Spec No.: ZTT24-A091201

TECHNICAL SPECIFICATION

16-Port,X-Pol,TDD&FDD Antenna,Integrated RET
FDD:2×690-960&2×1695-2690MHz,TDD:4×2300-2690MHz

Version	Date	Prepared	Reviewed	Approved
A.0	Sep 12,2024	Zack	Michael	Mr.Wang

Address: No. 88 Qixin Road, NETDA, Nantong, Jiangsu, P.R. China, 226009
Tel:+86 513 8010 0986 | E-mail: sales@zttgroup.com | Website: www.zttgroup.com

Electrical Specifications

Description	16-Port,X-Pol,TDD&FDD Antenna,Integrated RET FDD:2×690-960&2×1695-2690MHz,TDD:4×2300-2690MHz					
ZTT Product Code	**HBH448S631619**					
Frequency Range	MHz	FDD:2×690-960(**R1/R2**)				
Frequency Band	MHz	690-824	790-894	880-960		
Gain Over All Tilts	dBi	15.2±0.4	16.0±0.6	16.2±0.3		
Gain by Tilt Average Min	dBi	15.5	15.9	16.4		
Gain by Tilt Average Mid		15.3	15.6	15.9		
Gain by Tilt Average Max		14.9	15.4	15.7		
Horizontal 3dB Beam Width	Deg	63±8	62±8	61±5		
Vertical 3dB Beam Width	Deg	8.7±0.5	7.9±0.5	7.5±0.3		
1st Upper Side Lobe Suppression Above Main Beam	dB	≥18	≥15	≥15		
Front to Back Ratio at 180Deg ±30Deg	dB	≥30				
Cross-Polar Ratio at 0Deg	dB	≥20	≥20	≥25		
Electrical Downtilt	Deg	**2-12,Continuously adjustable**				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥25				
Interband Isolation	dB	≥25				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	400(at 50°C ambient temperature)				
Frequency Range	MHz	FDD:2×1695-2690(**Y1/Y2**)				
Frequency Band	MHz	1695-1880	1850-1990	1920-2170	2300-2500	2490-2690
Gain Over All Tilts	dBi	18.2±0.9	18.7±0.4	18.9±0.6	19.5±0.8	19.6±0.8
Gain by Tilt Average Min	dBi	18.8	19.1	19.4	19.9	20.3
Gain by Tilt Average Mid		18.5	18.7	19.1	19.5	19.8
Gain by Tilt Average Max		18.2	18.5	18.8	19.2	19.5
Horizontal 3dB Beam Width	Deg	75±5	68±5	66±5	60±4	56±4
Vertical 3dB Beam Width	Deg	8.8±0.6	8.2±0.4	7.8±0.7	6.6±0.5	6.1±0.4
1st Upper Side Lobe Suppression Above Main Beam	dB	≥17	≥19	≥18	≥17	≥19

Front to Back Ratio at 180Deg ±30Deg	dB	≥30				
Cross-Polar Ratio 0Deg	dB	≥19	≥19	≥20	≥24	≥24
Electrical Downtilt	Deg	**2-12,Continuously adjustable**				
VSWR	/	≤1.5				
Cross Polar Isolation	dB	≥25				
Interband Isolation	dB	≥25				
Intermodulation IM3	dBc	≤-150(2×43 dBm carrier)				
Max. Power Per Port	Watt	250(at 50℃ ambient temperature)				
Impedance	Ohm	50				
Polarization	Deg	±45				

