

ezTracker D1P120

Version: V1.0

TÜV Certification



ETL Certification



CPP Wind Tunnel Test



DNV Bankability



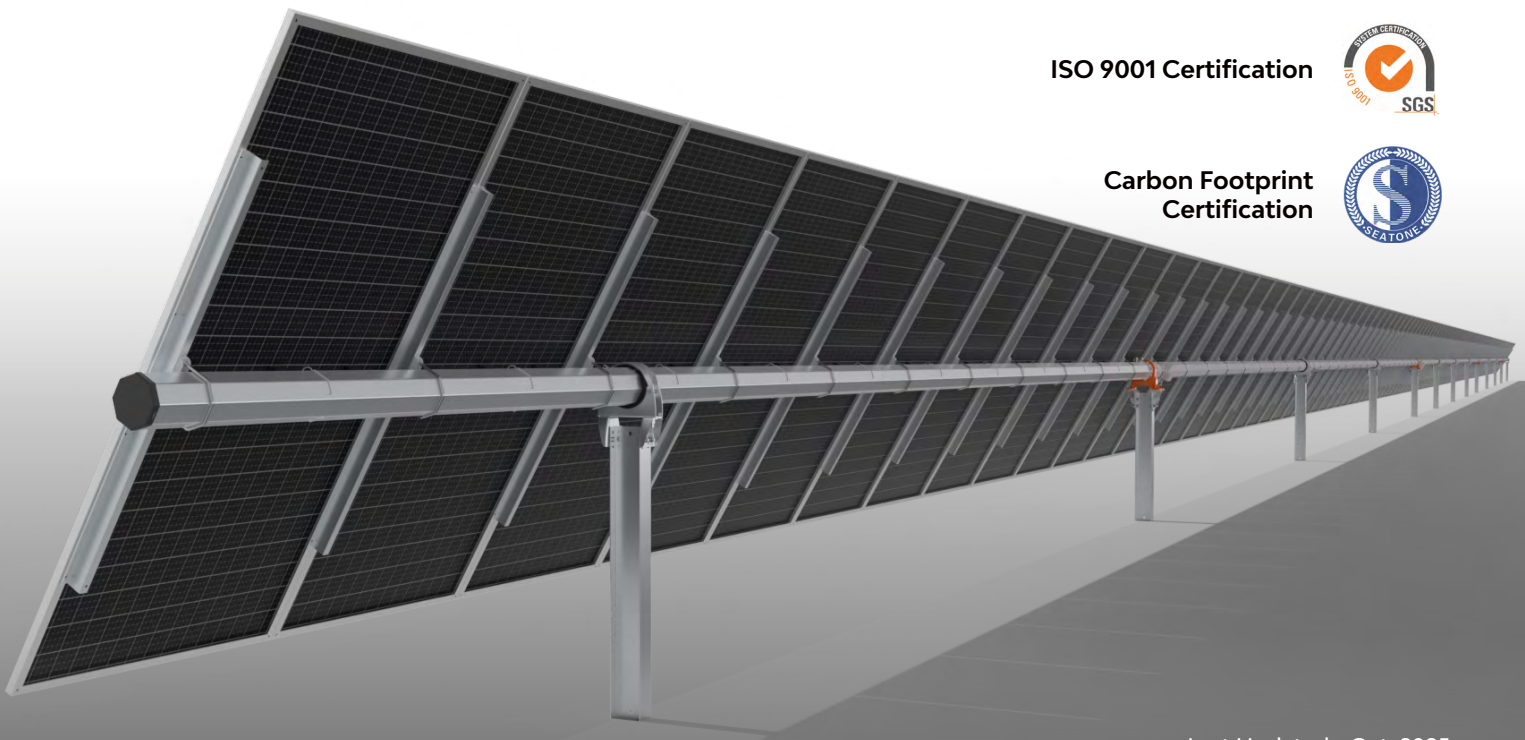
CE Certification



ISO 9001 Certification



Carbon Footprint
Certification



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Preface




About the Installation Manual

The purpose of this manual is to describe the installation procedure for the Clenergy Technology Co.,Ltd. Flat Single Axis Tracker ezTracker D1P120. The installer must strictly follow this manual to ensure that the system will function properly according to the manufacturer’s design requirements. If the installer fails to follow the instructions in this manual, Clenergy will not be held responsible for the overall performance or safety of the system. This manual is to be used in conjunction with the stamped construction drawings.

Safety Recommendations and Use of Signs

- Ensure that the installation is performed by a licensed solar professional, except that all tasks must be supervised by a designated technician, and ensure that no fewer than two professional solar panel installers are present when installing a single solar panel.
- Comply with all including any applicable local or national building codes that may supersede this manual.
- Ensure that Clenergy products such as mounting brackets are suitable for the specific installation and mounting environment.
- Use only genuine factory parts or parts supplied or Recommendation by Clenergy. Replacement with parts from other sources may void the applicable warranty.
- Verify staking parameters prior to installation as soil conditions may need to be evaluated based on local geotechnical reports. We recommend consulting an engineer familiar with local codes and building site requirements, including soil conditions, topography, and loading criteria. All parameters may affect foundation requirements.
- Comply with all applicable fire codes, including but not limited to keeping sidewalks clear and avoiding obstructions.
- Ensure that the site information provided is accurate; Clenergy is not responsible for problems caused by inaccurate information.
- Confirm with the module manufacturer the compatibility of the selected modules with the tracking bracket.
- Ensure safe installation of all electrical aspects of the PV system. All electrical installations and procedures should be performed by a licensed electrician or EPC. All work must comply with national, state and local installation procedures, product and safety standards.
- Refer to the O&M manual for periodic and preventive maintenance of the tracker.

For the reader's convenience, some symbols and meanings included in this manual are listed below:

	Key	Operate as required to prevent damage to the tracker or degradation of its performance, even if it affects the tracker's warranty.
	Recommendation	Follow the recommendations to make tracker assembly faster and easier.
	Customization	Customized to suit the project, refer to the stamped construction drawings for specific information.

Scope of Application and Limitations

This installation manual is a general guide for the Clenergy Tracker ezTracker D1P120. This manual is to be used in conjunction with the stamped construction drawings.

After-sales service

For after-sales support from Clenergy, please contact contactsales@clenergy.com.cn.

Tracker Overview

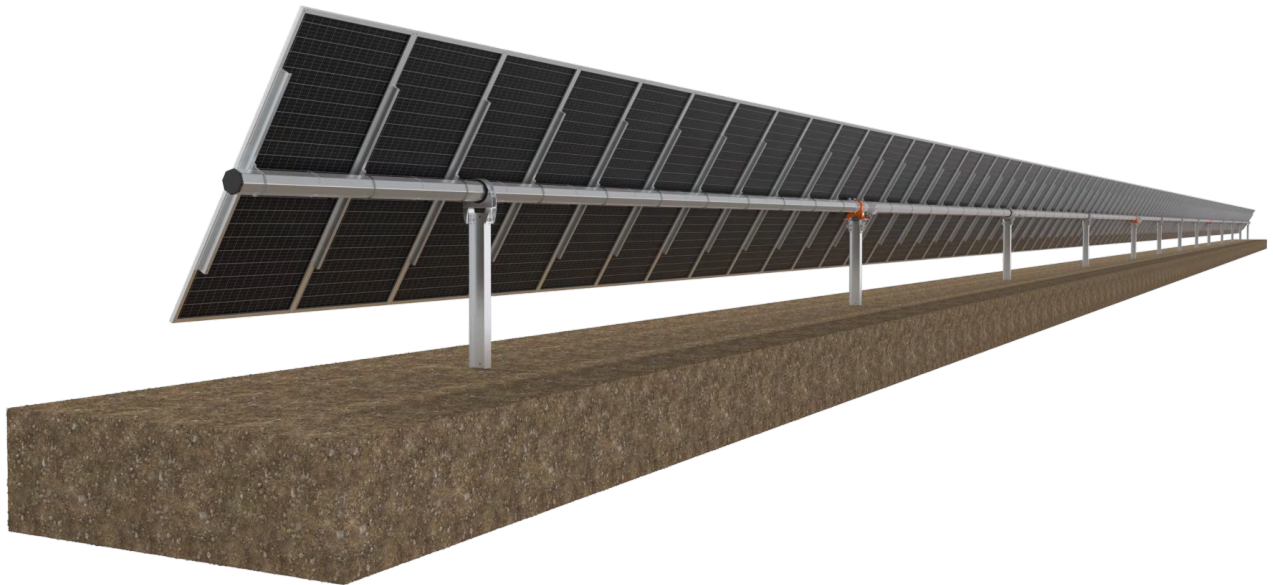


Figure 2-1 ezTracker D1P120 installation diagram

Tracker Parameter Table

Table 2-1 Structure Datasheet

Product Model	ezTracker D1P120
Product Type	Flat single-axis single-row drive tracker
Applicable PV Modules	All modules with bezel
Module Layout	Single vertical row
Maximum Mounting Capacity of PV Modules in a	120 modules, customized according to project
Single Row	Bolt fastening, PV module self-grounding function
Module Fastening Solution	$\pm 60^\circ$ or $\pm 45^\circ$, customized according to the project
Tracking Angle Range	$\pm 2^\circ$

Table2-2 TCU Datasheet

Maximum Input Voltage	18VDC
Maximum Input Current	18A
Output Voltage	19.5~28.5VDC
Output Current	0~18A
Total Output Power	0~450W
Battery Type	Lithium iron phosphate
Battery Capacity	6Ah
Charging Mode	CC-CV
Processor	MCU
Drive Motor Type	24VDC brush DC motor
Maximum Number of Synchronized Drives	4
Communication Protocol	Modbus
Communication Interface	Sub-1G
Operating Temperature	-30~+60°C
Protection Grade	IP65

Table2-3 NCU Datasheet

Model	TRKWLM-AC-EN
Maximum Input Voltage	25~264VAC
Rated Input Current	0.8A
GPS	GPS
Wind Speed Monitoring Range	0.5~50m/s
Processor	MCU
Communication Protocol	ModbusRTU / TCP / IEC104
Communication Interface	Sub-1G
Maximum Number of Communications	128
Operating Temperature	-30~+60°C
Protection Grade	IP65

Tracker Grounding Path

The PV modules are grounded to the tracker components and post through properly installed fasteners. The overall grounding of the system needs to comply with relevant national and industry standard requirements. Figure 2-2 illustrates the PV module grounding path.

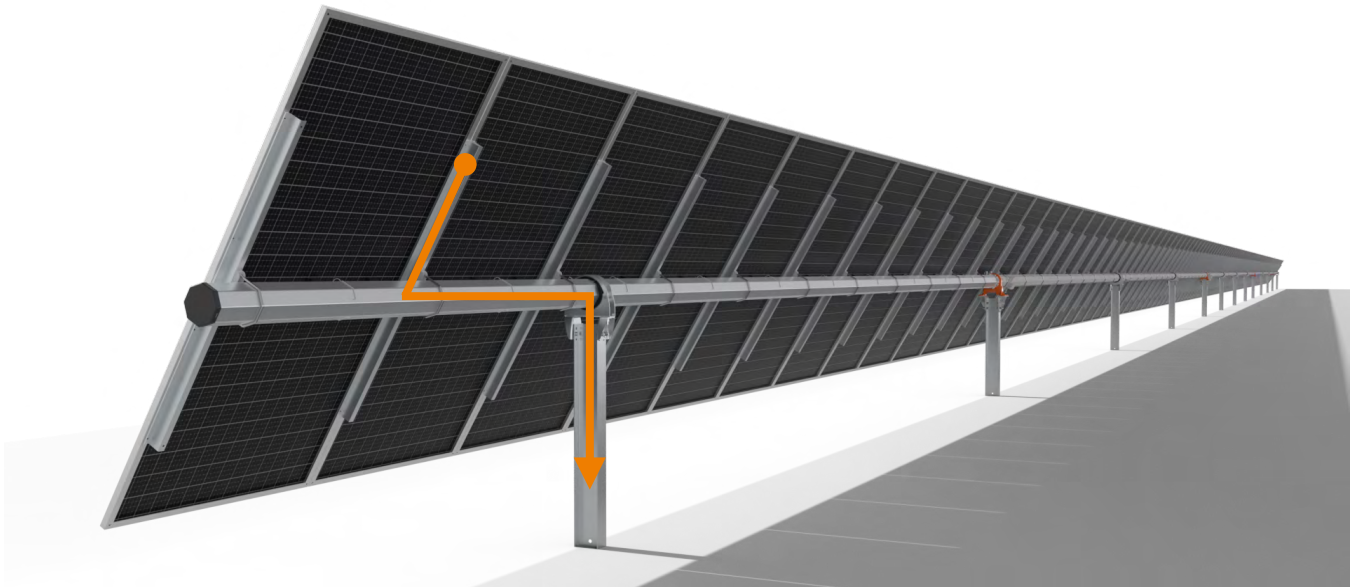


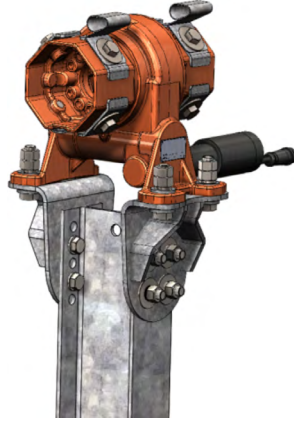
Figure2-2. PV Module Grounding Path

Tracker Components

Drive Post Components

Table3-1 Bill of Material of Drive Post Components

A1



Code	Picture	Part No.	Part Name	Code	Picture	Part No.	Part Name
A1.1		11-022-00110	Slew Cable Clip S5-OCT150	M16.30		11-011-00742	Hex Bolt GB/T 5783-M16*30-10.9U-tZn
A1.2		11-007-00342	Tube Pad OCT150	LF16		11-011-00250	Large Plain Washer GB/T 96.1-16*50
A1.3		15-042-00059	Slew Drive S5-OCT142	M18.75		11-011-01112	Hex Bolt GB/T 5783-M18*75-10.9U-tZn
A1.4		11-008-01263	Slew Support W6-S5	LF18		11-008-01361	Rectangular Washer M18-40*40*5
A1.5		Refer to BOM	Drive Post	S18		11-011-00602	Spring Washer GB/T 93-18
A1.6		17-093-00065	Recommendation sealant	N18		11-011-00497	Hex Nut GB/T 6170-M18-10-tZn
				M16.50		11-011-00028	Hex Bolt GB/T 5783-M16*50-8.8U-tZn
				F16		11-011-00032	Plain Washer GB/T 97.1-16*30
				LF16		11-011-00250	Large Plain Washer GB/T 96.1-16*50
				S16		11-011-00252	Spring Washer GB/T 93-16
				N16		11-011-00238	Hex Nut GB/T 6170-M16-8-tZn

Standard Post Components

Table3-2 Bill of Material of Standard Post Components

A2

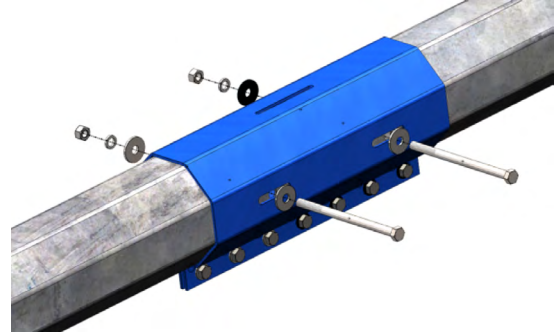
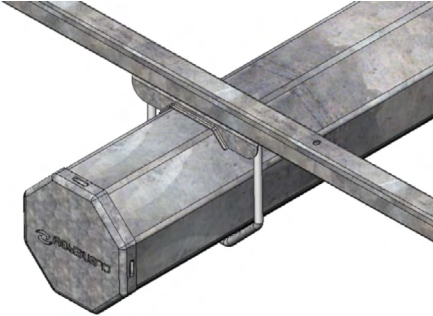


Code	Picture	Part No.	Part Name	Code	Picture	Part No.	Part Name
A2.1		11-008-01255	Bearing Stand Upper OCT150	M10.85		11-011-01148	Hex Bolt GB/T 5782-M10*85-8.8U-tZn
A2.2		11-121-00013	Bearing OCT150	F10		11-011-00081	Plain Washer GB/T 971-10
A2.3		11-022-00106	Bearing Cable Clip OCT150	S10		11-011-00255	Spring Washer GB/T 93-10
A2.4		11-008-01260	Bearing Stand Lower OCT150-W6	N10		11-011-00984	Nylon Lock Nut DIN 982-M10-8-tZn
A2.6		11-008-01264	Post Connector W6	M16.45		11-011-00440	Hex Bolt GB/T 5783-M16*45-8.8U-tZn
A2.7		Refer to BOM	Standard Post	LF16		11-011-00250	Large Plain Washer GB/T 96.1-16*50
				S16		11-011-00252	Spring Washer GB/T 93-16
				N16		11-011-00238	Hex Nut GB/T 6170-M16-8-tZn
				M12.35		11-011-00122	Hex Bolt GB/T 5783-M12*35-8.8U-tZn
				F12		11-011-00243	Plain Washer GB/T 971-12
				LF12		11-011-00229	Large Plain Washer GB/T 96.1-12*37
				S12		11-011-00256	Spring Washer GB/T 93-12
				N12		11-011-00343	Hex Nut GB/T 6170-M12-8-tZn

Tube Components

Table3-3 Bill of Material of Tube Components


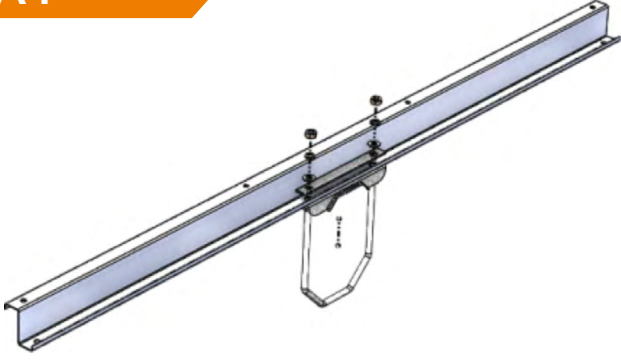
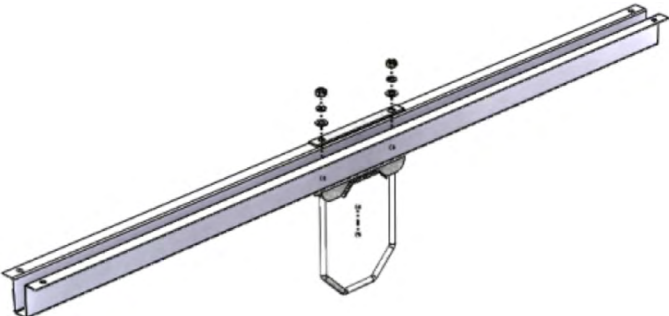
























