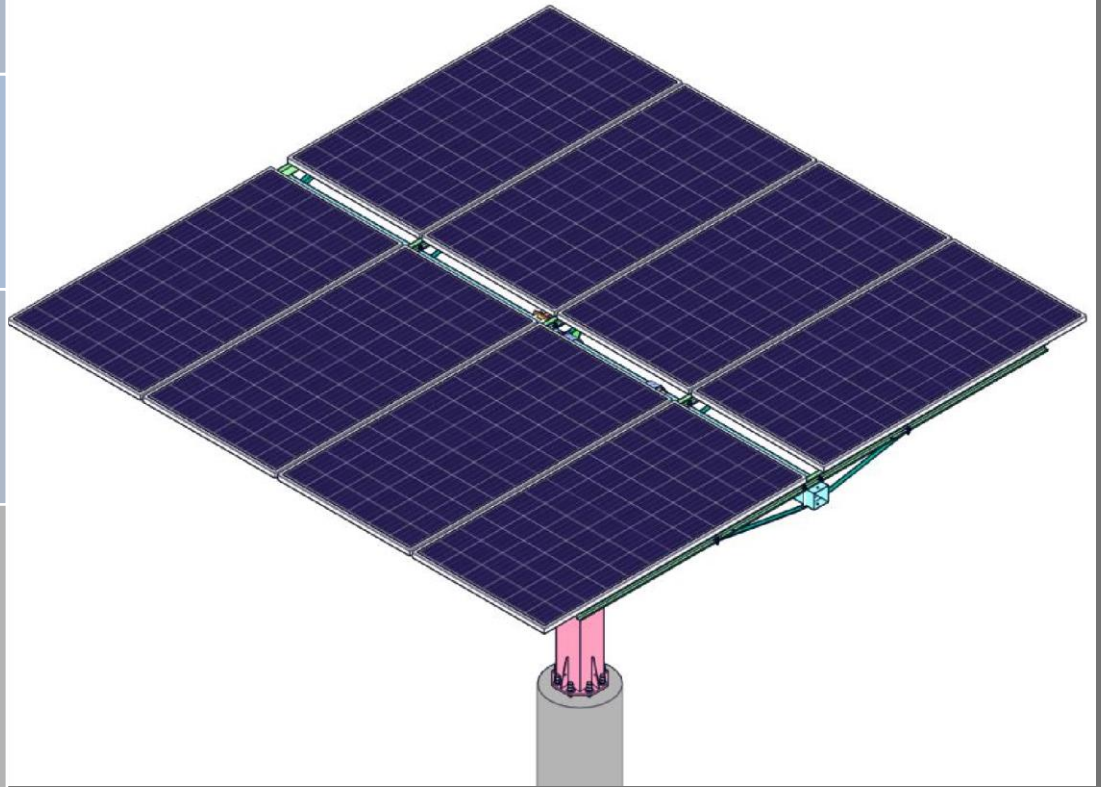


2024

# SunChaser 8 Tracking System Installation Manual (Northern Hemisphere)



SunChaser 8 HowtodiySolar  
[www.howtodiySolar.com](http://www.howtodiySolar.com)  
March, 2023



# INTRODUCTION

Thank you for purchasing the SunChaser 8 solar tracking system designed by Grady Mason of Howtodiysolar and manufactured in China, we will whole heartedly provide first-class product and service for you.

This manual provides important information about constructing the necessary concrete foundation, and the assembly of the tracking mechanism. Be sure to retain this manual for future reference. Read it carefully & thoroughly **before** starting the installation. We and our resellers accept no responsibility for your failing to follow these instructions.

Use proper tools and follow good safe work practices to avoid injury during assembly. Always wear a safety helmet to prevent head injury.

We own IPR (**Intellectual Property Rights**) on the solar tracking system we manufacture and distribute, with more than 40 patents at home and abroad, any patent infringements will be fully prosecuted to the extent of the law.

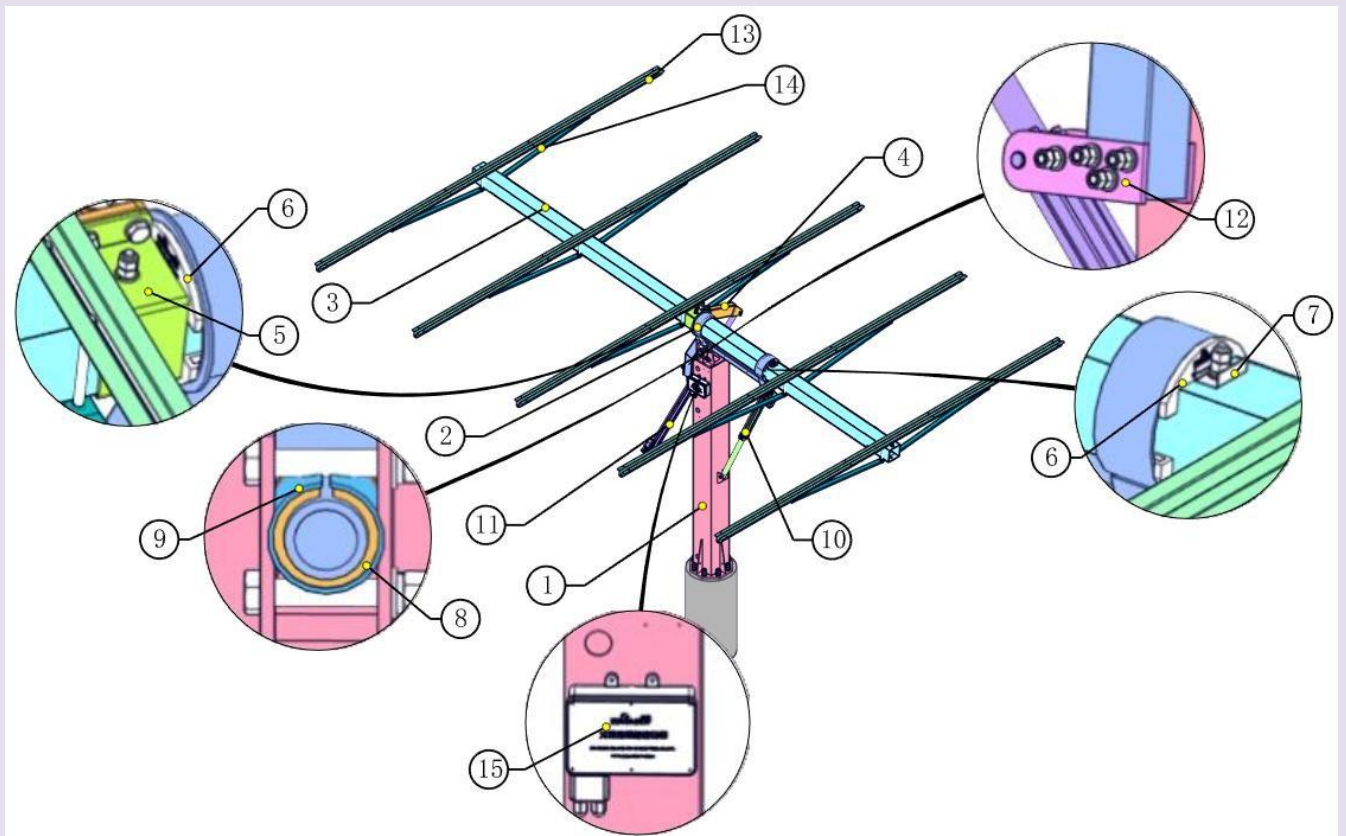
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**Part I. SunChaser 8 Tracking System Structure Chart**



System structure chart

**Main parts of SunChaser 8 solar tracking system**

Item	Description	Weight (kg)	Total Weight	Dimension(mm)	Quantity
1	Vertical pole	45.8	45.8	2000*200*200*2.5	1
2	L-shaped bracket	15.7	15.7	770*194*5	1
3	Center beam	42.6	42.6	120*120*4650*2.5	1

4	Swing arm	5.53	5.53	380*100*50*3.5	1
5	Swing arm fixing plate	2.2	2.2	212*110*120	1
6	Plastic bearing	0.2	0.8	φ120	4
7	Plastic bearing limit	0.25	0.5	36*50 angle steel	2

8	Plastic shaft sleeve	0.1	0.2	φ60*45	2
9	Steel shaft sleeve	0.4	0.8	70*5	2
10	Elevation linear actuator	8.0	8.0	L=940mm	1
11	Azimuth linear actuator	8.0	8.0	L=985mm	1
12	Azimuth linear actuator seat	0.9	1.8		2
13	Supporting beam	9.2	46	55*32*80*3730	5
14	Inclined strut	2.15	10.75	34*30*1.8*2200	5
15	Control unit	1.0	1.0		1
<b>Total</b>			<b>189.68</b>		

## Part II. Connecting Screws and Clamps Details

Item	Specification	Quantity
<b>S0</b>	M22 double nuts, 2 flat washers, spring washer	8 sets
<b>S1</b>	M14*160 bolt, double nuts, 2 flat washers, spring washer	2 sets
<b>S2</b>	M16*120 bolt, double nuts, 2 flat washers, spring washer	4 sets
<b>S3</b>	M16*60 bolt, double nuts, 2 flat washers, spring washer	4 sets
<b>S4</b>	M14*120 bolt, double nuts, flat washer, spring washer, 2 plastic washers	4 sets
<b>S5</b>	φ16*125 axis pin, flat washer, split pin, small plastic pipe	1 set
<b>S6</b>	φ16*85 axis pin, flat washer, split pin	2 sets
<b>S7</b>	M12*160 bolt, double nuts, 2 flat washers, spring washer, middle clamp, rectangular plate	10 sets
<b>S8</b>	M12*30 bolt, nut, 2 flat washer, spring washer	11 sets
<b>S9</b>	M8*25 bolt, double nuts, 2 flat washers, spring washer	32 sets

<b>S10</b>	M5*23 self-tapping screw	3 sets
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**For 'double nuts', please fasten the first nut, then fasten the second nut.**

