

# FS100 Series

## Air Conditioning Driver User Manual

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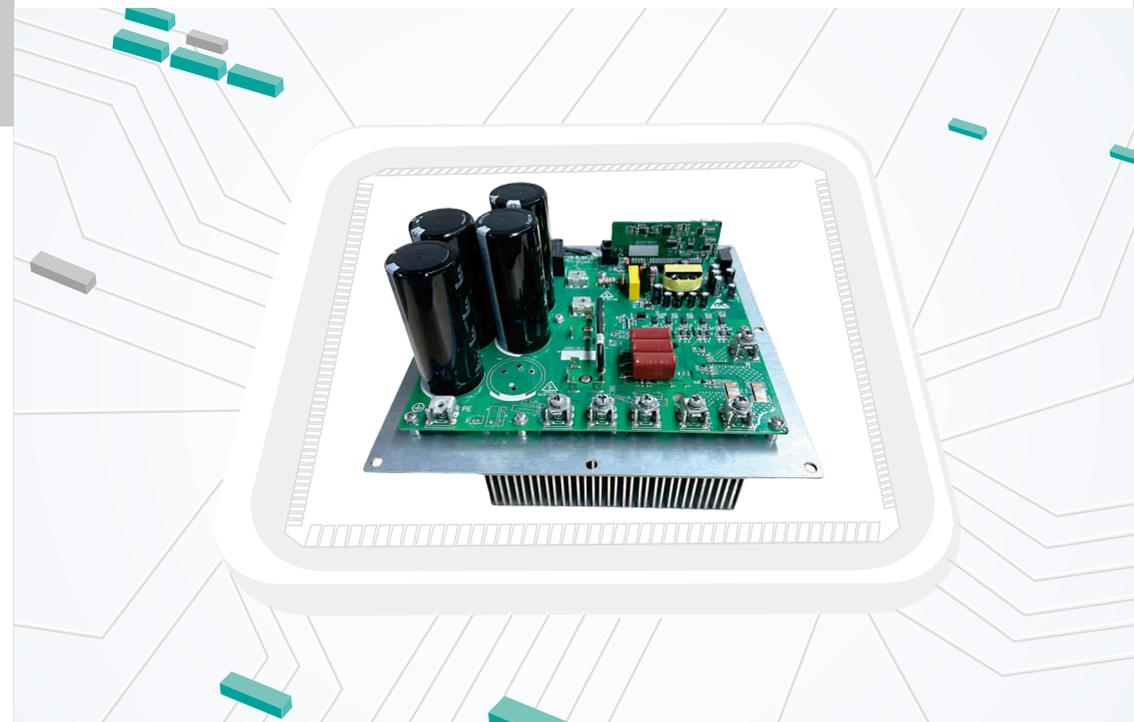
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## Preface

Thank you for choosing the FS100 series air conditioning driver produced by Shenzhen Simphoenix Electric Technology Co., Ltd.

This manual is for FS100 series air conditioning drivers, It will provide you with FS100 series air conditioning driver installation, wiring, functional parameters, daily maintenance, troubleshooting and other related details and precautions.

For the proper use of this series, maximize the excellent performance of the product and ensure the safety of users and equipment, be sure to read this manual in detail before using the FS100 series air conditioning driver. This manual is a random attachment, please keep it properly for the future repair and maintenance of the inverter.

Due to continuous improvement, the information is subject to change without notice.

Incorrect use may cause abnormal operation of the frequency converter, failure, reduce the service life, and even occur equipment damage, personal casualties and other accidents!



FS100 Series Air Conditioning Driver user's guide

Use the manual version V1.5

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**This manual is applicable to C200 and above program versions**



# Catalogue

Chapter 1	Product Confirmation and Precautions for Use.....	1
1.1	Product Confirmation1	
1.1.1	Confirmation of product body and accessories.....	1
1.1.2	Product nameplate.....	1
1.2	afety precautions.....	1
1.2.1	Installation precautions.....	1
1.2.2	Wiring safety precautions.....	2
1.2.3	Operational safety precautions.....	2
1.2.4	Maintenance and safety precautions.....	
1.2.5	Transportation and storage.....	3
1.2.6	Disposal precautions.....	3
Chapter 2	Product Introduction.....	4
2.1	Overview.....	4
2.2	Driver Model Description.....	4
2.3	Driver Model Table.....	4
2.4	Technical indicators and specifications of the drive.....	5
Chapter 3	Product Installation.....	7
3.1	Driver Installation Diagram.....	7
3.2	Information Table for Drive Boundary Dimensions, Installation Dimensions, and Air Channel Slotting Dimensions.....	7
3.3	Schematic diagram of external dimensions and installation dimensions of the Drive.....	8
3.4	Schematic diagram of slot size for driver air duct.....	8
3.5	EMI Filter Boundary Dimensions and Installation Dimensions Information Table.....	8
3.6	Schematic diagram of external dimensions and installation dimensions of EMI Filter.....	9
3.7	Information Table for External Dimensions and Installation Dimensions of DC Reactors.....	9
3.8	Schematic diagram of external dimensions and installation dimensions of DC Reactor.....	9
Chapter 4	Product Wiring and Station Address Dialing Settings.....	10
4.1	Driver Standard Wiring Diagram.....	10
4.2	Driver Main Circuit Wiring Terminal Description.....	12
4.3	Driver Control Circuit Wiring Terminal Description.....	13
4.4	Selection Guide for Drive Main Circuit Cable and Ear Selection.....	15
4.5	Driver Station Address Dialing Settings.....	15
Chapter 5	Functional Parameter Table.....	17
5.1	System Management Parameters.....	17
5.2	List of Status Monitoring Parameters.....	26
5.3	Historical Fault Records.....	27
5.4	Description of Status Range and Multifunctional Terminal Appendix.....	27

Chapter 6	Fault Diagnosis and Countermeasures.....	29
6.1	Protection functions and countermeasures.....	29
Chapter 7	Communication Protocol Description.....	31
7.1	Communication Settings.....	31
7.2	Communication Function.....	31
7.3	Protocol Format.....	31
7.4	Interpretation of Protocol Format.....	31
7.4.1	Slave Address.....	31
7.4.2	PDU section.....	31
7.4.3	Address Definition of Communication Parameters.....	33
7.5	Examples.....	35
Chapter 8	Accessories Selection.....	37
8.1	Debugging keyboard selection (manual operator).....	37
8.2	Instructions for Using Independent Fans.....	37
8.3	Information table on the size of air duct slots when using a square independent fan.....	37
8.4	Instructions for using RS485 adapter cables.....	38
Chapter 9	Product Dimensions.....	39
9.1	FS100-2S020P Dimensional Drawing.....	39
9.2	FS100-4T020P-R Dimensional Drawing.....	39
9.3	FS100-4T080P Dimensional Drawing.....	40
9.4	FS100-4T120P-RA1 Dimensional Drawing.....	40
9.5	FS100-4T120P-RA2 Dimensional Drawing.....	41
9.6	FS100-4T150P Dimensional Drawing.....	41
9.7	FS100-4T180P-R Dimensional Drawing.....	42
9.8	FS100-4T180P&4T220P Dimensional Drawing.....	42
9.9	FS100-4T370P&4T450P Dimensional Drawing.....	43
9.10	FS100-4T220PC Dimensional Drawing.....	43
9.11	FS100-4T370PC&4T450PC Dimensional Drawing.....	44

## Chapter 1 Product Confirmation and Precautions for Use

### 1.1 Product Confirmation

- After the product arrives, please carefully observe the outer packaging to confirm whether there is any damage to the outer packaging; If there is a label on the outer packaging, please confirm whether the model and specifications on the label are consistent with your ordering requirements. If any damage or inconsistency is found, please contact the supplier immediately for resolution

#### 1.1.1 Confirmation of product body and accessories

- When opening the packaging box, please carefully confirm whether the driver body and its accessories are damaged during transportation, whether the components are damaged or detached, whether the driver body and the following accessories are included:
  - User manual;
  - Certificate of conformity;
  - Product lis;
  - Other attachments ordered.
- If there is any omission or damage, please contact the supplier as soon as possible to resolve it.

#### 1.1.2 Product nameplate

- On the drive, there is a nameplate indicating the drive model, rated parameters, product serial number, and barcode. The content of the nameplate is shown in the following figure.



### 1.2 Safety precautions

- Please carefully read the product manual and safety precautions before installation!

#### 1.2.1 Installation precautions

- Do not install the drive on flammable materials, otherwise there is a risk of fire.

- Do not install the driver in areas with strong electric or magnetic fields.
- Do not install the drive in an environment containing explosive gases, as there is a risk of explosion.
- Do not use drivers with damaged or missing components, as it may cause personal injury, fire, and other accidents.
- Unauthorized disassembly and modification of the drive is prohibited.
- Do not drop foreign objects into the drive, otherwise it may cause the drive to malfunction.
- When the driver is installed in the cabinet or terminal equipment, the cabinet or terminal equipment needs to provide corresponding protective devices such as fire-resistant shells, electrical protective shells, and mechanical protective shells.

### 1.2.2 Wiring safety precautions

- Please entrust professional personnel to carry out wiring. Improper wiring operation may cause injury to equipment and personnel.
- It is prohibited to carry out wiring operations while the power is turned on, otherwise there may be a risk of electric shock.
- Before wiring, please cut off all equipment power. After cutting off the power, please wait for the drive LED indicator to turn off for at least 10 minutes before proceeding with wiring operations, otherwise there is a risk of electric shock.
- The grounding terminal of the driver must be reliably grounded, otherwise there is a risk of electric shock.
- Do not connect AC power to the U, V, or W of the drive, as it may damage the drive.
- Confirm that the input voltage is consistent with the rated voltage value of the driver, otherwise it may damage the driver.
- Confirm that the motor and driver are compatible, otherwise it may damage the motor or cause driver protection.

### 1.2.3 Operational safety precautions

- Do not use damp hands to operate the switch, otherwise it may cause electric shock.
- During the period when the driver is powered on, even if the motor is in a stopped state, do not touch the driver terminals, otherwise it may cause electric shock.
- If the restart function is used, as it will suddenly restart after eliminating the alarm, please do not approach the load equipment, otherwise it may cause personal injury.
- Please design the system to ensure personal and property safety even when it is restarted.

- Please set up an emergency stop switch separately, otherwise it may cause personal injury.
- The temperature of the installation board and DC reactor may be very high, please do not touch them, otherwise there is a risk of burns.

#### 1.2.4 Maintenance and safety precautions

- Non professionals are strictly prohibited from carrying out equipment maintenance, component replacement, and other maintenance operations on the drive. Please use insulated protective tools during homework. It is strictly prohibited to leave wire or metal objects inside the machine. Otherwise, it may cause hazards such as electric shock, fire, and personal injury.
- It is strictly prohibited to repair the drive while it is powered on, otherwise there is a risk of electric shock.
- After cutting off the power, please wait for the driver LED indicator to turn off for at least 10 minutes before conducting equipment maintenance and repair operations, otherwise there is a risk of electric shock.
- When the drive malfunctions or is damaged, professional personnel should follow the maintenance instructions to troubleshoot and repair the drive, and keep maintenance records.
- Do not continue to use equipment that has been damaged, as it may cause greater damage.
- After replacing the drive, please make sure to re check the equipment wiring and corresponding parameter settings, otherwise there is a risk of damage to property.

#### 1.2.5 Transportation and storage

- When handling products, please grip the bottom left and right sides of the body with both hands, not just the cover plate or parts.
- When storing, try to use the original packaging boxes of our company and store according to the storage conditions specified in the product instructions.
- Try to avoid storing the drive for more than 3 months. If it is stored for more than 3 months, please provide stricter protection and power on the drive once for more than half an hour. If it is stored for more than 6 months, necessary inspections must be carried out.

#### 1.2.6 Disposal precautions

- Do not incinerate the discarded drive at will, as the electrolytic capacitors inside the drive may explode during incineration.
- Dispose of the drive as industrial waste.

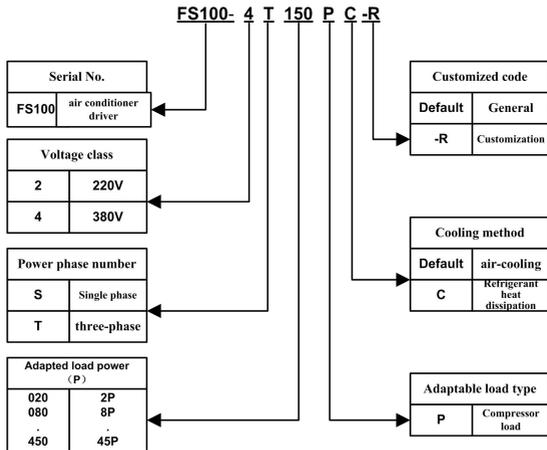
## Chapter 2 Product Introduction

### 2.1 summary

The FS100 series air conditioner driver is a variable frequency drive designed specifically for scroll compressors, using our independently developed compressor driving algorithm to achieve precise control of the scroll compressor. This product also has complete protection functions such as phase loss detection, undervoltage, overvoltage, short circuit, overcurrent, overheating, overload, etc.