A3



Code	Picture	Part No.	Part Name	Code	Picture	Part No.	Part Name
A3.1		11-007-00314	Cap OCT150	M12.50		11-011-00122	Hex Bolt GB/T 5783-M12*50-8.8U-tZn
A3.2		Refer to BOM	Standard Tube	LF12		11-011-00229	Large Plain Washer GB/T 96.1-12*37
A3.3		11-008-01242	Coupler OCT150*5-L450	S12		11-011-00256	Spring Washer GB/T 93-12
A3.4		Refer to BOM	Drive Tube	N12		11-011-00343	Hex Nut GB/T 6170-M12-8-tZn
A3.5		12-022-00044	Tube Cable Clip OCT150	M12.190		11-011-00122	Hex Bolt GB/T 5782-M12*190*Thread50-8.8U-tZn
				LF12		11-011-00229	Large Plain Washer GB/T 96.1-12*37
				S12		11-011-00256	Spring Washer GB/T 93-12
				N12		11-011-00343	Hex Nut GB/T 6170-M12-8-tZn

Purlin Components

Table3-4 Bill of Material of Purlin Components

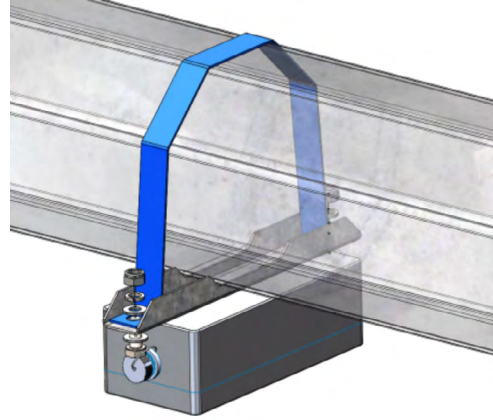
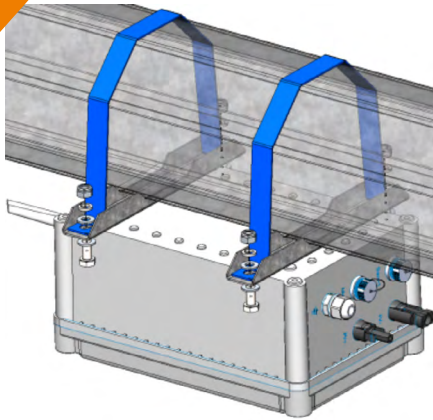
							
							
Code	Picture	Part No.	Part Name	Code	Picture	Part No.	Part Name
A4.1		Refer to BOM	Purlin Z	A4.2		Refer to BOM	Purlin OM
A4.3		11-007-00341	Purlin Sheet OCT150	A4.3		11-007-00341	Purlin Sheet OCT150
A4.4		11-008-01267	Purlin Anchor OCT150	A4.4		11-008-01267	Purlin Anchor OCT150
U10.161		11-011-01061	U Bolt M10*161*190*Thread 50-8.8U-tZn	U10.161		11-011-01061	U Bolt M10*161*190*Thread 50-8.8U-tZn
F10		11-011-00081	Plain Washer GB/T 97.1-10	F10		11-011-00081	Plain Washer GB/T 97.1-10
S10		11-011-00255	Spring Washer GB/T 93-10	S10		11-011-00255	Spring Washer GB/T 93-10
N10		11-011-00346	Hex Nut GB/T 6170-M10-8-tZn	N10		11-011-00346	Hex Nut GB/T 6170-M10-8-tZn
M8.20		12-011-00098	Hex Bolt DIN 933-M8*20-A2-70	M8.20		12-011-00098	Hex Bolt DIN 933-M8*20-A2-70
F8		12-011-00070	Plain washer DIN 125-1-8-A2	F8		12-011-00070	Plain washer DIN 125-1-8-A2
G8		12-011-01048	Grounding Washer DIN 6795-8-A2	G8		12-011-01048	Grounding Washer DIN 6795-8-A2
S8		12-011-00048	Spring Washer GB/T 93-8-A2	S8		12-011-00048	Spring Washer GB/T 93-8-A2
N8		12-011-00341	Nylon Lock Nut DIN 985-M8-A2-70	N8		12-011-00341	Nylon Lock Nut DIN 985-M8-A2-70

TCU Components

Table3-5 Bill of Material of TCU Components


















A5



Code	Picture	Part No.	Part Name	Code	Picture	Part No.	Part Name
A5.1		11-008-01509	Controller OCT150	A5.1		11-008-01509	Controller OCT150
A5.2		11-008-01259	Controller Rail OCT150	A5.2		11-008-01259	Controller Rail OCT150
A5.3		Refer to BOM	MTCU	A5.3		Refer to BOM	STCU
A5.4		PC15	STCU Power Cable	A5.5		23-023-00010	Grounding Cable S16-300-8-10
M8.20		12-011-00098	Hex Bolt DIN 933-M8*20-A2-70	M8.20		12-011-00098	Hex Bolt DIN 933-M8*20-A2-70
F8		12-011-00070	Plain washer DIN 125-1-8-A2	F8		12-011-00070	Plain washer DIN 125-1-8-A2
S8		12-011-00048	Spring Washer GB/T 93-8-A2	S8		12-011-00048	Spring Washer GB/T 93-8-A2
N8		12-011-00341	Nylon Lock Nut DIN 985-M8-A2-70	N8		12-011-00341	Nylon Lock Nut DIN 985-M8-A2-70

Wind Speed&Direction Monitoring Station Kit Components

Table3-6 Bill of Material of Wind Speed&Direction Monitoring Station Kit Components

A6	Code	Picture	Part No.	Part Name
	A6.1		11-013-00033	Wind Post 5m
	A6.2		11-008-01324	Pyranometer Rail
	A6.3		11-008-01313	Omni Antenna Anchor
	A6.4		15-114-00043	Wind Combined Sensor FA21-10m
	A6.5		11-007-00348	Anemometer FA13-10m
	A6.7		11-008-01312	Wind Post Anchor D102
	A6.8		15-077-00071	Snow Sensor JGXS-1
	A6.9		15-114-00042	Pyranometer TBQ-2 -5m
	A6.10		11-016-05115	Antenna Rail
	A6.11		15-037-00032	NCU-AC-WL-915
	A6.12		11-008-01314	Communication Box Rail
	A6.13		15-075-00417	Power Cable 2*1.5
	A6.14		15-075-00293	Ethernet cable
	A6.15		11-008-01325	Pyranometer Transmitter Clamp
	M12.35		11-011-00122	Hex Bolt GB/T 5783-M12*35-8.8U-tZn
	F12		11-011-00243	Plain Washer GB/T 97.1-12
	S12		11-011-00256	Spring Washer GB/T 93-12
	N12		11-011-00343	Hex Nut GB/T 6170-M12-8-tZn

Recommendation Installation Equipment and Tools

Table 4-1 Recommendation Installation Equipment




		
<p>Pile Driver</p>	<p>Forklift ≥10 tons</p>	<p>Sling, 5T, 1m&2m&5m</p>

Table 4-2 Recommendation Installation Tools
















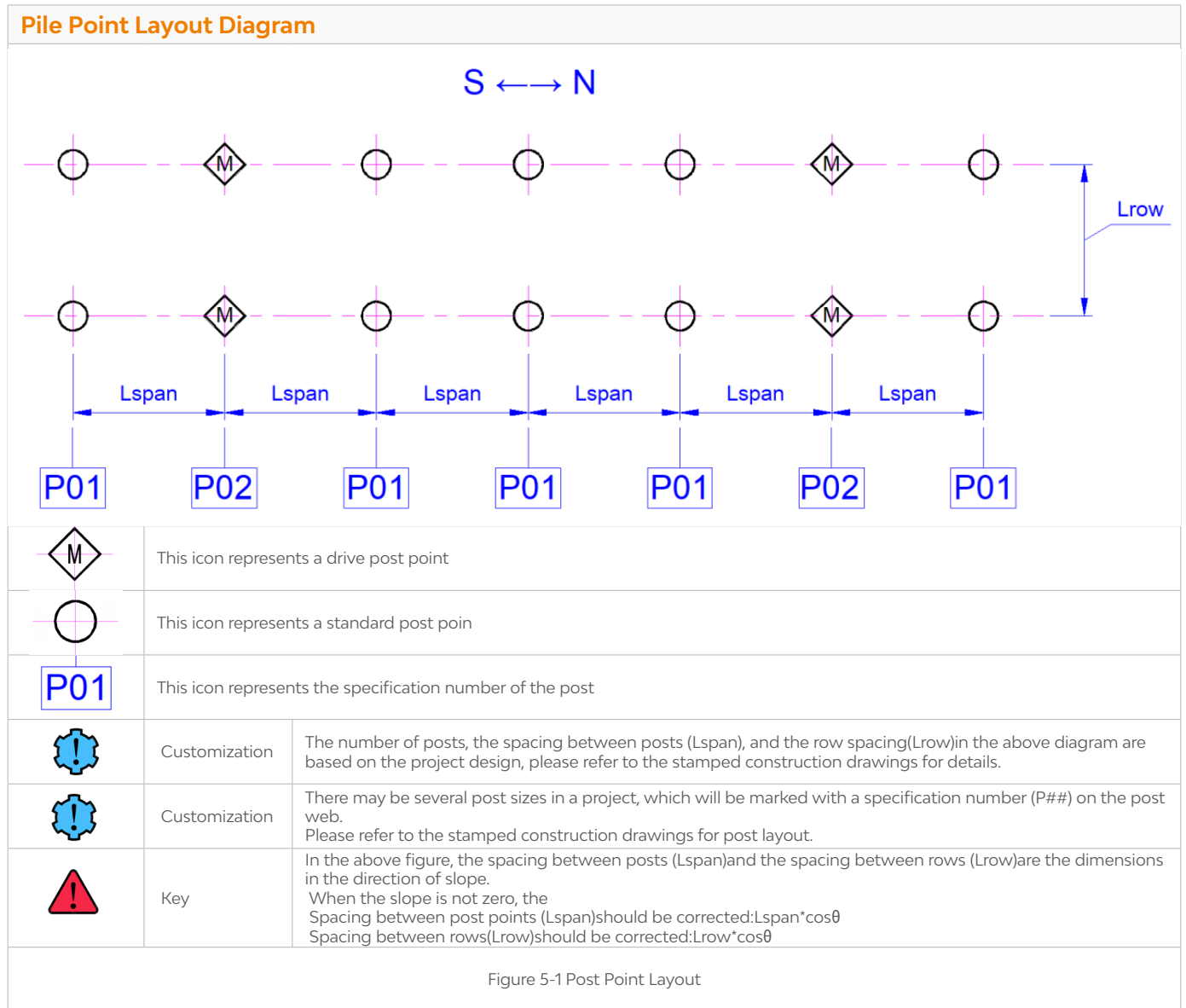
				
<p>M8/10/12/16/18/20 Hexagonal wrench</p>	<p>M4 Hexagonal Wrench</p>	<p>M4/M5/M6 Socket Screwdriver</p>	<p>M8/10/12/16/18/20 Torque Wrench and Socket Set, Torque Range 0-450N·m</p>	<p>M8/10/12/16/18/20 Electric Wrench and Extended Socket Set</p>
				
<p>Inclinometer (Accuracy 0.01°)</p>	<p>Multimeter</p>	<p>Small Screwdriver.</p>	<p>Diagonal Nose Pliers</p>	<p>Crimping Pliers 7"</p>
				
<p>Wire Stripper 7"</p>	<p>Nylon Wire 2mm,100m</p>	<p>Tape Measure≥10m</p>	<p>Rubber Hammer Copper Hammer Head Weight ≥ 1kg</p>	<p>Marking Pen</p>

Table 4-3 Preloading Torque Table

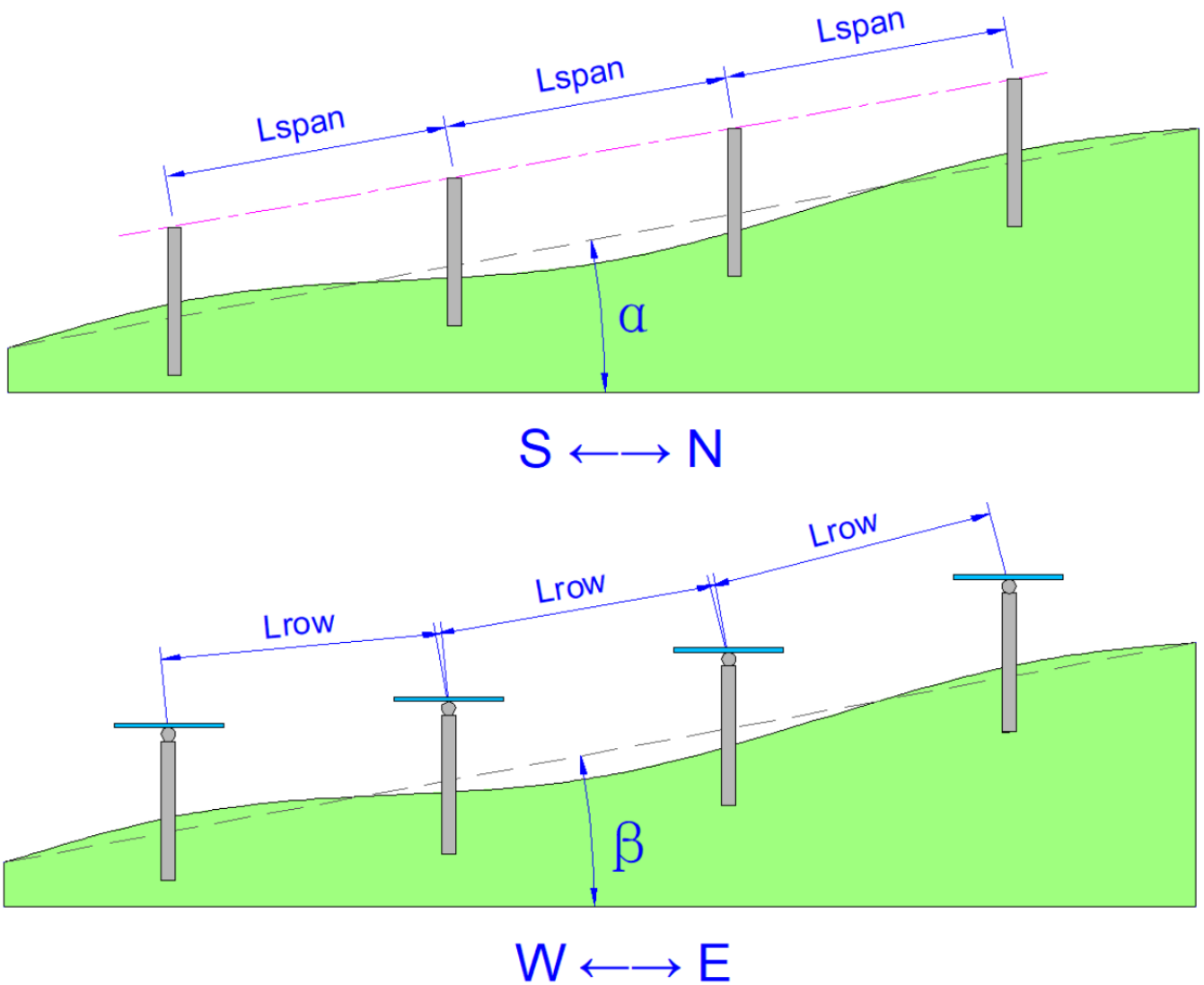
Specification	Pre-tighten Torque(N·m)	Lower Limit of Residual Torque(N·m)	Wrench Size(mm)
M4	1.5	1.3	7
M5	4	3.6	8
M6	8	7.2	10
M8	10	9	13(14)
M10	40	36	16(17)
M12	80	72	18(19)
M16	210	190	24
M18	270	250	27
M20	290	270	30

Tracker Installation Steps

Step 1: Installation of foundation and post



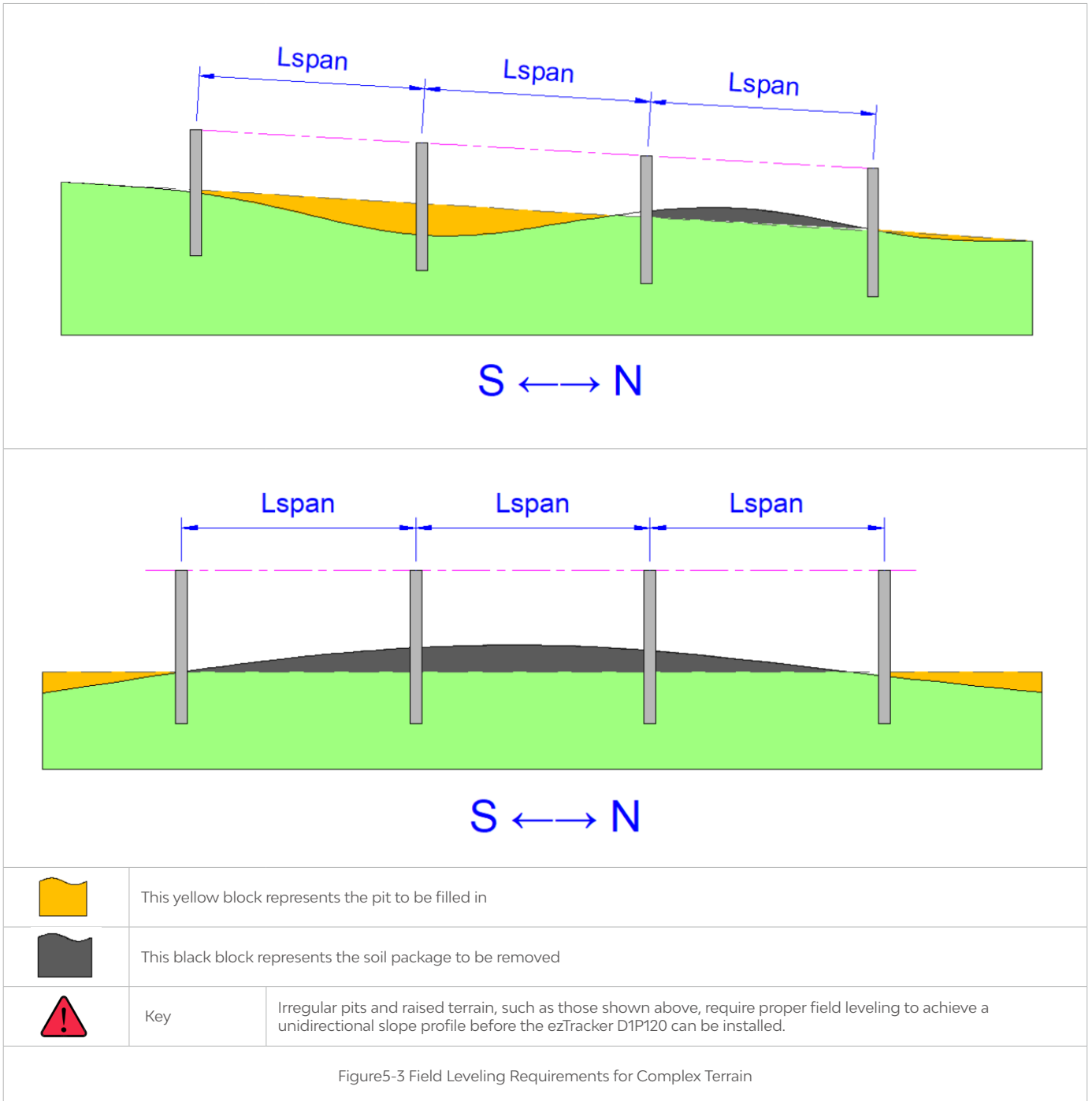
Terrain Adaptation



Key

For unidirectional steep slopes, the ezTracker D1P120 can be installed with the slope as shown in the figure above. The ezTracker D1P120 can adapt to a maximum slope (α) of 15% in the north-south direction and a maximum slope (β) of 20% in the east-west direction.

