

## **INDUSTRIAL CEILING FAN**

### **OPERATION INSTRUCTIONS**

For after-sales service:

Berton's Place #46 Sta. Rosa Street Barangay Manresa Quezon City, Philippines.  
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Before operating this series unit, please read this manual carefully.

## Cautions

1. Do not throw anything and jump under the ceiling fan. Users with lower ceiling should pay more attention.
2. Do not allow to hold up any objects under the rotating ceiling fan to prevent them from contacting the ceiling fan and causing mechanical injury.
3. Please switch on until the converter frequency to be more than 4Hz to get the ceiling fan started.
4. When turning off the ceiling fan, do not cut off the power directly. If there is a sudden overload of protection, turn the knob switch to "RESET" and then restart.
5. Please cut off the power and send the fan to qualified technician for checking if the running fan emit unusual noise, smoke or machine blade can not run after power supply.
6. Except for the scope of maintenance permitted in this specification, non-professional personnel shall not disassemble, repair or modify the fan on their own, and all disassembly, repair or modification personnel must hold an electrician's certificate and an aerial work certificate to operate
7. Turn off the ceiling fan immediately when running with strong wind to avoid danger or accident.

## Maintenances

1. Regularly check running state of ceiling fan and check if the fan runs abnormally or emit abnormal noise.
2. Regularly check working status of the control box whether there is failure.
3. Check whether the blade is horizontal or shaking.
4. Check whether the fastening bolts are loose.
5. Check the building structure where ceiling fans are installed.
6. Check the tension of protective rope.
7. Check if power wire is damage.
8. The fan must be cleaned periodically to keep clean and attractive.
9. When cleaning fan, the power supply should be cut off first. Arrange professional aerial workers with soft sweep, soft cloth or a little cleaning liquid wipe (do not use gasoline or other corrosive liquid such as paint parts) to clean and dry with cloth.
10. Be careful not to let water flow into the motor or contact other electrical components with water when cleaning; Do not collide with the blade or change the angle of the blade.
11. Please open the two dust covers at the bottom of the electric box regularly every month to clean the dust in the dust cotton to ensure the ventilation of the electric box and heat dissipation.

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## Features and Uses

1. The rare earth NdFeB permanent magnet rotor motor directly drives the fan blades without gear box and long-term maintenance-free.
2. The blade is designed with high lift-resistance ratio aviation airfoil without electrostatic aviation composite
3. The installation hanger adopts double universal structure and automatically adjusts the perpendicularity.
4. Suitable for large logistics warehouses and distribution centers, large workshops, public buildings, large farms, stations, stadiums etc. for ventilation and improving environment.

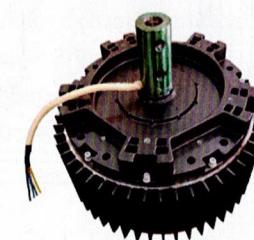
## Operating Instructions

1. Please refer to the installation and operation specification before installation. Before installation, check the spare parts detailedly to prevent bumping or damage during transportation.
2. The voltage and frequency should be the same as the motor label fixed. Don't use it in corrosive and other wet environment.
3. Turn the knob switch to RUN and the ceiling fan starts to run.
4. Rotate the speed control knob to adjust the air volume without magnitude.
5. Turn the knob switch to STOP and the fan stops.

## Product Advantage

1. Permanent magnet synchronous external rotor motor

Features: high efficiency and energy saving (Level I energy efficiency which reaches 84.5%), small volume and light weight; Motor IP65 structure, waterproof and dustproof.

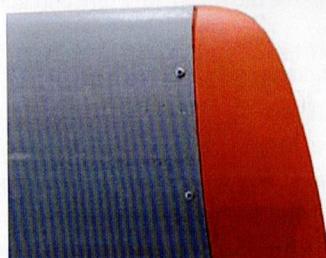


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## 2、Blade

Features: aviation polymer composite material (helicopter wing material) with high strength, light weight, impact resistance, anti-aging with long service life, large air volume, high pressure, uniform air volume, high efficiency and energy saving.

Patent designed wingtip guide plate to reduce vortex and effectively reduce.



