

BEFORE YOU BEGIN

- ◆ In the installation, adjustment and the cleaning processes please don't bend the fan blades, or it will damage the equipment or affect using effects.
- ◆ Please make sure the fan's input voltage and supply voltage are the same before cut-in the power.
- ◆ Please don't proceed examine and repair works while power on so as to prevent electric shock.
- ◆ Please don't secretly alter the structure and installation site of the fan.
- ◆ Please don't open the electrical control box while power on so as to prevent electric shock.
- ◆ Please don't operate the damaged devices, or it will bring serious consequences of personal injury.
- ◆ Strictly prohibit the structural changes or parameter changes of the electrical control box, or it will cause equipment damage or personal injury and death accident due to the improper set.
- ◆ In the electrical control box there includes high-voltage storage capacitor. When you operate the fan control device, please wait for 3 minutes to let the voltage release out (notes: the display blackness is not the mark that the voltage has reached the safety level) to prevent electric shock.
- ◆ Strictly prohibit the operation when the safety space of the fan is insufficient.
- ◆ Strictly prohibit the operation during the reverse back process of the fan's operating space, and make sure whether there are obstacles before starting.

CAUTION



- ◆ The installation and layout of the circuit wiring must be performed by our professional qualified staff.
- ◆ Please use the specified device component appointed by our company.

HVLS FAN

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SAFETY& PRECAUTIONS

READ THE ENTIRE MANUAL BEFORE OPERATING THE FAN

Read and understand this manual before installing or operating a fan unit.

Installation, adjustment, repair or maintenance must be performed by qualified personnel.

Follow all safety practices and instructions during the installation, operation and servicing of the fan. Failure to apply these safety practices could result in death or Serious injury.

If you do not understand the instructions, please call our Technical Department for guidance.

All fan controls and incoming power should be installed only by qualified technicians.

Failure to follow these guidelines will void the manufacturer's warranty.

All electrical controls are configured at the factory and are ready to use. No user adjustments are available. Follow the included installation instructions when installing this device to ensure proper operation. Do not make any changes to any part of the fan without first consulting manufacturer.

HVLS FAN - INSTALLATION GUIDE

1.Product introduction

PMSM Series

The PMSM HVLS(High Volume-Low Speed) large energy-saving ceiling fan is an application based on permanent-magnet synchronous tech.The fans can circulate the airflow in the space efficiently, then improve the comfortable feeling greatly. The product combined a series of advanced technologies, such as aerodynamics, industry design, dynamics, The product is widely used in commercial space, industrial space, stadiums, airports, office space, auditorium, restaurant and other large& high occasions.

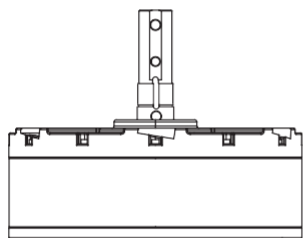
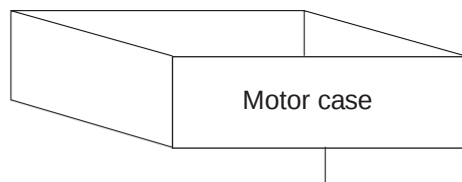
1.1 Technical Specification

Model	Fan diameter ft(m)	Motor power (kw)	Motor torque (Nm)	Rotate (rpm)	Rated current 220v	Motor power (kw)	Noise (dBA)	Actual Coverage (Sqm)
LZ-PMM-7.3	24(7.3m)	1.5	230	0-56	220/4.6	13850	40	800
LZ-PMM-6.1	20(6.1)	0.8	95	0-60	220/3.0	12500	40	750
LZ-PMM-5.5	18(5.5)	0.8	95	0-65	220/2.5	11500	40	650
LZ-PMM-4.9	16(4.9)	0.8	95	0-70	220/2.5	10800	40	550
LZ-PMM-4.2	14(4.2)	0.45	50	0-75	220/2.0	9500	40	480
LZ-PMM-3.8	12.5(3.8)	0.45	50	0-85	220/2.0	8500	40	420
LZ-PMM-3.3	11(3.3)	0.45	50	0-95	220/2.0	7000	40	380
LZ-PMM-2.5	8(2.5)	0.45	50	0-100	220/1.8	6000	40	300

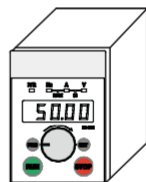
Note:

- 1.Weight:the weight doesn't contain control box,top connection parts etc.
- 2.Size:the above-mentioned product size is standard,other size can be customized.
- 3.Noise:sound level measured a distance of 1m from the motor,electromagnetic noise is less than 43db(A).
- 4.Packing:Carton packing.
- 5.Input power:220V/1PH

2.Packing list



1 Motorx1



2 Control Box x1



3 Steel wire rope*25m

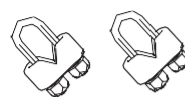
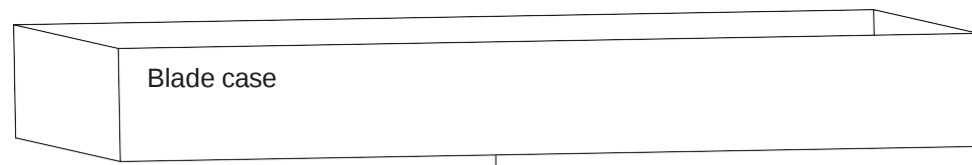


6 Cable



22 Manual*1

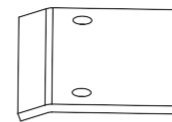
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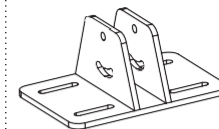
4 Steel wire rope chuck*18