Electrical Specifications

Frequency Range		MHz	TDD:4×2300-2690(Y3)	
Frequency Band		MHz	2300-2500	2490-2690
Coupling Factor between Calibration Port and Each Antenna Port		dB	-26±2	
Max.Amplitude Tolerance from Calibration Port to Input Ports		dB	≤0.9	
Max.Phase Tolerance from Calibration Port to Input Ports		Deg	≤8	
VSWR		/	≤1.5	
Intermodulation IM3		dBc	≤-150(2×43 dBm carrier)	
Electrical Downtilt		Deg	**2-12,Continuously adjustable**	
Max. Power Per Port		Watt	50(at 50℃ ambient temperature)	
Co-polarization Isolation Between Ports		dB	≥25	
Cross-polarization Isolation Between Ports		dB	≥25	
Single Column Beam	**Horizontal 3dB Beam Width**	Deg	89±16	87±15
	Vertical 3dB Beam Width	Deg	6.0±0.5	5.6±0.5
	Gain Over All Tilts	dBi	16.8±0.6	17.1±0.5
	Gain by Tilt Average Min	dBi	17.4	17.6
	Gain by Tilt Average Mid	dBi	17.0	17.3
	Gain by Tilt Average Max	dBi	16.7	17.0
	Cross-Polar Ratio 0Deg	dB	≥17	≥15
	1st Upper Side Lobe Suppression Above Main Beam	dB	≥18	≥18

	Front to Back Ratio at 180Deg ±30Deg	dB	≥30	
Broadcast Beam	**Horizontal 3dB Beam Width**	Deg	63±5	64±3
	Vertical 3dB Beam Width	Deg	6.0±0.5	5.6±0.5
	Gain Over All Tilts	Deg	16.8±0.5	17.0±0.5
	Gain by Tilt Average Min	dBi	17.1	17.3
	Gain by Tilt Average Mid	dBi	16.8	17.1
	Gain by Tilt Average Max	dBi	16.5	16.9
	Cross-Polar Ratio at 0Deg	dB	≥23	≥22
	1st Upper Side Lobe Suppression Above Main Beam	dB	≥18	≥18
	Upper Sidelobe Suppression, Peak to 20Deg	dB	≥16	≥15
	Front to Back Ratio at 180Deg ±30Deg	dB	≥30	
Service Beam	**0° Beam Gain Over All Tilts**	dBi	20.5±0.3	20.6±0.7
	0° Beam Gain by Tilt Average Min	dBi	20.7	21.1
	0° Beam Gain by Tilt Average Mid	dBi	20.5	20.8
	0° Beam Gain by Tilt Average Max	dBi	20.1	20.5
	0° Beam Horizontal 3dB Beam Width	Deg	23±2	23±2
	0° Beam Horizontal Sidelobe	dB	≥12	
	0° Beam Front to Back Ratio	dB	≥30	≥30
	0° Beam Cross-Polar Ratio at 0Deg	dB	≥30	≥27
	±30° Beam Gain Over All Tilts	dBi	20.2±0.3	20.0±0.7
	±30° Beam Gain by Tilt Average Min	dBi	20.4	20.6
	±30° Beam Gain by Tilt Average Mid	dBi	20.1	20.3
	±30° Beam Gain by Tilt Average Max	dBi	19.9	20.0
	±30° Beam Horizontal 3dB Beam Width	Deg	31±1	28±1
	±30° Beam Vertical 3dB Beam Width	Deg	6.0±0.5	5.6±0.5
	±30° Beam Vertical Sidelobe	dB	≥18	≥18
	±30° Front to Back Ratio	dB	≥30	≥30

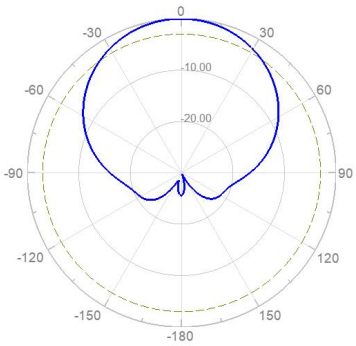
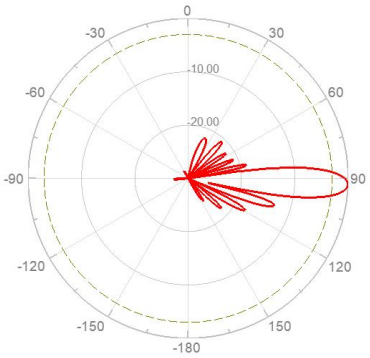
Mechanical Specifications

