

# Manual

## T150 Series Mini Inverter



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## Chapter 1 Standard Specification

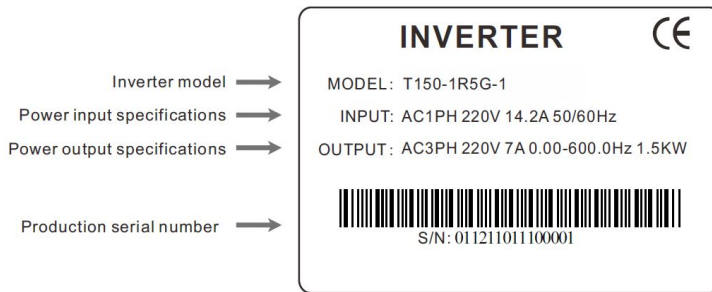
All inverters are given strict test and quality inspection before leaving the factory. Please firstly check whether the product package is damaged due to transportation carelessness after your purchasing and whether the specification and type is consistent with the machine you ordered. Please contact with dealers of our company in various places or directly contact with our company if there is any problem.

### 1-1 Inspect after unboxing

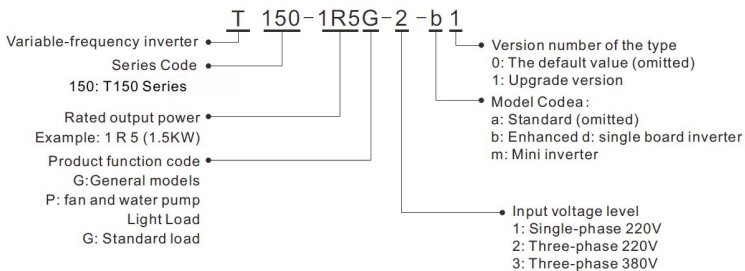
※ Inspect it includes one machine, an manual and a warranty card.

※ Inspect nameplate at the side of variable-frequency inverter to confirm the product you obtain is the product you ordered.