### Part III: Tools Required for Installation (Self-prepared by users)

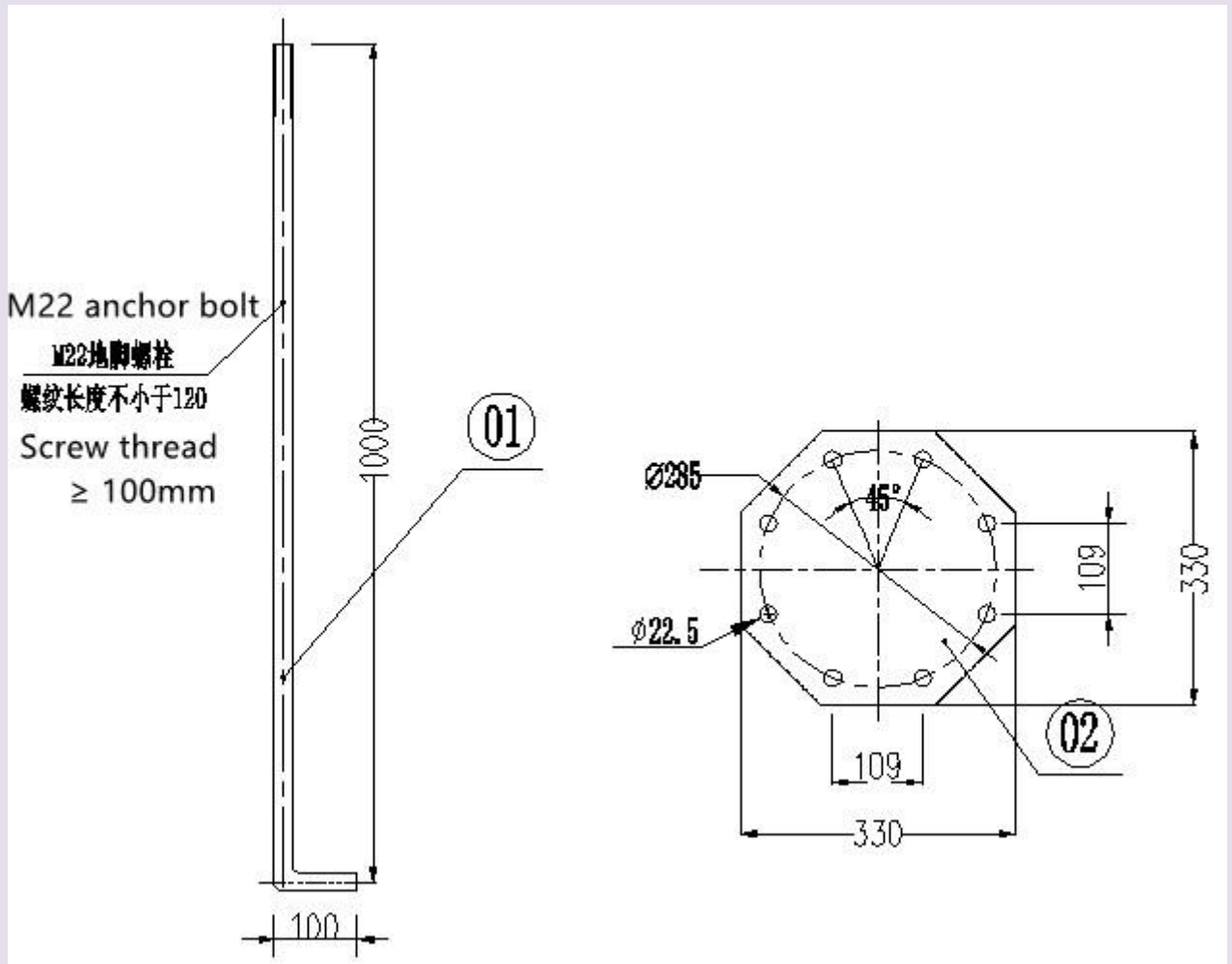
No.	Tools	Spec.	Quantity	Remarks
1	Open spanner	13/14	2	M8 screws
2	Open spanner	17/19	2	M12 screws
3	Open spanner	20/22	2	M14 screws
4	Open spanner	22/24	2	M16 screws
5	Open spanner	30/32	1	M20 screws
6	Adjustable spanner	10 Inch	2	Crescent adjustable wrench
7	Screwdriver	3#	1	Electric debugging (flat head or cruciform)
8	Rubber Hammer		1	Facilitate the installation
9	Double ladder or Scaffolding		2	or use small crane

### Part IV. Concrete Foundation

#### Materials Preparation

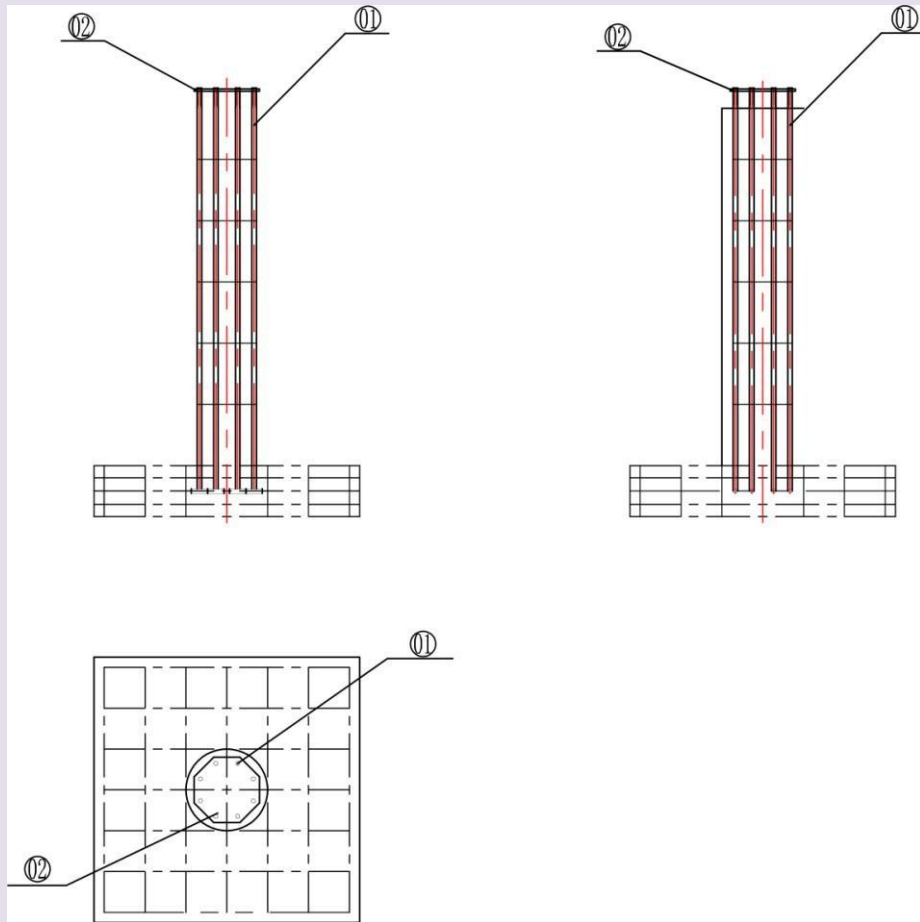
Marks	Description	Material	Quantity
○ <sub>01</sub>	Foundation bolt	M22	8
○ <sub>02</sub>	Fixture template	---	1
○ <sub>03</sub>	Foundation (above ground)	C30 concrete	---
○ <sub>04</sub>	Foundation (below ground)	C30 concrete	---

1. Make 8 foundation bolts ○<sub>01</sub> , one foundation bolt fixture template ○<sub>02</sub> (using rigid material, only for positioning bolts, thickness is not important).



2. Position 8 foundation bolts  $\bigcirc 01$  with the fabricated fixture template  $\bigcirc 02$ , secure the bolts to foundation steel mesh grid (using  $\phi 8$  steel rebar).





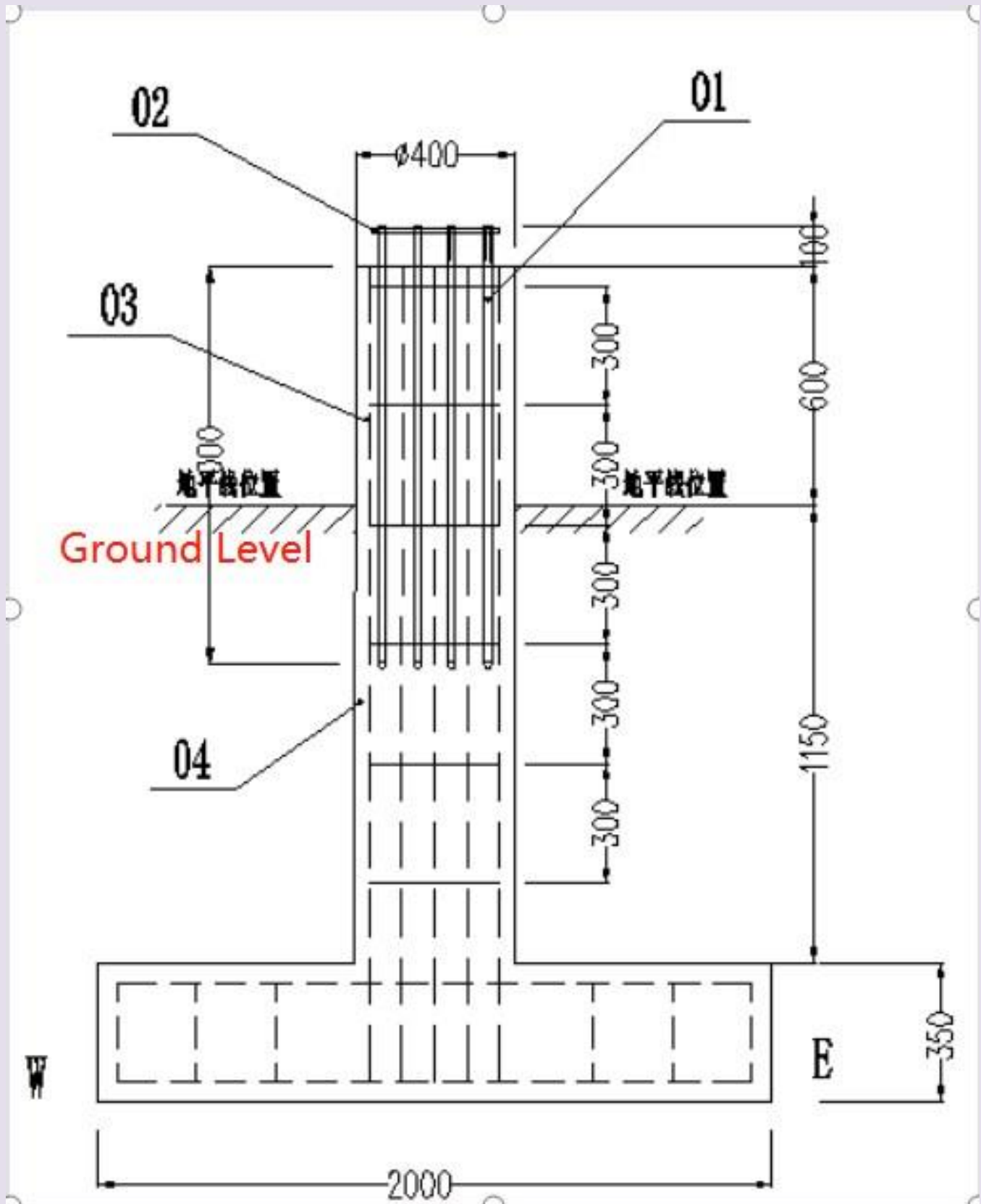
3.

Confirm the east-west direction carefully, pour concrete foundation according to the dimensions shown in the following drawings, remove the fixture template

○ 102 after the concrete is cured. The solar tracking system installation can be

carried out only AFTER the concrete is thoroughly cured.

