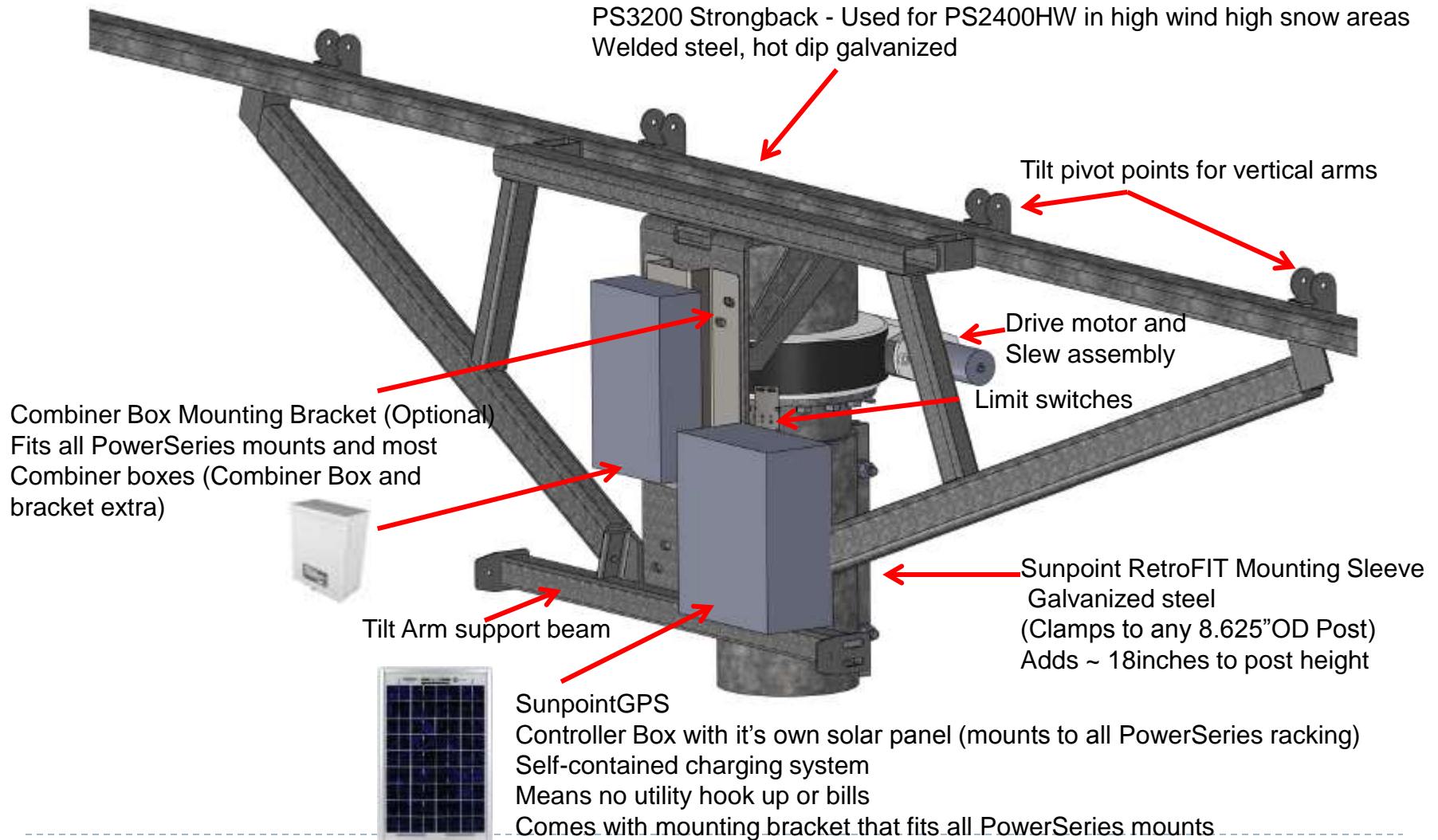
It is important to initially orient the SunpointGPS tracker facing GRID SOUTH. Pick any two opposite bolts on the mounting flange and then precisely align GRID south as shown on the right. With this done correctly, the unit will always be able to correctly face the sun and reestablish it's location even after shutting down the unit for annual inspection. Annual inspection simply check of the condition of the system to ensure nothing is loose and includes a grease check of the slew drive.