The driver adopts an integrated embedded structure design, integrating the control board, power board, driver board, and power board into one, with stable performance and simple installation.

### 2.2 Driver Model Description



### 2.3 Drive Model Table

Drive model	input voltage (VAC)	Maximum capacity (KVA)	Maximum current (A)	Adapted motor (P)	Adaptive filter	Adapted reactor	Gross Weight(Kg)	Net Weight(Kg)
FS100-2S020P	single-phase 220V	2.9	7.5	2	nothing	Not supported	1.6	1.3
FS100-4T020P-R	three-phase 380V	2.7	4.1	2	nothing	Not supported	1.9	1.6
FS100-4T080P		13.2	20	8	integration	SFDR-041	3.8	3.4
FS100-4T120P-RA1		17.8	27	12	nothing	SFDR-041	5.7	5
FS100-4T120P-RA2		17.8	27	12	nothing	SFDR-041	5.4	4.7
FS100-4T150P		21.7	33	15	integration	SFDR-042	4.4	4
FS100-4T180P-R		24.4	37	18	EEF-A405	SFDR-043	6.6	5.7
FS100-4T180P		30.3	46	18	EEF-A405	SFDR-043	5.0	4.6
FS100-4T220P(C)		32.9	50	22	EEF-A405	SFDR-043	5.3(4.2)	4.9(3.8)
FS100-4T370P(C)		44.1	67	37	EEF-A406	SFDR-044	7.6(7.6)	6.7(6.7)
FS100-4T450P(C)		59.2	90	45	EEF-A406	SFDR-031	7.6(7.6)	6.7(6.7)

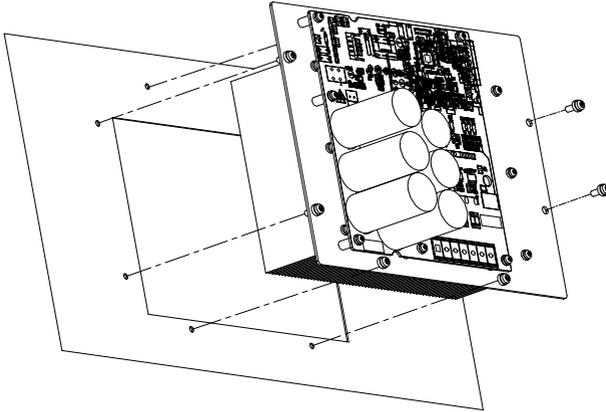
## 2.4 Technical specifications and specifications of the drive

<b>transport enter transport Outbound</b>	Input power supply	single-phase 2S: AC 220V(-15%)~240V(+10%), 50/60Hz; three-phase 4T: AC 380V(-15%)~415V(+10%), 50/60Hz;	
	output voltage	single-phase 2S: 0~220 V;	three-phase 4T: 0~380 V
	output frequency	Low frequency mode: 0.50~500.00Hz;	High frequency mode: 5.0~1000.0Hz;
	frequency resolution	Low frequency mode: 0.01Hz;	High frequency mode: 0.1Hz
	Analog input	1 set of analog input AI1 (standard across the entire series), default 0-10VDC, can be selected by dialing 4-20mADC, 1 set of analog 5V power supply (only supported by FS100-2S020P)	
	Digital input	1 set of programmable digital inputs DI1	
	Digital output	1 set of programmable open collector output DO1	
	Relay output	1 set of programmable relay outputs TA/TB/TC	
	DC fan output	2 sets of DC fan interfaces DCFAN1~2 (only supported by FS100-4T080P and FS100-4T150P)	
<b>Control characteristics</b>	control mode	Open loop vector control	V/F control
	Starting torque	0 Speed 180%	0 Speed 180%
	Speed regulation range	1: 200	1: 100
	Stable speed accuracy	±0.2%	±0.5%
	Torque control accuracy	±5%	--
	Torque response time	≦25ms	--
	carrier frequency	2~8KHz	
	Acceleration and deceleration time	0.01~600.00Sec	
<b>Featured features</b>	RS485 communication	1-way RS485, supports MODBUS-RTU protocol	
	Hardware Station Address	Support hardware station address dialing settings for 1-15, please refer to Chapter 4.5 for details	
	General functions	Fault self recovery, motor parameter dynamic/static self identification, start delay, overcurrent suppression, overvoltage/undervoltage suppression, custom curve, and wire breakage detection	

	Macro parameters	Using macro parameters, typical applications can be implemented with just one click
<b>Protection function</b>	Power supply	Undervoltage protection, three-phase power imbalance protection, and power phase loss protection (only applicable to 4T models)
	Operation protection	Overcurrent protection, overvoltage protection, driver overheating protection, driver overload protection, motor overload protection, output phase loss protection, IGBT drive protection
<b>work environment</b>	Installation environment	No dust, corrosive, flammable gases, no oil mist, water vapor, no dripping water, salt content
	Altitude	0-1000 meters. For every 1000 meters increase, the output current capacity is reduced by 10%
	Working environment temperature	-20℃ ~ +60℃
	Storage environment temperature	-30℃ ~ +70℃
	Environmental humidity	Below 95%, no water droplets condensing
	Vibration	< 6m/s <sup>2</sup>

## Chapter 3 Product Installation

### 3.1 Driver Installation Diagram

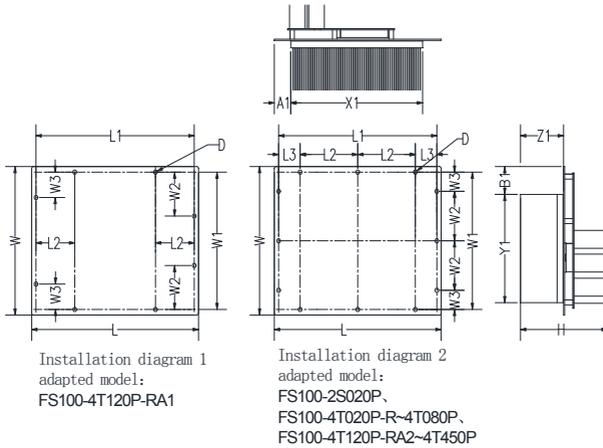


### 3.2 Information Table of Drive Boundary Dimensions, Installation Dimensions, and Air Channel Slotting Dimensions (Unit: mm)

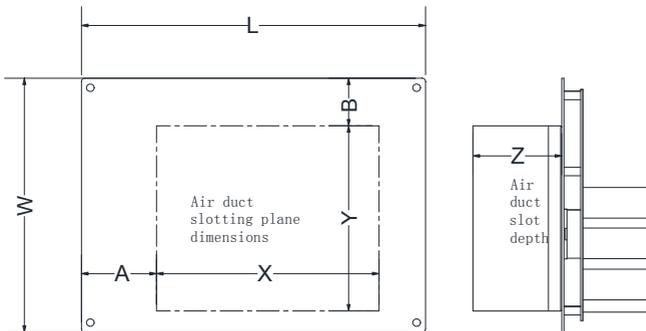
Drive model	External dimensions			Installation dimensions							Recommended size for air duct slotting				
	L	W	H	L1	L2	L3	W1	W2	W3	D	X	Y	Z	A	B
FS100-2S020P	140	175	110	126	-	0	161	-	0	6.0	132	97	35	4	47
FS100-4T020P-R	175	210	113	125	-	0	197	-	0	5.0	134	105	51	21	85
FS100-4T080P	227	236	112	219	90.8	18.8	224	90.8	21.3	5.0	135	202	50	29	22
FS100-4T120P-RA1	310	240	150	294	72	-	222	71	41	7.0	250	181	85	28	42
FS100-4T120P-RA2	280	246	157	268	115	19	234	117	0	7.0	222	153	94	45	70
FS100-4T150P	250	260	163	236	118	0	246	123	0	6.0	181	131	87	46	90
FS100-4T180P-R	275	300	200	261	130.5	0	286	143	0	7.0	245	115	96	15	141
FS100-4T180P	275	275	176	261	130.5	0	261	130.5	0	7.0	185	136	85	59	115
FS100-4T220P	275	275	186	261	130.5	0	261	130.5	0	7.0	185	136	85	59	115
FS100-4T370P	275	300	191	261	130.5	0	286	143	0	7.0	203	155	95	52	110
FS100-4T450P	275	300	201	261	130.5	0	286	143	0	7.0	203	155	95	52	110
FS100-4T220PC	275	275	130	261	130.5	0	261	130.5	0	7.0	185	136	29	59	115
FS100-4T370PC	275	300	125	261	130.5	0	286	143	0	7.0	203	155	29	52	110
FS100-4T450PC	275	300	135	261	130.5	0	286	143	0	7.0	203	155	29	52	110

Explanation: The direction of the frequency converter is based on the radiator teeth as the up and down direction, and the input and output terminals are facing left or beyond the bottom as the standard.

### 3.3 Schematic diagram of external dimensions and installation dimensions of the driver



### 3.4 Schematic diagram of slot size for driver air duct



### 3.5 EMI filter external dimensions and installation dimension information table (unit: mm)

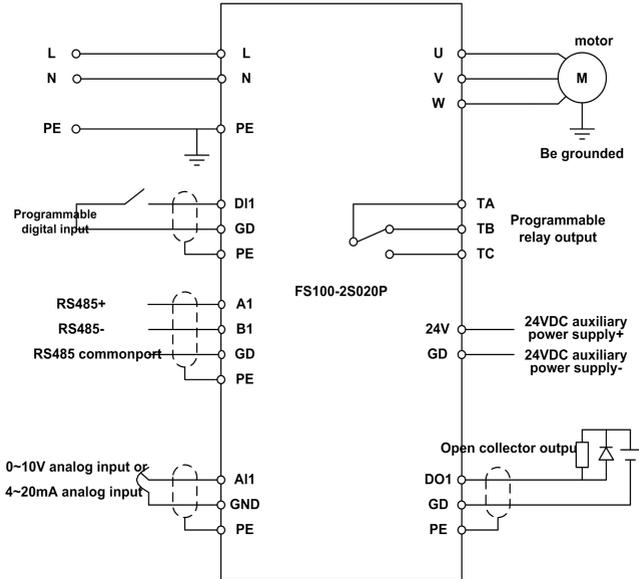
EMI filter model	External dimensions			Installation dimensions						
	L	W	H	L1	L2	L3	W1	W2	H1	D
EEF-A405	160	120	70	149	-	-	109	-	15	5.0
EEF-A406	160	120	85	149	-	-	109	-	15	5.0



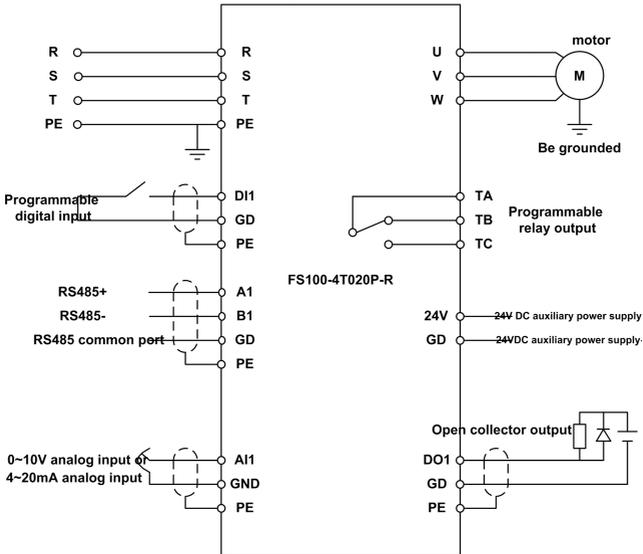
## Chapter 4 Product Wiring and Station Address Dialing Settings

### 4.1 Driver Standard Wiring Diagram

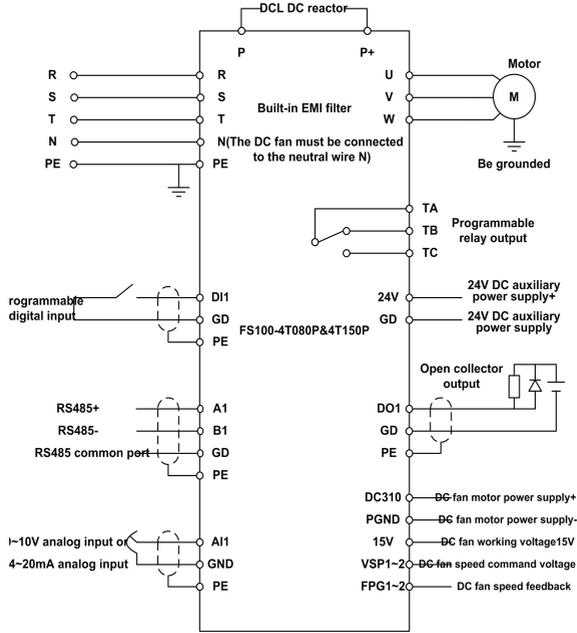
I Applicable models for class wiring diagram: FS100-2S020P