Antenna Dimensions	mm	2680×498×180
Antenna Net Weight	kg	35.2
Packing Dimensions	mm	2930×550×218

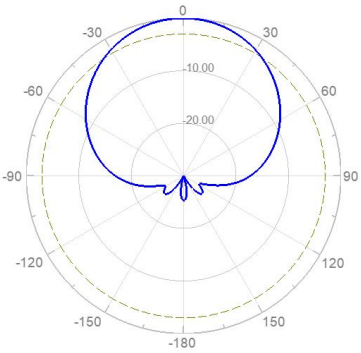
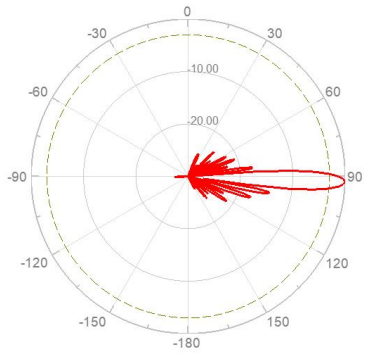
Antenna Gross Weight	kg	55.0
Connector Type	/	8×4.3-10 Female +1×MQ4+1×MQ5
Connector Position	/	Bottom
Radiator Material	/	Aluminum&Low loss circuit broad
Radome Material / Color	/	Upvc / Light Grey RAL7035
Reflector Material	/	Aluminum
Storage Temperature	°C	-40 to +60
Operating Temperature	°C	-40 to +60
Humidity	/	0% to 95%
Max. operational Wind Speed	km/h	200
Wind Load @Rated Wind Front	N	1680
Wind Load @Rated Wind Side	N	251
Wind Load @Rated Wind Rear	N	1883
Lightning Protection	/	DC ground
Accessories		
Downtilt Kit (mechanical)	Deg	0-12
Mounting Accessories (clamp)	/	Included with antenna
Mounting Pipe Diameter	mm	50-125
Internal RET Specifications		
RCU (remote control unit)	/	Replaceable RET (can be exchangable without exchanging antenna)
		AISG2.0 /3GPP
Input Voltage Range	V	10-30 DC
Power Consumption	W	< 10 (motor activated , single RET) < 2 (stand by, single RET)
Adjustment Time (full range)	s	< 120 (typically, depending on antenna type)
RET Connector	/	1 pair of AISG 5 pin male & female
Pin Assignment According AISG	/	5-pin circular connector conforming to IEC 60130-9 - Ed. 3.0
Lightning Protection	kA	5 (8/20 μs differential mode), 8 (8/20 μs common mode)

Reference Pattern

FDD:690-960MHz

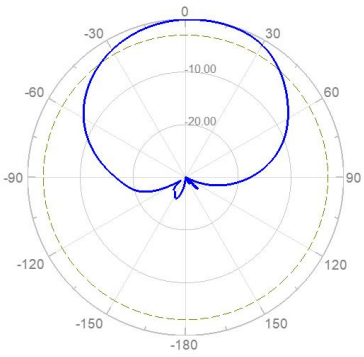
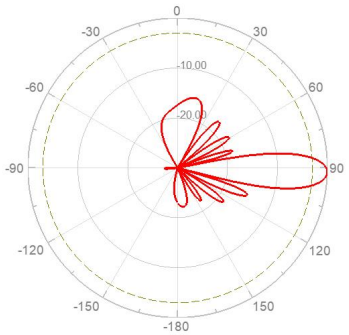
Horizontal Pattern	Vertical Pattern
	