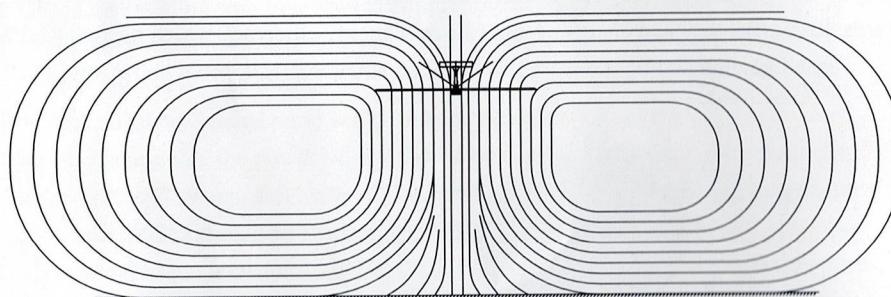
## 3、Product performance

Omnidirectional natural wind covers super large area.

Soft, comfortable and cool wind makes people feel temperature drop scale from 4°C ~ to 8°C .

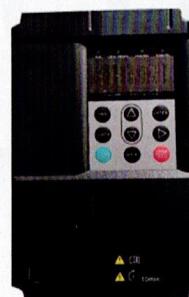
Using together with central air-conditioner, effect of this fan will be much better. High efficiency and energy saving are achieved.

Omnidirectional natural wind



## 4、Customized special frequency converter

Developed in cooperation with professional manufacturer of frequency converter, with over-current protection, over-voltage / under-voltage protection, overload protection, and effective matching with fans. Start, accelerate, decelerate, stop softly without impact, it can effectively reduce vibration and noise.



## 5、11 major safety protection designs.

Features:

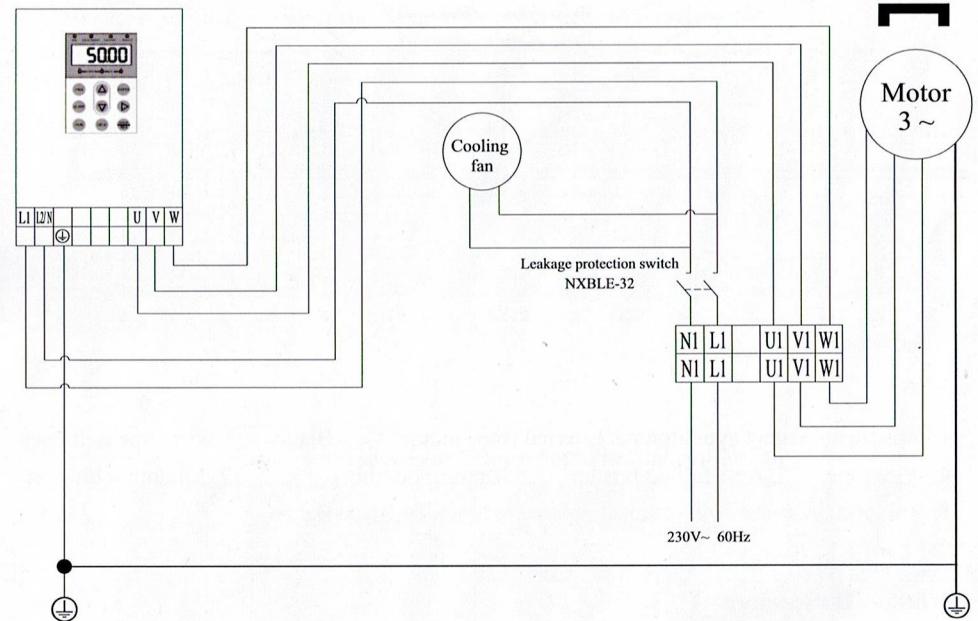
1. Steel beam locking safety structure protection.
2. Hanger safety steel cable protection.
3. Motor shaft safety bracket protection.
4. Step lock safety design inside the motor.
5. Permanent magnet self-locking safety protection.
6. The blade is made of non-metal polymer composite material, which is impact resistant and not easy to break.
7. Reinforced blade mounting bracket.
8. Blade safety link mechanism protection.
9. Control system overload protection.
10. Grade 12.9 high strength fasteners.
11. Anti-loosening washer and thread anti-loosening glue achieve at double protection.



