

POLETOPS™

Series 5004 Double Row 6-Inch Pole Top with SolarMount™ HD Rails

(Upgrade from former U-PT/96L and U-PT/104M thru U-PT/160)

Installation Manual 507.3

U.S. and other patents pending.



Thank you for purchasing a UniRac. Please review this manual completely before proceeding.

This rack is intended for a 6-inch Schedule 40 steel pole (O.D. 6⁵/₈ inches).

Assembly order is not critical. Work from the pole outward or attach PV modules to rails before mounting the array to the pole.

The installer is solely responsible for:

- complying with all applicable building codes, including any that supersede these instructions;
- pole installation appropriate to local wind and soil conditions;
- using only UniRac parts and installer-supplied parts as specified by UniRac (substitution of parts will void the warranty);
- installing all electrical aspects of the PV array.

Parts List

| Part | Qty. | Wrench size | Recommended torque (ft-lbs) |
|---------------------------------------|------|-------------|-----------------------------|
| SolarMount HD rail | 4 | | |
| Square cross tube, 3" | 2 | | |
| Tilt strut | 2 | | |
| Pole can, 6" | 1 | | |
| Pole can set screws, 3/8" x 1" | 4 | 9/16" | 35 |
| Carriage bolt, zinc plated, 3/8" x 1" | 6 | 9/16" | 30 |
| Square U-bolt, 3/8" | 8 | | |
| Flange nut, 3/8" | 22 | 9/16" | 30 |
| Cross tube bolt, 7/16" x 4 | 4 | 5/8" | 30 |
| Washer plate, 3" x 3" | 4 | | |
| Flat washer, 7/16" | 4 | | |
| Lock washer, 7/16" | 4 | | |
| Nut, 7/16" | 4 | 5/8" | 30 |
| Module mounting clip | 4* | | |
| Module bolt, 1/4" x 5/8" | 4* | 7/16" | 15 |
| Flange nut, 1/4" | 4* | 7/16" | 15 |

Caution

Stainless steel hardware can seize up, a process called galling. To significantly reduce the likelihood of galling, apply a small drop of anti-seize lubricant to the threads of all bolts before installation. Anti-seize lubricants are readily available in any auto parts and some hardware stores. In their absence, any lubricant will reduce the chance of galling.

Note: Parts are illustrated in exploded views (pp. 2–4).

* Per module to be mounted. Series 5004 racks include clips and hardware to mount from 4 to 12 modules, depending on the model number.

Mounting pole guidelines for UniRacs

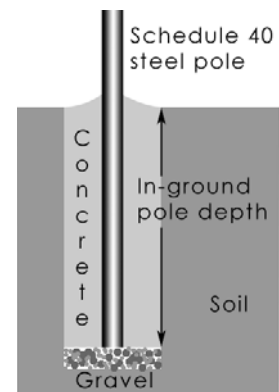
The installer is solely responsible for use of the information below. These are general guidelines for normal installations. The following variances can affect your installation:

- The required diameter and depth of the hole are dependent on soil type, which varies by locale. An installation in loose, sandy soil will require larger, deeper holes and, therefore, more concrete than an installation in soil of average density.
- The depth and width of the hole should also be increased in areas subject to winds in excess of 120 miles per hour, particularly if the location of the mounting pole is open and unprotected. Design wind speed in the table below assumes 29 psf wind force at 90 mph and 51 psf wind force at 120 mph, which correspond to Exposure Category C, terrain that is flat and generally open extending one-half mile or more from the site in any quadrant. More severe exposure—within a quarter mile of open water, for example—will require greater in-ground pole depth and concrete volume.
- Poles taller than 6 feet above ground require that the depth of the hole be increased. Significantly taller poles may require a larger pole diameter than called for in these installation instructions.

