VT200 Series

Inverter User Manual

Preface

Thank you for using VT200 Series multifunctional and high-performance inverter.

The diagram of this manual is for explanation. It may be slightly different from the product. Due to the upgrade of the product, it may also be slightly different. Please refer to the physical object as the standard.

Please note that this manual should be handed over to the user and kept properly for future overhaul and maintenance.

If you have any questions, please contact us or our agent in time, and we will serve you wholeheartedly.

Safety Precautions

Read this manual carefully before installation, operation, maintenance or inspection.
The precautions for safe operation in this manual are classified as “Warning" or “Caution".

Indicates potentially dangerous situations that if not avoided, may lead to personal injury or death.

points out potentially dangerous situations that if not avoided, may lead to mild or moderate injuries and equipment damage. This can also be used to alert against unsafe operations.

In some cases, even the contents described in **Precautions** can also lead to major accidents. Therefore, these important precautions should be observed in any case.

★Attention steps taken to ensure proper operation.

Warning marks appear on the front cover of the drive.

Follow these guidelines when using drives.

Warning marks

DANGER
·Risk of injection and electrical shock. ·Read the manual and follow the safety instruction before use. ·Isolate from supply and wait 10 minutes before removing his cover. ·Ensure property earth connection. ·Mount the inverter on a non-combustible surface.

Unpacking inspection

CAUTION
Do not install or run any drives that are damaged or have faulty parts. Otherwise, there is a risk of injury.

Take out the drive after unpacking. Please check the following items.

① Make sure that the driver is free from any damage (damage or notch on the body) during transportation. ② Confirm that there are instructions and warranty cards in the packing box.

③ Check the driver nameplate and confirm that it is the product you ordered.

④ If you have ordered an option for the drive, please confirm that the option you receive is what you need. If you find damage to the drive or optional parts, please call your local dealer immediately.

Remove and Install Warning

Equipment must be designed, installed, commissioned and operated by trained and qualified professionals to carry out; In the course of work, you must follow all the regulations in the “Warning", otherwise it may cause serious personal injury or major property loss.
The input power cord is only allowed to be permanently fastened, and the device must be reliably grounded.
·Hazardous voltages may be present at the following terminals even when the driver is inactive:
-Power terminal R, S, T
-Terminals connecting the motor U, V, W
·After the power switch is turned off, you must wait more than 10 minutes, and the driver is discharged, the installation operation is allowed to begin.
The minimum cross-sectional area of the grounding conductor is at least 10mm, or corresponding to the data in the following table, it is required to select the maximum of the two as the grounding conductor area:
Cross-sectional area of power line conductor S mm2 sectional area of grounding conductor:

Power line conductor cross section S mm^2	Grounding conductor cross section
$S \leqslant 6$	S
$16 < S \leqslant 35$	16
$35 < S$	S/2

CAUTION

Lift the cabinet with the base support. Do not hold the panel when moving the driver, otherwise the main unit may fall and cause personal injury.
The driver should be installed on flame retardant materials such as metals, away from heat sources and flammable objects to avoid fire.
When installing more than two drivers in one cabinet, it is necessary to install a cooling fan and control the air temperature below 40℃, otherwise overheating will cause fire or device damage.

Contents

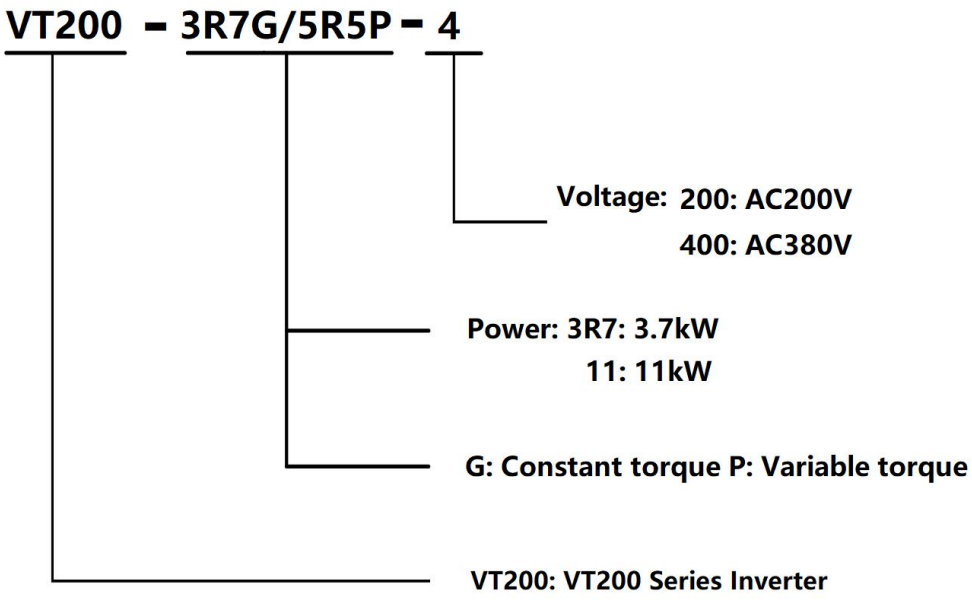
Chapter 1 Introduction

1.1 Comprehensive technical characteristics of inverter

Items		Specifications
Basic functions	Maximum frequency	0-600Hz
	Carrier frequency	0.5kHz-16kHz The carrier frequency can be automatically adjusted according to the load characteristics.
	Input frequency resolution	Digital settings: 0.01Hz Analog settings: Max frequency×0.025%
	Control method	V/F control Open-loop vector control (No PG) Closed-loop vector control (With PG)
	Start torque	Model G: 0.5Hz/150% (No PG); Model P: 0.5Hz/100%
	Speed range	1: 100 (No PG)
	Torque control accuracy	±5%(FVC)
	Overload capacity	Model G: 150% rated current, 60s; 180% rated current, 3s. Model P: 120% rated current, 60s; 150% rated current, 3s.
	Torque compensation	Automatic torque compensation; Manual torque compensation 0.1%-30.0%
	V/F curve	3 modes: Linear type; multi-point type; N-power V/F curves (1.2power, 1.4power, 1.6power, 1.8power, 2power)
	V/F separation	2 modes: Full separation, semi-separation
	Acceleration/deceleration curve	Straight line or S curve acceleration and deceleration mode. Four acceleration and deceleration time, acceleration and deceleration time range: 0.0-6500.0s
	DC braking	DC braking frequency: 0.00Hz-Maximum frequency; Braking time: 0.0s-100.0s; Braking action current value: 0.0%-100.0%
	Inching control	Inching frequency range: 0.00Hz-50.00Hz. Inching acceleration and deceleration time: 0.0s-6500.0s.
	Simple PLC, multi-segment speed running	Up to 16-segment speed running can be realized through built-in PLC or control terminal
	Built-in PID	It's easy to realize the closed-loop control with process control

	Automatic voltage regulation (AVR)	When the grid voltage changes, it can automatically keep the output voltage constant
	Overvoltage and overcurrent stall control	Automatically limit current and voltage during operation to prevent frequent overcurrent and overvoltage tripping
	Fast current limiting	Minimize overcurrent fault and protect the normal operation of inverter
	Torque limit and control	"Excavator" feature, automatically limit torque during operation to prevent frequent overcurrent tripping
Personalized function	Excellent performance	Realize asynchronous motor with high performance current vector control technology
	Instantaneous stop	In case of instantaneous power outage, the load feedback energy is used to compensate the voltage reduction, so as to maintain the inverter to continue running in a short time
	Fast current limiting	Avoid frequent overcurrent faults of inverter
	Timing control	Timing control function: Set the time range: 0.0Min-6500.0Min
	Communication mode support	RS-485
Operation	Command number	The operation panel is given, the control terminal is given, and the serial communication port is given. It can be switched in many ways
	Frequency source	10 frequency sources: Digital given, analog voltage given, analog current given, pulse given, serial port given. It can be switched in many ways.
	Auxiliary frequency source	10 auxiliary frequency sources. It can flexibly realize auxiliary frequency adjustment and frequency synthesis
	Input terminal	5 digital input terminals, one of which supports high-speed pulse input up to 100kHz; 1 analog input terminal supports 0-10V voltage input or 4-20mA current input
	Output terminal	1 collector output terminal 1 relay output terminal 1 analog output terminal, supporting 0-20mA current output or 0-10V voltage output
Display and keyboard operation	LED display	Display parameters
	Key lock and function selection	Realize partial or full locking of keys, and define the action range of some keys to prevent maloperation
	Protective function	Short circuit detection of power-on motor, output open phase protection and overcurrent protection, overvoltage protection, undervoltage protection, overheat protection, overload protection, etc.
Surroundings	Application scenarios	Indoor, free from direct sunlight, dust, corrosive gas, combustible gas, oil mist, water vapor, dripping water or salt, etc.
	Altitude environment	Less than 1000m (higher than 1000m needs to be downshifted)
	Ambient temperature	-10℃-+40℃ (ambient temperature at40℃-50DEG C. Please descend usage)
	Humidity	Less than 95% RH, no condensation of water droplets
	Vibration	Less than 5.9 m/s2(0.6g)
	Storage temperature	-20℃-+60℃

1.2 Nameplate description



1.3 Models

Model	Input voltage	Rated output power (kw)	Rated input current (A)	Rated output current (A)	Motor power (kw)
VT200-0R4G-2	AC 1PH 220V± 15%	0.4	5.4	2.1	0.4
VT200-0R75G-2		0.75	7.2	3.8	0.75
VT200-1R5G-2		1.5	10.0	7.2	1.5
VT200-2R2G-2		2.2	16.0	9	2.2
VT200-3R7G-2		3.7	23	13	3.7
VT200-0R4G-4	AC 3PH 380V± 15%	0.4	3.4	1.5	0.4
VT200-0R75G-4		0.75	3.8	2.1	0.75
VT200- 1R5G-4		1.5	5.0	3.8	1.5
VT200-2R2G-4		2.2	5.8	5.1	2.2
VT200-3R0G-4		3.0	8.5	7.2	3.0
VT200-3R7G/5R5P-4		3.7/5.5	10/15	9/13	3.7/5.5
VT200-5R5G/7R5P-4		5.5/7.5	15/20	13/17	5.5/7.5
VT200-7R5G/11P-4		7.5/11	20/26	17/25	7.5/11
VT200-11G/15P-4		11/15	26/35	25/32	11/15
VT200-15G/18.5P-4		15/18.5	35/38	32/37	15/18.5
VT200-18.5G/22P-4		18.5 / 22	38/46	37/45	18.5/22
VT200-22G/30P-4		22 / 30	46/62	45/60	22/30
VT200-30G/37P-4		30 / 37	62/76	60/75	30/37
VT200-37G/45P-4		37/45	76/90	75/90	37/45
VT200-45G/55P-4		45/55	90/105	90/110	45/55
VT200-55G-4		55	113	110	55

Chapter 2 Installation and wiring of inverter

2.1 Installation environment and requirements

Inverter installation environment has a direct impact on the service life and normal function of the inverter. If the inverter is used in an environment that does not meet the allowable range of the operating instructions, it may lead to inverter protection or fault.

VT200 series inverter is wall-mounted inverter, please install vertically to facilitate air convection and heat dissipation.

Installation environment of inverter, please confirm that it must conform to:

(1) Ambient temperature -10℃ to +40℃

(2) Ambient humidity 0-95% and no condensation

(3) Avoid direct sunlight

(4) The environment does not contain corrosive gases and liquids

(5) There is no dust, floating fiber, cotton wool and metal particles in the environment

(6) Keep away from radioactive materials and combustibles

(7) Keep away from electromagnetic interference sources (such as electric welding machines and large power machines)

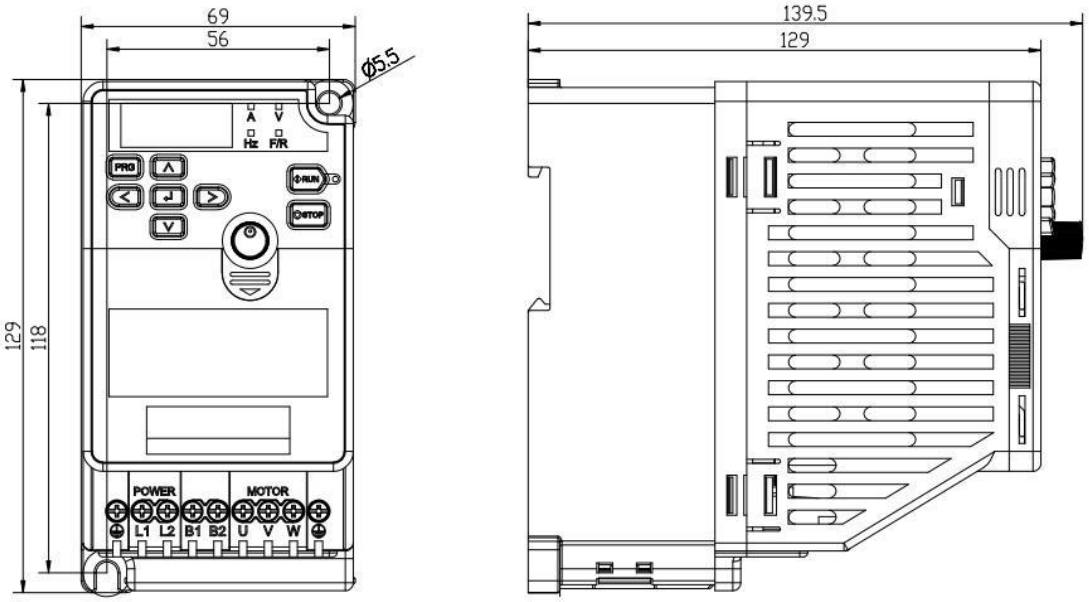
(8) The installation area is firm and vibration-free. If vibration cannot be avoided, please equip anti-vibration gaskets to reduce vibration

(9) Please install the inverter in a well-ventilated place, which is easy to check and maintain, and install it on a firm and non-combustible material, away from heating elements (such as braking resistors, etc.)

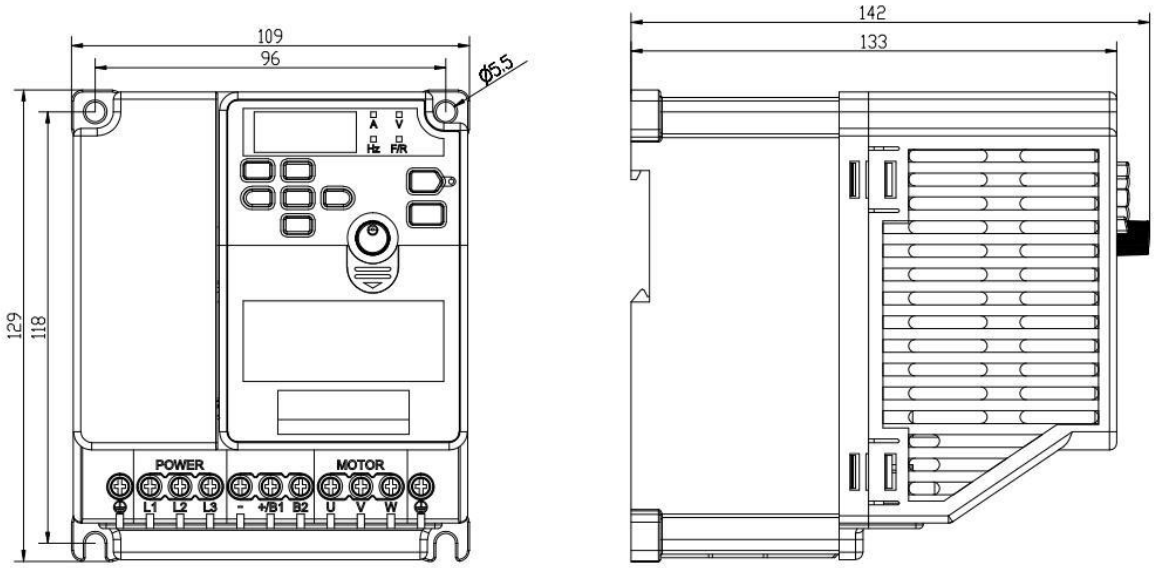
(10) Please reserve enough space for inverter installation, especially for multiple frequency converters, please pay attention to frequency conversion. The placement position of the device, and a hot fan is added to make the ambient temperature lower than that of the45℃.