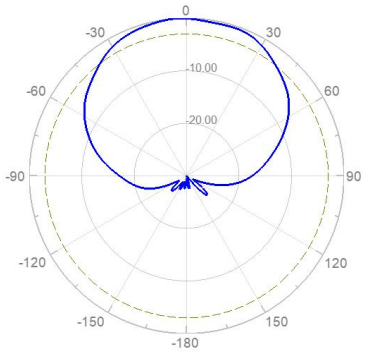
FDD:1695-2690MHz

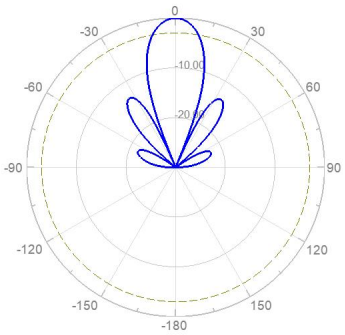
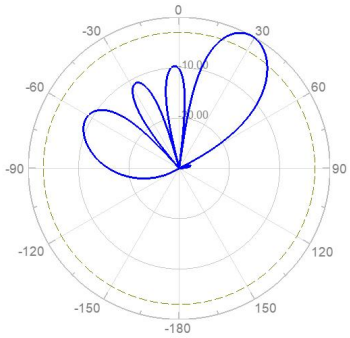
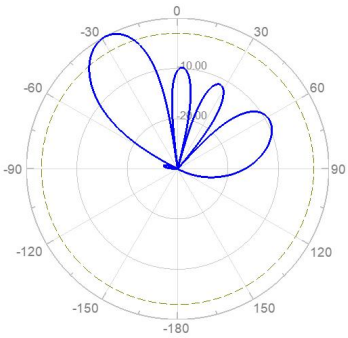
Horizontal Pattern	Vertical Pattern
	

TDD:2300-2690

Single Column Beam

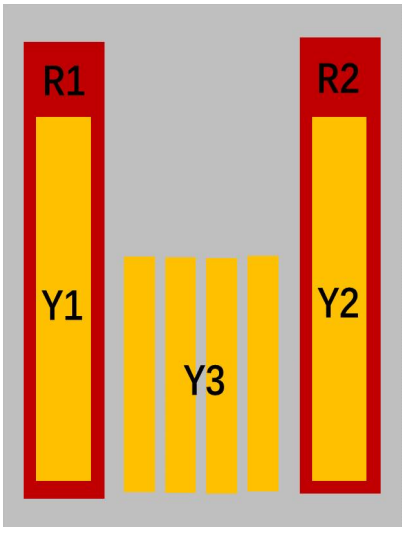
Horizontal Pattern	Vertical Pattern
	

Broadcast Beam


0° Service Beam	+30° Service Beam	-30° Service Beam
		

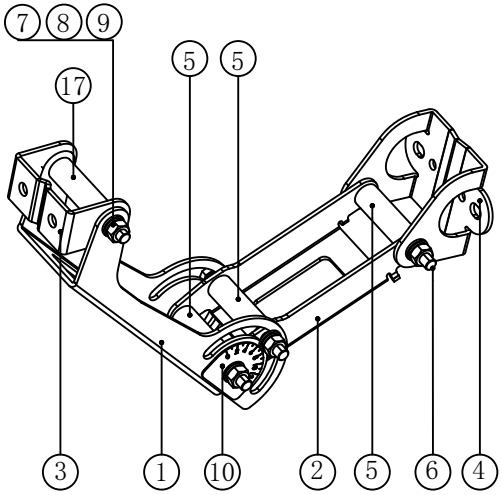
Layout of Array

Array	Frequency(MHz)	RET Serial
R1	690-960	ZTR1...01
R2	690-960	ZTR2...02
Y1	1695-2690	ZTY1...03
Y2	1695-2690	ZTY2...04
Y3	2300-2690	ZTY3...05

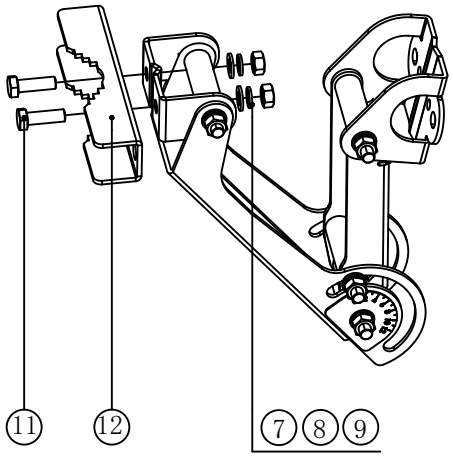


All data are based on NGMN recommendations on Base Station Antenna Standards (BASTA V11.1).