Figure5-2 Slope Adaptation of ezTracker D1P120



Pile foundation construction requirements



Customization

The types of pile foundations that the tracking bracket is suitable for include static pressure Steel posts, filling concrete pile, and PHC pipe piles + welded steel posts. It depends on the project.

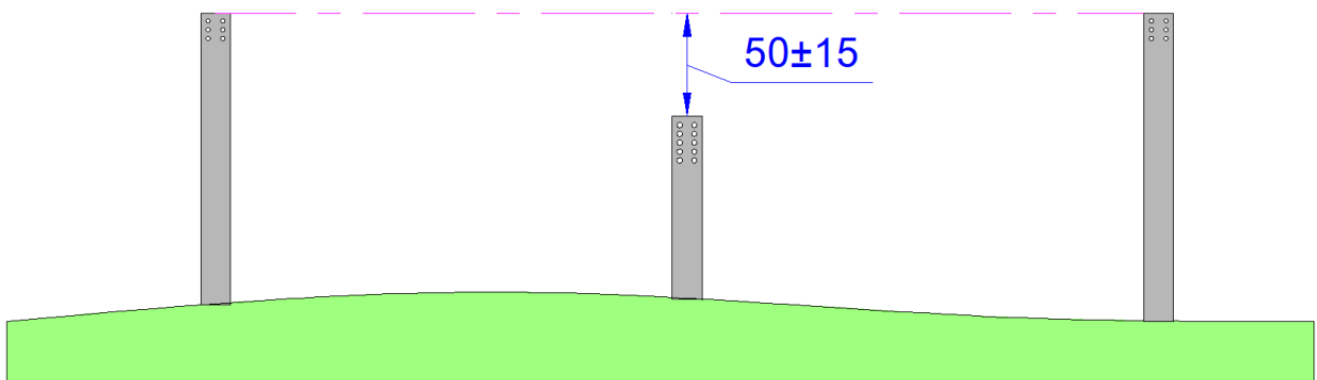
A.Ramming posts or filling concrete piles



Figure 5-4A Ramming posts

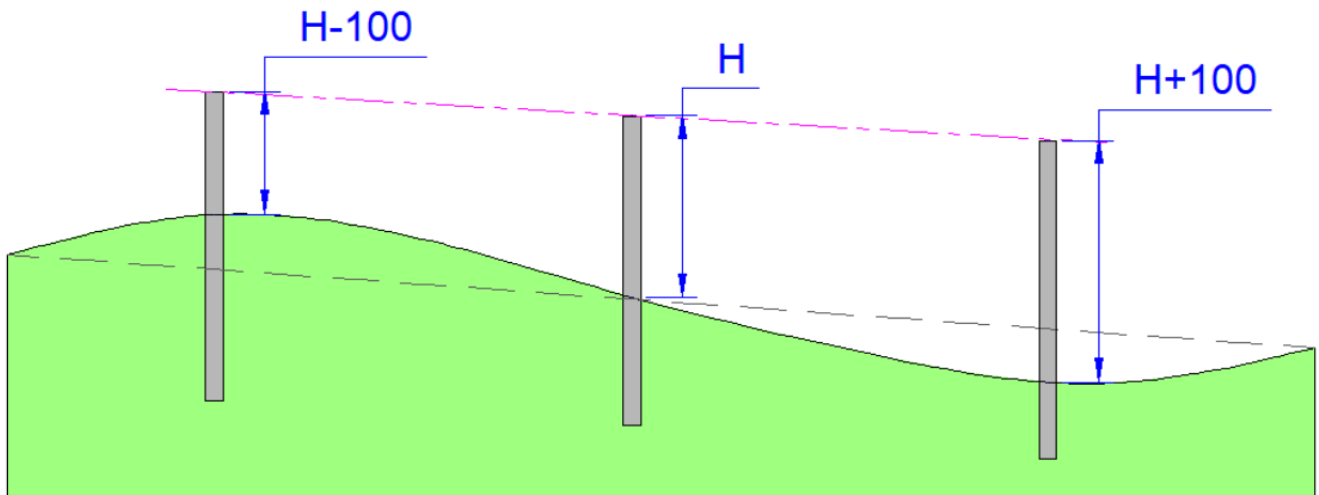


Figure 5-4B filling concrete piles



	Standard Post	Drive Post	Standard Post
	Key	This installation manual is based on the top of the drive posts. The height tolerance between the top of the drive post and the top of the standard post is 50±15mm.	
	Key	The allowable tolerance of the elevation of each post is ± 15mm.	

Figure 5-5 post top elevation requirements



	Standard Post	Drive Post	Standard Post
	Key	In undulating terrain, to ensure that the elevations of all posts of the same tracker array are located in the same plane, the allowable tolerance of the post's unearthed height (H) is $\pm 100\text{mm}$.	
Figure 5-6 Unearthed height tolerance of ramming post			

East-west position tolerance	North-south position tolerance	Axial torsional tolerance	East-west vertical tolerance	Vertical tolerance in the north-south direction
$\pm 15\text{mm} (*)$	$\pm 20\text{mm} (*)$	$\pm 2^\circ$	$\pm 1^\circ$	$\pm 1^\circ$
	Key	Note: (*) indicates non-cumulative error. For the allowable tolerance relative to the reference post, it is recommended to use the middle drive post as the reference post.		
Figure 5-7 Piling tolerance of ramming posts				

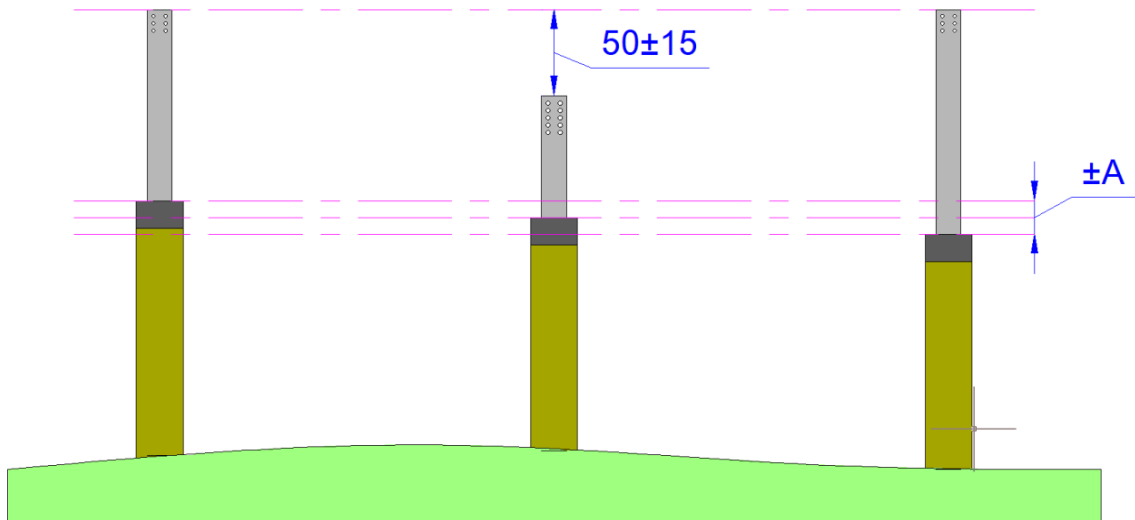
B.PHC pile+ welded steel post



Figure 5.8A PHC pile driving construction



Figure 5.8B Welded steel post on top of PHC pile

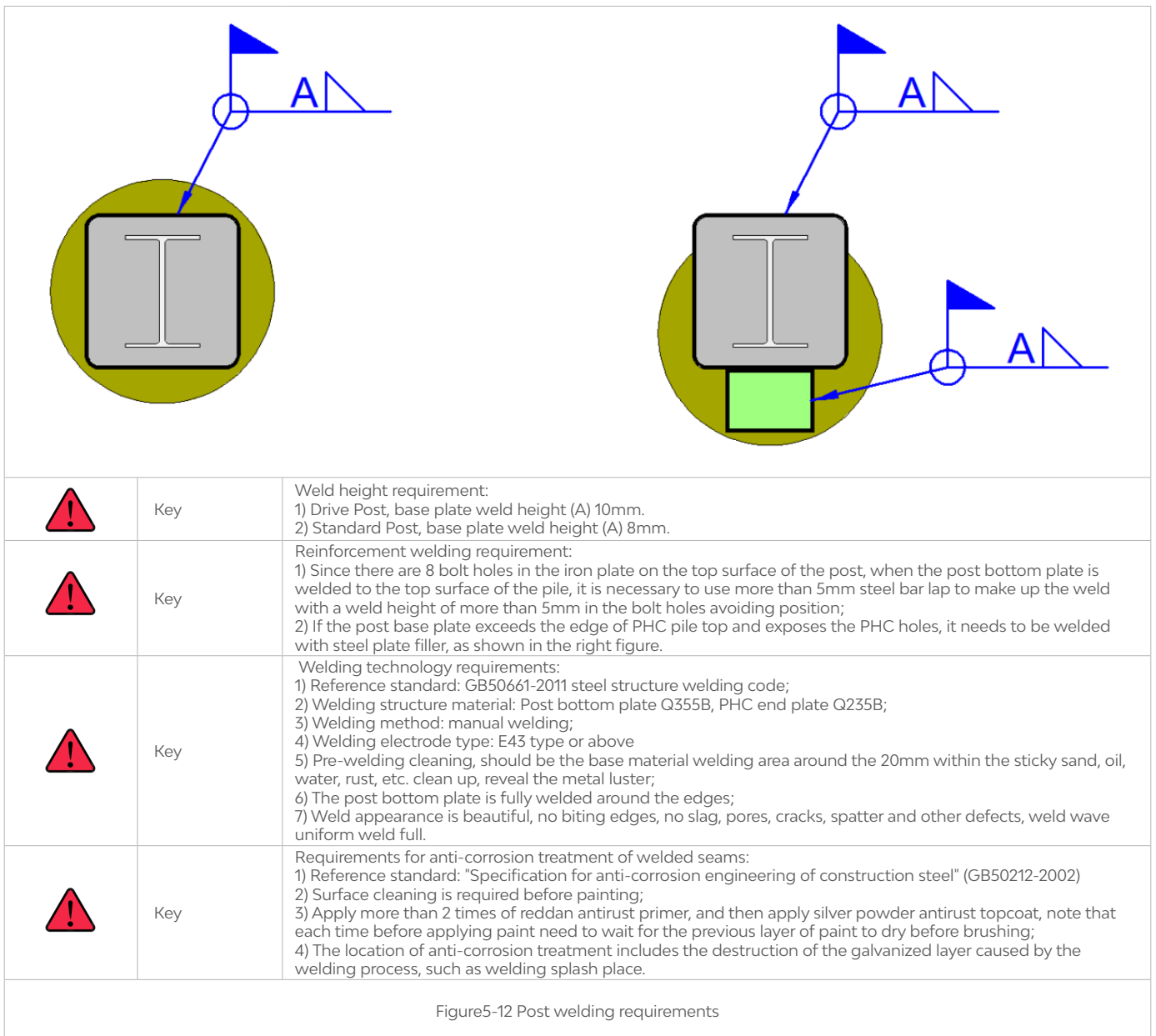


Standard posts		Drive post	Standard posts
	Key	This installation manual is based on the top of the driven pile. The top elevation of the driven post is consistent with that of the standard post, with an allowable tolerance (A) of ±15mm.	
	Key	The height tolerance between the top of the drive post and the standard post is 50 ±15mm.	

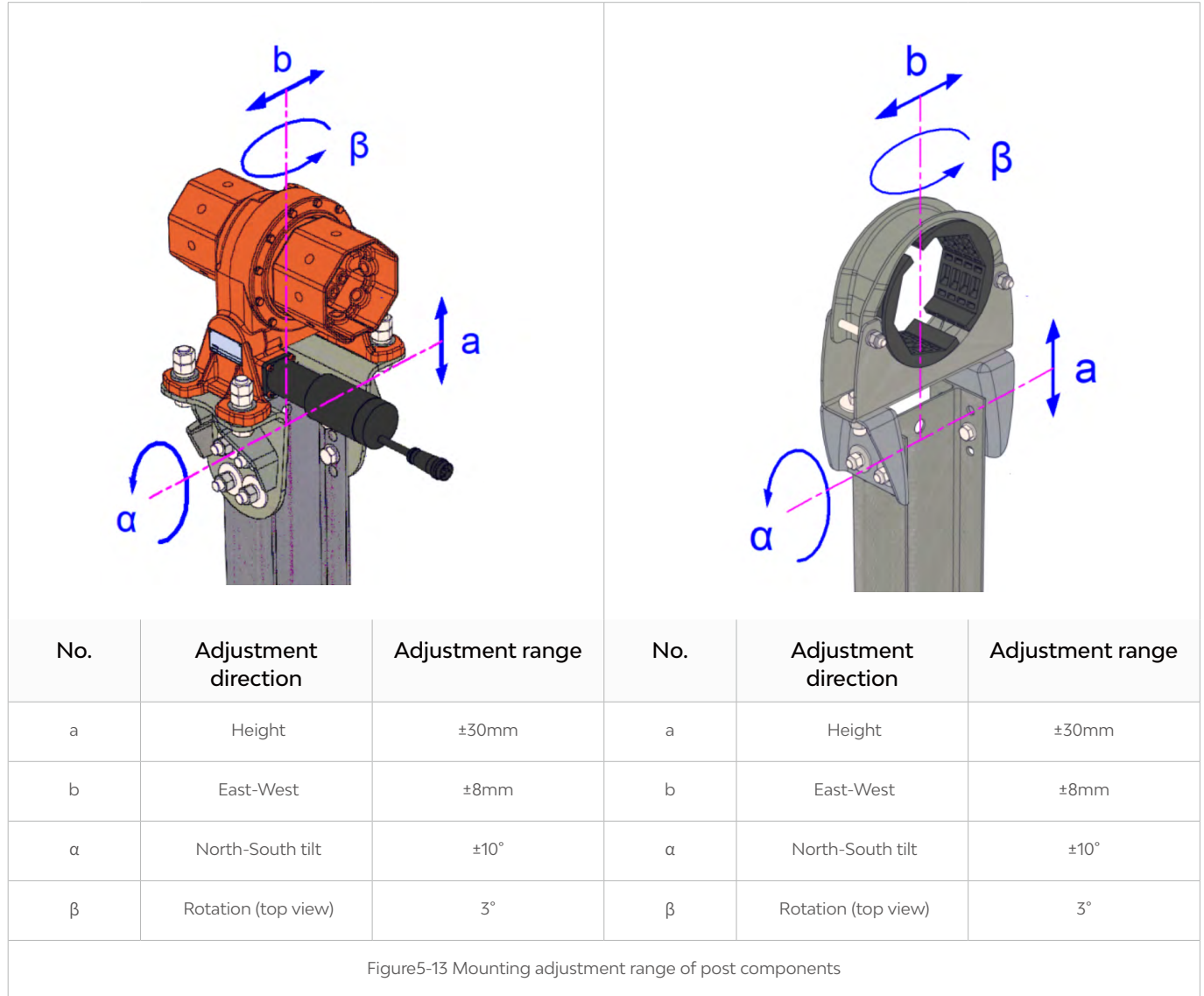
Figure 5-9 post top elevation requirements

East-west position tolerance	North-south position tolerance	East-west vertical tolerance	Vertical tolerance in the north-south direction	Elevation tolerance
$\pm 30\text{mm}$ (*)	$\pm 30\text{mm}$ (*)	$\pm 1^\circ$	$\pm 1^\circ$	$\pm 10\text{mm}$
	Key	Note: (*) indicates non-cumulative error. With respect to the allowable tolerance of the reference post, it is recommended to take the middle drive post as the reference post.		
Figure 5-10 PHC pile driving tolerance				

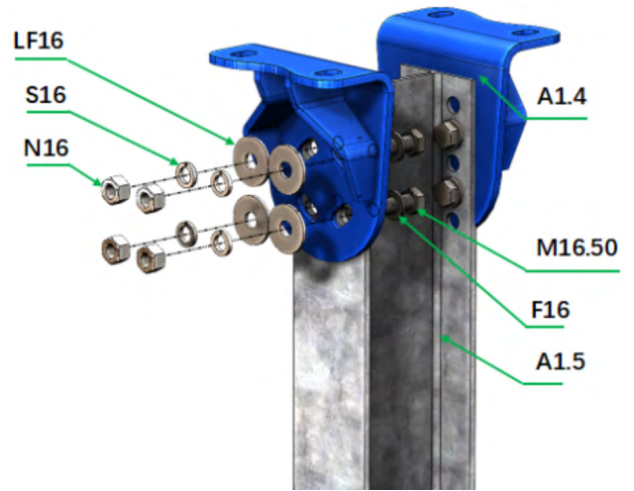
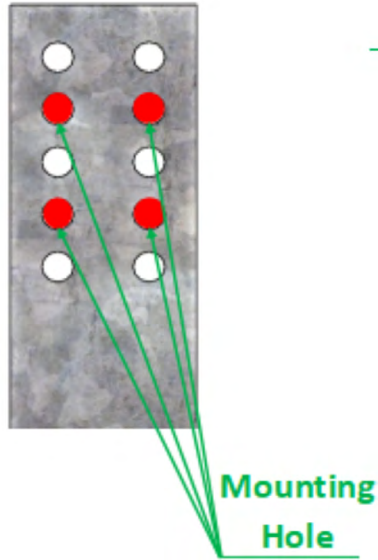
East-west position tolerance	North-south position tolerance	Axial torsional tolerance	East-west vertical tolerance	Vertical tolerance in the north-south direction
$\pm 15\text{mm}$ (*)	$\pm 20\text{mm}$ (*)	$\pm 2^\circ$	$\pm 1^\circ$	$\pm 1^\circ$
	Key	Note: (*) indicates non-cumulative error. With respect to the allowable tolerance of the reference post, it is recommended to take the middle drive post as the reference post.		
Figure 5-11 Steel post welding positioning tolerance				



Step 2: Installation and leveling of slewing support and Post connector



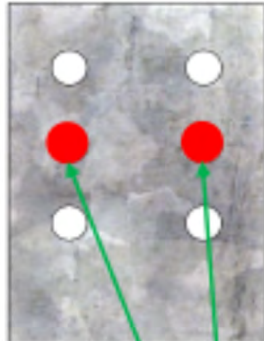
Installation of Slew Support



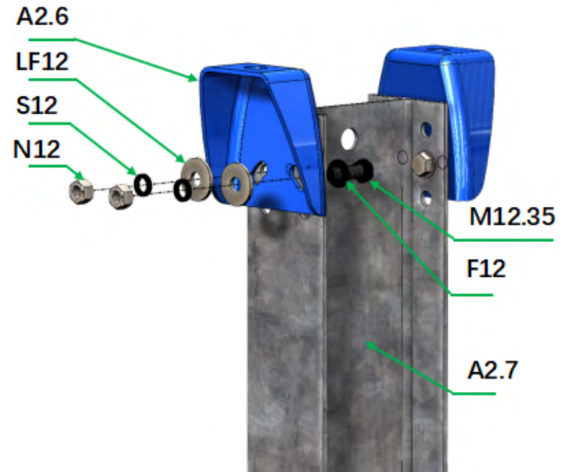
Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A1.4	11-008-01263	Slew Support W6-S5	2	210N*m	24mm
A1.5	Refer to BOM	Drive Post	1		
M16.50	11-011-00028	Hex Bolt GB/T 5783 M16*50	8		
F16	11-011-00032	Plain Washer GB/T 97.1-16*30	8		
LF16	11-011-00250	Large Plain Washer GB/T 96.1-16*50	8		
S16	11-011-00252	Spring Washer GB/T 93-16	8		
N16	11-011-00238	Hex Nut GB/T 6170-M16-8-tZn	8		
!	Recommendations	Ensure that all bolts face the same direction.			
!	Recommendation	In order to facilitate the subsequent steps to adjust the position, this step does not need to pre-tighten the bolts, after completing "Step 6: Installation and Splicing of Tube", then pre-tighten the bolts according to the requirements.			