(Covering the poured concrete with a plastic sheet will make it stronger, because it will dry out slower from sun exposure. To convert the dimensions from mm to inches divide by 25.4)

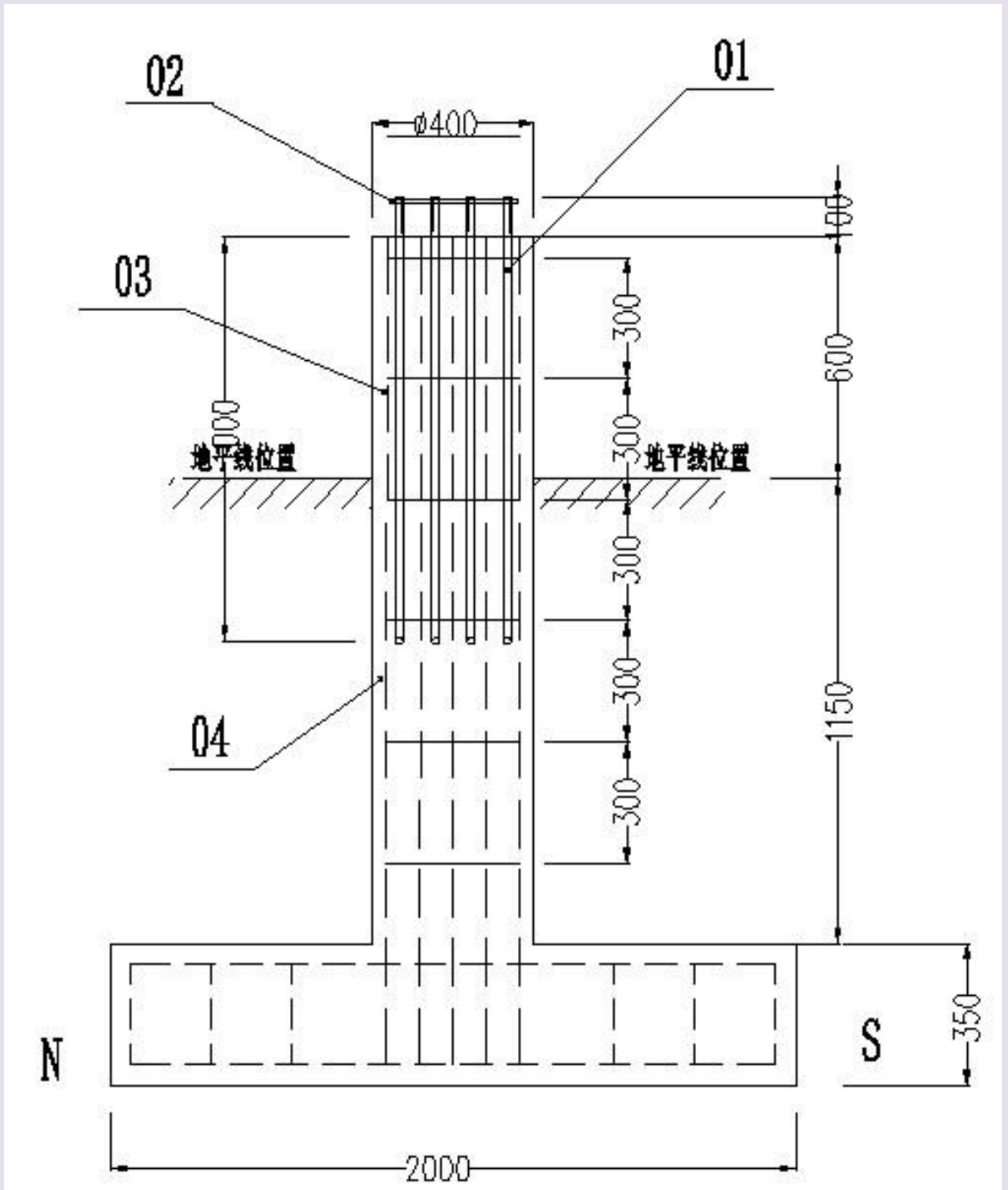


Foundation as viewed from the South.

300MM = 12" 350MM = 14" 400MM = 15 ¾ "

600MM = 23 5/8" 1000MM = 39" 1150MM = 45 ¼ "

2000MM = 78 ¾ "

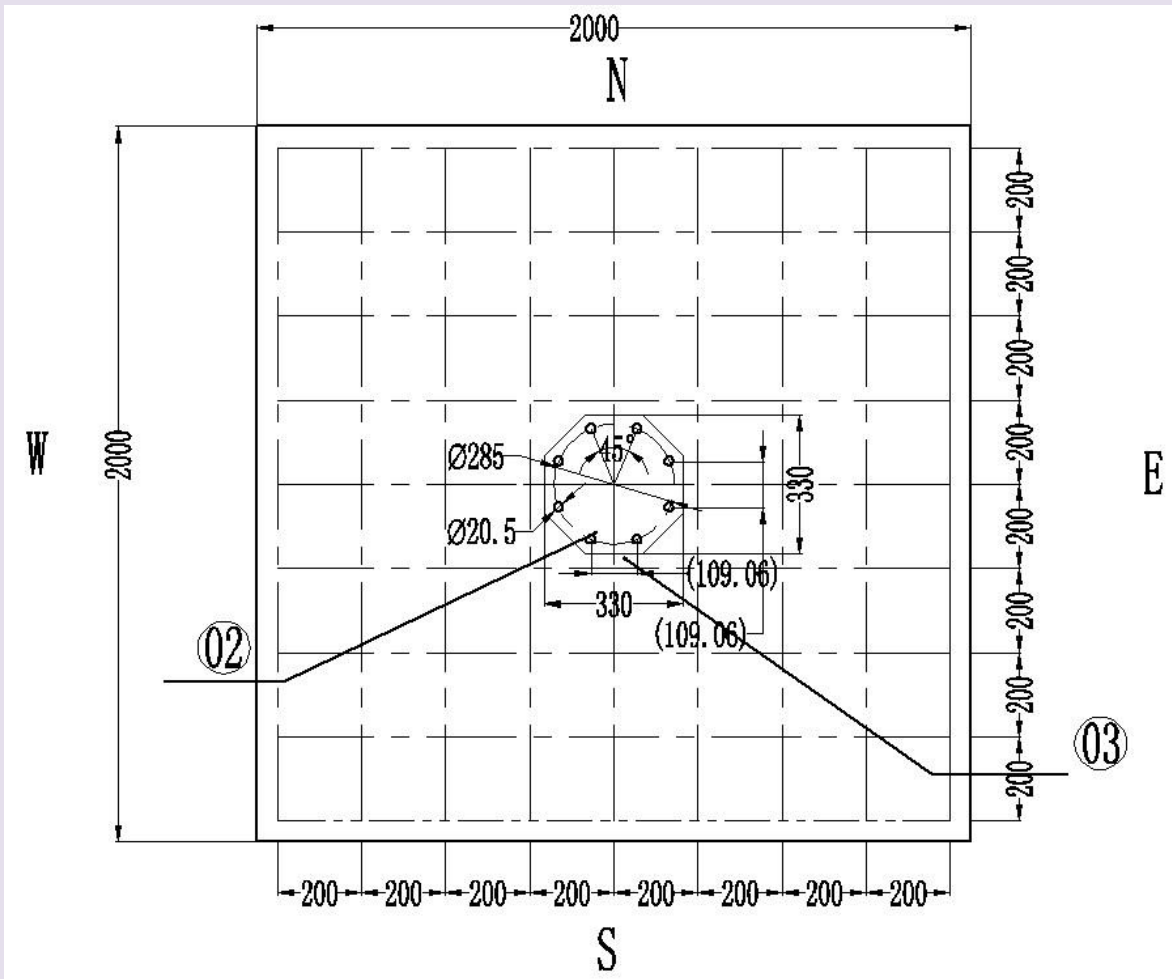


Foundation as viewed from the West

300MM = 12" 350MM = 14" 400MM = 15 ¾"

600MM = 23 5/8" 1000MM = 39" 1150MM = 45 ¼"

2000MM = 78 ¾"



Foundation as viewed from Above.

200MM = 8" 2000MM = 78 ¾ "

Note: Foundation above the ground should be more than 24", exposed foundation bolts  $\bigcirc$ 01 thread at least 4 ". To ensure the verticality of tracking system pole, the top face of foundation shall be leveling with spirit level. The dimensions and depth of the concrete foundation is just a guide, please design it for your local soil conditions and maximum wind speeds.

Concrete, foundation bolts ○01 and fixture template ○02 shall all be prepared by users. Φ40mm conduit for electrical wires can be planned into the concrete foundation, used for threading PV lines, controller power lines, etc.

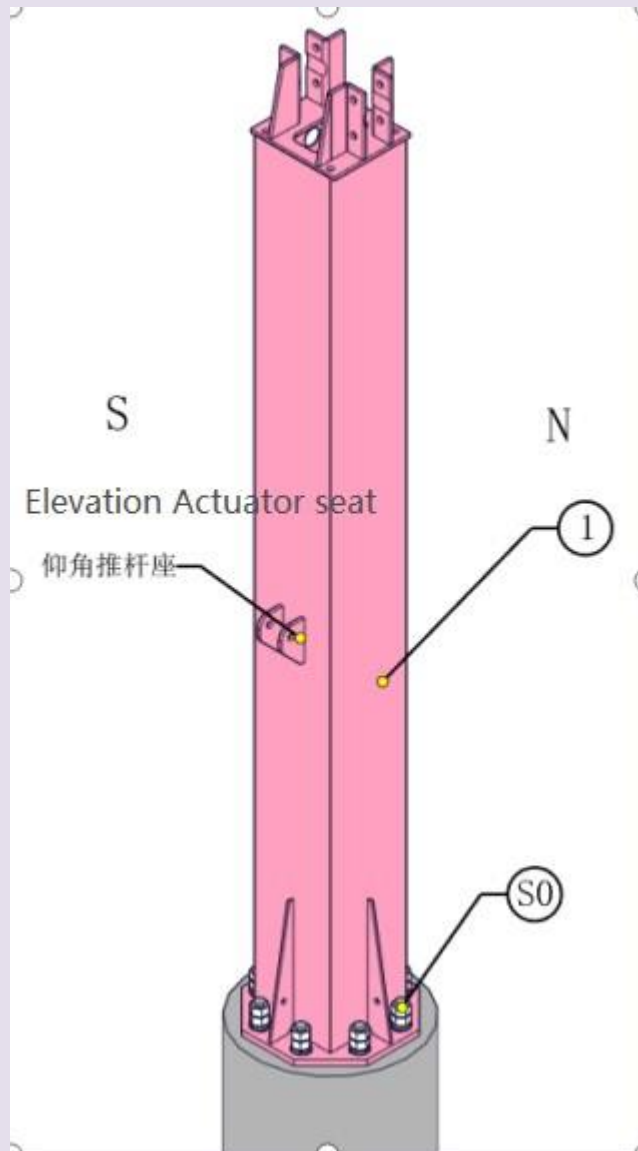
## Part V. Installation of SunChaser 8 Tracking System

### 5.1 Installation of Vertical Pole

Screw on one nut on each foundation bolt first, make them on the same level, put on one flat washer, then put the vertical pole ○1 on the concrete foundation, **verify the orientation of the vertical pole ○1** to ensure the side with linear actuator seat is facing **South**, then put on flat and spring washers, secure with hardware ○S1 (double nuts) to stabilize the vertical pole ○1 .

