Introduction

When performing an off-grid measurement campaign, use of a Remote Power Supply (RPS) solution is sometimes required. Sizing the power supply is dependent on the site location (climate), days of desired autonomy, and number of sensors being installed. Please consult your NRG Systems representative to discuss RPS sizing for your specific installation.

These instructions explain how to mount the booms and PV panel(s) (Kits #14414, 14415, & 14416) to an NRG Systems Solar Tower. These kits can be connected to one of several different pre-assembled Control Boxes, depending on the application. Details on these Control Boxes can be found in their respective instruction sheets, denoted by the NRG part number.

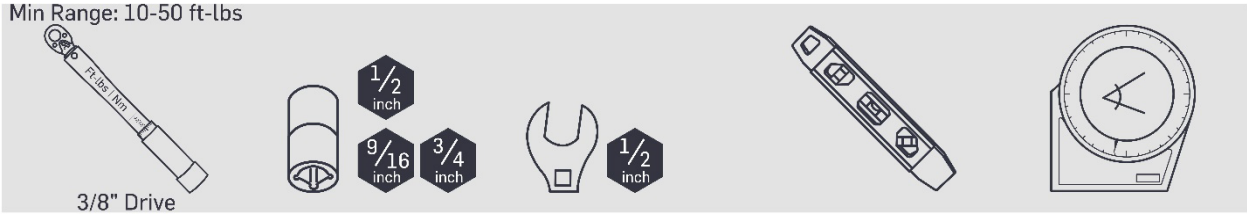
#14414|14415|14416 Parts/BOM

NRG Part Number	Part Description	Part Specification Notes	Quantity
1588	Nut	1/2-13 threaded | Galvanized	2
16256	PV Panel(s)*	100W | Pre-drilled for mounting U-bolts	1-3*
12013	Mounting Bolt	1/2-13 threaded | 1.5” length | Galvanized	2
12118	Lock Washer	1/2” ID | Split-lock | Galvanized	2
14092	Mounting Bracket	0.17” Thickness | Galvanized	1
14099	U-bolt	1.75” ID | Galvanized	4
14223	U-bolt	1.75” ID | Clamping | Galvanized	5-13*
14232	Clamping U-bolt	3.625” ID	4
14361	Boom Strut	Angled Aluminum | Pre-drilled | Mirror to 14366	1
14366	Boom Strut	Angled Aluminum | Pre-drilled | Mirror to 14361	1
14391	Pipe cap	Red, PE	2
14394	Pipe Boom	6061 Aluminum | Sch. 40 | 1.65” nominal OD	8-15* (per ft)**
14411	U-bolt Plate	1.75” Hole spacing | Galvanized	5-13*
14959	Washer	1/2" ID | Galvanized	4
14989	Lower Strut Mount	Aluminum U-channel | Pre-drilled	1

*Qty depends on kit ordered (#14414, 14415, 14416).

**This tubing (NRG part #14394) is sold by the foot. Certain kits have specific standard lengths already included, but custom lengths can be ordered.

