

Medium Mount Assembly

Options

Kinetic Solar Top of Pole Mounts can be assembled two ways:

1. Full assembly at the install site.
2. Pre-assemble in a “shop” location with final assembly at the install site.

If a shop location is available, the mount can be assembled most of the way and then folded down to be transported to the install site for completion. This method is quicker and easier when available.

The first steps of assembly are the same for both methods. At the point where the two methods of assembly separate, the manual will indicate what step to proceed to.

Tools

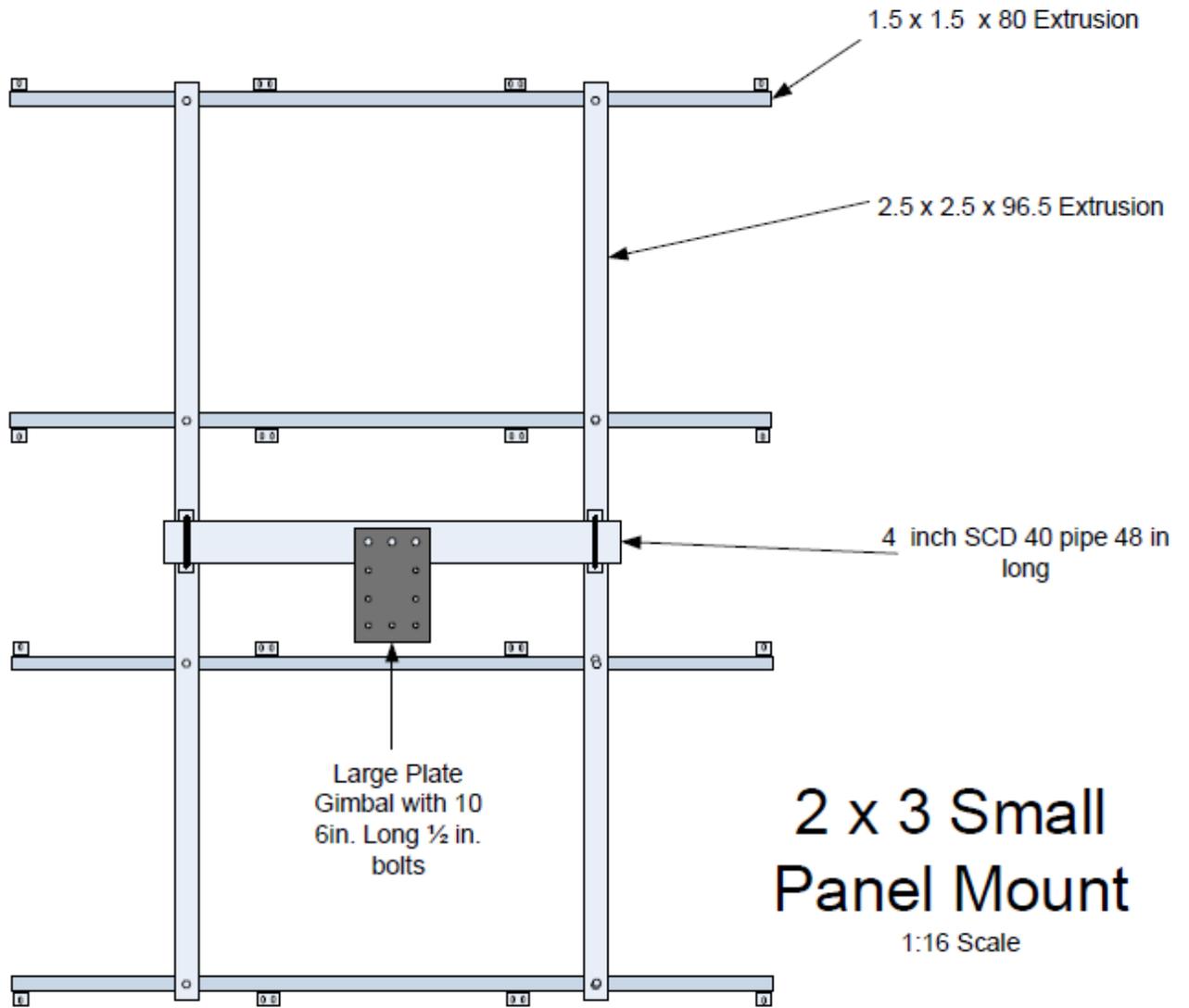
1. Box Wrenches:
 - a. 7/16 inch
 - b. 1/2 inch
 - c. 9/16 inch
 - d. 3/4 inch
2. Sockets wrenches:
 - a. 7/16 inch 1/2 inch
 - b. 9/16 inch
 - c. 3/4 inch
3. Measuring tape
4. Level
5. Compass (optional)
6. Drill with 1/2” bit
7. Ladder (depending on pole height)



Precautions

1. Do not proceed if there is a possibility of lightning or high winds.
2. Two or more people are required for installing mounts.
3. Watch for pinch hazard when folding the mount for transport.
4. Larger mounts can be heavy, handle with care.
5. Use caution when working around power lines.