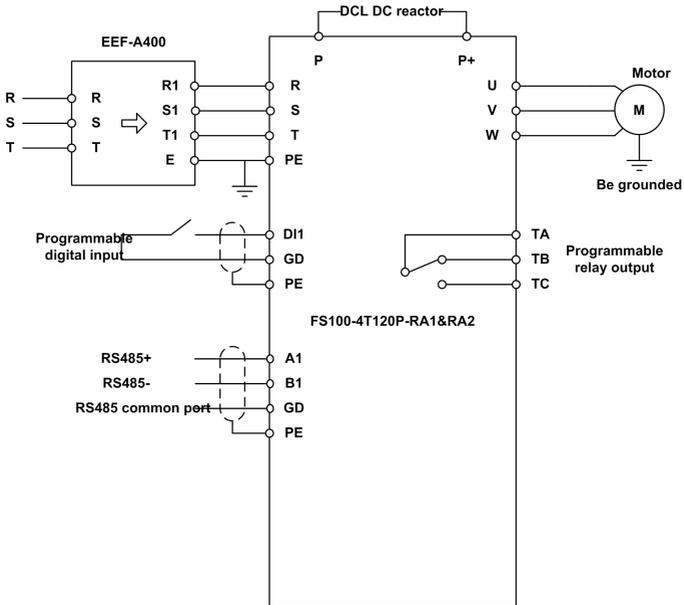
II Applicable models for class wiring diagram: FS100-4T020P-R



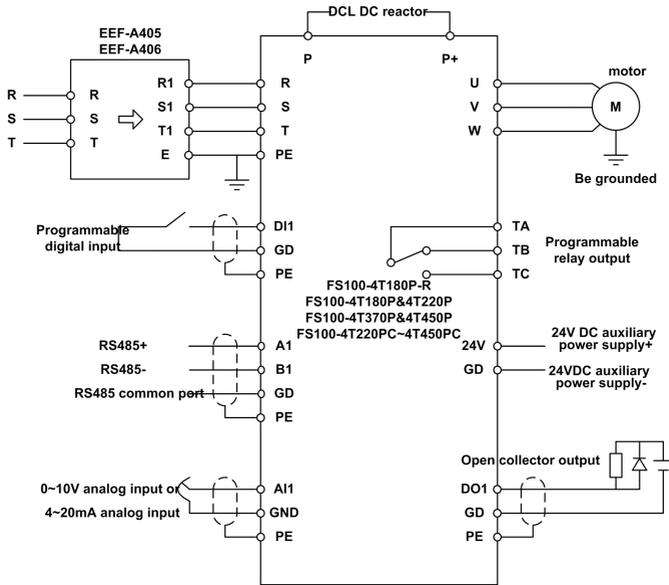
III Applicable models for class wiring diagram: FS100-4T080P, FS100-4T150P



IV Applicable models for class wiring diagram: FS100-4T120P-RA1&RA2



V Applicable models for class wiring diagram: FS100-4T180P-R、FS100-4T180P~4T450P、FS100-4T220PC~4T450PC



#### 4.2 Driver main circuit wiring terminal description

I Applicable models for the wiring terminals of the main circuit of class drivers: FS100-2S020P

Main circuit symbol	Function Description	Main circuit symbol	Function Description
L、N	Single phase 220V AC power supply	U、V、W	Fans ,water pumps
PE	Grounding	CON11	PE jumper socket, unplug the jumper when testing AC withstand voltage

II Applicable models for the wiring terminals of the main circuit of class drivers: FS100-4T020P-R

Main circuit symbol	Function Description	Main circuit symbol	Function Description
R、S、T	Three phase 380V AC power supply	U、V、W	Fans ,water pumps, compressors
PE	Grounding	CON11	PE jumper socket, unplug the jumper when testing AC withstand voltage

III Applicable models for the wiring terminals of the main circuit of class drivers :

FS100-4T080P~4T150P

Main circuit symbol	Function Description	Main circuit symbol	Function Description
R、S、T	Three phase 380V AC power supply	U、V、W	Fans ,water pumps, compressors
P、P+	DC reactor	PE	Grounding
CON11&CON15	PE jumper socket, unplug the jumper when testing AC withstand voltage		

IV Applicable models for the wiring terminals of the main circuit of class drivers :

FS100-4T180P-R

Main circuit symbol	Function Description	Main circuit symbol	Function Description
R、S、T	Three phase 380V AC power supply	U、V、W	Fans ,water pumps, compressors
P、P+	DC reactor	PE	Grounding
J1(DNR017)	Measure AC withstand voltage and unplug this terminal		

V Applicable models for the wiring terminals of the main circuit of class drivers :

FS100-4T180P~4T450P、FS100-4T220PC~4T450PC

Main circuit symbol	Function Description	Main circuit symbol	Function Description
R、S、T	Three phase 380V AC power supply	U、V、W	Fans ,water pumps, compressors
P、P+	DC reactor	PE	Grounding

#### 4.3 Description of wiring terminals for driver control circuit

I Applicable models for wiring terminals of class drive control circuits: FS100-2S020P

Control circuit symbols	Function Description	Control circuit symbols	Function Description
A1~B1~GD	A1: RS485 +; B1: RS485 -; GD: RS485 Land;	DI1~GD	Programmable digital input, default to "emergency stop", set by F3.00~F3.01; Optocoupler isolation input: 24VDC/5mA;
24V~GD	Switching terminal auxiliary power supply, capable of providing 24V/50mA power supply to the outside;	DO1~GD	Programmable open collector output, from F4.00~F4.03 settings;
GD	RS485, DI1, DO1, 24V common terminal	TA、TB、TC	Programmable relay output, set from F4.00 to F4.03; Contact capacity: 250VAC/2A;
A11~GND	Analog input A11: default 0-10VDC, can be selected by dialing 4-20mADC;	5V~GND	Analog terminal auxiliary power supply: can provide 5V/20mA power supply to the outside
GND	5V, A11 common terminal		

II Applicable models for wiring terminals of class drive control circuits :  
FS100-4T120P-RA1&4T120P-RA2

Control circuit symbols	Function Description	Control circuit symbols	Function Description
A1~B1~GD	A1: RS485 +; B1: RS485 -; GD: RS485 land;	DI1~GD	Programmable digital input, default to "emergency stop", set by F3.00~F3.01; Optocoupler isolation input: 24VDC/5mA;
GD	RS485、DI1 Public end	TA、TB、TC	Programmable relay output, set from F4.00 to F4.03; Contact capacity: 250VAC/2A;

III Applicable models for wiring terminals of class drive control circuits: FS100-4T080P&4T150P

Control circuit symbols	Function Description	Control circuit symbols	Function Description
A1~B1~GD	A1: RS485 +; B1: RS485 -; GD: RS485 land;	DI1~GD	Programmable digital input, default to "emergency stop", set by F3.00~F3.01; Optocoupler isolation input: 24VDC/5mA;
24V~GD	Switching terminal auxiliary power supply, capable of providing 24V/50mA power supply to the outside;	DO1~GD	Programmable open collector output, from F4.00~F4.03 settings;
GD	RS485、DI1、DO1、24V Public end	TA、TB、TC	Programmable relay output, set from F4.00 to F4.03; Contact capacity: 250VAC/2A;
A11~GND	Analog input A11: default 0-10VDC, can be selected by dialing 4-20mADC;	GND	A11 Public end
DCFAN1~2	2 sets of DC fans		

IV Applicable models for wiring terminals of class drive control circuits: FS100-4T020P-R、4T180P-R、4T180P~4T450P (C)

Control circuit symbols	Function Description	Control circuit symbols	Function Description
A1~B1~GD	A1: RS485 +; B1: RS485 -; GD: RS485 地;	DI1~GD	Programmable digital input, default to "emergency stop", set by F3.00~F3.01; Optocoupler isolation input: 24VDC/5mA;
24V~GD	Switching terminal auxiliary power supply, capable of providing 24V/50mA power supply to the outside;	DO1~GD	Programmable open collector output, from F4.00~F4.03 settings;
GD	RS485、DI1、DO1、24V Public end	TA、TB、TC	Programmable relay output, set from F4.00 to F4.03; Contact capacity: 250VAC/2A;
A11~GND	Analog input A11: default 0-10VDC, can be selected by dialing 4-20mADC;	GND	A11 Public end

#### 4.4 Guide for selecting the main circuit cable and ear of the driver

Single phase driver model	L, N (mm <sup>2</sup> )	U, V, W, PE (mm <sup>2</sup> )	P, P+ (mm)	Screw specifications	Recommended torque (N.m)	Recommended thread ear
FS100-2S020P	1.5	1	nothing	8*6.3 Insert piece	nothing	FDFD2-250
Model of three-phase driver	R, S, T (mm <sup>2</sup> )	U, V, W, PE (mm <sup>2</sup> )	P, P+ (mm)	Screw specifications	Recommended torque (N.m)	Recommended thread ear
FS100-4T020P-R	0.75	0.75	nothing	M3.5	0.7~0.9	PTV1.25-9
FS100-4T080P	4	4	4	M5	2~4	RNY2-5S
FS100-4T120P-RA1	4	4	6	M5	2~4	RNY5.5-5
FS100-4T120P-RA2	4	4	6	M5	2~4	RNY5.5-5
FS100-4T150P	10	10	10	M5	3~5	RNY8-5S
FS100-4T180P-R	10	10	10	M5	4~6	RNY8-5S
FS100-4T180P	10	10	10	M5	4~6	RNY8-5S
FS100-4T220P(C)	10	10	10	M5	4~6	RNY8-5S
FS100-4T370P(C)	16	16	16	M5	6~8	RNY22-5S
FS100-4T450P(C)	16	16	16	M5	6~8	RNY22-5S

#### 4.5 Driver Station Address Dialing Settings

The FS100 variable frequency drive integrates a hardware station address dial switch. The RS485 communication station address=software station address setting parameter F6.01+station address dial switch set station address. The specific settings are as follows:

Instructions for Setting the DIP Switch	DIP switch status	Software Station Address	RS485 communication station address
<p>① The station address dial switch has 4 groups from left to right, including 1, 2, 3, and 4. Each group has two states: 0 and 1. When dialed to the bottom, it represents the 0 state, and when dialed to the top (ON), it represents the 1 state.</p>	0000	1(Scope can be set 1~127)	1
	1000	1	2
	0100	1	3
	1100	1	4
	0010	1	5
	1010	1	6
	0110	1	7
	1110	1	8
	0001	1	9
	1001	1	10
	0101	1	11
	1101	1	12
	0011	1	13
	1011	1	14
	0111	1	15
	1111	1	16



## Chapter 5 FUNCTIONAL PARAMETER TABLE

## 5.1 System Management Parameter

parameter type	Function Code	Name	Setting Range and Description	Minimum Unit	Factory Default	Change Limit
Basic operating parameter group	F0.00	Frequency input channel and fan control	<b>LED Units:</b> Frequency input channel 0: Digital setting 1: External simulation quantity 2: External communication 3: Panel potentiometer 4: External terminal selection 5: Combination setting 6: Terminal UP / DW setting <b>LED Thousands:</b> <b>Cooling fan control</b> 0: Not valid 1: valid(Temperature> 45℃ was run)	1	3	W1
	F0.01	Frequency number setting	0.00Hz ~ [F0.02]Hz	0.01	50.00	W1
	F0.02	Upper limiting frequency	Low frequency mode: 0.5 ~ 500.00Hz High frequency mode: 5.0 ~ 1000.0Hz	0.01	50.00	W2
	F0.03	Lower limit frequency	0.00 ~ [F0.02] Hz	0.01	0.00	W2
	F0.04	Parameter locking	<b>LED Units: Parameter display and modification</b> 0: All of the parameters are allowed to change 1: Only this parameter and F001 are allowed 2: Parameter lock only allows the modification of this parameter <b>LED 千位: Macro parameter</b> 0: No macro parameters 1~4: Apply the macro parameters	1	0000	W1
	F0.05	Operation direction and Combination setting	<b>LED Units:</b> Run in reverse direction 0: Not valid 1: The direction is reversed <b>LED Tens:</b> Direction lock 0: Not valid 1: Reverse prevent 2: Positive rotation prevention <b>LED Hundreds:</b> Lower limit frequency mode 0: Below the lower limit Keep the lower limit 1: Below the lower limit output 0 frequency <b>LED Thousands:</b> Frequency combination setting 0: External voltage + panel setting 1: External voltage + panel setting + number setting 2: Communication setting + external voltage setting 3: Communication setting + external voltage setting + panel setting 4: Communication setting-panel setting + number setting 5: Communication setting-the external voltage setting 6: Communication setting + external voltage-panel setting 7: External voltage setting-panel setting + number setting 8: Panel setting-Number setting 9: UP / DW frequency + external voltage setting A: UP / DW frequency + panel setting + external voltage setting b: Digital setting-the external voltage setting	1	0000	W1
	F0.06	Run the command channel and the mode selection	<b>LED Units:</b> Run the command channel selection 0: Keyboard control 1: External terminal control 2: Serial communications port <b>LED Tens:</b> Run the command mode selection 0: Second-line mode1 1: Second-line mode2 2: Three line mode1 3: Three line mode2 <b>LED Hundreds:</b> Reserved <b>LED Thousands:</b> Start protection options 0: Not protect 1: Protect	1	0000	W1
	F0.07	Parameter initialization	0: Not valid 1: Standard initialization 2: Clear the fault record 3: Full initialization	1	0	W2
F0.08	Carrier frequency	2.0 ~ 8.0KHz	0.1	☆	W1	