2.1.1 Inverter appearance and Installation Dimensions

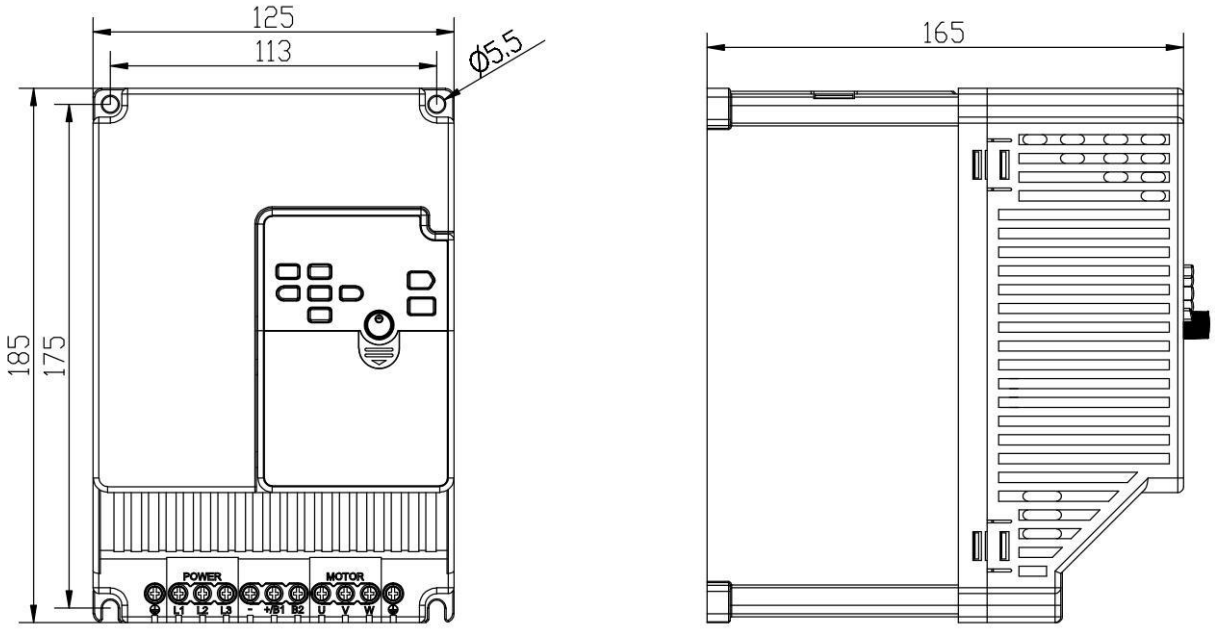
① AC220V 0.4-1.5kW



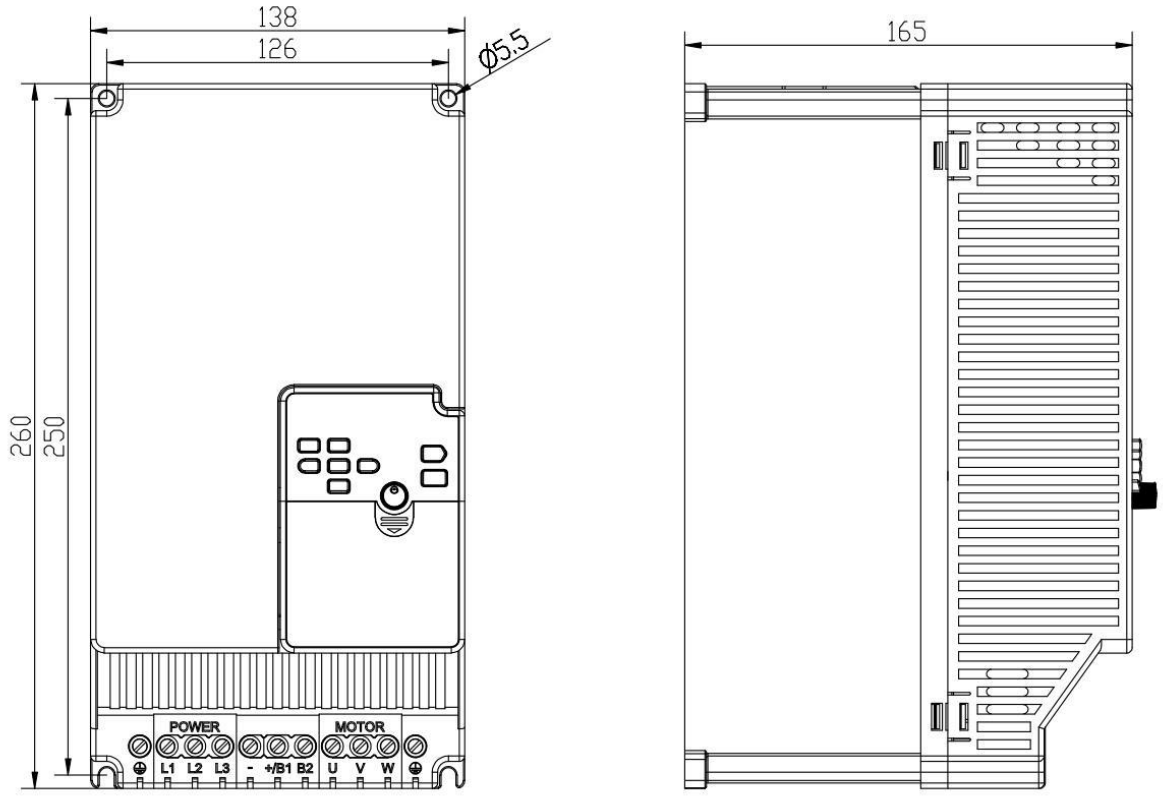
② AC220V 2.2kW&AC380V 0.4-3.7kW



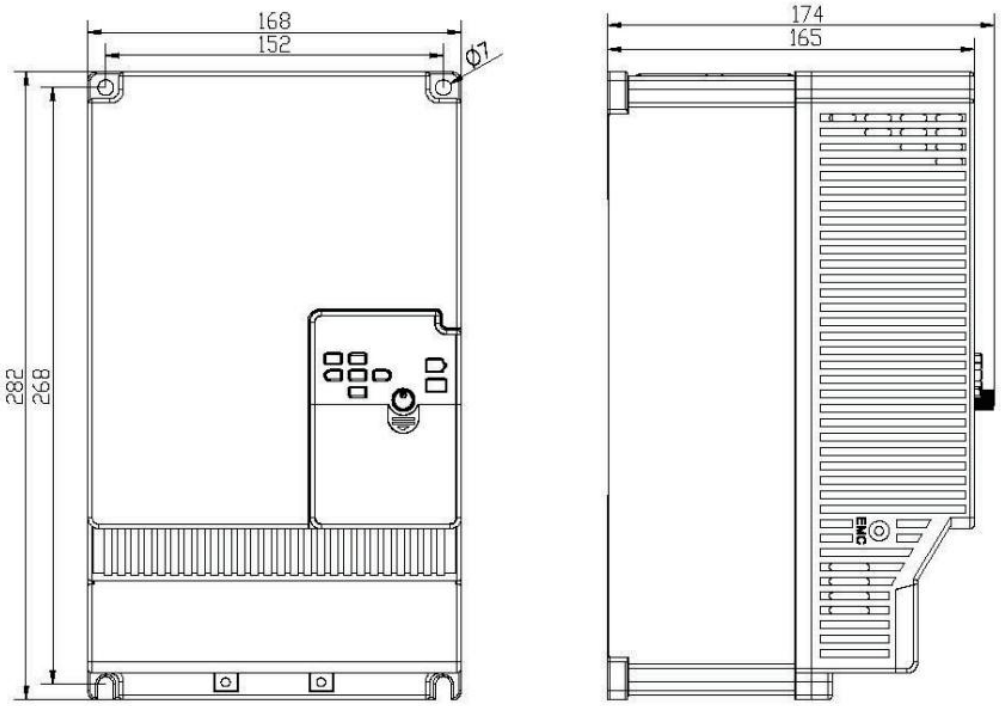
③ AC380V 5.5-7.5kW



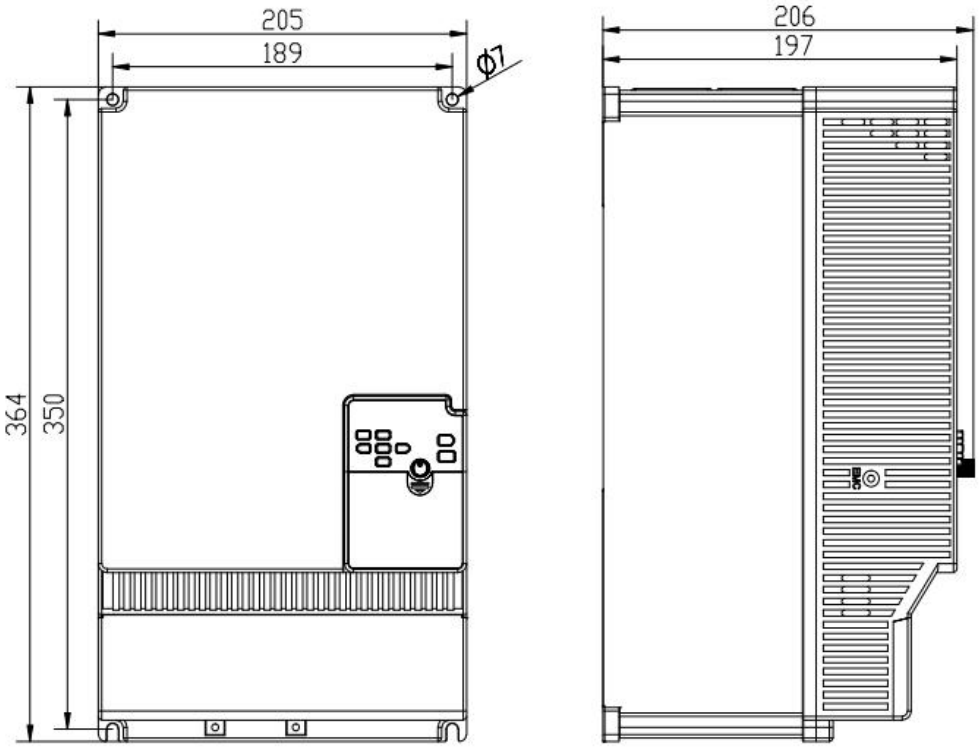
④ AC380V 11--15KW



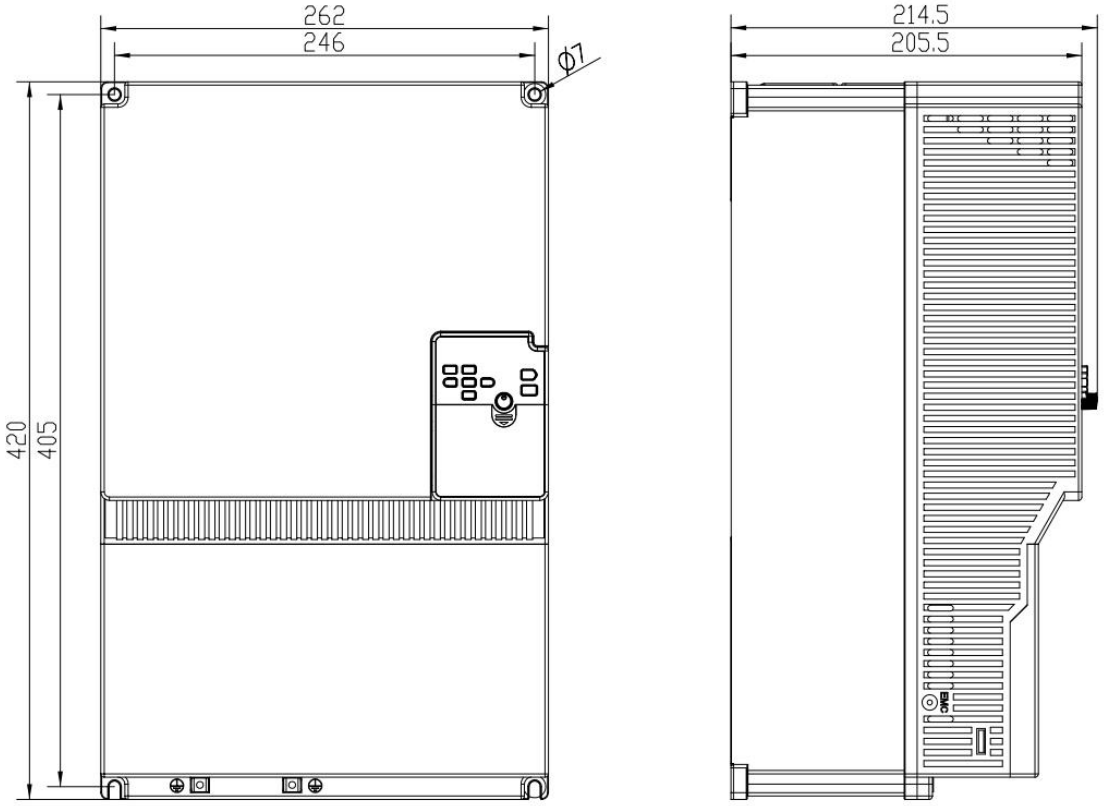
⑤ AC 380V 18kw-22kw



⑥ AC 380V 30kw-37kw



⑦ AC 380V 45kw-55kw

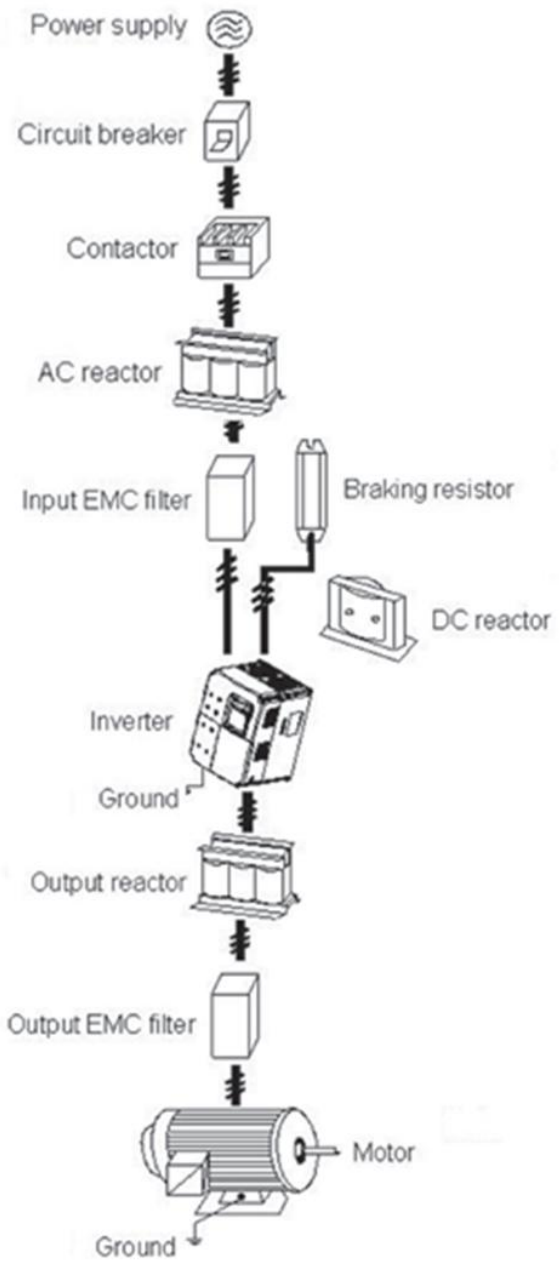


2.2 Keyboard cannot be pulled out

2.3 Inverter wiring

Inverter wiring is divided into main loop part and control part.

2.3.1 Main Circuit Wiring



2.3.2 Peripheral Device Description

(1) AC Power Supply

Please supply power according to the power specification specified in the instruction manual.

(2) Fuse-less circuit breaker (MCCB)

When the power supply voltage is too low or the input side is short-circuited, the circuit breaker can protect. When inspecting, maintaining, or when it does not work, the circuit breaker can be disconnected to isolate the inverter from the power supply.

(3) Electromagnetic contactor (MC)

It is easy to control the power-on and power-off of the inverter to ensure safety.