Example of a Medium Mount



Parts List

Fasteners

Caution: the larger fasteners are wetted with anti-seize compound that can be messy when handled.

- 1/4" x 5/8" stainless steel bolts, 4 per panel.
- 1/4" stainless steel flange nuts, 4 per panel.
- 3/8" x 5" stainless steel bolts, 4 per square extrusion.
- 3/8" x 1 1/2" stainless steel flat washers, 4 per square extrusion.
- 3/8" stainless steel locking nuts, 4 per square extrusion.
- 2 U-bolts, 1 per square extrusion.
- 4 stainless steel locking nuts, 2 per U-bolt.
- U-bolt plates with 3 holes, 1 for each U-bolt.
- U-bolt saddles, 1 for each u-bolt.

Components

- 1 1/2" x 1 1/2" slotted aluminum extrusion with attached L brackets
- 2 1/2" x 2 1/2" square aluminum extrusion.
- 4 1/2" pipe with attached gimbal plates



Assembly

1. Check and inventory all parts against parts list.
2. Lay out the aluminum channel extrusion so that the small angle brackets are towards the ground.



Extrusion # 1 and # 3



Extrusion # 2 and # 4

3. You will see coloured number tags on the extrusion. Place #1 at the top followed by #2 below and so on.
4. Lay the larger square extrusion on top of the channel extrusion from step 2.
5. Number tags on the extrusion will match up with the identical number tag on the channel extrusion from step 2.



6. With all the number tags matched with their counterparts, you will find bolt holes through both pieces of extrusion.
7. Bolt the two extrusions together at each point where they cross with the supplied hardware. Leave the bolts slightly loose. They will be tightened later. The Bolt head should be at the channel extrusion and the nut (washer) should be on the larger square extrusion.

If this is a full assembly at the site, skip to step # 12

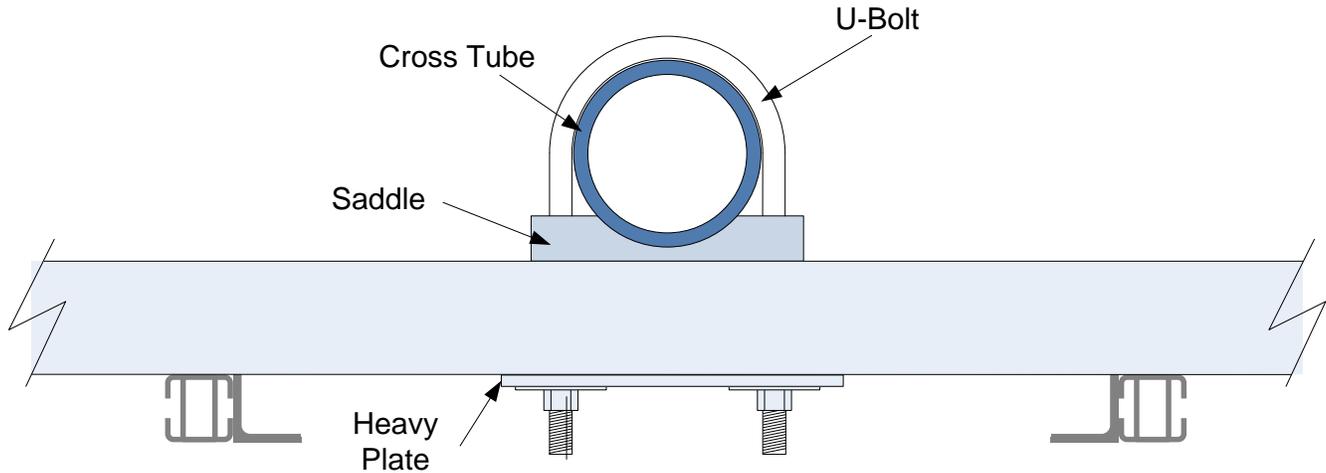
8. Tilt the mount vertically so that the channel extrusions are parallel to the ground.
9. By pressing the top most channel extrusion downward and toward one side. The mount will compress down on to its self like a big parallelogram. Watch for pinch points as the mount folds.



10. The mount is now ready to be transported to the installation site.
11. At the site, hold one channel extrusion and pull the other channel extrusion away until it is back to its original position. Again watch for pinch points.
12. Measure the mount from corner to corner diagonally to make certain that the mount is square to its self. Adjust as necessary.
13. Fully tighten all the bolts from step # 7
14. Temporarily remove one bolt from the gimbal plates. So that there is room to slide the gimbal down over the pole.



15. Slide the round Cross Tube extrusion in under the curved part of the U-bolts. If saddles are supplied for this particular mount, they need to be between the tube and the extrusion. If there are large flat plates with 3 slots included they go between the square extrusion and the nuts.