**The nuts below vertical pole are used for adjusting the levelness of vertical pole.** We suggest pour concrete between foundation and bottom plate of vertical pole.

**South** means the direction of the geographical longitude lines, it can be confirmed with gyroscope or compass (need to amend the geomagnetic declination, different sites, difference geomagnetic declination).



## 5.2 Assembly of L-shaped bracket & Center beam

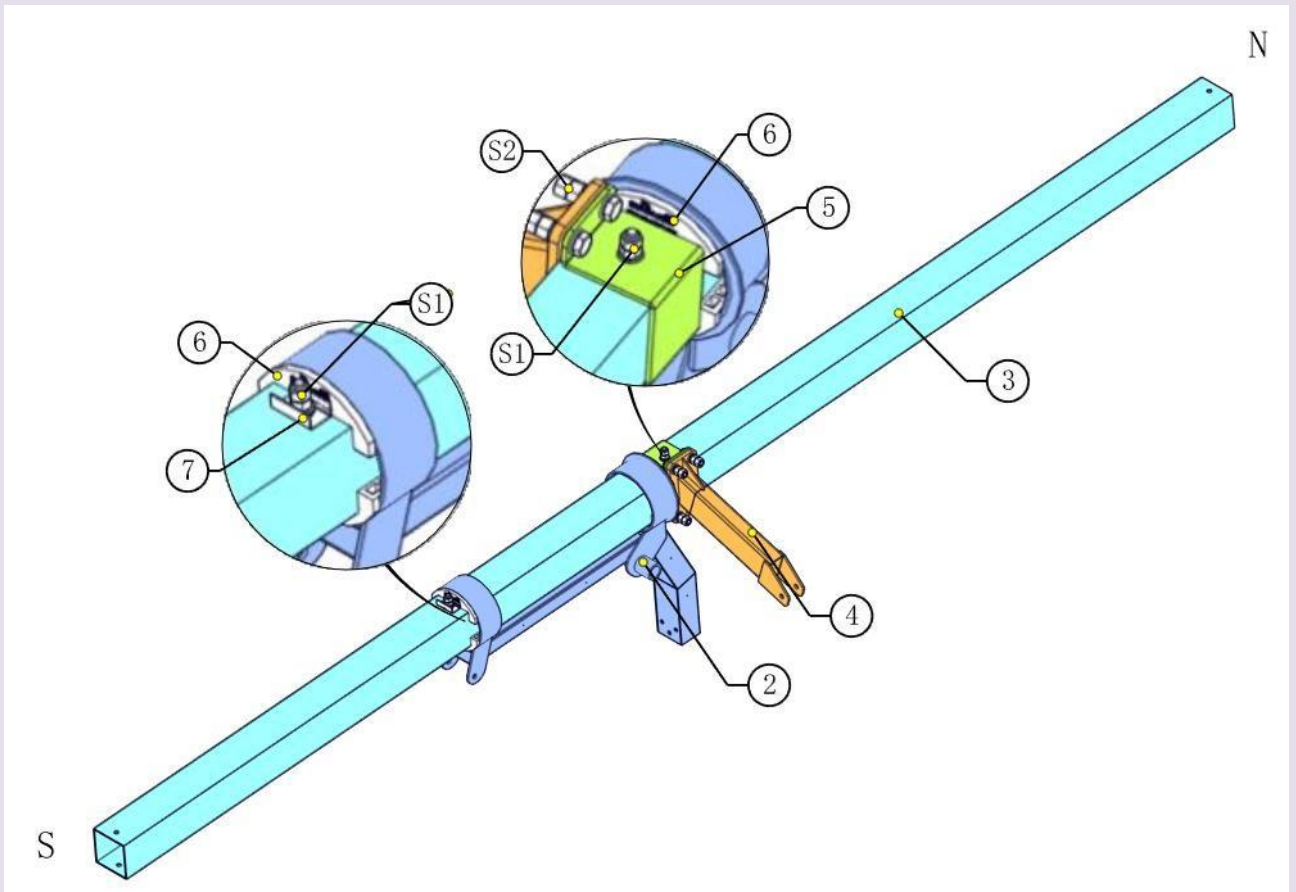
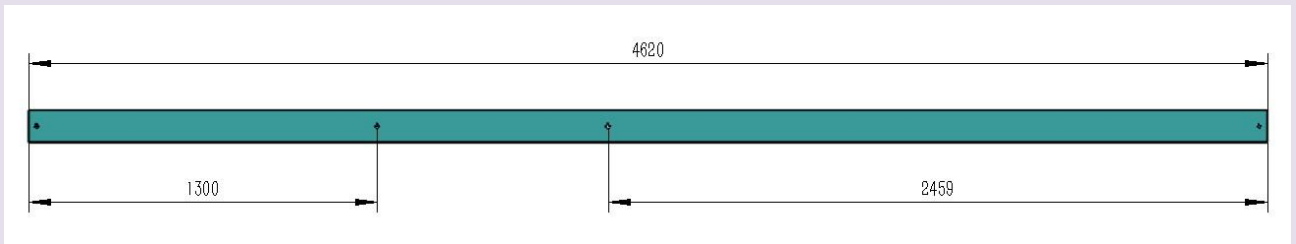
Put the center beam **○3** into the L-shaped bracket **○2**, please pay attention to the direction of the center beam

. Then put two plastic bearing **○6** into

the **north** hoop of the **L-shaped bracket** (insert the **plastic bearing** from the **north** side), then fix the **swing arm fixing plate** ○<sub>5</sub> onto the **center beam** with **hardware** ○<sub>S1</sub> , then fix the **swing arm** ○<sub>4</sub> onto **swing arm fixing plate** ○<sub>5</sub> with hardware S2 ;

And put two **plastic bearing** ○<sub>6</sub> into the **south** hoop of the **L-shaped bracket** (insert the **plastic bearing** from the **south** side). Then use **hardware** ○<sub>S1</sub> to fix the **plastic bearing limit** ○<sub>7</sub> on the center beam. **Installer may need to knock the plastic bearing into the hoop with hammer, this is for reducing shaking space.**

**Grady's Note:** Make sure the plastic bearing is properly aligned with the bolt holes in the main beam. The top of the bearing should be next to the holes.



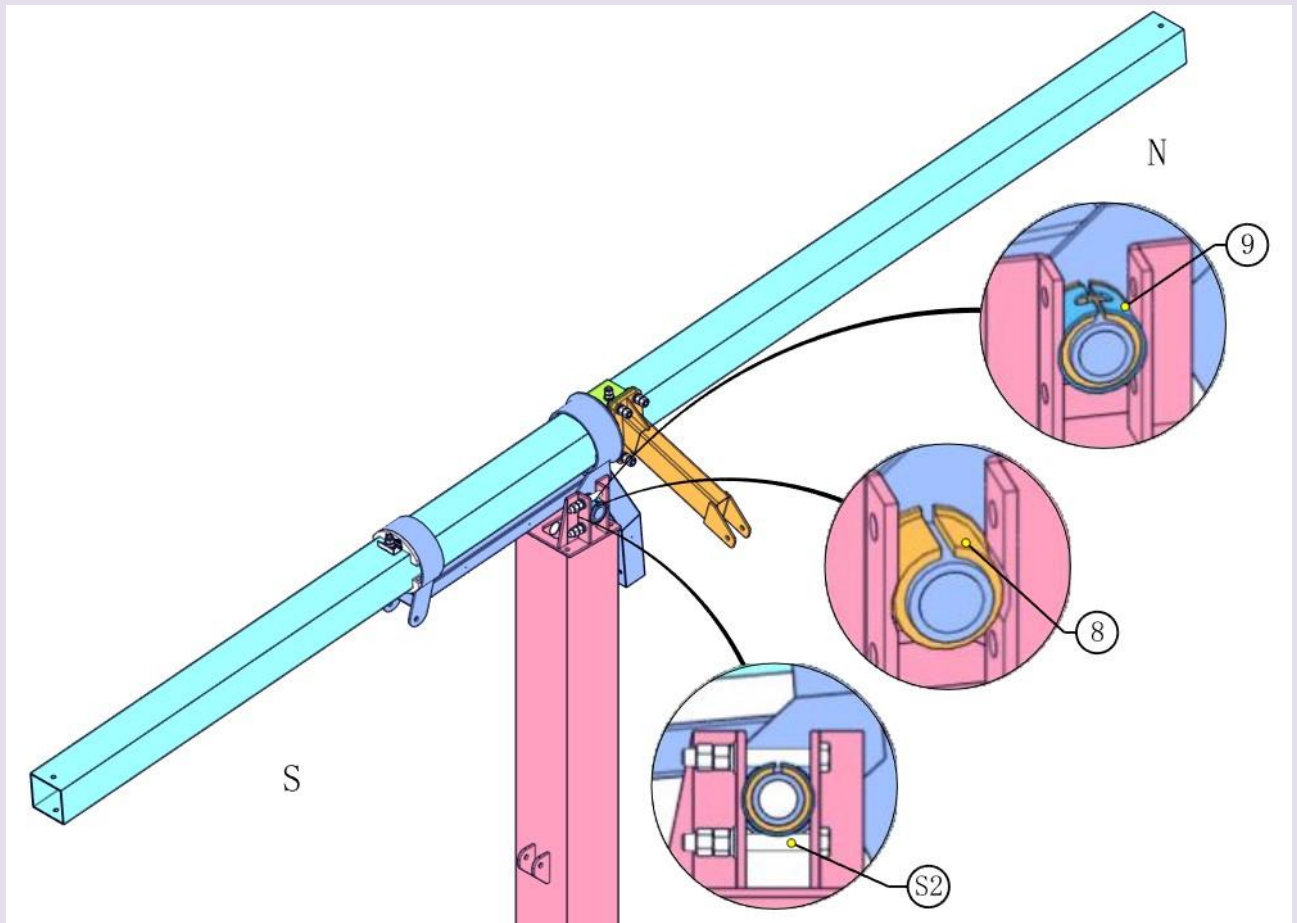
### 5.3 Installation of L-shaped bracket & Elevation linear actuator

Install two lower screws of **hardware** ○S2 onto the top of **vertical pole** ○1 , do not fasten it for the time being. Put the **plastic shaft sleeve** ○8 into the **steel shaft sleeve** ○9 , both openings are in same direction. Then affix the **L-shaped bracket** ○2 onto the **vertical pole** ○1 , put the plastic shaft sleeve and steel shaft sleeve onto the shaft of **L-shaped bracket**, the opening faces upwards, **please pay attention to the direction of plastic shaft sleeve**, then install



the other two upper screws of hardware ○S2 , tighten the four screws of hardware ○S2 .