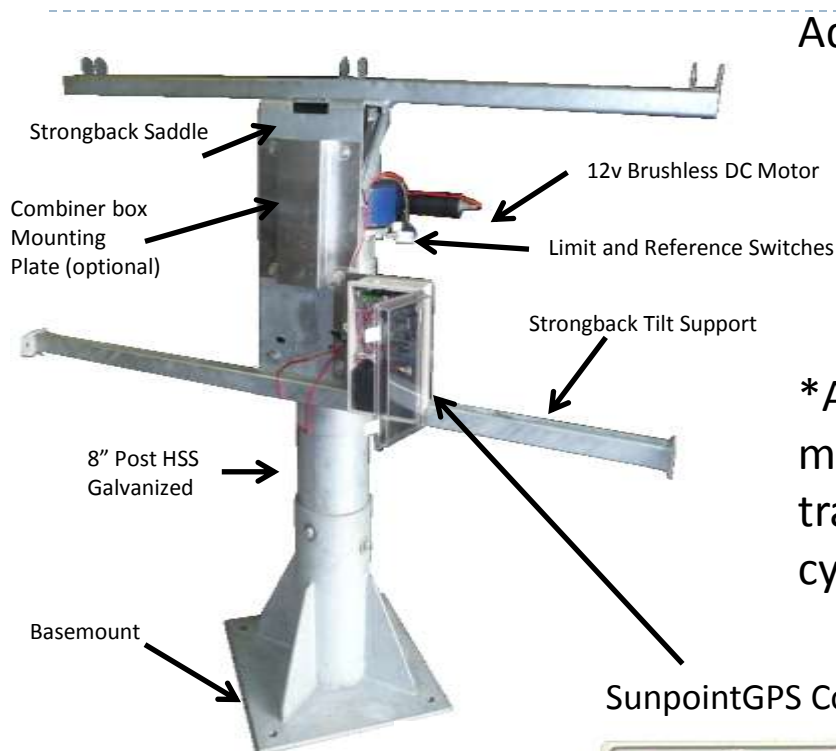
SunpointGPS Assembly



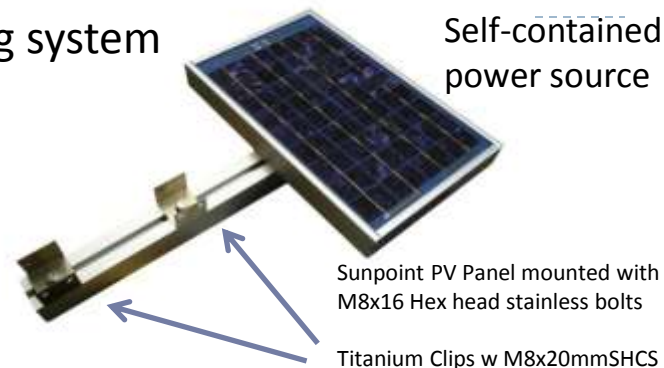
V9.3 7 Jan 2011



Sunpoint_{GPS} Tracker

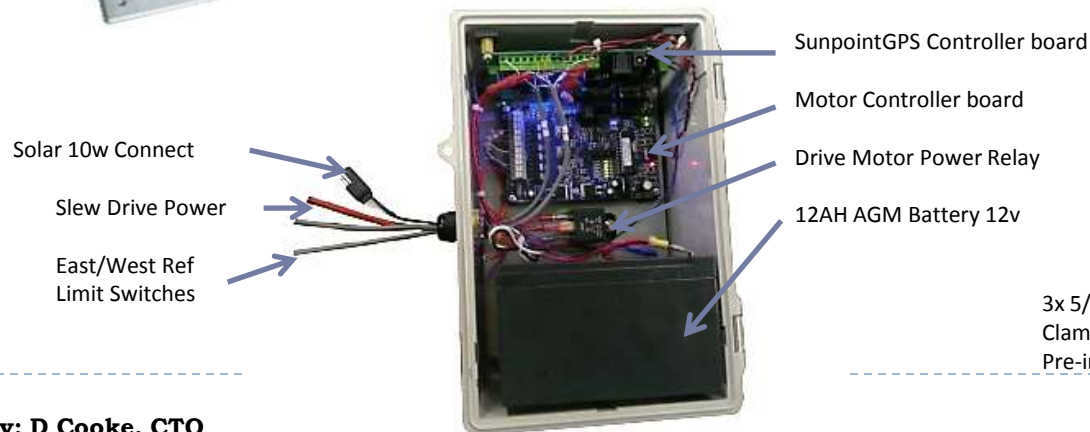


Add to any existing system

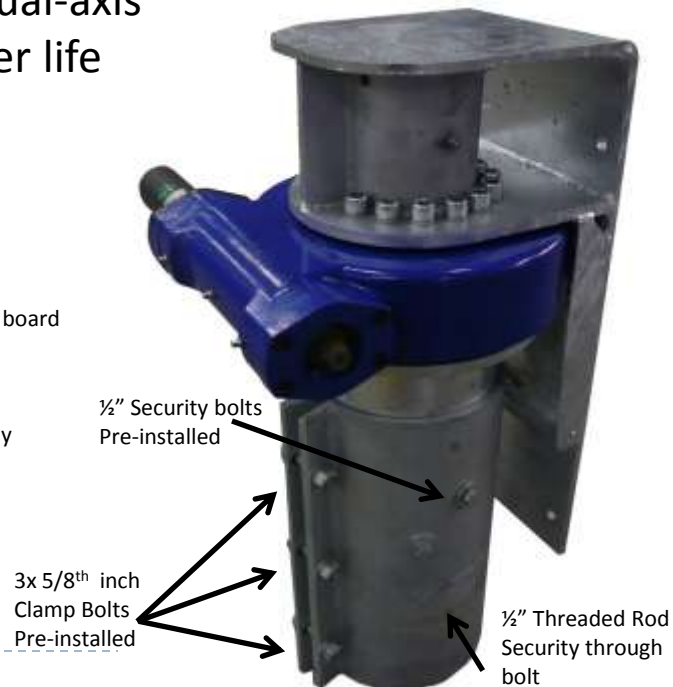


*Azimuth trackers produce more energy than dual-axis trackers due to lower life cycle cost.

SunpointGPS Controller



RetroFIT Mount



PS5000 with SunpointGPS

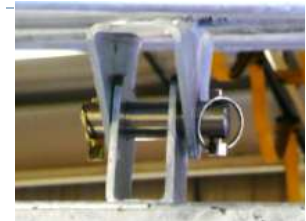


V9.1 1 Jan 2011

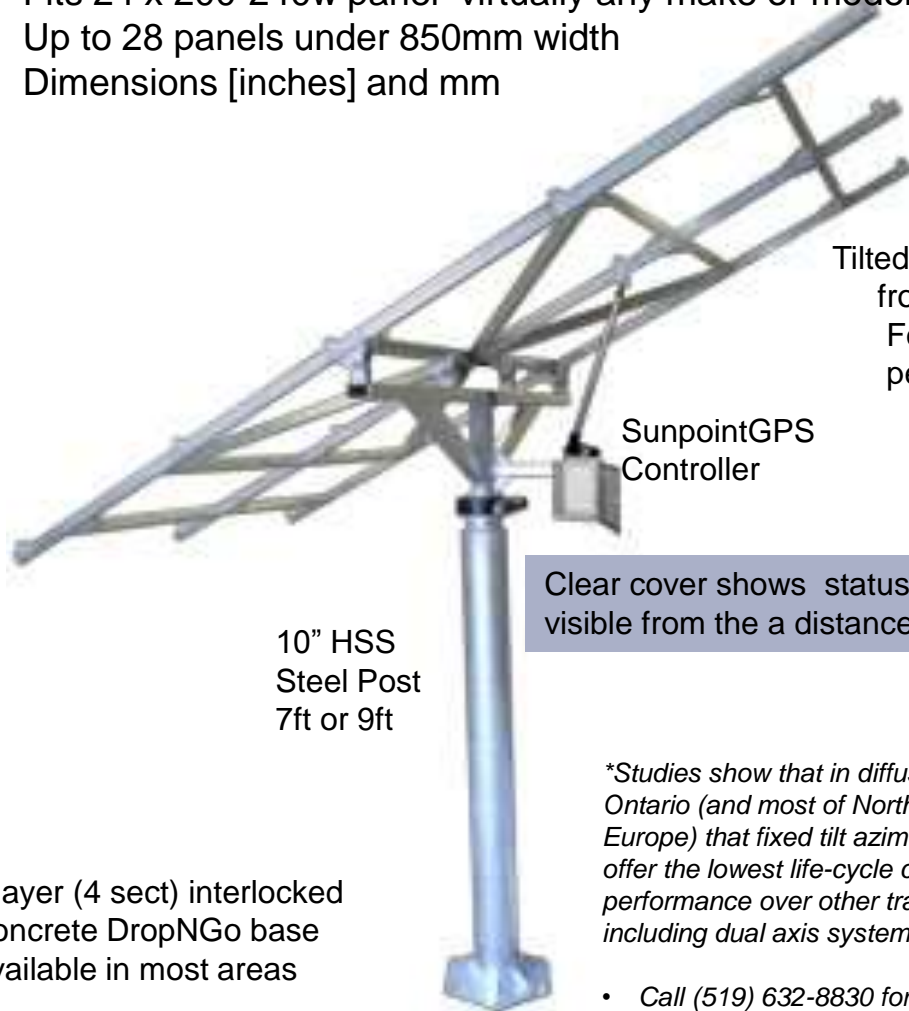
Fits 24 x 200-240w panel virtually any make or model
Up to 28 panels under 850mm width
Dimensions [inches] and mm



TITANIUM and STAINLESS Fittings – for 90mph wind And 50lbs/sqft snow loads



PS5000 Strongback and Tower



Tilted fixed 30-45 deg from horizontal
For optimum performance*

SunpointGPS Controller

Clear cover shows status LEDs visible from the a distance

10" HSS Steel Post
7ft or 9ft

**Studies show that in diffuse light regions like Ontario (and most of North America and Europe) that fixed tilt azimuth drive systems offer the lowest life-cycle cost and best performance over other tracking methods including dual axis systems.*

• Call (519) 632-8830 for details

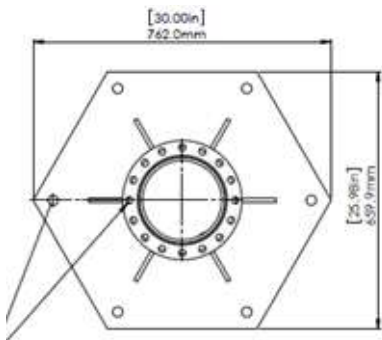
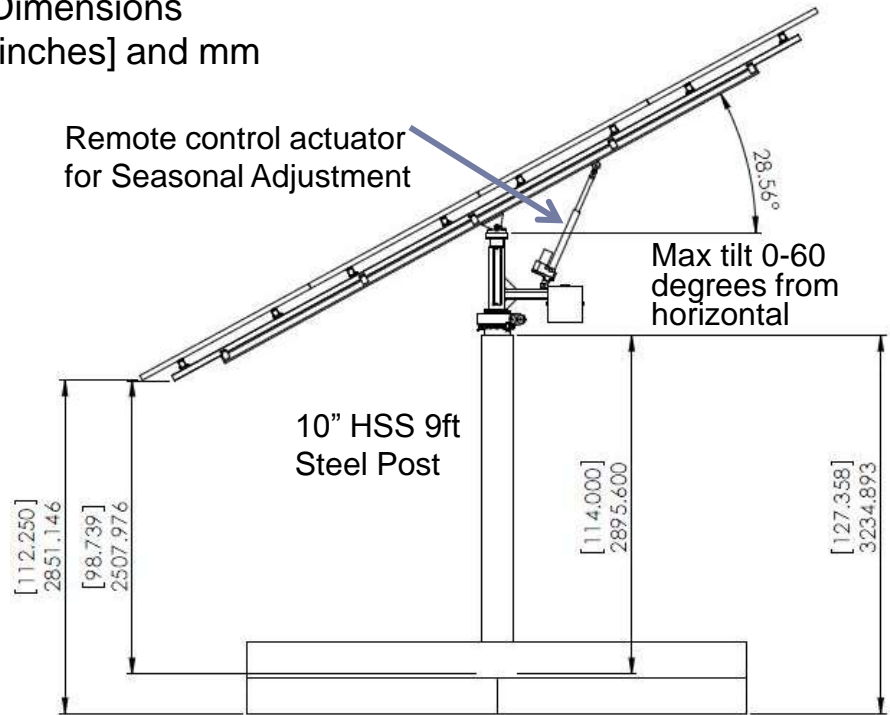