6. Multiple patents, with CE and CB certification.

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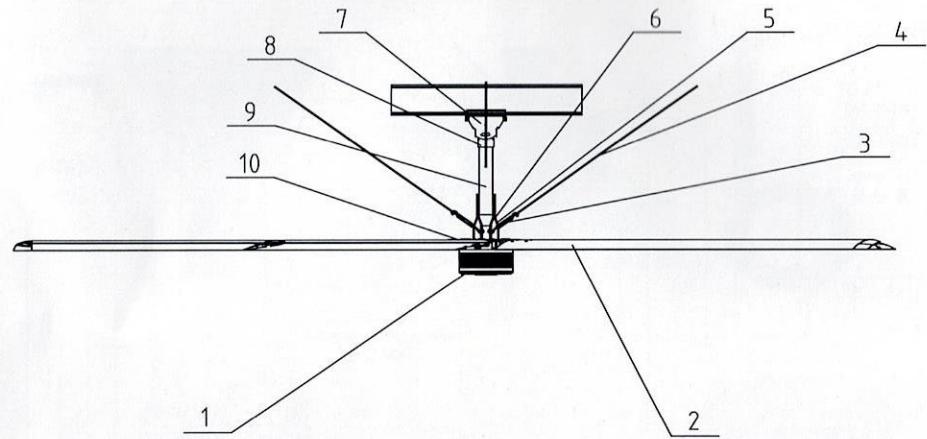
### Wiring Drawing



### Specification

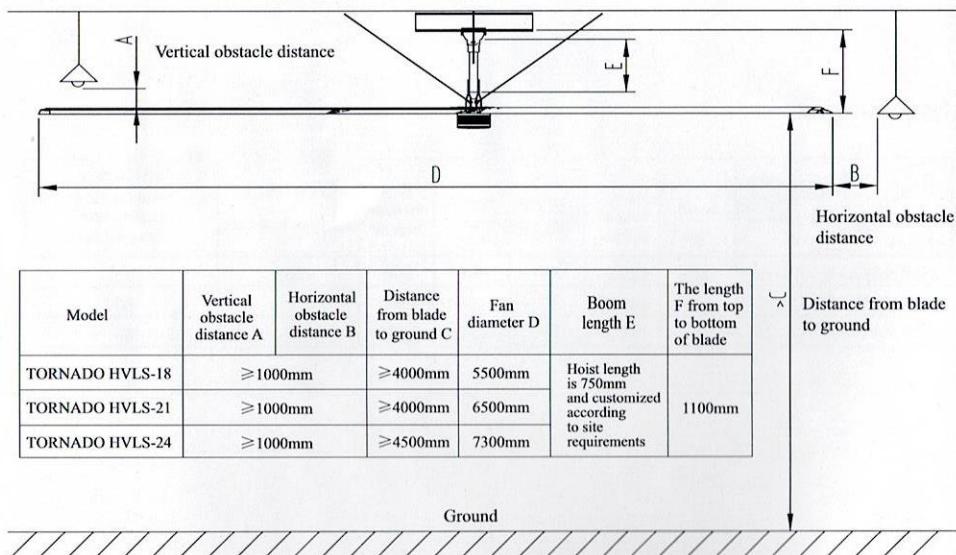
Model	Item Parameter	Speed rpm	Air volume m³/min	Noise dB(A)	Power W	Wind coverage area m²	Best Use Area m² Wind speed ≥1m/s	FAN BODY (Motor+Blade+Connecting square tube) weight (Kg)
TORNADO HVLS-18		80	12000	39	850	800	450	75
TORNADO HVLS-21		66	14900	39	1100	1100	650	80
TORNADO HVLS-24		56	17800	39	1250	1375	840	85