18 Table of functional parameters

parameter type	Function Code	Name	Setting Range and Description	Minimum Unit	Factory Default	Change Limit
	F0.09	The carrier characteristics	<b>LED Units:</b> Load association adjustment 0: Not valid 1: Valid <b>LED Tens:</b> Temperature association adjustment 0: Not valid 1: Valid <b>LED Hundreds:</b> Base frequency association adjustment 0: Not valid 1: Valid <b>LED Thousands:</b> Modulation mode 0: Asynchronous 1: Synchronization 2-5: Noise smooth	1	0111	W1
	F0.10	Output and control settings	<b>LED Units:</b> Motor control mode 0: VF control 1: Open-loop vector control of the Asynchronous motor 2: Motor open ring vector control <b>LED Tens:</b> Reserved <b>LED Hundreds:</b> Reserved <b>LED Thousands:</b> Output mode 0: Low frequency mode(0~500.00Hz) 1: High frequency mode(0~1000.0Hz) 2: Stable stant load operation (P-type)	1	0000	W2
	F0.11	Rights password and parameter copy	0: Not valid 1: Parameter upload 2: Parameter download	1	0	×
	F0.12	Monitoring parameter selection	0 ~ 31(D0.00 ~ D0.31)	1	0	W1
	F0.13	S curve ratio	0 ~ 50%	1	0	W1
	F0.14	Acceleration time 1	0.01 ~ 600.00 Sec	0.01	☆	W1
	F0.15	Deceleration time 1	0.01 ~ 600.00 Sec	0.01	☆	W1
	F0.16	Acceleration time 2 (point action)	0.01 ~ 600.00 Sec	0.01	☆	W1
	F0.17	Deceleration time 2 (point action)	0.01 ~ 600.00 Sec	0.01	☆	W1
	F0.18	Positive turn point movement frequency	0.00 ~ [F0.02]Hz	0.01	5.00	W1
	F0.19	Reverse point motion frequency	0.00 ~ [F0.02]Hz	0.01	5.00	W1
Basic control parameter group	F1.00	Start the pre-excitation current	0.0 ~ 100.0%	0.1	30.0	W1
	F1.01	Start the pre-excitation time	0.00 ~ 10.00 Sec	0.01	0.0	W1
	F1.02	Start frequency	0.0 ~ min(F0.02,100.00)Hz	0.01	1.00	W1
	F1.03	Start the frequency hold time	0.00 ~ 10.00 Sec	0.01	0.0	W1
	F1.04	Halt mode	<b>LED Units:</b> Starting mode 0: Regular start 1: Unidirectional speed tracking start 2: Bidirectional speed tracking starts <b>LED Tens:</b> Reserved <b>LED Hundreds:</b> Stop type 0: deceleration time 1 stop 1: Free shutdown 2: deceleration time 2 stop <b>LED Thousands:</b> Emergency stop mode 0: Slow down 1: Free shutdown	1	0000	W1
	F1.05	Shutdown DC brake frequency	0.0 ~ min(F0.02,100.0) Hz	0.01	5.00Hz	W1
	F1.06	Shutdown DC brake current	0.0 ~ 100.0%	0.1	30.0%	W1
	F1.07	Shutdown the DC brake time	0.00 ~ 20.00 Sec	0.01	0.00	W1
	F1.08	Energy consumption braking level	340 ~ 400/650 ~ 800V	1	360/680	W1

parameter type	Function Code	Name	Setting Range and Description	Minimum Unit	Factory Default	Change Limit
	F1.09	Energy consumption braking action selection	0: Action only when slowing down 1: Not limited by deceleration	1	0	W1
	F1.10	Inhibition of action selection	<b>LED Units:</b> Underpressure suppression <b>LED Tens:</b> Overpressure inhibition <b>LED Hundreds:</b> Accelerated current limit <b>LED Thousands:</b> Run current limit 0: not valid 1: valid	1	1111	W1
	F1.11	Under pressure suppression level	160 ~ 220/340 ~ 420V	1	190/380	W1
	F1.12	The level of overpressure inhibition	350 ~ 400/650 ~ 800V	1	360/720	W1
	F1.13	Accelerated current limit level	120 ~ 220%	1	135%	W1
	F1.14	Operating current limit level	50 ~ 220%	1	150%	W1
	F1.15	Magnetic flux braking level	0 ~ 100%	1	0%	W1
	F1.16	Motor overload protection level	10 ~ 131%	1	110%	W1
	F1.17	Protect action selection	<b>LED Units:</b> Output lack of phase <b>LED Tens:</b> Temperature sensor fault <b>LED Hundreds:</b> Motor short-circuit to the ground detection <b>LED Thousands:</b> Overload temperature correlation 0: Not valid 1: Valid	1	0111	W1
	F1.18	Number of fault self-recovery times	0 ~ 5	1	0	W1
	F1.19	Failure self-recovery time	0.00 ~ 600.00 Sec	0.01	1.00	W1
Motor parameter group	F2.00	Basic frequency	5.00 ~ 1000.0Hz	0.01	50.00	W2
	F2.01	Maximum output voltage	25 ~ 250V/50 ~ 500V	1	220/380	W2
	F2.02	Recurrent ascension	0.0 ~ 20.0%	0.1	3.0	W1
	F2.03	The V / F curve selection	0: Normalized form 1: Enhancement mode 2: Multiple spot 3: 1.2 Times 4: 1.4 Times 5: 1.6 Times 6: 1.8 Times 7: 2.0 Times	1	0	W1
	F2.04	V/F frequency1	0.00 ~ [F2.00] Hz	0.01	0.00	W1
	F2.05	V/F voltage1	0 ~ [F2.01] V	1	0	W1
	F2.06	V/F frequency2	0.00 ~ [F2.00] Hz	0.01	0.00	W1
	F2.07	V/F voltage2	0 ~ [F2.01] V	1	0	W1
	F2.08	V/F frequency3	0.00 ~ [F2.00] Hz	0.01	0.00	W1
	F2.09	V/F voltage3	0 ~ [F2.01] V	1	0	W1
	F2.10	Reserved				W1
	F2.11	Zero frequency torque retention	0: Not valid 1: Valid	0	0	W1
	F2.12	Automatic voltage	0: Not valid 1: Slow down invalid 2: Valid	1	0	W1
	F2.13	Motor pole logarithm	1 ~ 16	1	2	W1
	F2.14	The VF shock inhibition coefficient	0 ~ 100%	1	60	W1
	F2.15	The SVC velocity filtering coefficient	100 ~ 900	1	650	W1
F2.16	Undervoltage suppression gain	0.01~10.00	0.01	1.5		

20 Table of functional parameters

parameter type	Function Code	Name	Setting Range and Description	Minimum Unit	Factory Default	Change Limit
	F2.17	Ultra-temperature frequency reduction point	20~100.0	0.1	85	W1
	F2.18	Overcurrent downfrequency protection point		0.1	☆	W1
	F2.19	Failure self-recovery clean-up time	0 ~ 6000min	1	60	W1
Digital input and analog quantity parameter groups	F3.00	Input terminal attribute selection	<b>LED Units:</b> D11 Input Retro <b>LED Tens:</b> D12 Input Retro <b>LED Hundreds:</b> D13 Input Retro <b>LED Thousands:</b> D14 Input Retro 0:Not valid 1:Valid	1	0000	W1
	F3.01	Multifunction terminal DI1	0 ~ 22, See Schedule 1	1	0	W2
	F3.02	Multifunction terminal DI2	0 ~ 22, See Schedule 1	1	0	W2
	F3.03	Multifunction terminal DI3	0 ~ 22, See Schedule 1	1	0	W2
	F3.04	Multifunction terminal DI4	0 ~ 22, See Schedule 1	1	0	W2
	F3.05	UP/DW Terminal frequency power storage	0: Not valid 1: Valid	1	0	W1
	F3.06	UP/DW Terminal integral time	0.01 ~ 50.0 Sec	0.01	3.00	W1
	F3.07	Input the terminal filter time	1 ~ 50ms	1	10	W1
	F3.08	Enter the missing phase-protection configuration	<b>LED Units:</b> Input missing phase protection (valid for 4T model) 0: Not valid 1: Valid	1	☆	W1
	F3.09	AI input lower limit voltage	0.00 ~ [F3.10]	0.01	0.00	W1
	F3.10	AI input upper limit voltage	[F3.19] ~ 10.00 When AI1 is a voltage-type input, 10 corresponds to 10V When AI1 is a current-type input, 10 corresponds to 20 mA	0.01	10.00	W1
	F3.11	AI input filter time	0 ~ 200ms	1	10	W1
	F3.12	AI minimum set frequency	0.00 ~ [F3.13] Hz	0.01	0.00	W1
	F3.13	AI maximum set frequency	[F3.12] ~ [F0.02] Hz	0.01	50.00	W1
	F3.14	DC fan fault judgment speed	10 ~ 500rpm	1	200	W1
	F3.15	Failure judgment time of the DC fan	0.0 ~ 600.0 Sec	0.1	60.0	W1
	F3.16	AO output selection	0: output frequency 1: output current 2: output voltage 3: Fixed value output 4: Double-DC fan control 5: DC fan 1 control 6: DC fan 2 control	0	0	W1
	F3.17	AO output lower limit voltage	0.00 ~ [F3.18] V	0.01	0.00	W1
	F3.18	AO output upper limit voltage	[F3.17] ~ 10.00V	0.01	10.00	W1
F3.19	AO fixed-value output voltage	[F3.17] ~ [F3.18]	0.01	0	W1	
	F4.00	Output feature selection	<b>LED Units:</b> OC output reversion <b>LED Tens:</b> RLY output inverse <b>LED Hundreds:</b> Reserved <b>LED Thousands:</b> Reserved 0:Not valid 1:Valid	1	0000	W1
	F4.01	DO1 output selection	0 ~ 13	1	0	W1
	F4.02	RLY output selection	0 ~ 13	1	8	W1