PowerSeries

PS-5000



Dimensions
[inches] and mm



SunpointGPS (All 12v)
Controller Box with it's own solar panel (mounts to all PowerSeries racking)



Self-contained charging system
Means no utility hook up or bills
Controller comes with Panel and mounting bracket that fits all mounts

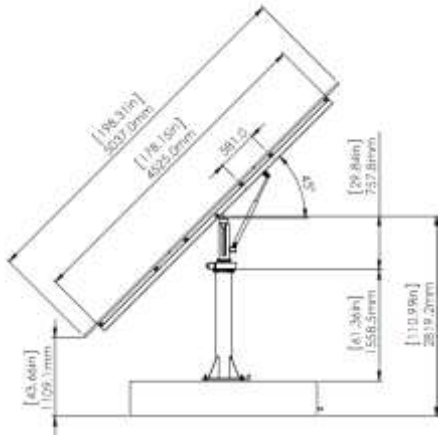


FIXED TILT or Optional Remote Tilt

Studies show adding seasonal tilt to Azimuth Tracking systems provided <1-2% additional energy and increase the Mean Time Between Failure (MTBF) of the system. More energy production is likely and lower life cycle cost is expected with azimuth drive and tilt angle optimized for summer and winter.

Visit www.truenorthpower.com
[FREE Wind News](#)





**Note: 10" x 5ft Post
6 bolt Hex Base**

Call for Wind and Snow load limits
Generally 90mph. Depends panel choice

CONFIGURATION & SOME OF THE TYPICAL PANELS THAT FIT*

A 18 Panel ~30.5 M²
(~327 ft²)

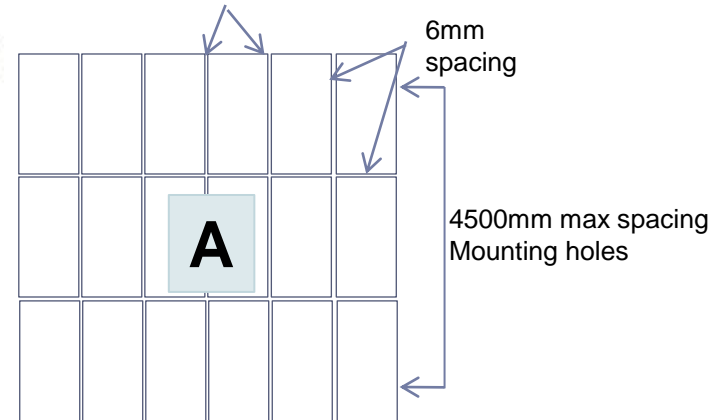
Ecosun 230, Sharp 235, Suntech 210, CS6P200
Day4 45MC or 60MC, ES190-210, Kyocera 185-210
Ky180-210, OPsun240-300, PWatt215 REC230,
Schott235, SolarWorld 220-230, Solgate 230 and others

B 21 Panel ~27.7 M²
(~300ft²)

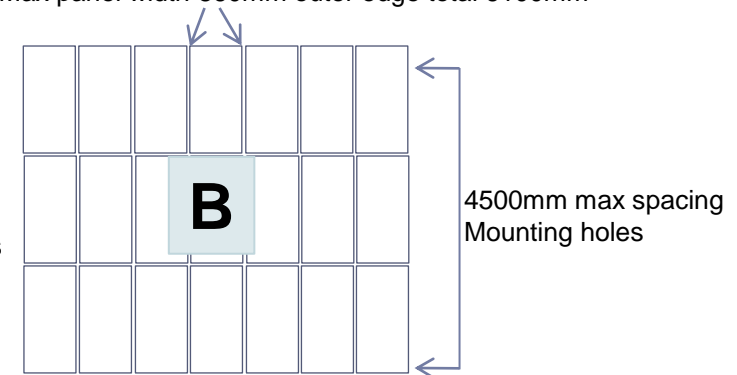
CS 160-180, Suntech 175, SG 150-180
SolarWorld 175-180, Kyocera 135,
Sharp 176-198 SanyoHIT190-200-210-215N

For 8" x 15ft (8.625OD) HSS steel Galvanized
Pedestal Moment Requirements available FREE

18 Panel Max Mounting Measurements.
Max panel width+ Space=1010 mm outer edge total 6100 mm



21 Panel Max Mounting Measurements.
Max panel width 860mm outer edge total 6100mm

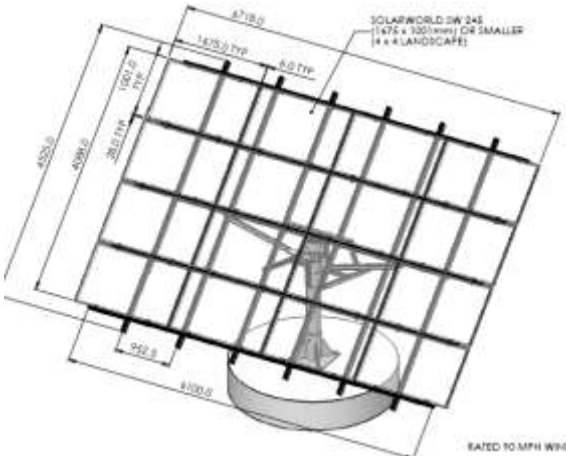


This model uses only 3 posts to achieve 10kW
Micro-FIT but has limited string and inverter matches
for 2x5kW inverters. Enphase mounts on rails.
Specify Enphase mounting kits if needed.

Landscape 4x4

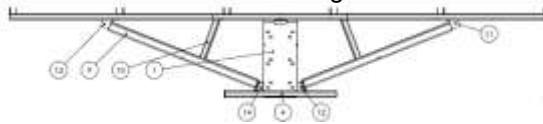
Portrait 5-6-5 layout

16 Panel 4x4 Landscape
Max panel length + Space ~5100mm edge to edge



**Fits 8" poles (8.625"OD) or DropNGo base mount
Tamperproof security bolt OPTION now available**

V-Mount Strongback



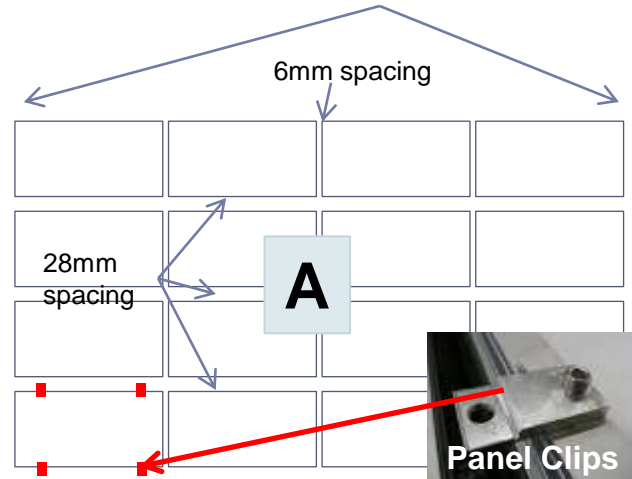
Call for Wind and Snow load limits
Generally 90mph. Depends panel choice

CONFIGURATION & SOME OF THE TYPICAL PANELS THAT FIT*

A

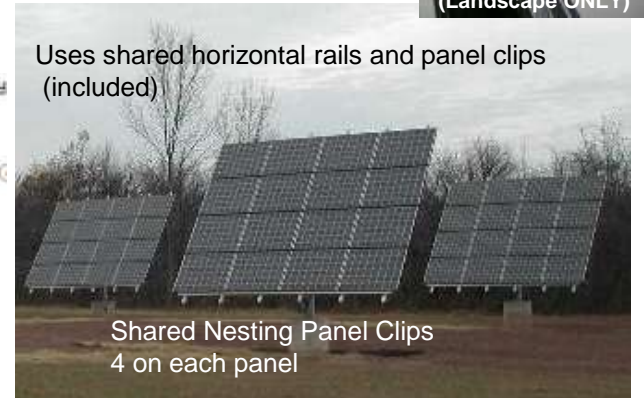
**16 Panel ~27.8 M²
(~300 ft²)**

Ecosun 230, Sharp 235, Suntech 210, CS6P200
Day4 45MC or 60MC, ES190-210, Kyocera 185-210
Ky180-210, OPsun240-300, PWatt215 REC230,
Schott235, SolarWorld 220-230, Solgate 230 and others