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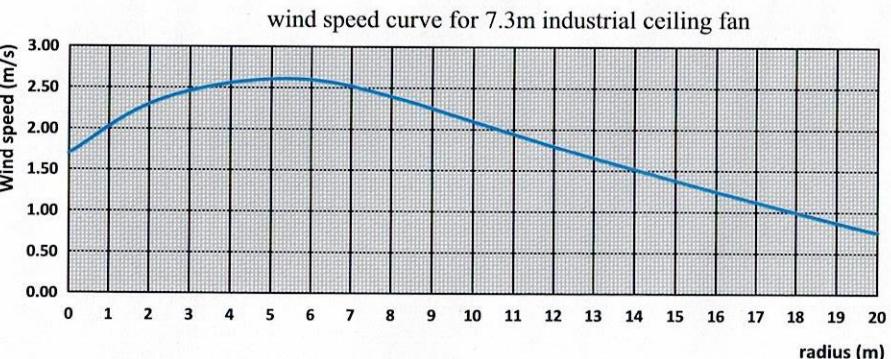
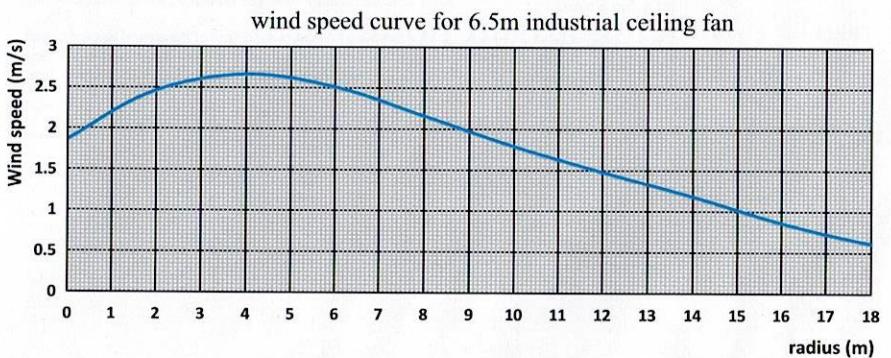
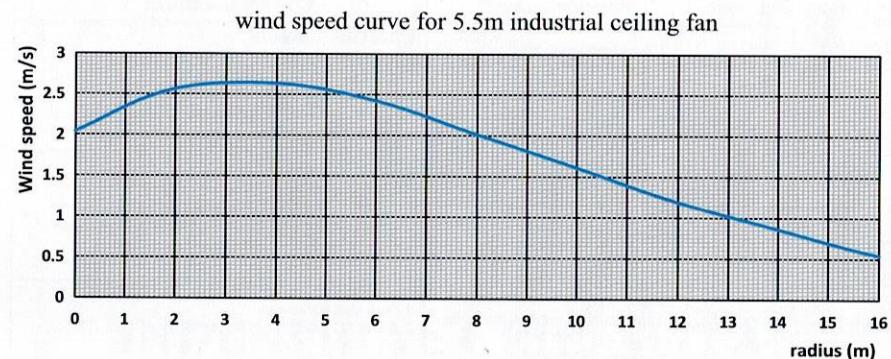
1. Permanent magnet synchronous external rotor motor    2. Blade  
 4. Wire rope    5. Anti-falling bracket    6. Motor mounting parts  
 8. Universal suspender    9. Connecting square tube    10. Blade flange

#### Product Dimensions



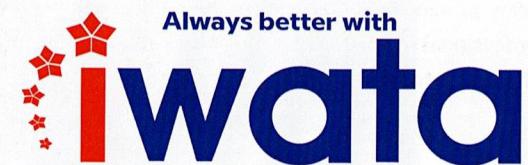
Model	Vertical obstacle distance A	Horizontal obstacle distance B	Distance from blade to ground C	Fan diameter D	Boom length E	The length F from top to bottom of blade
TORNADO HVLS-18	≥1000mm	≥4000mm	5500mm			Hoist length is 750mm and customized according to site requirements
TORNADO HVLS-21	≥1000mm	≥4000mm	6500mm			
TORNADO HVLS-24	≥1000mm	≥4500mm	7300mm			1100mm

#### Wind speed curve for optimal use area



## Fault and Diagnosis

Common fault code	Possible cause	Countermeasures
ERR02	E02.00	1.The parameters are not tuned; 2.There is grounding or short circuit in inverter output circuit (U,V,W terminals).
ERR03	E03.00	
ERR04	E04.00	
ERR05	E05.00	
ERR06	E06.00	1. Input voltage too high; 2. External force imposes on the motor during acceleration.
ERR07	E07.00	1.Adjust the voltage to its normal range; 2.Tune the motor parameters; check the blade flange and anti-falling bracket for friction and see whether the other objects fall into the motor to stop motor operation.
ERR09	E09.00	1.Instant blackout or to disconnect the power switch before stopping the fan; 2.Input voltage too low.
ERR14	E14.00	1.Ambient temperature too high; 2.Air duct blocked; 3.Fan damaged; 4.The internal module of the inverter is damaged.
		1.Check whether the ambient temperature is too high.The ambient temperature range of inverter is-10°C~40°C. If the ambient temperature is above 40°C and each 5°C increase shall decrease by 10%. The maximum ambient temperature is 55°C. 2.Whether the dust proof cotton of the control box is blocked. 3.Whether the cooling fan on the side of the control box stops turning, and whether the cooling fan inside the inverter stops turning. 4.Seek technical support.