5 PVC tube and joint



7 Beam clip*2



8 Upper yolk*1



9 Blade retainer*6



10 Cable clip for beam*7



11 Fan blade bolts M10*50 *1



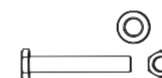
12 Blade tail screws M4.2*19 *12



13 Beam clip bolts M16*60 *4



14 UP extension rod bolts M16*120 *2



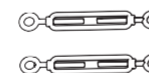
15 Down extension rod bolts M12*100 *2



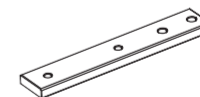
16 Tail*6



17 Controller screws M12*25 *4



18 Flange bolts *4



19 Blade plug*6

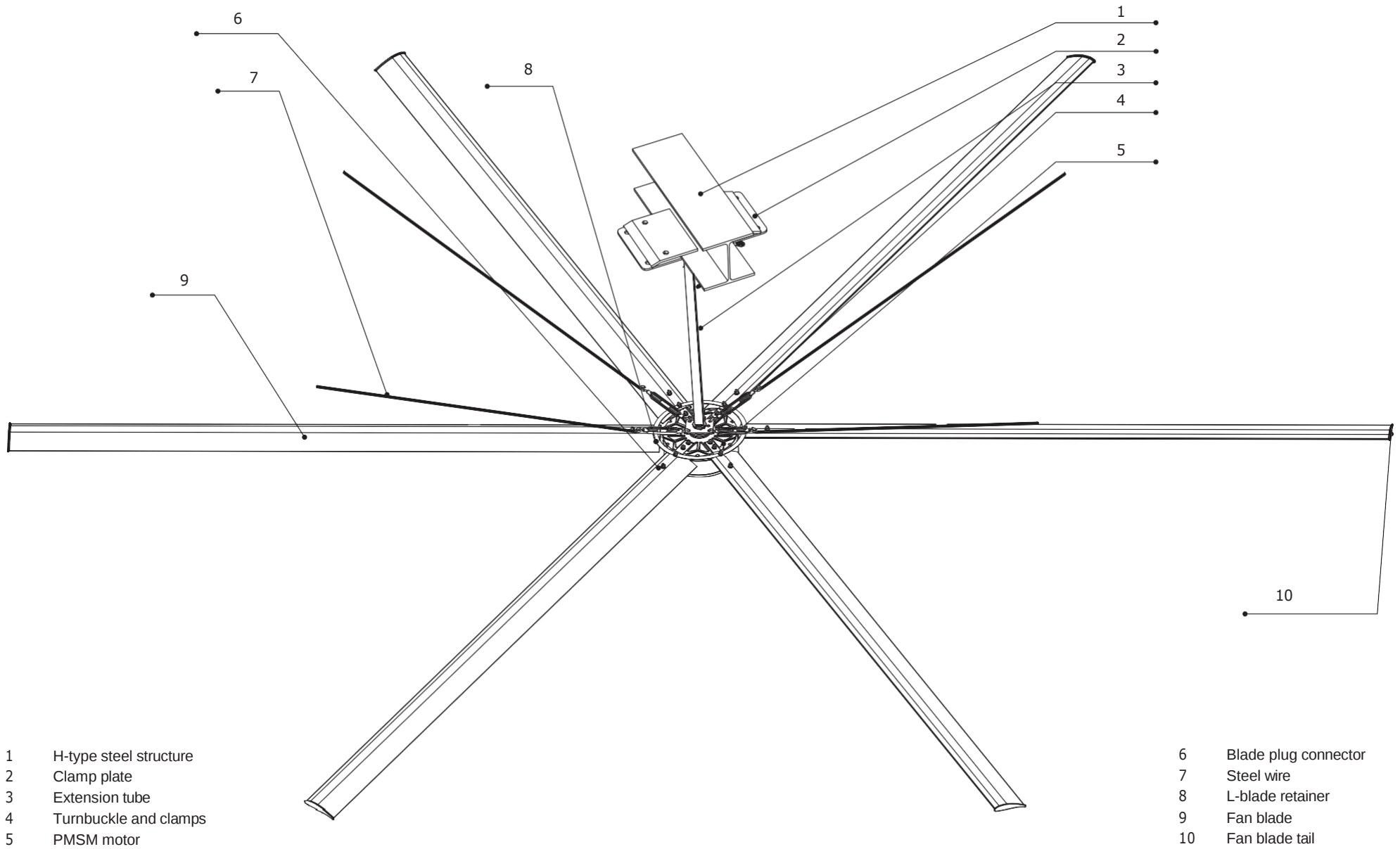


20 Extension rod*1

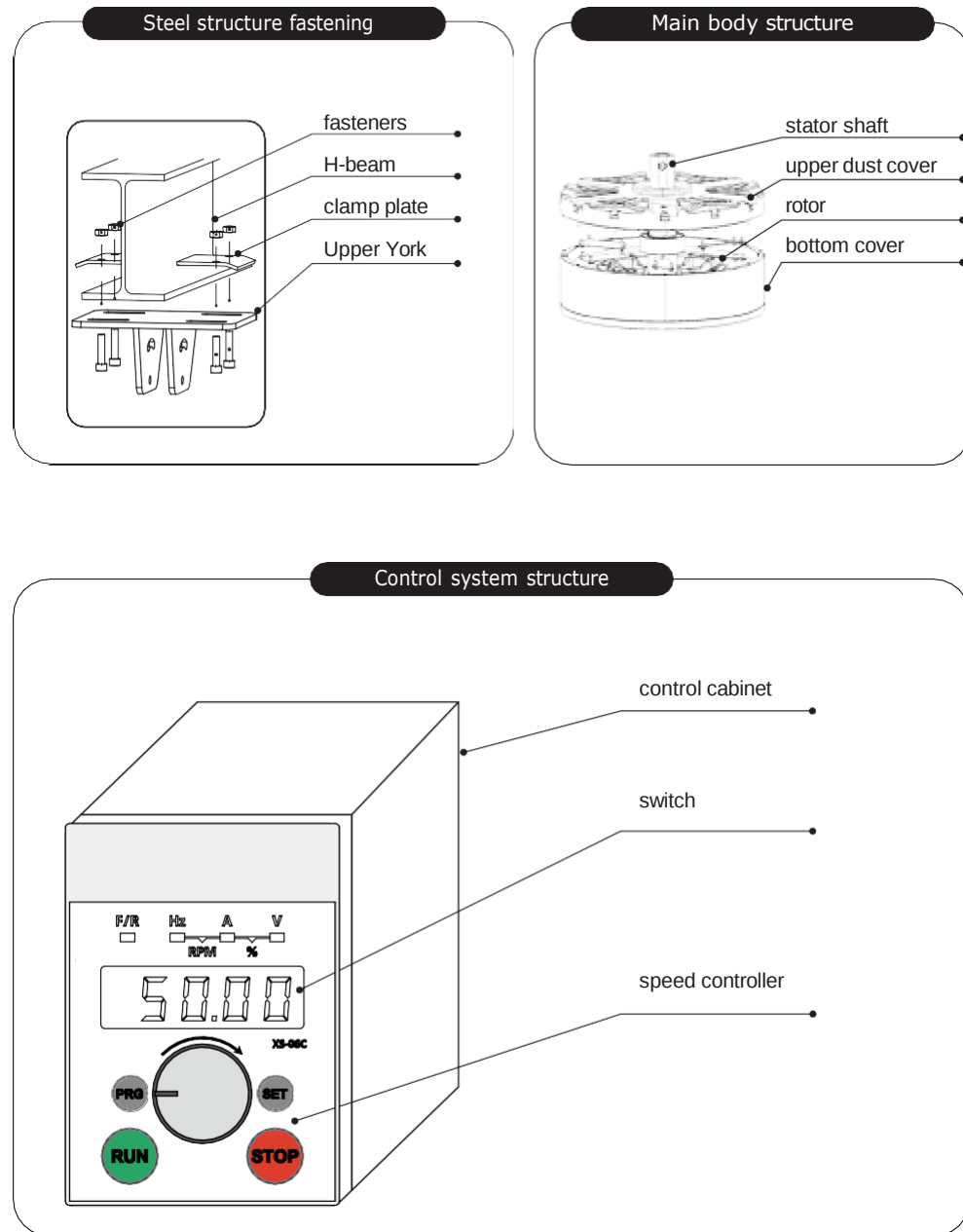


21 Fan blades*6

3.Product drawing



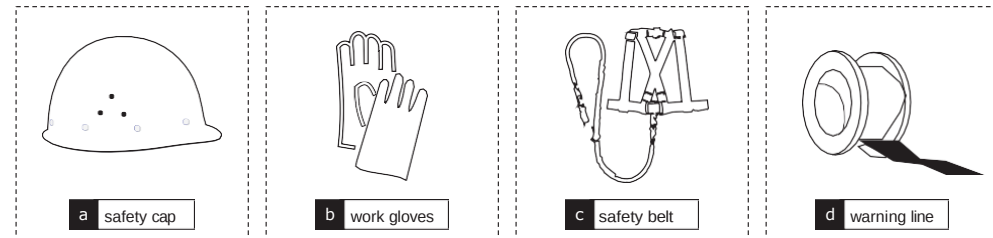
3.1 Standard part structure diagram



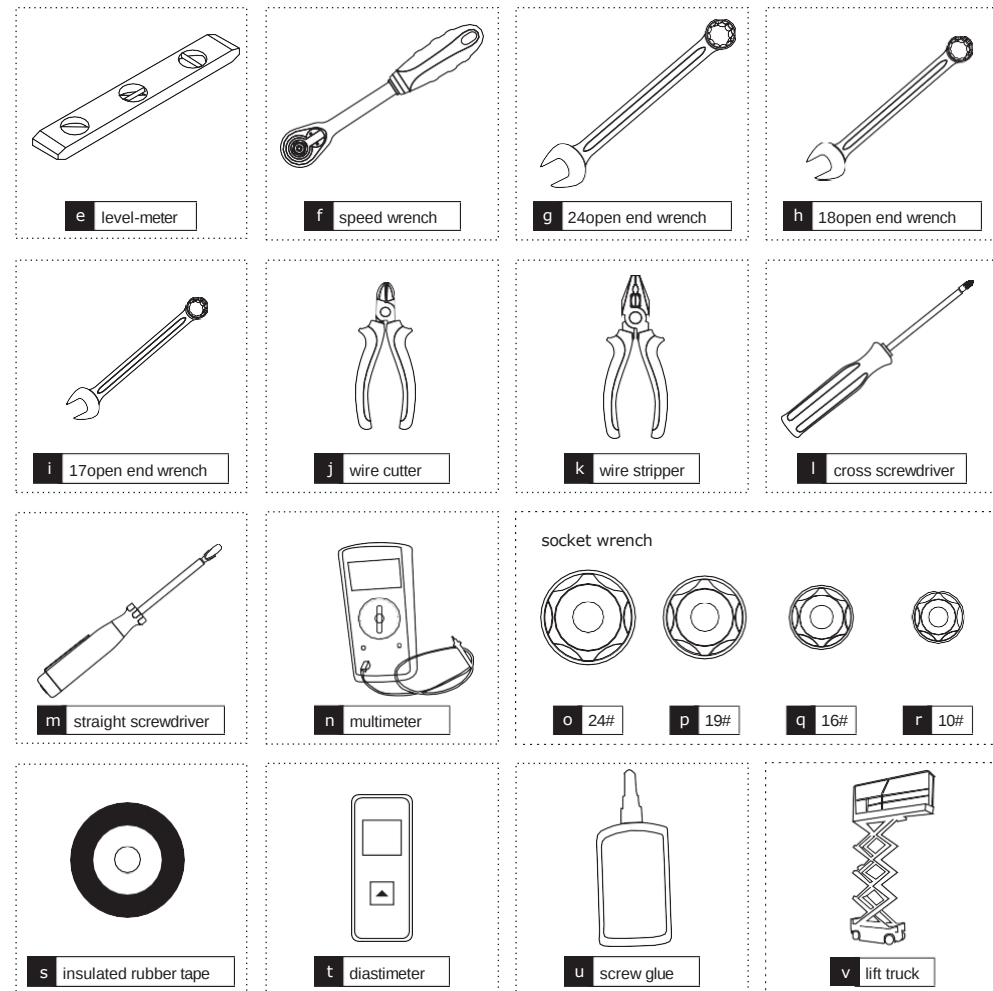
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4. Preparation before installation