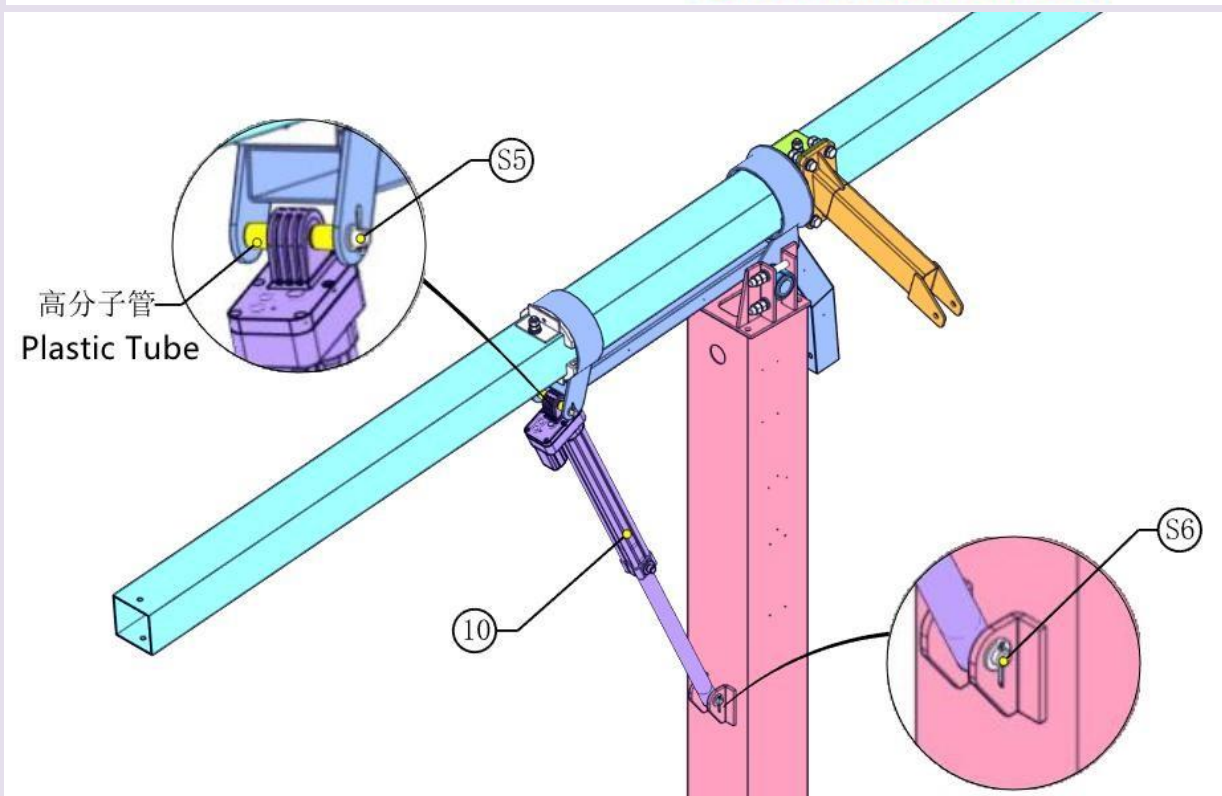
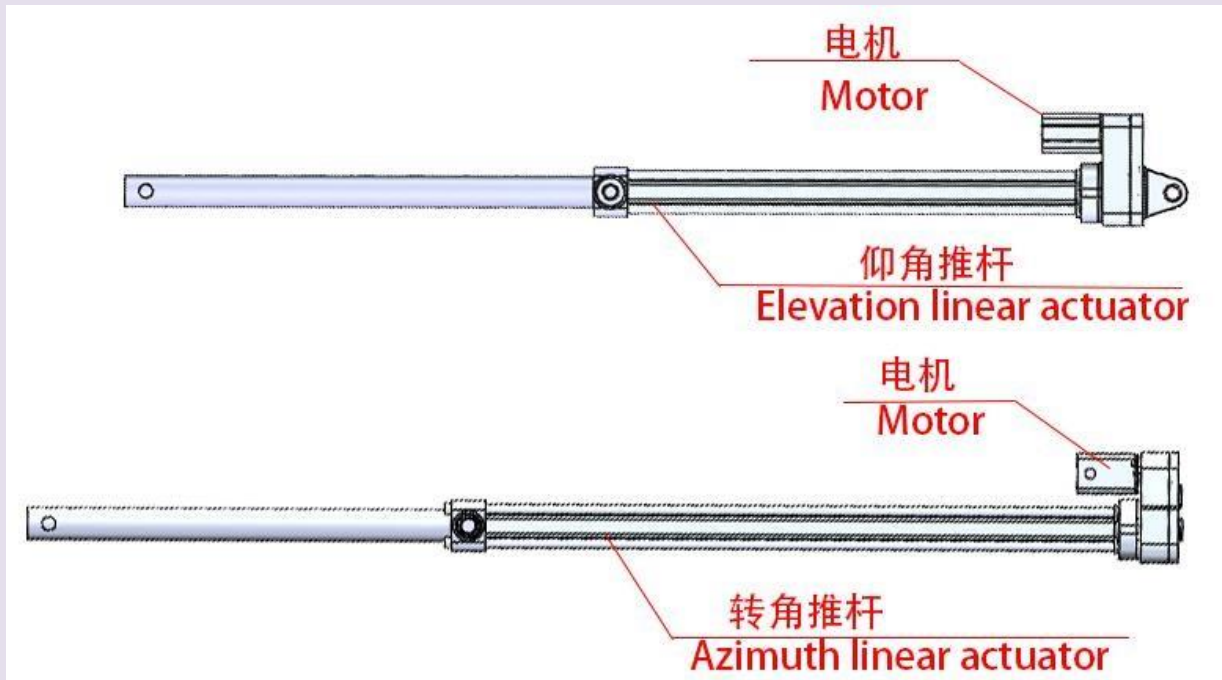
**Note: Please pay attention to the direction of L-shaped bracket ○2 !**



Gradys Note: INSTALL THE AZIMUTH ACTUATOR FIRST or leave the bottom pin out.

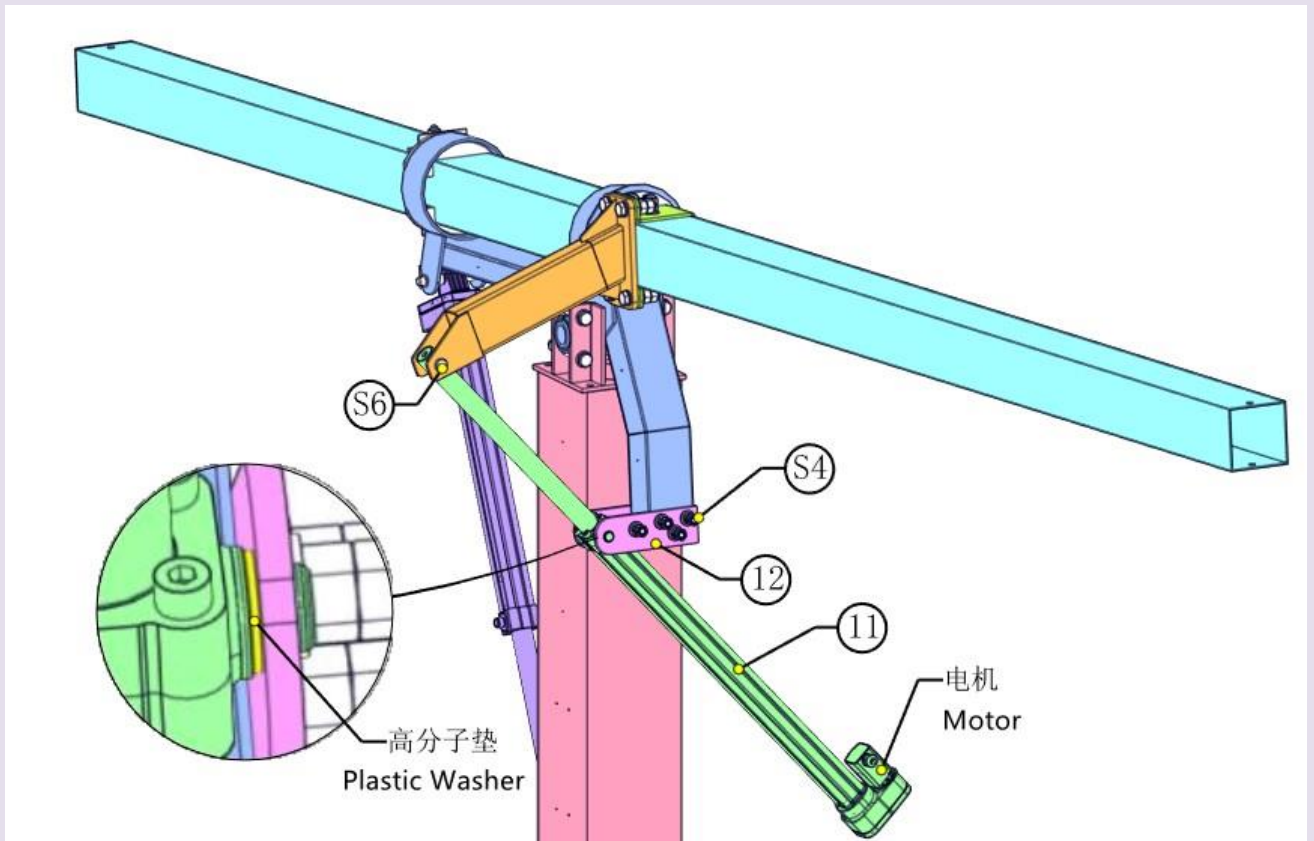
Fix **elevation linear actuator** ○10 with **L-shaped bracket** ○2 with **hardware** ○S5 . The motor is on top and **south** side. Put the plastic washers of **hardware**

○S5 as following drawing. Fix **elevation linear actuator** ○5 with **vertical pole** ○1 with hardware ○S6 , split the split pin. There are two kinds of linear actuators for each unit, do not mix them up when installing them.