#### 1-1-1 Explanative to nameplate

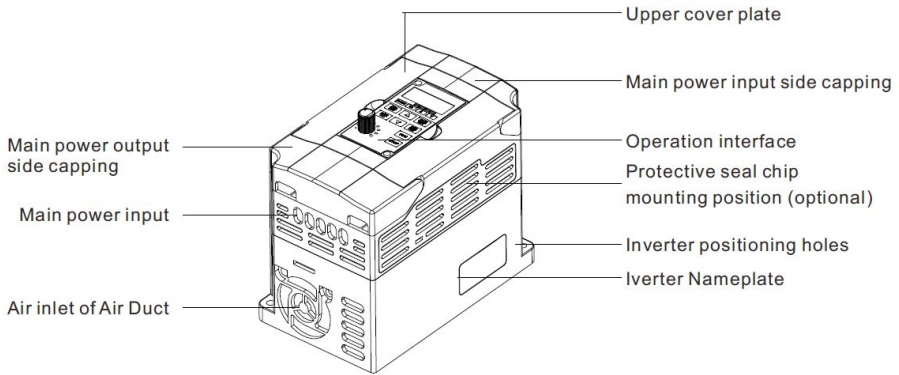


#### 1-1-2 Type instruction



1-2 Dimensions

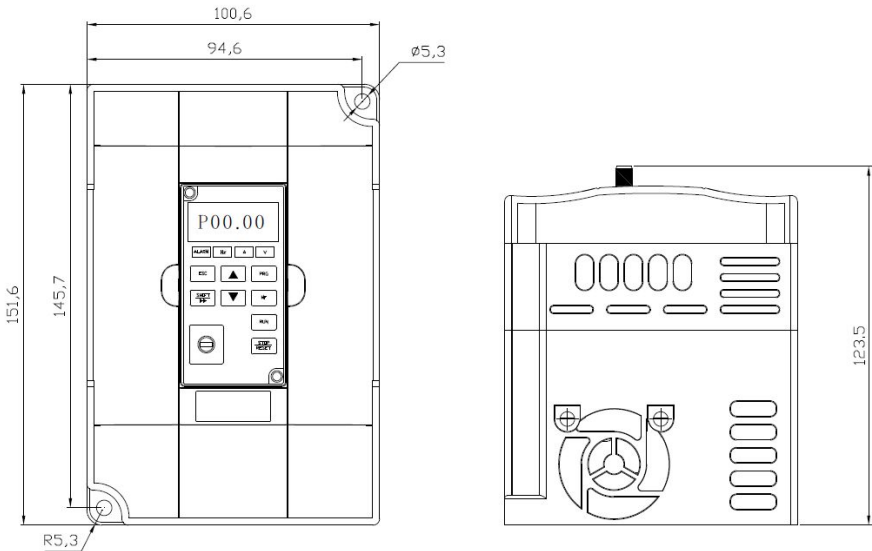
1-2-1 Product appearance, size of Installation hole.



Pic 1- 1 Product appearance

1-2-2 PT150 Series

1. 1S2

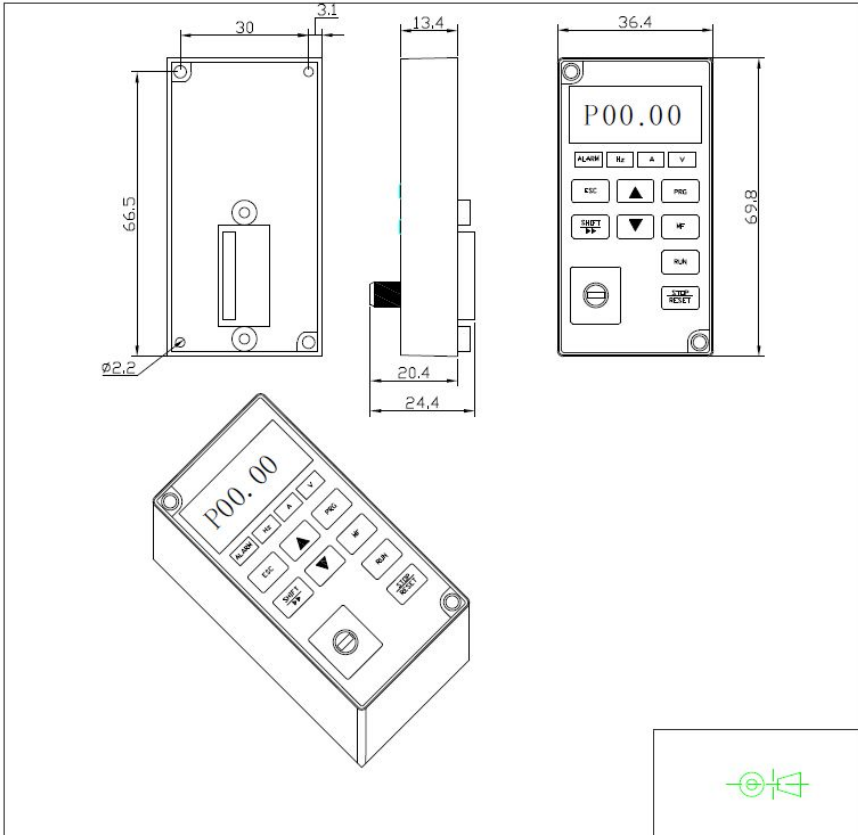


Pic 1- 2 1S2 Dimensions

Power Supply	Type	Power
Single phase 220v	G	0.4~1.5
Three phase 220v	G	0.4~1.5
Three phase 380v	G	0.4~1.5

## 1-2-3 Keypad Dimensions

JP6E150 Dimensions:



Pic 1-3 JP6E150 dimension

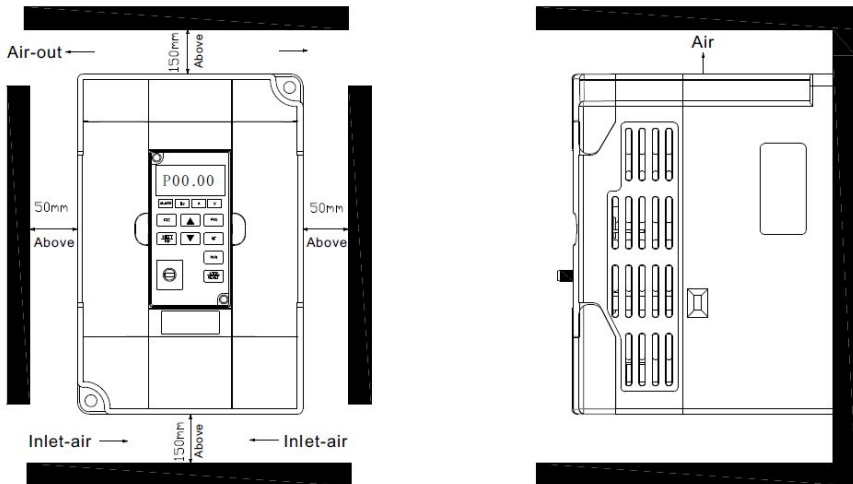
## Chapter 2 Installation and Standby circuit

### 2-1 Usage environment

- (1) Environment temperature  $-10^{\circ}\text{C}\sim 40^{\circ}\text{C}$ .
- (2) Prevent electromagnetic interference and be far away from interference source.
- (3) Prevent the invasion of water drop, vapor, dust, dirt, cotton fiber and lemel.
- (4) Prevent the invasion of oil, salt and corrosive gas.
- (5) Avoid vibration.
- (6) Avoid high temperature and humidity, there is not drench from the rain; and the humidity is smaller than 90%RH (without condensation).
- (7) Prohibit being used in environment with inflammable, combustible and explosive air, liquid or solid.

### 2-2 Installation direction and space

Inverter should be installed in a well-ventilated indoor spaces, and using a wall-mounted, and must be adjacent and surrounding objects or baffle (wall) maintain enough space. It is shown as the following chart.