## INDUSTRIAL CEILING FAN

### Installation Instructions

Before operating this series unit, please read this manual carefully.

1.Determined installation scheme.

1) Wear labor safety protection equipment (safety helmet, safety belt for high-altitude operation and professional insulating shoes). The installation personnel must have the qualification of high-altitude operation and electrician certificate.



2) Estimate that the structure has sufficient bearing strength and can be installed safely and firmly. Measure the installation height and evaluate the safety distance (more than 500mm) between the blades and building and lamps after the installation.



3) Determine the installation position of the control box, evaluate the safety of the high-altitude wiring passing through, and measure the total wiring length.

4) Isolate the installation area.



2.Ground auxiliary work

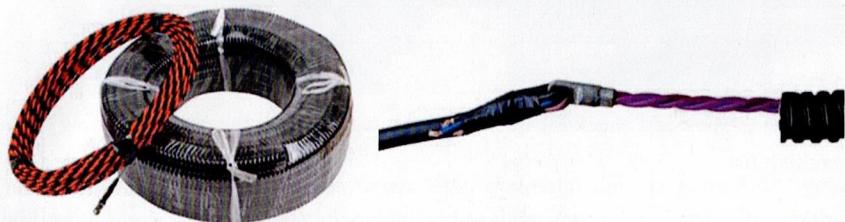
1) Open the box and check the quantity and integrity of all the parts according to the packing list.



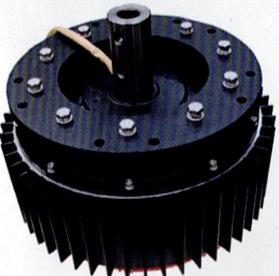
2) Prepare the tools required for aerial work, and confirm that the equipment is in normal condition.



3) Use threading tools to thread the power cord into the plastic coated metal hose.

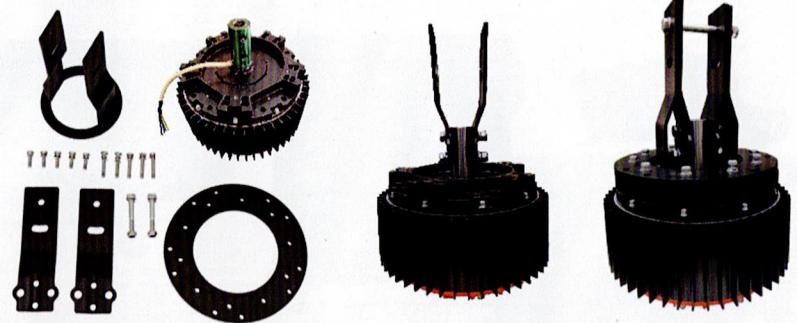


4) Loosen the 10 bolts and remove the blade flange.



Type	Dimensions	Qty
Hex Bolt	M8×30	5
Hex Bolt	M8×50	5
Flat Washer	Φ8	10
Spring washer	Φ8	10

5) Install the motor mounting parts, anti-falling bracket and blade flange (the bolts of the blade flange need not be fully tightened, and reserve the installation clearance).

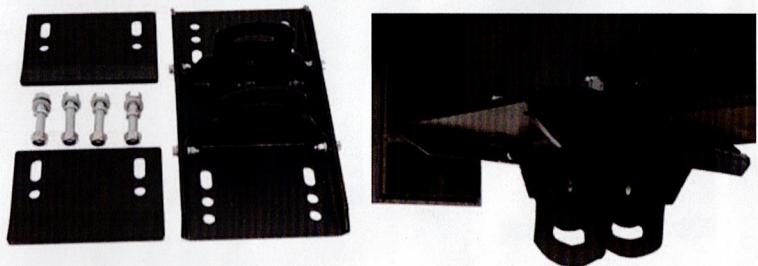


Type	Dimensions	Qty
Hex Bolt	M12×80	2
Hex Bolt	M12×120	1
Hexagon Lock Nut	M12	3
Flat Washer	Φ12	6
Spring washer	Φ12	3