parameter type	Function Code	Name	Setting Range and Description	Minimum Unit	Factory Default	Change Limit
Digital output and pendulum frequency operation parameter group	F4.03	RLY output time delay	0.00 ~ 30.00 Sec	0.01	0.00	W1
	F4.04	monitor input variable	0 ~ 6: Monitoring parameter variables, 100% full degree output value 0: Output frequency, upper limit frequency 1: Output current, 2.5 times the frequency converter rated current 2: Output voltage, single-phase 500V, three-phase 1,000 3: DC side voltage, single-phase 500V, three-phase 1000 4: Maximum equipment temperature, 150 C 5: All value, 10V (for All to current input, 10V corresponds to 20 mA) 6: AO1 value, 10V	1	0	W1
	F4.05	Lower limit of the monitor variable	0 ~ 100.0%	0.1	0	W1
	F4.06	Upper limit of the monitor variable	0 ~ 100.0%	0.1	100.0	W1
	F4.07	The frequency reaches the detection amplitude	0.0 ~ 50.0Hz	0.01	5.00	W1
	F4.08	FDT setting	0.00 ~ 50.00Hz	0.01	10.00	W1
	F4.09	FDT action delay	0.00 ~ 20.00 Sec	0.01	0.00	W1
	F4.10	Overload alarm level	10 ~ 200%	1	110	W1
	F4.11	Overload alarm delay	0.00 ~ 600.00 Sec	0.01	5.00	W1
	F4.12	Jump frequency	0.00 ~ [F0.2] Hz	0.01	0	W1
	F4.13	Jump frequency range	0.00 ~ 10.00 Hz	0.01	0	W1
	F4.14	Pressing frequency operation Settings	<b>LED Units:</b> Function setting 0: Function invalid 1: Effective function <b>LED Tens:</b> Center frequency selection 0: Frequency center frequency setting point 1: Frequency channel for the given value <b>LED Hundreds:</b> Place the choice 0: Fixed swing amplitude (relative maximum frequency) 1: Variable swing (relative center frequency) <b>LED Thousands:</b> Reserved	1	0000	W1
	F4.15	Pressing frequency center frequency	0.00 ~ [F0.02] Hz	0.01	25.00	W1
	F4.16	The frequency amplitude	0.00 ~ 50.00%	0.1	20.0	W1
	F4.17	The amplitude of the jump frequency	0 ~ 50.0%	0.1	0	W1
F4.18	The time of swing frequency rise	0.01 ~ 600.00 Sec	0.01	1.00	W1	
F4.19	The drop time of swing frequency	0.01 ~ 600.00 Sec	0.01	1.00	W1	
Multistage speed and PLC operating parameter groups	F5.00	Multi-speed operation mode	<b>LED Units:</b> Multiple speed selection 0: Not valid 1: Valid 2: Effective terminal input 3: Valid at startup <b>LED Tens:</b> Mode selection 0: Monocycle 1: Keep the final value 2: Keep the set value 3: continuous loop <b>LED Hundreds:</b> Speed switching mode 0: Continuous switching 1: Zero frequency switch <b>LED Thousands:</b> Reserved	1	0000	W1
	F5.01	Multi-speed frequency1	0.00Hz ~ [F0.02]Hz	0.01	35.00	W1
	F5.02	Multi-speed frequency2	0.00Hz ~ [F0.02]Hz	0.01	15.00	W1
	F5.03	Multi-speed frequency3	0.00Hz ~ [F0.02]Hz	0.01	3.00	W1

22 Table of functional parameters

parameter type	Function Code	Name	Setting Range and Description	Minimum Unit	Factory Default	Change Limit
	F5.04	Multi-speed frequency4	0.00Hz ~ [F0.02]Hz	0.01	20.00	W1
	F5.05	Multi-speed frequency5	0.00Hz ~ [F0.02]Hz	0.01	25.00	W1
	F5.06	Multi-speed frequency6	0.00Hz ~ [F0.02]Hz	0.01	30.00	W1
	F5.07	Multi-speed frequency7	0.00Hz ~ [F0.02]Hz	0.01	35.00	W1
	F5.08	Phase 1 run time	0.0 ~ 6500.0 Sec	0.1	0.0	W1
	F5.09	Phase 2 run time	0.0 ~ 6500.0 Sec	0.1	0.0	W1
	F5.10	Phase 3 run time	0.0 ~ 6500.0 Sec	0.1	0.0	W1
	F5.11	Phase 4 run time	0.0 ~ 6500.0 Sec	0.1	0.0	W1
	F5.12	Phase 5 run time	0.0 ~ 6500.0 Sec	0.1	0.0	W1
	F5.13	Phase 6 run time	0.0 ~ 6500.0 Sec	0.1	0.0	W1
	F5.14	Phase 7 run time	0.0 ~ 6500.0 Sec	0.1	0.0	W1
	F5.15	PLC multi-speed Running direction	<b>BIT0~BIT7</b> 0:Forward direction 1:Opposite direction	1	0000	W1
	F5.16	PLC multispeed acceleration and deceleration selection	<b>BIT0~BIT7</b> 0:Accelerated and deceleration time 1 1:Accelerated and deceleration time 2	1	0000	W1
	F5.17	PLC runs is time shutdown	0 ~ 9999 min	1	0	W1
	F5.18	Mapping state parameters6	D000~D031	1	D115	W1
	F5.19	Mapping state parameters7	D000~D031	1	D116	W1
The communication sets the parameter group	F6.00	Communication settings	<b>LED Units:</b> Porter rate selection 0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps 4: 19200bps 5: 38400bps <b>LED Hundreds:</b> Data format 0: 1-8-1-N, RTU 1: 1-8-1-E, RTU 2: 1-8-1-O, RTU <b>LED Thousands:</b> communicating protocol 0: standard communication protocol 1: Custom protocol 1 2: Custom protocol 2	0000	0003	W2
	F6.01	This machine address	0 ~ 127	1	1	W1
	F6.02	Response delay	0 ~ 1000 ms	1	2	W1
	F6.03	Time out detection time	0.1 ~ 20.0 Sec	0.1s	2.0	W1
	F6.04	Communication disconnection action selection	0: Halt 1: Run in the last state 2: Alarm shutdown	1	0	W1
	F6.05	Linkage function	0000 ~ 0001	1	0000	W2
	F6.06	Communication setting coefficient	0.100 ~ 10.000	0.001	1.000	W1
	F6.07	Reserved				W1
	F6.08	DC fan 1 rotation speed setting	0 ~ 1500rpm	1	500	W1
	F6.09	DC fan 2 rotation speed setting	0 ~ 1500rpm	1	500	W1
	F6.10	Mapping application parameters1	F000 ~ F919	1	F608	W1
	F6.11	Mapping application parameters2	F000 ~ F919	1	F609	W1
	F6.12	Mapping application parameters3	F000 ~ F919	1	F001	W1
	F6.13	Mapping application parameters4	F000 ~ F919	1	F001	W1

parameter type	Function Code	Name	Setting Range and Description	Minimum Unit	Factory Default	Change Limit
	F6.14	Mapping application parameters5	F000 ~ F919	1	F001	W1
	F6.15	Mapping application parameters1	D000 ~ D031	1	D000	W1
	F6.16	Mapping application parameters2	D000 ~ D031	1	D002	W1
	F6.17	Mapping application parameters3	D000 ~ D031	1	D004	W1
	F6.18	Mapping application parameters4	D000 ~ D031	1	D006	W1
	F6.19	Mapping application parameters5	D000 ~ D031	1	D007	W1
PID parameter group	F7.00	PID function setting	<b>LED Units:</b> Function setting 0: PID function is closed 1: PID function to open <b>LED Tens:</b> The deviation polarity is reversed 0: Not valid 1: Polarity regurgitation <b>LED Hundreds:</b> Output polarity 0: Unipolarity 1: Bipolar <b>LED Thousands:</b> Frequency regulation benchmark 0: Upper limiting frequency 1: Frequency channel settings	1	0000	W1
	F7.01	Digital setting	0.0 ~ 100.0%	0.1	50.0	W1
	F7.02	Feedback gain correction	0.100 ~ 10.000	0.01	1.000	W1
	F7.03	PID feedforward action coefficient	0 ~ 100%	1	0	W1
	F7.04	Range of homeostatic bias	0 ~ 10.0%	0.1	0	W1
	F7.05	Reserved				
	F7.06	Reserved				
	F7.07	proportional gain	0.01 ~ 5.00	0.01	1.00	W1
	F7.08	integration time	0.00 ~ 3.00 Sec	0.01	1.00	W1
	F7.09	differential gain	0.01 ~ 2.00	0.01	0	W1
	F7.10	Reserved				
	F7.11	PID adjusts the frequency range	0.0 ~ 100.0%	0.1	100.0	W1
	F7.12	Broken line detection	0.0 ~ 50.0%	0.1	5.0	W1
	F7.13	Judgment of disconnection detection time	0.01 ~ 60.00 Sec	0.01	5.00	W1
	F7.14	Reserved				
	F7.15	PID dormancy function	0: Close 1: Open	1	0	W1
	F7.16	The dormancy frequency	0-upper limiting frequency	0.01	0	W1
	F7.17	Sleep delay	0 ~ 3600.0 Sec	0.1	3.0	W1
	F7.18	Sleep arousal bias	0 ~ 100%	0.1	5.0	W1
F7.19	Wake up delay	0 ~ 3600.0 Sec	0.1s	3.0	W1	
	F8.00	Motor is rated power	0.1 ~ 100.0KW	0.1	☆	W2
	F8.01	Motor is rated voltage	20 ~ 250V/30 ~ 450V	1	☆	W2
	F8.02	Rated current of motor	0.1 ~ 1000.0A	0.1	☆	W2
	F8.03	Rated frequency of motor	5 ~ 1000.0Hz	0.1	☆	W2
	F8.04	Motor rated speed	300 ~ 6000rpm	1	☆	W2
	F8.05	No-load current	0.01 ~ 300.00A	0.01	☆	W2

24 Table of functional parameters

parameter type	Function Code	Name	Setting Range and Description	Minimum Unit	Factory Default	Change Limit
Asynchronous motor vector running parameter group	F8.06	Stator resistance	0.001 ~ 65.000Ω	0.001	☆	W2
	F8.07	The stator inductance	0.1 ~ 6500.0mH	0.1	☆	W2
	F8.08	Total leakage	0.1 ~ 650.00mH	0.01	☆	W2
	F8.09	Rotor time constant	5.0 ~ 6500.0ms	0.1	☆	W2
	F8.10	Transfer difference compensation coefficient	0.5 ~ 1.50	0.01	1.00	W1
	F8.11	Motor parameter determination	<b>LED Units:</b> parameter identification 0: Close 1: Static identification 2: Dynamic identification <b>LED Tens:</b> Gain select 0: Single PID parameters 1: Dual PID parameters <b>LED Hundreds:</b> Speed identification mode 0: One-way mode 1: Two-way mode <b>LED Thousands:</b> Reserved	1	0000	W2
	F8.12	Gain switch on the frequency	1.0-Rated frequency of motor Hz	0.1	5.0	W1
	F8.13	Gain switch under frequency	0.5 ~ [F8.12]Hz	0.1	3.0	W1
	F8.14	Proportional gain1	0.10 ~ 2.00	0.01	0.8	W1
	F8.15	Integration time1	0 ~ 1.00 Sec	0.01	0.3	W1
	F8.16	Proportional gain2	0.10 ~ 2.00	0.01	0.8	W1
	F8.17	Integration time2	0 ~ 1.00 Sec	0.01	0.35	W1
	F8.18	Speed regulator positive limit amplitude	0 ~ 250%	1	180	W1
	F8.19	Speed regulator negative limit amplitude	0 ~ 250%	1	180	W1
Synchronous motor operation parameter group	F9.00	Rated voltage of the synchronous motor	20 ~ 250V/30 ~ 450V	1	☆	W1
	F9.01	Rated current of the synchronous motor	0.1 ~ 1000.0A	0.1	☆	W1
	F9.02	Rated rotation speed of the synchronous motor	300 ~ 6000rpm	1	☆	W1
	F9.03	Number of synchronous motor poles	1 ~ 50	1	☆	W1
	F9.04	Reverse potential voltage (Valid value between the lines)	1.0 ~ 500.0V/krpm	0.1	☆	W1
	F9.05	Stator resistance (between lines)	0.001 ~ 65.000Ω	0.001	☆	W1
	F9.06	DD-axis inductance	0.01 ~ 650.00mH	0.01	☆	W1
	F9.07	Q-axis inductance	0.01 ~ 650.00mH	0.01	☆	W1
	F9.08	Chain Observer gain	0.1 ~ 2.5	0.1	1.0	W1
F9.09	Speed-filter bandwidth	10 ~ 500Hz	1	☆	W1	

parameter type	Function Code	Name	Setting Range and Description	Minimum Unit	Factory Default	Change Limit
	F9.10	Motor parameter determination and speed observation and selection	LED Units: Parameter identification 0: Close 1: Static identification LED Tens: Speed observation selection 0: Model reference adaptive 1: Flux observer LED Hundreds: Reserved LED Thousands: Observed current compensation 0: Compensation is valid 1: Back EMF compensation is valid 2: Electrical angle compensation is valid 3: None is	1	0	W1
	F9.11	The velocity-ring proportional gain	0.01 ~ 2.00	0.01	0.6	W1
	F9.12	The velocity loop integral gain	0.01 ~ 2.00	0.01	0.8	W1
	F9.13	Speed estimate proportional gain	0.1 ~ 5.00	0.01	1.00	W1
	F9.14	Speed estimate for the integral gain	0.1 ~ 5.00	0.01	2.50	W1
	F9.15	Excitation switching speed	0 ~ [F9.02]/2	0.01	[F9.02]/10	W1
	F9.16	Low-speed excitation current limit amplitude	0 ~ 60%	0.01	30	W1
	F9.17	High-speed weak magnetic current limit amplitude	0 ~ 50%	1	25	W1
	F9.18	Positive torque limit	0 ~ 250%	1	135	W1
	F9.19	Negative torque limit	0 ~ 250%	1	135	W1