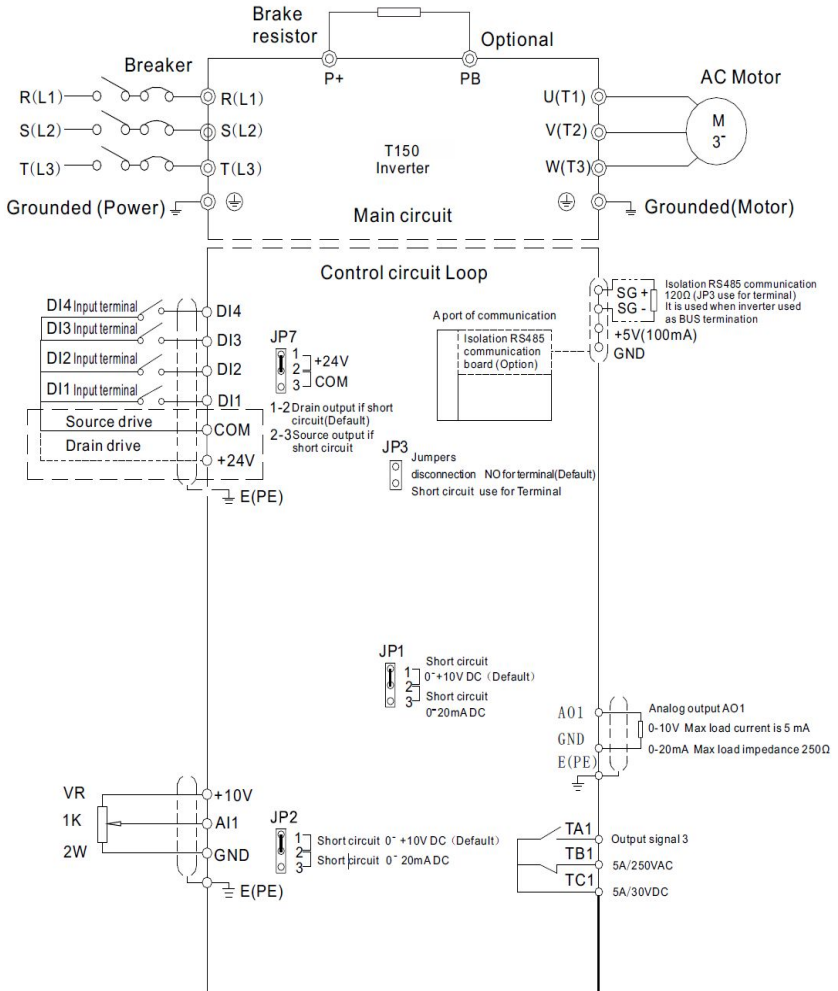


Pic 2-1 installation direction and space

2-3 Wiring diagram

Wiring of inverter divides into main circuit and control circuit loop. The user must make the connection correctly following the below wiring circuit.

2-3-1 Wiring diagram below 1.5kw(1S2)



Pic 2-2. Wiring diagram below 1.5kw(1S2)

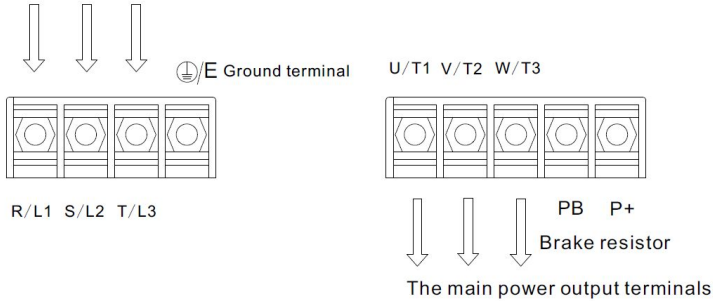


2-4 Main circuit terminals (G type)

2-4-1 Main circuit terminals of T150

Main circuit terminals below 1.5KW

The main power input terminals



Pic 2- 3 Main circuit terminals below 1. 5kW(220V)

2-4-2 Description for the function of terminal

Terminal sign	Terminal name	Function
R/L1	The main power Input terminal	R.S.T terminals for 3-phase
S/L2		AC power supply, R and T
T/L3		terminal for single phase AC power supply
⊕/E	Grounding terminal	Connect with the ground
U/T1	The main power Output terminal	Connect with the 3-phase ac motor
V/T2		
W/T3		
P+,PB	Braking resistor Terminal	Connect to the external resistor.

2-5.Control circuit terminals

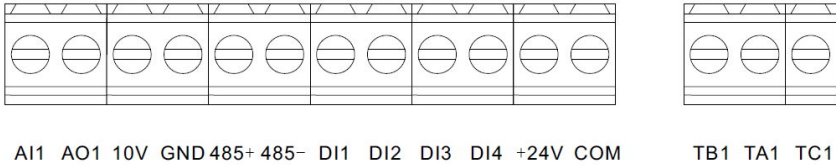
2-5-1 Description for control circuit terminals

Classification	Terminal	Name	Function
Input signal	DI1~DI4	DI1~DI4 input terminals	Multi-function input terminals,See the function P06.00~P06.03
Supplementary power supply	+24V	The power supply	The maximum output is +24V/200mA; Never make a short circuit between COM and GND under any condition
	COM	Common terminal	
Output signal	TA1/TB1/TC1	Common terminal	TA1→TC1 normally open, TB1→TC1 normally close; and output function is set by P08.00.