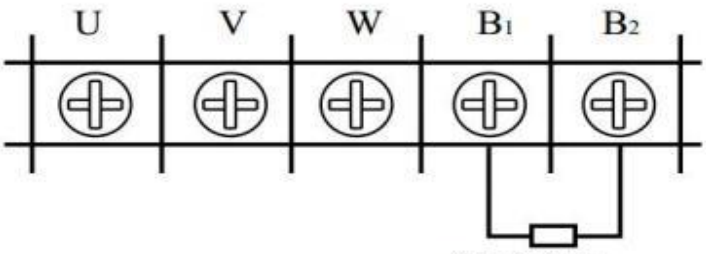
(4) AC inductor

a: Suppress upper harmonic wave and protect inverter

b: Improve power factor

(5) Braking resistance

When the motor is braking, avoid over-high voltage in the DC loop of the inverter and improve the braking ability of the built-in braking unit. The braking resistance of the T200 series inverter is connected as follows:



Braking resistor

2.3.3 Precautions in wiring of main circuit

(1) Wiring line specifications, please implement wiring according to electrical laws and regulations;

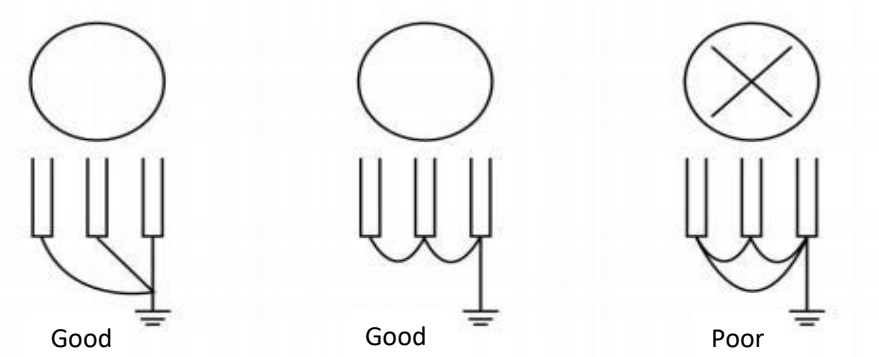
(2) Do not connect alternating current to the output end (U, V, W) of the inverter, otherwise it will cause damage to the inverter;

(3) For power wiring, please try to use isolation lines and tubes, and ground both ends of isolation lines or tubes;

(4) The grounding wire of inverter cannot be grounded together with electric welding machine, high-power motor or large current load, please ground it separately;

(5) The grounding terminal E should be grounded in the third way, and the grounding impedance is less than 100Ω;

(6) For the use of grounding wire, please use it according to the specifications specified by electrical equipment technology. The shorter the length of grounding wire is, the better it is;
(7) Multiple inverters are grounded, please be careful not to cause grounding circuits, as shown in the following figure;



(8) The power line and control line of the main circuit must be wiring separately, the parallel wiring should be more than 10cm apart, and the cross wiring should be perpendicular to each other. Do not place the control line and power line in the same line slot, otherwise it will cause interference;
(9) In general, the distance between inverter and motor should be less than 30 meters. When the distance is too long, the impulse current generated by parasitic capacitance will cause overcurrent protection, and may also cause maloperation, which may lead to inverter failure or abnormal device operation. The maximum distance between inverter and motor should not exceed 100 meters. When the distance is long, please select the output side filter and reduce the carrier frequency;
(10) The output side (U, V, W) of the inverter shall not be added with absorption capacitors or other resistance-capacitance absorption devices;
(11) Please confirm that the main circuit terminals are locked, and the leads are in good contact with the terminals, so as to prevent short circuit due to vibration loosening and sparks;
(12) In order to reduce interference, it is recommended to connect surge absorber to the coils of electromagnetic contactors, relays and other devices in the circuit around the inverter.

2.3.4 Recommended specifications

Inverter model	Input Voltage	Matching motor (KW)	Main circuit wire diameter (mm^2)	Air circuit breaker (A)	Magnetic contactor (A)
VT200-0R4G-2		0.4	0.75	10	9
VT200-0R75G-2		0.75	0.75	16	12
VT200-1R5G-2		1.5	1.5	25	18
VT200-2R2G-2		2.2	2.5	32	25
VT200-0R4G-4		0.4	0.75	6	9
VT200-0R75G-4		0.75	0.75	6	9
VT200-1R5G-4		1.5	0.75	10	9
VT200-2R2G-4		2.2	0.75	10	9
VT200-3R0G-4		3.0	1.5	16	12
VT200-3R7G/5R5P-4		3.7/5.5	1.5	16	12
VT200-5R5G/7R5P-4		5.5/7.5	2.5	20	18
VT200-7R5G/11P-4		7.5/11	4	32	25
VT200-11G/15P-4		11/15	4	40	32
VT200-15G/18.5P-4		15/18.5	6	50	38

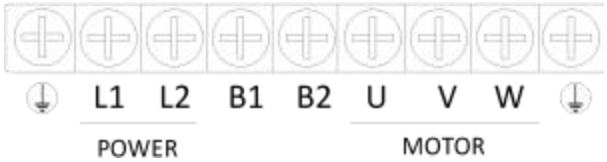
*The data in this table are for reference only.

2.3.5 Main circuit terminal and description

When the user opens the upper cover plate of the inverter, the main circuit terminal can be seen.

1. The main circuit terminals of VT200 series inverters are arranged as follows:

A.1PH AC 220V 0.4-1.5kW

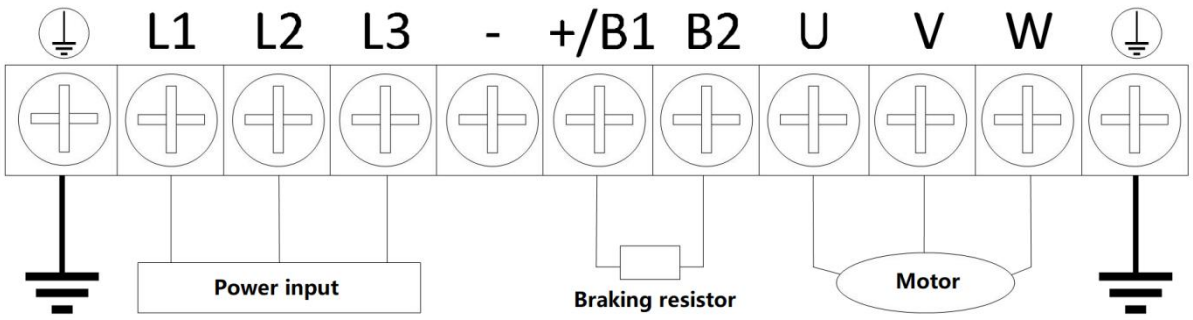


B. 3PH AC 380V 0.4-15KW & 1PH AC 220V 2.2kW

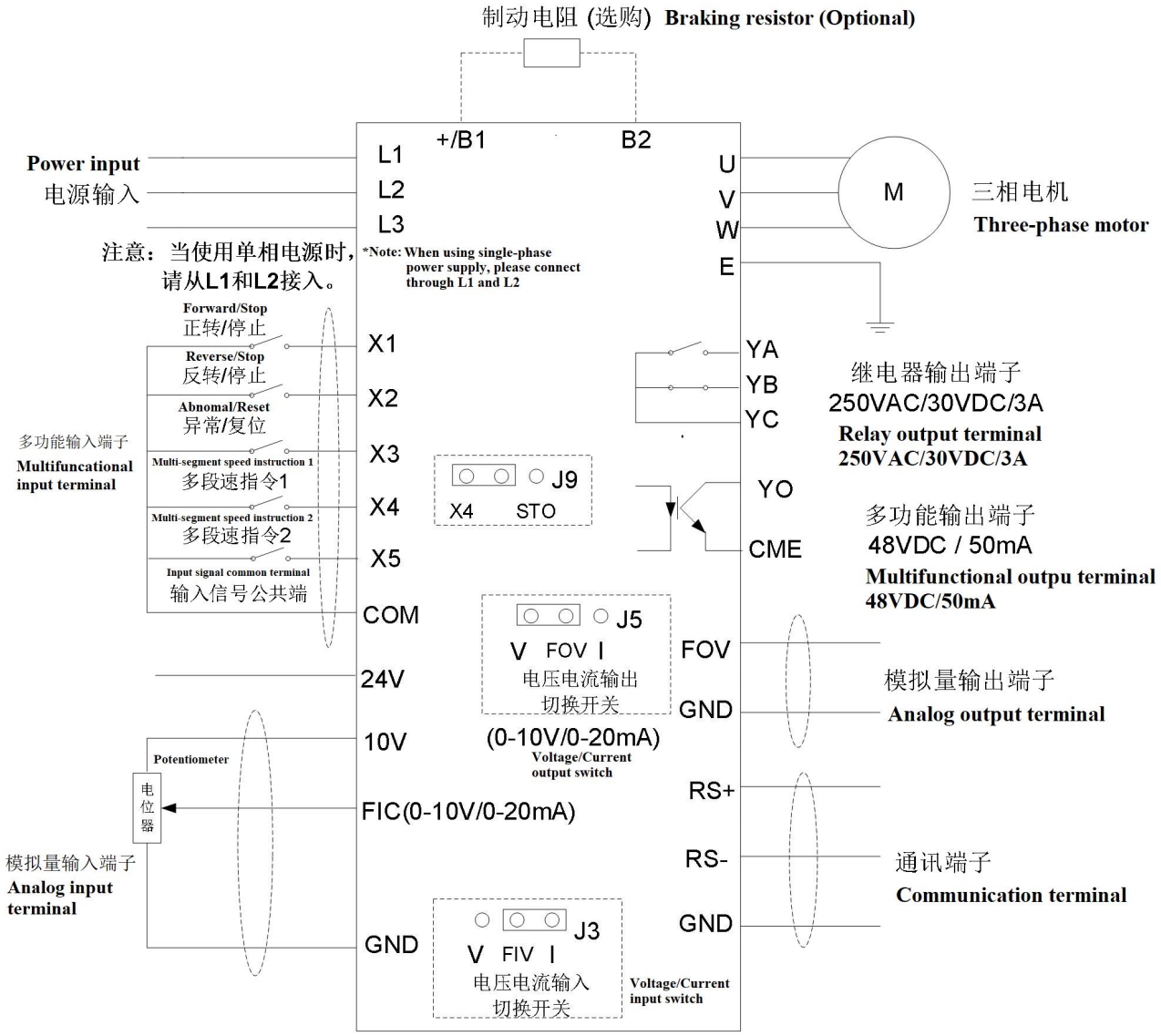
2. Main circuit terminal description

Name	Function description
⏚	Ground terminal
R/L1 S/L2 T/L3	Power input terminal
U/T1, V/T2, W/T3	Three-phase AC motor
+/B1, B2	Braking resistor terminal
+/B1, -	DC bus terminal, the braking unit can be externally connected

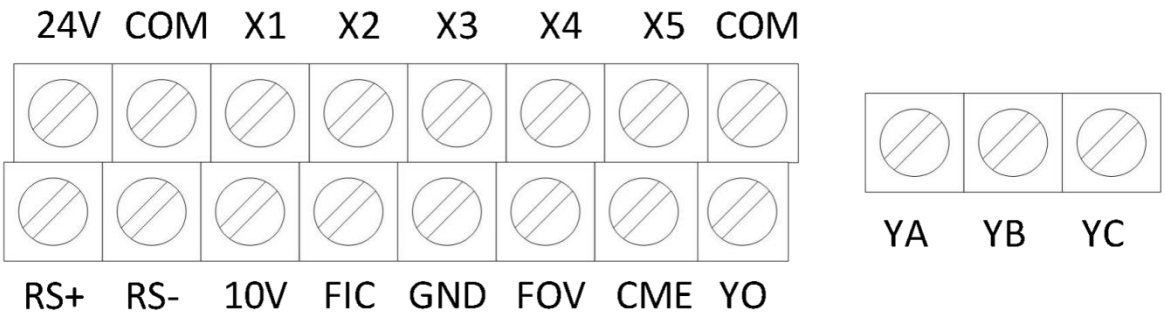
3. Wiring example:



4. Basic wiring diagram



2.4 Control terminal



2.4.1 Control Terminal Description

Terminal name	Function definition description	Remarks
X1	Forward rotation command input terminal (multifunctional input terminal)	Multifunctional input terminals X1-X5 can be specifically set by parameters P4.00-P4.04, which is valid when the set terminal is closed with COM.
X2	Reverse command input terminal (multi-function input terminal)	
X3	Fault reset	
X4	Multiple speed command 1	
X5	Multiple speed command 2 (High speed pulse input)	
COM	Digital input common terminal	
FOV	Analog Output Terminal	0-10V/0-20mA
10V	Power supply for frequency setting	
FIC	Analog input terminal	0-10V/0-20mA
24V	24V Auxiliary power supply	
GND	Input signal common terminal	
CME	Optically coupled output common terminal	
Y0	Multifunctional optical coupling output contact	
YA	Relay output contact (normally open)	
YB	Relay wheel exit contact (normally closed)	
YC	Relay output contact RA, RB common terminal	

Control panel switch description:

Dip Switch Name	Dip Switch Description
J5	V, FOV short-circuit for voltage output; I, FOV short-circuit for current output
J3	V, FIC short-circuit for voltage input; I, FIC short-circuit for current input
J9	The X4 side is a standard multi-function input terminal, and the STO side turns on the STO function. (✎**Note: STO function does not need to set parameters, only J9 selects STO, short circuit X4 and COM, and STO off; Disconnect X4 and COM, STO on**)
J4	RS485 communication terminal resistance switch, the ON side is connected with 120 Ω resistors in RS+ and RS-, and the OFF side with RS+ and RS- has no parallel terminal resistors
J7, J8	At the same time, jump to BMQ side to select LED keyboard, and jump to LCD side to select LCD keyboard
J1	NPN/PNP switch
J6	Ground EMC interference ON/OFF switch

Precautions in power distribution of control loop:

(1) Please separate the control signal line from the main circuit, other power lines and power lines.
(2) To prevent maloperation caused by interference, please use stranded shielded wire or double-stranded shielded wire with specifications of 0.5-2mm2.
(3) Please confirm the permissible conditions of each terminal, such as: Power supply, allowable maximum current, etc.
(4) Grounding terminal E should be grounded correctly, and the grounding impedance is less than 100Ω.
(5) Wiring requirements of each terminal, correctly select accessories such as potentiometer, voltmeter, input power supply, etc.
(6) Please check it correctly after wiring is completed, and power it on only after it is confirmed to be correct.

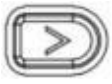
Chapter 3 Operation

3.1 Operation panel description

The operation panel is also called keyboard.

3.1.1 Schematic diagram of panel

3.1.2 Key function description

Key symbol	Name	Function description
PRG	Programming key	Enter or exit the first-level menu, and delete the shortcut parameters
	Confirm key	Enter the menu screen step by step, and set the parameters to confirm
	UP increment key	Increment of data or function code
	DOWN descending key	Decrease of data or function code
	Left shift	In the shutdown display interface and the operation display interface, the display parameters can be selected cyclically; When modifying a parameter, you can select the modification bit of the parameter
	Right shift	In the shutdown display interface and the operation display interface, the display parameters can be selected cyclically; When modifying a parameter, you can select the modification bit of the parameter.
RUN	Run key	In keyboard operation mode, used to run and operation
STOP	Stop/Reset key	In the running status, press this key to stop the running operation, which is restricted by the function code P7.04; In case of fault alarm status,

		this key can be used to reset the fault, which is not limited by function code P7.04.
	Encoder	When the knob is rotated when P0.03=4, the set frequency can be modified; The display screen can be switched by pressing the knob during standby. By setting P7.03-P7.05, the output frequency, output current, output voltage, bus voltage, output speed and so on can be displayed.

3.1.3 indicator description:

Symbolic feature	Symbolic content description
Hz	Frequency indicator
A	Current indicator
V	Voltage indicator
F/R	Positive and reverse indicator: When the light goes out, it means that it is in a forward status; The light on indicates that it is in the reverse status.

3.2 Operation flow

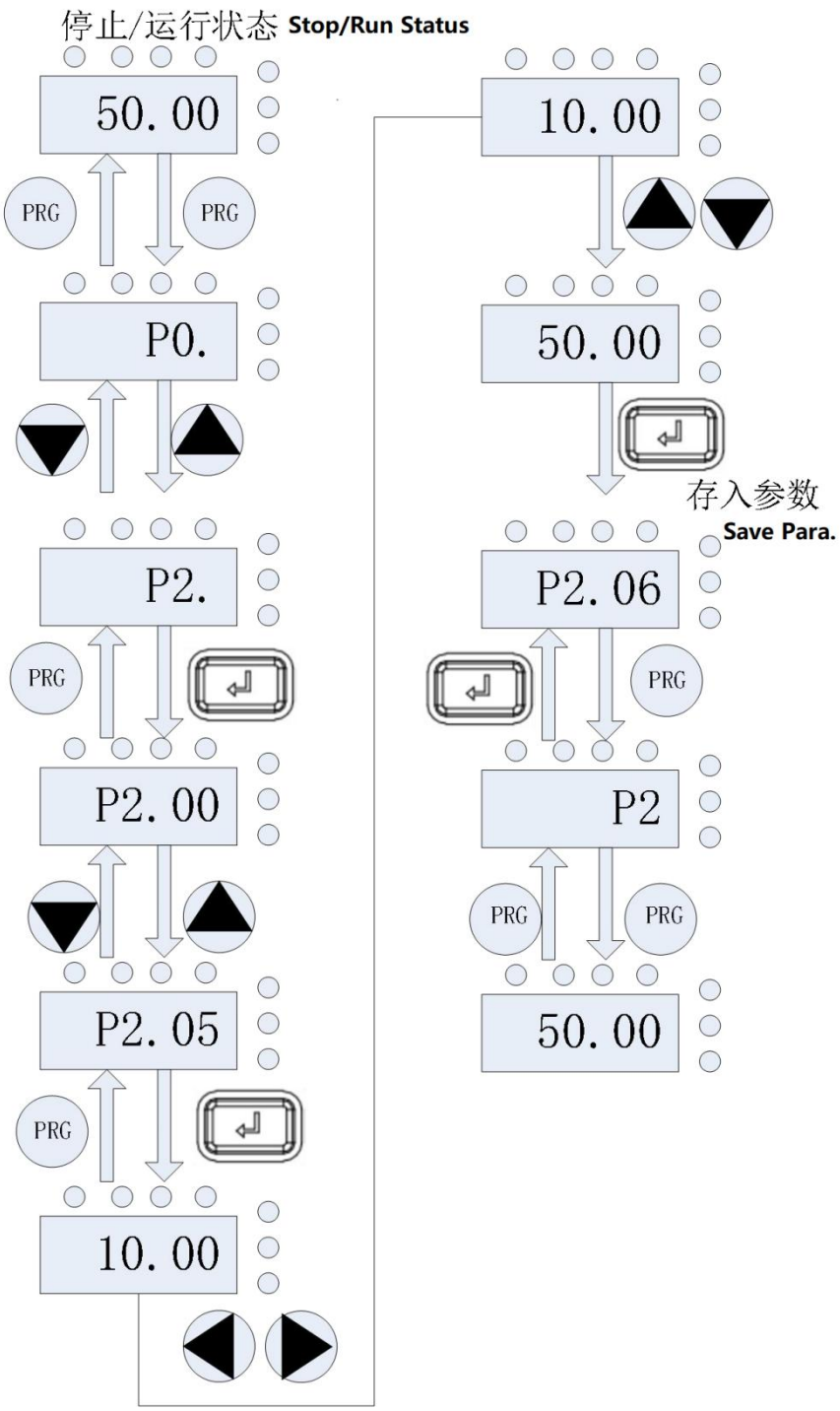
3.2.1 Parameter settings

The three-level menus are:

1. Function code group number (first level menu);
2. Function code setting value (second level menu).
3. Function code setting value (third level menu).