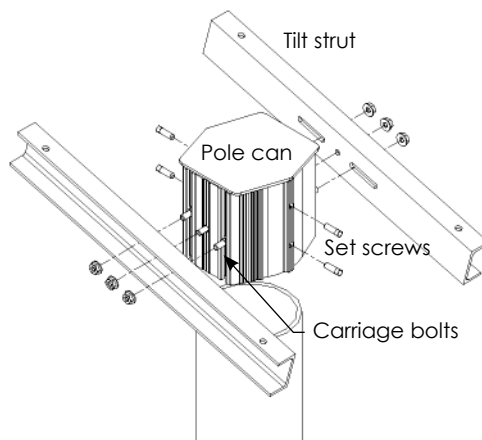
If in doubt, consult a professional civil engineer who is familiar with local soil conditions and wind load requirements.

1. Dig the hole at least four inches deeper than required under “In-ground pole depth” in the chart below. Fill the hole with four inches of gravel to allow water drainage.

| Total area of modules | Design wind speed | Hole diameter | In-ground pole depth | Concrete volume | Maximum above-ground pole height |
|-----------------------|-------------------|---------------|----------------------|-----------------|----------------------------------|
| 60 sq. ft. | 90 mph | 24 in. | 46 in. | 12 cu. ft. | 6 ft. |
| 60 sq. ft. | 120 mph | 30 in. | 52 in. | 21 cu. ft. | 6 ft. |
| 70 sq. ft. | 90 mph | 24 in. | 54 in. | 14 cu. ft. | 6 ft. |
| 70 sq. ft. | 120 mph | 30 in. | 60 in. | 24 cu. ft. | 6 ft. |
| 80 sq. ft. | 90 mph | 24 in. | 60 in. | 16 cu. ft. | 6 ft. |
| 80 sq. ft. | 120 mph | 30 in. | 68 in. | 28 cu. ft. | 6 ft. |
| 90 sq. ft. | 90 mph | 24 in. | 68 in. | 18 cu. ft. | 6 ft. |
| 90 sq. ft. | 120 mph | 30 in. | 76 in. | 31 cu. ft. | 6 ft. |
| 100 sq. ft. | 90 mph | 24 in. | 76 in. | 20 cu. ft. | 6 ft. |
| 100 sq. ft. | 120 mph | 30 in. | 82 in. | 34 cu. ft. | 6 ft. |