### 3. Installation of lifting bracket group

#### 1) Installation of mounting bracket

##### 1.1) Steel Beam Structure



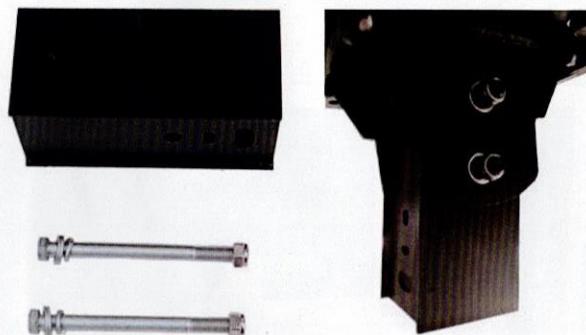
Type	Dimensions	Qty
Hex Bolt	M12×65	4
Hexagon Lock Nut	M12	4
Flat Washer	Φ12	8
Spring washer	Φ12	4

1.2) Cement Beam Structure



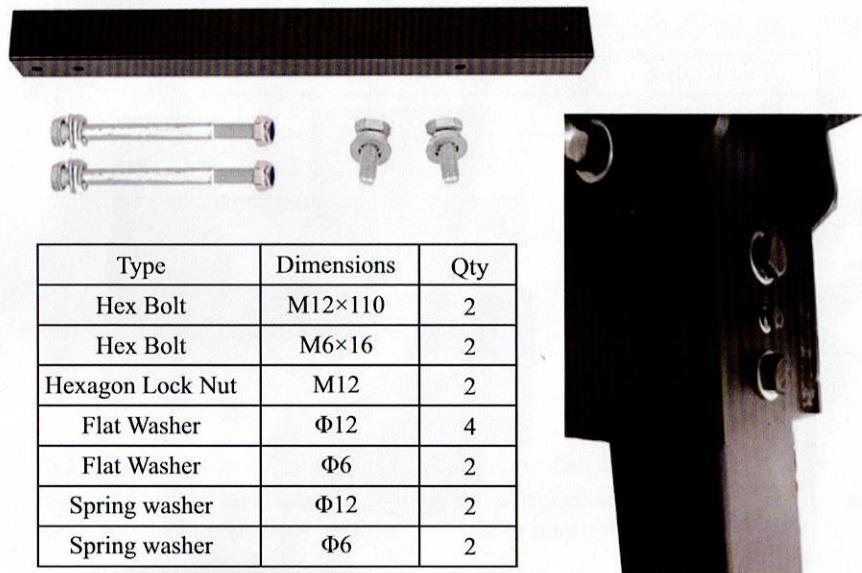
Type	Dimensions	Qty
Hex Bolt	M14×65	4
Hexagon Lock Nut	M14	4
Flat Washer	Φ14	8
Spring washer	Φ14	4
Expansion bolt	M12×100	10

2) Installation of universal suspender.



Type	Dimensions	Qty
Hex Bolt	M12×140	2
Hexagon Lock Nut	M12	2
Flat Washer	Φ12	4
Spring washer	Φ12	2

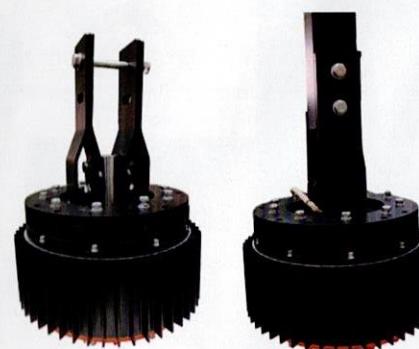
3) Installation of connecting square tube.



Type	Dimensions	Qty
Hex Bolt	M12×110	2
Hex Bolt	M6×16	2
Hexagon Lock Nut	M12	2
Flat Washer	Φ12	4
Flat Washer	Φ6	2
Spring washer	Φ12	2
Spring washer	Φ6	2

4. Installation of motor

1) Place the motor with installed components on the lifting operation platform, and use the platform to lift the motor to the lower part of the connecting square tube, or use other safe methods to align the installation holes of the motor mounting parts and anti-falling bracket with that of the connecting square tubes, and fix them through the bolts and lock nuts.

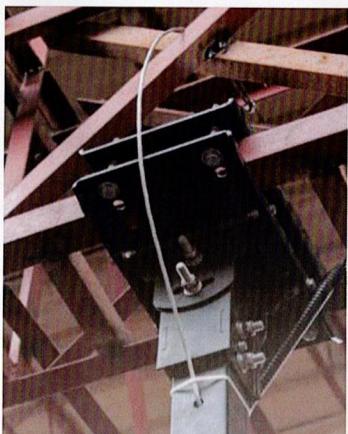


Type	Dimensions	Qty
Hex Bolt	M12×120	2
Hexagon Lock Nut	M12	2
Flat Washer	Φ12	4
Spring washer	Φ12	2

2) Adjust the verticality connection of square tube and meet the horizontality of motor, and tighten all bolts and lock nuts.