Description: In the third-level menu operation, you can press PRG or  return to the second-level menu. The difference between the two is: Press  , save the set parameters into the control panel, then return to the second menu and automatically transfer to the next function code; Press PRG to return to the second menu directly, without storing parameters, and keep staying in the current function code.

Examples: Example of changing the function code P2.05 from 10.00Hz to 50.00Hz.



In the third-level menu, if the parameter has no flashing bit, it means that the function code cannot be modified. The possible reasons are as follows:

1) The function code is an unmodified parameter. Such as actual detection parameters, operation record parameters, etc.;

2) The function code can not be modified in the running status, and can only be modified after stopping the machine;

3.2.2 Fault reset

After the inverter fails, it will prompt relevant fault information. Users can reset the fault through the STOP key on the keyboard or the terminal function (P4 group). After the fault reset, the inverter is in standby status.

If the inverter is in a fault status and the user does not reset it, the inverter is in a running protection status and cannot run.

3.2.3 Motor parameter self-learning

1. Comprehensive parameter self-learning

When choosing the operation mode without PG vector control, the nameplate parameters of the motor must be accurately input, and the inverter will match the standard motor parameters according to the nameplate parameters; In order to obtain good control performance, it is recommended to carry out self-learning of motor parameters, and the self-learning operation steps are as follows:

First, select the running instruction channel selection (P0.02) as the keyboard instruction channel.

Then please enter the following parameters according to the actual motor parameters:

P1.01: Rated power of motor;

P1.02: Rated voltage of motor;

P1.03: Rated current of motor;

P1.04: Rated frequency of motor;

P1.05: Rated speed of motor.

✎**Note: In the process of comprehensive parameter self-learning, the motor should be separated from the load, otherwise, the motor parameters obtained by self-learning may be incorrect.**

2. Self-learning of static parameters

When the motor static parameters are self-learning, it is not necessary to separate the motor from the load. Before the motor parameters are self-learning, the motor nameplate parameters (P1.01-P1.05) must be correctly input. After self-learning, the stator resistance, rotor resistance and leakage inductance of the motor will be detected. The mutual inductance and no-load current of the motor can not be measured.

The user can input the corresponding value according to the motor nameplate.

3.3 Running status

3.3.1 Power-on initialization

During the power-on of the inverter, the system is initialized first, and the indicator lights are all on. After initialization, the inverter is in standby status.

3.3.2 Standby

A variety of status parameters can be displayed in downtime or running status. The function codes P7.03 and P7.04 (operation parameters) and P7.05 (shutdown parameters) can be selected by binary bits. See the description of P7.03, P7.04 and P7.05 function codes for the definition of each bit.

3.3.3 Self-learning of motor parameters

Please refer to the detailed description of function code P1.37.

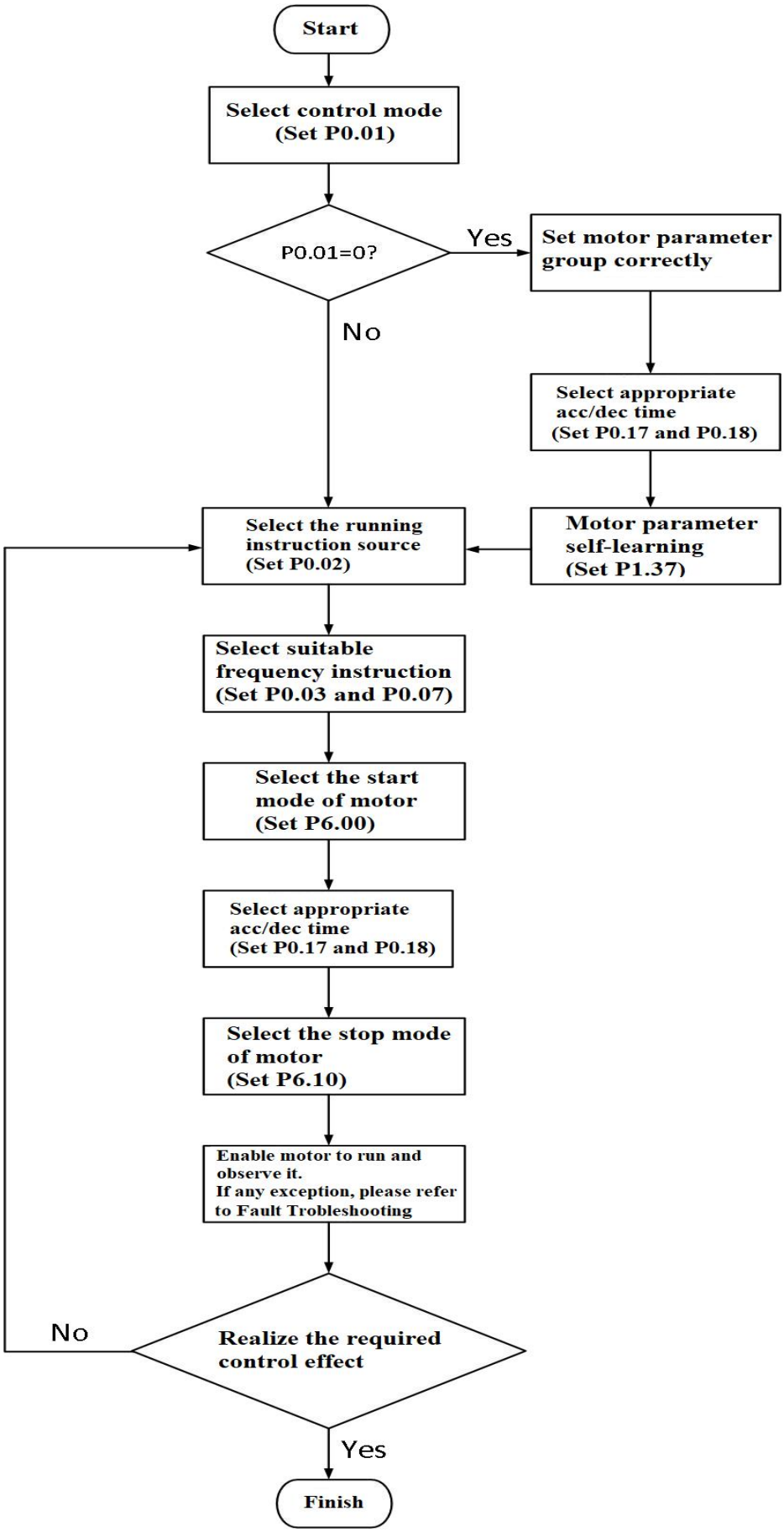
3.3.4 Run

In the running status, there are 29 status parameters that can be selected to display or not, namely: Operating frequency, set frequency, bus voltage, output voltage, output current, running speed, output power, output torque, etc. are selected by function codes P7.03 and P7.04 according to bits (converted into binary), and the selected parameters are switched and displayed according to the order of left and right shift keys.

3.3.5 Fault

VT200 series inverter provides a variety of fault information. For details, please refer to VT200 Series Inverter Fault and Troubleshooting.

3.4 Quick debugging



Chapter 4 Fault check and troubleshooting

4.1 Fault alarm and treatments

VT200 inverter has a number of warning information and protection functions. Once a fault occurs, the protection function enables. The inverter stops outputting, the fault relay contact of the inverter acts, and the fault code is displayed on the inverter display panel.

Before seeking service, users can self-check according to the prompts in this section, analyze the causes of faults and find solutions. If it is for the reasons stated in the dotted box, please ask for help and contact the agent of your inverter or contact our company directly.

OUOC in fault information is hardware overcurrent or overvoltage signal, and OUOC alarm is caused by hardware overvoltage fault in most cases.

Fault 1 Name	Inverter unit protection
Operation panel display	OC
Troubleshooting	1. Short circuit of inverter output circuit 2. The wiring of motor and inverter is too long 3. The module overheats 4. The internal wiring of the inverter is loose 5. Abnormal main control board 6. Abnormal drive plate 7. Abnormal inverter module
Troubleshooting	1. Troubleshoot peripheral faults 2. Install reactor or output filter 3. Check whether the air duct is blocked and whether the fan works normally and excludes its existing problem 4. Plug in all the connecting wires 5. Seek technical support 6. Seek technical support 7. Seek technical support
Fault 2 Name	Accelerated overcurrent
Operation panel display	OC1
Fault causes and troubleshooting	1. Grounding or short circuit exists in the output circuit of inverter 2. The control mode is vector and no parameter identification is carried out 3. The acceleration time is too short 4. Manual torque compensation or inappropriate V/F curve 5. The voltage is low 6. Enable the rotating motor 7. Sudden load during acceleration 8. The selected inverter is small
Trouble handling and measures	1. Troubleshoot peripheral faults 2. Identification of motor parameters 3. Increase the acceleration time 4. Adjust the manual lifting torque or V/F curve 5. Adjust the voltage to the normal range 6. Select speed tracking to start or wait for the motor to stop before starting 7. Cancel sudden load 8. Choose an inverter with higher power level

Fault 3 Name	Deceleration overcurrent
Operation panel display	OC2
Fault causes and troubleshooting	1. Grounding or short circuit exists in the output circuit of inverter 2. The control mode is vector and no parameter identification is carried out 3. The deceleration time is too short 4. The voltage is low 5. Sudden load during deceleration 6. No braking unit and braking resistor are added.
Trouble handling and measures	1. Troubleshoot peripheral faults 2. Identification of motor parameters 3. Increase the deceleration time 4. Adjust the voltage to the normal range 5. Cancel sudden load 6. Add brake unit and resistor
Fault 4 Name	Constant speed overcurrent
Operation panel display	OC3
Fault causes and troubleshooting	1. Grounding or short circuit exists in the output circuit of inverter 2. The control mode is vector and no parameter identification is carried out 3. The voltage is low 4. Whether there is a sudden load in the running 5. The selected inverter is small
Trouble handling and measures	1. Troubleshoot peripheral faults 2. Identification of motor parameters 3. Adjust the voltage to the normal range 4. Cancel sudden load 5. Select an inverter with higher power
Fault 5 Name	Accelerated overvoltage
Operation panel display	OU1
Fault causes and troubleshooting	1. The input voltage is high 2. There is external force driving the motor to run during acceleration 3. The acceleration time is too short 4. No braking unit and braking resistor are added
Trouble handling and measures	1. Adjust the voltage to the normal range 2. Cancel additional power or add braking resistor 3. Increase the acceleration time 4. Install brake unit and resistor
Fault 6 Name	Deceleration overvoltage
Operation panel display	OU2
Fault causes and troubleshooting	1. The input voltage is high 2. There is external force driving the motor to run during deceleration 3. The deceleration time is too short 4. No braking unit and braking resistor are added
Trouble handling and measures	1. Adjust the voltage to the normal range 2. Cancel additional power or add braking resistor 3. Increase the deceleration time 4. Install brake unit and resistor
Fault 7 Name	Constant speed overvoltage
Operation panel display	OU3
Troubleshooting	1. The input voltage is high 2. There is an external force to drive the motor to run during running
Troubleshooting	1. Adjust the voltage to the normal range 2. Cancel additional power or add braking resistor

Fault 8 Name	Control power supply fault
Operation panel display	POF
Troubleshooting	1. The input voltage is not within the range specified in the specifications
Troubleshooting	1. Adjust the voltage to the range required by the specifications
Fault 9 Name	Undervoltage fault
Operation panel display	LU
Fault causes and troubleshooting	1. Instantaneous power outage 2. The input voltage of the inverter is not in the range required by the specifications 3. The bus voltage is abnormal 4. The rectifier bridge and buffer resistance are abnormal 5. Abnormal drive plate 6. Abnormal control panel
Trouble handling and measures	1. Reset fault 2. Adjust the voltage to the normal range 3. Seek technical support 4. Seek technical support 5. Seek technical support 6. Seek technical support
Fault 10 Name	Inverter overload
Operation panel display	OL2
Troubleshooting	1. Whether the load is too large or the motor is locked 2. The selection of inverter is small
Troubleshooting	1. Reduce the load and check the motor and machinery 2. Choose an inverter with higher power level
Fault 11 Name	Motor overloaded
Operation panel display	OL1
Fault causes and troubleshooting	1. Whether motor protection parameters P9.01 is set appropriately. 2. Whether the load is too large or the motor is locked 3. The selected inverter is small
Trouble handling and measures	1. Set this parameter correctly 2. Reduce the load and check the motor and machinery 3. Choose an inverter with higher power
Fault 12 Name	Input phase missing (reserved)
Operation panel display	LI
Fault causes and troubleshooting	1. The three-phase input power supply is abnormal. 2. Abnormal drive plate 3. Abnormal lightning protection plate 4. Abnormal main control board
Trouble handling and measures	1. Check and eliminate problems in peripheral lines 2. Seek technical support 3. Seek technical support 4. Seek technical support
Fault 13 Name	Output open phase
Operation panel display	LO
Fault causes and troubleshooting	1. The lead from inverter to motor is abnormal 2. The three-phase output of inverter is unbalanced when the motor is running 3. Abnormal drive plate 4. Module anomaly

Trouble handling and measures	1. Troubleshoot peripheral faults 2. Check whether the three-phase winding of the motor is normal and troubleshoot 3. Seek technical support 4. Seek technical support
Fault 14 Name	Module overheating
Operation panel display	OH
Fault causes and troubleshooting	1. The ambient temperature is too high. 2. The air duct is blocked. 3. Fan damage 4. Module thermistor is damaged 5. Inverter module is damaged
Trouble handling and measures	1. Reduce the ambient temperature 2. Clean the air duct 3. Replace the fan 4. Replace the thermistor 5. Replace the inverter module

Fault 15 Name	External fault
Operation panel display	EF
Troubleshooting	1. Input the signal of external fault through multi-function terminal
Troubleshooting	1. Reset and run
Fault 16 Name	Communication fault
Operation panel display	CE
Fault causes and troubleshooting	1. The upper computer does not work normally 2. The communication line is abnormal 3. Communication parameters PD group is not set correctly
Trouble handling and measures	1. Check the wiring of the upper computer 2. Check the communication connection line 3. Set communication parameters correctly
Fault 17 Name	Contactor failure
Operation panel display	rAy
Troubleshooting	1. The driving board and power supply are abnormal 2. The contactor is abnormal
Troubleshooting	1. Replace the drive board or power board 2. Replace the contactor
Fault 18 Name	Current detection fault
Operation panel display	IE
Troubleshooting	1. Check Hall element abnormality 2. Abnormal drive plate
Troubleshooting	1. Replace Hall element 2. Replace the drive plate

Fault 19 Name	Motor self-learning fault
Operation panel display	TE
Troubleshooting	1. Motor parameters are not set according to nameplate 2. The process of parameter identification is timeout
Troubleshooting	1. Set the motor parameters correctly according to the nameplate 2. Check the lead wire from inverter to motor
Fault 20 Name	Reserved
Operation panel display	Reserved
Troubleshooting	Reserved
Troubleshooting	Reserved
Fault 21 Name	EEPROM read-write fault
Operation panel display	EEP
Troubleshooting	1. EEPROM chip is damaged.
Troubleshooting	1. Replace the main control board
Fault 22 Name	Hardware failure of inverter
Operation panel display	OUOC
Troubleshooting	1. There is overvoltage. 2. There is overcurrent.
Troubleshooting	1. Handle according to overvoltage fault 2. Handle according to overcurrent fault
Fault23 Name	Short circuit fault to ground
Operation panel display	GND
Troubleshooting	1. Short circuit of motor to ground
Troubleshooting	1. Replace cables or motors
Fault 26 Name	Accumulative preset runtime fault
Operation panel display	END1
Troubleshooting	1. The accumulated running time reaches the set value
Troubleshooting	1. Use parameter initialization function to clear record information
Fault 29 Name	Accumulative preset power-on time fault
Operation panel display	END2
Troubleshooting	1. The accumulative power-on time reaches the set value
Troubleshooting	1. Use parameter initialization function to clear record information
Fault 30 Name	Load dropping fault
Operation panel display	LOAD

