

PERMANENT MAGNET DIRECT DRIVE HVLS CEILING FAN

Enjoy the natural wind



Variable speed



Natural wind



Intelligent control



Energy saving comfort



The technical data and installation dimensions in this manual are for reference only.



I. Safety Precautions

General

Some figures in the Installation Flow Chart are in exploded view in order to explain the installation process. Please operate the product according to this manual.

Danger

Please read this manual carefully before installation.

In order to prevent electric shock:

Nonprofessionals are not allowed to repair, inspect or replace the parts.

Do not carry out wiring work within 1 minute of switching on or of the power, otherwise there will be a risk of electric shock (the capacitor will also have power in a short time of switching of the power). When to replace or move the power supply, please cut of the power and wait for all indicators to be of for 1 minute before operation.

Warning

Use the correct controller according to the product model. Do not use unmatched controller, which may cause damage to the motor or controller.

Please confirm whether the power is connected according to the marks and whether there is any obstacle within the operating range of the product before operation. After operation, please check whether the rotation direction of the product is correct (clockwise as viewed from below).

This product shall not be operated in freezing, corrosive, explosive and severely dusty environment.

Installation

The installation and maintenance must be carried out by professionally trained or experienced personnel with electrician certificates.

Wiring is to be installed as per the requirements of authorities having jurisdiction.

II. Introduction

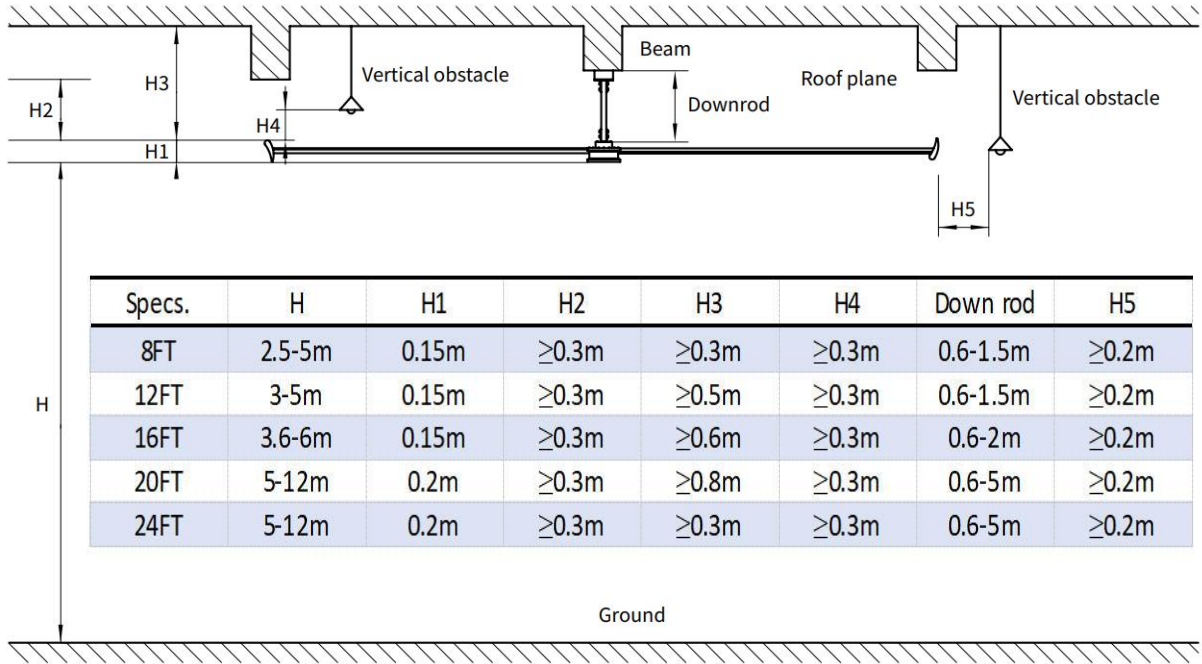
NAP series permanent magnet direct drive HVLS ceiling fan is specially developed to save energy, reduce consumption and create a comfortable work environment. The independently designed permanent magnet motor is featured by small size, light weight, high efficiency, low noise, variable frequency speed regulation, compact structure and beautiful shape. It is a new type of ceiling fan which is widely used in industrial plants, logistics warehouses, waiting rooms, exhibition halls, gyms and supermarkets for ventilation and cooling. The fan can produce a large amount of airflow to the ground to form a certain height of airflow layer for overall air circulation. It is like the natural breeze system and you can intimately experience the natural wind.

III. Technical Parameters

Model	NAP-8	NAP-12	NAP-16	NAP-20	NAP-24
Fan Size (ft)	8	12	16	20	24
Power(kW)	0.37	0.75	0.75	1.1	1.1
Horsepower(HP)	0.5	1	1	1.5	1.5
Voltage(V)	1-Phase 230V/3-Phase 208-230V/3-Phase 460V				
Frequency (Hz)	50/60				
Air Volume(m ³ /min)	4000	5000	10000	11500	13000
Speed(RPM)	120	100	80	65	50
Blade number	5	5	5	6	6
Noise(dB)	38	38	38	38	38
Effective area(m ²)	150	230	300	600	700
Cover area(m ²)	250	380	500	1000	1500

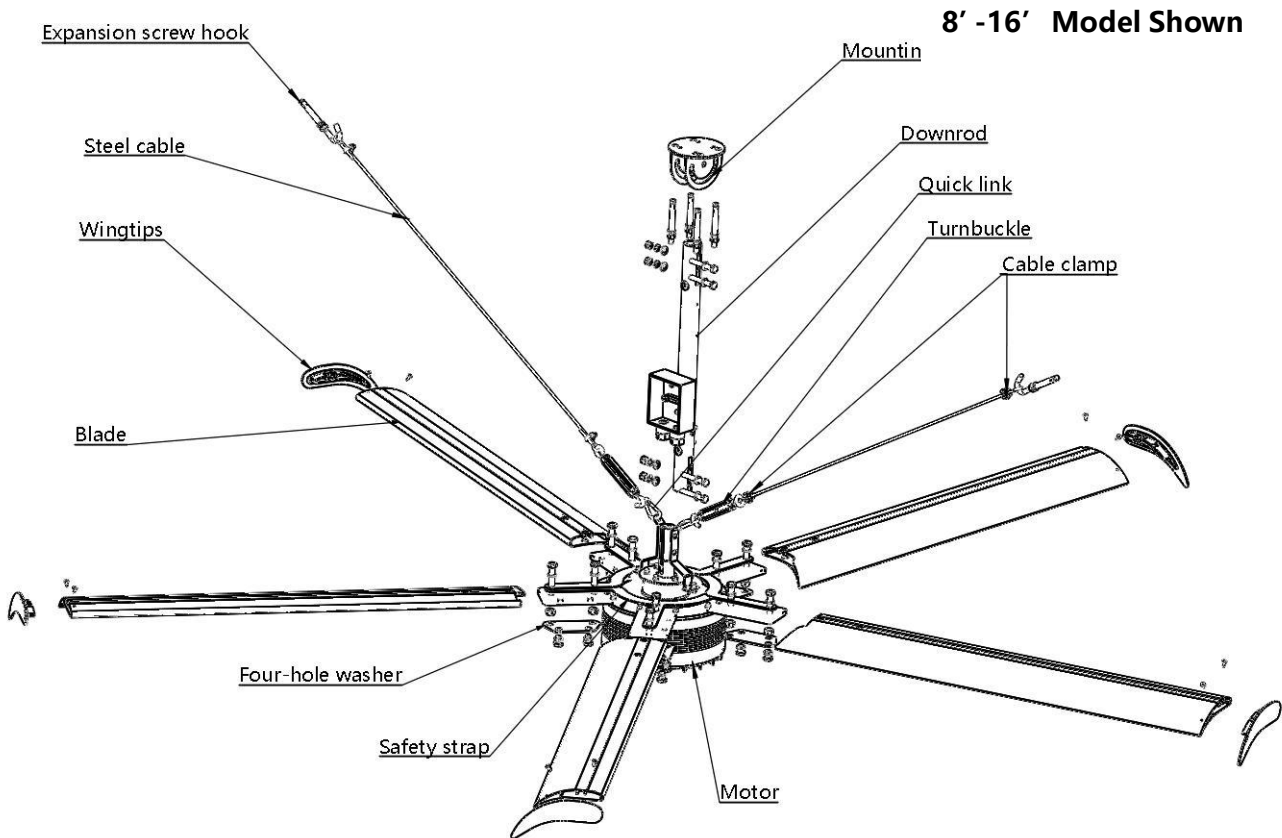
Other specifications can be customized according to user needs.

