
User's Manual

**Small Wind Pole with 35T
Mechanical Device**

Contents

1. Preface.....	2
2. Safety Regulation	3
3. Bill of Materials	4
4. Assembly and Installation	5
5. Equipment Datasheet.....	14
6. Appendix.....	15

1. Preface







2

- 1.1. This manual includes the instruction of use and maintenance for 35T Mechanical Device and also the installation of corresponding wind pole
- 1.2. Users are required to read this manual carefully before installation.
- 1.3. This manual covers the primary procedures and key points for the assembly and installation.
Please contact Valmont/ARE or appointed agents for further support.

2. Safety Regulation

- 2.1. Worm screw mechanical jacking device should be operated by personnel with adequate training or knowledge. People are not allowed to touch or change the wiring of power circuit in the control box without the permission of manufacturer.
- 2.2. Operators must wear a helmet or have adequate safety protection measures during the stage of installation.
- 2.3. It is forbidden to run the mechanical device during the heavy raining, thundering or lightning days. Maximum allowable wind speed for installation or maintenance is 8m/s.
- 2.4. Operators should stay at least two meters away from the pole when running the mechanical jacking device. People or unrelated objects are forbidden to stay underneath the pole.
- 2.5. Operators must observe the working status of the entire mechanical jacking system carefully and make sure that the motor is running smoothly by checking the motor shaft.
- 2.6. Make sure to remove all the bolts between the two flanges in the hinge area before lowering the pole.
- 2.7. Make sure that the pivot axes are well fixed before the operation of Mechanical Device.
- 2.8. Make sure anything unrelated not hanging on the pole shaft before the operation of Mechanical Device.
- 2.9. Make sure that the wind turbine is installed completely before the operation of Mechanical Device.
- 2.10. Make sure that nuts are tightened after pole shaft is installed completely.
- 2.11. Make sure that all the bolts installed in the flange of the bottom A & B section of the pole with nuts above the flange.
- 2.12. The screw shaft and the worm wheel of the mechanical device should be inspected and its grease should be injected once a year or every 10 running cycles and all the leftover grease should be replaced when the mechanical jacking device is running up to 50 cycles or less than 50 cycles but more than 10 years. The recommended brand of grease is OMEGA 77 or Mobile Mobilux EP#1.
- 2.13. Replace the dust cover when damaged.
- 2.14. Ambient temperature requirement: $-20^{\circ}\text{C} \sim +50^{\circ}\text{C}$

3. Bill of Materials ^{note 1}

Item No.	Description	Detail Items	Qty	Notes
#1	Base Section (Note 2)	Tower Section A	1	
		Tower Section B	1	
		Hinge link	1	
#2	Other Sections	Tower Other Sections		
#3	Worm Screw Mechanical Jacking Device ("Mechanical Device" for short)	Worm Screw (Note 3)	1	
		Worm Support (Note 3)	1	
		Motor	1	
		Control Box	1	
		Pivot Axes	2	To Fix Worm Screw
#4	Anchor Base for Mechanical Device		1	

Note 1: The BOM listed include only the main parts of the tower.




Note 2: Section A, B and Hinge plate have been preassembled together before shipment.




Note 3: The worm screw and worm support have been preassembled together before shipment.




4. Assembly and Installation

4.1. Preparation

4.1.1. Tools:

Adjustable Spanner		Adjustable Spanner		Shackle	
Type: 12"	Quantity:2	Type: 18"	Quantity:2	See Note 4	Quantity:4
					

Crane		Pliers		Electrician Equipment	
See Note 4	Quantity:1	Quantity:2		Quantity: 1 set	
					

Lifting belt		Chain Block		Alloy Aluminum Ladder	
Type: 5t	Quantity:2	See Note 4	Quantity:2	2.5m high	Quantity:2
					

Note 4: The type of shackle and chain block should follow the slip force, which listed in appendix 1 in the end.

Note 5: Crane with at least 8T capacity is recommended, however the crane should be determined by crane supplier and Valmont pole weights and also the site conditions.

- 4.1.2. Make sure all the components are complete and ready.
- 4.1.2.1 Make sure that foundation is well prepared and anchor nuts are leveled.
- 4.1.2.2 Before installing the tower, Concrete foundations should be finished according to at least 28 days maintenance period or the guidance of foundation design engineer.
- 4.1.2.3 The projection anchor bolts above ground should follow Valmont anchor bolt cage drawings.
- 4.1.2.4 The anchor bolts must be in vertical position.
- 4.1.2.5 Make sure there is enough space around the foundation for tower lifting and lowering.
- 4.1.3. Make sure the power's Voltage and Frequency is the same as which showed in the control box.

4.2. Primary assembly and Installation Procedures

4.2.1. Assemble the sections except base section on the ground

- a) Align all sections, excluding the bottom two (A & B), on the ground and support with wood blocks (See Figure 1). Soapy water is recommended to use for smoothly slip jointing when there are difficulties.



Figure 1 Align all sections



Figure 2 Exert slip force

- b) Two chain blocks on opposite sides of the pole tube could be used to provide slip force (See Figure 2).
- c) There are two methods to fix two poles sections by using chain blocks
- Option 1 – T-type Jacking Plates with M24 bolts (See Figure 3).

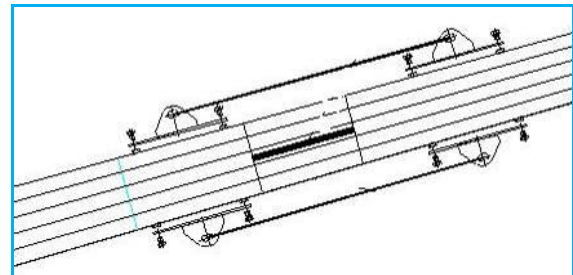


Figure 3 Use T-type Jacking Plates

- Option2 – Use lifting belts (See Figure 4).