Analog input and output	+10V→GND	Simulated power supply	Offer +10V power supply; the maximum output current: 10mA, It is generally used as power for external potentiometer; potentiometer resistance value ranges from 1KΩ~5KΩ
	AI1	Multi-function analog input signal 1	JP2 1-2 Short circuit: It can be adjusted among 0- +10V. JP2 2-3 Short circuit: It can be adjusted among 0- +20mA. P06.07-P06.10 sets the range of input voltage/current. P06.09 sets the input signal's value
	AO1	Multi-function analog output signal 1	JP1 1-2 Short circuit: 0- +10V. JP1 2-3 Short circuit: 0- +20mA. P08.01 sets the output function of analog P08.02-P08.05 sets the range of output signal value

2-5-2 Arrangement of control circuit terminals

Control circuit terminals of 150MCB PCB board



Pic 2-4 Control circuit terminals of 150MCB PCB board

Chapter 3 Keypad operation procedure

3-1 Keypad introduction



JP6E150 Keypad control display










Pic 3-1 Picture of JP6E150 Keypad



3-2 Introduction of keypad's indicator light

Indicator Signal		Name	Unit display	Implication	Color
State LED	ALARM	Alarm LED		Alarm LED on: the inverter is in the fault state; Alarm LED off :the inverters is NOT in the fault state Alarm LED Flicking: current fault of inverter hasn't been confirmed	Red
Indicator of unit Combination	Hz	Frequency indicator	Hz	Bright: current display parameter is output frequency Flicker: current display parameter is set frequency	Green
	A	Current indicator	A	Bright: current display parameter is output current	Green

Indicator Signal		Name	Unit display	Implication	Color
Indicator of unit combination	V	Voltage indicator	V	Bright: current display parameter is voltage	Green
	Hz+A	Percentage indicator	%	Bright :current display parameter is percentage	Green
	A+V	User-defined indicator	s	Bright/flicker: current display parameter is user-defined parameter	Green
	Hz+V	Temperature indicator	℃	Bright: current display parameter is temperature	Green
	Hz+A+V	Speed indicator	RPM	Bright:current display parameter is RPM	Green
		Indicator without unit		Off:current display parameter has no unit	Green

### 3-3 Key description of keypad

Sign	Name	Function
	Parameter setting/Escape key	<ul style="list-style-type: none"> <li>* Exit the data modification of function code</li> <li>* Return to state display menu from submenu or function menu</li> </ul>
	Shift key	<ul style="list-style-type: none"> <li>* Under third-level menu, use  to move data edit bit</li> <li>* Moving right to select the displaying parameter circularly in stopping and running mode(see P07.03-P07.04 for refer meaning of display)</li> </ul>
	Forward running Key /Reverse running Key	<ul style="list-style-type: none"> <li>* Inverter JOG operation</li> <li>* Shift between forward rotations and reverse rotations</li> <li>* Inverter clear settings of increasing  / decreasing </li> </ul>
	Confirm Key	<ul style="list-style-type: none"> <li>* Enter each level menu and confirm setting of parameter</li> </ul>
	Operation key	<ul style="list-style-type: none"> <li>* Use for running under the keypad control mode</li> </ul>
	Stop/Reset Key	<ul style="list-style-type: none"> <li>* Inverter stops operation</li> <li>* Abnormal reset</li> <li>* Fault confirmation</li> </ul>

Sign	Name	Function
	Increase (UP)	<ul style="list-style-type: none"> <li>* Under the first-level menu, increase group code P00-P15</li> <li>* Under the second-level menu, increase function code</li> <li>* Under the third-level menu, increase data</li> <li>* Under stopping/operating state, increasing for frequency presetting or presetting of closed loop</li> </ul>
	Decrease(DOWN)	<ul style="list-style-type: none"> <li>*Under the first-level menu, decrease group code P00-P15</li> <li>*Under the second-level menu, decrease function code</li> <li>* Under the third-level menu, decrease data</li> <li>*Under stopping/operating state, decreasing for frequency presetting or presetting of closed loop</li> </ul>

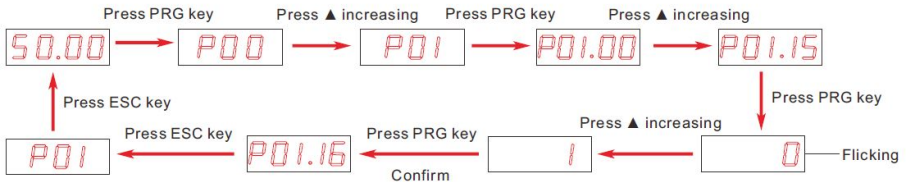
3-4 Operation examples

Displaying parameter in the stop state is the set frequency in the following example, the factory setting is 50.00Hz. underline represents current editing bit in the below Pic 3-2.