IV. Installation Data



V. Installation for 8Ft ,12 Ft and 16Ft HVLS fan

5.1 Installation steps for concrete structure



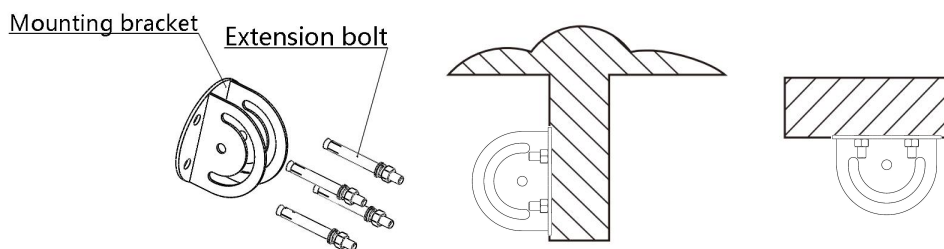
5.1.1 Unpack the product and check whether the accessories are complete.

ITEMS INCLUDED IN YOUR FAN KIT					
Name	Qty.	Name	Qty.	Name	Qty.
Motor assembly	1	#S4 Hardware Bag		#S10	
VFD	1	M6 Cable clamp	8	Downrod assembly	1
Blade	5	M8 Turnbuckle	4	#S11	
#S1 Hardware Bag		Cotter pin	3	Concrete structure mounting bracket	1
M12x60 Hex bolt	10	M6 Quick link	2	#S12	
M12x16 Hex bolt	10	#S5 Hardware Bag		Square /I-shaped beam mounting bracket	1
M12 Hex nylon nut	12	M10x150 Hex bolt	4	#S13	
φ 12 Standard spring washer	12	φ 10 Washer	10	Square /I-shaped beam mounting plate	1
Four-hole washer	22	φ 10 Standard spring washer	6	#S14	
#S2 Hardware Bag		M10 Hex nylon nut	6	I-shaped Beam clamp	2
M4.8 x13 Self-tapping screw	14	#S6 Hardware Bag		#S15 Hardware Bag	
Wingtips	5	M10x100 Expansion bolt	4	M12x16 Hex bolt	2
		M10x80 Expansion bolt hook	2		
#S3 Hardware Bag		#S7			
M10x60 Hex bolt	4	20m Electrical Cable	1		
M10x70 Hex bolt	4	#S8			
φ 10 Washer	22	8.3m Steel Cable	1		
φ 10 Standard spring washer	12	#S9			
M10 Hex nylon nut	12	Blade Safety strap	5		

5.1.2 Determine the installation position of the fan, mark it with the Concrete structure mounting bracket (#S11) , drill the mounting hole with a 12mm drill bit (hole depth>60mm) and then install the M10x100 expansion bolts to fix the mounting bracket.

Accessories needed:

Name	Qty.
Concrete structure mounting bracket	1
M10x100 Expansion bolt	4

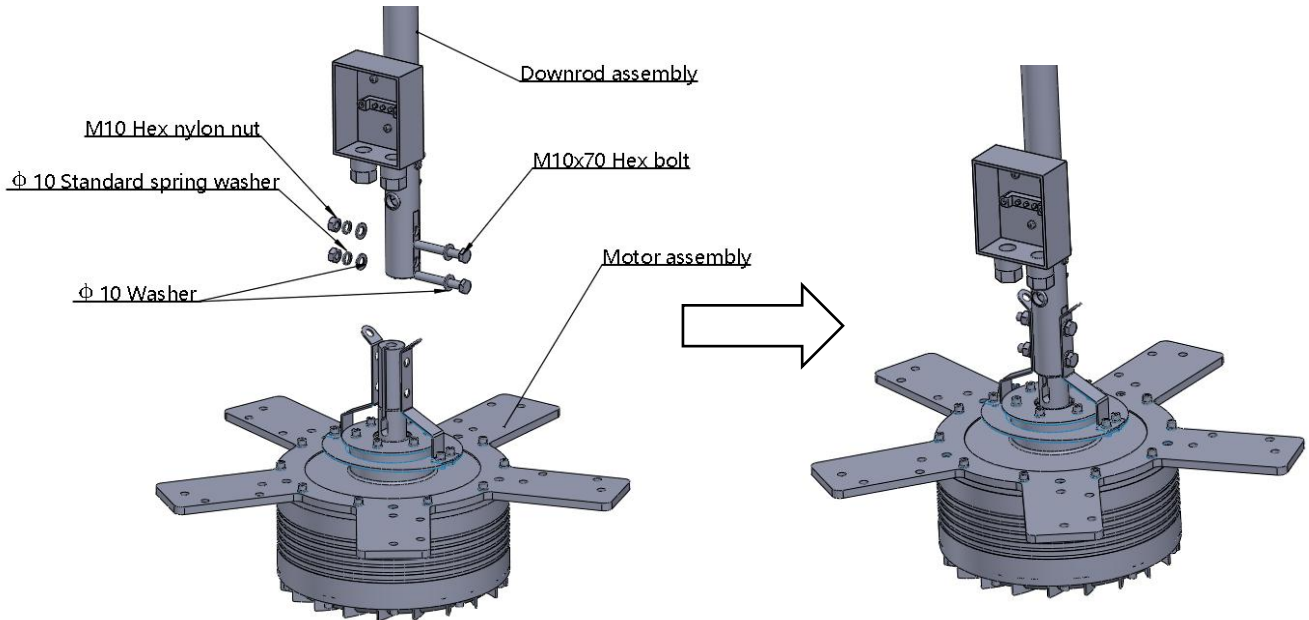


Attention: Pay attention to safety during the work and install expansion bolts securely.

5.1.3 Install the downrod on the motor and screw it without tightening.

Accessories needed:

Name	Qty.	Name	Qty.
Motor assembly	1	φ 10 Washer	4
Downrod assembly	1	φ 10 Standard spring washer	2
M10x70 Hex bolt	2	M10 Hex nylon nut	2

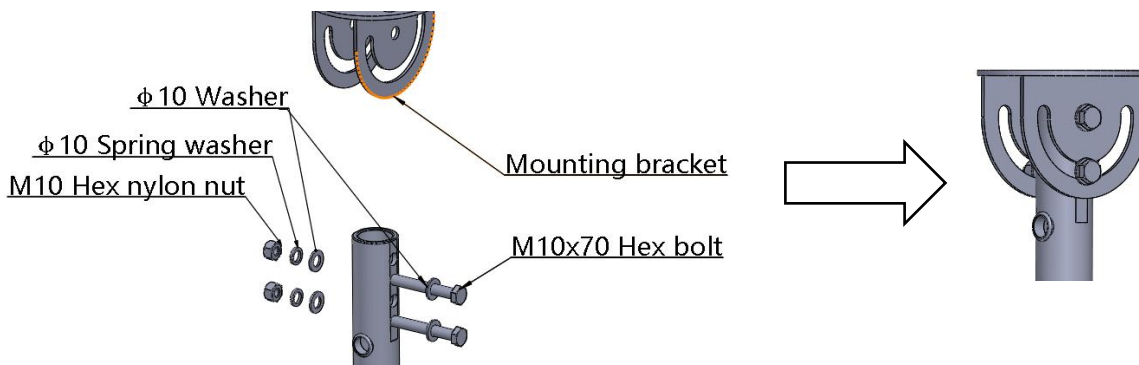


Attention: Check whether the blade bracket on the motor assembly is installed in the correct direction(see figure above)