4.1 Security tool preparation

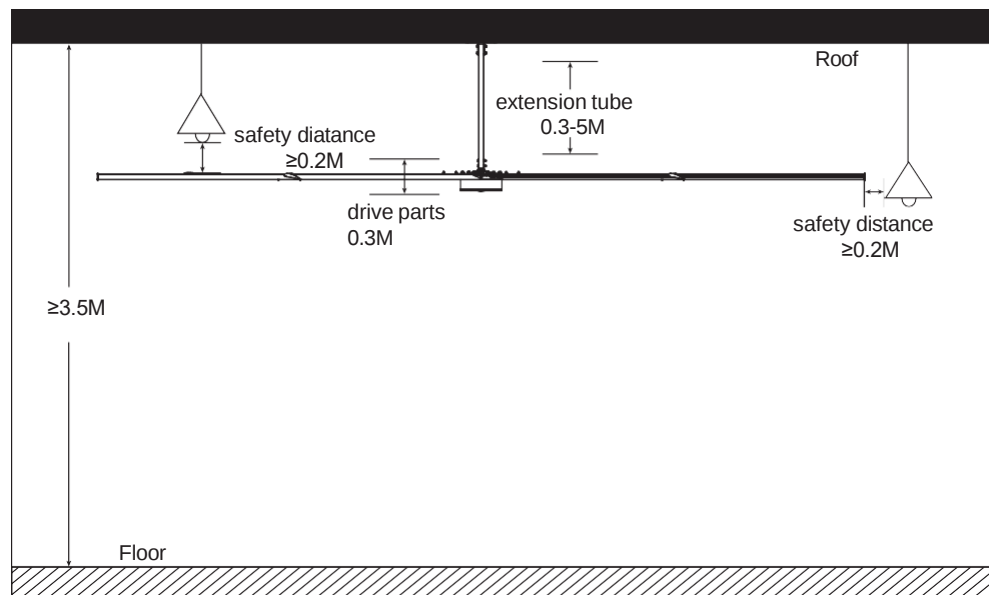


4.2 Installation tool preparation



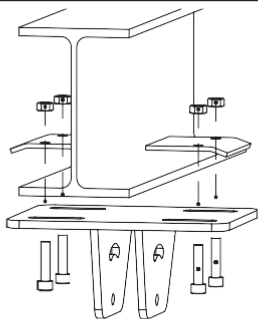
5. Installation conditions and types

5.1 Roof installation requirement



5.2 Brief introduction of different installation structure

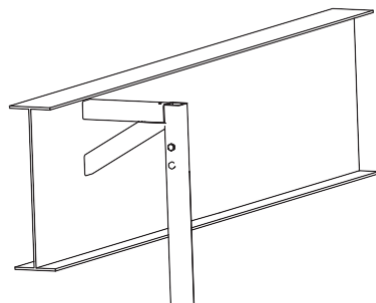
Hanging on I-beam



Mounting on I-beam:

1. first confirm the mounting position;
2. then assemble top plate, spacer and beam clip.
3. Keeping the beam is in the middle of the top plate, and top plate is vertical; spacer and beam clip must fit together the beam.

Side Mount on I-beam

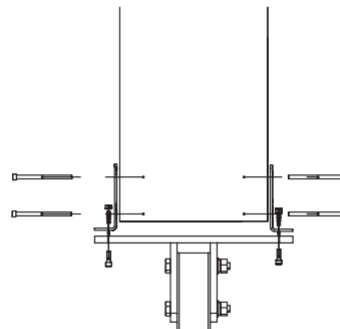


Side mount on I-beam:

- confirm the size of the beam and the position to weld bracket and guarantee to keep the distance from the bottom of beam to fan blade no less than 30cm.
- First paint off, then spot welding for brackets. full welding after confirming the balance of bracket. At last clean welding slag and paint as before.

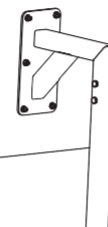
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Hang on Concrete



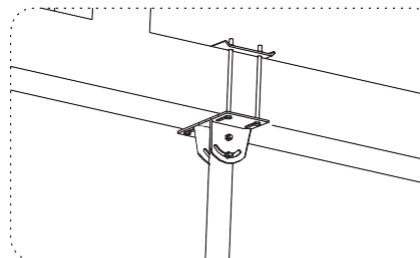
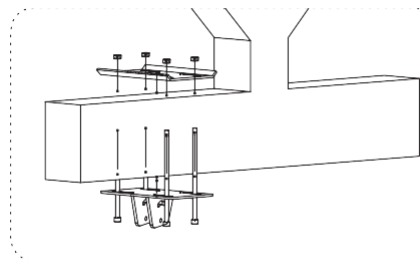
Assemble extended top plate with bending pieces, to fit the concrete beam. Keep top plate vertical referring to the beam bottom. Dig holes marked at first with percussion drill, the depth of the hole refers to the length of expansion bolt. Drive expansion bolts into the holes and then mount fasteners for bending pieces.

Side Mount on Concrete



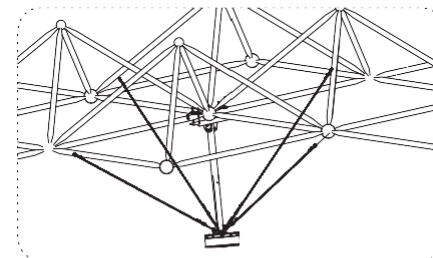
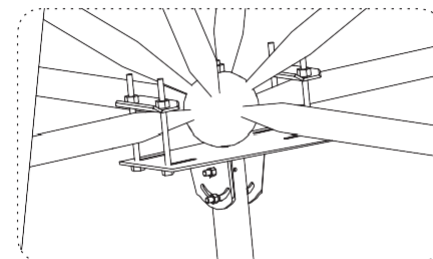
Confirm the size of the concrete beam, and the position to mount bracket and guarantee to keep the distance from the bottom of beam to obstacles no less than 30cm. Dig holes marked at first with percussion drill, the depth of the hole refers to the length of expansion bolt. Drive expansion bolts into the holes and then mount side-mounted brackets and tighten fasteners.

Mount on Bent Structure



Two steel plates hoop the beam with 4 pcs studs, tighten with doubled nuts and washers to guarantee the structure's stability.

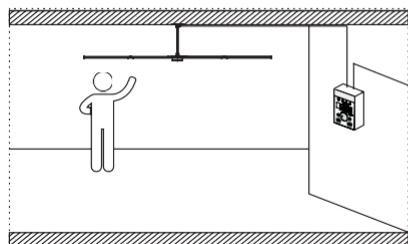
Mount on Pipe/Tube Structure



Confirm installation position, it's better that the position is close to the pipe connection. Measure the pipe's diameter, if its diameter is less than 15cm, keep brackets mounted along the pipe. Cut stud, and each stud length should be 10cm longer than pipe. Mount top plate under the pipes and tighten the brackets to keep steady.

6.Fan installation procedures

1 Site survey confirmation



- ◆ Confirm installation position
- ◆ Measure the height to mount fan with diastimeter
- ◆ Confirm any obstacle or not (crane, light, cables, fire protection equipment, camera etc)
- ◆ Confirm the position on beam to connect steel guy wire
- ◆ Confirm the position to mount control box



2 Installation readiness check



Check all accessories. Prepare safety equipment(safety belt, safety cap etc), life truck and installation tools.



safety cap



work gloves



diastimeter



lift truck

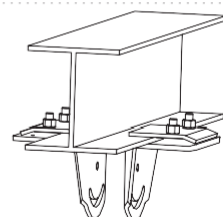
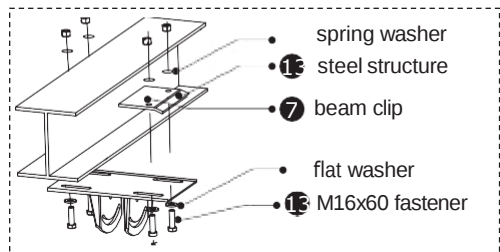
PS:Detailed installation tools please refer to P10



3 Installing roof



First confirm the mounting position, keeping the beam is in the middle of the top plate, and top plate is vertical; spacer and beam clip must fit together the beam. Use 24# open end wrench(g), speed wrench(f) and 24# socket wrench(o) to tighten M16x55mm fasteners. Other mounting brackets also required to install firmly.