Troubleshooting	1. The operating current of the frequency converter is less than P9.64
Troubleshooting	Confirm whether the load is disconnected or whether the parameter settings of P9.64 and P9.65 conform to each other actual operating conditions
Fault 31 Name	Runtime PID feedback loss fault
Operation panel display	PIDE
Troubleshooting	1. PID feedback is less than PA.26 set value.
Troubleshooting	1. Check PID feedback signal or set PA.26 as an appropriate value
Fault 40 Names	Wave-by-wave current limiting fault
Operation panel display	CBC
Troubleshooting	1. Whether the load is too large or the motor is locked 2. The selection of inverter is small
Troubleshooting	1. Reduce the load and check the motor and machinery 2. Choose an inverter with higher power level
Fault 42 Name	Excessive speed deviation fault
Operation panel display	ESP
Troubleshooting	1. Parameter identification is not carried out. 2. Excessive speed deviation detection. The setting of parameters P9.69 and P9.60 is unreasonable.
Troubleshooting	1. Parameter identification of motor 2. Set the detection parameters reasonably according to the actual situation
Fault 43 Name	Motor overspeed fault
Operation panel display	oSP
Troubleshooting	1. Parameter identification is not carried out.
Troubleshooting	1. Parameter identification is not carried out.
Fault 51 Name	Reserved
Operation panel display	Reserved
Troubleshooting	Reserved
Troubleshooting	Reserved

4.2 Common faults and treatments

The following faults may occurred during the use of the inverter. Please refer to the following methods for simple fault analysis:

Common faults and treatments

Serial number	Fault phenomenon	Possible cause	Solutions
1	Power-on without display	No grid voltage or too low; Fault of switching power supply on inverter drive board; The rectifier bridge is damaged; Inverter buffer resistance is damaged; Fault of control board and keyboard; The connection between the control board, the drive board and the keyboard is broken;	Check the input power supply; Check bus voltage; Seek service from manufacturers;
2	Power-on display "2000"	The connection between the drive plate and the control plate is in poor contact; Damage of related devices on the control board; The motor or motor wire has short circuit to ground; Hall fault; The grid voltage is too low;	Seek service from manufacturers;
3	Power-on display "GND" alarm	Short circuit to ground of motor or output line; Inverter is damaged;	Measure the insulation of motor and output line with megger; Seek service from manufacturers;
4	Power-on inverter displays normally, and after running "2000" is displayed and downtime at once	The fan is damaged or locked; There is short circuit in the connection of peripheral control terminal;	Replace the fan; Eliminate external short circuit fault;
5	Frequent report OH (IGBT overheat) fault	Carrier frequency setting is too high. The fan is damaged or the air duct is blocked. Damage of internal components of inverter	Reduce the carrier frequency (P0.15). Replace the fan and clean the air duct. Seek service from manufacturers
6	The motor does not rotate after the inverter runs.	Motor and motor wire; Inverter parameter setting error (motor parameter); Poor contact between drive board and control board; Drive board fault;	Reconfirm the connection between inverter and motor; Replace the motor or remove mechanical faults; Check and reset motor parameters;
7	S-terminal invalid.	Parameter setting error; external signal error; control panel failure;	Check and reset Group P4 relative parameters; reconnect an external signal line;Seek service from manufacturers;
8	Reserved		
9	Inverter frequently reports overcurrent and overvoltage faults.	Incorrect setting of motor parameters; Inappropriate acceleration and deceleration time; Load fluctuation;	Reset motor parameters or carry out motor self-learning; Set the appropriate acceleration and deceleration time; Seek service from manufacturers;

10	Power on (or running) reports rAY	The contactor is not attracted;	Check whether the contactor cable is loose; Check whether the contactor is faulty; Check whether the contactor 24V power supply is faulty; Seek service from manufacturers;

Appendix I Summary of functional parameters

PP.00 is set to a non-0 value, that is, the parameter protection password is set. In the function parameter mode and the user change parameter mode, the parameter menu can only be entered after the password is correctly entered. To cancel the password, PP.00 should be set to 0. Group P, Group C is the basic functional parameter, Group D is monitoring function parameters. The symbols in the menu are described as follows:

“☆” : Indicates that the set value of this parameter can be changed when the inverter is in downtime and running status;

"★” : Indicates that the set value of this parameter cannot be changed when the inverter is in running status;

"●": Indicates that the value of this parameter is the actual test recording value and cannot be changed;

"*": Indicates that the parameter is "Manufacturer parameters", only set by the manufacturer, and users are prohibited from operating.

Summary of basic functional parameters:

Function code	Name	Set range	Delivery value	Change
P0 Basic functional group				
P0.00	G/P type display	1: Model G (Constant Torque Load) 2: Model P (Vanable torque load, e.g. Fan and pump)	Model dependent	●
P0.01	Control mode selection	0: No PG vector control 1: PG vector control 2: V/F control	2	★
P0.02	Command source selection	0: Keyboard control (LED off) 1: Terminal control (LED on) 2: Communication control (LED flashing)	0	☆
P0.03	Main frequency source X	0: Digital setting (Preset frequency P0.08,UP/ DOWN can be modified, power failure does not remember) 1: Digital setting (Preset frequency P0.08, UP/ DOWN can be modified, power-DOWN memory) 2: FIV (Expansion Card) 3: FIC 4: Reserved 5: PULSE setting 6: Multistage instructions 7: Simple PLC	0	★

		8: PID 9: Communication setting		
P0.04	Auxiliary frequency source Y selection	Same as P0.03 (Main frequency source X selection)	0	★
P0.05	Range selection of auxiliary frequency source Y during superposition	0: Relative to the maximum frequency 1: Relative to main frequency source X	0	☆
P0.06	Auxiliary frequency source superposition Y range	0%-150%	100%	☆
P0.07	Frequency source superposition selection	Unit's digit: Frequency source selection 0: Main frequency source X 1: M1: Main-Auxiliary operation results (The operation relationship is determined by ten digits) 2: Switch main frequency source X and auxiliary frequency source Y 3: Switch main frequency source X and the results of main and auxiliary operations 4: Switch auxiliary frequency source Y and the results of main-auxiliary operations Ten's digit: Main and auxiliary operation relationship of frequency source 0: Main+Auxiliary 1: Main-Auxiliary 2: Maximum of both 3: Minimum of both	00	☆
P0.08	Preset frequency	0.00Hz-Maximum frequency （P0.10）	50.00Hz	☆
P0.09	Running direction	0: Same direction 1: Reverse direction	0	☆
P0.10	Maximum frequency	50.00 Hz-600.00 Hz	50.00Hz	★
P0.11	Upper limit frequency source	0: P0.12 setting 1: FIV (Expansion Card) 2: FIC 3: Reserved 4: PULSE setting 5: Communication setting	0	★
P0.12	Upper limit frequency	Lower limit frequency P0.14-maximum frequency P0.10	50.00Hz	☆
P0.13	Upper limit frequency bias	0.00 Hz-Maximum frequency P0.10	0.00Hz	☆
P0.14	Lower limit frequency	0.00 Hz-upper limit frequency P0.12	0.00Hz	☆
P0.15	Carrier frequency	0.5kHz-16.0kHz	Model dependent	☆

P0.16	Carrier frequency adjusts according to temperature	0: No 1: Yes	1	☆
P0.17	Acceleration time 1	0.00s-65000s	Model dependent	☆
P0.18	Deceleration time 1	0.00s-65000s	Model dependent	☆
P0.19	Acceleration/ deceleration time unit	0: 1 second 1: 0.1 second 2: 0.01 second	1	★
P0.21	Frequency offset of auxiliary frequency source during superposition	0.00 Hz-Maximum frequency P0.10	0.00Hz	☆
P0.22	Frequency command resolution	2: 0.01Hz	2	★
P0.23	Retentive of digital setting frequency upon power	0: Non-retentive 1: Retentive	0	☆
P0.25	Reference frequency of acceleration and deceleration time	0: Maximum frequency (P0.10) 1: Set frequency 2: 100Hz	0	★
P0.26	Runtime frequency instruction UP/DOWN benchmark	0: Run frequency 1: Set the frequency	0	★
P0.27	Command source bundled frequency source	Unit's digit: Operation panel command binding frequency source selection 0: No binding 1: Frequency source by digital setting 2: FIV (Expansion Card) 3: FIC 4: Reserved 5: PULSE setting 6: Multiple reference 7: Simple PLC 8: PID 9: Communication setting Ten's digit: Binding terminal command to frequency source Hundred's digit: Binding communication command to frequency source	0000	☆
P1 Motor Parameters 1				
P1.00	Type of motor	0: Common asynchronous motor 1: Variable frequency asynchronous motor	0	★
P1.01	Motor rated power	0.1kW-1000.0kW	Model dependent	★

P1.02	Motor rated voltage	1V- 2000V	Model dependent	★
P1.03	Rated current of motor	0.01A-655.35a (Inverter power<= 55kW) 0.1A-6553.5A (Inverter power>55kW)	Model dependent	★
P1.04	Motor rated frequency	0.01Hz-Maximum frequency	Model dependent	★
P1.05	Motor rated speed	1rpm-65535rpm	Model dependent	★
P1.06	Stator resistance of asynchronous motor	0.001Ω-65.535Ω (Inverter power<= 55kW) 0.0001Ω-6.5535Ω (Inverter power>55kW)	Learning parameter	★
P1.07	Rotor resistance of asynchronous motor	0.001Ω-65.535Ω (Inverter power<= 55kW) 0.0001Ω-6.5535Ω (Inverter power>55kW)	Learning parameter	★
P1.08	Leakage inductance reactance of asynchronous motor	0.01mH-655.35mH (Inverter power<= 55kW) 0.001mH-65.535mH (Inverter power>55kW)	Learning parameter	★
P1.09	Mutual inductance reactance of asynchronous motor	0.1mH-6553.5mH (Inverter power<= 55kW) 0.01mH-655.35mH (Inverter power>55kW)	Learning parameter	★
P1.10	No-load current of asynchronous motor	0.01A-P1.03 (Inverter power<= 55kW) 0.1A-P1.03 (Inverter power>55kW)	Learning parameter	★
P1.27	Encoder line number	1-65535	1024	★
P1.28	Encoder type	0: ABZ incremental encoder 2: Resolver	0	★
P1.30	ABZ incremental encoder AB phase sequence	0: Forward 1: Reverse	0	★
P1.31	Encoder mounting angle	0.0-359.9 °	0.0°	★

Appendix I Summary of Functional Parameters

P1.34	Pole pair of resolver	1-65535	1	★
P1.36	Velocity feedback PG disconnection detection time	0.0: No action 0.1s-10.0s	0.0	★
P1.37	Self-learning selection	0: No operation 1: Static self-learning 2. Dynamic self-learning	0	★
Group P2 motor vector control parameters				
P2.00	Proportional gain of velocity loop 1	1-100	30	☆
P2.01	Velocity loop integration time 1	0.01s-10.00s	0.50s	☆
P2.02	Switching frequency 1	0.00-P2.05	5.00Hz	☆
P2.03	Proportional gain of velocity loop 2	1-100	20	☆
P2.04	Velocity loop integration time 2	0.01s-10.00s	1.00s	☆
P2.05	Switching frequency 2	P2.02-Maximum frequency	10.00Hz	☆
P2.06	Vector control slip gain	50%-200%	100%	☆
P2.07	Time constant of velocity loop filtering	0.000s-0.100s	0.015s	☆
P2.09	Torque digital setting under torque control mode	0: Function code P2. 10 Settings (There is no distinction between electric power and power generation) 1: FIV (Expansion Card) 2: FIC 3: Reserved 4: PULSE setting 5: Communication setting 6: MIN (FIV (expansion card), FIC) 7: MAX (FIV), the full scale of 1-7 options corresponds to P2.10	0	☆
P2.10	Torque up under speed control mode Limit digital setting (electric)	0.0%-200.0%	150.0%	☆
P2.11	Torque up under speed control mode Limited instruction selection (power generation)	0: Function code P2. 10 Settings 1: FIV (Expansion Card) 2: FIC 3: Reserved 4: PULSE setting 5: Communication setting 6: MIN (FIV (expansion card), FIC) 7: MAX (FIV (expansion card), FIC) 8: Function code P2.12 settings The full-scale of 1-7 options corresponds to P2.12	0	☆

P2.12	Torque up under speed control mode Digital setting only (power generation)	0.0%-200.0%	150.0%	☆
P2.13	Excitation adjusted proportional gain	0-60000	2000	☆
P2.14	Excitation adjusted integral gain	0-60000	1300	☆
P2.15	Torque regulated proportional gain	0-60000	2000	☆
P2.16	Torque regulated integral gain	0-60000	1300	☆
P2.17	Integral property of velocity loop	Unit's digit: Integral separated 0: Invalid 1: Valid	0	☆
P2.21	Maximum torque coefficient in weak field region	50%-200%	100%	☆
P2.22	Generated power limit enabled	0: Invalid 1: Valid in whole process 2: constant speed valid 3: Deceleration valid	0	☆
Group P3 V/F control parameters				
P3.00	VF curve setting	0: Straight line V/F 1: Multiple points V/F 2: Square V/F 3: 1.2 power V/F 4: 1.4 power V/F 6: 1.6 power V/F 8: 1.8 power V/F 9: Reserved 10: VF complete separation mode 11: VF semi-separation mode	0	★
P3.01	Torque compensation	0.0%: (Automatic torque compensation) 0.1%-30.0%	Model dependent	☆
P3.02	Torque compensation cut-off frequency	0.00Hz-Maximum frequency	50.00Hz	★
P3.03	Multi-point VF frequency point 1	0.00Hz-P3.05	0.00Hz	★
P3.04	Multi-point VF voltage point 1	0.0%-100.0%	0.0%	★
P3.05	Multi-point VF frequency point 2	P3.03-P3.07	0.00Hz	★
P3.06	Multi-point VF voltage point 2	0.0%-100.0%	0.0%	★
P3.07	Multi-point VF frequency point 3	P3.05-Rated frequency of motor (P1.04)	0.00Hz	★
P3.08	Multi-point VF voltage point 3	0.0%-100.0%	0.0%	★
P3.09	VF slippage compensation gain	0.0%-200.0%	0.0%	☆

P3.10	VF overexcitation gain	0-200	64	☆
P3.11	VF oscillation suppression gain	0-100	Model dependent	☆
P3.13	VF separated voltage source	0: Digital setting (P3.14) 1: FIV (Expansion Card) 2: FIC 3: Reserved 4: PULSE setting 5: Multiple instructions 6: Simple PLC 7: PID 8: Communication setting ✎Note: 100.0% corresponds to rated voltage of motor	0	☆
P3.14	VF separation voltage digital setting	0V-Motor rated voltage	0V	☆
P3.15	Voltage acceleration time of VF Separation	0.0s-1000.0s ✎Note: Denote the time that 0V to the rated voltage of the motor	0.0s	☆
P3.16	Voltage deceleration time of VF separation	0.0s-1000.0s ✎Note: Indicates that time of the rated voltage of the motor changing to 0V	0.0s	☆
P3.17	Selection of downtime mode for VF separation	0: Frequency/voltage independently reduced to 0 1: After voltage reduced to 0, the frequency decreases again	0	☆
P3.18	Overcurrent stall action current	50%-200%	150%	★
P3.19	Overcurrent stall enable	0: Invalid 1: Valid	1	★
P3.20	Overcurrent stall suppression gain	0-100	20	☆
P3.21	Current compensation coefficient of double-speed overcurrent and loss-speed action	50%-200%	50%	★
P3.22	Overvoltage stall action voltage	650.0V-800.0V	770.0V	★
P3.23	Overvoltage stall enable	0: Invalid 1: Valid	1	★
P3.24	Overvoltage stall suppression frequency gain	0-100	30	☆
P3.25	Overvoltage stall suppression voltage gain	0-100	30	☆
P3.26	Maximum ascending frequency limit of overvoltage stall	0-50Hz	5Hz	★
Group P4 Input terminal				
P4.00	X1 terminal function	0: No function	1	★

	selection			
P4.01	X2 terminal function selection	1: Forward running (FWD)	2	★
P4.02	X3 terminal function selection	2: Reverse run (REV)	9	★
P4.03	X4 terminal function selection	3: Three-wire operation control	12	★
P4.04	X5 terminal function selection	4: Forward inching (JOGF)	13	★
P4.05	X6 terminal function selection (expansion card)	5: Reverse inching (JOGR)	0	★
P4.06	X7 terminal function selection (Expansion card)	6: Terminal UP 7: Terminal DOWN 8: Free stop	0	★
P4.07	Reserved	9: Fault reset 10: Run paused	0	★
		11: External fault normally open input 12: Multi-segment command terminal1 13: Multi-segment command terminal 2 14: Multi-segment command terminal 3 15: Multi-segment command terminal 4 16: Acceleration and deceleration time selection terminal 1 17: Acceleration and deceleration time selection terminal 2 18: Frequency source switching 19: UP/DOWN setting is cleared (Terminal, keyboard) 20: Run command switch terminal 21: Acceleration and deceleration are prohibited 22: PID pause 23: PLC status reset 24: Wobble suspension 25: Counter input 26: Counter reset 27: Length count input 28: Length reset 29: Torque control inhibited 30: PULSE frequency input 31: Reserved 32: Immediate DC braking 33: External fault normally closed input 34: Frequency modification enabled 35: Reverse PID action direction 36: External parking terminal 1 37: Control command switching terminal 2		