## 5.4 Installation of Azimuth Linear Actuator

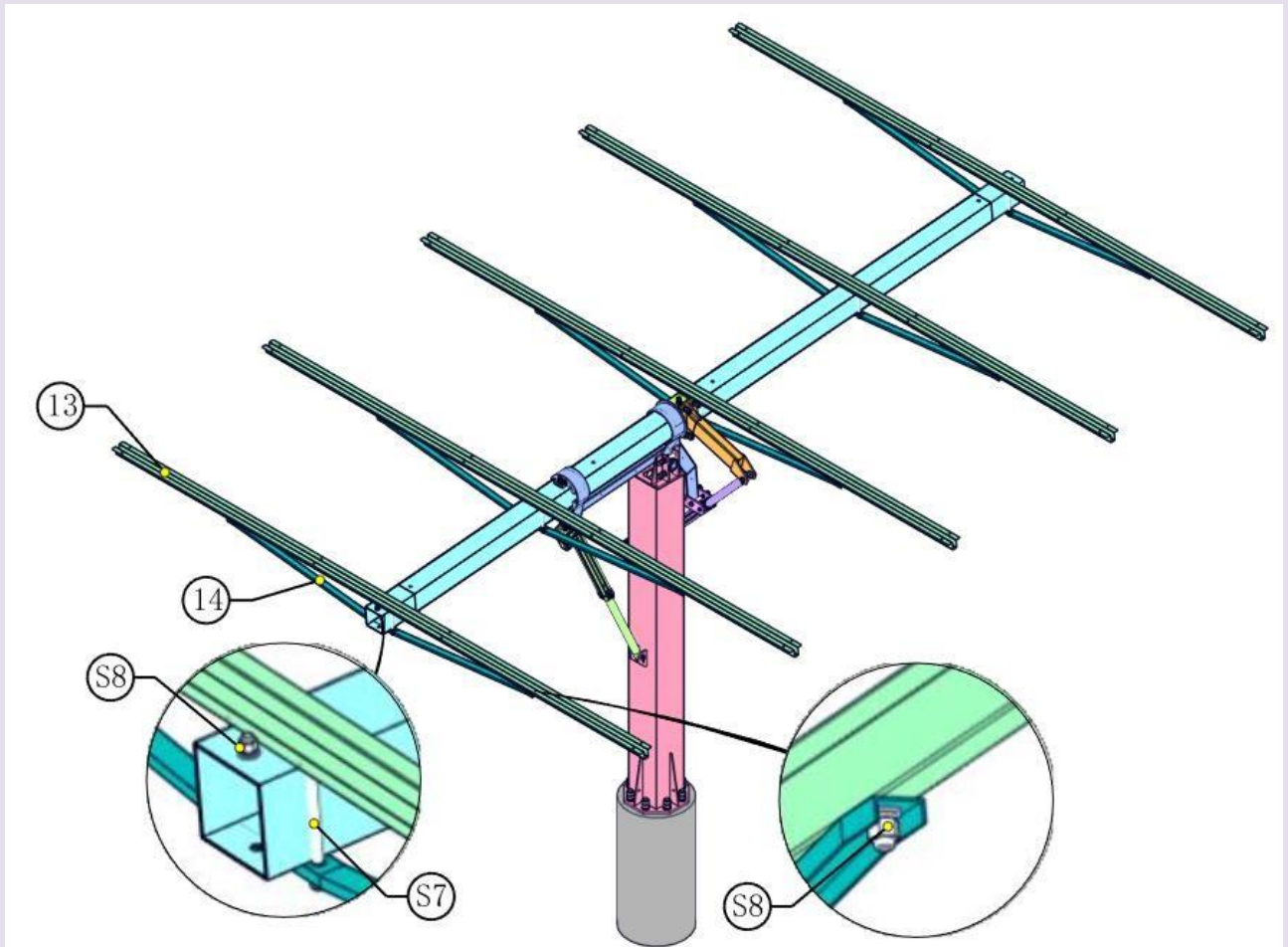
Fix the **azimuth linear actuator** ○<sub>11</sub> to **L-shaped bracket** ○<sub>2</sub> with **azimuth linear actuator seat** ○<sub>12</sub> and **hardware** ○<sub>S4</sub>. Please pay attention to the direction of the motor. The nuts of **hardware** ○<sub>S4</sub> should be on the **north** side. Put the plastic washers of **hardware** ○<sub>S4</sub> between the **azimuth linear actuator seat** and **azimuth linear actuator**. Fix **azimuth linear actuator** ○<sub>12</sub> to **swing arm** with **hardware** ○<sub>S6</sub>, the split pin of **hardware** ○<sub>S6</sub> should be at the **south** side of **swing arm**, split the split pin. **Adjust the position of swing arm and swing arm fixing plate slightly, make the linear actuator at the center position of swing arm.**

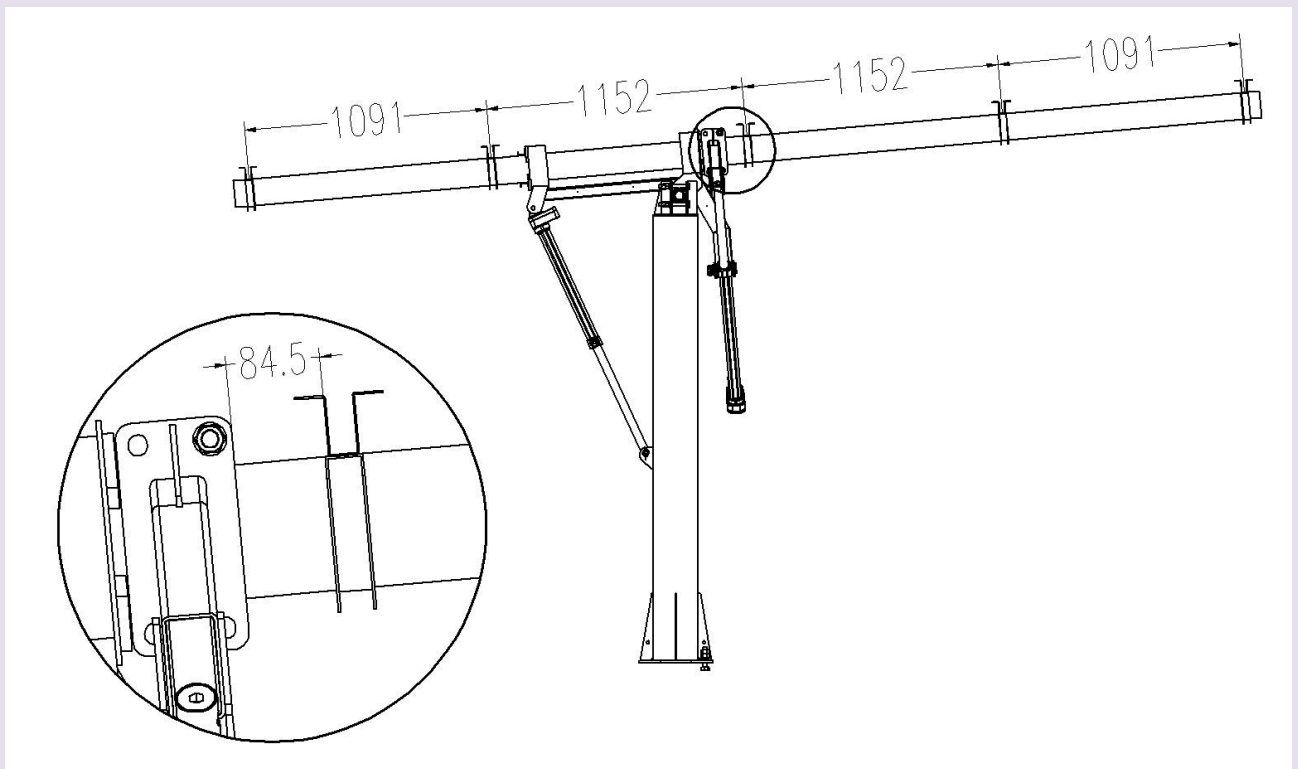


### 5.5 Installation of Supporting Beam & Inclined strut

Fix the first **supporting beams** ○13 and **Inclined strut** ○14 onto **center beam** at the **north** side of **L-shaped bracket** with **hardware** ○S7 & ○S8 . Then install other **supporting beams** and **Inclined strut** as distance in following drawing. Then

install a M12\*30 bolt of hardware ○ S8 at the **south** end of **center beam** for anti-slip purpose.