**Panel Clips
(Landscape ONLY)**

Uses shared horizontal rails and panel clips
(included)



Shared Nesting Panel Clips
4 on each panel

For 8" x 15ft (8.625OD) HSS steel Galvanized
Pedestal Moment Requirements available FREE

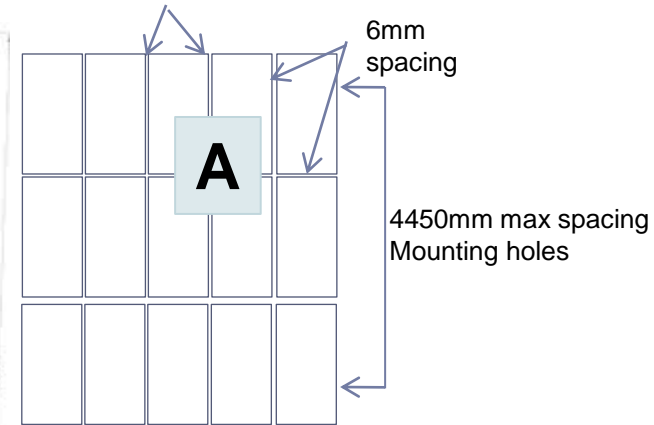


This model uses only 3 posts to achieve 10kW
Micro-FIT but has limited string and inverter matches
for 2x5kW inverters. Enphase mounts on rails.
Specify Enphase mounting kits if needed.

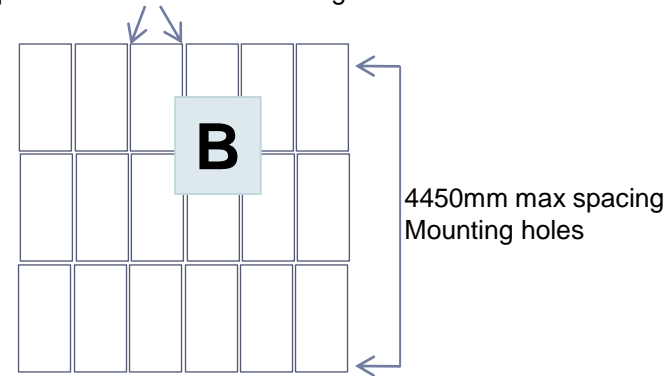
V9 24Nov2010



15 Panel Max Mounting Measurements.
Max panel width+ Space=1022 mm outer edge total 4996mm



18 Panel Max Mounting Measurements.
Max panel width 827mm outer edge total 4996mm



Call for Wind and Snow load limits
Generally 90mph. Depends panel choice

**Tamperproof security bolt
OPTION now available**

CONFIGURATION & SOME OF THE TYPICAL PANELS THAT FIT*

A

15 Panel ~24.7 M²
(~267 ft²)

Ecosun230, Sharp 235, Suntech 210, CS6P200 Day4
48MC, 60MC ES190-210, Holistic215-280 Kyocera 210
PhotoWatt215 REC230, Schott235, SolarWorld 230,
Solgate 230 +others

B

18 Panel ~23 M²
(~250 ft²)

CS 160-180, Suntech 175, SG 150-180
SolarWorld 175-180, Kyocera 135,
Sharp 176-198 SanyoHIT190-200-210-215N

For 8" x 15ft (8.625OD) HSS steel Galv. or DropNGo as shown above
Pedestal Moment Requirements available FREE

Prepared by: D Cooke, CTO

Copyright © 2010 True North Power NG Inc



This model uses only 3 posts to achieve 10kW
Micro-FIT but has limited string and inverter matches
for 2x5kW inverters. Enphase mounts on rails.
Specify Enphase mounting kits if needed.

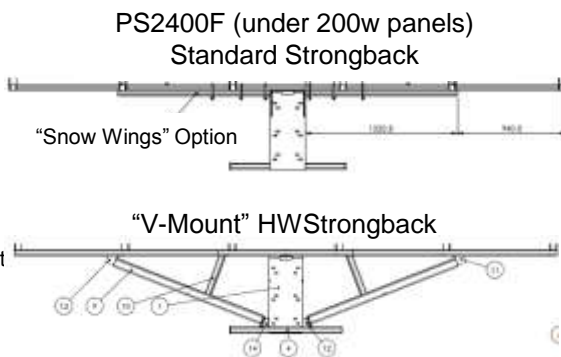
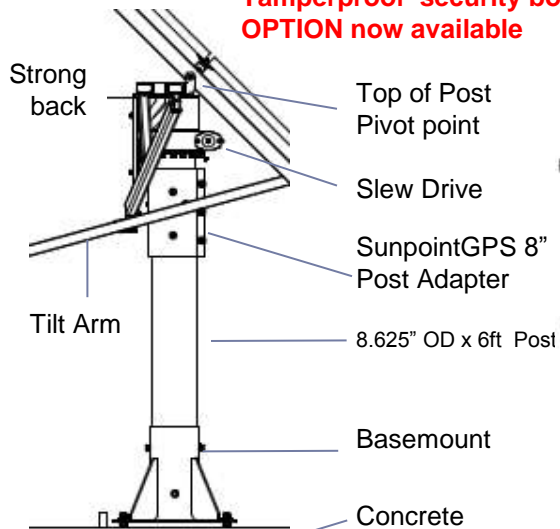
**If unsure, please call and check actual panel dimensions to confirm configuration*

Power Series

PS-2400F and HW

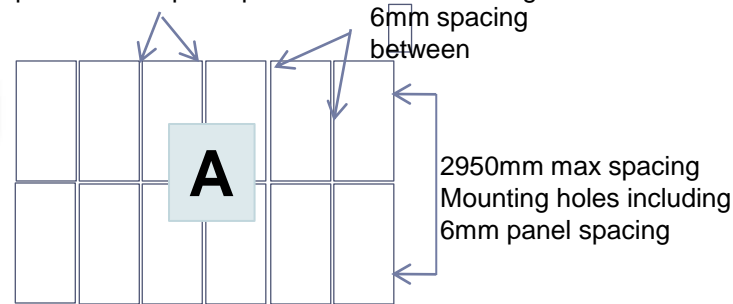


**Tamperproof security bolt
OPTION now available**

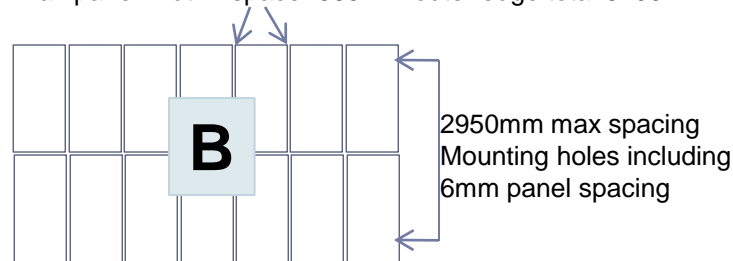


This model uses 4 posts to achieve 10kW Micro-FIT and has simpler string and inverter matching for 2x5kW inverters

12 Panel Max Mounting Measurements.
Max panel width +plus space=1012mm outer edge total 6100mm



14 Panel Max Mounting Measurements.
Max panel width +space=865mm outer edge total 6100mm



CONFIGURATION & SOME OF THE TYPICAL PANELS THAT FIT*

A	12 Panel ~20 M² (~217 213 ft ²)	Ecosun230, Sharp 235, Suntech 210, CS6P200 Day4 48MC, 60MC ES190-210, Holistic215-280 Kyocera 210 PhotoWatt215 REC230, Schott235, SolarWorld 230, Solgate 230 +others
B	14 Panel ~15.5 M² (~167 ft ²)	CS 160-180, Suntech 175, SG 150-180 SolarWorld 175-180, Kyocera 135, Sharp 176-198 SanyoHIT190-200-210-215N

Mount virtually any make or model of panels
Even mix string sizes on each row
No custom orders needed

For 110mph certification specify 75mm verticals, +\$200 SPECIFY CERTIFIED LOAD LIMITS IF NEEDED Generally Exceeds 90mph Specify Enphase mounting.

For 8"x12ft (8.625OD) HSS Steel post Galvanized Pedestal Moment Requirements available FREE

Power Series PS-2400G



The "Big-Eh!"