Figure5-14 Installation diagram of Slew Support

Installation of Post Connector



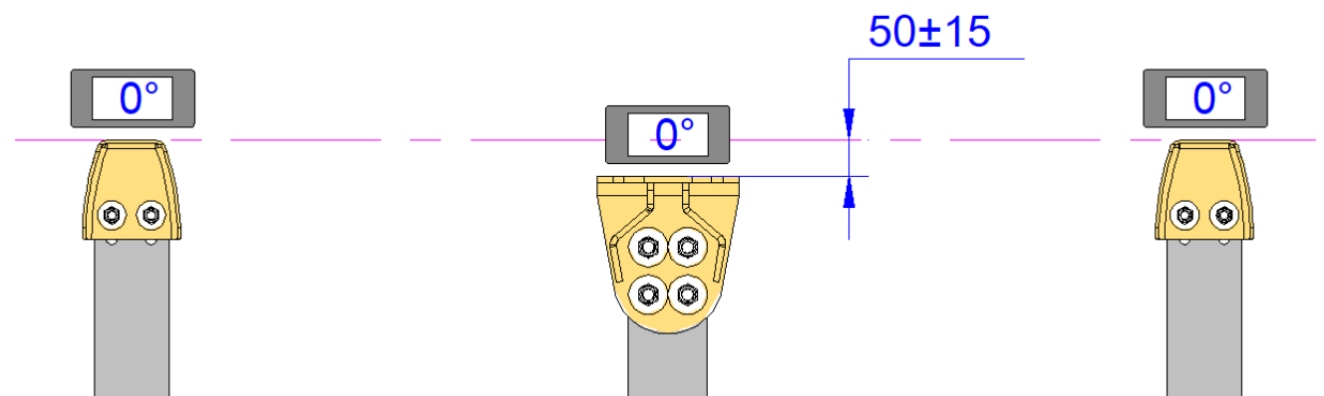
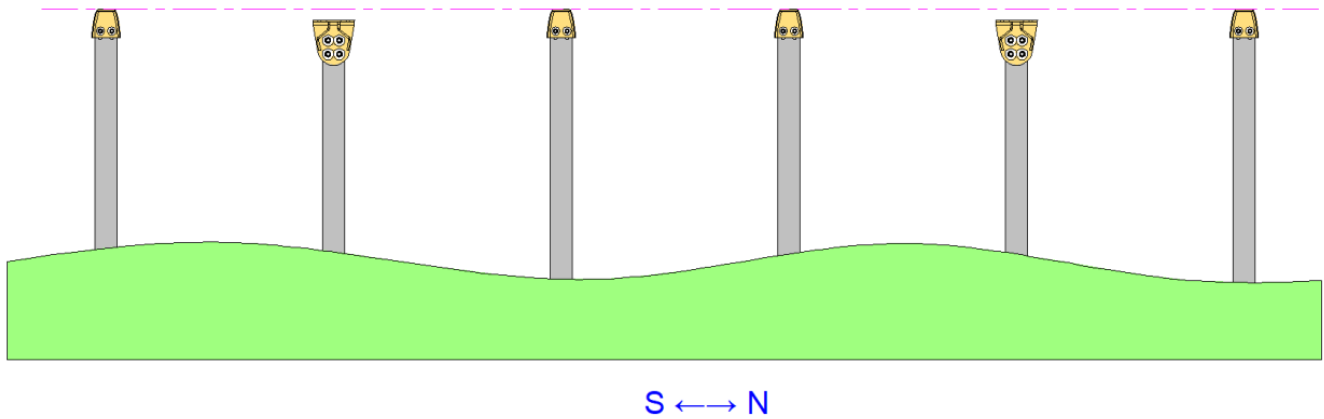
Mounting Hole



Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A2.6	11-008-01264	Post Connector W6	2	80N*m	18(19)mm
A2.7	Refer to BOM	Standard Post	1		
M12.35	11-011-00122	Hex Bolt GB/T 5783-M12*35	4		
F12	11-011-00243	Plain Washer GB/T 971-12	4		
LF12	11-011-00229	Plain Washer GB/T 96.1-12*37	4		
S12	11-011-00256	Spring Washer GB/T 93-12	4		
N12	11-011-00343	Hex Nut GB/T 6170-M12-8-tZn	4		
⚠	Recommendation	Ensure that all bolts face the same direction.			
⚠	Recommendation	In order to facilitate the subsequent steps to adjust the position, this step does not need to pre-tighten the bolts, after completing "Step 6: Installation and Splicing of Tube", then pre-tighten the bolts according to the requirements.			

Figure5-15 Installation diagram of Post Connector

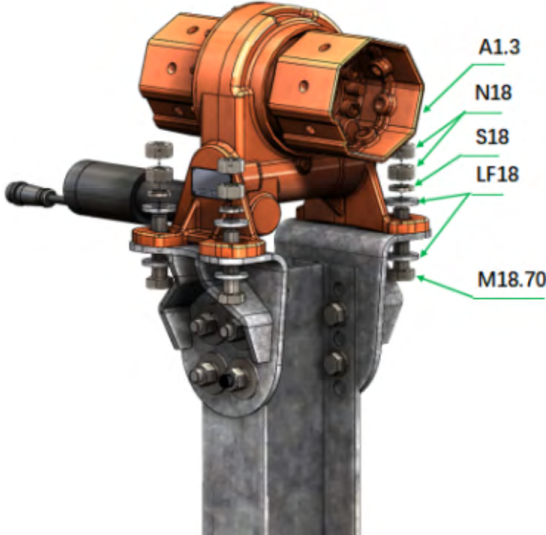



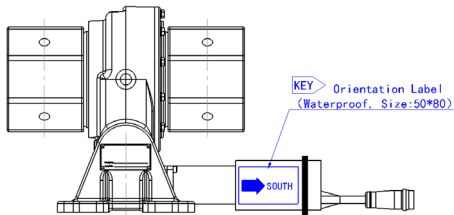


Alignment and leveling of Slew Support and Post Connector



	Post Connector	Slew Support	Post Connector
	Recommendation	Select one slew support as a single reference and align the other slew supports and post connectors with it.	
	Key	Align and level all post connectors and all slew supports by pulling a line across the top of the post connectors on both the first and last posts. Adjust the height of the post connectors or slew supports to ensure that the top of the post connectors is 50±15mm higher than the top of the slew support slew supports.	

Figure5-16 Diagram of alignment and leveling of Slew Support and Post Connector

Step 3: Installation of Slew Drive

					
Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A1.3	15-042-00059	Slew Drive S5-OCT142	1	270N*m	27mm
M18.75	11-011-01112	Hex Bolt GB/T 5783-M18*75	4		
LF18	11-008-01361	Rectangular Washer M18-40*40*5	4		
S18	11-011-00602	Spring Washer GB/T 93-18	4		
N18	11-011-00497	Hex Nut GB/T 6170-M18-10-tZn	8		
	Key	If there are different brands of Slew Drives in the same project site, then no mixing is allowed on the same tracker.			
	Key	 <p>KEY: Orientation Label (Waterproof, Size:50*80)</p> <p>SOUTH</p> <p>Pay attention to the installation orientation of the Slew Drive and install it according to the orientation label of the Slew Drive Motor, with the outlet side of the motor oriented uniformly.</p>			
	Recommendation	Ensure that all bolts face the same direction.			
	Recommendation	In order to facilitate the subsequent steps to adjust the position, this step does not need to pre-tighten the bolts, after completing "Step 6: Installation and Splicing of Tube", then pre-tighten the bolts according to the requirements.			
Figure5-17 Installation diagram of Slew Drive					

Step 4: Installation of Bearing Stand Lower




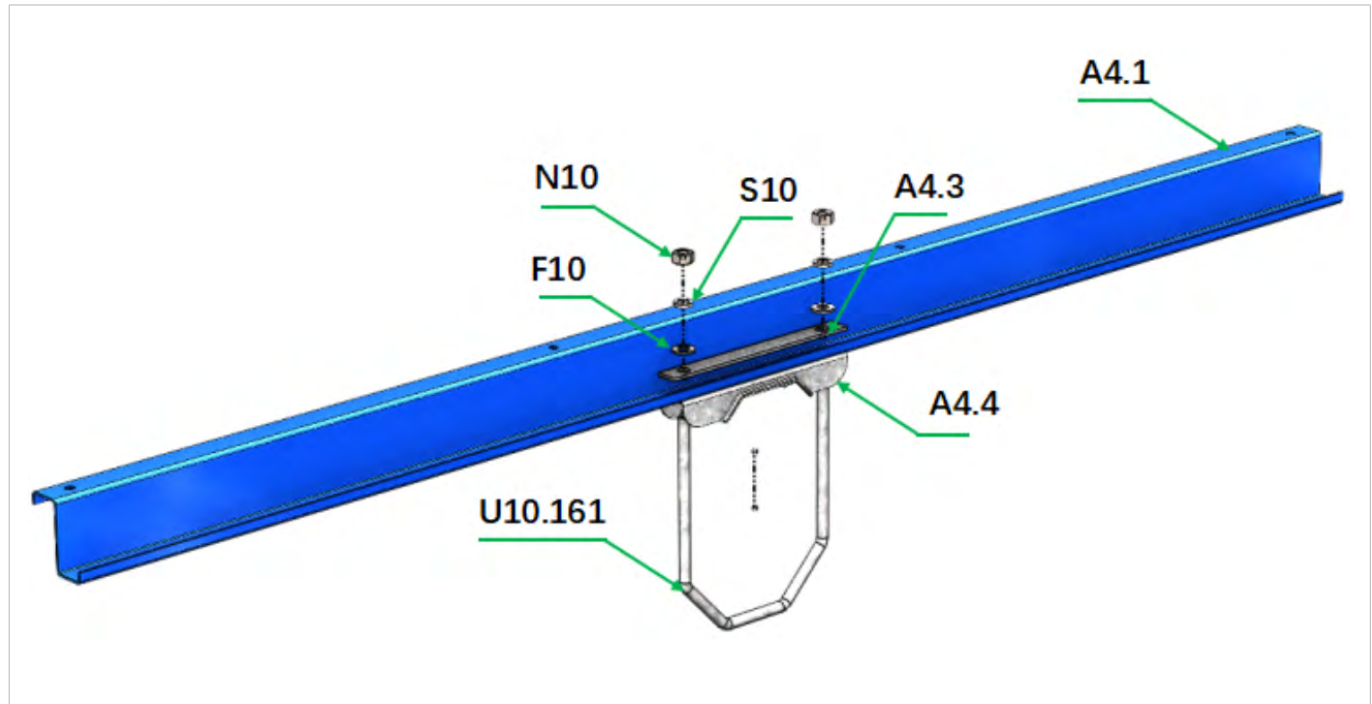

Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A2.4	11-008-01260	Bearing Stand Lower OCT150-W6	1	210N*m	24mm
M16.45	11-011-00440	Hex Bolt GB/T 5783-M16*45-8.8U-tZn	2		
LF16	11-011-00250	Large Plain Washer GB/T 96.1-16*50	2		
S16	11-011-00252	Spring Washer GB/T 93-16	2		
N16	11-011-00238	Hex Nut GB/T 6170-M16- 8-tZn	2		
	Recommendation	Ensure that all bolts face the same direction.			
	Recommendation	In order to facilitate the subsequent steps to adjust the position, this step does not need to pre-tighten the bolts, after completing "Step 6: Installation and Splicing of Tube", then pre-tighten the bolts according to the requirements.			

Figure5-18 Installation diagram of Bearing Stand Lower

Step 5: Preassembly of Purlin




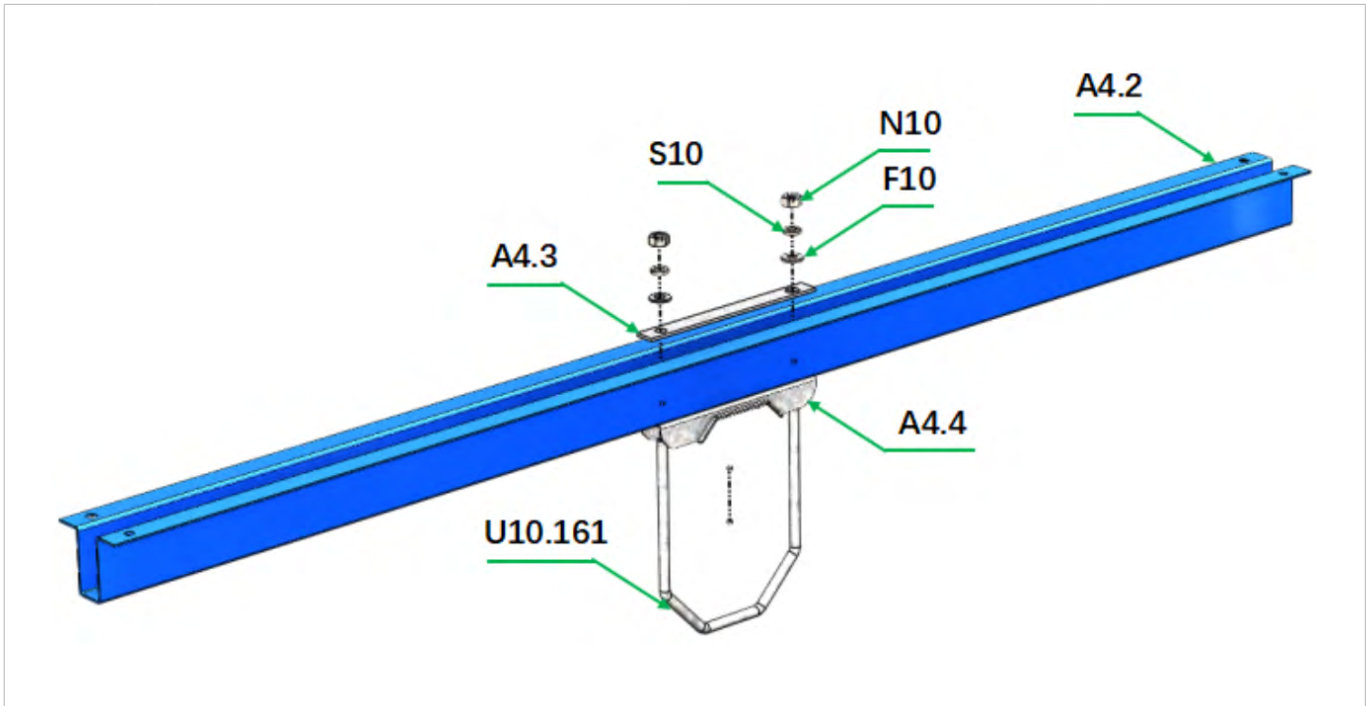

Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A4.1	Refer to BOM	Purlin-Z	1	20N*m	16(17)mm
A4.3	11-007-00341	Purlin Sheet OCT150	2		
A4.4	11-008-01267	Purlin Anchor OCT150	2		
U10.161	11-011-01061	U Bolt M10*161*190*Thread50-8.8U-tZn	2		
F10	11-011-00081	Plain Washer GB/T 97.1-10	4		
S10	11-011-00255	Spring Washer GB/T 93-10	4		
N10	11-011-00346	Hex Nut GB/T 6170-M10-8-tZn	4		
	Recommendation	In order to facilitate the subsequent steps to adjust the position, this step does not need to pre-tighten the bolts, after completing "Step 7: Adjustment of Purlin spacing", then pre-tighten the bolts according to the requirements.			