5.1.4 Install the downrod on the mounting basket and screw it without tightening.

Accessories needed:

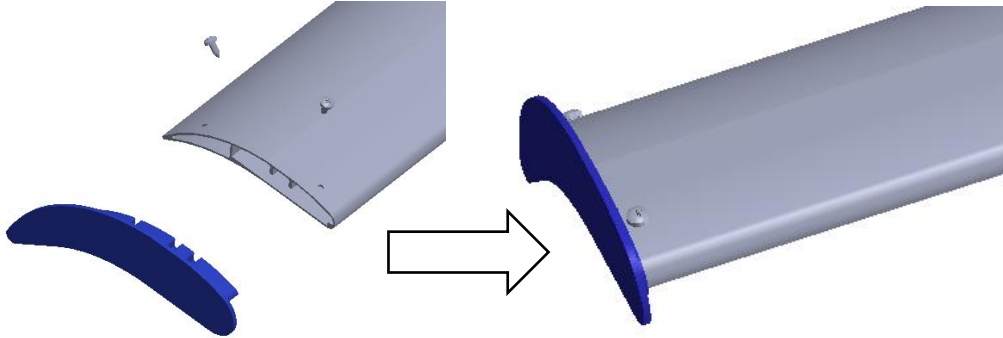
Name	Qty.	Name	Qty.
Mounting bracket	1	φ 10 Washer	4
Downrod assembly	1	φ 10 Standard spring washer	2
M10x70 Hex bolt	2	M10 Hex nylon nut	2



5.1.5 Install the Wingtips on the blade and lock it.

Accessories needed:

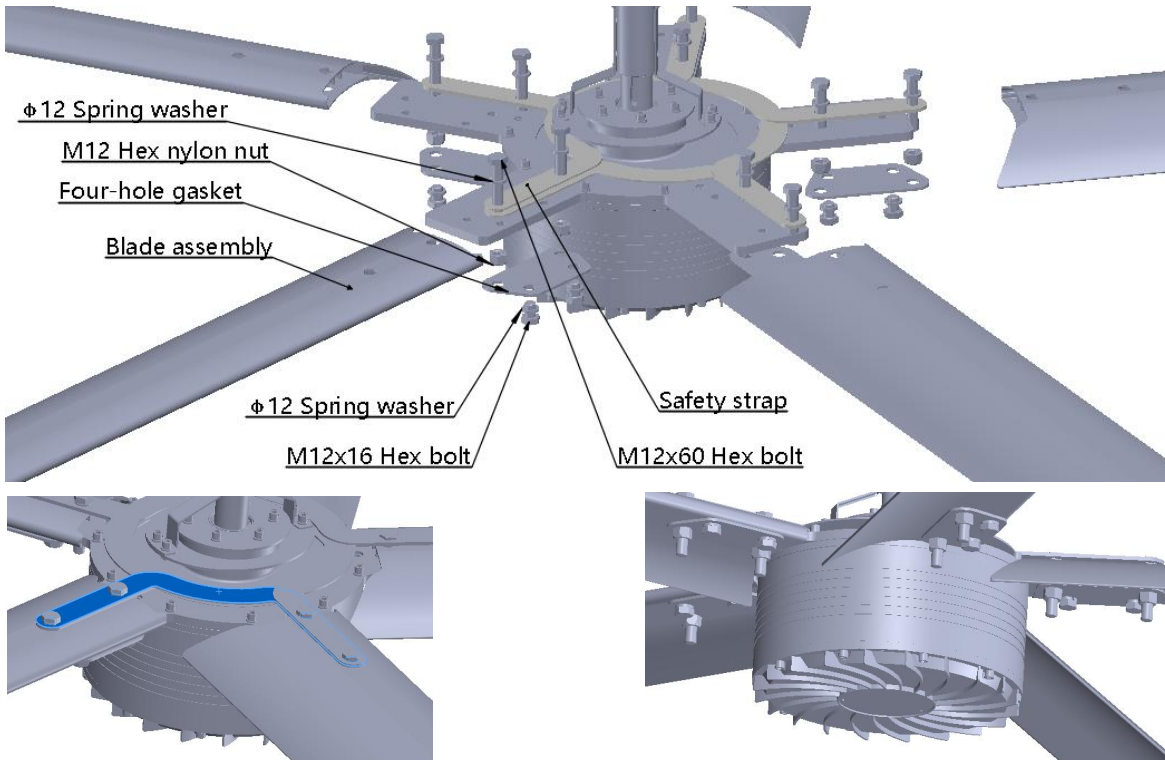
Name	Qty.	Name	Qty.
Blade	5	M4.8 x13 Self-tapping screw	10
Wingtips	5		



5.1.6 Install the blade assembly on the motor, install the screws and pull the blade outward from the center of the motor. Install the blade screws without tightening.

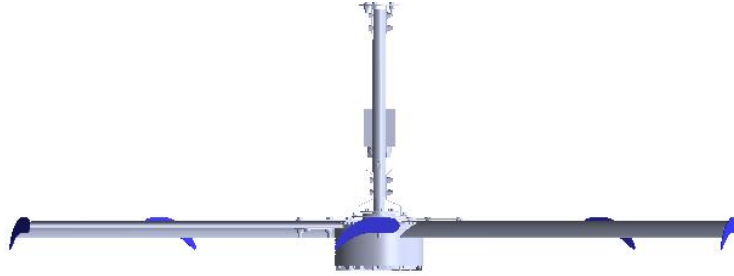
Accessories needed:

Name	Qty.	Name	Qty.
Blade assembly	5	M12 Hex nylon nut	10
M12x60 Hex bolt	10	Φ 12 Spring washer	20
M12x16 Hex bolt	10	Safety strap	5



Attention: Before tightening the fan blade screws, pull the blade outward from the center of the motor. Adjust the levelness of the motor and the verticality of the downrod before tightening the screws and check whether all the screws are tightened.

5.1.7 Adjust the levelness of the motor and the verticality of the downrod, then tighten the screws



5.1.8 Determine the position of the expansion bolt hook, drill the mounting hole with a 12mm drill bit hole (depth > 60mm), install the M10x80 expansion bolt hook with the hook upward and tighten the expansion screw hook.

Accessories needed:

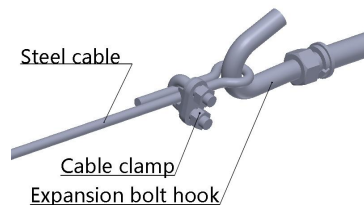
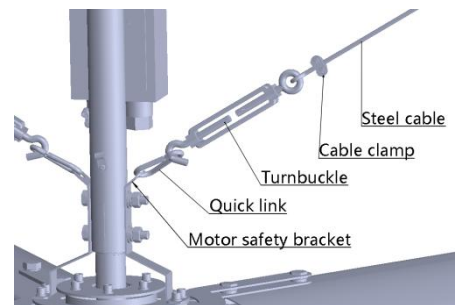
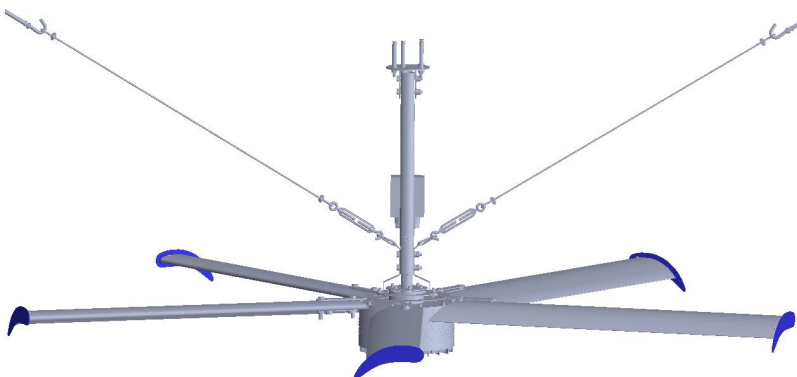
Name	Qty.
M10x80 Expansion bolt hook	2



5.1.9 Fix the steel cable on the O end of turnbuckle with the cable clamp and connect the other end with the quick link,, then install the quick link on the safety bracket of the motor. One end of the steel cable is fixed on the expansion bolt hook with the cable clamp and adjust the tension of the steel cable with the turnbuckle (Until the steel cable is just straight) Finally lock the screw of the turnbuckle with the cotter pin.