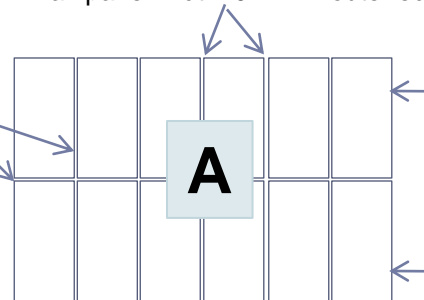
**Tamperproof security bolt
OPTION now available**



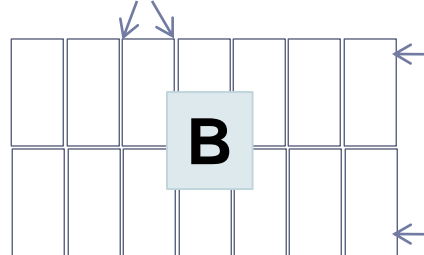
Four of these units makes a 10kW Micro-FIT and has simpler string and inverter matching for 2x5kW inverters
Specify Enphase mounting bolts if needed

12 Panel Max Mounting Measurements.
Max panel width 1012mm outer edge total 6100mm

6mm spacing between



14 Panel Max Mounting Measurements.
Max panel width 865mm outer edge total 6100mm



Mount virtually any make or model of panels
Even mix string sizes on each row
No custom orders needed

**Call for Wind and Snow load limits,
Depends on panel choice
Generally Exceeds 90mph with 4x220kg ballast**

**All Ontario made galvanized steel & aluminum
Anchoring Moment Requirements available FREE**

CONFIGURATION & SOME OF THE TYPICAL PANELS THAT FIT*

A

12 Panel ~20 M²
(~217 213 ft²)

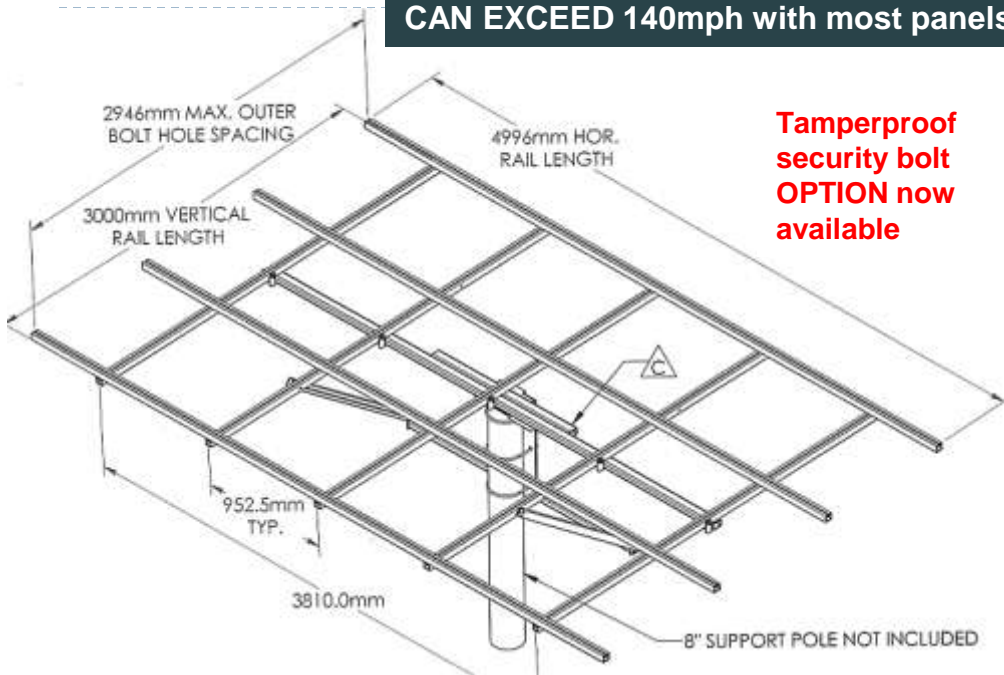
Ecosun230, Sharp 235, Suntech 210, CS6P200 Day4 48MC, 60MC ES190-210, Holistic215-280 Kyocera 210 PhotoWatt215 REC230, Schott235, SolarWorld 230, Solgate 230 +others

B

14 Panel ~15.5 M²
(~167 ft²)

CS 160-180, Suntech 175, SG 150-180 SolarWorld 175-180, Kyocera 135, Sharp 176-198 SanyoHIT190-200-210-215N

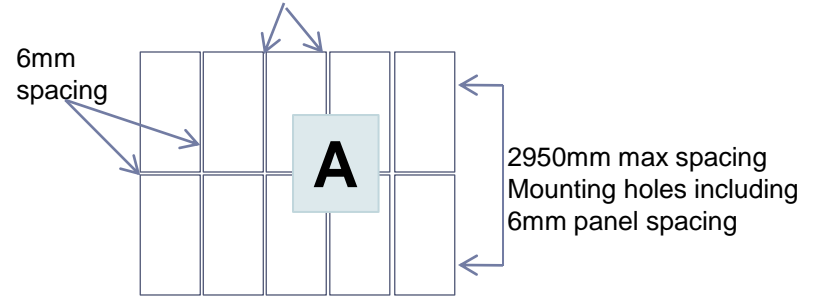
CAN EXCEED 140mph with most panels



Tamperproof security bolt OPTION now available

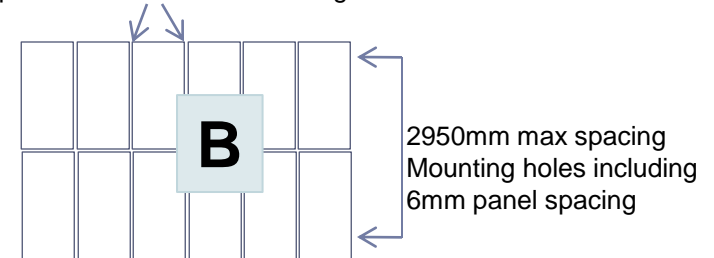
10 Panel Max Mounting Measurements.

Max panel width 1022 mm outer edge total 4996mm



12 Panel Max Mounting Measurements.

Max panel width 827mm outer edge total 4996mm



CONFIGURATION & SOME OF THE TYPICAL PANELS THAT FIT*

A

10 Panel ~16.5 M² (~177ft²)

Ecosun230, Sharp 235, Suntech 210, CS6P200 Day4 48MC, 60MC ES190-210, Holistic215-280 Kyocera 210 PhotoWatt215 REC230, Schott235, SolarWorld 230, Solgate 230 +others

B

12 Panel ~13 M² (~140 ft²)

CS 160-180, Suntech 175, SG 150-180 SolarWorld 175-180, Kyocera 135, Sharp 176-198 SanyoHIT190-200-210-215N

Mount virtually any make or model of panels
Even mix string sizes on each row

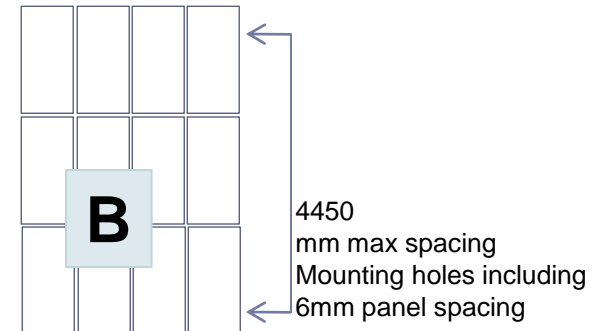
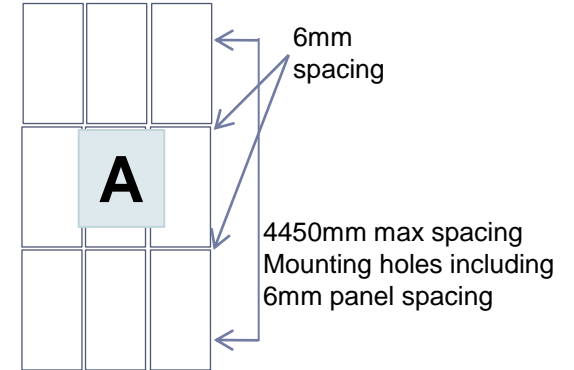
**Call for Wind and Snow load limits, Depends on panel choice
Can Exceed 90-110-140mph on most panel choices
Certified Drawings available at additional cost**

For 8"x12-15ft (8.625OD) .322 - .5" wall HSS Steel Pedestal Moment Requirements available FREE



**Tamperproof
security bolt
OPTION now
available**

3 x 4450x50x75mm Vertical rails
6 x 3100x 50x50 Heavy Horizontal Rail



CONFIGURATION & SOME OF THE TYPICAL PANELS THAT FIT*

A

10 Panel ~15 M²
(~160ft²)

Ecosun230, Sharp 235, Suntech 210, CS6P200 Day4
48MC, 60MC ES190-210, Holistic215-280 Kyocera 210
PhotoWatt215 REC230, Schott235, SolarWorld 230,
Solgate 230 +others