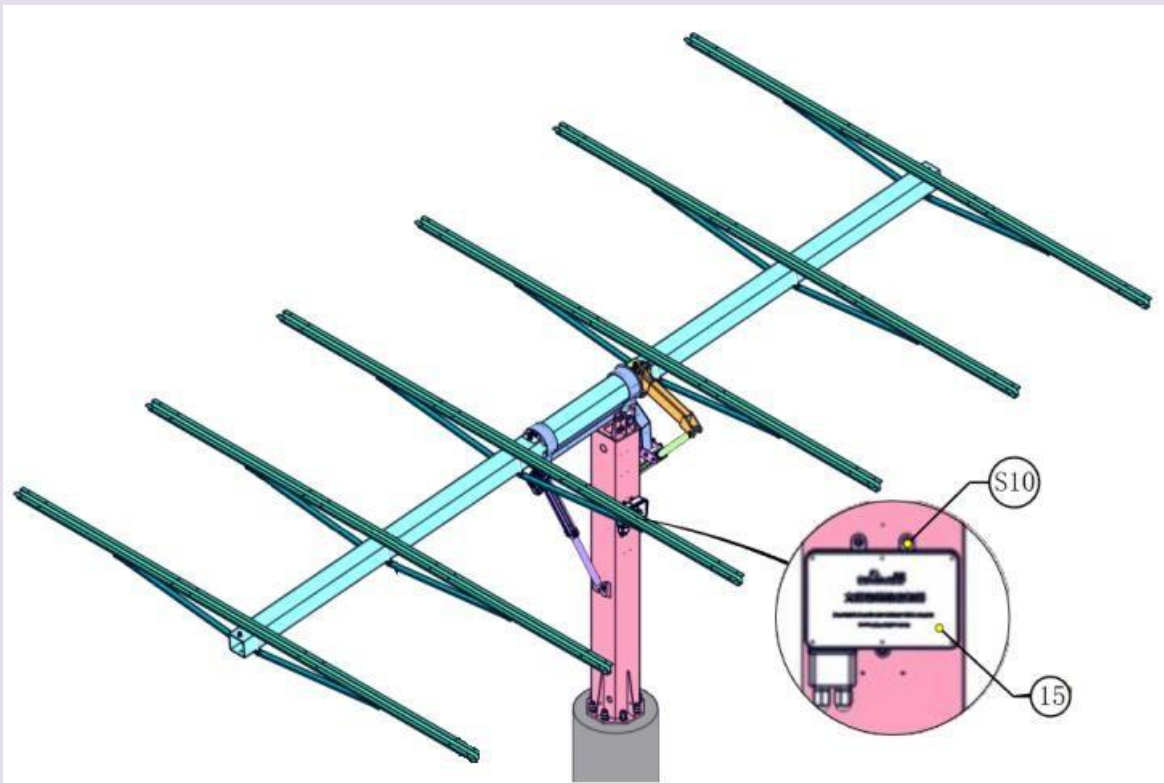


**Grady's Note: 84.5MM = 3 3/8" Adjust the other dimensions to your panels.**

### **5.6 Installation of Control Unit**

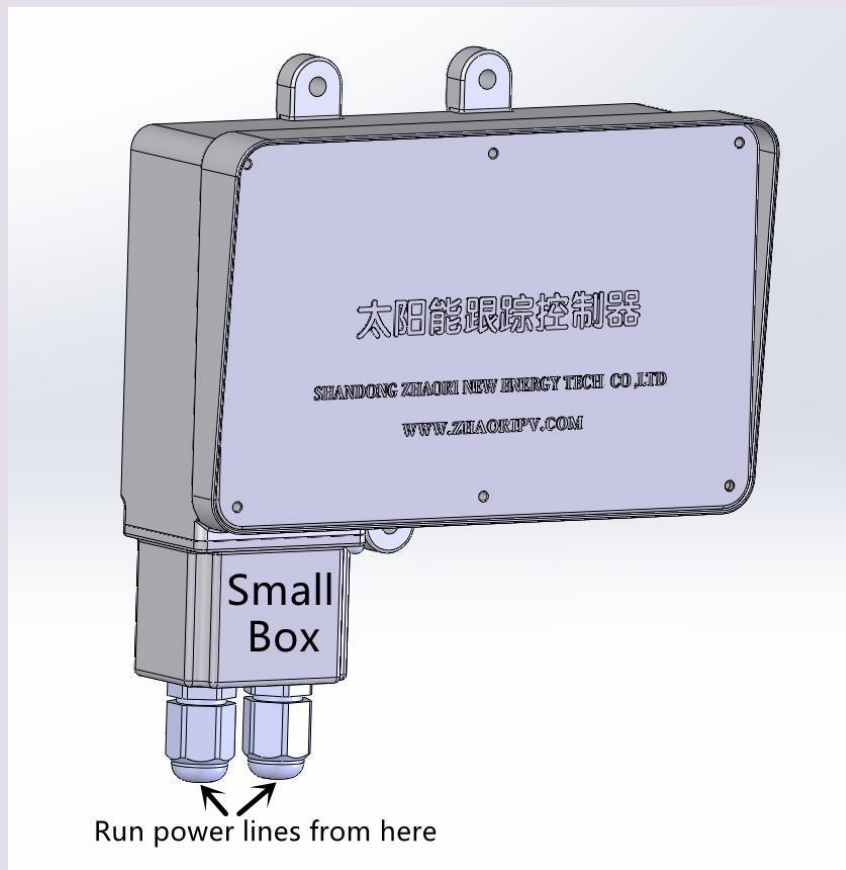
Fix the **control unit**  $\bigcirc_{15}$  on the **vertical pole** with hardware **S10**, there are small holes on **vertical pole** for fixing control unit.





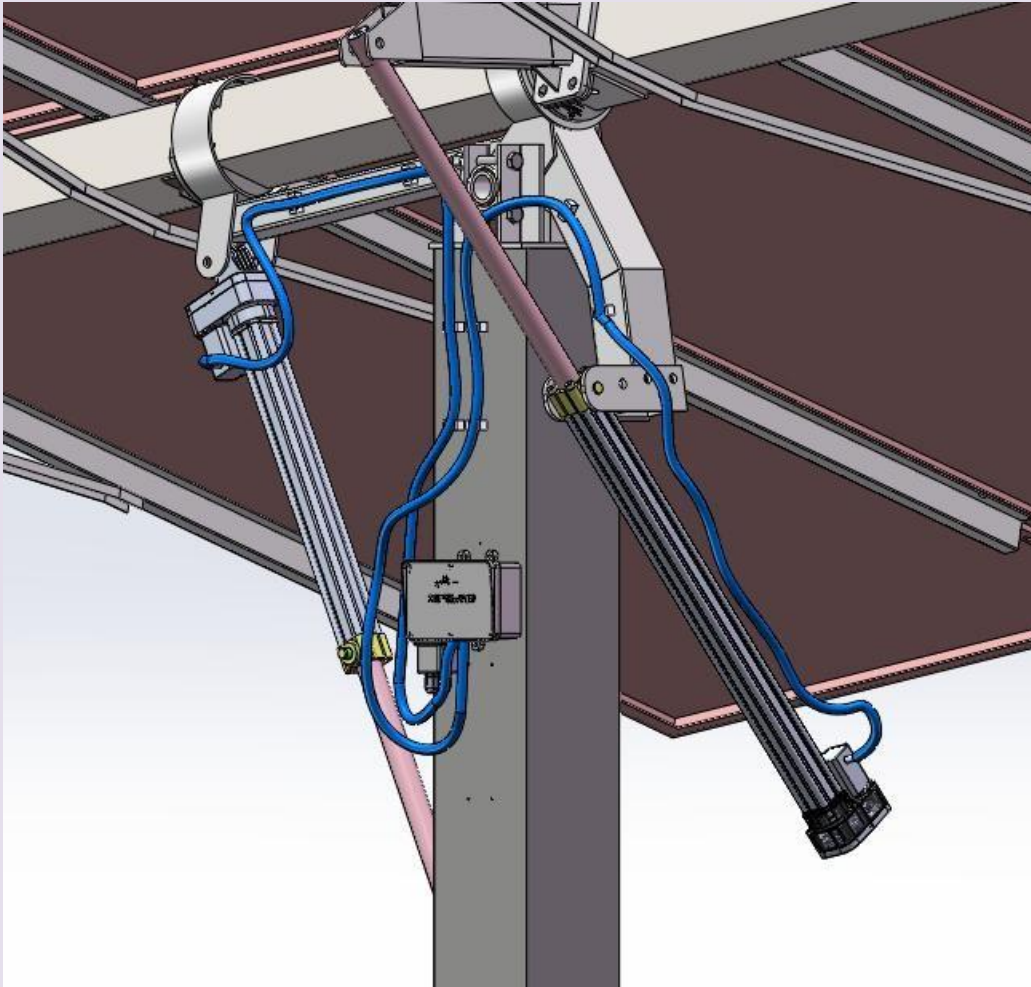
### 5.7 Connect Control Unit Circuit Using A/C power supply

Connect azimuth motor cable (**with label**) with the motor on azimuth linear actuator, connect elevation motor cable (**with label**) with the motor on elevation linear actuator. Take off the small box on control unit, run A/C power from the cable holes of the small box, and connect the two power lines to the **power connectors**.



Use corrugated pipe (the blue part in the figure) and pipe clamp to fix the motor cable onto the vertical pole and L-shaped bracket, there are reserved small fixing holes on vertical pole and L-shaped bracket.





Installers can connect the wind sensor (if equipped) to the wind sensor cable **host control unit** with wind sensor wire for wind protection purpose.



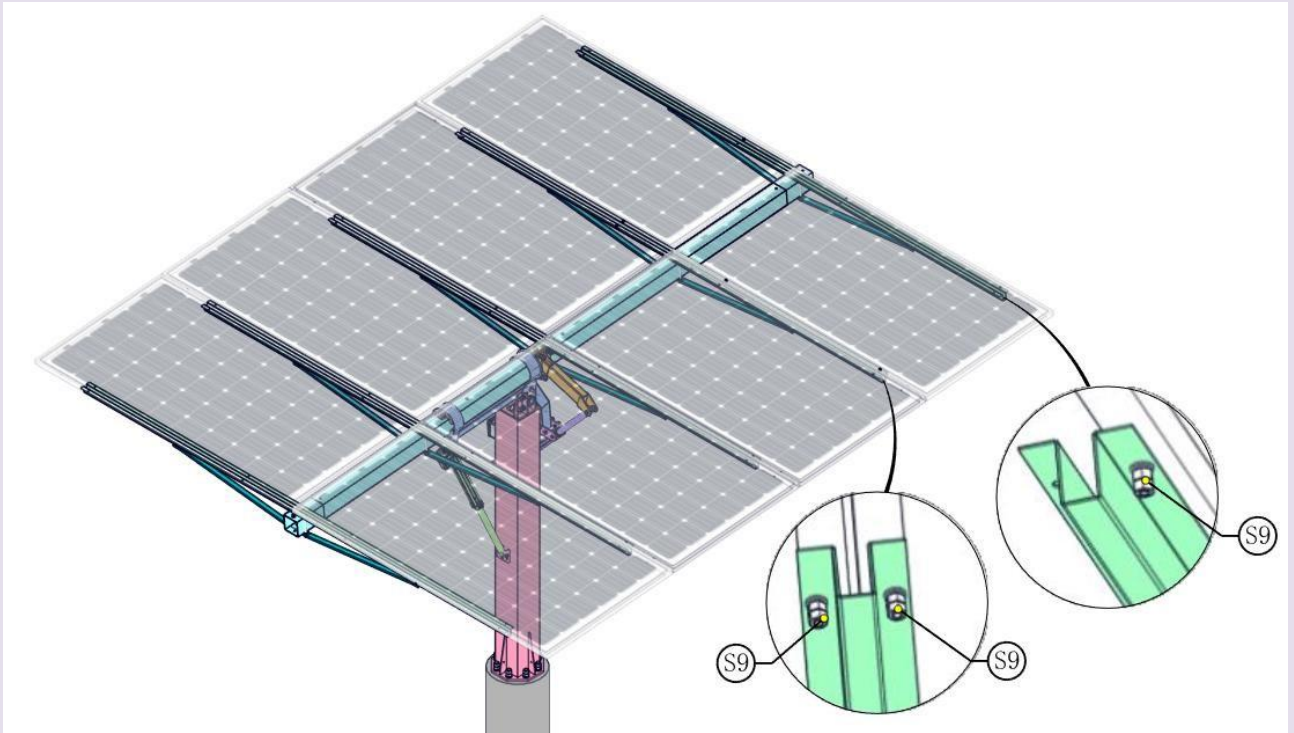
### 5.8 Installation of Solar Panels

To facilitate the installation of solar panels, installers can supply power to the **controller panel port** on control unit, insert the controller panels on the control

box, press **manual** button, then press **confirm** button, then press **west** button to adjust the structure close to the flat position in east-west, it will stop rotating by pressing **west** button again, then press **north** button to adjust the structure close to flat position (It can lean slightly to the south), it will stop rotating by pressing **north** button again. **Cut off the power after the adjustment.**



Fix all the solar panels to the **supporting beam** with hardware  $\bigcirc$  S9 , each solar panel is fixed by 4 points.