Accessories needed:

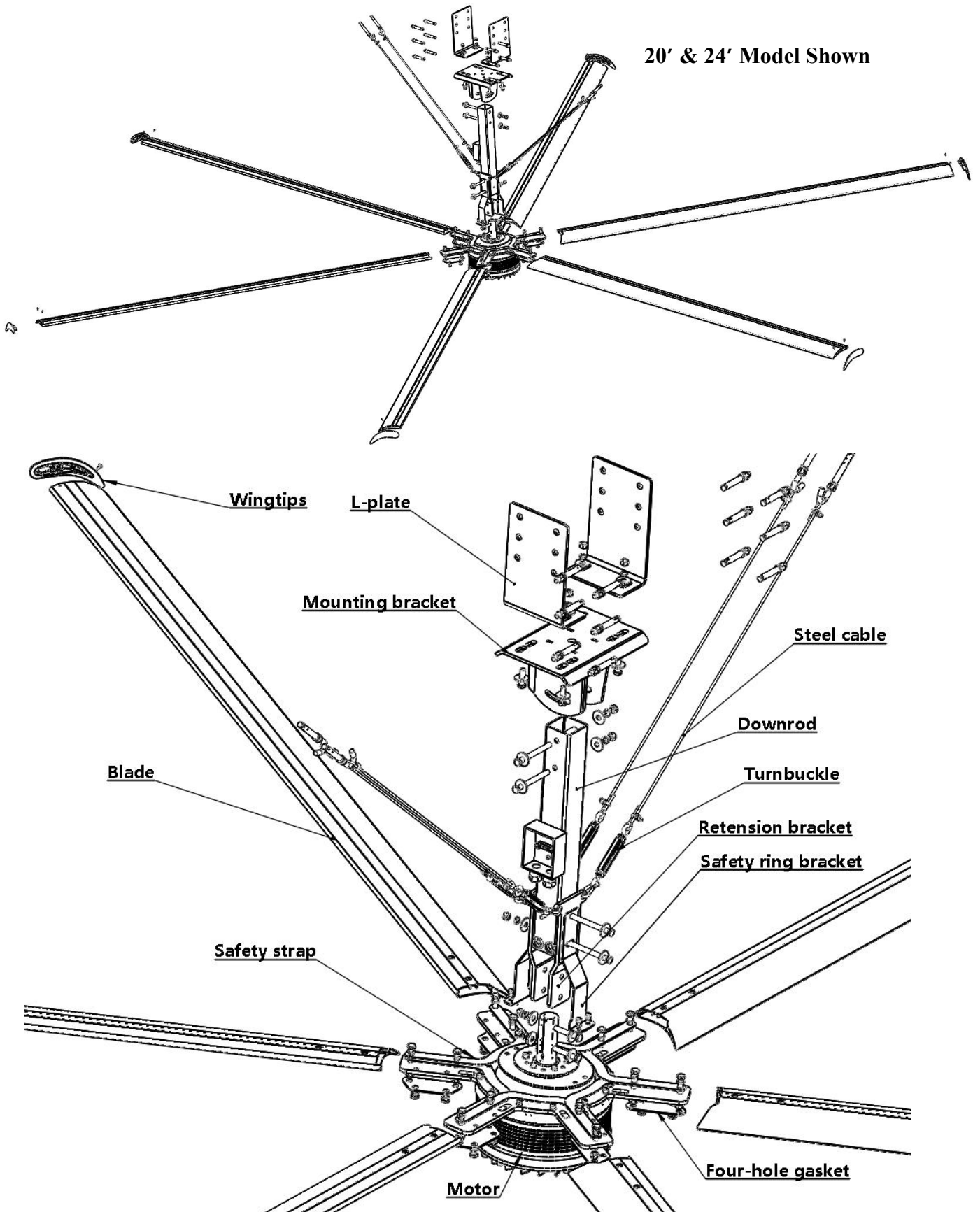
Name	Qty.	Name	Qty.
M6 Cable clamp	4	Cotter pin	2
M8 Turnbuckle	2	M6 Quick link	2
8.3m Steel Cable	1		



Attention: The included angle between the steel cable and the downrod is greater than 30° and less than 45°. The cable clamp shall be securely installed and the steel cable can be adjusted by the turnbuckle without too tight.

VI. Installation for 20Ft and 24Ft HVLS fan

6.1 Installation steps for concrete structure



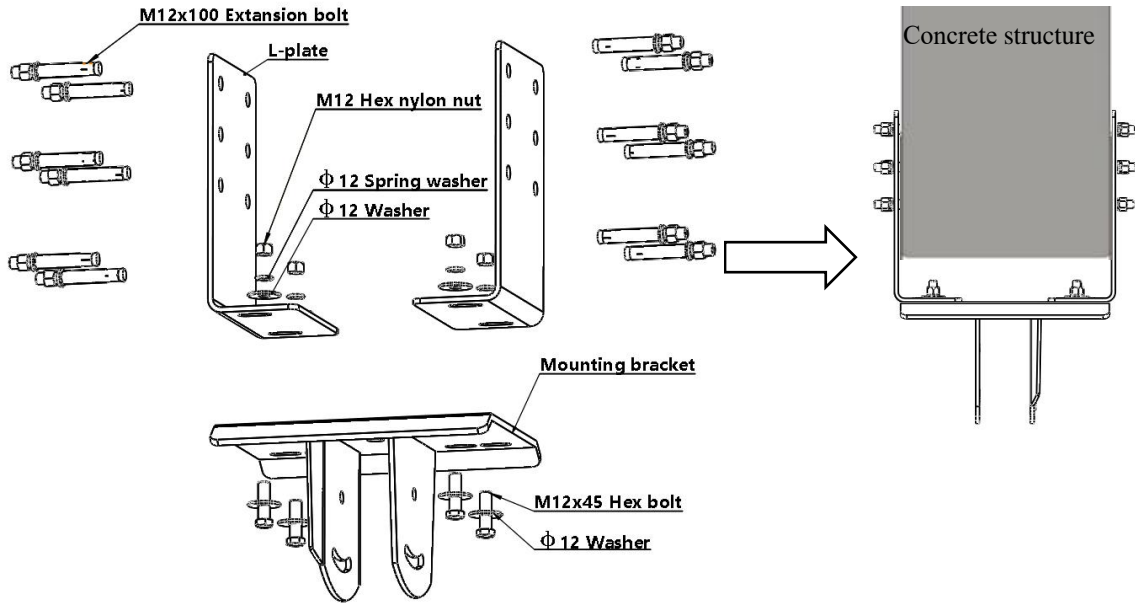
6.1.1 Unpack the product and check whether the accessories are complete.