B

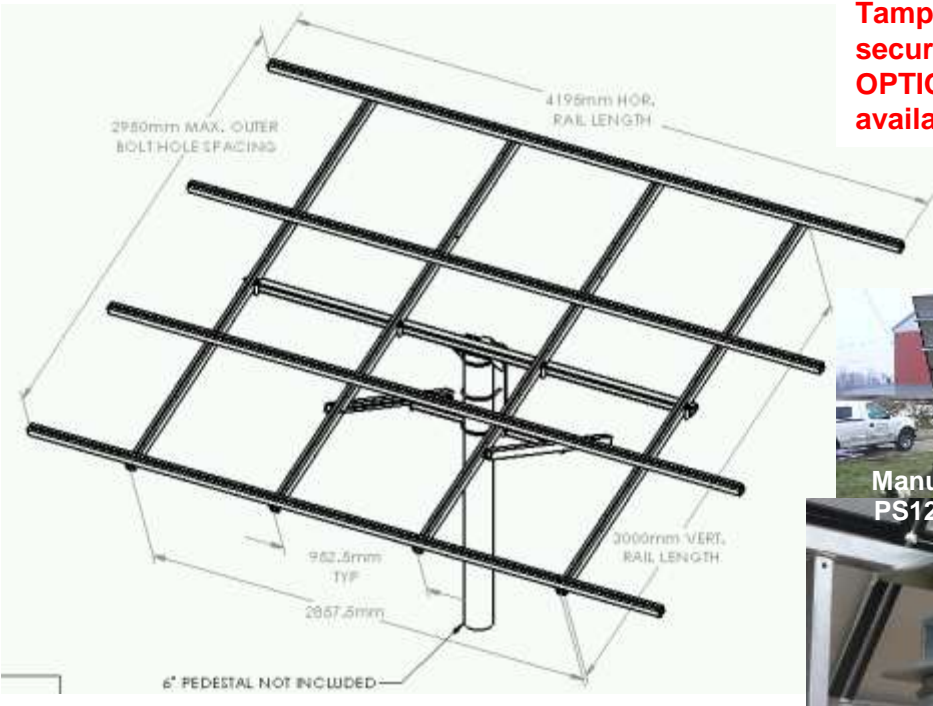
12 Panel ~15.5 M²
(~167 ft²)

CS 160-180, Suntech 175, SG 150-180
SolarWorld 175-180, Kyocera 135,
Sharp 176-198 SanyoHIT190-200-210-215N

Mount virtually any make or model of panels
Even mix string sizes on each row

**Call for Wind and Snow load limits,
Depends on panel choice
Can Exceeds 90-110mph on most panel choices
Certified Drawings available at additional cost**

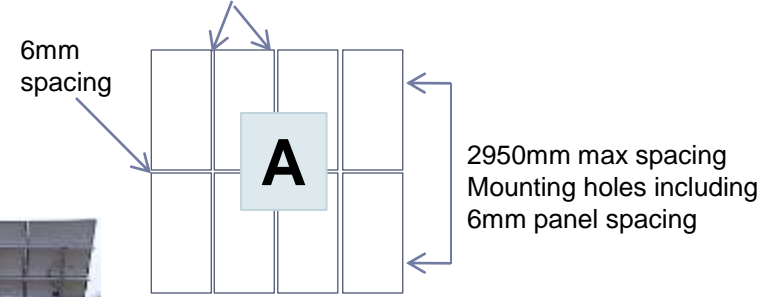
**For 8"x12-15ft (8.625OD) .322 - .5" wall HSS Steel
Pedestal Moment Requirements available FREE**



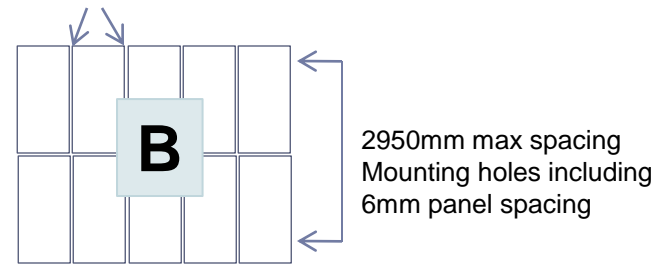
Tamperproof security bolt OPTION now available



8 Panel Max Mounting Measurements.
Max panel width 1022 mm outer edge total 4200mm



10 Panel Max Mounting Measurements.
Max panel width 827mm outer edge total 4200mm



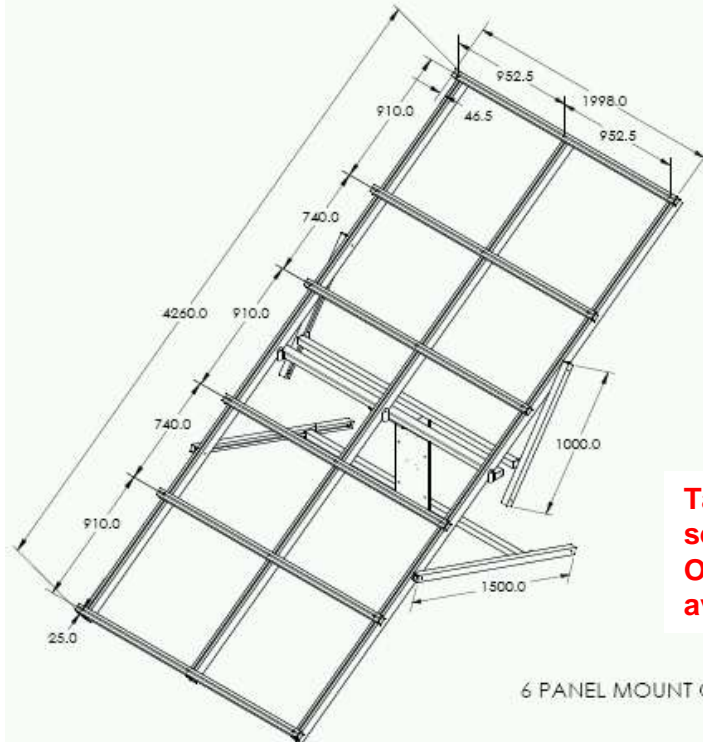
CONFIGURATION & SOME OF THE TYPICAL PANELS THAT FIT*

A	8 Panel 10 M² (112 ft²)	Ecosun230, Sharp 235, Suntech 210, CS6P200 Day4 48MC, 60MC ES190-210, Holistic215-280 Kyocera 210 PhotoWatt215 REC230, Schott235, SolarWorld 230, Solgate 230 +others
B	10 Panel 13 M² (140 ft²)	CS 160-180, Suntech 175, SG 150-180 SolarWorld 175-180, Kyocera 135, Sharp 176-198 SanyoHIT190-200-210-215N

Mount virtually any make or model of panels
Even mix string sizes on each row

Call for Wind and Snow load limits, Depends on panel choice
Can Exceed 90-110mph on most panel choices
Certified Drawings available at additional cost

For 6"x12ft (6.625OD) .322 wall HSS Steel Galv Pedestal Moment Requirements available FREE



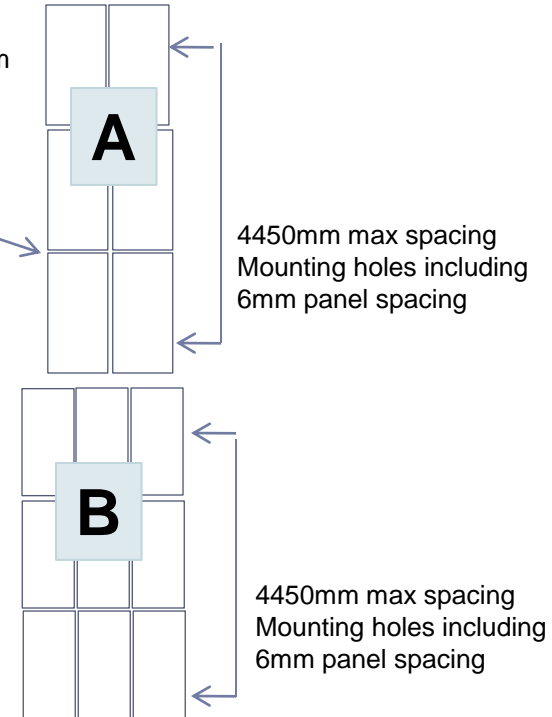
6 PANEL MOUNT ON 9 PANEL FRAME

Tamperproof security bolt OPTION now available

6 Panel Max Mounting Measurements.
Max panel width 1022 mm
outer edge total 4996mm

8 Panel Max Mounting Measurements.
Max panel width 827mm
outer edge total 4996mm

6mm spacing



CONFIGURATION & SOME OF THE TYPICAL PANELS THAT FIT*

A 6 Panel 20 M² (215 ft²)