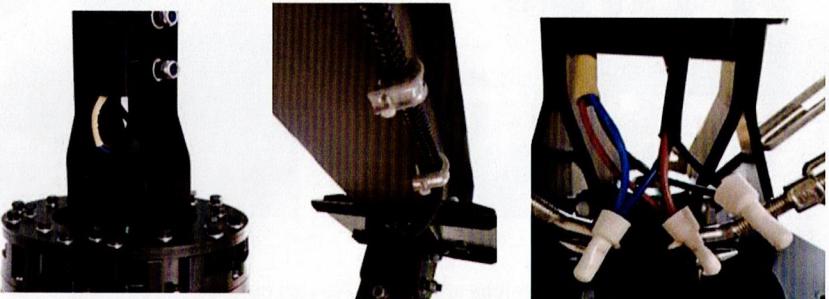
3) According to the installation structure, cut a suitable length of protective wire rope on the ground, pass the protective wire rope through the connecting square tube, and circle it with moderate tension, and lock the two ends of the wire rope with wire rope rolling head.



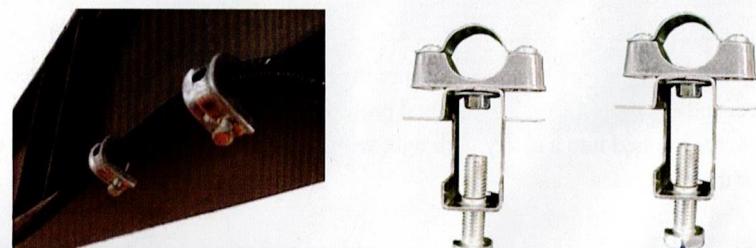
Type	Dimensions	Qty
Wire rope rolling head	M6	2

#### 5. Wiring and installation of control box

1) Starting from the installation bracket, fix the power cord by clip, reserve enough length for the exposed power cord, pass through the universal suspender and connecting square tube, and connect the motor outlet line with closed-circuit terminal.



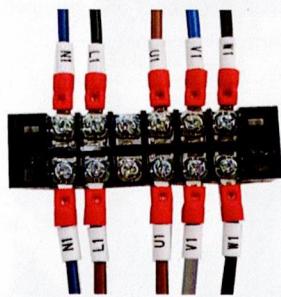
2) Fix the power cord at the firm place. Two clips shall be used at the beginning, and one clip shall be used for the others. The clip shall not be pried by hand without tools, and the interval between them shall not be longer than 1.5 m.



3) The control box shall be installed at the position convenient for operation and firmly installed, and must meet the requirements of safe electricity use.



4) All power cords are connected according to the corresponding electronic wire color.  
All wiring requirements are safe and firm.

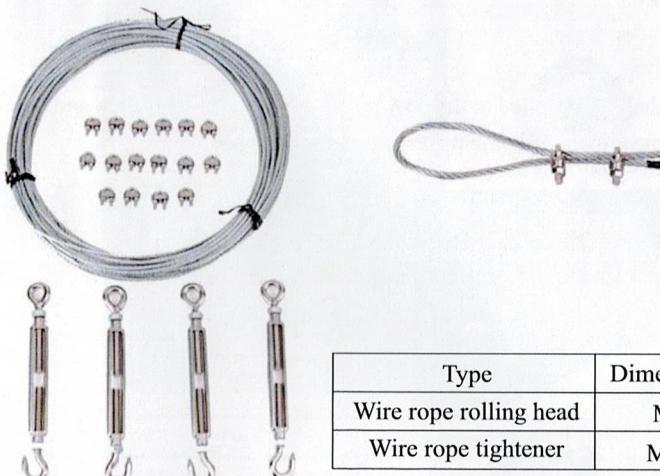


#### 6.No-load operation of the motor

- 1) After checking that all the connections are correct, switch on the control box and check the parameter settings of the frequency converter.
- 2) Switch on the motor, check if it is running normally and no abnormal noise.
- 3) After passing the no-load operation testing, turn off the power and hang the "No switching on" sign at the obvious position of the control box.