**Parameter table factory setting and change restrictions description:**

R: only read

W1: unrestricted

W2: Operation ban reform

W3: Password limit

☆: Model association parameters

## 5.2 List of status monitoring parameters

Monitoring code	Monitoring content and instructions	unit
d0.00	Inverter output frequency	Hz
d0.01	motor speed	rpm
d0.02	Output current (effective value)	A
d0.03	Output torque(effective value)	%
d0.04	Output voltage(effective value)	V
d0.05	Output power	KW
d0.06	Device body maximum temperature	℃
d0.07	Voltage at DC side	V
d0.08	Inverter running status LED Units <b>Motor control mode</b> 0: VF control 1: Open ring vector LED Tens: <b>running status</b> 0: halt 1: Speed to reach 2: quicken 3: moderate LED Hundreds: Reserved LED Thousands: <b>Inhibition of action</b> 0: attonity 1: Overflow inhibition 2: Overpressure inhibition 3: Underpressure suppression 4: Overtemperature frequency reduction inhibition	-
d0.09	The frequency sets the channel command value	Hz
d0.10	The stator frequency	Hz
d0.11	Enter the DI status	-
d0.12	Simog input AI1 value	V
d0.13	Analog quantity to output the AO1 value	V
d0.17	exciting current	A
d0.18	torque current	A
d0.20	Motherboard program version (H)	-
d0.21	Equipment capacity	KW
d0.22	U phase current sampling zero bias	-
d0.23	V phase current sampling zero bias	-
d0.26	Cumulative running time1	H
d0.27	Cumulative running time2	Sec
d0.28	Cumulative power time1	H
d0.29	Cumulative power time2	Sec
d0.30	Cumulative electricity consumption1	MW · H
d0.31	Cumulative electricity consumption2	KW · H
d1.15	The DC fan 1 has a feedback rotation speed	rpm
d1.16	The DC fan 2 has a feedback rotation speed	rpm
d1.17	Compressor mechanical frequency	Hz
D1.28	Weak magnetic coefficient	-
D1.29	Observed current deviation	-
D1.30	Back EMF compensation coefficient	-
D1.31	Electrical angle compensation coefficient	-

### 5.3 Historical fault record

<b>Fault code</b>	<b>Fault content</b>
d1.00	Last time fault recording
d1.01	Historical fault record 1
d1.02	Historical fault record 2
d1.03	Historical fault record 3
d1.04	Historical fault record 4
d1.05	Historical fault record 5

### 5.4 Operating status of the frequency converter at the last failure

<b>Fault code</b>	<b>Fault content</b>	<b>unit</b>
d1.06	running frequency	Hz
d1.07	Output current	A
d1.08	Output voltage	V
d1.09	DC side voltage	V
d1.10	Equipment temperature	℃
d1.11	Set the frequency	Hz
d1.12	Operation status of the frequency converter	-
d1.13	Accumulated startup run time at the last failure	H

**Table 1: Comparison Table of Multifunctional Input Terminal DI Functions**

<b>NO.</b>	<b>function</b>	<b>NO.</b>	<b>function</b>
0	No function	1	Multi-speed control 1
2	Multi-speed control 2	3	Multi-speed control 3
4	FWD jog	5	REV jog
6	Frequency setting channel selection 1	7	Frequency setting channel selection 2
8	Free downtime control	9	Three-line mode operation control
10	Downtime DC brake	11	Forward-turn control (FWD)
12	Reverse Control (REV)	13	Fault reset (RESET)
15	Emergency shutdown (EMS)	16	External Fault Input
17	Broken line input	18	PLC put into
19	Pop frequency operation input	20	UP
21	DOWN	22	acceleration and deceleration time switch

**Table 2: Comparison Table of Multifunctional Output Terminal DO/RO Variables**

NO.	function	NO.	function
0	Frequency converter in operation	1	Frequency to arrive
2	Frequency Level Detection (FDT)	3	overload detection
4	The frequency reaches the upper limit	5	The frequency reaches the lower limit
6	Zero speed operation	7	Overpressure shutdown
8	Frequency converter fault	9	Broken line fault
10	The PLC cycle is complete	11	The monitor input variable is below the lower limit
12	The Monitor input variable is above the upper limit	13	The monitor input variable is within the upper and lower limits
14	The frequency converter is ready	15	Zero speed (effective for shutdown)

## Chapter 6 Fault Diagnosis And Countermeasures

## 6.1 Protection function and countermeasures

Fault Code	Fault Description	Possible Reasons	Solutions
Fu.01	Over current occurs in inverter acceleration running process	1. The acceleration time is too short. 2. Start the rotating motor directly. 3. The torque boost is preset as too large. 4. The network voltage is too low.	1. Extend acceleration time. 2. Restart the motor after stop 3. Reduce voltage of torque boost. 4. Check the network voltage and reduce power.
Fu.02	Over current occurs in inverter deceleration running process	The acceleration time is too short.	Increase the acceleration time
Fu.03	Over current occurs in inverter running or stop condition	1. Load changes suddenly 2. The network voltage is too low.	1. Reduce the load fluctuation. 2. Check the power voltage.
Fu.04	Overvoltage occurs in inverter acceleration running process	1. The input voltage is too high. 2. Put the power on and off frequently.	1. Check the power. 2. Lower the setting of acceleration torque level.
Fu.05	Overvoltage occurs in inverter deceleration running process	1. The acceleration time is too short. 2. The input voltage is abnormal.	1. Extend the acceleration time. 2. Check the power voltage. 3. Install braking resistor or reselect braking resistor.
Fu.06	Overvoltage occurs in inverter running process	1. The power voltage is abnormal. 2. There is energy feedback load.	1. Check the power voltage. 2. Install the braking unit and braking resistor or reselect braking resistor.
Fu.07	Overvoltage occurs in inverter stop condition	The power voltage is abnormal.	Check the power voltage.
Fu.08	Under-voltage occurs in inverter running process	1. The power voltage is abnormal. 2. There is starting operation of heavy load in network.	1. Check the power voltage. 2. Supply power separately.
Fu.09	UVW Interphase short circuit	Motor short circuit	1.excluding output lines
Fu.10	Motor power line grounding	Motor power line short circuit to the ground	Check whether the wiring is reasonable.
Fu.11	Electromagnetic interference	Jamming drive signal	1. Check whether the wiring is reasonable. 2. The strong and weak lines are separated.
Fu.12	Inverter overload	1. The load is too large. 2. The acceleration time is too short. 3. The torque boost is too high. 4. The network voltage is too low.	1. Reduce load or change a larger capacity inverter. 2. Extend the acceleration time. 3. Reduce the voltage of torque boost. 4. Check the network voltage.
Fu.13	Motor overload	1. The load is too large. 2. The acceleration time is too short. 3. The protection factor Setting is too small. 4. The torque boost is too high.	1. Reduce load. 2. Extend the acceleration time. 3. Increase the overload protection factor of motor. 4. Reduce torque boost.
Fu.14	Inverter overheat	1. Air duct obstruction 2. The environment temperature is too high. 3. The fan is damaged.	1. Clean air duct or improve ventilation condition. 2. Improve the ventilation condition and reduce the carrier frequency. 3. Change fan.
Fu.16	External equipment fault	The exterior fault input terminal is ineffective.	1. Check the exterior equipment. 2. Disconnect the external fault input terminal.
Fu.17	PID feedback off-line	1 The feedback signal is lost. 2. The setting of off-line detection threshold value is not appropriate.	1. Check line. 2. Reduce threshold value of off-line detection.
Fu.18	Communication interruption	Communication line interruption	Check communication connection
Fu.20	Current detection error	The current detection devices or circuit is damaged.	1. Check socket line. 2. Ask for manufacturers' assistance.
Fu.21	Temperature sensor fault	NTC short circuit	1. Check the NTC line 2. Change NTC

30 Alarm, warning diagnosis and countermeasures

Fu.22	No motor is connected during parameter identification	Motor power line is disconnected.	Check motor wiring
Fu.23	parameter identification is wrong	Motor parameter identification is abnormal.	Check whether the motor line is in good contact.
Fu.24	The deviation of motor speed is too large.	1、 Wrong phase sequence connection of the motor 2、 Incorrect parameter settings for the compressor motor 3、 Demagnetization or damage of the	1、 Check if the motor wiring phase sequence is correct. 2、 Check if the parameters are set correctly. 3、 Check if the compressor is magnetized or damaged.
Fu.25	Three-phase power supply input-phase deficiency	1、 The R / S / T phase input of any phase voltage is missing, or the power cord is disconnecte 2、 Defsing phase check circuit fault	1、 Check the external power supply 2、 Replace the new power cord 3、 Seek manufacturer service
Fu.26	Output missing phase	The output line is out of phase.	Check the circuit between motor and inverter.
Fu.27	DC fan 1 fault	1、 The setting rotation speed of the DC fan 1 is not consistent with the feedback rotation speed 2、 The DC fan circuit fails 3、 The F3.15 is greater than 0.0 without a DC fan	1、 Check the line between the DC fan 1 and the frequency converter 2、 Seek manufacturer service 3、 The F3.15 is set to 0.0 without a DC fan
Fu.28	DC fan 2 fault	1、 The setting rotation speed of the DC fan 2 is not consistent with the feedback rotation speed 2、 The DC fan circuit fails 3、 The F3.15 is greater than 0.0 without a DC fan	1、 Check the line between the DC fan 2 and the frequency converter 2、 Seek manufacturer service 3、 The F3.15 is set to 0.0 without a DC fan
Fu.35	Software overcurrent	1、 The acceleration time is too short. 2、 Overload	1、 Increase acceleration time. 2、 .Lighten the load.
Fu.40	Internal data EEPROM error	The read-write errors of control parameters.	Ask for manufacturers' assistance.

## Chapter 7 Description Of Communication Protocol

### 7.1 Communications setting

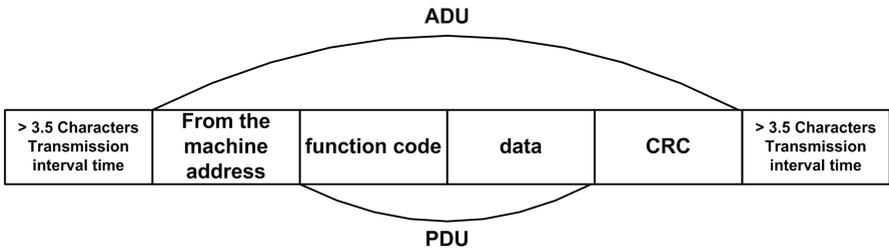
This agreement is the MODBUS RTU Agreement

### 7.2 Communication function

Complete the communication between the upper computer and the converter, including sending operation commands to the converter, setting the operating frequency, rewriting the function code parameters, and reading the operating status, monitoring parameters, fault information and function code parameters of the converter.

### 7.3 Protocol format

MODBUS RTU format



### 7.4 Protocol format interpretation

#### 7.4.1 From the machine address

0 is the broadcast address, and the slave address can be set to 1~127.

#### 7.4.2 PDU part

(1) Function code 03: Read the function parameters, operation status, monitoring parameters and fault information of multiple inverter, and can read the continuous inverter parameters with 16 addresses at a time.

Host Send:

PDU part	03	Register start address		Number of registers	
		high-order	low-order	high-order	low-order
Data Length (Byte)	1	1	1	1	1

From machine response:

PDU part	03	Number of read bytes (2 * registers)	Read the content
Data Length (Byte)	1	1	2 * Number of registers

(2) Function code 06: rewrite the operation command, operation frequency and function parameters of a single frequency converter.

Host Send

PDU part	06	Register start address		Number of registers	
		high-order	low-order	high-order	low-order
Data Length (Byte)	1	1	1	1	1

From machine response:

PDU part	06	Register start address		Number of registers	
		high-order	low-order	high-order	low-order
Data Length (Byte)	1	1	1	1	1

( 3 ) Function code 10: Overwrite multiple inverter operation commands, operation frequency and function parameters.

Host Send:

PDU part	10	Register start address		Number of registers		The number of contents bytes	Register content
		high-order	low-order	high-order	low-order		
Data Length (Byte)	1	1	1	1	1	1	2 * Number of registers

From machine response:

PDU part	10	Register start address		Number of registers	
		high-order	low-order	high-order	low-order
Data Length (Byte)	1	1	1	1	1

Note: The frequency converter is stored from the register of the lowest address to the highest address, storing up to 6 function codes at a time. If some error occurs, the slave will respond to objections.