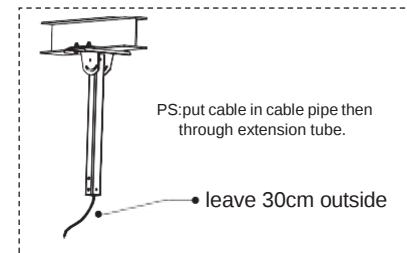
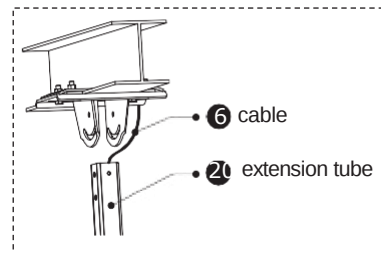
PS Tighten all fasteners

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4 Extension rod threading



put cable through the extension tube, leave 30cm outside to connect cables from motor.



PS:put cable in cable pipe then through extension tube.

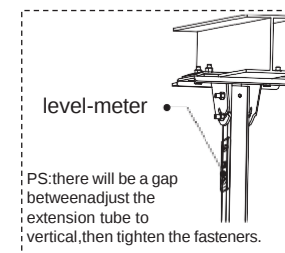
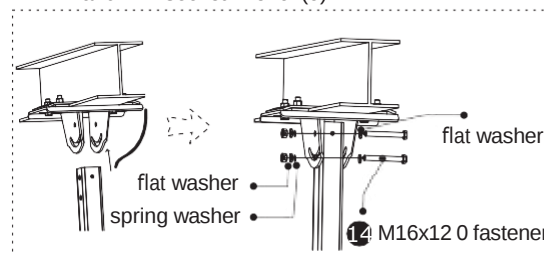
• leave 30cm outside



5 Install extension rod



Put extension tube between the bending pieces, align to the holes with level-meter(e), then tight asteners with 24# open end wrench(g), speed wrench(f) and 24# socket wrench(o).



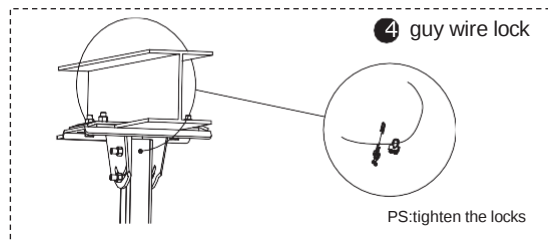
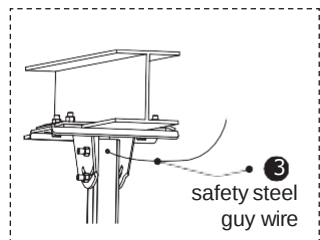
level-meter

PS:there will be a gap betweenadjust the extension tube to vertical,then tighten the fasteners.

6 Install safety rope



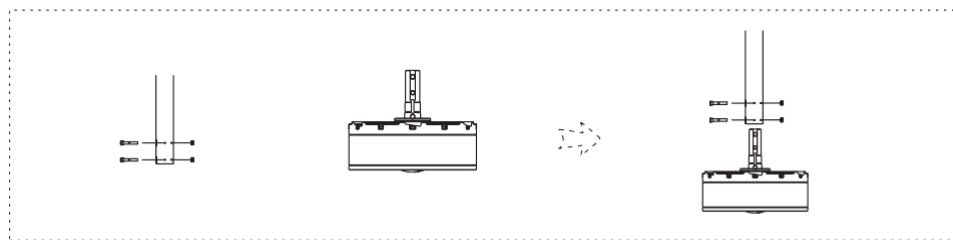
Put wire through a small hole on extension tube, and then twist the whole beam, adjust the safety wire and tighten the guy wire locks with speed wrench(f) and 10# socket wrench(r).



7 Install host



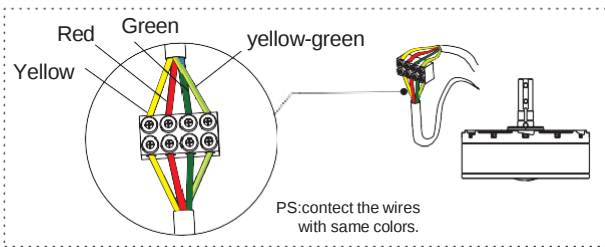
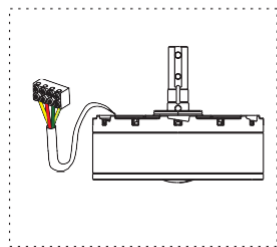
The motor shall be in horizontal, and the fasteners shall be tightened after the field is completed.



8 Host wiring



Strip the cable with wire stripper(k) and keep copper wire unbroken. Connect four lines with the same color, and fix the connector with cross screwdriver(l), then packed with insulated rubber tape to avoid sparks and improper contact.

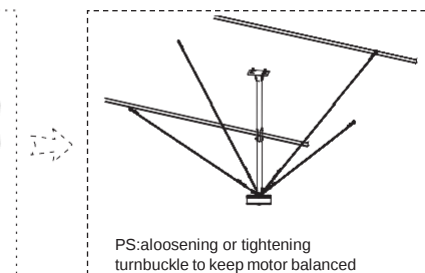
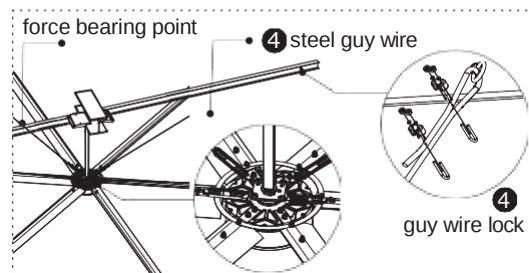


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9 Installation of steel wire fastener



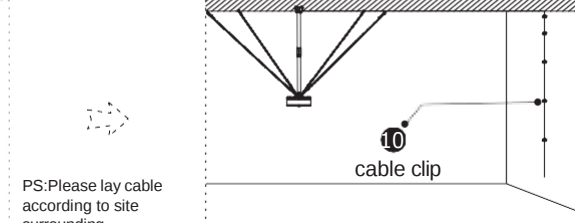
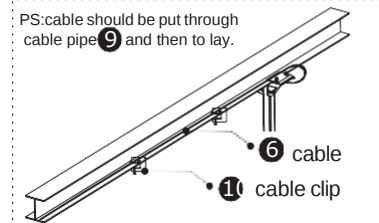
Please pre-judge the 4 points can bear the force or not, put the wire through the hole punched beforehand on the purlin. Connect turnbuckle with eyebolt on motor with guy wire, then loosen the turnbuckle at the most and put guy wire through lock and connect turnbuckle. Four safety wires must be isometric, symmetrical and even load. At last tighten all wire locks with speed wrench(f) and 10# socket wrench(r), and paint with screw glue on locks and turnbuckle.