Figure5-19A Preassembly diagram of Purlin-Z



Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A4.2	Refer to BOM	Purlin-OM	1	20N*m	16(17)mm
A4.3	11-007-00341	Purlin Sheet OCT150	2		
A4.4	11-008-01267	Purlin Anchor OCT150	2		
U10.161	11-011-01061	U Bolt M10*161*190*Thread50-8.8U-tZn	2		
F10	11-011-00081	Plain Washer GB/T 97.1-10	4		
S10	11-011-00255	Spring Washer GB/T 93-10	4		
N10	11-011-00346	Hex Nut GB/T 6170-M10-8-tZn	4		
	Recommendation	In order to facilitate the subsequent steps to adjust the position, this step does not need to pre-tighten the bolts, after completing "Step 7: Adjustment of Purlin spacing", then pre-tighten the bolts according to the requirements.			
Figure5-19B Preassembly diagram of Purlin-OM					

Step 6: Installation and Splicing of Tube

Installation of Tube and Purlin

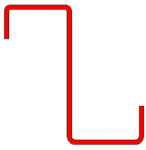
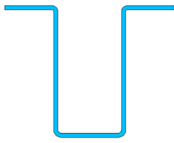
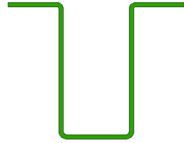

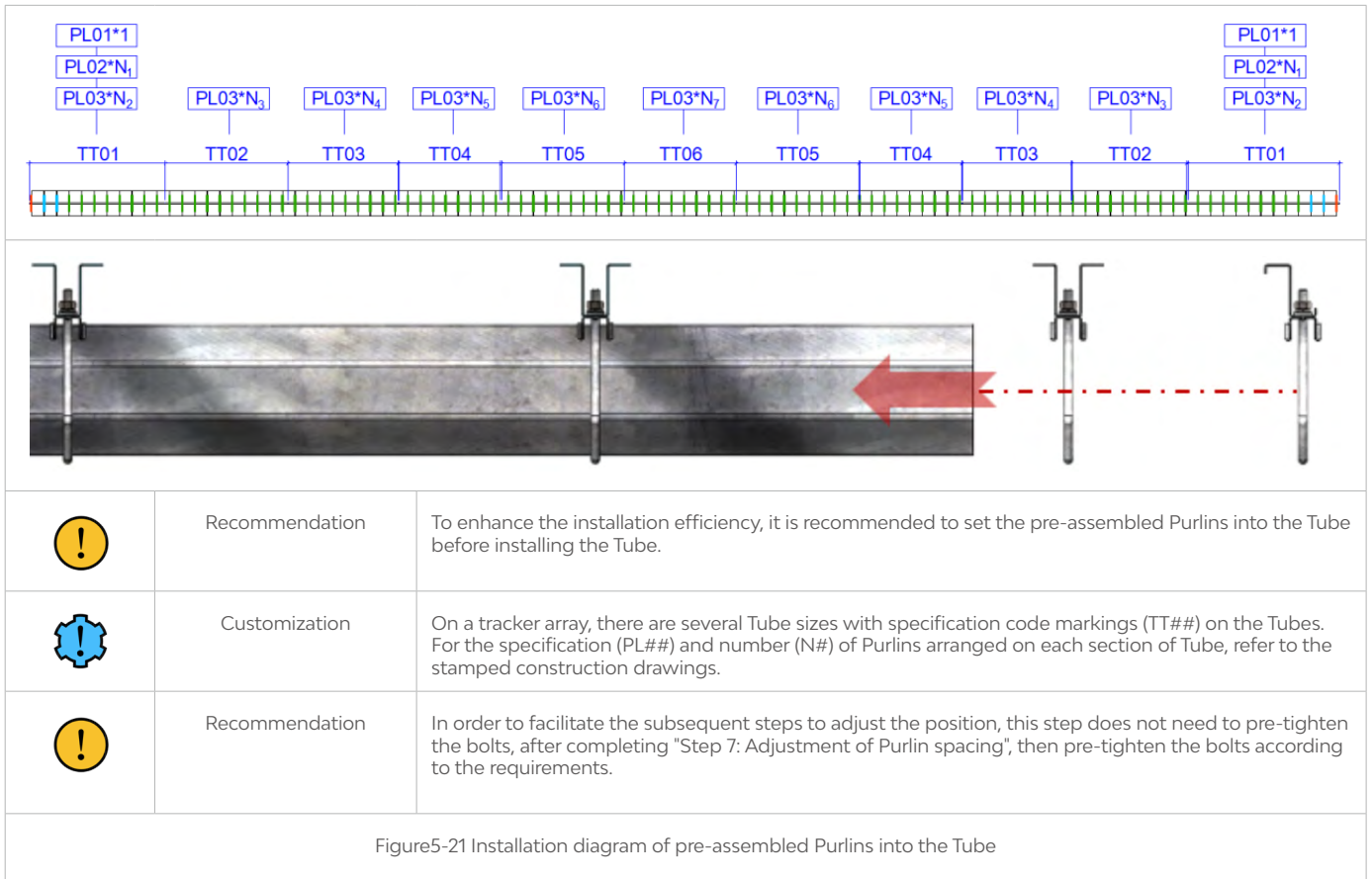
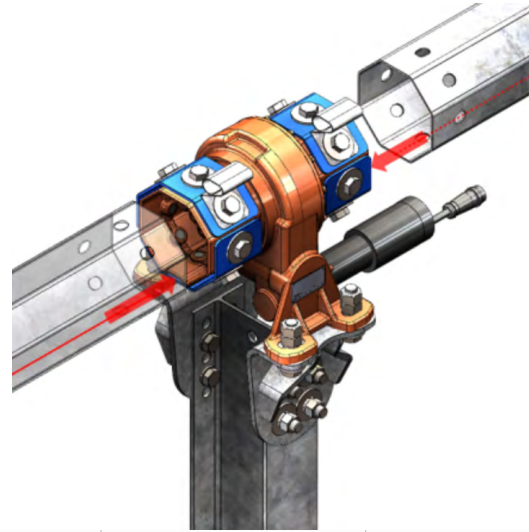
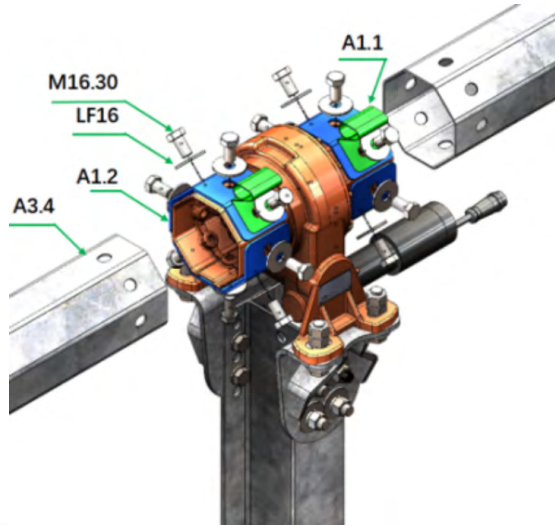
		
<p>PL01</p>	<p>PL02</p>	<p>PL03</p>
	<p>Customization</p>	<p>There may be several purlin sizes in a project, which are marked with a specification number (PL##) on the purlin. Please refer to the stamped construction drawings for purlin arrangement according to the number during construction.</p>

Figure5-20 Types of Purlins



Splicing of Tube and Slew Drive




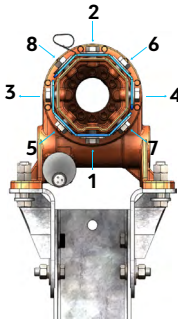
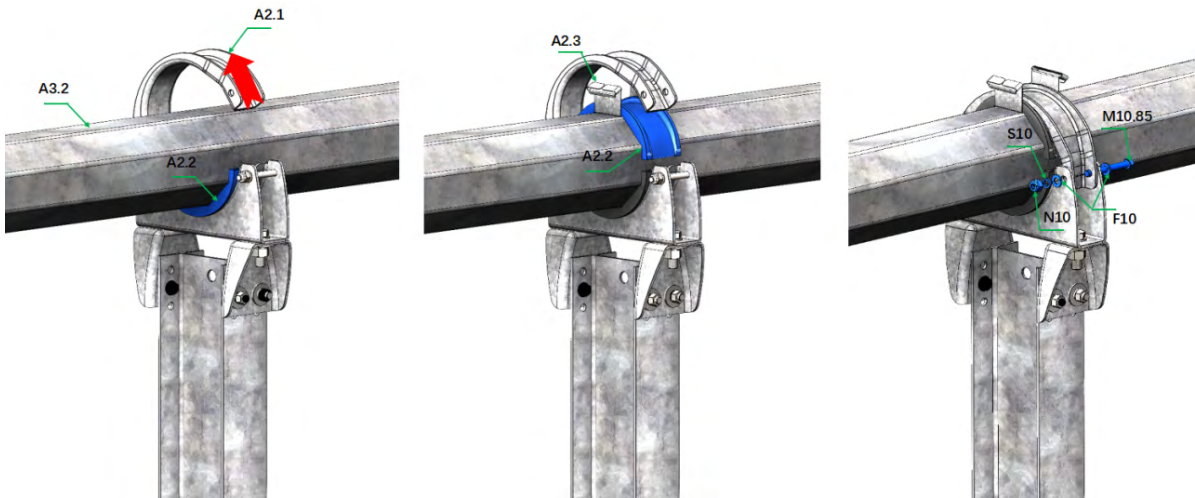
Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A1.1	11-022-00110	Slew Cable Clip S5-OCT150	2	270N*m	24mm
A1.2	11-007-00342	Tube Pad OCT150	4		
A1.6	17-093-00065	Recommended Sealant	\		
A3.4	Refer to BOM	Drive Tube	2		
M16.30	11-011-00742	Hex Bolt GB/T 5783-M16*30	16		
LF16	11-011-00250	Large Plain Washer GB/T 96.1-16*50	16		
	Key	When installing the Tube, the plane where the Tube welding line (shown by the red thin line) is located needs to coincide with the groove surface of the joint of the Slew Drive.			
	Key	After installation, the maximum axial angle of the center axis of the Tube on both sides of the Slew Drive should not be more than 0.5°			
	Key	 <p>All M16 bolts used to connect the Tube and the Slew Drive must be coated with Recommended Sealant on at least 10 threads.</p>			
	Recommendation	 <p>All M16 bolts used to connect the Tube to the Slew Drive should be installed before pre-tightening the bolts in sequence.</p>			

Figure5-22 Splicing diagram of Tube and Slew Drive

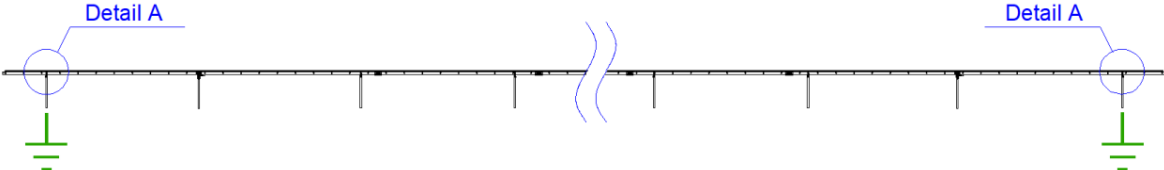
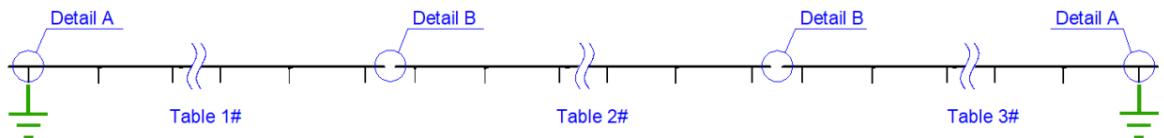
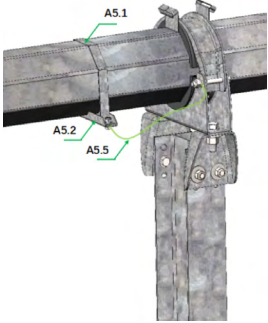
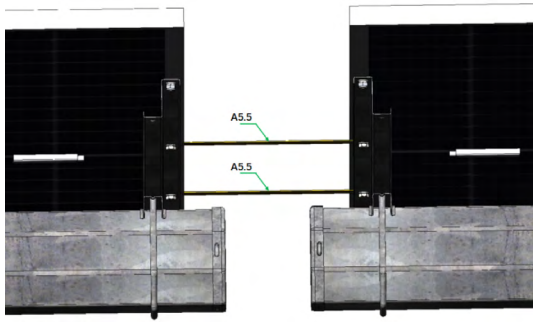


Installation of Tube and Bearing Stand



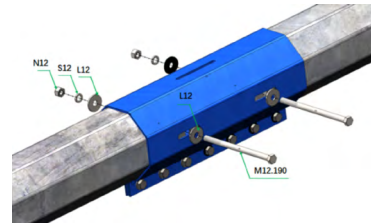
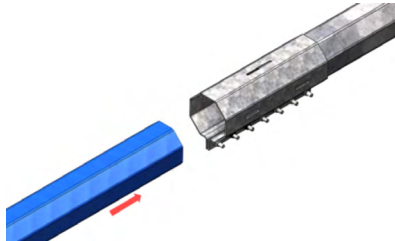
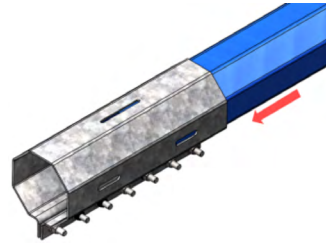
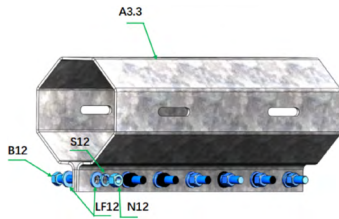
Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A2.1	11-008-01255	Bearing Stand Upper OCT150	1	40N*m	16(17)mm
A2.2	11-121-00013	Bearing OCT150	2		
A2.3	11-022-00106	Bearing Cable Clip OCT150	1		
A3.2	Refer to BOM	Standard Post	1		
M10.85	11-011-01148	Hex Bolt GB/T 5782-M10*85	2		
F10	11-011-00081	Plain Washer GB/T 97.1-10	4		
S10	11-011-00081	Spring Washer GB/T 93-10	2		
N10	11-011-00984	Nylon Lock Nut DIN 982-M10-8-tZn	2		
	Key	<p>When placing the Tube on the bearing, adjust the number of Purlins on both sides of the Bearing Stand according to the project design requirements.</p>			

Figure5-23 Installation diagram of Tube and Bearing Stand

Grounding of Tube

<p>rounding Option 1</p>					
<p>rounding Option 2</p>					
					
<p style="text-align: center;">Detail A</p>			<p style="text-align: center;">Detail B</p>		
Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A5.1	11-008-01509	Controller OCT150	2	10N*m	13(14)mm
A5.2	11-008-01259	Controller Rail OCT150	2		
A5.5	23-023-00010	Grounding Cable S16-300-8-10	2		
M8.20	12-011-00098	Hex Bolt DIN 933 M8*20	2/4		
F8	12-011-00070	Plain washer DIN 125-1-8	4/8		
S8	12-011-00048	Spring Washer GB/T 93-8	2/4		
N8	12-011-00341	Nylon Lock Nut DIN 985-M8	2/4		
	<p>Recommendation</p>	<p>The Grounding Cable needs to be mounted on the outermost post at each end of the ezTracker D1P120.</p>			
	<p>Customization</p>	<p>The position of Grounding Cable can be adjusted according to the specific requirements of the project, and the grounding network is arranged on the principle of not increasing the impedance to the current path.</p>			
<p>Figure5-24 Installation diagram of Tube grounding</p>					

Installation of Tube and Coupler



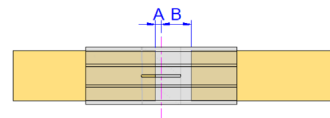
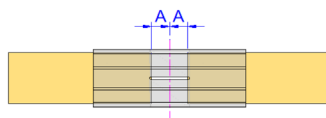
Detail A

Detail B


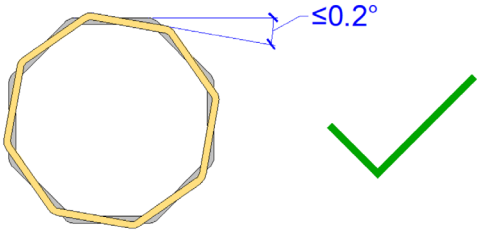



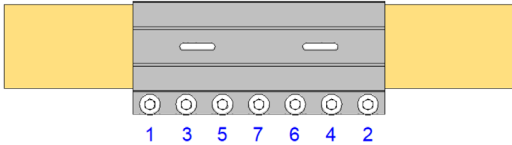
Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A3.3	11-008-01242	Coupler OCT150*5-L450	1	80N*m	80N*m
M12.50	11-011-00122	Hex Bolt GB/T 5783-M12*50	7		
LF12	11-011-00229	Plain Washer GB/T 96.1-12*37	14		
S12	11-011-00256	Spring Washer GB/T 93-12	7		
N12	11-011-00343	Hex Nut GB/T 6170-M12-8-tZn	7		
M12.190	11-011-00026	Hex Bolt GB/T 5782-M12*190	2	80N*m	18(19)mm
LF12	11-011-00229	Plain Washer GB/T 96.1-12*37	2		
S12	11-011-00256	Spring Washer GB/T 93-12	2		
N12	11-011-00343	Hex Nut GB/T 6170-M12-8-tZn	2		



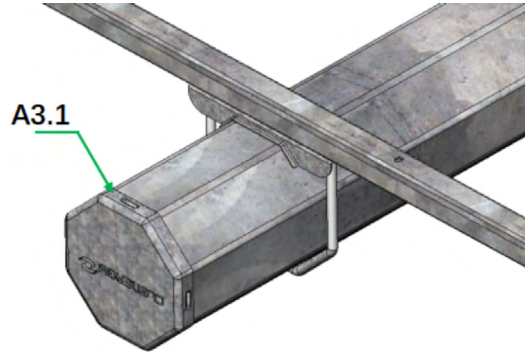
Key



Before installing the Coupler, it is necessary to place the digital inclinometer on the Tube within 50cm of the joint position and measure the axial angle. If the angle deviation is >0.5°, the Tube should be lifted to the horizontal state to avoid Tube sagging during initial installation.

	<p>Key</p>	 <p>Before installing the Coupler, it is necessary to place the digital inclinometer on the Tube within 50cm of the connector position and measure the east-west rotation angle. If the angle deviation is $>0.2^\circ$, the Tube should be rotated until the angle deviation is $<0.2^\circ$, in order to avoid the angle deviation of both Tubes during the initial installation.</p>
	<p>Key</p>	 <p>During installation, the Couplers should be centered relative to the splicing gap between the two Tubes.</p>
	<p>Key</p>	 <p>M12x50 bolts should be installed in the sequence shown in the above figure, repeated 3 times, and the required preload torque should be strictly enforced.</p>
<p>Figure5-25 Installation diagram of Tube and Coupler</p>		

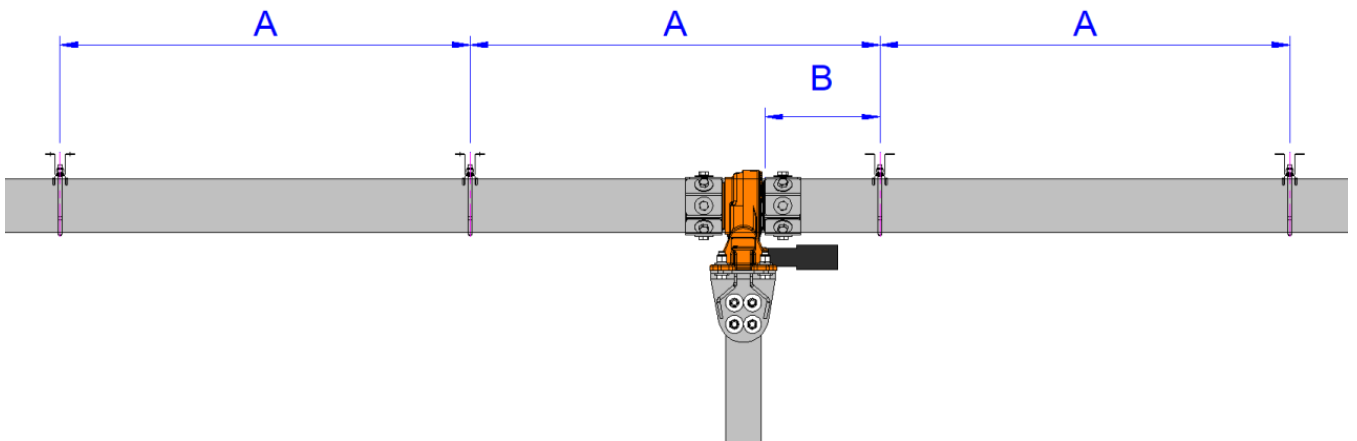
Installation of Tube and Cap



Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A3.1	11-007-00314	Cap OCT150	2		
	Key	To ensure the Cap and Tube fit correctly, note that faces the correct direction.			