Figure 4 Use lifting belts

- 4.2.2. Install the base section to the foundation. (See Figure 5 and Figure 6).



Figure 5 Lift the base section



Figure 6 fix the base section

Note:

- The bottom two sections have been fix together by 2-3 bolts before shipment.
- The base plate shall be set in the right direction to ensure the mechanical jacking device installed smoothly.

4.2.3. Install the anchor base for mechanical device onto the separate foundation using the nuts tightly (See Figure 7).

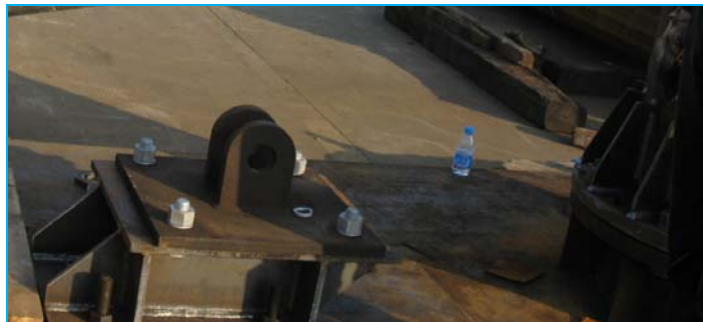


Figure 7 Install the anchor base

4.2.4. Install the motor onto worm screw and fix it with bolts (See Figure 8).



Figure 8 Install the motor

4.2.5. Lift the mechanical device and fix it on the anchor base by pivot axes (See Figure 9).



Figure 9 Lift the worm screw

4.2.6. Lift the Mechanical Device with crane and fasten it to the base section with chain block and lifting belts.



Figure 10 Lift the Mechanical Device

4.2.7. Connect the power control box to power resource and motor, and make sure all the components are well connected. (see Figure 11 to Figure 15).



Figure 11 Power plug



Figure 12 Control box



Figure 13 Aviation plug

- a) Get the power resource ready and make sure the power's Voltage and Frequency is the same as which showed in the control box.



Figure 14 Control box

- b) Test the connection
- 1) Press the “ON” button of the Motor Starter;
 - 2) Turn the Drum Switch to “UP” to start the motor;
 - 3) Check the motor running normally;
 - 4) Turn the Drum Switch to “0” and turn off the Motor Starter.



Figure 15 Control box interior

4.2.8. Remove all the bolts between section A and section B. (See Figure 16).



Figure 16 Remove the bolts

4.2.9. Rotated section B to horizontal position by crane.

11



Figure 17 Rotate section B to horizontal position

4.2.10. Fix the top of Mechanical Device to section B with pivot axes.

Attention: Keep section B on horizontal position by crane, lift the top of the Mechanical Device by chain block and fix it to section B. If the Worm Screw can't reach the bracket on section B, run Mechanical Device to adjust the length of Worm Screw or adjust the height of section B by crane.



Figure 17 Fix the top of Mechanical Jacking Device to section B

4.2.11. Lift other sections which have been assembled together and joint it to section B by crane.



Figure 18 Joint other sections to section B

4.2.12. Secure the section B and other sections tightly using by the same way as 4.2.1.



Figure 19 Secure the section B and other sections tightly

4.2.13. Install wind turbine and the wire

4.2.14. Raising the pole

Attention:

- a) Make sure that the pivot axes are well fixed before the operation of Mechanical Device.
- b) Make sure anything unrelated not hanging on the pole shaft before the operation of Mechanical Device.
- c) Make sure that the wind turbine is installed completely before the operation of Mechanical Device.

- 1) Get the power resource ready, See 4.2.7 for the details
- 2) Press the “ON” button of the Motor Starter
- 3) Turn the Drum Switch to “UP” to rise the pole.

Attention: Operators must observe the rising status of the entire mechanical device carefully; Make sure the motor is running smoothly by checking the motor shaft; Make sure nothing special happens like abnormal noises, the motor stops running. Stop the motor immediately when anything special happens. Don't start the motor until the problem solved.

- 4) Keep running the Mechanical Device, until the pole sit on the flange smoothly in the vertical position. Make sure the motor is stopped when the two flanges are in the right position.



Figure 20 Raising the pole

- 5) Fasten all the bolts between section B to section A, make sure they are well tightened and with nuts above the flange. (See in Figure 21).



Figure 20 Fix section B to the section A using all bolt

5. Equipment Datasheet

Motor

Nominal rated Voltage: 120V, 240V (single phase)

Nominal Frequency: 60HZ, 50HZ

Nominal rated Power: 1.5 KW

Rotational speed: 60 r/min, 50r/min

Driving ratio: 30

Output moment: 61 N·M

Type: NF40150301

Worm screw mechanism

Type:

Maximum lifting capacity: 35T

Driving ratio: 32

6. Appendix

Slip force of the sections

Interior flat-flat diameter of the female section (mm)	Slip force (KN)
	Average load of the two pulleys
《300	20
300-500	30
500-700	40
700-900	50
900-1200	60
1200-1400	80
1400-1600	100
1600-1800	120
1800-2000	150
》2000	200

Note: Use one assembly chain and pulley on both side of the slip pole section and connect the pulleys with the jacking nuts on the poles or belts and operate the slip force by the pulleys.