10 Layout power line



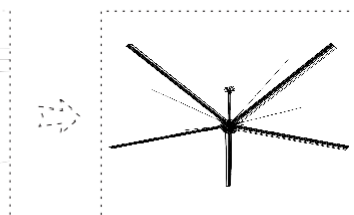
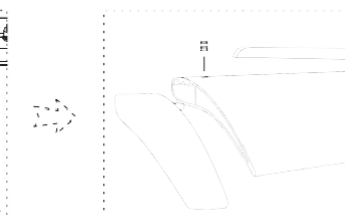
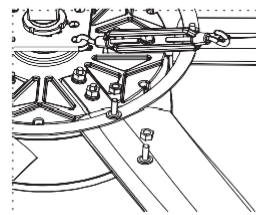
Cable routing should be neat and good-looking, every 1.5M with a cable clip while laying cable, and then tighten cable clips on beam and wall with straight screwdriver(m).



11 Install fan blade



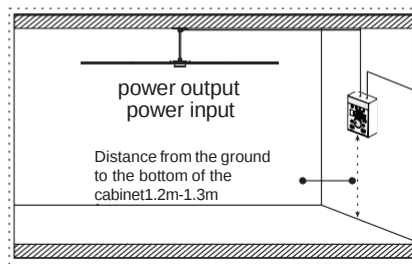
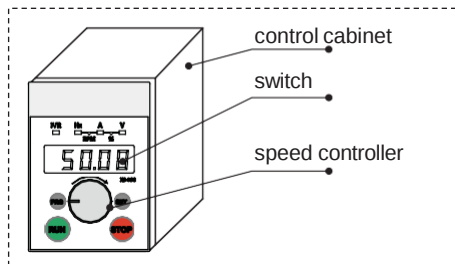
Cable routing should be neat and good-looking, every 1.5M with a cable clip while laying cable, and then tighten cable clips on beam and wall with straight screwdriver(m).



12 Installation control system



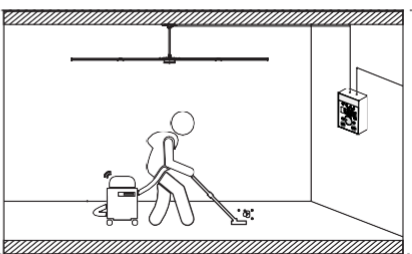
Fix control box to confirm mounted position, keep box balanced. Punch hole with electric tools and fix buckles into the holes with cross screwdriver(I). The box should be fixed at a height between 1.2m-1.3m from the ground.



13 Clean up the scene



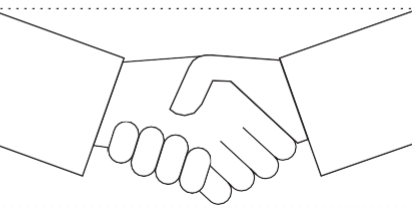
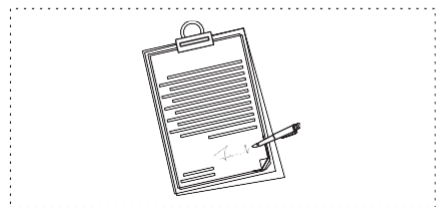
Remove all things about installation, clean the site and return the scene.



14 Customer signature



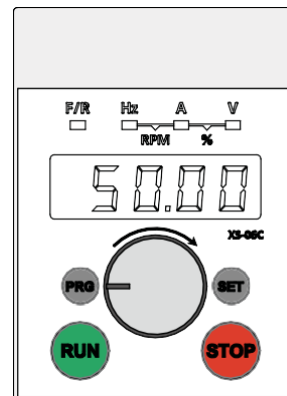
Client's signature and acceptance.



15 Installation is complete

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7. The control panel and display system



Function	Diameter
Output voltage	Volt(V)
Frequency	Hertz(Hz)
Power	Kilowatt(kW)
Current	Ampere(A)

1. After normal power-on, the display panel will self-test reset for a few seconds, and then display "STOP" when it is stable.
2. After starting the control box, 5 groups of data showed on display window will monitor the operation status quickly and show the current speed, output current, voltage, phase and temperature of controller.

8. Operating instructions

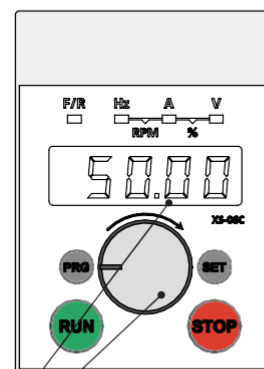
Three Gears Control Switches

Three gears control switches are the electrical devices that control speed, RUN and STOP, and they are weak current control switches. They directly control the frequency converter.

RUN Normal operation of fan

STOP Fans stop running

Speed knob



speed controller

switch-on/off



Before operating the equipment, please read the product instruction and clear the obstacles in the fan revolve area to ensure there is enough safety space for the fan operation.

Warning: Please make sure to turn off the power supply first before doing any electrical and fan maintenance and did by professionals to avoid being wounded!

RUN

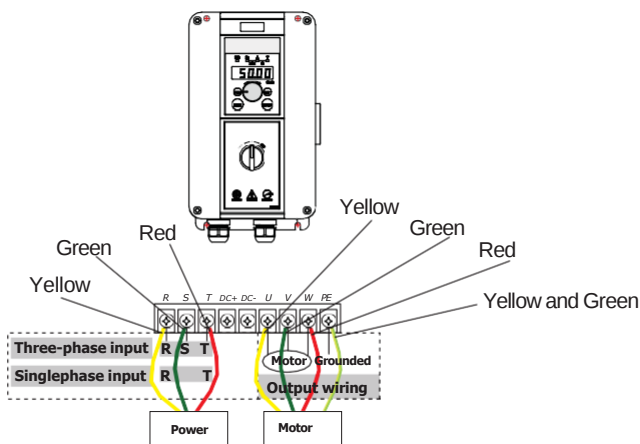
1. Confirm there is no obstruction and potential danger in the fan operation space ;
2. Confirm the input power supply is correct and meet the product's requirement;
3. Confirm the speed knob at the minimum position;
4. Turn on the fan, press RUN;
5. After the fan starts, adjust speed knob to get the appropriate speed and best effect.