Objection response:

PDU part	0x80+Function code	Dissent code
Data Length (Byte)	1	1

Objecode indicates error category:

Dissent code	Corresponding error
01	Illegal function code
02	Illegal data address
03	Data over limit
04	Invalid operation from machine
05	Too many reading and writing parameters
06	Read and write retention, implicit parameters
07	Modifying data is prohibited from slave running
08	Data modification is password-protected

CRC verification:

CRCverification	CRC low-order	CRC high-order
Data Length (Byte)	1	1

CRC check function is as follows

```

unsigned int crc_chk_value(unsigned char *data_value, unsigned char leng
{
    unsigned int crc_value=0xFFFFF;
    int i;
    while(length--)
    {
        crc_value^=*data_value++;
        for(i=0;i<8;i++)
        {
            if(crc_value&0x0001)
                crc_value=( crc_value>>1)^0xA001;
            else
                crc_value= crc_value>>1;
        }
    }
    return(crc_value);
}

```

### 7.4.3 Address definition of the communication parameter

(1) Frequter direct access parameter address distribution:

Access address	content	Register name
F000~F919	The high level is the function code group number, and the low level is the function code number mark; Such as F1.11, and its register RAM address F111	functional parameter
D000~D119	The high is the monitoring group number, the low is the monitoring mark; Such as d0.12, its register address is D012	Monitoring parameters

Note: Frequent EEPROM of functional code parameters will reduce its service life. Some parameters are in communication mode, but need to change the value in RAM.

When writing the EEPROM value of the function parameter, you only need to change the F in the high register level address to E. If you want to write the EEPROM value of F1.11, the register address should be E111.

(2) Frequter mapping parameter address distribution:

Access address	content	Register name
0x1300	0: halt                      1: running 2: Reverse operation      3: normal inching turning 4 : reverse inching turning      5 : Free shutdown (emergency stop)      6: Fault reset	control word
0x1301	0~30000	Set the frequency (0.01Hz)
0x1302	Reserved	
0x1303	Default mapping parameter [F6.08], the corresponding function sets the speed for fan 1 (1 RPM)	Mapping application parameters 1
0x1304	Default mapping parameter [F6.09], the corresponding function sets the speed for fan 2 (1 RPM)	Mapping application parameters 2
0x1305	Mapping range[F0.00~F9.19]	Mapping application parameters 3
0x1306	Mapping range[F0.00~F9.19]	Mapping application parameters 4
0x1307	Mapping range[F0.00~F9.19]	Mapping application parameters 5

When you need to access multiple application parameters or monitoring parameters with discontinuous addresses, these parameters can be mapped to the bus control parameter area for access, where the mapping parameters are set in the F parameter group.

(3) Frequter status address distribution:

Access address	content	Register name
0x1400	Reserved	
0x1401	0: The DC voltage is not ready      1: Is in operation 2: Reverse operation                      3: halt 4: fault condition	Frequency converter state
0x1402	The fault information is 8 bits 0, and the low 8 bits corresponds to the mark after the fault code Fu. * * For example, the fault information code of 0x000C indicates that the frequency converter fault code is Fu.12	fault message
0x1403	output frequency (0.01Hz)	Mapping state parameters 1
0x1404	Output current (0.1A)	Mapping state parameters 2
0x1405	output voltage (1V)	Mapping state parameters 3

0x1406	Frequency converter temperature (0.1℃)	Mapping state parameters 4
0x1407	busbar voltage (1V)	Mapping state parameters 5
0x1408	Fan 1 is the feedback rotation speed (1RPM)	Mapping state parameters 6
0x1409	Fan 2 is the feedback rotation speed (1RPM)	Mapping state parameters 7

## 7.5 example

- 1) Start the 1 # frequency converter in forward operation.

master request:

From the machine address	Function code	Register start address		Register data		CRC verification	
		high-order	low-order	high-order	low-order	low-order	high-order
01	06	13	00	00	01	4C	8E

From machine response: The frequency converter is running forward and returns the same data as the host request.

- 2) Set the operating frequency of the frequency converter at 50.00Hz.

master request:

From the machine address	Function code	Register start address		Register data		CRC verification	
		high-order	low-order	high-order	low-order	low-order	high-order
01	06	13	01	13	88	D1	D8

From machine response: The inverter 50.00Hz runs and returns the same data as the host request.

- 3) Read the current operating frequency and output speed of frequency converter, inverter response frequency 50.00Hz and output speed 1500 RPM.

master request:

From the machine address	Function code	Register start address		Register data		CRC verification	
		high-order	low-order	high-order	low-order	low-order	high-order
01	03	D0	00	00	02	FC	CB

From machine response:

From the machine address	Function code	Number of read bytes	The 1st register of the data		The 2nd register of the data		CRC verification	
			high-order	low-order	high-order	low-order	low-order	high-order
01	03	04	13	88	05	DC	7C	54

- 4) Start the forward operation of 1 # converter and set the operating frequency 40.00Hz.

master request:

From the machine address	Function code	Register start address		Number of registers		The number of contents bytes	The 1st register of the data		The 2st register of the data		CRCverification	
		high-order	low-order	high-order	low-order		high-order	low-order	high-order	low-order	low-order	high-order
01	10	13	00	00	02	04	00	01	0F	A0	7E	D7

From machine response:

From the machine address	Function code	Register start address		Register data		CRC verification	
		high-order	low-order	high-order	low-order	low-order	high-order
01	10	13	00	00	02	45	4C

## Chapter 8 Accessories Selection

### 8.1 Debug the keyboard selection (manipulator)

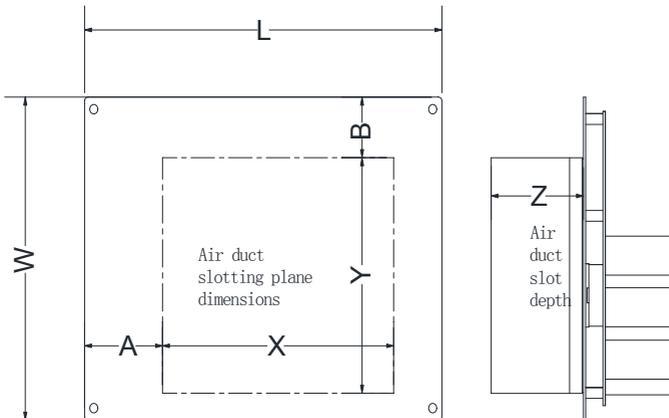
The FS100 Series driver matches the debug keyboard model of DPNL350EM-FS100.

### 8.2 Instructions for independent fan

FS100 series air conditioning drive full series of no fan, for FS100-4T150P and above models, drive radiator on both sides of the air plate installed fixed hole, buy Simphoenix independent fan set can be installed directly, drive installation plate also reserved the fan power line through the hole, plus the fan tear off the protective sticker on the back of the installation board, the O rubber ring 0070M0018 ( $\phi 16.5$ ) installed in the fan power line through the hole, Details of the fan package are shown in the table below:

Drive model	Fan specifications	electric fan quantity	Air duct plate specifications	Fan power supply specifications	Fan power	Fan air volume(CFM)	Fan speed(RPM)	Fan noise(dB)
FS100-4T150P	SP-F141-01	2	AB9091M0004	HDR-60-24	0.95A/20.8W @24VDC	128.5	6000	55.4
FS100-4T180P	SP-F151-01	2	AB8163M0003	LRS-75-24	1.5A/35W @24VDC	181.36	8500	64.8
FS100-4T220P	SP-F151-01	2	AB8163M0003	LRS-75-24	1.5A/35W @24VDC	181.36	8500	64.8
FS100-4T370P	SP-F151-01	2	AB8160M0043	LRS-75-24	1.5A/35W @24VDC	181.36	8500	64.8
FS100-4T450P	SP-F151-01	2	AB8160M0043	LRS-75-24	1.5A/35W @24VDC	181.36	8500	64.8

### 8.3 Channel tted tted dimension table when using Simphoenix independent fan (in mm)

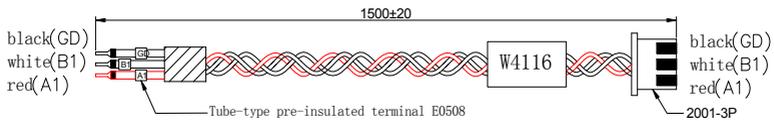


Drive model	Increase the recommended size of the air duct slot after the fan				
	X	Y	Z	A	B
FS100-4T150P	193	200	90	40	20
FS100-4T180P	197	220	105	53	30
FS100-4T220P	197	220	105	53	30
FS100-4T370P	225	241	105	35	24
FS100-4T450P	225	241	105	35	24

**Description:** the frequency converter direction to the radiator tooth plate as the upper and lower direction, and the input and output terminal facing left or over down as the standard.

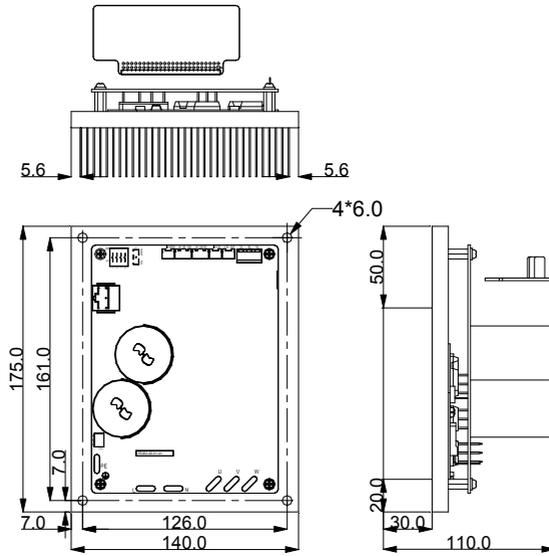
#### 8. 4 RS485 Switter Instructions

The RS485 communication terminal of FS100 series air conditioning driver is 2 PCS socket of 2001S-3P in parallel. If there is no corresponding adapter, Simphoenix RS485 communication adapter can be used. The specification is SP-W4116-01, line length is 1500mm, and the plug terminal of FS100 series driver is 2001-3P, and the terminal of other controllers is pipe pre-insulated terminal E0508. See the drawing size::

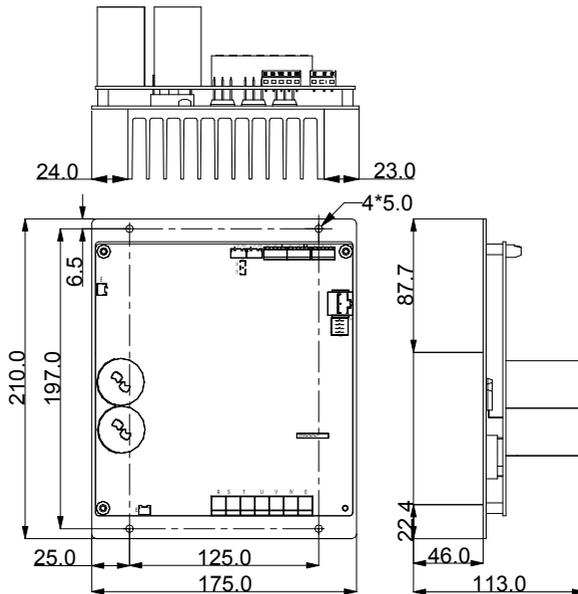


## Chapter 9 product size

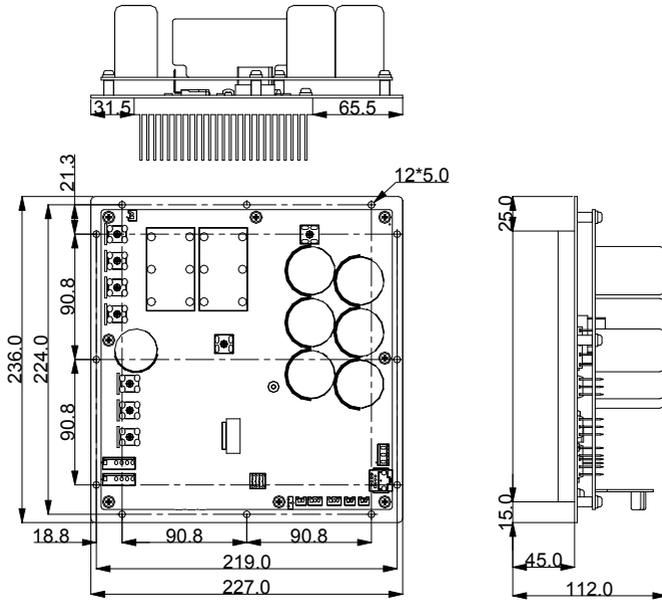
### 9.1 FS100-2S020P dimensional drawing