3-4-1 Restore factory parameter

For example, set P01.12=1:

Restore all parameters in P area to the factory settings, beside parameter of AC motor (P03 Group)



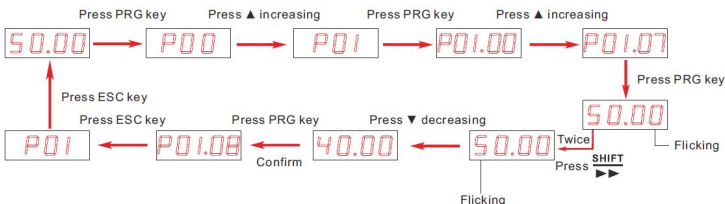
Pic 3-2 Restore factory parameter

3-4-2 Setup set frequency

For example, set P01.07=50Hz to 40Hz

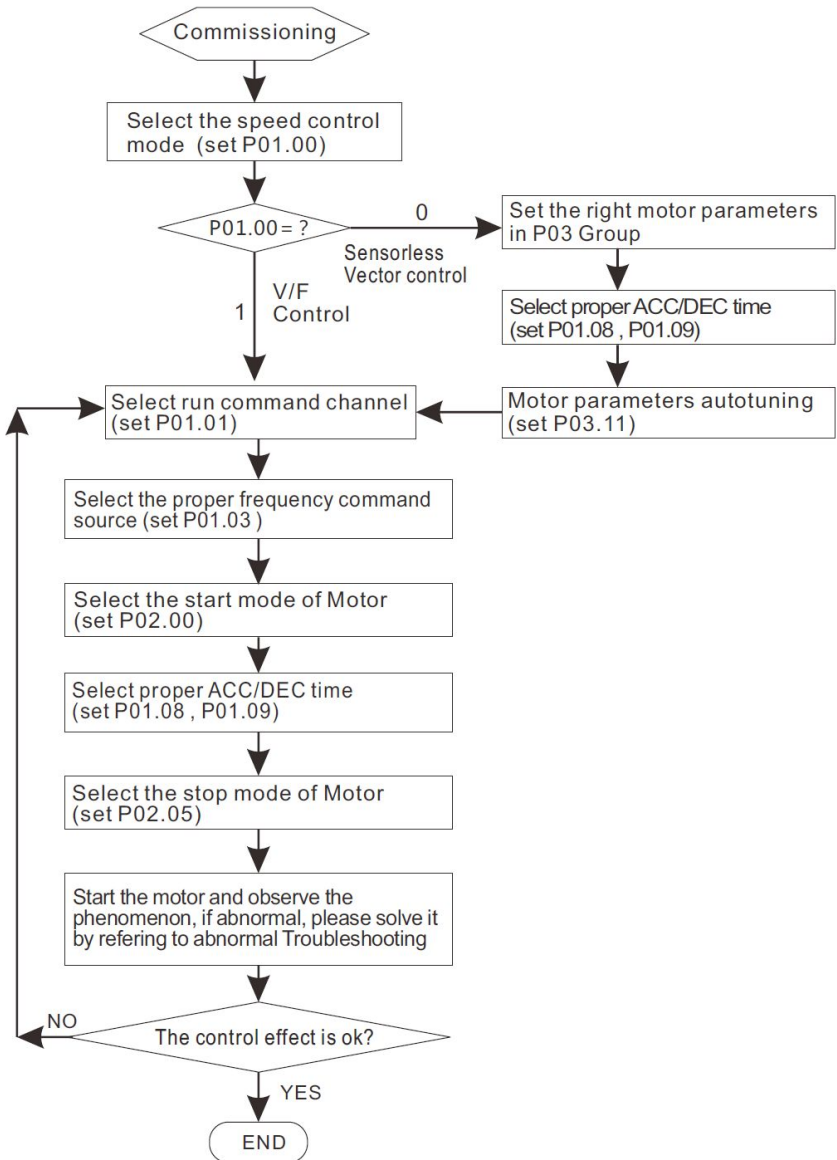
The first step:P01.03→0(the default value is 7 which shows the decoder is effective)