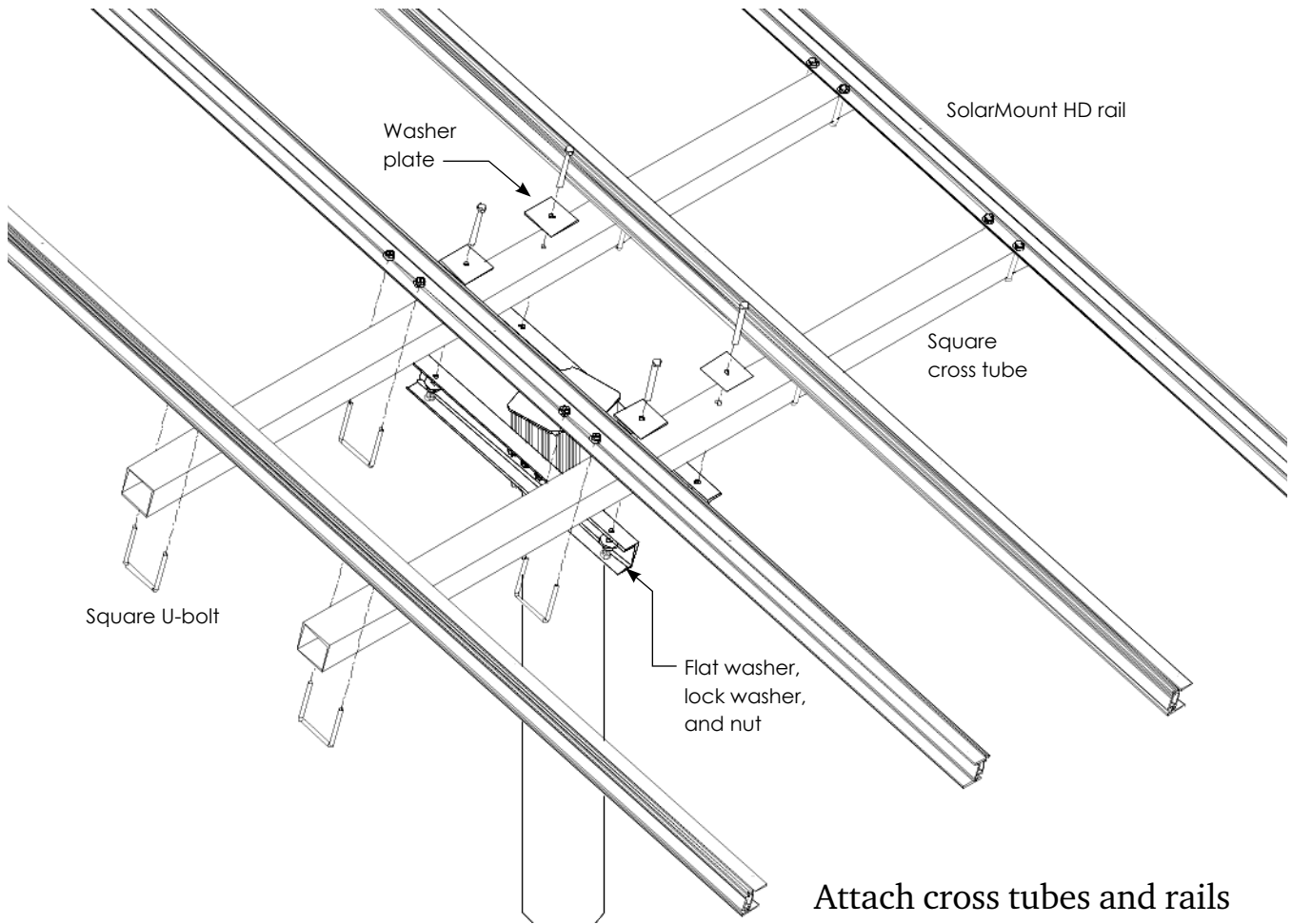


2. Stand the pipe in the hole. Brace the pole so that it is plumb. Pour concrete around the pipe, filling the hole to ground level. Add an inch or two of extra concrete above the hole. Use a trowel to form the concrete so that it slopes up to the pole (illustration).
3. Allow the concrete to set up for at least 24 hours before installing your UniRac.



Attach struts to pole can

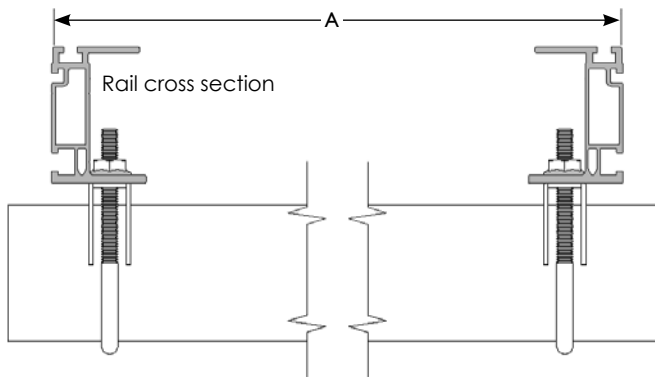
On each side of the can, install the center $\frac{3}{8}$ -inch carriage bolt, pushing it through the square hole from inside the pole can. (The can may now be placed on the pole and set screws finger tightened *or* assembly may continue off pole, depending on installer preference.) Slide the remaining four carriage bolts into the slots on both sides of the can. Place the tilt struts and finger tighten flange nuts on all six carriage bolts.