		38: PID integration paused 39: Switching frequency source X and preset frequency 40: Switching frequency source Y and preset frequency 41-42: Reserved 43: PID parameter switching 44-45: Reserved 46: Speed control/torque control switching 47: Emergency stop 48: External parking terminal 2 49: Deceleration DC braking 50: The running time is cleared 51-59: Reserved		
P4.10	Switching value filtering time	0,000s-1,000s	0.010s	☆
P4.11	Terminal command mode	0: Two-wire type 1 1: Two-wire type 2 2: Three-wire type 1 3: Three-wire type 2	0	★
P4.12	Terminal UP/DOWN rate of change	0.001Hz/s-65.535Hz/s	1.00Hz/s	☆
P4.13	FI curve 1 Minimum input	0.00V-P4.15	0.00V	☆
P4.14	FI curve 1 Minimum input correspondence Setting	-100.0%-+100.0%	0.0%	☆
P4.15	FI curve 1 Maximum input	P4. 13-+10.00V	10.00V	☆
P4.16	FI curve 1 Maximum input correspondence Setting	-100.0%-+100.0%	100.0%	☆
P4.17	FI curve 1 filtering time	0.00s-10.00s	0.10s	☆
P4.18	FI curve 2 Minimum input	0.00 V-P4.20	0.00V	☆
P4.19	FI curve 2 Minimum input correspondence Setting	-100.0%-+100.0%	0.0%	☆
P4.20	FI curve 2 Maximum input	P4.18-+10.00V	10.00V	☆
P4.21	FI curve2 Maximum input correspondence Setting	-100.0%-+100.0%	100.0%	☆
P4.22	FI curve 2 Filtering time	0.00s-10.00s	0.10s	☆
P4.23	FI curve 3 Minimum input	-10.00V-P4.25	-10.00V	☆
P4.24	FI curve 3 Minimum input correspondence Setting	-100.0%-+100.0%	-100.0%-+100.0%	☆
P4.25	FI curve3 Maximum input	P4.23-+10.00V	10.00V	☆

P4.26	FI curve3 Maximum input correspondence Setting	-100.0%-+100.0%	100.0%	☆
P4.27	FI curve 3 Filtering time	0.00s-10.00s	0.10s	☆
P4.28	PULSE Minimum Input	0.00kHz-P4.30	0.00kHz	☆
P4.29	PULSE Minimum Input Correspondence Setting	-100.0%-100.0%	0.0%	☆
P4.30	PULSE Maximum Input	P4.28-100.00kHz	50.00kHz	☆
P4.31	PULSE maximum input setting	-100.0%-100.0%	100.0%	☆
P4.32	PULSE filtering time	0.00s-10.00s	0.10s	☆
P4.33	FI curve selection	Unit's digit: FIV (Expansion Card) Curve selection 1: Curve 1 (2 points, seeP4. 13-P4. 16) 2: Curve 2 (2 points, seeP4.18-P4.21) 3: Curve3 (2 points, see P4.23-P4.26) 4: Curve4 (4 points, see C6.00-C6.07) 5: Curve5(4 o'clock, see C6.08-C6.15) Ten's digit: FIC curve selection, same as above Hundred's digit: Reserved	321	☆
P4.34	FI is lower than the minimum input setting Option	Unit's digit: FIV (Expansion Card) is below minimum input setting selection 0: Correspond to the minimum input setting 1: 0.0% Ten's digit: FIC below minimum input setting selection, ibid.	000	☆
P4.35	X1 delay time	0.0s-3600.0s	0.0s	★
P4.36	X2 delay time	0.0s-3600.0s	0.0s	★
P4.37	X3 delay time	0.0s-3600.0s	0.0s	★
P4.38	X terminal valid mode selection 1	0: High level valid 1: Low level valid Unit's digit: X1 Ten's digit: X2 Hundred's digit: X3 Thousand's digit: X4 Ten thousand's unit: X5	00000	★
P4.39	X terminal valid mode selection 2	0: High level valid 1: Low level valid One's unit: X6(Expansion card) Ten's unit: X7(Expansion card) Hundred's digit: Reserved Thousand's digit: Reserved Ten thousand's unit: Reserved	00000	★

Group P5 output terminal				
P5.00	MO1 terminal output mode selection (Expansion card)	0: Pulse output (MO1-COM) 1: Switch value output (MOA-MOB-MOC)	1	☆
P5.01	MOA-MOB-MOC Output function selection(Expansion card)	0: No output 1: Inverter in operation 2: Fault output 3: Frequency level detection FDT1 output 4: Frequency preset 5: Operation at zero-speed (no output during downtime) 6: Motor overload warning 7: Inverter overload warning 8: Set the count value to reach 9: Specify that the count value reach 10: Length reach 11: PLC cycle complete 12: Accumulative runtime reach 13: Frequency limited 14: Torque limited 15: Ready to run 16: FIV (Expansion Card)>FIC 17: Upper limit frequency reach 18: Lower limit frequency reach (operation related) 19: Undervoltage status output 20: Communication settings 21: (Reserved) 22: (Reserved) 23: Operation at zero speed 2 (also output during downtime) 24: Accumulative power-on time reach 25: Frequency level detection FDT2 output 26: Frequency 1 reaches output 26: Frequency 2 reaches output 28: Current 1 reaches at the output 29: Current2 reach output 30: Timed arrival output 31: FIV (expansion card) input over limits 32: Load drop	0	☆
P5.02	Control board relay function selection (YA-YB-YC)		2	☆
P5.03	Reserved		0	☆
P5.04	YO terminal output function selection		1	☆
P5.05	Reserved		4	☆

		33: In reverse operation 34: Zero current status 35: Module temperature threshold 36: Output current overrun 37: The lower limit frequency reaches (it is also output after downtime) 38: Alarm Output (Continue running) 39: Motor overtemperature warning 40: This running time reaches 41: Fault output (undervoltage and no output)		
P5.06	MO1 output function selection	0: Run frequency 1: Set frequency 2: Output current 3: Output torque 4: Output power 5: Output voltage 6: PULSE input (100.% corresponding to 100.0kHz) 7: FIV (Expansion Card) 8: FIC 9: Reserved 10: Length 11: Value count 12: Communication settings 13: Motor speed 14: Output current (100.0% corresponding to1000.0A) 15: Output voltage (100.0% corresponding to1000.0V) 16: Motor output torque (actual value, relative percentage of motors)	0	☆
P5.07	FOV output function selection		0	☆
P5.08	FOC (Expansion Card) output function selection		1	☆
P5.09	MO1 output maximum frequency	0.01kHz-100.00kHz	50.00kHz	☆
P5.10	FOV zero bias coefficient	-100.0%-+100.0%	0.0%	☆
P5.11	FOV gain	-10.00-+10.00	1.00	☆
P5.12	FOC (Expansion Card) zero bias coefficient	-100.0%-+100.0%	0.0%	☆
P5.13	FOC (Expansion Card) Gain	-10.00-+10.00	1.00	☆
P5.17	MOA-MOB-MOC output delay time	0.0s-3600.0s	0.0s	☆

P5.18	YA-YB-YC output delay time	0.0s-3600.0s	0.0s	☆
P5.22	Effective status selection of output terminal	0: Positive logic 1: Anti-logic One's unit: MOA-MOB-MOC Ten's unit: YA-YB-YC Hundred's digit: Reserved	00000	☆
P6 Start-Stop parameter group				
P6.00	Startup mode	0: Startup directly 1: speed tracking restart 2: Pre-excitation enables (AC asynchronous machine) 3: SVC Quick Start	0	☆
P6.01	Speed tracking mode	0: Starting from the downtime frequency 1: Start at zero speed 2: Start at the maximum frequency	0	★
P6.02	Speed tracking	1-100	20	☆
P6.03	Startup frequency	0.00 Hz-10.00 Hz	0.00Hz	☆
P6.04	Start frequency holding time	0.0s-100.0s	0.0s	★
P6.05	Start DC braking current/pre-excitation current	0%-100%	0%	★
P6.06	Start DC braking time/pre-excitation time	0.0s-100.0s	0.0s	★
P6.07	Acceleration and deceleration mode	0: Linear acceleration and deceleration 1: S curve acceleration and deceleration A 2: Dynamic S curve acceleration and deceleration	0	★
P6.08	Time proportion at the beginning of S curve	0.0%-(100.0%-P6.09)	30.0%	★
P6.09	Time ratio at the end of S curve	0.0%-(100.0%-P6.08)	30.0%	★
P6.10	Stop mode	0: Slow down and stop1: Free stop	0	☆
P6.11	Start frequency of downtime DC braking	0.00Hz-Maximum frequency	0.00Hz	☆
P6.12	Waiting time of downtime DC braking	0.0s-100.0s	0.0s	☆
P6.13	Shutdown DC braking current	0%-100%	0%	☆
P6.14	Downtime DC braking time	0.0s-100.0s	0.0s	☆
P6.15	Braking utilization rate	0%-100%	100%	☆
P6.18	Speed tracking current	30%-200%	Model dependent	★
P6.21	Demagnetization time (SVC valid)	0.00-5.00s	Model dependent	☆
P7 Group Operation Panel and Display				

P7.02	STOP/RESET key function	0: Enabled only in operation panel control STOP/RESET key shutdown function is valid 1: STOP/RESET shutdown function is effective in any operation mode	1	☆
P7.03	LED Display running parameters 1	0000-FFFF Bit00: Running frequency 1(Hz) Bit01: Set frequency (Hz) Bit02: Bus voltage(V) Bit03: Output voltage (V) Bit04: Output current (A) Bit05: Output power (kW) Bit06: Output torque (%) Bit07: Input terminal status Bit08: Output terminal status Bit09: FIV (Expansion Card) voltage (V) Bit10: FIC Voltage(V) Bit11: Reserved Bit12: Count value Bit13: Length value Bit14: Load speed display Bit15: PID Setting	1F	☆
P7.04	LED operation display parameters2	0000-FFFF Bit00: PID Feedback Bit01: PLC stage Bit02: PULSE input frequency (kHz) Bit03: Running frequency2 (Hz) Bit04: Runtime remaining Bit05: FIV (expansion card) voltage before correction (V) Bit06: Voltage before FIC correction (V) Bit07: Reserved Bit08: Motor speed Bit09: Current power-on time (Hour) Bit10: Current runtime (Min) Bit11: PULSE Input frequency (Hz) Bit12: Communication setting value Bit13: Encoder feedback speed (Hz) Bit14: Main frequency X display (Hz) Bit15: Auxiliary frequency Y display (Hz)	0	☆
P7.05	LED display stop parameters	0000-FFFF Bit00: Set frequency (Hz) Bit01: Bus voltage(V) Bit02: Input terminal status Bit03: Output terminal status Bit04: FIV (Expansion Card) Voltage (V)	33	☆

		Bit05: FIC Voltage(V) Bit06: Reserved Bit07: Count value Bit08: Length value Bit09: PLC stage Bit10: Load speed Bit11: PID Setting Bit12: PULSE setting frequency(kHz)		
P7.06	Load speed display coefficient	0.0001-6.5000	1.0000	☆
P7.07	Heatsink temperature of inverter	0.0℃-120.0℃	-	●
P7.08	Rectifier bridge radiator temperature	0.0℃-120.0℃	-	●
P7.09	Accumulative running time	0h- 65535h	-	●
P7.10	Performance software version number	-	-	●
P7.11	Software version	-	-	●
P7.12	Numbers of decimal places for load speed display	0: 0 decimal place 1:1 Decimal place 2:2 Decimal places 3:3 decimal places	1	☆
P7.13	Accumulative power-on time	0h- 65535h	-	●
P7.14	Accumulative power-on consumption	0kW-65535kWh	-	●
Group P8 Auxiliary function				
P8.00	Inching operation frequency	0.00Hz-Maximum frequency	2.00Hz	☆
P8.01	JOG acceleration time	0.0s-6500.0s	20.0s	☆
P8.02	JOG deceleration time	0.0s-6500.0s	20.0s	☆
P8.03	Acceleration time 2	0.00s-65000s	Model dependent	☆
P8.04	Deceleration time 2	0.0s-65000s	Model dependent	☆
P8.05	Acceleration time 3	0.0s-65000s	Model dependent	☆
P8.06	Deceleration time 3	0.0s-65000s	Model dependent	☆
P8.07	Acceleration time 4	0.0s-65000s	Model dependent	☆
P8.08	Deceleration time 4	0.0s-65000s	Model dependent	☆
P8.09	Jump frequency 1	0.00Hz-Maximum frequency	1.00Hz	☆
P8.10	Jump frequency 2	0.00Hz-Maximum frequency	0.00Hz	☆
P8.11	Frequency jump amplitude	0.00Hz-Maximum frequency	0.01Hz	☆
P8.12	Forward/reverse dead-zone time	0.0s-30000.0s	0.0s	☆
P8.13	Reverse control	0: Enabled 1: Disabled	0	☆
	Runing mode when set	0: Run at lower limit frequency		☆

P8.14	frequency lower than frequency over limit	1: Downtime 2: Run at zero speed	0	
P8.15	Droop control	0.00 Hz-10.00 Hz	0.00Hz	☆
P8.16	Accumulative power-on time threshold	0h-65000h	0h	☆
P8.17	Accumulative running time threshold	0h-65000h	0h	☆
P8.18	Startup protection	0: No1: Yes	0	☆
P8.19	Frequency detection value (FDT1)	0.00Hz-Maximum frequency	50.00Hz	☆
P8.20	Frequency detection hysteresis (FDT1)	0.0%-100.0% (FDT1 level)	5.0%	☆
P8.21	Frequency arrival detection width	0.0%-100.0% (maximum frequency)	0.0%	☆
P8.22	Whether the jump frequency valid during acceleration and deceleration	0: Invalid 1: Effective	0	☆
P8.25	Acceleration time1 and acceleration time2 switch frequency points	0.00Hz-Maximum frequency	0.00Hz	☆
P8.26	Deceleration time 1 and deceleration time 2 switch frequency points	0.00Hz-Maximum frequency	0.00Hz	☆
P8.27	Terminal inching priority	0: Invalid 1: Effective	0	☆
P8.28	Frequency detection value (FDT2)	0.00Hz-Maximum frequency	50.00Hz	☆
P8.29	Frequency detection hysteresis (FDT2)	0.0%-100.0% (FDT2 level)	5.0%	☆
P8.30	Arbitrary arrival frequency detection value 1	0.00Hz-Maximum frequency	50.00Hz	☆
P8.31	Arbitrary preset frequency detection width 1	0.0%-100.0% (maximum frequency)	0.0%	☆
P8.32	Arbitrary arrival frequency detection value 2	0.00Hz-Maximum frequency	50.00Hz	☆
P8.33	Arbitrary arrival frequency detection width	0.0%-100.0% (maximum frequency)	0.0%	☆

Appendix I Summary of Functional Parameters

	2			
P8.34	Zero current detection level	0.0%-300.0% 100.0% corresponds to rated current of motor	5.0%	☆
P8.35	Zero current detection delay time	0.01s-600.00s	0.10s	☆
P8.36	Output current overrun	0.0% (not detected) 0.1%-300.0% (motor rated current)	200.0%	☆
P8.37	Delay time of output current overrun detection	0.00s-600.00s	0.00s	☆
P8.38	Arbitrary arrival current 1	0.0%-300.0% (motor rated current)	100.0%	☆
P8.39	Arbitrary arrival current 1 width	0.0%-300.0% (motor rated current)	0.0%	☆
P8.40	Arbitrary arrival current 2	0.0%-300.0% (motor rated current)	100.0%	☆
P8.41	Arbitrary arrival current 2 width	0.0%-300.0% (motor rated current)	0.0%	☆
P8.42	Timing function selection	0: Invalid 1: Valid	0	☆
P8.43	Timed duration source	0: P8.44 Setting 1: FIV (Expansion Card) 2: FIC 3: Reserved Analog input range corresponding to P8.44	0	☆
P8.44	Timed running time	0.0Min-6500.0Min	0.0Min	☆
P8.45	FIV (Expansion Card) input voltage lower limit	0.00V-P8.46	3.10V	☆
P8.46	FIV (Expansion Card), upper limit of input voltage protection value	P8.45-10.00V	6.80V	☆
P8.47	Module temperature threshold	0℃-100℃	75℃	☆
P8.48	Cooling fan control	0: Fan working during running 1: Fan working continuously	0	☆
P8.49	Wake-up frequency	Dormant frequency (P8.51)-Maximum frequency (P0.10)	0.00Hz	☆
P8.50	Wake-up delay time	0.0s-6500.0s	0.0s	☆
P8.51	Dormant frequency	0.00Hz-Wakeup frequency (P8.49)	0.00Hz	☆
P8.52	Dormant delay time	0.0s-6500.0s	0.0s	☆
P8.53	Current running time reached	0.0Min-6500.0Min	0.0Min	☆
P8.54	Output power correction coefficient	0-200%	100%	☆
Group P9 Fault and protection				
P9.00	Motor overload protection selection	0: Prohibited 1: Allow	1	☆
P9.01	Motor overload protection gain	0.20-10.00	1.00	☆
P9.02	Motor overload warning coefficient	50%-100%	80%	☆