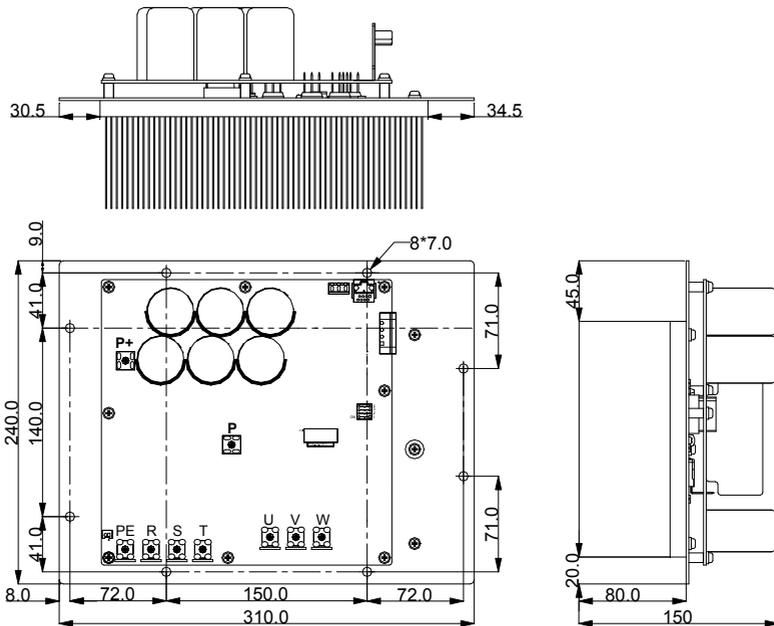
### 9.2 FS100-4T020P-R dimensional drawing



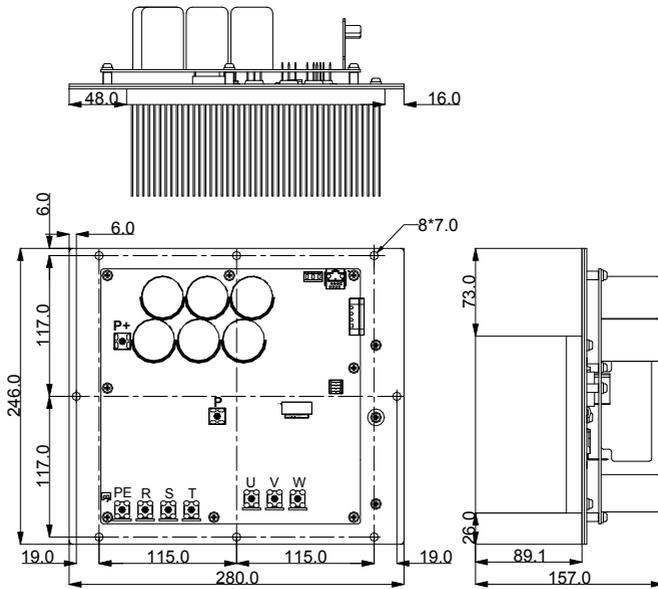
### 9.3 FS100-4T080P dimensional drawing



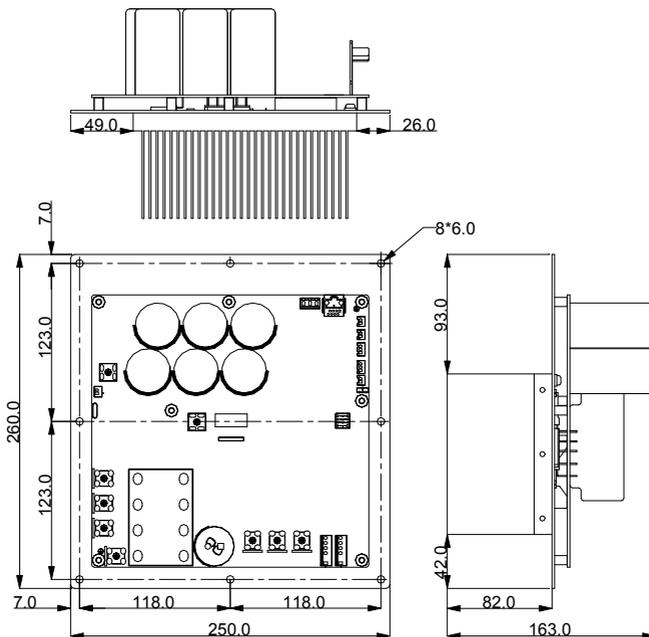
### 9.4 FS100-4T120P-RA1 dimensional drawing



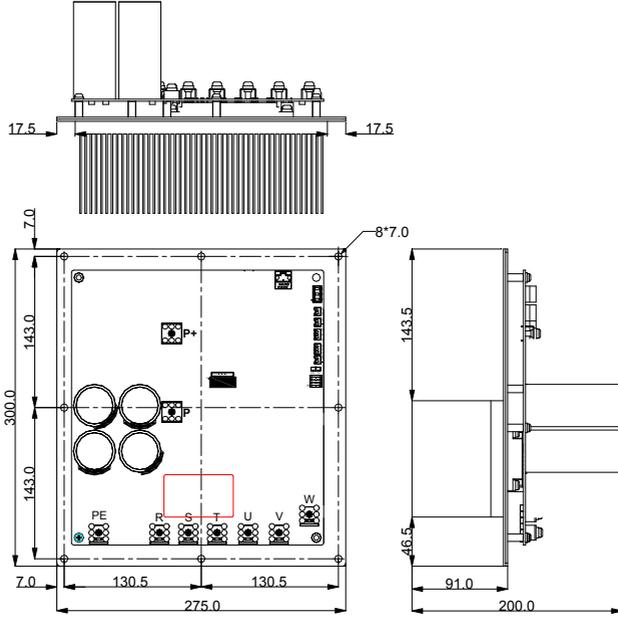
9.5 FS100-4T120P-RA2 dimensional drawing



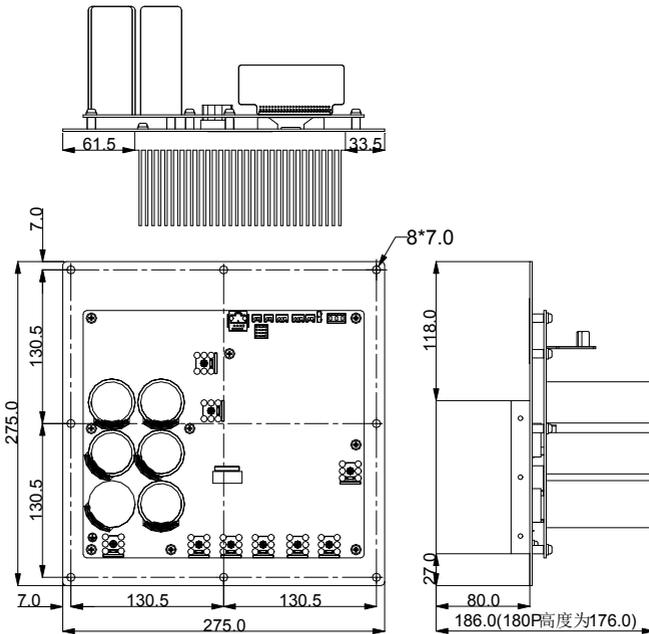
9.6 FS100-4T150P dimensional drawing



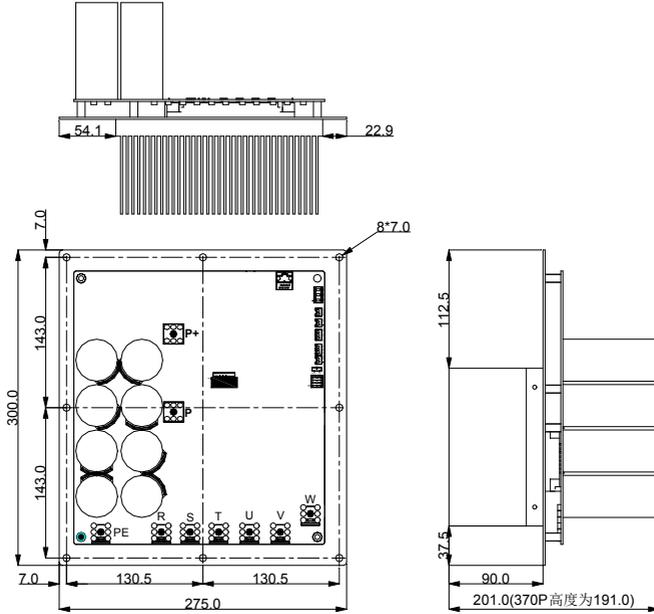
### 9.7 FS100-4T180P-R dimensional drawing



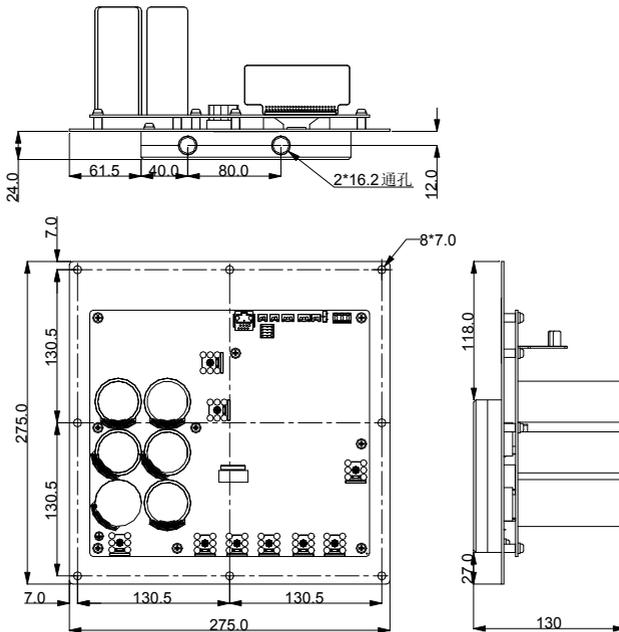
### 9.8 FS100-4T180P&4T220P dimensional drawing



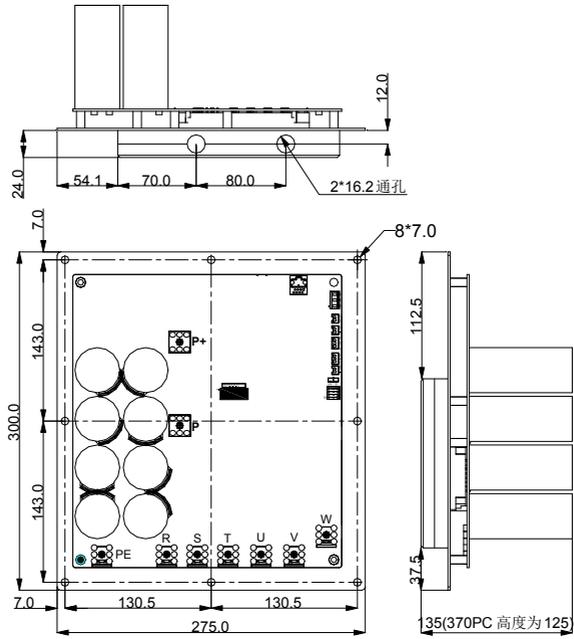
9. 9 FS100-4T370P&4T450P dimensional drawing



9. 10 FS100-4T220PC dimensional drawing



### 9.11 FS100-4T370PC&4T450PC dimensional drawing





# Warranty Card

Maintenance Company: \_\_\_\_\_ User: \_\_\_\_\_

Model No.: \_\_\_\_\_ Purchase Date: \_\_\_\_\_

Invoice No.: \_\_\_\_\_ Purchased From: \_\_\_\_\_

Add: Building A,Huichao Industrial Park,Gushu 2nd Rd.,Xixiang,Bao'an  
District,Shenzhen,China.

Post Code: 401336 Tel: 0086-0755-26607756

Service: 0086-0755-26910928 Fax: 0086-0755-26919882

Note:

1. Please keep this card properly, please contact service center with this card and invoice when need maintenance.
2. The warranty period is 18 months.

**Shenzhen Simphoenix Electric Technology Co.,Ltd**

Cut along the dotted line



## Certificate of Approval

This product is approved to delivery  
according to the standard

Inspector: \_\_\_\_\_



Shenzhen Simphoenix Electric Technology Co.,Ltd

**If the frequency inverter body has the following cases, the company will provide warranty service:**

- If faults or damages occur in normal use condition within the warranty period (within 18 months from the date of purchase), our company will provide free maintenance. Our company will charge a reasonable cost of maintenance when the warranty period has expired (more than 18 months).

- Even in the warranty period, if any fault is caused by the following cases, our company will charge certain amount of maintenance cost:

- ① Fault due to that the users do not operate the device according to the operation manual or beyond the standard;

- ② Fault due to random repair and modification without permission;

- ③ Fault caused by poor preservation;

- ④ Fault caused by improper use of the inverter for unintended purposes;

- ⑤ Damage to the machine due to fire, corrosive salt, gas corrosion, earthquake, storms, floods, thunder, abnormal voltage or other force majeure.

- The company will provide lifelong paid maintenance services even the warranty period expires.