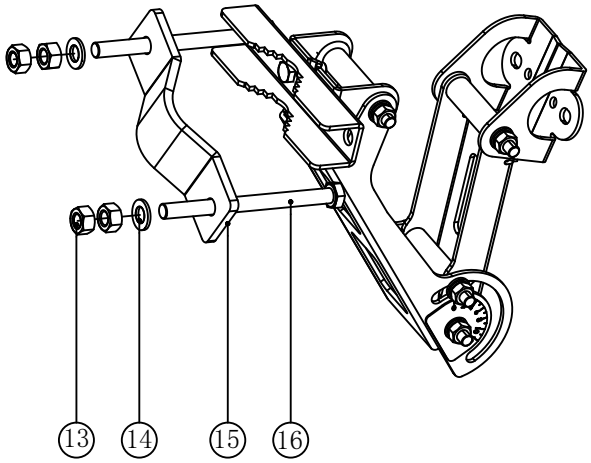
Assemble upper moumting bracket



Step 1



Step 2



Step 3

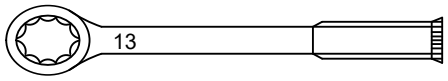
Step 1: Identify downtilt kit,assemble mounting base A③ on long arm① side and fastening it with M8 hex bolts(18N · m)；

Step 2: Assemble U-clamp⑫ on mounting base A③ and fastening it with M8 hex bolts(18N · m)；

Step 3: Attach pipe clamp⑮ to the U-clamp⑫ in step 2 with M10 bolts;

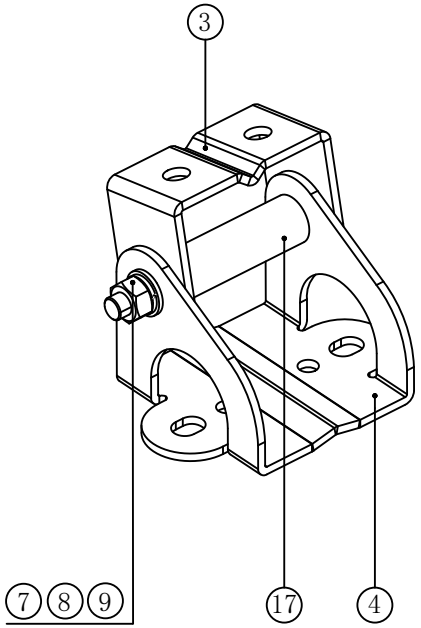
Installation tools:

Torque wrench(13#)*2

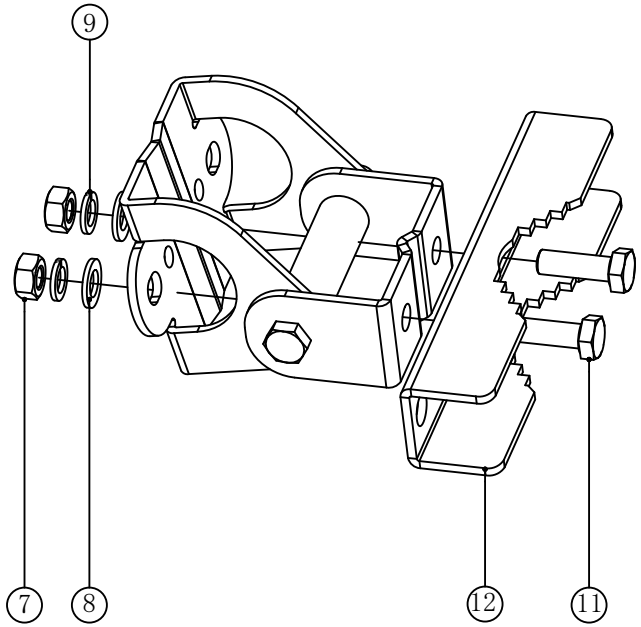


Packing list			
Assembly	QTY	NO.	Part
Downtilt kit	1	1	Long arm*1
		2	Short arm*1
		3	Mounting base A*1
		4	Mounting base B*1
		5	Short supporting tube*3
		6	Hex bolt (M8x85)*4
		7	Nut(M8)*4
		8	Plain washer (D8)*4
		9	Spring washer (D8)*4
		10	Angle label*1
		17	Long supporting tube*2
Mounting base assembly	1	3	Mounting base A*1
		4	Mounting base B*1
		7	Nut(M8)*1
		8	Plain washer (D8)*1
		9	Spring washer (D8)*1
		17	Long supporting tube*1
Clamp	2	12	U-clamp*1
		15	Pipe clamp*1

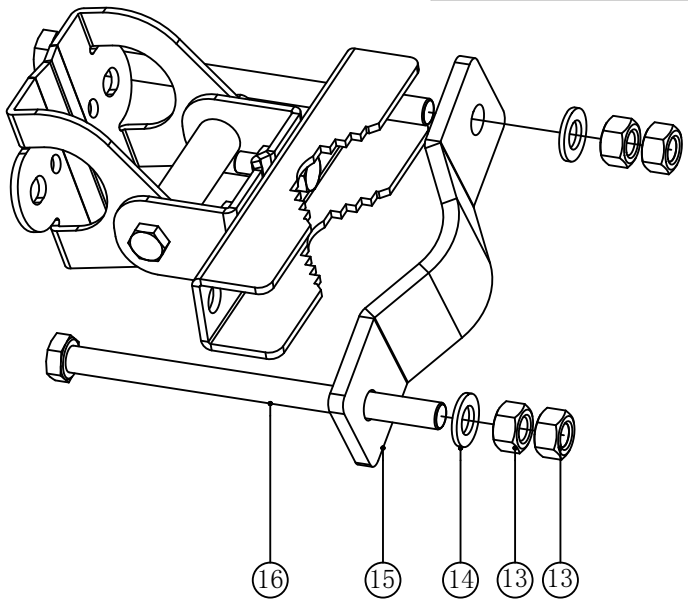
Assemble lower moumting bracket



Step 4



Step 5



Step 6

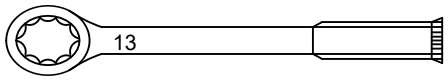
Step 4: Identify mounting base assembly,assemble mounting base A③ to B④ and fastening it with M8 hex bolts(18N · m)；

Step 5: Assemble U-clamp⑫ on mounting base A③ and fastening it with M8 hex bolts(18N · m)；