Ecosun230, Sharp 235, Suntech 210, CS6P200 Day4 48MC, 60MC ES190-210, Holistic215-280 Kyocera 210 PhotoWatt215 REC230, Schott235, SolarWorld 230, Solgate 230 +others

B 9Panel 15 M² (164 ft²)

CS 160-180, Suntech 175, SG 150-180 SolarWorld 175-180, Kyocera 135, Sharp 176-198 SanyoHIT190-200-210-215N

Mount virtually any make or model of panels
Even mix string sizes on each row

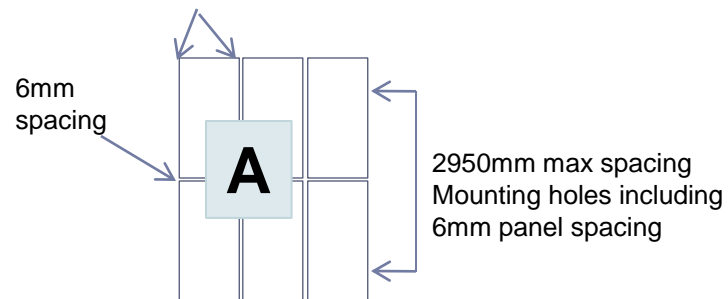
**Call for Wind and Snow load limits,
Depends on panel choice and post height
Can Exceed 90-110mph on most panel choices
Certified Drawings available at additional cost**

**For 6"x12ft (6.625OD) .322 wall HSS Steel Galv
Pedestal Moment Requirements available FREE**

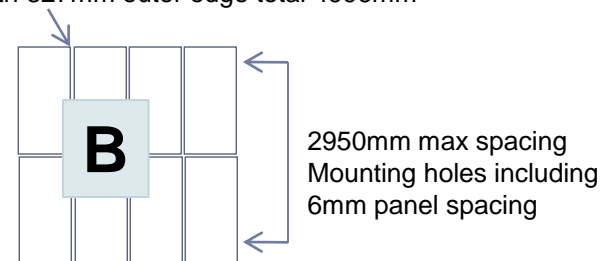


**Tamperproof
security bolt
OPTION now
available**

6 Panel Max Mounting Measurements.
Max panel width 1022 mm outer edge total 4996mm



8 Panel Max Mounting Measurements.
Max panel width 827mm outer edge total 4996mm



CONFIGURATION & SOME OF THE TYPICAL PANELS THAT FIT*

A

6 Panel ~7.5 M²
(~84ft²)

Ecosun230, Sharp 235, Suntech 210, CS6P200 Day4
48MC, 60MC ES190-210, Holistic215-280 Kyocera 210
PhotoWatt215 REC230, Schott235, SolarWorld 230,
Solgate 230 +others

B

8 Panel ~10 M²
(~112 ft²)

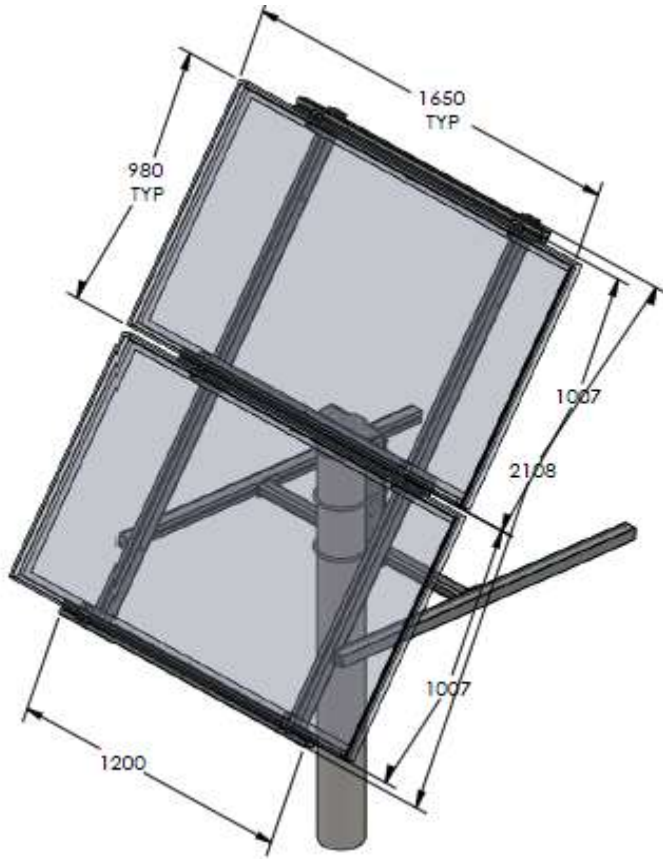
CS 160-180, Suntech 175, SG 150-180
SolarWorld 175-180, Kyocera 135,
Sharp 176-198 SanyoHIT190-200-210-215N

Mount virtually any make or model of panels
Even mix string sizes on each row

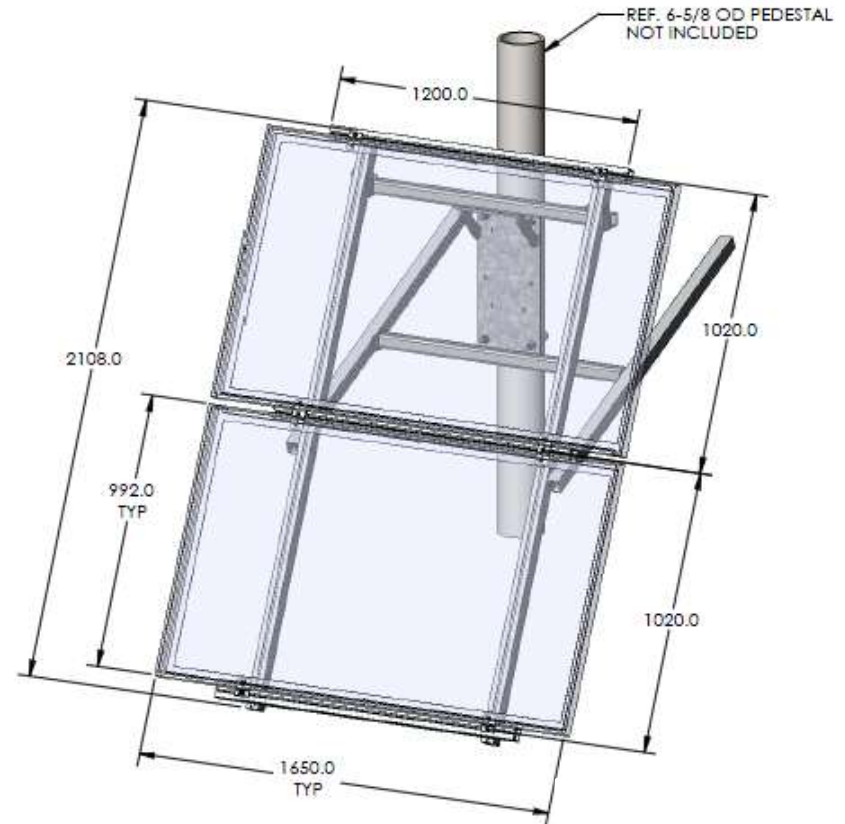
**Call for Wind and Snow load limits,
Depends on panel choice
Can Exceed 90-110mph on most panel choices
Certified Drawings available at additional cost**

**For 6"x12ft (6.625OD) .322 wall HSS Steel Galv
Pedestal Moment Requirements available FREE**

PS400 Options



Top of Pole



Side Mount

Free Engineering Support



Wind and Snow loads generally exceed 90mph and literally over a ton of snow (>2200lbs) This depends on panel choice – Coastal areas may require 110mph certification. All larger mounts built since April 2010 exceed 90mph with virtually all panel choices. To be CERTIFIED to EXCEED 110mph you must order 75mm verticals (\$200 each post - not discounted. Stamped drawings will then also be supplied)

Defining Pedestal support requirements takes engineering hours and final calculations depend on soil calculation and height above ground. Always consult a Local Civil Engineer who can specify the concrete and depth to meet local building codes safety margin for the soil conditions in your area

Send us your pedestal and panel choice, height above grade and desired wind speed and we'll send you a post specification and un-factored moment required to support your array in up to that speed. AT NO COST!