16. Make sure that the tube is centered between the U-bolts and the central gimbal is facing upwards.
17. Tighten the U-bolts.
18. Turn the entire mount over.
19. Lift the mount up and over the main vertical support pole. Slide the central gimbal down on to the pole. If the vertical pole is higher than your reach, it is possible to orient the central gimbal horizontally and then tip the mount up vertically and then lift it up and onto the pole. This method should be done with great care, as the mount is heavy and in a vertical orientation, can tip over.
20. Tighten the gimbal compression bolts slightly.
21. The mount must be in a horizontal position to mount the solar panels. If needed loosen the U-bolts and tilt the mount to the horizontal. Completely tighten all the U-bolts.
22. The mount is now ready for the solar panels to be installed. There is hardware included for the panels.
23. Fasten one panel at a time starting with the middle panels first.
24. The mount can be rotated to allow easier access to the panels.
25. Working from a flat deck trailer or the box of a pick-up truck can make the work easier.
26. Put the bolts through the holes in the panel and then down through the slot in each of the L brackets.
27. Once all the solar panels are installed, loosen the U bolts and tilt the mount to the desired angle. Be careful as the mount and all of its panels are heavy and will want to tilt on their own. Working with 2 people is recommended.
28. Rotate the mount so that the panels are facing due south and tighten the heavy bolts on the central gimbal.
29. If no compass is available, observe the shadow of the panels. At 12:00 noon. The spaces between the panels will let sun light through to the ground if the mount is aligned due south.
30. Once the mount is aligned due south, drill through the vertical support pole where the empty hole is on the central gimbal. Repeat on the opposite side. You may need to temporarily change the tilt to allow access to the other side of the gimbal. Feed the bolt from step 14 all the way through the gimbal and tighten with the lock nut. Re-adjust the tilt for the season.
31. Your mount is complete and the panels are ready to be wired.

Tilting the Mount

Selecting the angle:

The ideal angle, in relation to the ground, that a solar panel is set to is dependent on three factors.

1. The latitude of the installation site
2. The season
3. Environmental factors

Latitude:

As you move northward the angle at which the Sun light strikes the Earth become smaller. At the Equator the sun is at 90° to the surface of the earth. As you move northward the sun appears lower and lower until it reaches the horizon in the far north. To optimize your performance you need to adjust the tilt to match the angle of the earth. However, in the far north panels may remain at 90° . Conversely around the equator panels may stay horizontal.

Season:

The Sunlight's angle to the earth changes with the seasons. A solar panel will lose efficiency if it is tilted to maximize production for the wrong season. In the summer the panels need to be more horizontal and in the winter more vertical. The spring and fall are half way in-between. Adjusting the tilt of your panels to match the seasons will maximize production.

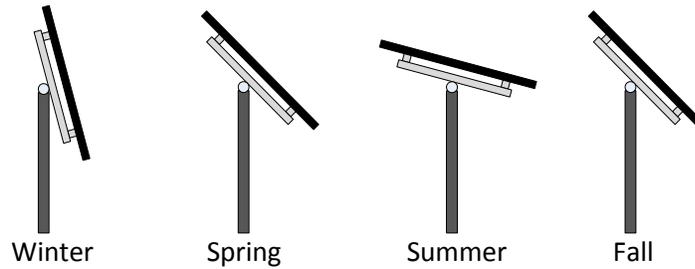
Environment:

The environment can affect the angle that is best for a particular season. If snow is an issue, then it is best to have the panels set vertical so that the snow can fall off. If birds like to land on your panels the angle in the summer may need to be steeper. In the fall leaves and needles can be an issue. These types of concerns will require some trial and error over time.

Calculation:

During both the spring and the fall, the angle of the panels will equal the degrees of latitude at the installation site. In the winter, increase the tilt by 25° . In the summer, decrease the tilt by 25° . Therefore, if you live in Kelowna British Columbia Canada, your latitude would be about 49.9° N. Therefore, in the summer, your panels would be set to 25° . In the spring and fall changed to 50° . In the winter changed to 75° . If you live in Edmonton Alberta your latitude would be 53.5 . In this location, the angles would be 28.5° for the summer, 53.5° for spring and fall, and 78.5° for the winter.





Adjusting the Angle

The U-bolts:

The frame that supports the solar panels is secured to the cross tube with a series of stainless steel ½ inch U-bolts. They are the mechanism that allows the tilt of the frame to be adjusted. By loosening the lock nuts (do not remove) on the U-bolts, the frame will rotate around the cross tube. Once the frame is at the desired angle, the nuts on the U-bolts must be re-tightened.



Precautions:

- The panels are heavy, when the U-bolts are loose, the frame will try to rotate on its own.
- A second person to hold the frame while the U-bolts are loosened is required.
- Be careful not to slide the mount sideways, or one of the U-bolts could slide off the end of the cross tube.
- When the desired angle is set the nuts need to be tightened very tight. Pushing on the frame, by hand, should not allow slipping at the cross tube.
- Do not work on the mount in high winds or when there is a possibility of lightning.