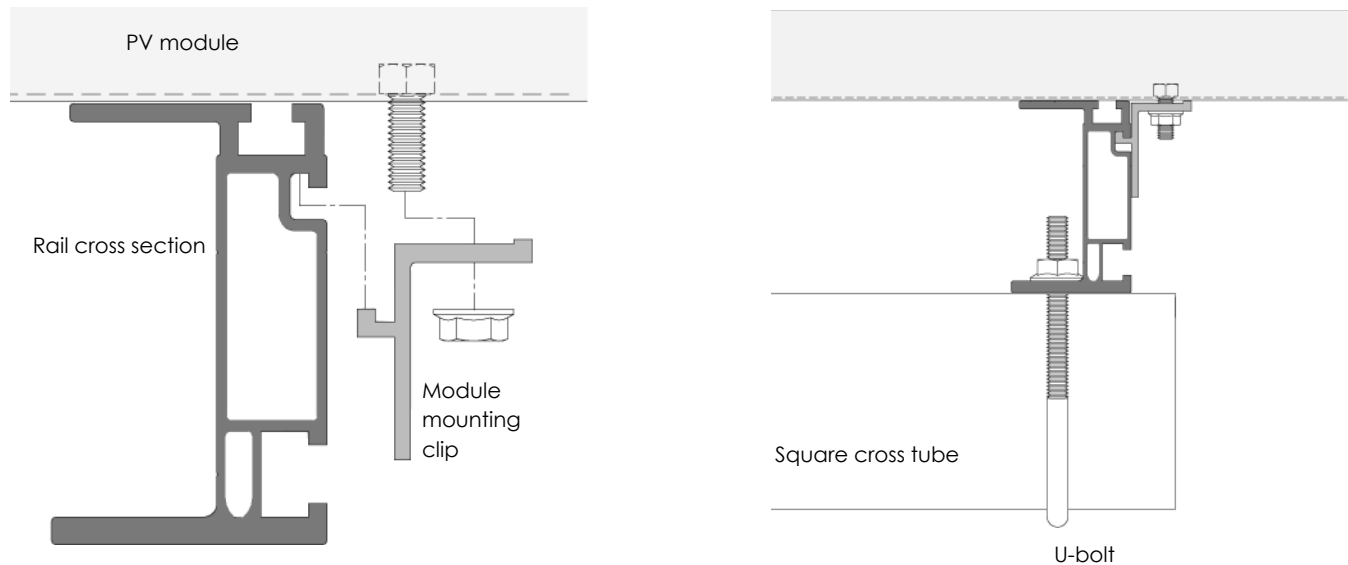
Attach cross tubes and rails

Attach square cross tube to tilt struts using 7/16 x 4-inch bolts and associated hardware. Torque to 30 foot-pounds.

Add rails using U-bolts. Make sure the rails are parallel and that the two outer rails are equidistant from the center of the cross pipe. Finger tighten 3/8-inch flange nuts on U-bolts.



Distance (A) between rails' outer edges equals distance between module mounting-hole centers minus 1 inch.



Install modules

Secure each PV module using two clips per rail. Be sure modules are centered along the length of the rail. Initially finger tighten 1/4-inch flange nuts. When all modules are in place, torque 1/4-inch flange nuts to 15 foot-pounds.

Final adjustment

Loosen tilt strut flange nuts and adjust the array to the desired tilt angle. Torque flange nuts to 30 foot-pounds.

When the array is fully assembled, the 3/8-inch set screws securing the pole clamps can be loosened, allowing entire array to turn as needed on the pole. Be sure to torque the nuts to 35 foot-pounds after final adjustment.

10 year limited Product Warranty

UniRac, Inc., warrants to the original purchaser ("Purchaser") of product(s) that it manufactures ("Product") at the original installation site that the Product shall be free from defects in material and workmanship for a period of ten (10) years, from the earlier of 1) the date the installation of the Product is completed, or 2) 30 days after the purchase of the Product by the original Purchaser. This Warranty does not cover damage to the Product that occurs during its shipment, storage, or installation.

This Warranty shall be VOID if installation of the Product is not performed in accordance

with UniRac's written installation instructions, or if the Product has been modified, repaired, or reworked in a manner not previously authorized by UniRac IN WRITING, or if the Product is installed in an environment for which it was not designed. UniRac shall not be liable for consequential, contingent or incidental damages arising out of the use of the Product by the Purchaser under any circumstances.

If within the specified Warranty period the Product shall be reasonably proven to be defective, then UniRac shall repair or replace the defective Product, or any part thereof,

in UniRac's sole discretion. Such repair or replacement shall completely satisfy and discharge all of UniRac's liability with respect to this limited Warranty. Under no circumstances shall UniRac be liable for special, indirect or consequential damages arising out of or related to use by Purchaser of the Product.

Manufacturers of related items, such as PV modules and flashings, may provide written warranties of their own. UniRac's limited Warranty covers only its Product, and not any related items.