The second step: see the following Pic 3-3



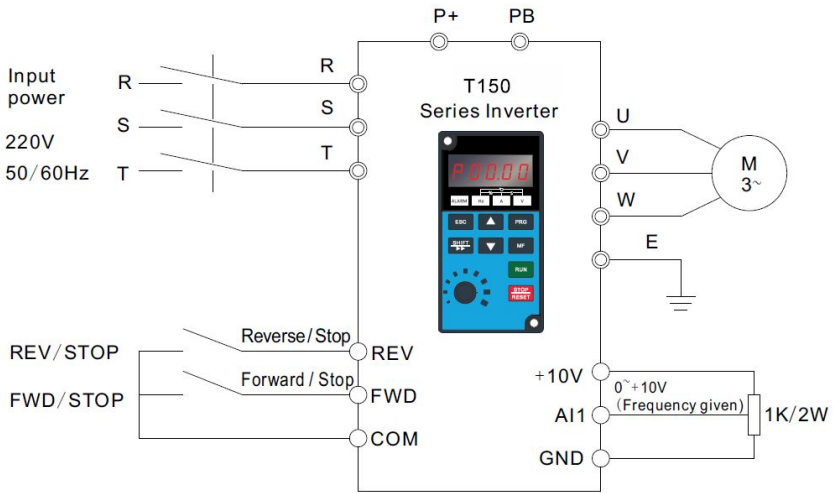
Pic 3-3 Setup set frequency

## Chapter 4 Commissioning



Pic 4-1 Commissioning

- Before connecting the power supply to the inverter, Make sure the AC input power supply is in range of the inverter's rated input voltage
- Connect the power supply to the inverter R, S, T inputs
- Choose the appropriate running control mode



Pic 4-2 Running control mode

Example: Analog A11 + UP / DOWN setting (P01.03 = 6) (P06.01=1,P06.02=2);

Frequency signal is given via terminal A11 , terminals DI2 and DI3 control forward and reverse rotation.

Example: potentiometer on keypad(P01.01=0, P01.03=5) + forward/reverse switch operation on keypad(P07.03=1)

Frequency is given by the keypad potentiometer, Operates keypad **MF** key to switch forward and reverse rotation

- ※ Non-load operation, change speed for checking
- ※ Confirm The Minimum And Maximum Output Frequency Settings
- ※ Check By JOG Control
- ※ Confirm Acceleration Deceleration Time
- ※ Connect To The Ac Motor
- ※ Check The Direction Of Rotation Of The Motor At A Low Speed
- ※ Check Display And Output Are All Correct During The All Operations

## Chapter 5 Function Parameter Description

### 5-1 List of function parameter

Function of T150 series inverter can be divided into 15 groups, there are P01~P15 groups; and every function group includes several function codes. The function code adopts three-level menu; for example, P08.08 means the eighth function code in function group; and P15 is the manufacturer parameter and the user has no right to visit the parameter in this group.

In order to facilitate the setting of function code, When using the keypad, Function group number corresponds to the Level 1 menu, Function code number corresponds to the Level 2 menu, Function code parameters corresponds to the Level 3 menu

1. Instruction of menu's Row as following:

The first Row "NUMBER": it is the serial number for this function code in the whole function code; meanwhile, it is also the register address for the communication.

The second Row "CODE": it is the function parameter group and parameter's number.

The third Row "Describing LED display": it is the detailed description of this function parameter.

The fourth Row "SETTING RANGE": it is the effective setting range of the function parameter, and it is shown on LED operation panel.