STOP

1. STOP device, press STOP;
2. Power outage is prohibited during the fan normal operation.

8.1 Control box wiring

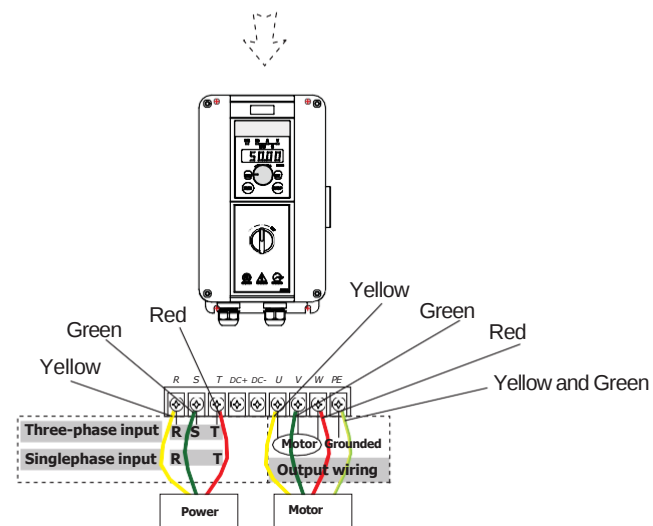
The cable at the output end of the motor is connected with the cable at the input end of the control box. The connection is fastened with a screwdriver. When connecting, it is necessary to ensure that the connected core wires are of the same color. Do not mistake or reverse the connection.



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The wiring shown above is 220V three-phase wiring.

The following is a 220V single-phase connection.



9. Troubleshooting

Common causes for the malfunctioning operation:

- ◆ The external power supply of the control box is not valid;
- ◆ Open the master switch, and then turn on the three gears control switch, if the fan can still not work, please check whether the speed knob is of the MIN state. Otherwise, please contract manufacturer.
- ◆ Non-professional staffs do not open the electrical control box! For repair or adjustment;
- ◆ If you find the equipment is damaged or has abnormal sound, please stop running as soon as possible, cut off power supply, and contact our service department;
- ◆ Notes: Equipment damages due to the improper use are not covered by the warranty. Personal injuries and equipment damages for your failure to comply with the contents of this manual, the Company will not bear any responsibilities.

FI110 Series

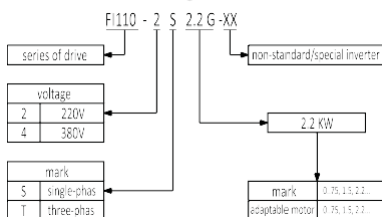
USER Manual (v1.2)

Chapter 1

FI110 is a multifunctional and practical industrial fan controller developed by our company. It has the characteristics of high protection, easy control, and stable operation. It supports rapid power on and off, and can also choose functions such as fast switching of forward and reverse rotation of the motor.

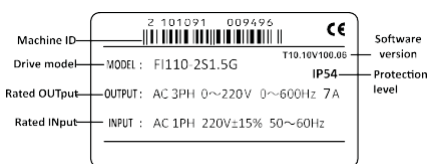
Chapter 2 product information

2.1 Designation rules

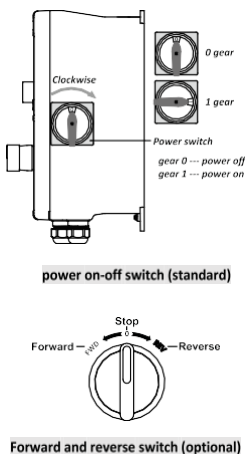


Note: The suffix area of the model number only displays the configuration with optional options, and no suffix is required for standard configuration.

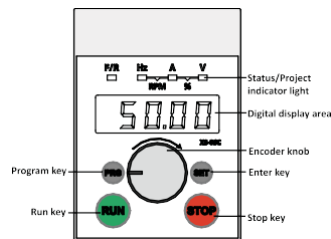
2.2 Nameplate of the PV100



2.3 Description for power switch & forward/reverse switch



2.4 Operation panel



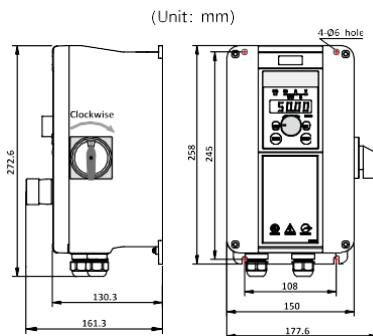
keyboard with encoder

Introduction to keyboard key functions

PRG	Program key	Level 1 menu entry or exit, programming mode switch
SET	Enter key	Enter the menu screen step by step, confirm and save the parameters
RUN	Run key	In the keyboard operation mode, start the inverter
STOP	Stop key	In the keyboard operation mode, stop the inverter; Press this key to reset the inverter after the fault occurs and the fault is rectified.
Encoder knob	Encoder knob	Left-handed value decreases/right-handed value increases; Move one character (or digit) to the right with each press

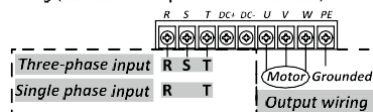
Chapter 3 Product installation

3.1 Product Size



3.2 Main circuit terminal wiring

3.2.1 Single-phase power supply/three-phase power supply wiring (standard with power on-off switch)



Three-phase & single-phase AC power wiring diagram

Application model:

Single phase: FI110-2S(0.75 ~ 2.2)G

Three-phase: FI110-2T(0.75 ~ 2.2)G FI110-4T(0.75 ~ 4.0)G

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Single-phase wiring:

Terminal marking	name	explain
R T	Single-phase AC power input terminal	Connecting to single-phase AC power
U V W	Inverter output terminal	Connecting a three-phase motor
PE	Ground terminal	Inverter ground terminal

Three-phase wiring:

Terminal marking	name	explain
R S T	three-phase AC power input terminal	Connecting to three-phase AC power
U V W	Inverter output terminal	Connecting a three-phase motor
PE	Ground terminal	Inverter ground terminal

Chapter 4 Debugging steps and parameters

Step number	Function code	Set value	Function Description
1	P0.13	1	restore factory defaults
2	P0.04	determined by the motor	Enter the rated frequency of the motor
3	P0.05		Enter the upper limit frequency or maximum speed of the motor demand operation
4	P0.10	0	If the motor is in the reverse direction, it can be set to 1 to achieve the purpose of changing the direction of the motor without changing the motor wiring.
5	P0.11	12.0KHz	The carrier frequency above 3Hz (if the electromagnetic noise of the motor is large, it can be increased, generally around 12K)
6	P2.03	determined by the motor	Enter the rated frequency of the motor
7	P2.04		Enter the rated speed of the motor
8	P2.06		Input motor rated current