ITEMS INCLUDED IN YOUR FAN KIT					
Name	Qty.	Name	Qty.	Name	Qty.
Motor assembly	1	#B4 Hardware Bag		#B9	
VFD	1	M6 Cable clamp	8	33m Steel Cable	1
Blade	6	M8 Turnbuckle	4	#B10	
#B1 Hardware Bag		Cotter pin	6	Blade Safety strap	6
M12x60 Hex bolt	12	M6 Quick link	4	#B11	
M12x16 Hex bolt	12	#B5 Hardware Bag		Downrod assembly	1
M12 Hex nylon nut	14	M12x60 Hex bolt	4	#B12	
φ 12 Standard spring washer	26	φ 12 Washer	10	Retention bracket	1
Four-hole washer	6	φ 12 Standard spring washer	6	#B13	
#B2 Hardware Bag		M12 Hex nylon nut	6	Safety ring bracket	1
M4.8 x13 Self-tapping screw	14	#B6 Hardware Bag		#B14	
Wingtips	6	M12x45 Hex bolt	4	Mounting bracket	1
		M12x160 Hex bolt	4	#B15	
#B3 Hardware Bag		φ 12 Washer	18	Pressing plate	1
M12x150 Hex bolt	2	φ 12 Standard spring washer	10	#B16	
M12x130 Hex bolt	2	M12 Hex nylon nut	10	L-shaped plate	2
M12x100 Hex bolt	2	#B7 Hardware Bag		#B17	
φ 12 Washer	14	M12x100 Expansion bolt	10	I-shaped beam clamp	2
φ 12 Standard spring washer	8	M12x100 Expansion bolt hook	4	#B18 Hardware Bag	
M12 Hex nylon nut	8	#B8		M12x16 Hex bolt	2
		30m Electrical Cable	1	M12x45 Hex bolt	2

6.1.2 Determine the installation position of the ceiling fan, mark it with the L-plate, drill the mounting holes with a 14mm drill bit (hole depth>80mm), install the M12x100 expansion bolt, install the L-plate on the expansion bolt, adjust the levelness of the L-plate, tighten the expansion screw and install the mounting bracket under the L-plate and tighten it.

Accessories needed:

Name	Qty.
Mounting bracket	1
L-shape plate	2
M12x100 Expansion bolt	4
M12x45 Hex bolt (full thread)	4
φ 12 Washer	4
Φ 12 Spring washer	8
M12 Hex nylon nut	4

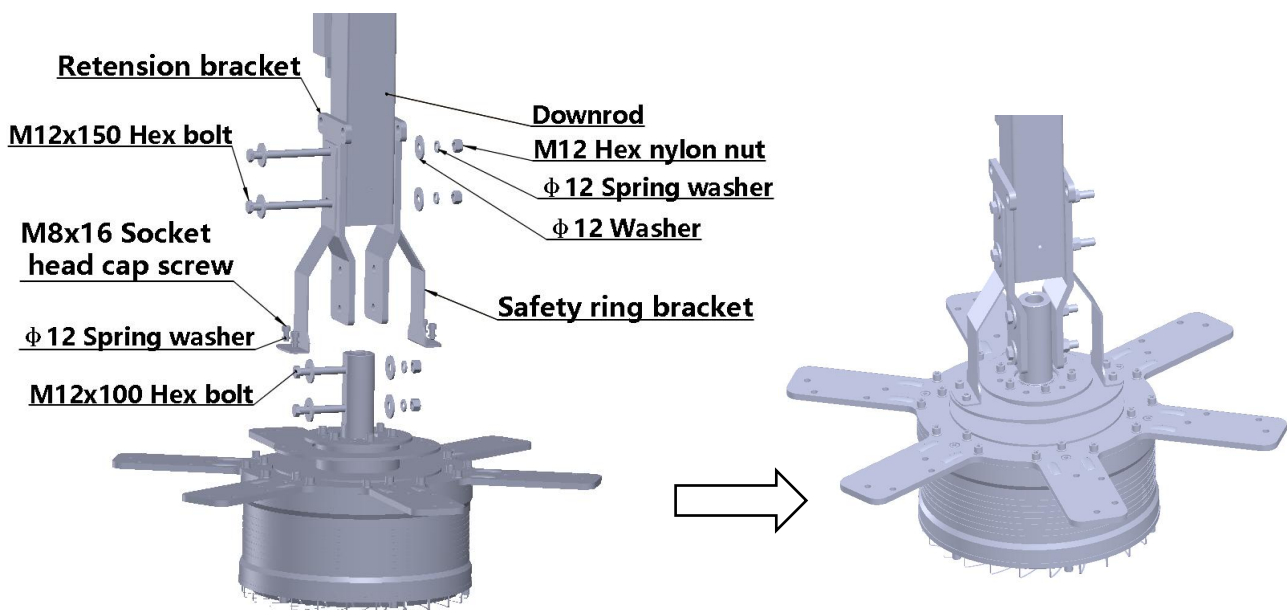


Attention: Both the L-plate and the mounting bracket shall be installed horizontally and symmetrically at both ends.

6.1.3 Install the downrod on the motor, left the screws not being tightened.

Accessories needed:

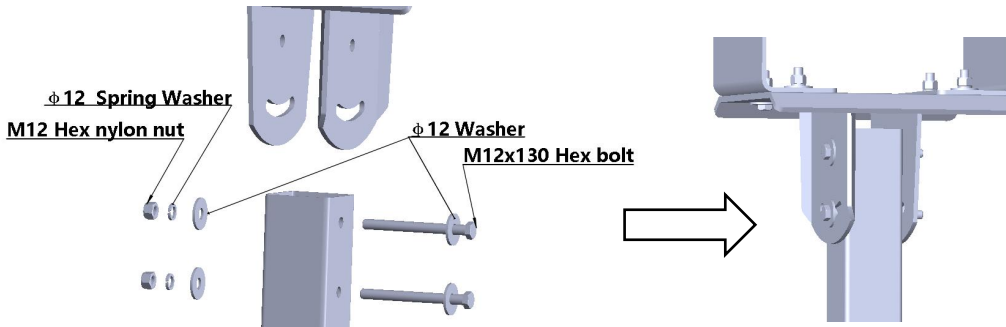
Name	Qty.	Name	Qty.
Downrod assembly	1	M12 Hex nylon nut	4
Safety ring basket	2	φ12 Washer	8
Retension bracket	2	φ12 Spring washer	4
M12x100 Hex bolt	2	M8x16 Socket head cap screw	4
M12x150 Hex bolt	2		



6.1.4 Install the downrod assembly on the mounting bracket and screw it without tightening.

Accessories needed:

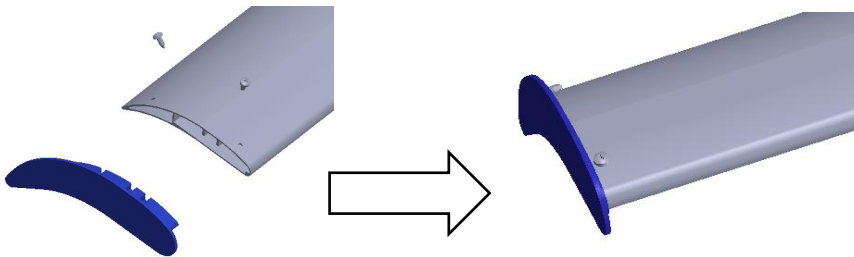
Name	Qty.	Name	Qty.
M12x130 Hex bolt	2	Φ12 Washer	4
M12 Hex nylon nut	2	Φ12 Spring washer	2



6.1.5 Install the Wingtips on the blade and lock it.

Accessories needed:

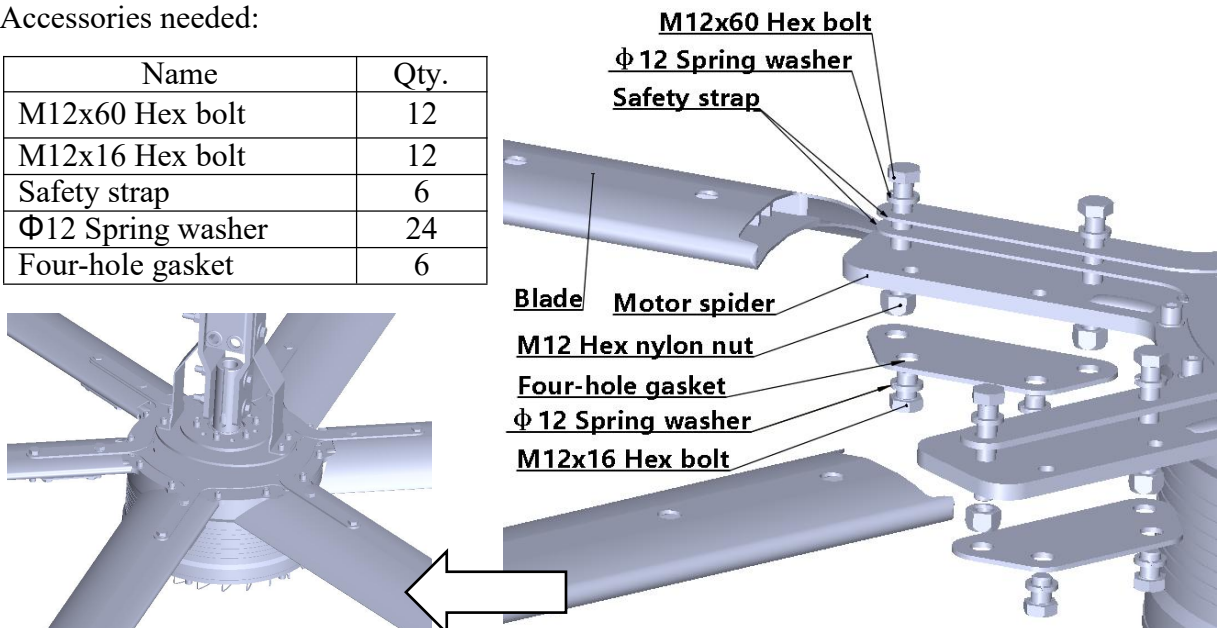
Name	Qty.	Name	Qty.
Blade	6	M4.8 x13 Self-tapping screw	12
Wingtips	6		



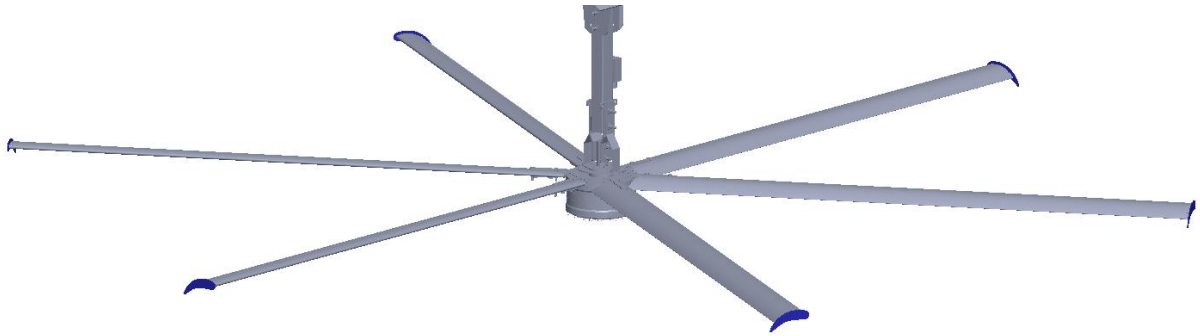
6.1.6 Install the blade assembly on the motor, install the screws and pull the blade outward from the center of the motor. Screw the blade without tightening.

Accessories needed:

Name	Qty.
M12x60 Hex bolt	12
M12x16 Hex bolt	12
Safety strap	6
Φ12 Spring washer	24
Four-hole gasket	6



6.1.7 Adjust the levelness of the motor and the verticality of the downrod, tighten the downrod and blade screws.



Attention: Before tightening the blade screws, pull the blade outward from the center of the motor. Adjust the levelness of the motor and the verticality of the downrod before tightening the screws and check whether all the screws are tightened.

6.1.8 Determine the position of the expansion bolt hook, drill the mounting hole with a 14mm drill bit (hole depth>80mm), install the M12X100 expansion bolt hook with the hook upward and tighten it.

Accessories needed:

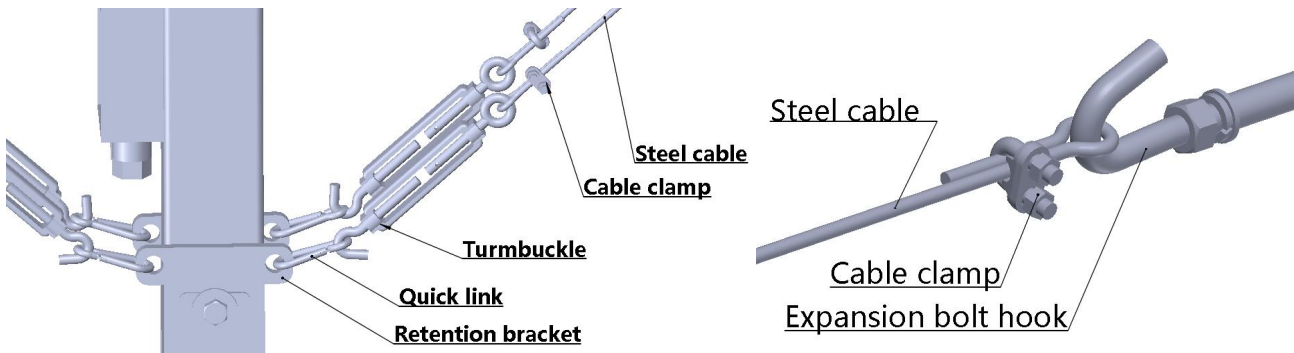
Name	Qty.
M12x100 Expansion bolt hook	4



6.1.9 Fix the steel cable on the O end of turnbuckle with the cable clamp and connect the other end with the quick link, then install the quick link on the holes of retention bracket. One end of the steel cable is fixed on the expansion bolt hook with the cable clamp and adjust the tension of the steel cable with the turnbuckle (Until the steel cable is just straight) Finally lock the screw of the turnbuckle with the cotter pin.

Accessories needed:

Name	Qty.	Name	Qty.	Name	Qty.
M6 Cable clamp	8	Cotter pin	4	33m Steel Cable	1
M8 Turnbuckle	4	M6 Quick link	4		

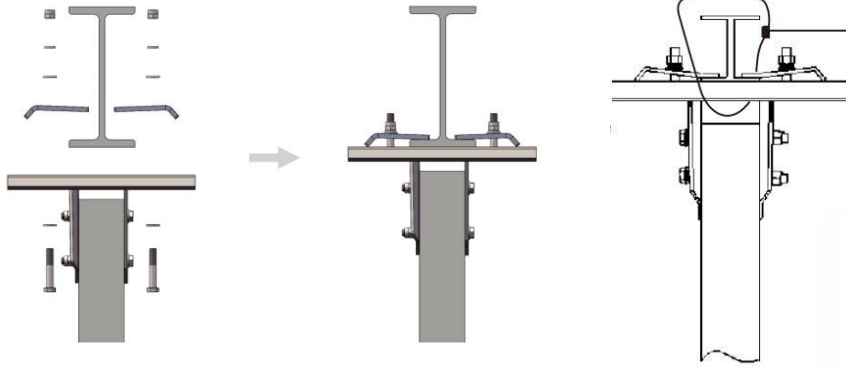


Attention: The included angle between the steel cable and the downrod is greater than 30° and less than 45°. The cable clamp shall be securely installed and the steel cable can be adjusted by the turn hook without too tight.