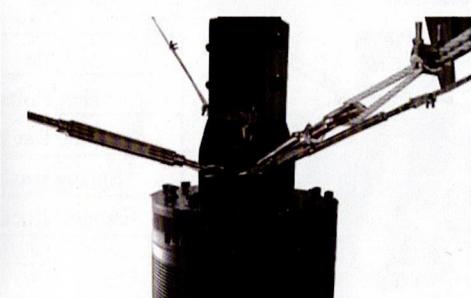
#### 7. Installation of protective wire rope

- 1) According to the installation structure, measure the length of the cable-stayed protective wire rope rope, and cut four pieces cable-stayed protective wire ropes. One end of the protective wire rope is tied into a safety lock with wire rope rolling head, and the other end is reserved for the pull codes.

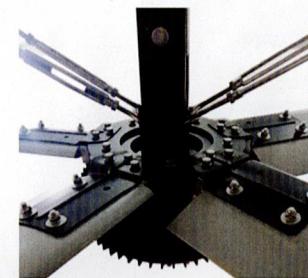


Type	Dimensions	Qty
Wire rope rolling head	M6	16
Wire rope tightener	M10	4

2) Fix the 4 protective rope end with safety lock on the 4 supporting points, and the other end is hooked on the mounting hole of the motor through wire rope tightener.

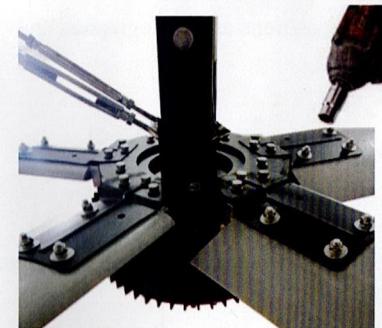


- 3) Keep the motor horizontal by adjusting wire rope tightener.



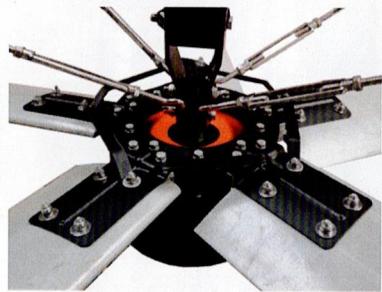
#### 8.Installation of blade and blade holders

- 1) Put blades on the lifting operation platform, raise the blades to the blade installation position and insert the blade mounting bracket into the blade installation position on the motor upper cover. Fixed with bolts, then the left four blades are installed accordingly.



Type	Dimensions	Qty
Hex Bolt	M8×45	10
Hex Bolt	M8×50	5
Flat Washer	Φ8	15
Spring washer	Φ8	15

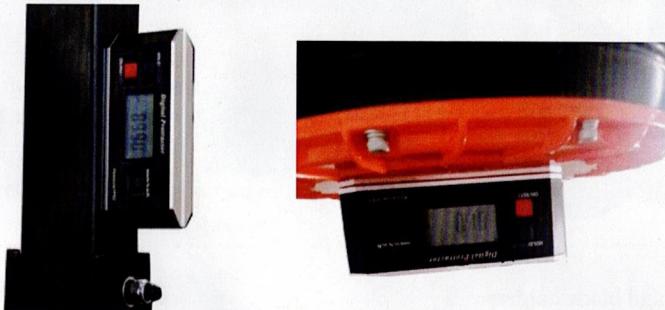
- 2) After installing the blades, tighten all bolts on the motor.
- 3) Install five blade holders on the reserved installation holes of the blade, and fix with bolts and lock-nuts.



Type	Dimensions	Qty
Hex Bolts	M8×50	5
Large side flat washer	Φ8	5
Spring washer	Φ8	5
Hexagon Lock Nut	M8	5

#### 9. Installation completed checking

- 1) Check the square tube verticality and the motor horizontal.



- 2) Lower the lifting operation platform, manually rotate the blade to confirm that the rotation is smooth and no mechanical collision.
- 3) Check all fasteners to confirm that the components are firmly installed. All bolts and lock-nuts are marked, and the bolts and lock-nuts at key positions are photographed and archived.

#### 10. Trial operation

- 1) Switch on the control box, run the industrial ceiling fan, adjust to the highest speed, check the output current of the frequency converter, confirm that the motor is not overloaded and the industrial ceiling fan is operating normally.
- 2) Switch on and power off for three times to confirm if the installed industrial ceiling fan is working normally.