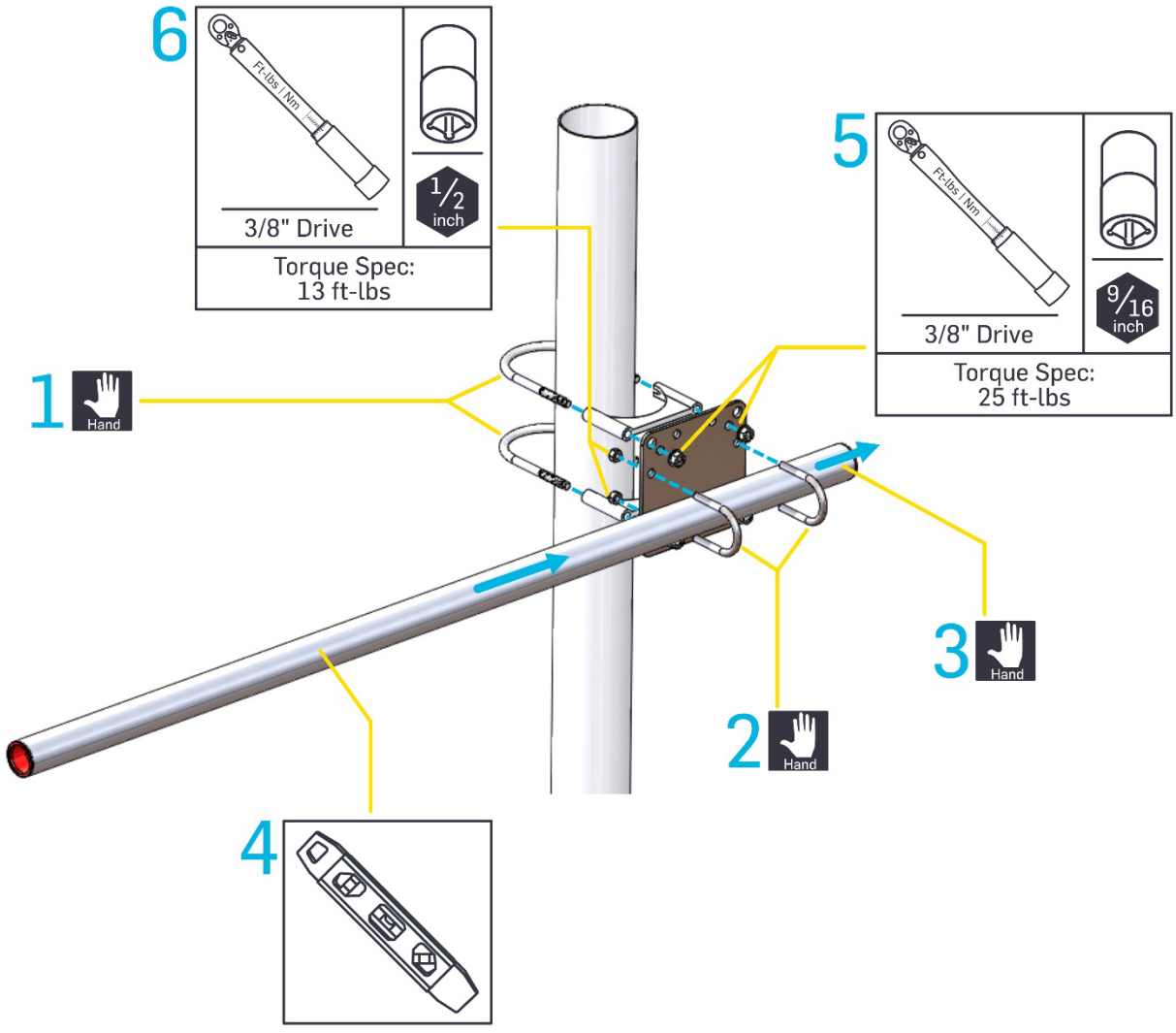
Tools



Procedures

Attaching the RPS Boom to the Tower

1. Place the bracket against the tower tube and feed two 3.625” U-bolts around the tower, through the clamping piece, and through the appropriate holes in the bracket.
2. Feed the 1.75” galvanized U-bolts through the appropriate holes in the bracket, from the side opposite of the tower. Thread the galvanized nuts onto the end threads of each U-bolt.
3. Feed the Sch. 40 aluminum pipe through the galvanized U-bolts to the desired location, depending on the intended length of boom on each side of the tower.
4. Orient the boom to your desired heading and level.
5. Torque the 3.625” U-bolt nuts to spec.
6. Torque the 1.75” U-bolt nuts to spec.

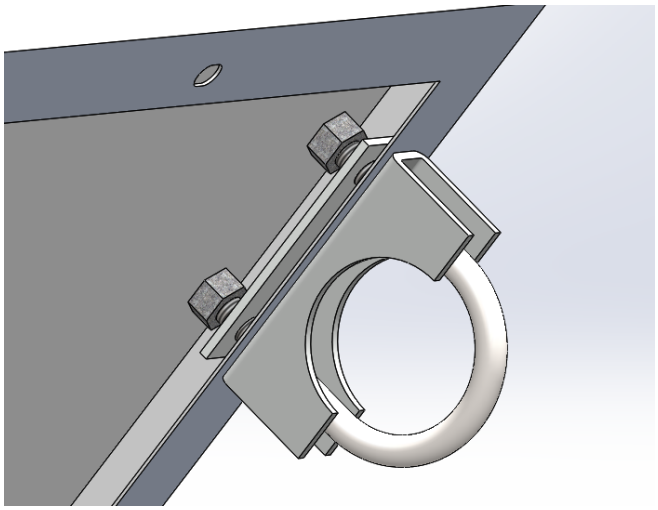


The boom can now be used to mount PV panels, pyranometers, and other sensors to the tower.

Installing the RPS PV Panel(s)

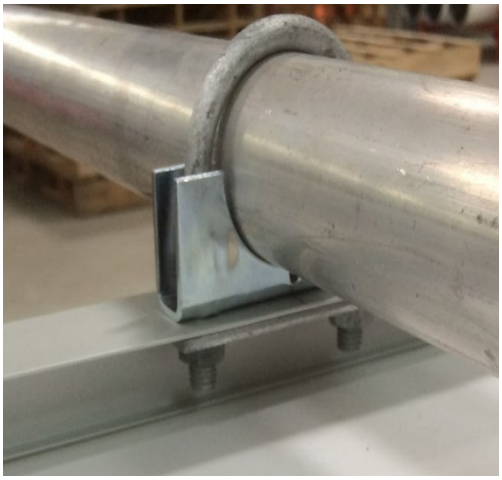
1 Install the 1.75” clamping U-bolts (#14223) & U-bolt plates (#14411) onto the frame of the PV panels.