6.2 I-shaped beam hanging installation

Accessories needed:

Name	Qty.	Name	Qty.
Mounting bracket	1	Φ12 Washer	8
I-shaped beam clamp	2	M12 Hex nylon nut	4
M12x60 Hex bolt	4	Φ12 Spring washer	4

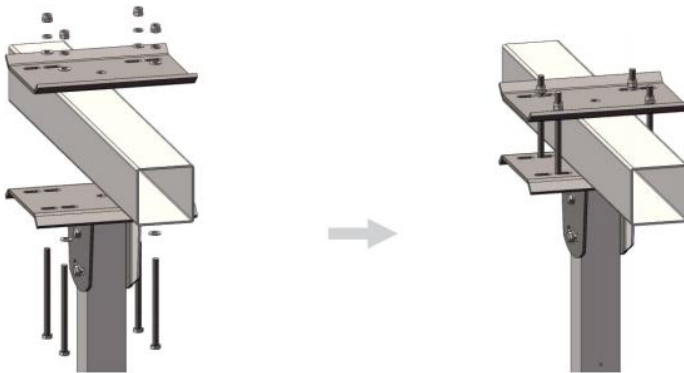


Use steel cable to tie the I-shaped beam and the mounting bracket together with the cable clamp.

6.3 Square beam hanging installation

Accessories needed:

Name	Qty.	Name	Qty.
Mounting bracket	1	Φ12 Washer	8
Pressing plate	1	M12 Hex nylon nut	4
M12x160 Hex bolt	4	Φ12 Spring washer	4



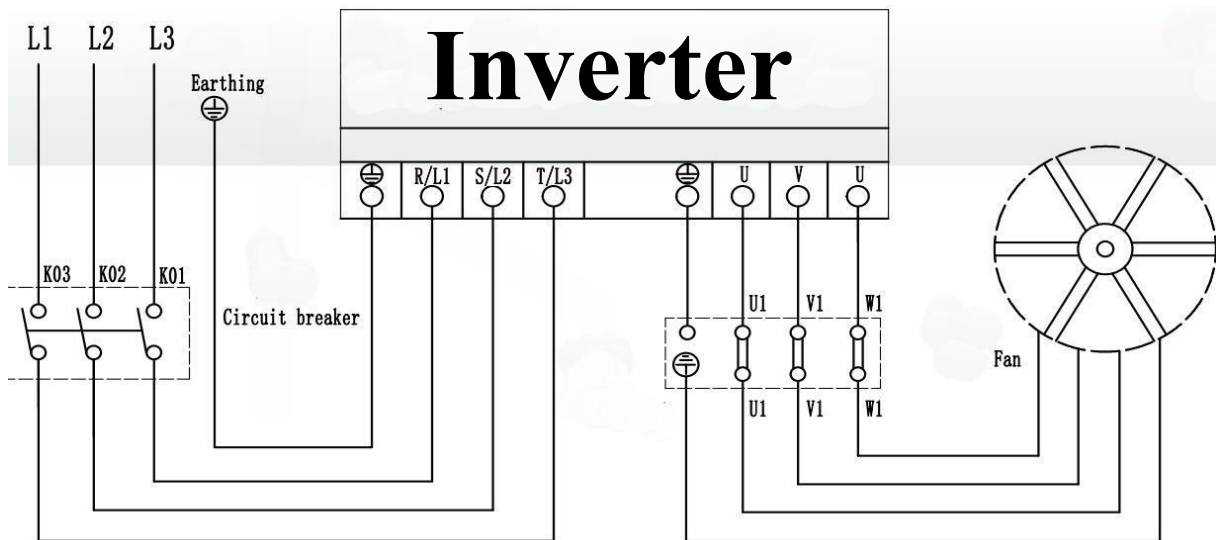
Expansion bolt hook is not available and can use steel cable to tie the square beam and the mounting bracket together with the cable clamp.

VII. Wiring

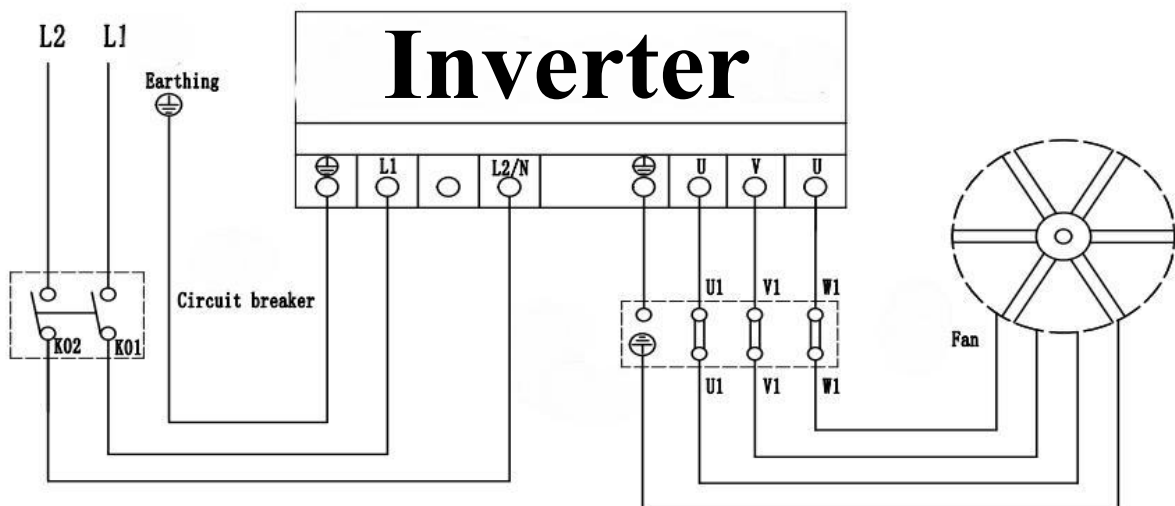
Install the Inverter. Connect the cable from the motor to the junction box and the junction box to the Inverter according to the requirements. Connect the mains supply to the Inverter as required. Check whether there are obstacles around the ceiling fan that affect the operation, and run the ceiling fan according to the instructions.

⚠ Wiring is to be installed as per the requirements of authorities having jurisdiction.

7.1 Wiring diagram



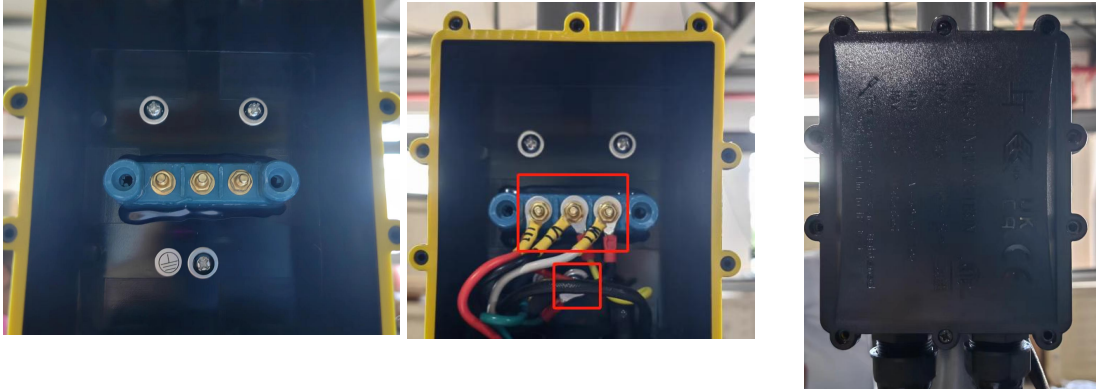
Three-phase input wiring diagram



Single-phase input wiring diagram

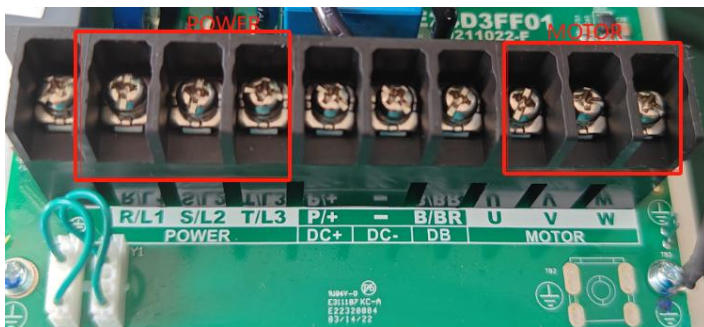
7.2 Wiring for junction box

As shown in the figure, the Inverter lead wire and the motor lead wire are fixed on the terminal post according to the mark. Make sure no short circuit. Secure the ground cable is fixed on the fixing screw of the junction box base, and lock the junction box cover.