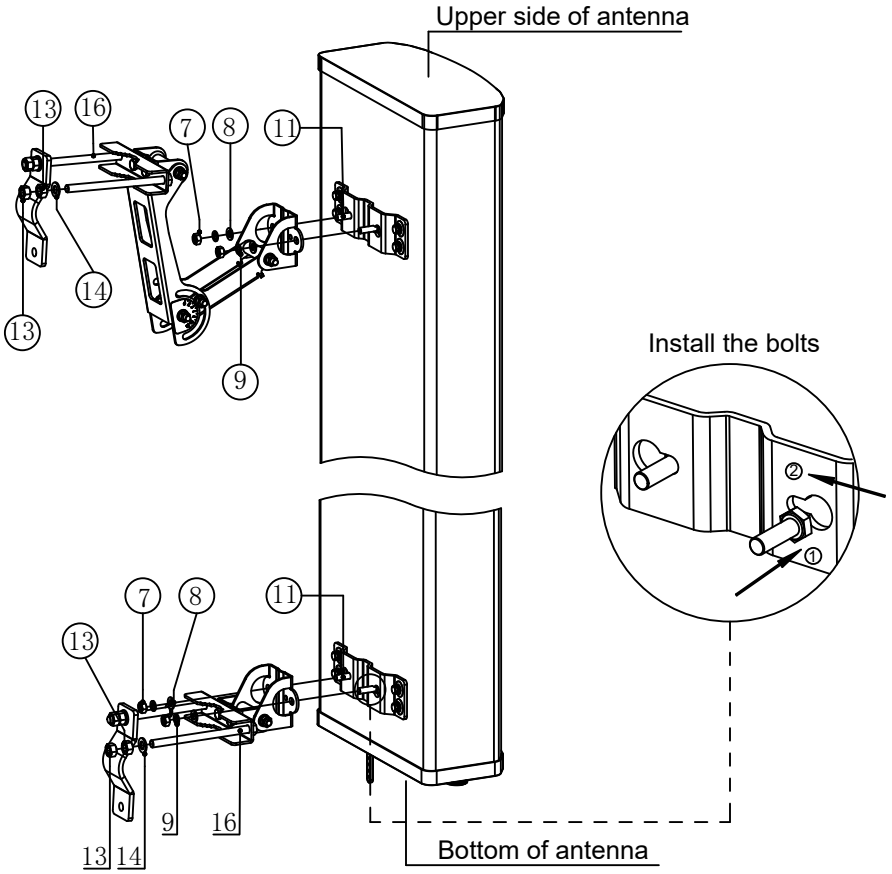
Step 6: Attach pipe clamp⑮ to the U-clamp⑫ in step 5 with M10 bolts;

Installation tools:

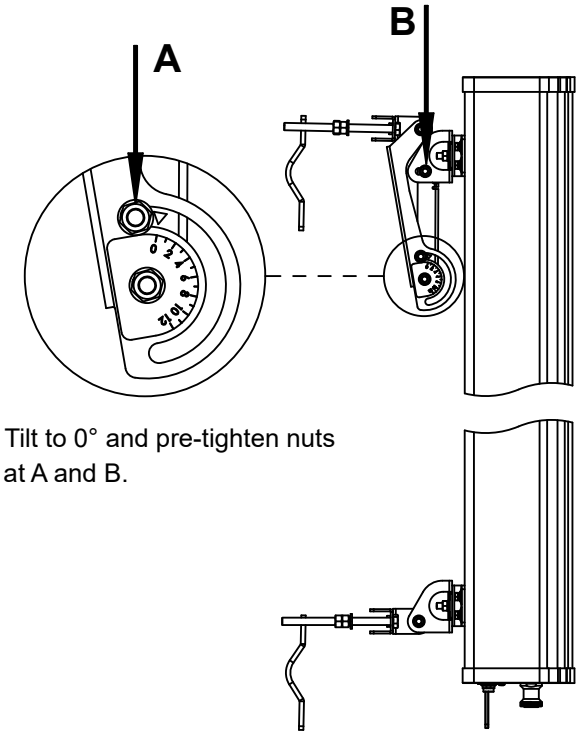
Torque wrench(13#)*2



Packing list			
Assembly	QTY	NO.	Part
Hex bolt(M10x150) assembly	4	16	Hex bolt(M10x150)*1
		14	Plain washer (D10)*1
		13	Nut(M10)*2
Hex bolt(M8x25) assembly	4	7	Nut(M8)*1
		8	Plain washer (D8)*1
		9	Spring washer (D8)*1
		11	Hex bolt(M8x25)*1



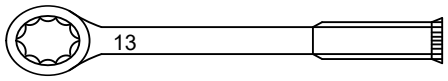
Step 7



Step 8

Installation tools:

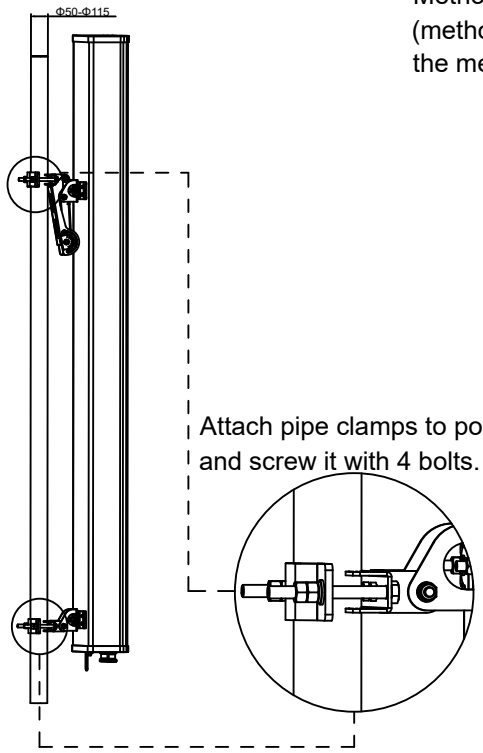
Torque wrench(13#)*2



Step 7: Attach upper mounting bracket and lower mounting bracket to antenna, fastening them with M8 hex bolts(18N·m);

Step 8: Tilt to 0° and pre-tighten nuts(M8) at A and B;

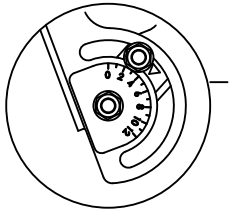
Install antenna to the pole



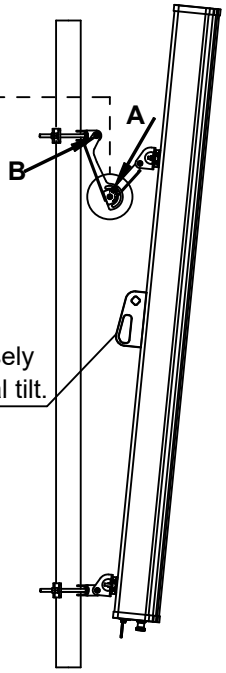
Attach pipe clamps to pole and screw it with 4 bolts.

Step 9

Method 1: Using a scal plate.
(method 1 is used to roughly adjust the mechanical tilt.)

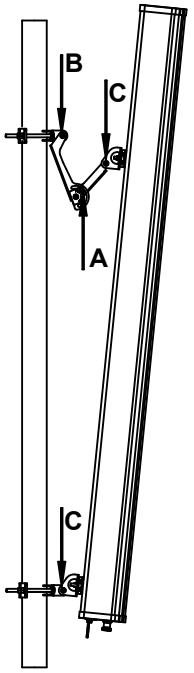


Loose nuts at A and B,
adjust downtilt to required angle.



Method 2: Using an inclinometer to precisely adjust the mechanical tilt.

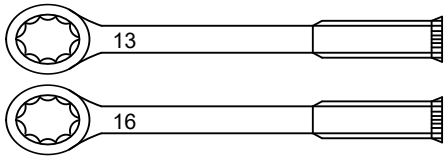
Step 10



Step 11

Installation tools:

Torque wrench(13#/16#)*2



Slope measuring instrument*1

Step 9: Attach mounting brackets to pole vertically and tighten M10 nuts(47N·m);

Step 10: Loosen M8 nuts at A and B,adjust downtilt to required angle;

Step 11: Tighten all M8 nuts at A 、B、C(18N·m).

Installation notes:
Check each package against packing list;
Observe safe working at heights;
Ensure lightning protection is applied;
Annual maintenance is recommended to antenna system.

Mechanical Downtilt Range

Mounting bracket	L(mm)	Downtilt range
00-ZJ23(12)	1450	0~12°
00-ZJ23(16)	1088	0~16°
00-ZJ23(20)	900	0~20°