Sample output below shows 12 Sharp 235NU, on a PS2400F on an 8" Steel Post 6.5 ft above grade at 110mph. Therefore your pedestal or any method of attachment must be designed to handle a moment of 49,021Nm at it's base.

All True North Power Mounts are "100% Made in Ontario"



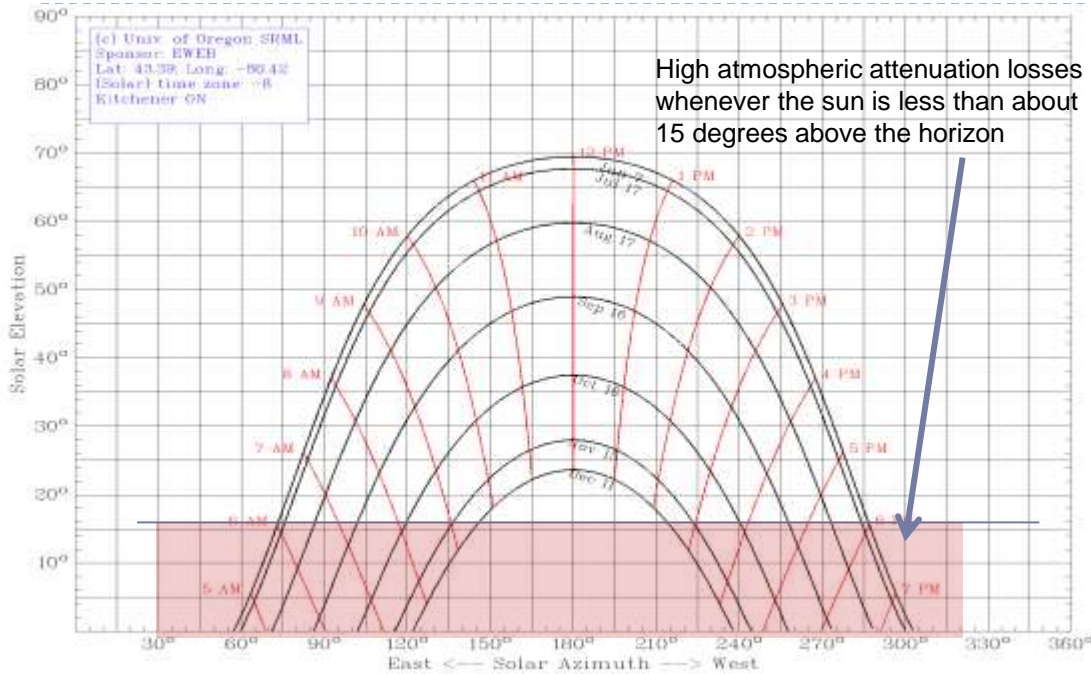
4 x PS2400F Shipping Package
4' x 4' x 20ft ~ 3050lbs
1.2 x 1.2 x 6 m ~ 1380kg

Panel/Array Config		Copyright © 2010 True North Power NG Inc.					4 post		Portrait	
		PS2400F 2x6	Panels	Watts	Kg	lbs	Array KW	RAIL	Horiz	Vert
PORTRAIT PANEL MOUNT	Rows	2	12	2820	240	529.1	11.28	AILS Required	4	6
	Panels/Row	6	each	235	20	44.1		RAIL LENGTHS	5994	2606
	Mounting Bolt mm	M8		P	83.44	184.0	Rail Approx	50H		2606
	Spacing SideSide	6	mm	Min 5mm for Sides				75H		
	Spacing EndEnd	6	mm	Min 5mm for Ends				Array Outer Dim (Meters)	6.006	3.286
			Pedestal Loads Calc		PS2400F 2x6			Feet	19.70	10.78
Sharp	Mono NU-U235F1		Post AGL Ft	6.5	LOADS lb/Ft2		Array Installed	Meters	19.74	sq Meter
	Panel Size mm	1640 X 994	Wall thick in	0.322	H-Rail	119.26	Area	Feet	212.43	sq Feet
	Panel Area M ²	1.63	OD in	8.625	V-Rail	36.78	Wind Speed	110	mph	Array Tilt
	Panel Area Ft ²	17.55	Moment Nm	49,021	StrgBk	103.60		49.2	m/s	90

Solar Siting and Tracking



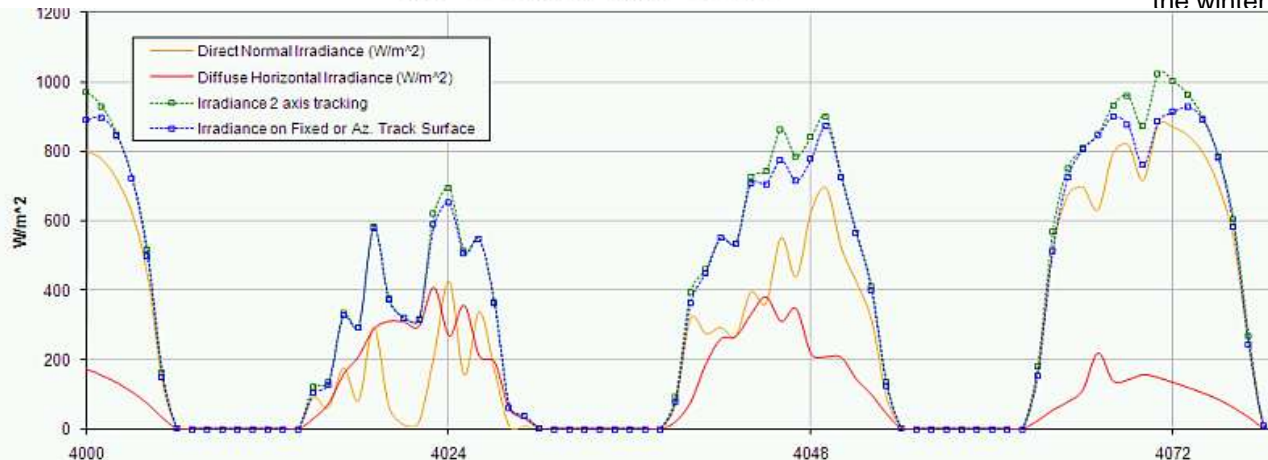
Summer and Winter Array Tilt Angles



Adjusting the tilt of the array only twice a year, to optimize production for summer and winter, will gain between 8 and 11% more energy than leaving a fixed array all year. Adjusting the tilt angle every month adds only a small amount of extra production, possibly less than 2%.

Adjusting winter setting for Dec 21st (winter solstice) is largely a waste of time since, in Canada at least, it is likely to be cloudy or even snowing that week and even if it is full sun all day the atmospheric attenuation at such a low angle and the few hours of sun there is does not collect any significant energy over a what would be collected with a tilt angle optimized or the 1st of Dec.

Also atmospheric attenuation is very high when the sun is less than 15 degrees above the horizon so pointing directly at early morning and late evening light is not nearly as valuable as the sunlight energy between roughly 8 am to 5:30pm in the summer and 9 till 4pm in the winter.



At left is an example of diffuse vs specular (direct sun) light and the value of tracking the sun precisely. Note that precise tracking is only valuable in specular light such as in desert and high sun areas. In most of Canada at least passive pointing systems gather nearly the same energy annually as so called "dual axis" trackers and use a lot less energy in the process by not "chasing" the diffuse energy around clouds and snow a lot of the time. If you adjust the array tilt angle only twice annually you'll capture >90-95% of the energy and revenue of a dual axis tracker with less drive train energy and maintenance.

Solar Pedestal Shading

Pedestal spacing depends on many factors

Height of the Pole (South towers can be shorter to help)

Tilt of the array

Slope of the ground

Tracking or not

Try using a piece of squared paper and a protractor for a quick assessment

If you have limited space then you want to design the post spacing and tilt angle to give you limited to no shading during the lowest sun angles, ie sunrise, sunset and winter solstice (21 Dec). Remember 21 Dec angle is only 1 DAY and in Canada it's likely cloudy or snowing anyway so not a critical optimization parameter.

Better Space them for shading at about 15-20 degrees sun angle and above where the solar power is higher and the atmospheric attenuation is lower.

Check the site angles for a solar chart.