P9.03	Overvoltage stall gain	0-100	0	☆
P9.04	Overvoltage stall protective voltage	120%-150%	130%	☆
P9.07	Short-circuit stall protective current	0: Invalid 1: Valid	1	☆
P9.09	Number of fault automatic resets	0-20	0	☆
P9.10	Fault during automatic reset of fault MOA-MOB-MOC action selection	0: No action 1: Action	0	☆
P9.11	Time interval between automatic reset of fault	0.1s-100.0s	1.0s	☆
P9.12	Input open phase/contactor attracting protection selection	Unit's digit: Input open phase protection selection Ten's digit: Contactor attracting protection selection 0: Prohibited 1: Allow	11	☆
P9.13	Output open phase protection selection	0: Prohibited 1: Allow	1	☆
P9.14	Type of first fault	0: No trouble	-	●
P9.15	Type of second fault	1: Reserved	-	●
P9.16	Third (latest) fault type	2: Accelerated overcurrent 3: Deceleration overcurrent 4. Constant speed overcurrent 5: Accelerated overvoltage 6: Deceleration overvoltage 7: Constant speed overvoltage 8: Buffer resistor overload 9: Undervoltage 10: Inverter overload 11: motor overload 12: Input phase missing 13: Output open phase 14: Module overheating 15: External fault 16: Abnormal communication 17: Contactor abnormality 18: Abnormal current detection 19: Motor self-learning anomaly 20: Encoder/PG card anomaly 21: Parameter read-write exception 22: Inverter hardware abnormal 23: Short circuit of motor to ground 24: Reserved	-	●

		25: Reserved 26: Runtime arrives 27: Reserved 28: Reserved 29: Power-on time reach 30: Load drop 31: Runtime PID feedback loss 40: Fast current limiting timeout 41: Reserved 42: Excessive speed deviation 43: Motor overspeed 45: Reserved		
P9.17	Frequency of the third (latest) failure	-	-	●
P9.18	Current at the third (latest) fault	-	-	●
P9.19	Bus voltage at the third (latest) fault	-	-	●
P9.20	Input terminal status during the third (latest) fault	-	-	●
P9.21	Output terminal status at the third (latest) fault	-	-	●
P9.22	Inverter status during the third (latest) fault	-	-	●
P9.23	Power-on time at the third (latest) failure	-	-	●
P9.24	Running time at the third (latest) failure	-	-	●
P9.27	Frequency at the second fault	-	-	●
P9.28	Current at the second fault	-	-	●
P9.29	Bus voltage at the second fault	-	-	●
P9.30	Input terminal status during the second fault	-	-	●
P9.31	Output terminal status during the second fault	-	-	●
P9.32	Inverter status during the second fault	-	-	●
P9.33	Power-on time at the second failure	-	-	●
P9.34	Running time at the second failure	-	-	●
P9.37	Frequency at the first failure	-	-	●
P9.38	Current at the first fault	-	-	●
P9.39	Bus voltage at the first fault	-	-	●

P9.40	Input terminal status at the first failure	-	-	●
P9.41	Output terminal status at the first fault	-	-	●
P9.42	Frequency converter status at the first fault	-	-	●
P9.43	Power-on time at first failure	-	-	●
P9.44	Running time at the first failure	-	-	●
P9.47	Fault protection action selection 1	Unit's digit: Motor overload (OL1) 0: Free stop 1: Stop the machine according to the stop mode 2: Continue to run Ten's digit: Reserved Hundred's digit: Output open phase (LO) Thousand's digit: External fault (EF) Ten thousand's unit: Communication Anomaly (CE)	00000	☆
P9.48	Fault protection action selection 2	Unit's digit: Reserved 0: Free stop Ten's digit: Function code read-write abnormality (EEP) 0: Free stop 1: Stop the machine according to the stop mode Hundred's digit: Reserved Thousand's digit: Reserved Ten thousand's unit: Run time arrived (END1)	00000	☆
P9.49	Fault protection action selection 3	Unit's digit: Reserved 0: Free stop 1: Stop the machine according to the stop mode 2: Continue to run Ten's digit: Reserved 0: Free stop 1: Stop the machine according to the stop mode 2: Continue to run	00000	☆
		Hundred's digit: Power-on time arrived (END2) 0: Free stop 1: Stop the machine according to the stop mode 2: Continue to run		

		Thousand's digit: Load drop (LOAD) 0: Free stop 1: Slow down and stop 2: Decelerate to 7% of the rated frequency of the motor and continue to run, and automatically resume to the set frequency when the load does not fall off. Ten thousand's unit: Runtime PID feedback loss (PIDE) 0: Free stop 1: Stop the machine according to the stop mode 2: Continue to run		
P9.50	Fault protection action selection 4	Unit's digit: Excessive speed deviation (42) 0: Free stop 1: Stop the machine according to the stop mode 2: Continue to run Ten's digit: Reserved Hundred's digit: Reserved	00000	☆
P9.54	=Continued operation frequency selection in case of fault	0: Run at the current running frequency 1: Run at a set frequency 2: Operate at the upper limit frequency 3: Run at lower limit frequency 4: Run at abnormal standby frequency	0	☆
P9.55	Abnormal standby frequency	60.0%-100.0% (100.0% corresponds to the maximum frequency P0.10)	100.0%	☆
P9.59	=Instantaneous power outrage action selection	0: Invalid 1: Slow down 2: Slow down and stop	0	☆
P9.60	Judgment voltage of instantaneous power outage pause	P9.62-100.0%	90.0%	☆
P9.61	Judgment time of instantaneous non-stop voltage rise	0.00s-100.00s	0.50s	☆
P9.62	Judgment voltage of instantaneous non-stop action	60.0%-100.0% (Standard bus voltage)	80.0%	☆
P9.63	Load-off protection selection	0: Invalid 1: Valid	0	☆
P9.64	Load drop detect level	0.0-100.0%	10.0%	☆
P9.65	Load drop detection time	0.0-60.0s	1.0s	☆
P9.67	Overspeed detection value	0.0%-50.0% (Maximum frequency)	20.0%	☆
P9.68	Over-speed detection time	0.0s-60.0s	5.0s	☆

P9.69	Excessive speed deviation detection value	0.0%-50.0% (Maximum frequency)	20.0%	☆
P9.70	Excessive speed deviation detection time	0.0s-60.0s	0.0s	☆
P9.71	Instantaneous stop gain	0-100	40	☆
P9.72	Instantaneous stop integral coefficient	0-100	30	☆
P9.73	Deceleration time of instantaneous stop action	0-300.0s	20.0s	★
Group PA: PID function				
PA.00	PID setting source	0: PA.01 1: FIV (Expansion Card) 2: FIC 3: Reserved 4: PULSE setting 5: Communication setting 6: Multi-reference	0	☆
PA.01	PID digital setting	0.0%-100.0%	50.0%	☆
PA.02	PID feedback source	0: FIV (Expansion Card) 1: FIC 2: Reserved 3: FIV (Expansion Card)-FIC 4: PULSE setting 5: Communication setting 6: FIV (Expansion Card) + FIC 7: MAX (FIV), FIC) 8: MIN (FIV), FIC)	0	☆
PA.03	PID action direction	0: Forward action 1: Reverse action	0	☆
PA.04	PID setting feedback range	0 to 65535	1000	☆
PA.05	Proportional gain Kp1	0.0-100.0	20.0	☆
PA.06	Integral time Ti1	0.01s-10.00s	2.00s	☆
PA.07	Differential time Td1	0.000s-10.000s	0.000s	☆
PA.08	Cut-off frequency of PID reverse rotation	0.00-Maximum frequency	2.00Hz	☆
PA.09	PID deviation limit	0.0%-100.0%	0.0%	☆
PA.10	PID differential limiting	0.00%-100.00%	0.10%	☆
PA.11	PID setting change time	0.00-650.00s	0.00s	☆

PA.12	PID feedback filter time	0.00-60.00s	0.00s	☆
PA.13	PID output filter time	0.00-60.00s	0.00s	☆
PA.15	Proportional gain KP1	0.0-100.0	20.0	☆
PA.16	Integral time Ti2	0.01s-10.00s	2.00s	☆
PA.17	Differential time Td2	0.000s-10.000s	0.000s	☆
PA.18	PID parameter switchover condition	0: No switchover 1: Switchover via X terminal 2: Automatic switchover based on deviation 3: Automatic switching according to running frequency	0	☆
PA.19	PID parameter switchover deviation 1	0.0%-PA.20	20.0%	☆
PA.20	PID parameter switching deviation 2	PA. 19-100.0%	80.0%	☆
PA.21	PID initial value	0.0%-100.0%	0.0%	☆
PA.22	PID initial value holding time	0.00-650.00s	0.00s	☆
PA.25	PID integral property	Unit's digit: Integral separated 0: Invalid 1: Valid Ten's digit: Whether to stop integral when the output reaches 0: Continue integral operation 1: Stop Integral operation	00	☆
PA.26	Detection value of PID feedback loss	0.0%: Not judging feedback loss 0.1%-100.0%	0.0%	☆
PA.27	PID feedback loss detection time	0.0s-20.0s	0.0s	☆
PA.28	PID operation at stop	0: No PID operation at downtime 1: PID operation at downtime	0	☆
Group PC Multi-reference and simple PLC				
PC.00	Reference 0	-100.0%-100.0%	0.0%	☆
PC.01	Reference 1	-100.0%-100.0%	0.0%	☆
PC.02	Reference 2	-100.0%-100.0%	0.0%	☆
PC.03	Reference 3	-100.0%-100.0%	0.0%	☆
PC.04	Reference 4	-100.0%-100.0%	0.0%	☆
PC.05	Reference 5	-100.0%-100.0%	0.0%	☆
PC.06	Reference 6	-100.0%-100.0%	0.0%	☆
PC.07	Reference 7	-100.0%-100.0%	0.0%	☆
PC.08	Reference 8	-100.0%-100.0%	0.0%	☆
PC.09	Reference 9	-100.0%-100.0%	0.0%	☆
PC.10	Reference 10	-100.0%-100.0%	0.0%	☆
PC.11	Reference 11	-100.0%-100.0%	0.0%	☆

PC.12	Reference 12	-100.0%-100.0%	0.0%	☆
PC.13	Reference 13	-100.0%-100.0%	0.0%	☆
PC.14	Reference 14	-100.0%-100.0%	0.0%	☆
PC.15	Reference15	-100.0%-100.0%	0.0%	☆
PC.16	Simple PLC running mode	0: Downtime after the AC drive runs one cycle 1: Keep final values after the AC drive runs one cycle 2: Loop all the time	0	☆
PC.17	Simple PLC retentive selection	Unit's digit: Power-fail safeguard selection 0: Not retentive 1: Retentive Ten's digit: Downtime memory selection 0: No memory after downtime 1: Downtime memory	00	☆
PC.18	Simple PLC0 segment runtime	0.0s(h)-6500.0s(h)	0.0s(h)	☆
PC.19	Simple PLC0 stage acceleration and deceleration time selection	0-3	0	☆
PC.20	Simple PLC 1st segment runtime	0.0s(h)-6500.0s(h)	0.0s(h)	☆
PC.21	Simple PLC1st acceleration and deceleration time selection	0-3	0	☆
PC.22	Simple PLC 2nd segment runtime	0.0s(h)-6500.0s(h)	0.0s(h)	☆
PC.23	Simple PLC 2nd stage acceleration and deceleration time selection	0-3	0	☆
PC.24	Simple PLC3rd segment runtime	0.0s(h)-6500.0s(h)	0.0s(h)	☆
PC.25	Simple PLC 3rd segment runtime selection	0-3	0	☆
PC.26	Simple PLC 4th-segment runtime	0.0s(h)-6500.0s(h)	0.0s(h)	☆
PC.27	Simple PLC 4th-stage acceleration and deceleration Time Choose	0-3	0	☆
PC.28	Simple PLC5th-segment runtime	0.0s(h)-6500.0s(h)	0.0s(h)	☆

PC.29	Simple PLC 5th-stage acceleration and deceleration time selection	0-3	0	☆
PC.30	Operation time of simple PLC in the sixth segment	0.0s(h)-6500.0s(h)	0.0s(h)	☆
PC.31	Simple PLC 6th-stage acceleration and deceleration time selection	0-3	0	☆
PC.32	Simple PLC 7th segment runtime	0.0s(h)-6500.0s(h)	0.0s(h)	☆
PC.33	Simple PLC 7th-stage acceleration and deceleration time selection	0-3	0	☆
PC.34	Simple PLC 8th-segment runtime	0.0s(h)-6500.0s(h)	0.0s(h)	☆
PC.35	Simple PLC 8th-segment acceleration and deceleration time selection	0-3	0	☆
PC.36	Simple PLC 9th-segment runtime	0.0s(h)-6500.0s(h)	0.0s(h)	☆
PC.37	Simple PLC 9th-stage acceleration and deceleration time selection	0-3	0	☆
PC.38	Simple PLC 10th-segment runtime	0.0s(h)-6500.0s(h)	0.0s(h)	☆
PC.39	Simple PLC 10th-segement acceleration and deceleration time selection	0-3	0	☆
PC.40	SimplePLC11th-segment runtime	0.0s(h)-6500.0s(h)	0.0s(h)	☆
PC.41	Simple PLC 12th-segment acceleration and deceleration time selection	0-3	0	☆
PC.42	SimplePLC12th-segment runtime	0.0s(h)-6500.0s(h)	0.0s(h)	☆
PC.43	Simple PLC 12th-segment acceleration and deceleration Time Choose	0-3	0	☆
PC.44	SimplePLC13th-segment runtime	0.0s(h)-6500.0s(h)	0.0s(h)	☆
PC.45	Simple PLC 13th-segment acceleration and deceleration Time Choose	0-3	0	☆
PC.46	Simple PLC 14th-segment runtime	0.0s(h)-6500.0s(h)	0.0s	☆

			(h)	
PC.47	Simple PLC 14th-stage acceleration and deceleration Time selection	0-3	0	☆
PC.48	Simple PLC 15th-segment runtime	0.0s(h)-6500.0s(h)	0.0s(h)	☆
PC.49	Simple PLC15th-segement acceleration and deceleration time selection	0-3	0	☆
PC.50	Simple PLC running time unit	0: s(seconds) 1: h(hour)	0	☆
PC.51	Multi-segment instruction 0 given mode	0: Function code PC.00 given 1: FIV (Expansion Card) 2: FIC 3: Reserved 4: PULSE 5: PID 6: Preset frequency (P0.08) given, UP/DOWN modifiable	0	☆
PD group communication parameters				
PD.00	Baud rate	Unit's digit: MODBUS 0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS Ten's digit: Reserved Hundred's digit: Reserved Thousand's digit: Reserved	0005	☆
PD.01	Data format	0: No parity(8-N-2) 1: Even check(8-E-1) 2: Odd check (8-O-1) 3: 8-N-1	3	☆
PD.02	Local address	1-247	1	☆

PD.03	Response delay	0ms-20ms	2	☆
PD.04	Communication timeout period	0.0(Invalid), 0.1s-60.0s	0.0	☆
PD.05	Select data transfer format	Unit's digit: MODBUS 0: Non-standard MODBUS protocol 1: Standard MODBUS protocol Ten's digit: Reserved	1	☆
PD.06	Communication read current resolution	0: 0.01A 1: 0.1A	0	☆
PP group user function code				
PP.00	User password	0 to 65535	0	☆
PP.01	Parameter initialization	0: No operation 01: Restore factory parameters, excluding motor parameters	0	★
Group C0 Torque control parameters				
C0.00	Selection of speed/torque control mode	0: Speed control 1: Torque control	0	★
C0.01	Selection of torque setting source under torque control mode	0: Digital setting (C0.03) 1: FIV (Expansion Card) 2: FIC 3: Reserved 4: PULSE 5: Communication setting 6: MIN (FIV (expansion card), FIC) 7: MAX (FIV (expansion card), FIC) (Full scale for 1-7 options, corresponding to C0.03 digital setting)	0	★
C0.03	Torque digital setting under torque control mode	-200.0%-200.0%	150.0%	☆
C0.05	Forward maximum frequency of torque control	0.00Hz-Maximum frequency	50.00Hz	☆
C0.06	Reverse maximum frequency of torque control	0.00Hz-Maximum frequency	50.00Hz	☆
C0.07	Torque control acceleration time	0.00s-65000s	0.00s	☆
C0.08	Torque control deceleration time	0.00s-65000s	0.00s	☆
Group C5 Control optimization parameters				
C5.00	DPWM switching upper frequency	0.00Hz-Maximum frequency	8.00Hz	☆
C5.01	PWM modulation mode	0: Asynchronous modulation 1: Synchronous modulation	0	☆
C5.02	Dead-zone time compensation mode selection	0: No compensation	1	☆