Use the U-bolt plate (#14411) on the inside face of the panel frame, in between the frame and the nuts, to reduce stress on the frame.



Keep the U-bolts loose so they will slide onto the mounting boom.

2 Slide the PV panel(s) onto the boom that was just mounted to the tower in the previous section. Orient the PV panel(s) so that the enclosure box containing the leads is closer to the top boom.



Leave the U-bolts loose so that the panel(s) hang vertically.

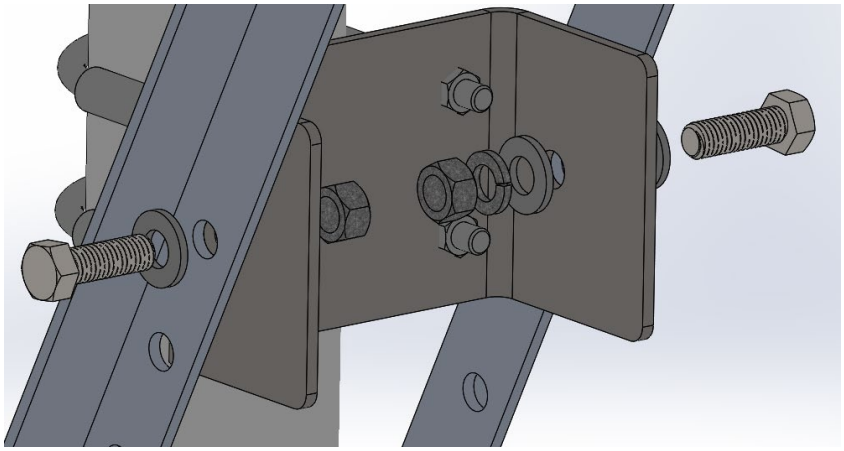
3 Slide the second Sch. 40 pipe into the lower U-bolts of the PV panel(s). Leave the panels and boom hanging vertically.

4 Attach the Lower Strut Mount (#14989) to the tower tube near the baseplate using two 3.625" clamping U-bolts (#14232).

Hand-tighten the nuts onto the U-bolts.

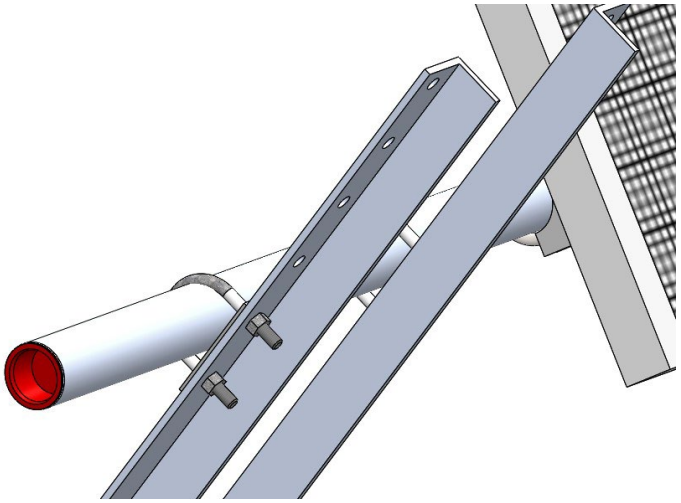
5 Attach the pair of Boom Struts (#14361 & #14366) to the lower strut mount using the galvanized 1/2-13 bolts (#12013), nuts (#1588), flat washers (#14959), & lock washers (#12218). Orient the struts as shown below.

Hand-tighten the hardware so the struts can swing freely.

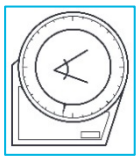


6 Angle the PV panel(s) by moving the lower boom away from the tower. At the same time, lift the Boom Struts up and line up the boom with a pair of holes on the struts.

Once lined up, secure the boom to the struts using 1.75” galvanized U-bolts.



7 With the RPS loosely assembled, set the PV panel(s) to the desired angle. The Boom Struts have several holes to allow for adjustment. If additional adjustment is needed, then the upper & lower mounts can be moved up or down the tower as well.



8 Once set to the desired angle, torque all hardware to the following specifications.

- **NRG #14232 | 3.625” ID U-bolt | 25 ft-lbs (33.9 Nm)**

- **NRG #14223 | 1.75” Galvanized U-bolt | 13 ft-lbs (17.6 Nm)**

- **NRG #12013 | 1/2-13 Galvanized Bolt | 37 ft-lbs (50.2 Nm)**

9 Run the positive & negative leads from each PV panel to the RPS control box. Secure to the top boom using electrical tape and/or zip ties.