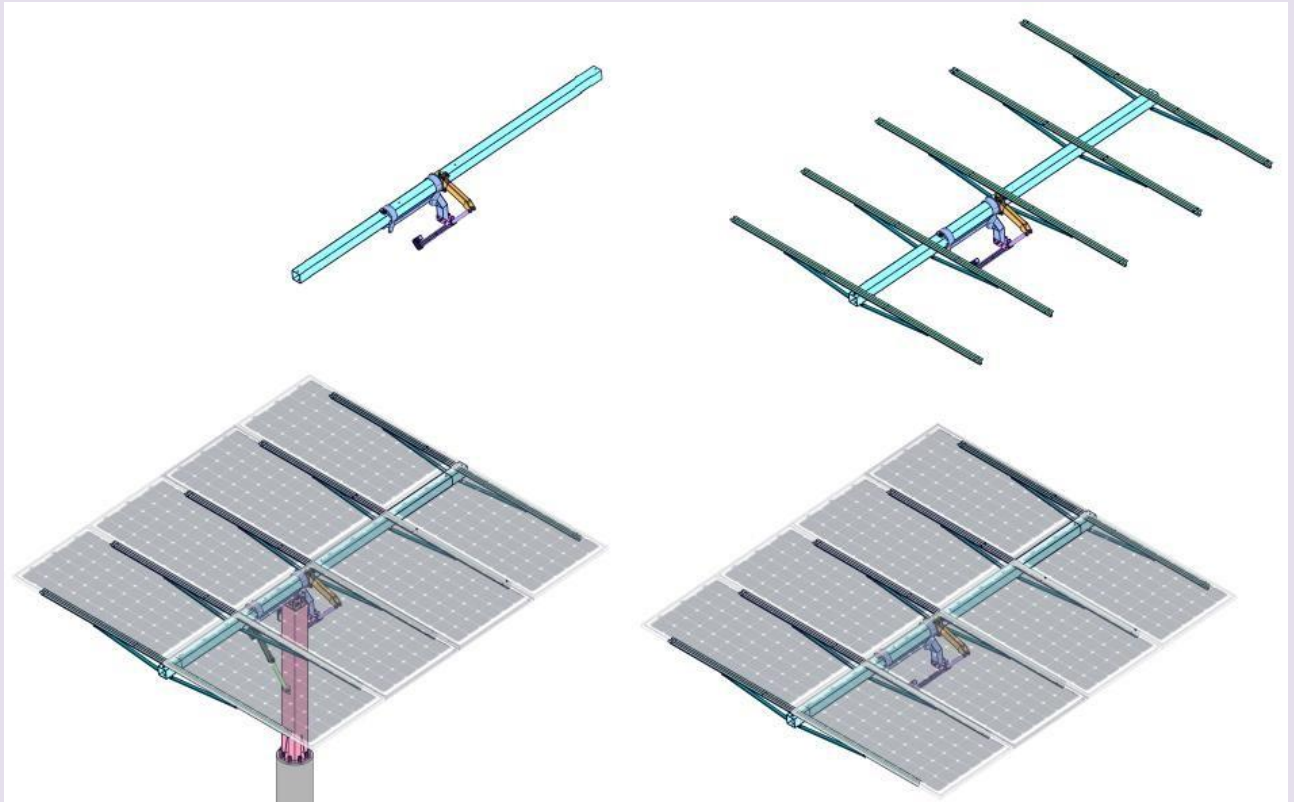


**Note:** after finished the installation of solar panels, please lock all of the connection screws.

There are reserved connecting holes at the bottom of vertical pole for lightning protection grounding, please grounding the brackets properly according to PV power station grounding standard in your country.

### **Part VI: Crane Hoisting**

If there is small crane equipped at the installation site, including the L-shaped bracket, azimuth linear actuator, frames and solar panels can be assembled in advance, then hoist it onto vertical pole ○1 directly, then following previous steps of 5.3 to fix the **L-shaped bracket** and **elevation linear actuator**.



## Part VII: Control Unit Debugging

Supply the A/C power to all of the driving systems in one project, the controller will automatically start after 5 minutes, and the host control unit will download GPS data automatically (need about 1 - 10 minutes), then the system will rotate to east or west and hit the angle limit position, then it will rotate to north or south and hit the angle limit position, then it will wait for a while and go to the right position automatically. **The slave driving systems will follow the movement of host driving system.**

## Part VIII: Daily Operation and Maintenance – Important !

### 8.1 Regular inspection and maintenance

1. In order to discover potential fault timely, improve the system operation reliability, regular inspection shall be not less than once for every six months.

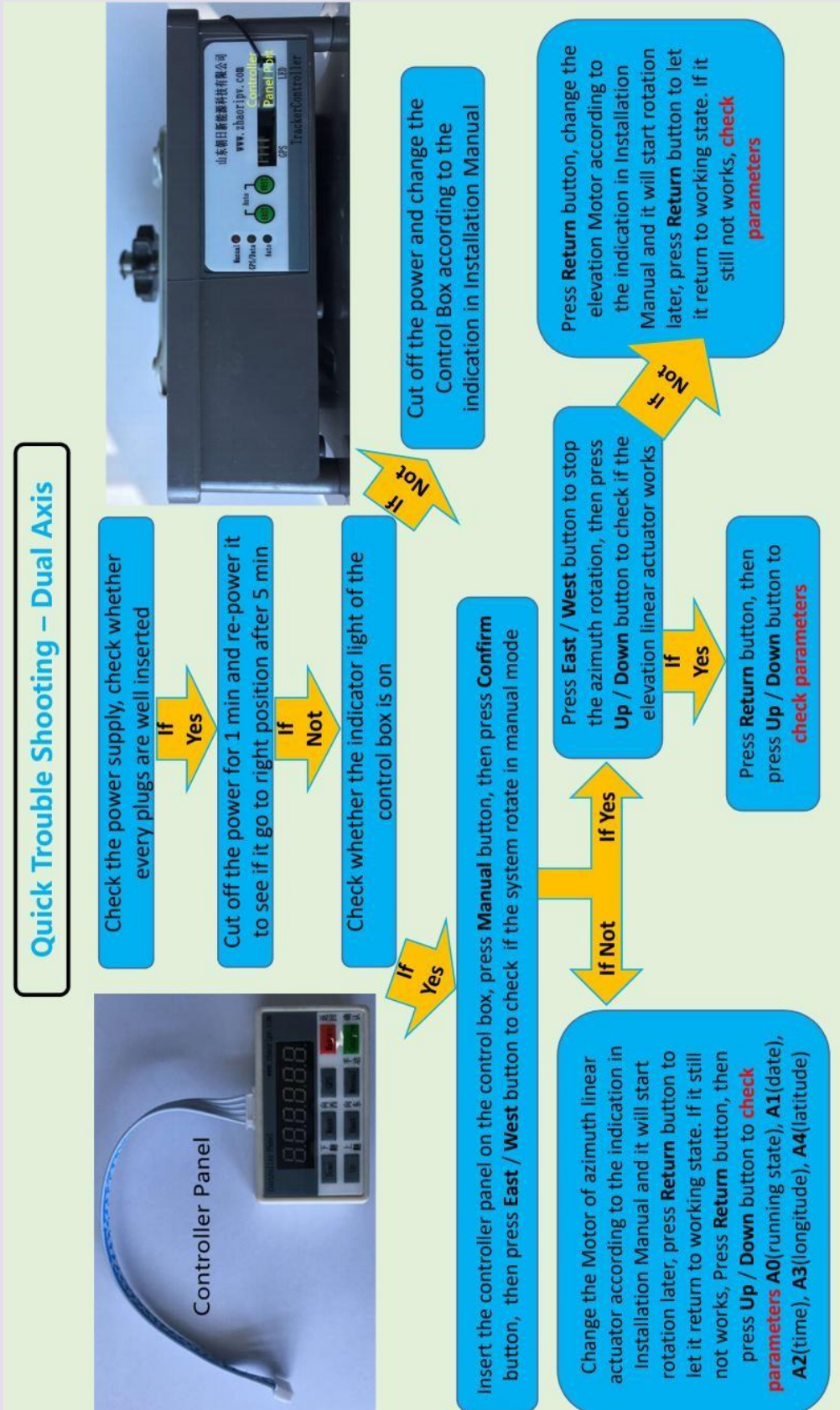
2. After bad weather like more than force 6 strong winds, tropical storm, heavy snow, or earthquake occurred, maintenance personnel should make a general checking for the bracket, repair it in time if there is any damage. **8.2 Inspection**

**items and problem treatment**

Item	Inspection content	Solutions
Bolts and nuts	Check whether bolts and nuts were loosed	If bolts and nuts were not well fastened during installation, or loosed due to strong winds, maintenance personnel need to re-fasten it.
Clamps	Check if clamps were deformed or loosed	If it was loosed because of screws were not well fastened, need to re-fasten the screws. If clamps were deformed, need to replace it.
Solar panels	Check whether solar panels are flat	If it's not flat and caused by structural distortion, need to rectify the distortion, or replace some parts. If it caused by loosed screws, need to re-fasten or replace the screws.
Brackets	Check whether there is any crack or rust problem	If it appears rust, should use abrasive paper for rust removing, then spary epoxy zinc-rich primer or other antifouling paint for protection. If cracks appear, consult with factory for solutions.
Wire connection in driving box	Check whether have loosed wire connection	If there is loosed wire connection, need re-connect it or replace the plugs.



## Part IX: Quick Trouble Shooting



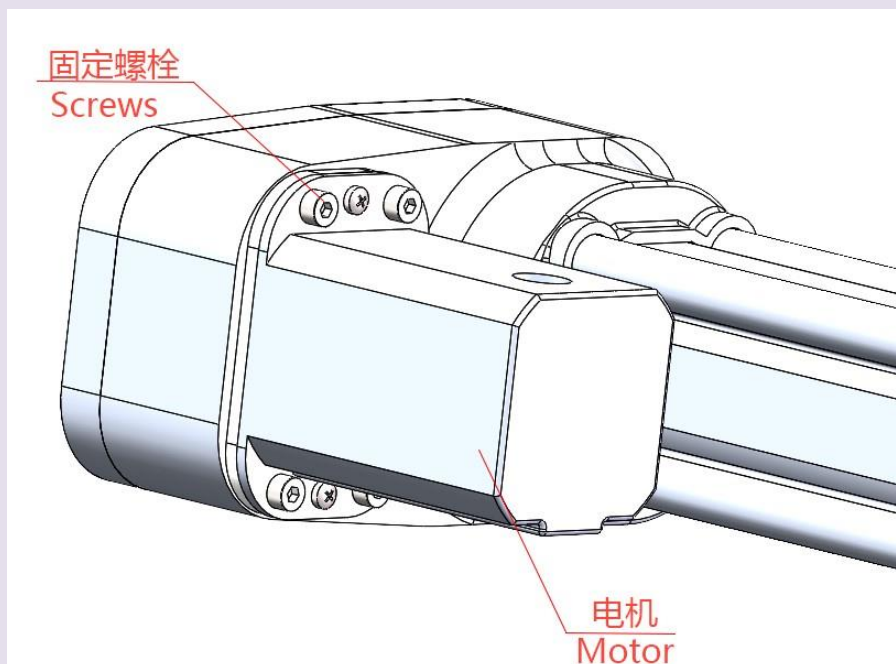
Please contact our customer service staff for situation not easy to judged and solved.

## Part X: Spare Parts Replacement

**Note: Cut off the power supply before replacement. If using PV power directly supply, disconnect all the connectors at input and output terminal of junction box or four-way connector. If using A/C power supply, cut off the A/C power switch.**

### 10.1 Gear motor replacement

Unplug the gear motor plug, unscrew four fixing screws, take off the gear motor, apply sealant on a new motor, then fix the new motor with fixing screws, plug in the motor plug.



### 10.2 Control unit replacement

Open the small box on control unit, take off the power lines and motor cables, then fix a new control box with the fixing screws, and connect all plugs as before, fix the small box on control unit.