Attention: The phase sequence of the motor connected to the Inverter shall not be wrong, otherwise the motor will reverse, affecting the product effect.

7.3 Wiring for Inverter



Three-phase Inverter



Single-phase Inverter

⚠ Do not connect the mains directly to the ceiling fan. Check whether the power supply voltage matches the controller voltage.

VIII. Control Panel Operation

8.1 Control panel operation



E2400 series Inverter



Start----->>> “RUN” key

Stop----->>> “STOP/RESET” key

Accelerate----->>> “△” key

Decelerate ----->>> “▽” key

Check the E2400 USER MANUAL for operation details.



LED shows running frequency, flashing target frequency, function code, parameter value or fault code.

4 LEDs indicate working status. RUN is lighting while running FWD is lighting when working forward and FRQ is lighting when showing

Press “Fun” for function code, and “set” for original parameters. ▲ and ▼ keys can be used to select function codes and parameters. Press “set” again to confirm. In the mode of keypad control, ▲ and ▼ keys can also be used for dynamic speed control. “Run” and “Stop/Reset” keys control start and stop. Press “Stop/Reset” key to reset inverter in fault status.

Operation Panel

IX. Trouble Shooting

When malfunction occurs to inverter, don't run by resetting immediately. Check any causes and get it removed if there is any.

Take counter measures by referring to this manual in case of any malfunctions on inverter. Should it still be unsolved, contact the manufacturer. Never attempt any repairing without due authorization.

Table 1-1 **Inverter's Common Cases of Malfunctions**

Fault	Description	Causes	Countermeasures
Err0	Prohibition modify function code	* prohibition modify the function code during running process.	* Please modify the function code in stopped status.
Err1	Wrong password	*Enter wrong password when password is valid * Do not enter password when modifying function code.	* Please enter the correct password.
2: O.C.	Over-current	* too short acceleration time	*prolong acceleration time;
16: OC1	Over-current 1	* short circuit at output side	*whether motor cable is broken;
67: OC2	Over-current 2	* locked rotor with motor * Too heavy load. * parameter tuning is not correct.	*check if motor overloads; *reduce V/F compensation value * measure parameter correctly.
3: O.E.	DC Over-Voltage	*supply voltage too high; *load inertia too big *deceleration time too short; *motor inertia rise again * bad effect of dynamic braking *parameter of rotary speed loop PID is set abnormally.	*check if rated voltage is input; *add braking resistance(optional); *increase deceleration time * Enhancing the dynamic braking effect *set the parameter of rotary speed loop PID correctly. * Change to VF control for centrifugal fan.
4: P.F1.	Input Phase loss	*phase loss with input power	*check if power input is normal; *check if parameter setting is correct.
5: O.L1	Inverter Overload	* load too heavy	*reduce load; *check drive ratio; *increase inverter's capacity
6: L.U.	Under-Voltage Protection	*input voltage on the low side	*check if supply voltage is normal *check if parameter setting is correct.
7: O.H.	Radiator Overheat	*environment temperature too high; *radiator too dirty *install place not good for ventilation; *fan damaged * Carrier wave frequency or compensation curve is too high.	*improve ventilation; *clean air inlet and outlet and radiator; *install as required; *change fan * Decrease carrier wave frequency or compensation curve.
8: O.L2	Motor Overload	* load too heavy	*reduce load; *check drive ratio; *increase motor's capacity
11: ESP	External fault	*External emergency-stop terminal is valid.	*Check external fault.

12: Err3	Current malfunction before running	*Current alarm signal exists before running.	*check if control board is connected with power board well. *ask for help from manufacture.
13: Err2	Parameters tuning wrong	* Do not connect motor when measuring parameters	*please connect motor correctly.
15: Err4	Current zero excursion malfunction	*Flat cable is loosened. *Current detector is broken.	*check the flat cable. *ask for help from manufacture.
17: PF0	Output Phase loss	* Motor is broken * Motor wire is loose. * Inverter is broken	* check if wire of motor is loose. * check if motor is broken.
18: AErr	Line disconnected	* Analog signal line disconnected * Signal source is broken.	* Change the signal line. * Change the signal source.
19: EP3 20: EP/EP2	Inverter under-load	* Water pump dries up. * Belt is broken. * Equipment is broken.	* Supply water for pump * Change the belt. * Repair the equipment.
22: nP	Pressure control	* Pressure is too high when negative feedback. * Pressure is too low when positive feedback. * Inverter enters into the dormancy status.	* Decrease the min frequency of PID. * Reset inverter to normal status.
23: Err5	PID parameters are set wrong,	* PID parameters are set wrong.	* Set the parameters correctly.
24:SLP	Dormancy protection	*Dormancy mode	*When the pressure is normal, it automatically exits dormancy mode.
26: GP	Earth fault protection (S2/T2 does not have GP protection)	*Motor cable is damaged, short connected to grounding. *Motor isolation is damaged, short connected to grounding. *inverter fault.	*change a new cable. *repair the motor. *contact manufacturer.
27: PG	Encoder fault	*Encoder installation fault *Encoder fault *Encoder line number setting fault	*Check the installation and connection *Check encoder *Setting F851 correctly
32: PCE	PMSM distuning fault	*motor parameters measurement is wrong. *load is too heavy.	* Measure motor parameters correctly. * Decrease the load.
35: OH1	PTC overheat protection	*external relay protection.	*check external heat protection equipment.
44: Er44	Master loses slave's response	*communication fault between master and slave	* check wiring. *check baud rate *check communication parameters setting
45: CE	Communication timeout error	Communication fault	*PC/PLC does not send command at fixed time *Check whether the communication line is connected reliably.

47: EEEP	EEPROM read/write fault	*interference around *EEPROM is damaged.	*remove interferences *contact manufacturer.
49: Err6	Watchdog fault	*Watchdog timeout	*please check watchdog signal
53: CE 1	Keypad disconnection protection	*Keypad disconnection	*Check communication line
55:Er55	Drop load protection	*Drop load	*Check external device

Motor Malfunction and Counter Measures

Malfunction	Items to Be Checked	Counter Measures
Motor not Running	Wiring correct? Setting correct? Too big with load? Motor is damaged? Malfunction protection occurs?	Get connected with power; Check wiring; Checking malfunction; Reduce load; Check against Table 1-1
Wrong Direction of Motor Running	U, V, W wiring correct? Parameters setting correct?	To correct wiring Setting the parameters correctly.
Motor Turning but Speed Change not Possible	Wiring correct for lines with given frequency? Correct setting of running mode? Too big with load?	To correct wiring; To correct setting; Reduce load
Motor Speed Too High or Too Low	Motor's rated value correct? Drive ratio correct? Inverter parameters are set in-corrected? Check if inverter output voltage is abnormal?	Check motor nameplate data; Check the setting of drive ratio; Check parameters setting; Check V/F Characteristic value
Motor Running Unstable	Too big load? Too big with load change? Phase loss? Motor malfunction.	Reduce load; reduce load change, increase capacity; Correct wiring.
Power Trip	Wiring current is too high?	Check input wiring; Selecting matching air switch; Reduce load; checking inverter malfunction.

Attention:

1. The installation and wiring work must be carried out by professionals according to the Operation Manual in order to prevent electric shock.
2. Check whether the surrounding room of the ceiling fan meets the requirements before operation. When the products used for the first time, please confirm whether the power supply meets the requirements and whether the wiring is correct and secure. The power can only be turned on when it is confirmed to be safe.
3. The system has over voltage, under voltage, voltage loss regulation, phase loss, overload, collision, overheating and lightning protection functions.
4. If the ceiling fan is not used for a long time, please run it for 10min every other month in order to prolong the service life of the product.