Figure5-26 Installation diagram of Tube and Cap

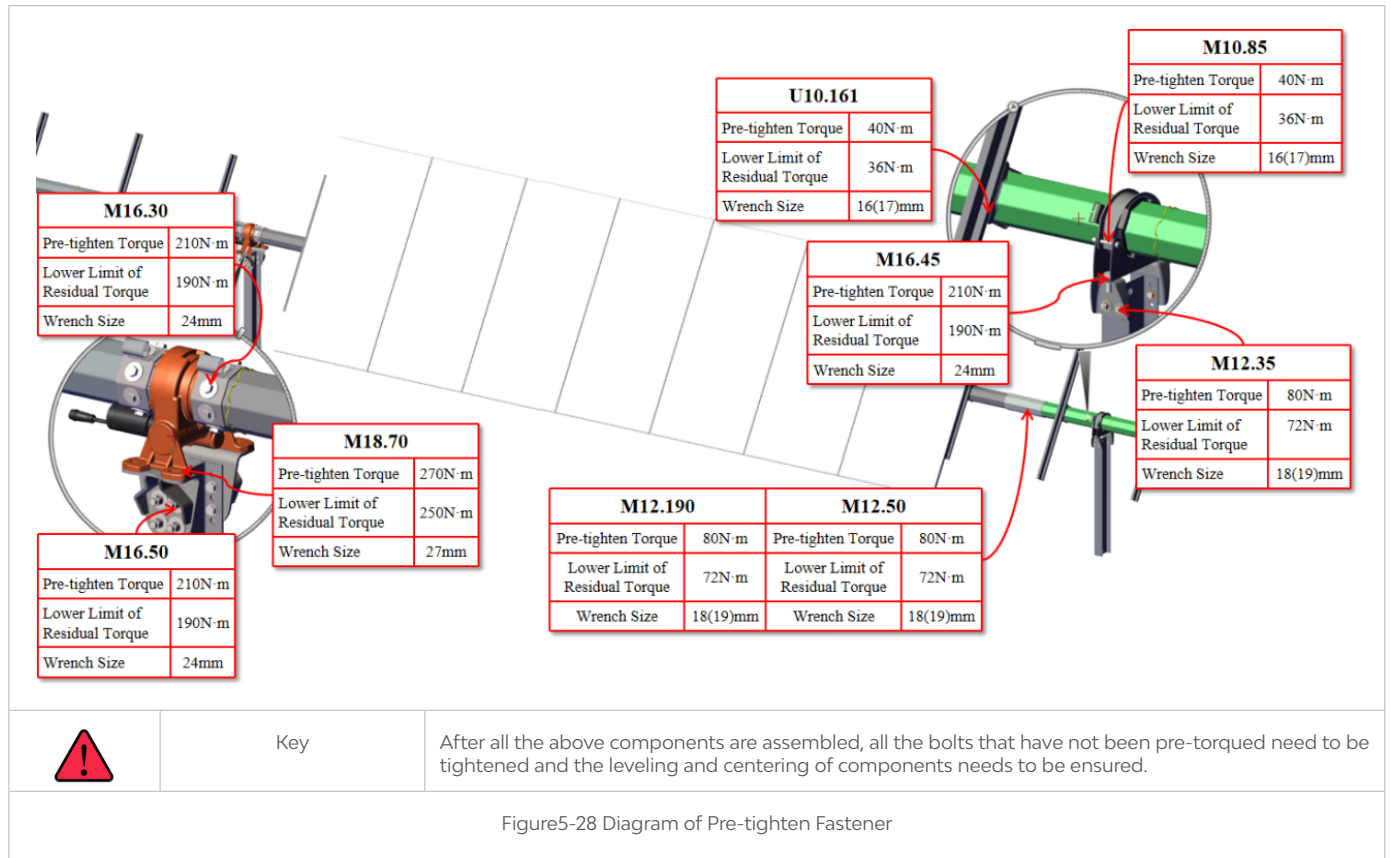
Step 7: Adjustment of Purlin spacing



Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
	Customization	For Purlin spacing dimension "A" for each project, please refer to the stamped construction drawings.			
	Recommendation	Purlins should be installed from Drive Posts to both sides, dimension "B" (Tube end face to Purlin center axis) please refer to the stamped construction drawings.			
	Recommendation	It is highly recommended to use a tool that always maintains the specified distance. This will speed up this step and also help in the installation of the PV modules.			

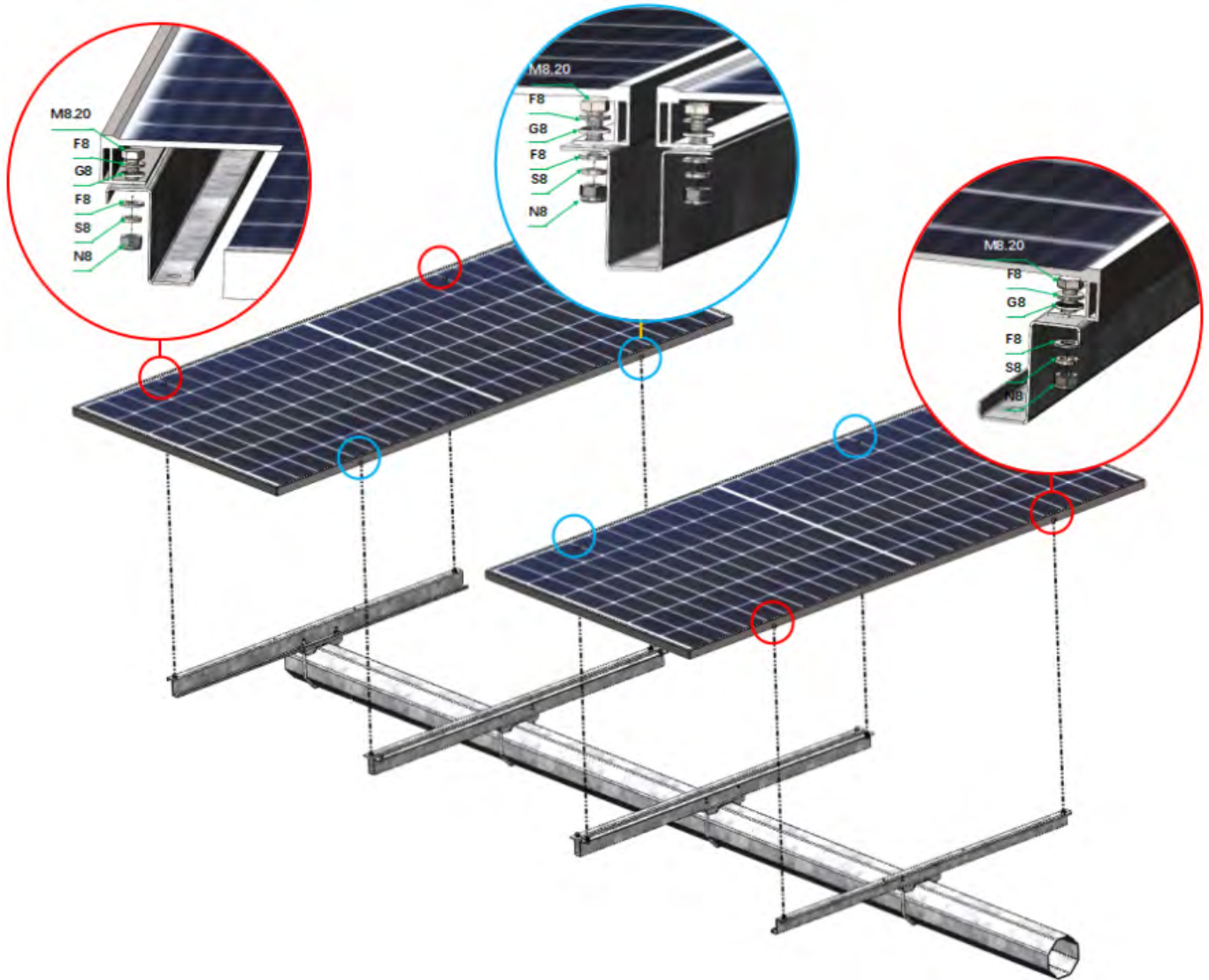
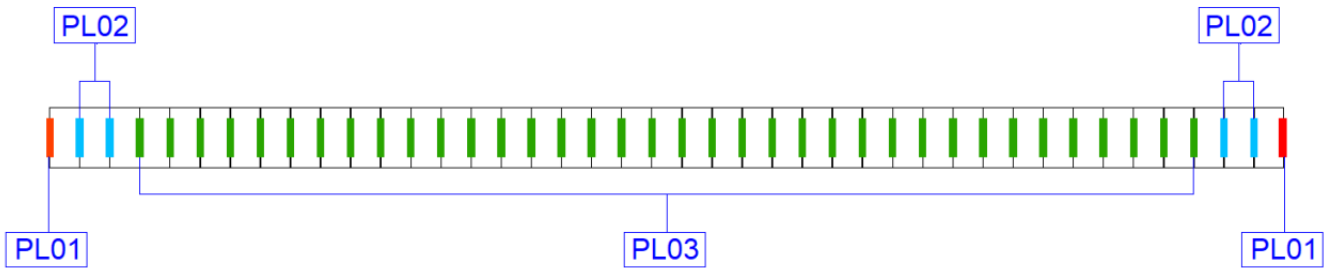
Figure5-27 Adjustment diagram of Purlin spacing

Step 8: Pre-tighten Fasteners



Step 9: Installation of PV modules

Placing of PV modules



PL01

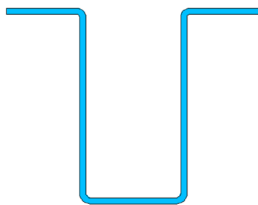
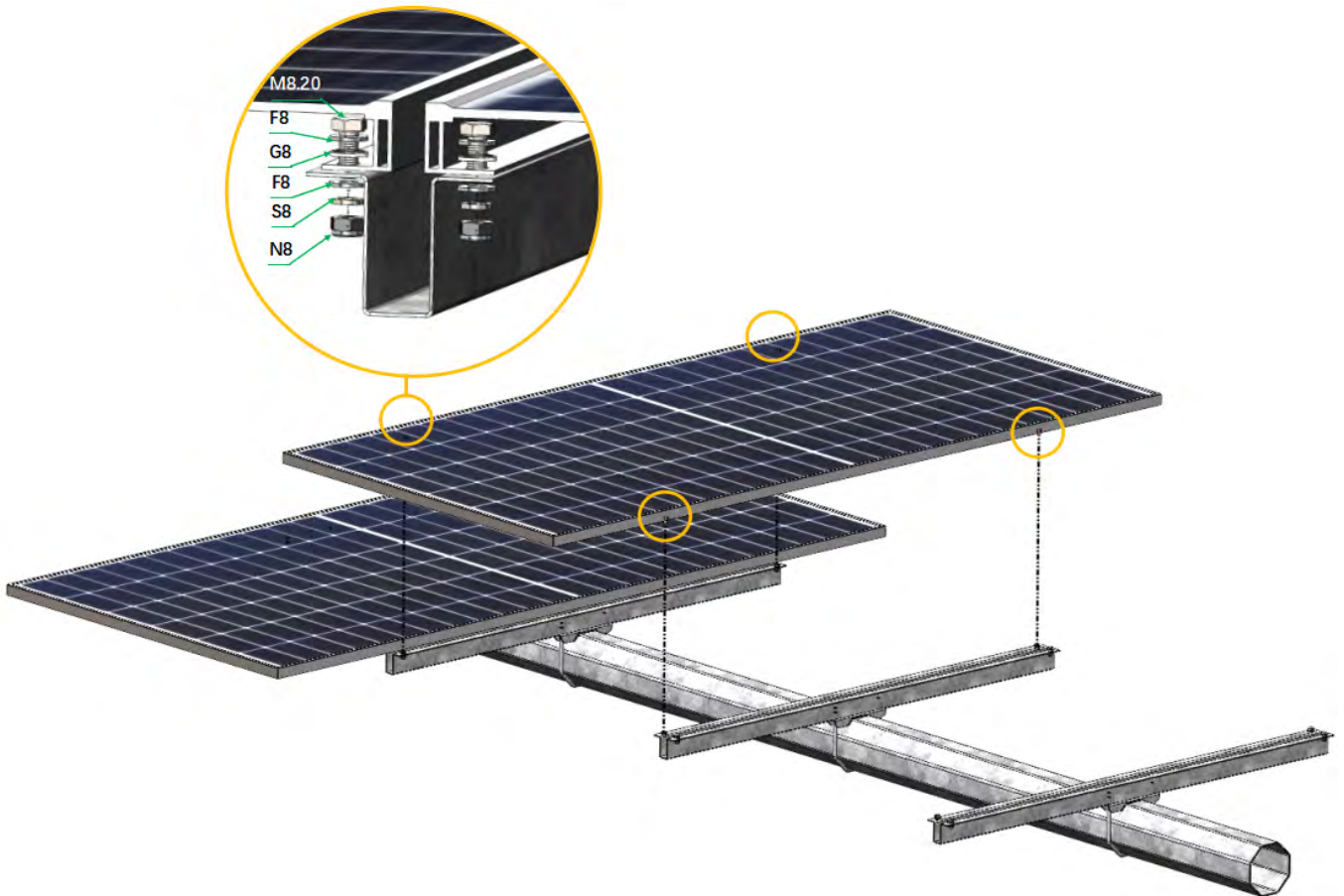


PL02

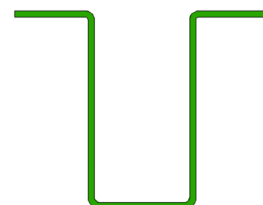


PL01








Placing of PV modules



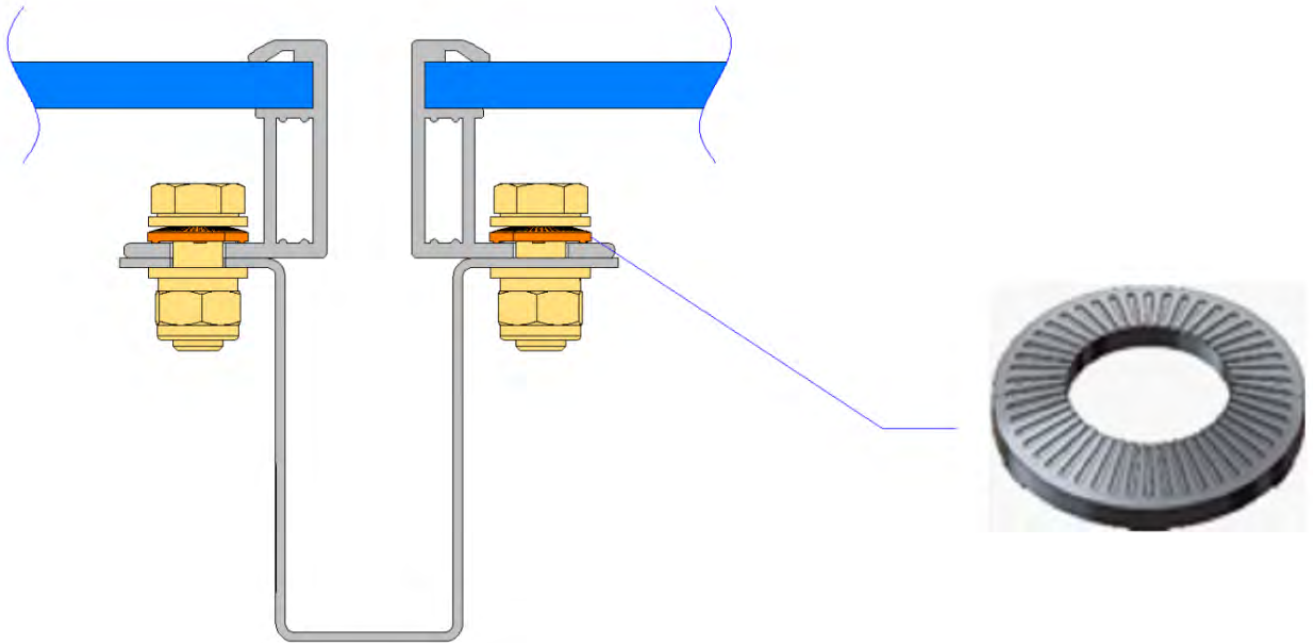
PL02



PL02

Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
M8.20	12-011-00098	Hex Bolt DIN 933-M8*20-A2-70	6	10N*m	13(14)mm
F8	12-011-00070	Plain washer DIN 125-1-8	6		
G8	12-011-01048	Grounding Washer DIN 6795-8	6		
S8	12-011-00048	Spring Washer GB/T 93-8-A2	6		
N8	12-011-00341	Nylon Lock Nut DIN 985-M8-A2-70	6		
	Key	ezTracker D1P120 should be in the 0 degree stop position during and after the installation of the PV modules.			
	Key	The PV modules should be installed in the order of perimeter row, interior edge row and interior row. The installation path should exhibit a "from outer to inner" contracting pattern, such as working circle by circle from the perimeter row toward the center. This ensures that the installed area always forms a complete and wind-load-stable structure at any stage.			
	Key	During installation, the continuous gap of uninstalled PV modules in any direction must not exceed 12 meters. If work must be suspended for any reason, pause at a fully installed section rather than in an incomplete section with large gaps.			
	Key	During installation, if high wind weather is forecast, stop work immediately and prioritize checking the connection tightness of already installed perimeter row. If PV modules of the perimeter row are not yet fully installed and high winds are imminent, promptly consider temporary reinforcement or disassembly of PV modules of interior row that have not yet formed a complete peripheral circle to mitigate risks. Under no circumstances should an unclosed peripheral circle be left exposed to high winds.			
	Key	The bolts, nuts and Washers of the PV modules should be installed in strict accordance with the diagrams in order to realize the grounding and fastening functions of the modules.			
	Key	Maintain consistent gaps between modules and refer to the stamped construction drawings for gap dimensions.			
	Key	After the PV modules are installed, ensure that the tracker remain at the stabilization angle before grid-connected debugging. Supports not in the stabilization angle must be adjusted by connecting a temporary power supply to the TCU under the guidance of qualified technicians.			
Figure5-29 Installation diagram of PV modules					