Tilt Adjustment for 6-Inch PV PoleTops

Addendum to Installation Manual 507.3

U.S. Des. Patent No. D496,249S. Other patents pending.

Don't Force the Rack

Six-inch poletop racks may bind at extreme tilt angles. **Never apply undue force** when attempting to adjust the tilt angle. Two easy steps will restore motion to the tilt struts.

1. Just loose, not too loose

Adjusting the tilt angle of the rack requires loosening the three flange nuts that secure each tilt strut, but if the nuts are too loose, the carriage bolts will droop and bind.

Once the nuts are loose, finger tighten them. Then back them off half a turn or so. Tilt adjustment should now proceed smoothly.

2. Lubricate carriage bolt slots

Apply a lubricant to carriage bolt slots. Any lubricant, such as WD-40, will help carriage bolts move more freely in the slots.

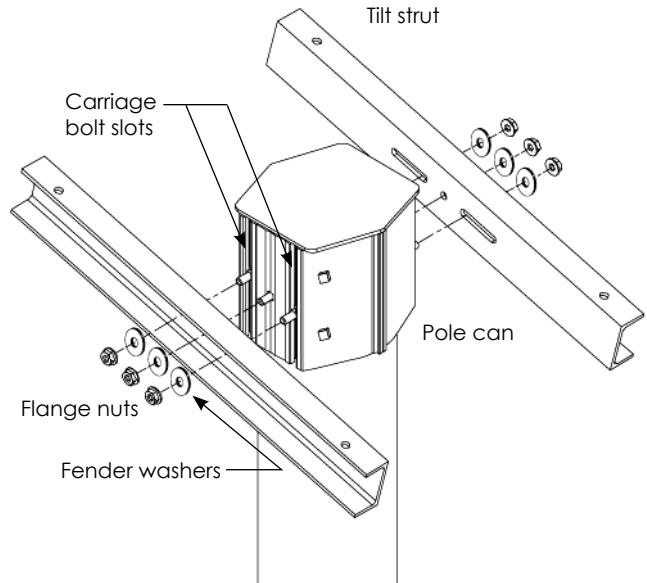


Figure 1. Pole can and tilt strut assembly, Series 5004 PV PoleTops.

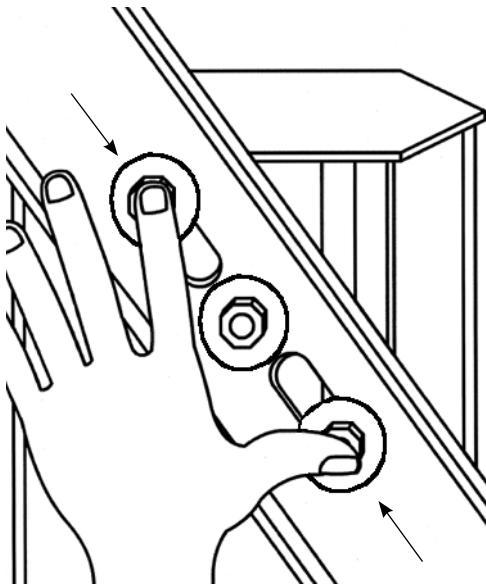


Figure 2. On both sides of the can simultaneously, carefully pinch the outer bolts toward the center bolt. Watch your fingers!

If Tilt Struts Bind at High Tilt Angle

If the rack still won't move, never try to force the tilt struts. The following two-person procedure should free the tilt struts:

An assembled rack should be evenly loaded with modules. Attempting the following procedure with uneven loading risks sudden, dangerous motion of the entire module array when it is freed.



While your assistant holds the rack at one end of the rails, loosen all six carriage bolts—just loose, not too loose, as described above.

Using the thumb and forefinger of both hands, pinch the outer bolts of both tilt struts toward the center bolts (Fig. 2) while your assistant carefully shifts the weight of the rack to and fro.

Be certain to keep thumbs and fingers clear of pinch points.



Parts List Addendum

| Part | Qty. |
|-------------------------------------|------|
| Fender washer (tilt strut assembly) | 6 |