		1: Compensation mode 1		
C5.03	Random PWM depth	0: Random invalid PWM 1-10: PWM carrier frequency random depth	0	☆
C5.04	Fast current limiting enable	0: Not enabled 1: Enabled	1	☆
C5.05	Voltage overmodulation coefficient	100-110	105	☆
C5.06	Undervoltage point setting	210-420	350	☆
C5.08	Dead-zone time adjustment	100%-200%	150%	☆
C5.09	Overvoltage point setting	200.0V-25000.0V	Model dependent	

Summary of Monitoring Parameters:

Function code	Name	Minimum unit
Group D0 basic monitoring parameters		
D0.00	Running frequency (Hz)	0.01Hz
D0.01	Set frequency (Hz)	0.01Hz
D0.02	Bus voltage(V)	0.1V
D0.03	Output voltage (V)	1V
D0.04	Output current (A)	0.01A
D0.05	Output power (kW)	0.1kW
D0.06	Output torque (%)	0.1%
D0.07	Input terminal status	1
D0.08	Output terminal status	1
D0.09	FIV Voltage (V)	0.01V
D0.10	FIC Voltage(V)	0.01V
D0.11	Reserved	
D0.12	Count value	1
D0.13	Length value	1
D0.14	Load speed display	1
D0.15	PID Setting	1
D0.16	PID feedback	1
D0.17	PLC stage	1
D0.18	PULSE Input frequency (kHz)	0.01kHz
D0.19	Reserved	
D0.20	Remaining running time	0.1min
D0.21	Voltage before FIV correction	0.001V

D0.22	Voltage before FIC correction	0.001 V
D0.23	Reserved	
D0.24	Linear velocity	1m/Min
D0.25	Current power-on time	1Min
D0.26	Current running time	0.1Min
D0.27	PULSE input frequency	1Hz
D0.28	Communication set value	0.01%
D0.29	Reserved	
D0.30	Reserved	
D0.31	Auxiliary frequency Y display	0.01Hz
D0.32	View any memory address value	1
D0.33	Reserved	
D0.34	Motor temperature value	1℃
D0.35	Target torque (%)	0.1%
D0.36	Reserved	1
D0.37	Power factor angle	0.1 °
D0.38	Reserved	1
D0.39	VF Separated Target Voltage	1 V
D0.40	VF Separated Output Voltage	1V
D0.41	Reserved	
D0.42	Reserved	
D0.43	Reserved	
D0.44	Reserved	
D0.45	Fault information	0
D0.58	Z signal counter	1
D0.59	Set frequency (%)	0.01%
D0.60	Operating frequency (%)	0.01%
D0.61	Inverter status	1
D0.74	Output torque of inverter	0.1
D0.76	Accumulative electricity consumption Low	0.1 degrees
D0.77	Accumulative electricity consumption High	1 degree
D0.78	Linear velocity	1 m/min

Appendix II VT200 Modbus Communication Protocol

VT200 series inverters are with RS485communication interface, and support Modbus communication protocol. Users can realize centralized control by computer or PLC, set the operation command of inverter, modify or read the function code parameters, read the working status and fault information of inverter through this communication protocol.

I. Protocol contents

This serial communication protocol defines the content and format of information transmitted in serial communication. These include: Host polling (or broadcast) format; The encoding method of the host includes: Function code of require action, data transmission and error check, etc. The slave response also adopts the same structure, and the content
include: Action confirmation, data return and error verification, etc. If the slave makes an error in receiving the message or fails to complete the action required by the master, it will organize a fault message as a response to the master.

II. Application mode

Inverter access has RS485 bus "Single master and multiple slave“ PC/PLC control network.

Ⅲ.Bus structure

(1) Interface mode RS485 Hardware Interface
(2) Transmission mode asynchronous serial and half-duplex transmission mode. At the same time, only one master or slave can send data and the other can only receive data. In the process of serial asynchronous communication, data is in the form of messages, which is sent frame by frame.
(3) Topological structure “single master multi-slave” system. The setting range of slave address is1-247. 0is the broadcast communication address. The slave address in the network must be unique.

IV. Description of protocol

The communication protocol of VT200 series inverter is an asynchronous serial master-slave Modbus communication protocol, and only one device (Master) in the network can establish the

protocol (called "query/command"). Other devices (slaves) can only respond to the "query/command" of the master by providing data, or make corresponding actions according to the "query/command" of the master. Master here refers to personal computer (PC), industrial control device or
programmable logic controller (PLC), etc., slave refers to VT200 inverter. The host can not only communicate with a slave, but also broadcast information to all slave. For individually accessed master "Query/Command", the slave will return a message (called a response) to the broadcast message sent by the master,
The slave does not need to response to the master.

V. Communication data structure

VT200 series inverter Modbus protocol communication data format is as follows: With RTU mode, message sending should start with a pause interval of at least 3.5 characters.
Under the network baud rate of various character times, which is the easiest to achieve. The first domain to be transmitted is the device address.
The transmission characters that can be used are hexadecimal0... 9, A...F. The network device constantly detects the network bus, including during the pause interval. When the first domain (address domain) receives it, each device decodes to determine whether it is sent to your own. After the last transmission character, a pause of at least 3.5 characters marks the end of the message. A new message can be paused here and then start.
The whole message frame must be transmitted as a continuous stream. If there is a pause time of more than 1.5 characters before the frame completes, the receiving device will refresh the incomplete message and assume that the next byte is the address field of a new message. Likewise, if a new message begins with a previous message in less than 3.5 characters, the receiving device will consider it a continuation of the previous message. This will lead to an error, because the value in the last CRC field cannot be correct.
RTU frame format:

Frame header START	3.5-character time
Slave address	Communication address: 1-247
Command code CMD	03: Read slave parameters; 06: Write slave parameters
Data content	Data content: Function code parameter address, the number of function code parameter, function code parameter value, etc.
Data content	
……	
Data content	
CRC CHK high	Detection value CRC value
CRC CHK low	
END	3.5-character time

CMD(Command instruction) and DATA(Data word description)
Command code: 03H, read words (Word) (be able to read at most 12 words). For example: Two

consecutive values are read from the start address F105 of the inverter with the address 01

Host command information

ADR	01H
CMD	03H
Start address high	F1H
Start address high	05H
The number of registers high	00H
The number of registers low	02H
CRC CHK low	CRC CHK value is to be calculated.
CRC CHK high	

Slave response information

When PD.05 is set to 0:

ADR	01H
CMD	03H
Number of high bytes	00H
Number of low bytes	04H
Data F002H high	00H
Data F002H low	00H
Data F003H high	00H
Data F003H high	01H
CRC CHK low	CRC CHK value is to be calculated.
CRC CHK high	

PD.05 is set to 1.

ADR	01H
CMD	03H
Number of bytes	04H
Data F002H high	00H
Data F002H low	00H
Data F003H high	00H
Data F003H low	01H
CRC CHK low	CRC CHK value is to be calculated.
CRC CHK high	

Command code: 06H write a Word. For example: Write 3000 (BB8H) to the slave address 05H at the F00AH address of the inverter.

Host command information

ADR	05H
CMD	06H
Data address high	F0H
Data address low	0AH
Data content high	0BH
Data content low	B8H
CRC CHK low	CRC CHK value is to be calculated.
CRC CHK high	

Slave response information

ADR	02H
CMD	06H
Data address high	F0H
Data address low	0AH
Data content high	13H
Data content low	88H
CRC CHK low	CRC CHK value is to be calculated.
CRC CHK high	

Check method-CRC parity: CRC(Cyclical Redundancy Check)
Using RTU frame format, the message includes an error detection field based on CRC method. The CRC domain detects the contents of the entire message.
CRC domain is a two-byte binary value containing 16 bits. It is added to the message by the transmission device after calculated. The receiving device recalculates the CRC of the received message and compares it with the value in the received CRC field. If the two CRC values are not equal, an error is indicated in the transmission.

First, CRC is stored in 0xFFFF, and then a procedure is called to process successive 8-bit bytes in the message with the value in the current register. Only 8-bit data of every character are valid for CRC, and the start and stop bits and parity bits are not valid.
During CRC generation, each 8-bit character is individually different from the register content OR (XOR), and the result is moved in the direction of the least valid bit, and the most valid bit is filled with 0. The LSB is extracted and detected. If the LSB is 1, the register alone and the preset value are exclusive or (XOR), if the LSB is 0, it is not performed. The whole process should be repeated 8 times. After the last bit (8th bit) is completed, the next 8-bit byte alone is OR different from the current value of the register. The value in the final register is the CRC value after all bytes in the message are executed.

When CRC is added to a message, low bytes are added first, and then high bytes. CRC simple function
as follows:

```
unsigned int crc_cal_value(unsigned char *data_value,unsigned char data_length)
{
int i;
unsigned int crc_value=0xffff;
while(data_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);
}
```

Address definition of communication parameters

This part is about communication, which is used to control the operation of the inverter, the status of the inverter and the setting of related parameters. Read and write function code parameters (some function codes can not be changed, only for manufacturers to use or monitor):

Function code parameter address marking rules:

Representation rules with function code group number and label as address parameters:

High byte: F0-FF(Group P),A0-AF(Group C),70-7F(Group D) low bytes: 00-FF

For instance: P3.12, the address is denoted as F30C; Note: PF Group: Neither read parameters norchange parameters; Group D: Read only, parameters cannot be changed.

Some parameters can not be changed when the inverter is running; Some parameters can not be changed regardless of the status of the inverter; Change the function code parameters, but also pay attention to the range, unit and related instructions of the parameters.

In addition, since EEPROM is frequently stored, it will reduce the service life of EEPROM. Therefore, some function codes do not need to be stored in communication mode, but only need to change the value in RAM.

If it is a P group parameter, to realize this function, it can be realized by changing the high endian F of the function code address to 0. If it is a C group parameter, to realize this function, it can be realized by changing the high byte A of the function code address into 4. The corresponding function code address is shown as follows: High byte: 00-0F(P
Group), 40-4F (Group C) low bytes: 00-FF
For instance: Function code P3. 12Not store to EEPROM, the address is represented as 030C; Function code
C0.05 is not stored in EEPROM, and the address is represented as 4005; This address means that you can only write RAM, but not read it. When read, it is an invalid address.
Downtime/operation parameters:

Parameter address	Parameter description
1000	*Communication settings (-10000-10000) (decimal)
1001	Operating frequency
1002	Bus voltage
1003	Output voltage
1004	Output current
1005	Output power
1006	Output torque
1007	Running speed
1008	Input terminal mark
1009	Output terminal mark
100A	FIV voltage
100B	FIC voltage
100C	Reserved
100D	Counter value input
100E	Length value enter
100F	Load speed
1010	PID setting
1011	PID feedback
1012	PLC Steps
1013	PULSE input frequency, unit 0.01kHz
1014	Reserved
1015	Remaining running time
1016	Voltage before FIV correction
1017	Voltage before FIC correction
1018	Reserved
1019	Linear velocity
101A	Current power-on time
101B	Current running time

101C	PULSE input frequency, unit 1Hz
101D	Communication set value
101E	Reserved
101F	Main frequency X-display
1020	Auxiliary frequency Y display

****Note:**

The communication set value is a percentage of the relative value, 10000 for 100.00%, -10000 for-100.00%.

For the data of the frequency dimension, this percentage is the percentage of the relative maximum frequency (P0.10); For the torque dimension data, the percentage is P2.10.

The control command is input to the inverter: (Write only)

Command word address	Command function
2000	0001: Forward running
	0002: Reversal running
	0003: Forward inching
	0004: Reverse inching
	0005: Free downtime
	0006: Slow down and stop
	0007: Fault reset

Read inverter status: (Read Only)

Status word address	Status word function
3000	0001: Forward running
	0002: Reversal running
	0003: Downtime

Parameter lock password verification: If returned as 8888H, which means that the password verification has passed)

Password address	Enter the contents of the password
1F00	*****

Output switching value control: (Write only)

Command address	Command content
2001	BIT 0: (Reserved) BIT1:YO output control BIT2: YA-YB-YC Output Control BIT 3: Reserved BIT4: MOA-MOB-MOC output control

Analog output FOV Control: (Write only)

Command address	Command content
2002	0-7FFF represent 0%-100%

Analog output FOC control: (Write only)

Command address	Command content
2003	0-7FFF represent 0%-100%

Pulse(PULSE) output control: (Write only)

Command address	Command content
2004	0-7FFF represent 0%-100%

Inverter fault description

Inverter fault address	Fault information of inverter
8000	0000: No fault 0001: Inverter unit protection 0002: Accelerated overcurrent 0003: Decelerated overcurrent 0004: Constant velocity overcurrent 0005: Accelerated overvoltage 0006: Deceleration overvoltage 0007: Constant velocity overvoltage 0008: Control power failure 0009: Undervoltage fault 000A: Inverter overload 000B: motor overload 000C: Reserved 000D: Output open phase 000E: Module overheating 000F: External fault 0010: Communication abnormal 0011: Abnormal contactor 0012: Current detection fault 0013: Motor self-learning fault 0014: Reserved 0015: Parameter read-write exception 0016: Inverter hardware failure 0017: Short circuit fault of motor to ground 0018: Reserved 0019: Reserved 001A: Runtime arrives 001B: Reserved 001C: Reserved 001D: Power-on time reach 001E: Load dropping 001F: Runtime PID feedback loss 0028: Fast current limiting timeout 0029: Runtime switching motor 002A: Excessive speed deviation 002B: Motor overspeed 002D: Motor over temperature 005A: Encoder line number setting error 005B: Unconnected encoder 005C: Initial position error 005E: Speed feedback error

Communication fault address	Fault function description
	0000: No fault

8001	0001: Wrong password 0002: Wrong command code 0003: CRC parity error 0004: Invalid address 0005: Invalid parameter 0006: Invalid parameter change 0007: The system is locked 0008: In progress of EEPROM operation

PD Group Communication Parameter Explanation

PD.00	Baud rate	Delivery value	0005
	Set range	Unit's digit: MODUBS baud rate 0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9:115200BPS	

This parameter is used to set the data transmission rate between the upper computer and the inverter.

Note: The baud rate set by the upper computer and by the inverter must be consistent, otherwise, communication cannot be carried out. The higher the baud rate is, the faster the communication is.

PD.01	Data format	Delivery value	0
	Set range	0: No check: Data format <8, N, 2> 1: EVEN: Data format <8, E, 1> 2: ODD: Data format < 8, O, 1> 3: No check: Data format <8, N, 1>	

The data format set by the upper computer and by the inverter must be consistent, otherwise, communication cannot be carried out.

PD.02	Local address	Delivery value	1
	Set range	1-247, 0 is the broadcast address.	

When the local address is set to 0, it is the broadcast address to realize the broadcast function of the upper computer.

The local address is unique (except the broadcast address), which is the basis of point-to-point communication between the upper computer and the inverter.

PD.03	Response delay	Delivery value	2 ms
	Set range	0~20ms	

Response delay: It refers to the intermediate interval between the end of inverter data acceptance and the sending of data to the upper computer. If the response delay is shorter than the system processing time, the response delay is based on the system processing time. If the response delay is longer than the system processing time, the system should delay waiting after processing the data until the response delay time arrives before sending the data to the upper computer.

PD.04	Communication timeout period	Delivery value	0.0s
	Set range	0.0s(Invalid) 0.1-60.0s	

When the function code is set to 0.0 s, the communication timeout period parameter is invalid. When the function code is set to a valid value, if the interval between one communication and the next communication exceeds the communication timeout, communication error will be reported (CE). Typically, it is set to invalid. If in a continuous communication system, set secondary parameters to monitor the communication status.

PD.05	Select communication protocol	Delivery value	0
	Set range	0: Non-standard Modbus protocol 1: Non-standard Modbus protocol	

PD.05=1: select the standard Modbus protocol.

PD.05=0: When reading an instruction, the number of bytes returned by the slave is one more than that of the standard Modbus protocol. See more details for this agreement in "Communication data structure".

PD.06	Communication read current resolution	Delivery value	0
	Set range	0: 0.01A 1: 0.1A	

It is used to confirm the current value when the communication reads the output current.