Grounding of PV modules

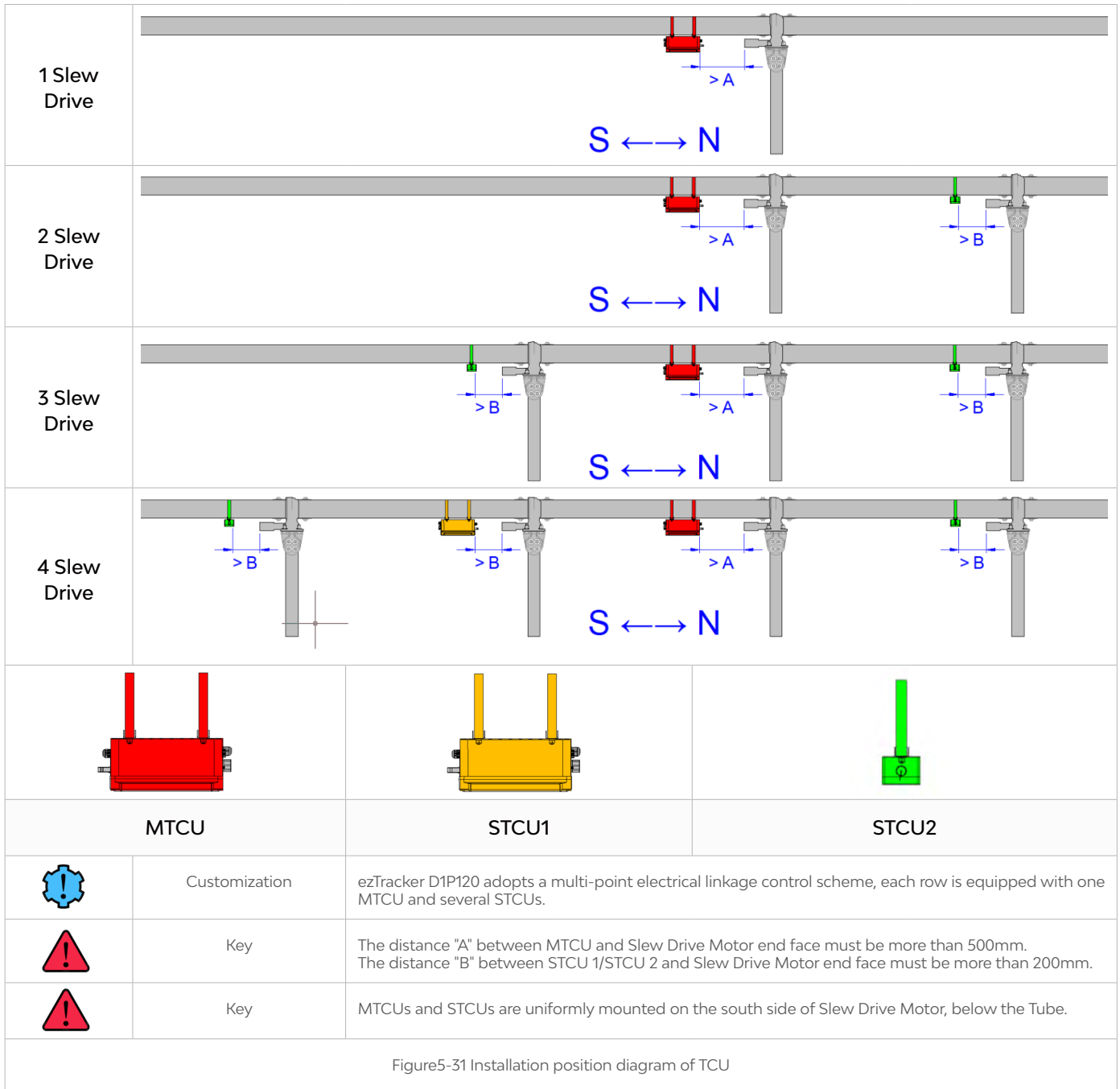


Key

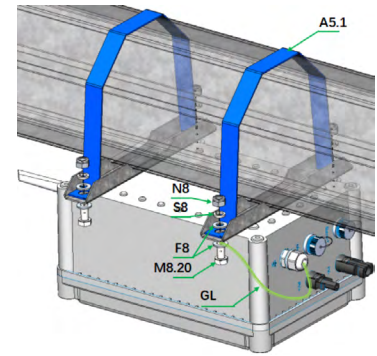
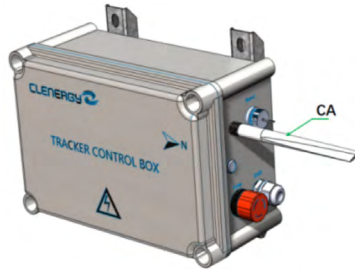
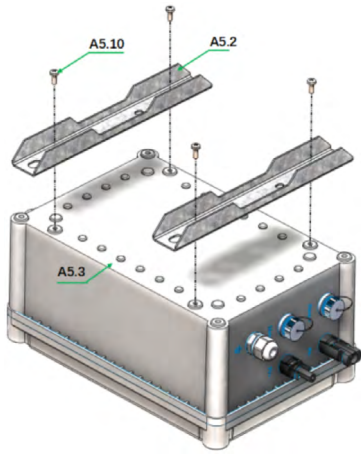
Special Grounding Washer is used in the bolt connection of PV modules. When pre-torque is applied, the Grounding Washer will pierce the anodized aluminum film of the PV module frame to realize grounding conduction.

Figure5-30 Grounding explanation of PV modules

Step 10: Installation of TCU



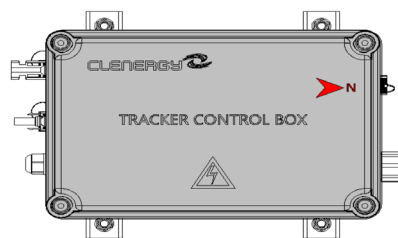
Installation of MTCU



Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A5.1	11-008-01509	Controller OCT150	2		
A5.2	11-008-01259	Controller Rail OCT150	2		
A5.3	Refer to BOM	MTCU	1		
CA	\	MTCU Antenna	1		
GL	\	Grounding Lead	1		
M5.10	\	M5*10 Screw	4	4N*m	8mm
M8.20	12-011-00098	Hex Bolt DIN 933 M8*20-A2-70	4	10N*m	13(14)mm
F8	12-011-00070	Plain washer DIN 125-1-8-A2	4		
S8	12-011-00048	Spring Washer GB/T 93-8-A2	4		
N8	12-011-00341	Nylon Lock Nut DIN 985-M8-A2-70	4		



Key



Pay attention to the mounting orientation on the MTCU.

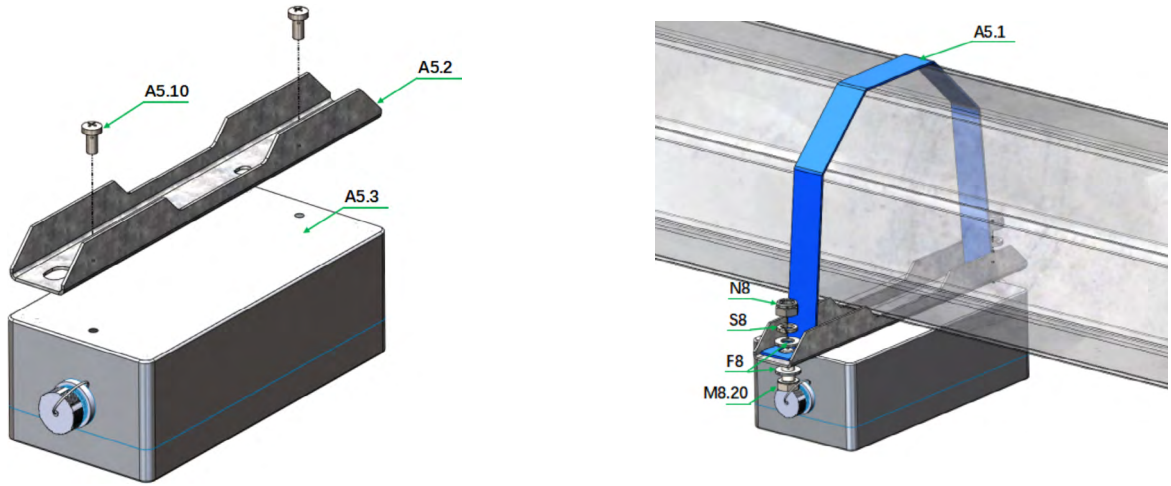


Key

MTCU is mounted on the bottom surface of the Tube.

Figure5-32 Installation diagram of MTCU

Installation of STCU



Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A5.1	11-008-01509	Controller OCT150	2		
A5.2	11-008-01259	Controller Rail OCT150	2		
A5.3	Refer to BOM	STCU	1		
M5.10	\	M5*10 Screw	4		
M8.20	12-011-00098	Hex Bolt DIN 933 M8*20	4		
S8	12-011-00048	Spring Washer GB/T 93-8	4	4N*m	8mm
F8	12-011-00070	Plain washer DIN 125-1-8	4	10N*m	13(14)mm
N8	12-011-00341	Nylon Lock Nut DIN 985-M8	4		



Key



PPay attention to the mounting orientation on the STCU.

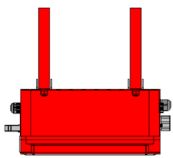
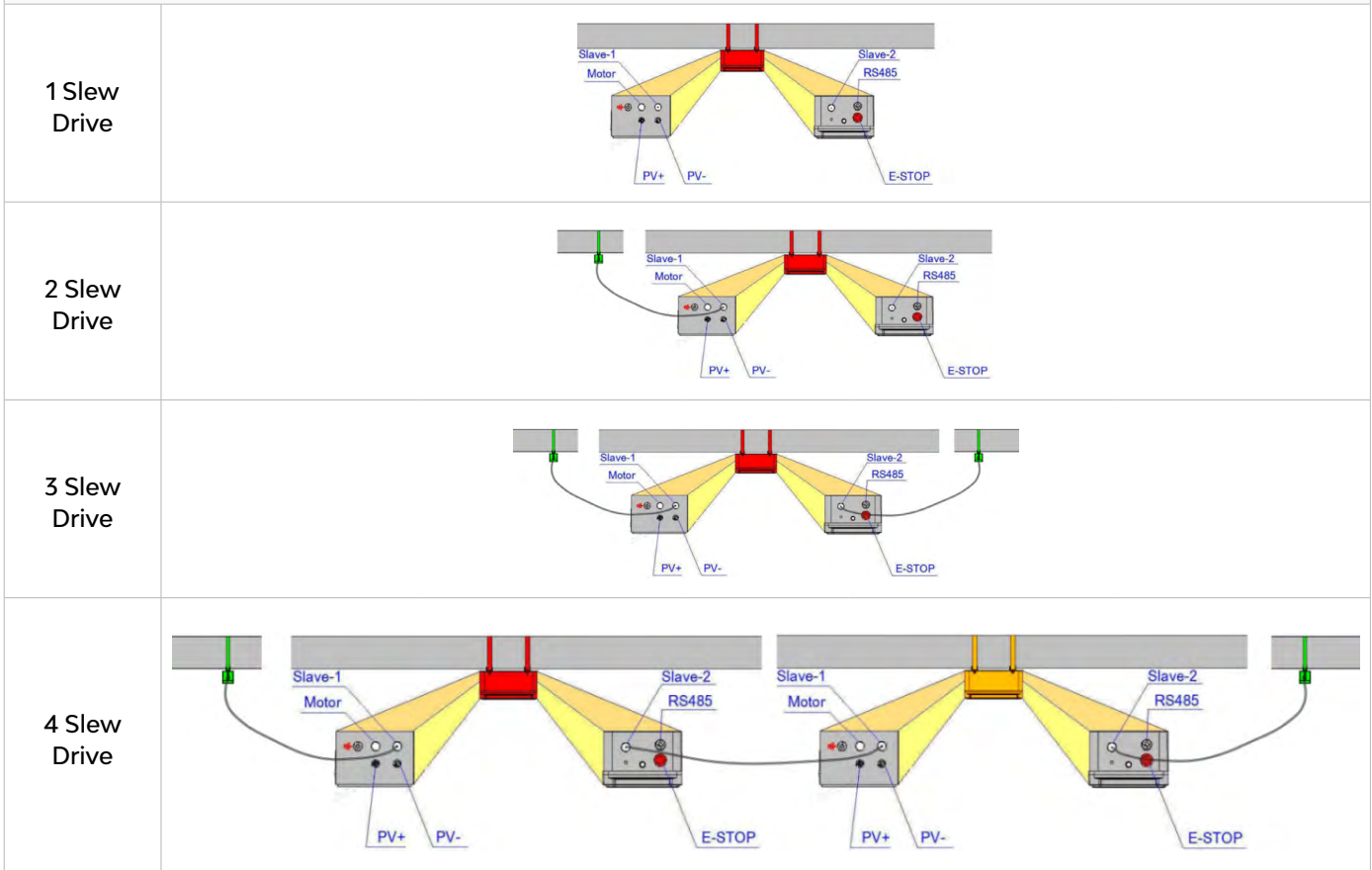


Key

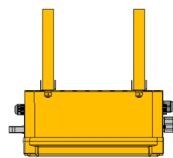
STCU is mounted on the bottom surface of the Tube.

Figure5-33 Installation diagram of STCU

Wiring of MTCU and STCU



MTCU



STCU1

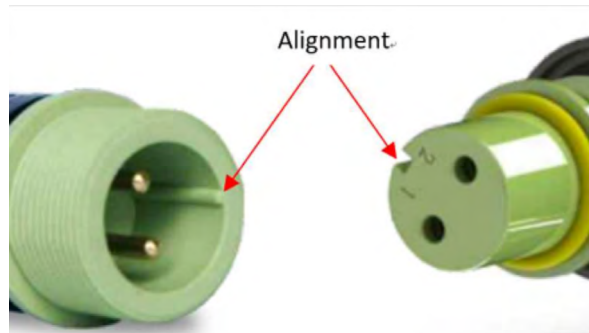
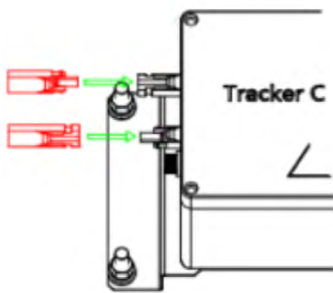
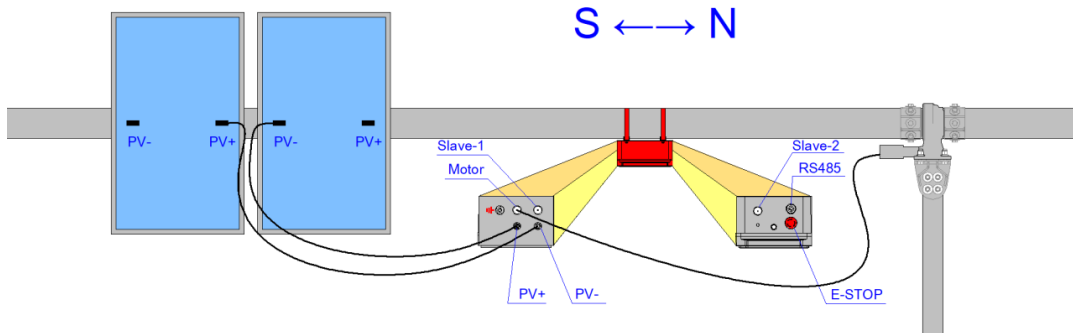


STCU2

Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A5.4	PC15	STCU Power Cable	1		
	Key	Before wiring, make sure the red emergency stop switch on TCU is depressed (shutdown state) to ensure safe wiring.			
	Key	When connecting the PV cable, be sure to turn off the inverter first to prevent fire due to excessive current.			
	Key	The power cable between TCU and Slew Drive Motor should have a free length of 300mm or more to meet the tracking and rotating work stretching action, to avoid direct pulling of the cable leading to breakage.			

Figure5-34 Wiring diagram of MTCU and STCU

Power wiring of MTCU



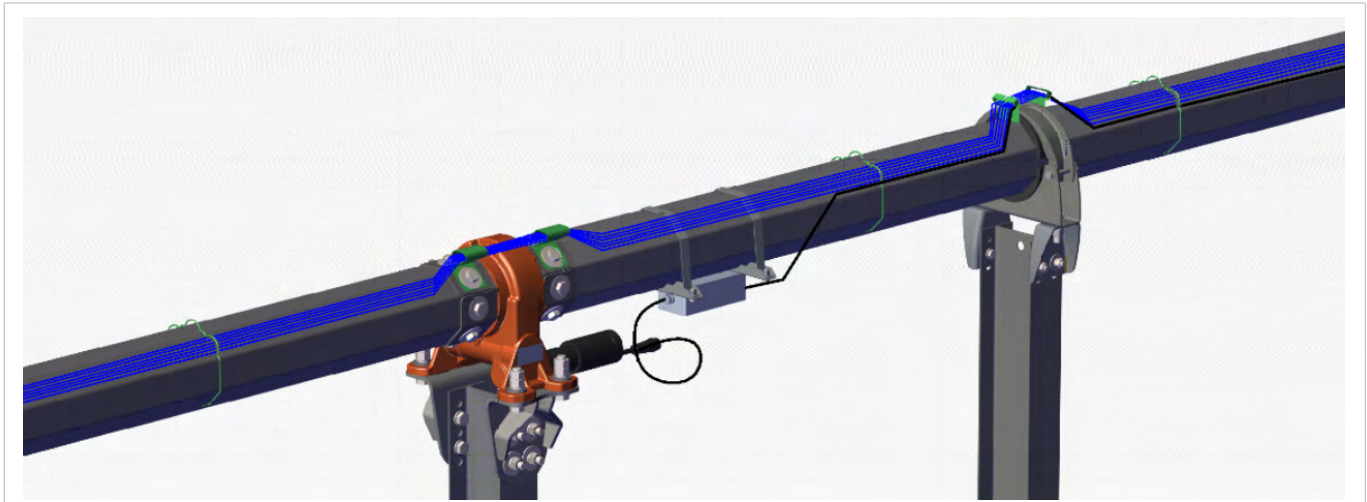
Wiring of PV+/PV-

Wiring of motor

Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A6.13	15-075-00417	Power Cable 2*1.5	\		
	Key	Before wiring, make sure that the DC switch is in the OFF position and the red emergency stop switch of MTCU is in the depressed state (shutdown state) to ensure safe wiring.			
	Key	When connecting the PV cable, be sure to turn off the inverter first to prevent fire due to excessive current.			
	Key	The two Power Cables are packed together with the control box.			

Figure5-35 Power wiring diagram of MTCU

Step 11: Cable management




Tube Cable		Slew Cable Clip		Bearing Cable Clip	
Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A1.1	11-022-00110	Slew Cable Clip S5-OCT150	2		
A2.3	11-022-00106	Bearing Cable Clip OCT150	1		
A3.5	12-022-00044	Tube Cable OCT150	1		
	Key	A free length of 300mm or more needs to be reserved when the cable crosses the Slew Drive and Bearing Stand to avoid the cable being pulled during normal rotation.			





Figure5-36 Diagram of Cable management

Step 12: Installation of Wind Speed&Direction Monitoring Station

Each sub-array is configured with a set of Wind Speed&Direction Monitoring Station for the weather monitoring and the communication between TCU and NCU.

Foundation of Wind Speed&Direction Monitoring Station

Depending on the foundation of the project, the types of foundation supported by wind post include, ramming pile, filling concrete pile and box variable platform installation.