Chapter 5 Fault diagnosis and treatment method

Fault code description and countermeasures

Code	Display	Possible Causes	Solutions
E001	Overcurrent during acceleration	1. The output circuit is grounded or short circuited. 2. Motor auto-tuning is not performed. 3. The acceleration time is too short. 4. Manual torque boost or V/F curve is not appropriate. 5. The voltage is too low. 6. The startup operation is performed on the rotating motor. 7. A sudden load is added during acceleration. 8. The AC drive model is too small power class.	1. Eliminate external faults. 2. Perform the motor auto-tuning. 3. Increase the acceleration time. 4. Adjust the manual torque boost or V/F curve. 5. Adjust the voltage to normal range. 6. Select rotational speed tracking restart or start the motor after it stops. 7. Remove the added load. 8. Select an AC drive of higher power class.
E002	deceleration overcurrent	1. The deceleration time is too short 2. The output of the inverter is grounded or short-circuited 3. There is no parameter identification for the motor in the vector control mode 4. There is a sudden load during deceleration 5. The manual torque rise is too large or the V/F curve is not set properly 6. Low voltage	1. Increase the deceleration time 2. Check the insulation of the motor and cables. 3. Parameter identification of the motor 4. Check the load 5. Reduce the torque boost value or modify the V/F curve value 6. Check the power supply voltage or check the bus voltage value

Constant speed overcurrent	1. The output of the inverter is grounded or short-circuited 2. There is no parameter identification for the motor in the vector control mode 3. There is a sudden load during operation 4. Low voltage 5. Inverter selection is too small	1. Check the insulation of the motor and cables. 2. Parameter identification of the motor 3. Check the load 4. Check the power supply voltage or check the bus voltage 5. Use a frequency conversion with a larger power level device
E004 Accelerating overvoltage	1. The input voltage is too high 2. The acceleration time is too short 3. During the acceleration process, there is an external force that drives the motor to run 4. The braking unit and braking resistor are not installed.	1. Adjust the voltage to the normal range 2. Increase the acceleration time 3. Check the load 4. Install braking unit and braking resistor
E005 deceleration overvoltage	1. The input voltage is too high. 2. An external force drives the motor during deceleration. 3. The acceleration time is too short. 4. The braking unit and braking resistor are not installed.	1. Adjust the voltage to normal range. 2. Cancel the external force or install a braking resistor. 3. Increase the acceleration time. 4. Install the braking unit and braking resistor.
E006 Constant speed overvoltage	1. The input voltage is too high 2. During the operation, there is an external force that drives the motor to run	1. Adjust the voltage to the normal voltage 2. Adjust the braking unit and braking resistor
E007 control power failure	1. Input voltage not within specification 2. The relay does not suck	1. Adjust the voltage to within the normal range
E008 Undervoltage fault	1. The input voltage is low or the contacts are in poor contact 2. The bus voltage is abnormal 3. The relay or contactor does not pull in 4. The control board is abnormal	1. Reset the fault. 2. Adjust the voltage to normal range. 3. Contact the agent.
E010 input phase loss	1. Phase loss of three-phase input power 2. The driver board is abnormal	1. Eliminate external faults
E011 output phase loss	1. The lead wire from the inverter to the motor is abnormal 2. The inverter output three-phase unbalanced or lack of phase 3. The driver board is abnormal 4. Module exception	1. Eliminate external faults. 2. Check whether the motor three-phase winding is normal.
E012 Short circuit to ground	The motor is short circuited to the ground.	Replace the cable or motor.
E014 AC drive overload	1. The load is too heavy or locked-rotor occurs on the motor. 2. The AC drive model is of too small power class.	1. Reduce the load and check the motor and mechanical condition. 2. Select an AC drive of higher power class.
E015 Motor overload	1. PE.01 is set improperly. 2. The load is too heavy or locked-rotor occurs on the motor. 3. The AC drive model is of too small power class.	1. Set PE.01 correctly. 2. Reduce the load and check the motor and the mechanical condition. 3. Select an AC drive of higher power class.
E016 Module overheat	1. The ambient temperature is too high 2. The air duct is blocked 3. The fan is damaged 4. Module overheating device damage	1. Improve the ambient temperature 2. Clean the air duct 3. Replace the fan 4. Seek technical support
E018 External device failure	Input external fault signal through multi-function digital terminal X	reset operation
E021 Current detection failure	1. Current Hall detection damage 2. Drive board failure	1. Replace the faulty current sensor. 2. Replace the faulty drive board.
E026 Motor identification fault	1. Improper setting of motor parameters 2. Check whether the inverter time is too long	1. Reset the motor parameters 2. Check whether the inverter is connected to the motor
E028 Fast current limit fault	1. Excessive load or motor stall 2. Inverter selection is too small 3. The motor is not self-learning	1. Check the motor and load 2. Self-identification of motor parameters 3. Change the control mode to V/F (PO.00:1) and restart. or right The motor performs rotation self-learning.

11. Safety protection and accident handling

We are produced in strict accordance with the quality of international national and industry standards and have passed international certification and testing. At the same time, the product adopts a frequency conversion control unit with safety protection.

In case of an emergency the frequency converter stops operation and sends warning or alarm signal and displays the relevant code.

Please contact the manufacturer or local distributor and provide error code for a solution in time.

12. Maintenance

Maintenance items	1st year 6th year	2nd year 7th year	3rd year 8th year	4th year 9th year	5th year 10th year
check running direction of the fan	daily				
check running noise and vibration	daily				
check control box working status					
check deformation of blades					
check tightness of steel wires					
check guy wire					
check connection of blade and connector					
check connection of blade safety strip					
check anti-detachment of motor and hub					
check mounting plate bolts					
check extension pipe and plate bolts					
check extension pipe and motor frame bolts					
check motor frame bolts					
check welding parts					
check bottom cover					
check wiring					
clean dust & dirt of motor, blade, control box					

Maintenance for long time out of use

- Ensure power supply is disconnected
- Clean dusts and dirt before re-connecting power supply and operation

13. Warranty & After Sales

This product enjoys 3 year full warranty since the date of shipment.

If the product fails during the product warranty period, please contact the manufacturer or local distributor for a solution in time.

Please don't try to troubleshoot by yourself so as not to be unable to enjoy the warranty.

Following situations will not be covered in warranty:

- Faults/damage caused by improper operation
- Faults/damage caused by power outage during operation
- Failure/damage caused by changing the structure or position of the product without permission
- Failure/damage due to force majeure factors such as floods, fires, earthquakes, droughts, wars, etc.

Maintenance Records

	Maintenance Records
1st year	
2nd year	
3rd year	
4th year	
5th year	
6th year	
7th year	
8th year	
9th year	
10th year	