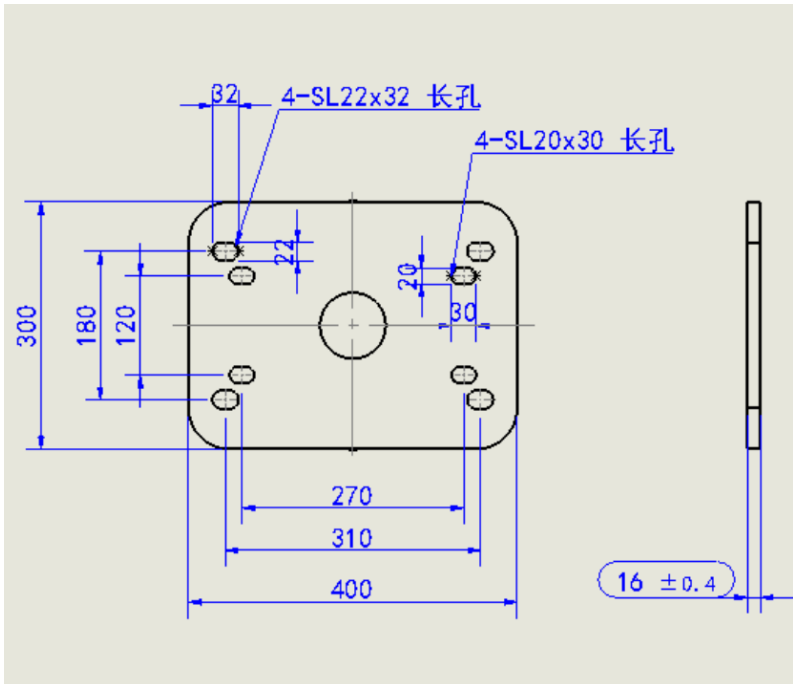

			
Ramming Pile & Filling Concrete Pile		Box Variable Platform	
	Key	The location of the Wind Speed&Direction Monitoring Station should be chosen in an open and level place. For the convenience of power collection and communication with the box variable, it is recommended that the Wind Speed&Direction Monitoring Station should be no more than 50m away from the box variable.	
	Key	All objects within 5m around the Wind Post should be at least 1m below the center of the wind cup of the wind speed sensor.	
Figure5-36 Diagram of Cable management			

A.Ramming Pile & Filling Concrete Pile

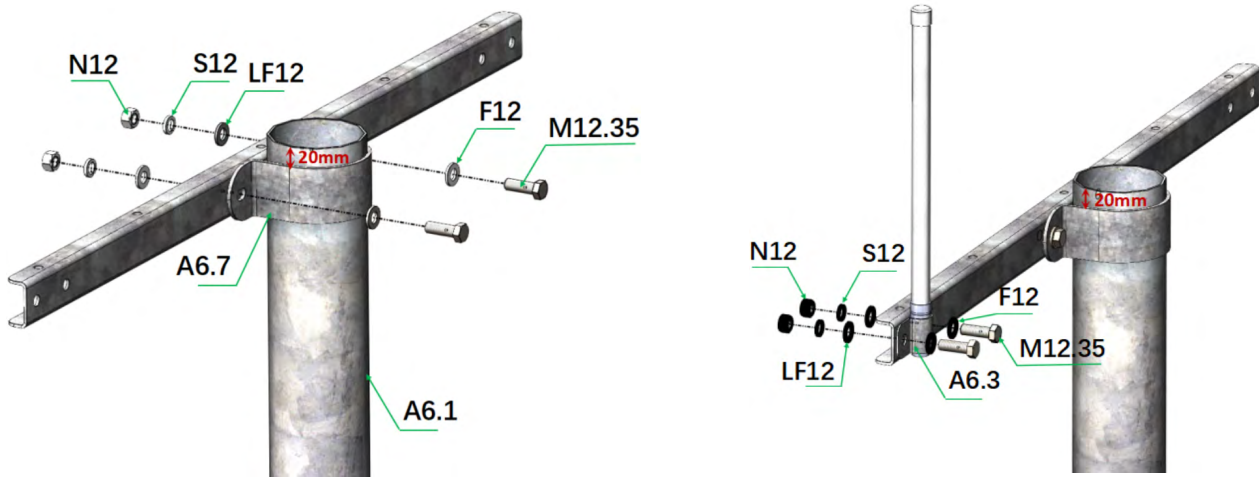
Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A1.5	Refer to BOM	Drive Post	1		
A1.4	11-008-01263	Slew Support W6-S5	2		
A6.1	11-013-00033	Wind Post 5m	1		
M16.50	11-011-00028	Hex Bolt GB/T 5783 M16*50	8	20N*m	16(17)mm
F16	11-011-00032	Plain Washer GB/T 971-16*30	8		
L16	11-011-00250	Large Plain Washer GB/T 961-16*50	8		
S16	11-011-00252	Spring Washer GB/T 93-16	8		
N16	11-011-00238	Hex Nut GB/T 6170-M16-8-tZn	8		
M20.90	11-011-00002	Hex Bolt GB/T 5783-M20*90	4	20N*m	16(17)mm
F20	11-011-00043	Plain Washer GB/T 1230-20	8		
S20	11-011-00461	Spring Washer GB/T 93 20	4		
N20	11-011-00462	Hex Nut GB/T 6170-M20-10-tZn	4		
	Key	Ensure that the Wind Post is perpendicular to the horizontal in all directions after installation.			
	Recommendation	Ensure that all bolts face the same direction.			

Figure5-38 Foundation diagram of ramming pile

B.Box Variable Platform

		
	<p>Recommendation</p>	<p>Install the Wind Post on the box variable platform, which can be welded by flange base plate or connected by anchor bolt.</p>
	<p>Key</p>	
	<p>Key</p>	<p>Base plate welding requirements.</p> <ol style="list-style-type: none"> 1) Cleaning before welding, should be the base material welding area around the 20mm within the sticky sand, oil, water, rust, etc. clean up, reveal the metal luster; 2) Wind Post base plate weld height of 10mm, full weld around the edge; weld appearance is beautiful, no biting edge, no slag, pores, cracks, spatter and other defects, weld wave uniform weld full, 3) Reference standard: GB50661-2011 steel structure welding standard; 4) Welding structure material: Wind Post base plate Q355B. 5) Welding method: manual welding; 6) Apply more than 2 times of reddan antirust primer, and then paint silver powder antirust top coat, pay attention to each time before painting need to wait until the last layer of paint is dry before brushing; anticorrosion directly affects the tracking system's safety and stability, and it is recommended that the construction unit is strictly in accordance with the specifications for painting. 7) The location of anti-corrosion treatment includes the damage of galvanized layer caused by welding process, such as welding splash place; 8) Refer to the specification: "construction steel anticorrosion engineering specification" (GB50212-2002) .
<p>Figure5-39 Foundation diagram of Box Variable Platform</p>		

Installation of NCU Antenna



Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A6.1	11-013-00033	Wind Post 5m	1		
A6.3	11-008-01313	Omni Antenna Anchor	1		
A6.7	11-008-01312	Wind Post Anchor D102	1		
A6.10	11-016-05115	Antenna Rail	1		
NA	\	NCU Antenna	1		
M12.35	11-011-00122	Hex Bolt GB/T 5783-M12*35	4	80N*m	18(19)mm
F12	11-011-00243	Plain Washer GB/T 97.1-12	4		
LF12	11-011-00229	Plain Washer GB/T 96.1-12*37	4		
S12	11-011-00256	Spring Washer GB/T 93-12	4		
N12	11-011-00343	Hex Nut GB/T 6170-M12-8-tZn	4		



Recommendation Ensure that all bolts face the same direction.

Figure5-40 Installation diagram of NCU Antenna

Installation of Wind Combined Sensor



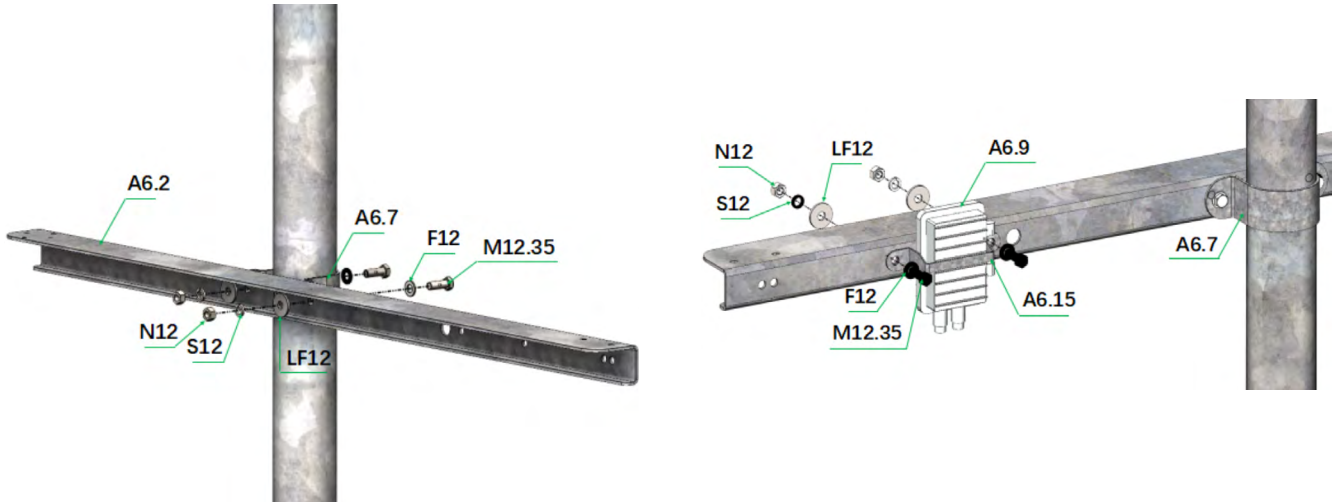
Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A6.1	11-013-00033	Wind Post 5m	1		
A6.4	15-114-00043	Wind Combined Sensor FA21-10m	1		
A6.5	11-007-00348	Anemometer FA13-10m	1		
A6.7	11-008-01312	Wind Post Anchor D102	1		
M6.25	11-011-00122	Cross-head bolt DIN 7045 M6*25	4	8N*m	10mm
S6	11-011-00243	Spring Washer GB/T 93-6	4		
LF6	11-011-00229	Large Plain Washer DIN 9021 -6*18	4		
M12.35	11-011-00122	Hex Bolt GB/T 5783-M12*35	2	80N*m	18(19)mm
F12	11-011-00243	Plain Washer GB/T 97.1-12	2		
LF12	11-011-00229	Plain Washer GB/T 96.1-12*37	2		
S12	11-011-00256	Spring Washer GB/T 93-12	2		
N12	11-011-00343	Hex Nut GB/T 6170-M12-8-tZn	2		



Recommendation Ensure that all bolts face the same direction.

Figure5-41 Installation diagram of Wind Combined Sensor

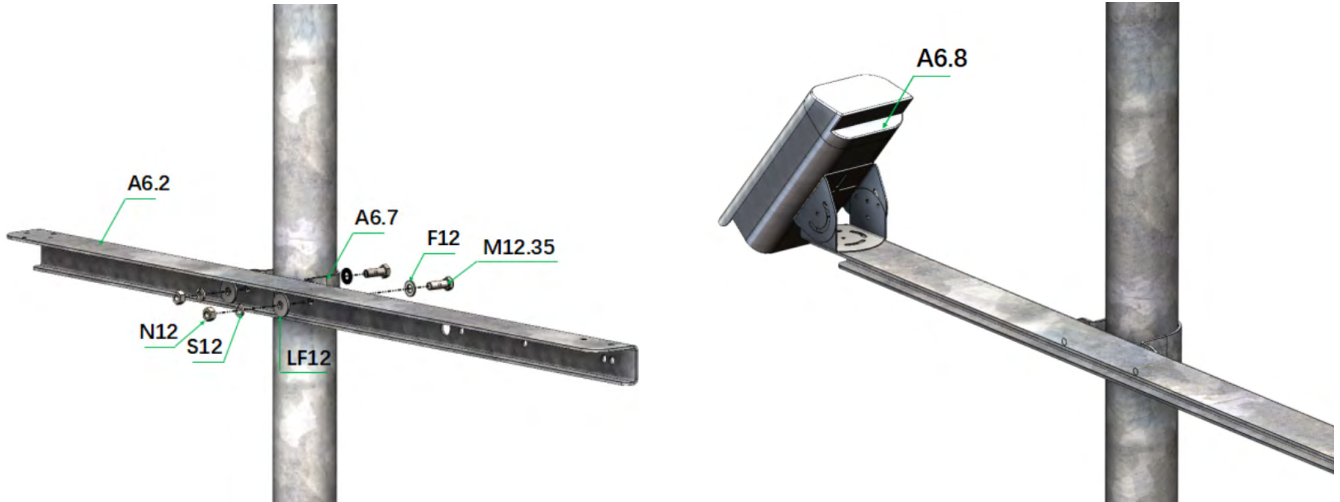
Installation of Pyranometer (Optional)



Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A6.2	11-008-01324	Pyranometer Rail	1		
A6.7	11-008-01312	Wind Post Anchor D102	1		
A6.9	15-114-00042	Pyranometer TBQ-2 -5m	1		
A6.15	11-008-01325	Pyranometer Transmitter Clamp	1		
M12.35	11-011-00122	Hex Bolt GB/T 5783-M12*35	4	80N*m	18(19)mm
F12	11-011-00243	Plain Washer GB/T 97.1-12	4		
LF12	11-011-00229	Plain Washer GB/T 96.1-12*37	4		
S12	11-011-00256	Spring Washer GB/T 93-12	4		
N12	11-011-00343	Hex Nut GB/T 6170-M12-8-tZn	4		
	Customization	Pyranometer, optional according to project requirements.			
	Recommendation	Only one set of Pyranometer is configured for a project, and it is recommended to be installed on the Wind Speed&Direction Monitoring Station in the subarray near the O&M station to facilitate O&M.			

Figure5-42 Installation diagram of Pyranometer

Installation of Snow Sensor (Optional)





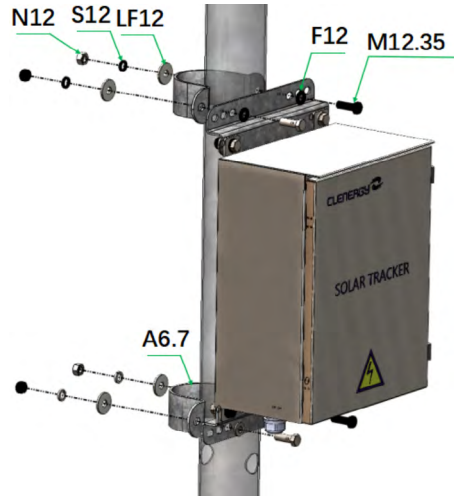
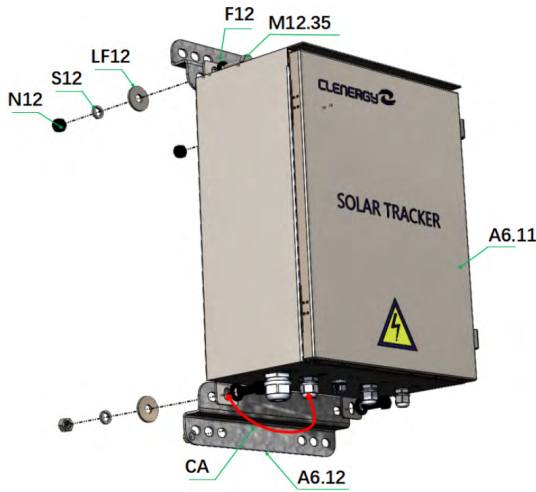
Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A6.2	11-008-01324	Pyranometer Rail	1		
A6.7	11-008-01312	Wind Post Anchor D102	1		
A6.8	15-077-00071	Snow Sensor JGXS-1	1		
M12.35	11-011-00122	Hex Bolt GB/T 5783-M12*35	2	80N*m	18(19)mm
F12	11-011-00243	Plain Washer GB/T 97.1-12	2		
LF12	11-011-00229	Plain Washer GB/T 96.1-12*37	2		
S12	11-011-00256	Spring Washer GB/T 93-12	2		
N12	11-011-00343	Hex Nut GB/T 6170-M12-8-tZn	2		
	Customization	Snow Sensor, optional according to project requirements.			
	Recommendation	Only one set of Snow Sensor is configured for a project, and it is recommended to be installed on the Wind Speed&Direction Monitoring Station in the subarray near the O&M station to facilitate O&M.			

Figure5-43 Installation diagram of Snow Sensor

Installation of NCU



Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
GL	\	Ground Lead	1		
A6.7	11-008-01312	Wind Post Anchor D102	1		
A6.11	15-037-00032	NCU-AC-WL-915	1		
A6.12	11-008-01314	Communication Box Rail	2		
M12.35	11-011-00122	Hex Bolt GB/T 5783-M12*35	8	80N*m	18(19)mm
F12	11-011-00243	Plain Washer GB/T 97.1-12	8		
LF12	11-011-00229	Plain Washer GB/T 96.1-12*37	8		
S12	11-011-00256	Spring Washer GB/T 93-12	8		
N12	11-011-00343	Hex Nut GB/T 6170-M12-8-tZn	8		



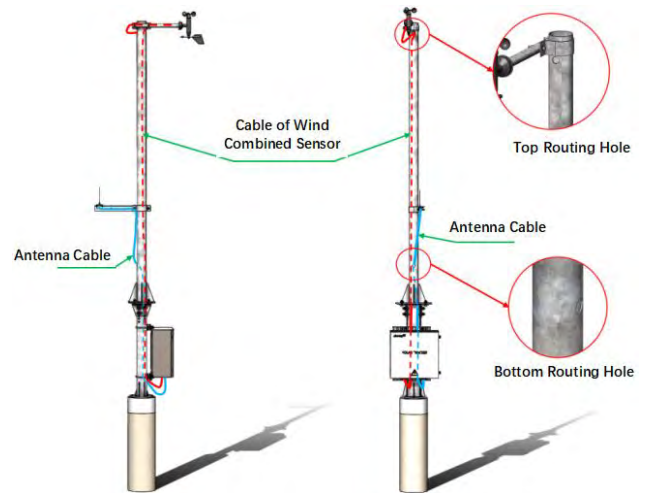
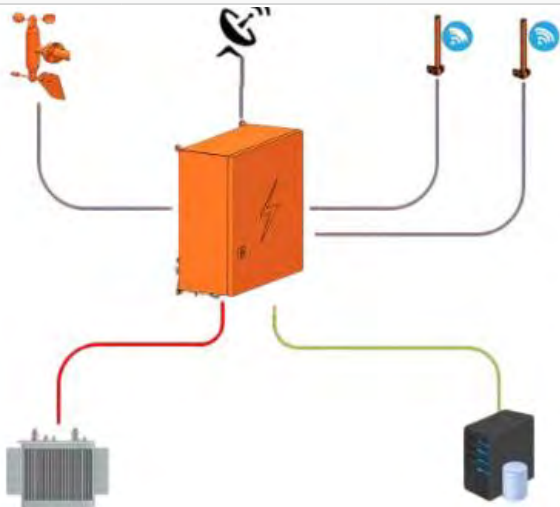
Key



L refer to the stamped construction drawings

Figure5-44 Installation diagram of NCU

Wiring of Wind Speed & Direction Monitoring Station



Code	Part No.	Part Name	Quantity	Pre-tighten Torque	Wrench Size
A6.14	15-075-00293	Ethernet cable	\		
	Key	NCU power supply requirements: 1) 220 volts AC ± 10% 2) Frequency 50/60Hz 3) Power 200 w			
	Key	Requirements for NCU power supply cable: 1) Flexible cable 2) Rated voltage 300/500AC; 3) Temperature resistance 125°C 4) UV resistant F2			
	Key	Requirements for NCU communication cables: 1) Shielded twisted pair (STP) 2) According to the site electrical installation, it is recommended that the communication distance does not exceed 100 meters			
	Key	Wind Combined Sensor cables are routed along the inside of the round tube to the top alignment hole, antenna cables are routed along the inside of the round tube to the bottom alignment hole, the dotted part of the above figure is the invisible part.			
	Key	The exposed portion needs to be sleeved and the cable (sleeved) is tied to the round tube with a cable tie.			

Figure5-45 Wiring diagram of Wind Speed&Direction Monitoring Station

Installation Process Video

- To add integrity to the installation process, we have provided an installation video with detailed installation steps (please scan the QR-Code below).
- Please combine the above installation guide with the video content to complete the installation.
- If this QR-Code does not work, please contact us for the latest installation video.










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