The fifth Row "FACTORY SETTING": it is the parameters value that the factory original sets

The sixth Row "ALTERATION": it is the properties of modifying the function parameters (i.e. whether it allows be modified and modified condition); and the instruction is as follow:

"◇" shows the parameter can be modified whenever the Inverter is stopped or running;

"□" shows the parameter can't be modified when the Inverter is in a running state;

"■" shows the value of the parameter is actual detecting record value; and it can't be modified;

( the Inverter has made an automatic check and restriction for every parameter, it can help the user to avoid wrong alternation.)

2. "Parameter system" is a decimal (D E C); if the parameter uses hexadecimal, every bit is independent mutually when the parameter is edited; value range of partial bits can be hexadecimal (0~F).

3. "Factory setting" is the value that functional code parameters are refreshed after restoring the default value; But the actual detected parameter values or record values are NOT refreshed.

4. In order to protect the parameter more effectively, the Inverter provides password protection for the parameters (User's password P07.00 is not 0), After the user's password is set, When user presses key to enter the function code editing status, The system will first enter the user's password verification status and shows "00000", The user must enter the correct password, otherwise can NOT enter. For manufacturer parameters, the user need to enter the correct manufacturer's password to enter. (Warning: Users should not attempt to modify the manufacturer parameters, If the parameter is set incorrectly, Easily lead to the Inverter abnormal working or even damage.) .You can modify the parameters at any time if the password protection is unlocked.

5. Using serial communication to modify parameters, the function of user's password also follows the above rules.



## Chapter 5 Funtion Parameter Description

### 5-1-1 Menu Group



Code	Describing LED Keypad display	Function description	Amount
P00	Monitoring function	Monitor frequency, current and so on; 18 monitoring objects	18
P01	Basic function group	Frequency setting, control mode, ACC and DEC time and so on	14
P02	Start-up and stop control	Start-up and stop control	12
P03	AC motor parameters	AC motor's parameters settings	12
P04	Vector control	Vector control parameters	8
P05	V/F control	V/F control parameters	20
P06	Input terminals	Analog and digital input parameters	12
P07	Human-Machine Interface	Parameters settings of user's menu	13
P08	Output terminals	Analog/Relay output parameters	6
P09	Enhanced function	ACC and DEC, JOG and traverse running and so on	31
P10	PID control	Built-in PID parameters settings	11
P11	Multi-step speed control	Multi-step speed settings and Simple PLC	21
P12	Communication control	MODBUS communication control	7
P13	Protective parameters	Protective parameters	8
P14	Function group of water supply	Constant pressure water supply	9
P15	Manufacturer parameters	Manufacturer's parameters settings	1

### 5-1-2 P00 Group: Monitoring function

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
P00.00	Output frequency	Display current output frequency of the inverter	Hz	■	0000
P00.01	Setting frequency	Display current set frequency of the inverter	Hz	■	0001
P00.02	DC bus voltage	Display current DC bus voltage of the inverter	V	■	0002
P00.03	Output voltage	Display current output voltage of the inverter	V	■	0003
P00.04	Output current	Display current output current of the inverter	A	■	0004
P00.05	Motor speed	Display the rotation speed of the motor	RPM	■	0005
P00.06	Output power	Display current output power of the inverter	%	■	0006
P00.07	Output torque	Display current output torque of the inverter	%	■	0007
P00.08	PID reference value	Display PID given value	%	■	0008
P00.09	PID feedback value	Display PID response value	%	■	0009

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
P00.10	Input terminals state	Input terminals state	-	■	000A
P00.11	Output terminals state	Output terminals state	-	■	000B
P00.12	AI1 input voltage	AI1 input voltage	V	■	000C
P00.13	The current step of the Multi-step speed	Display the current step of the Multi-step speed	-	■	000D
P00.14	Rectifier Module temperature	0~100.0℃	℃	■	000E
P00.15	Inverter Module temperature	0~100.0℃	℃	■	000F
P00.16	Software version	Depend on model	-	■	0010
P00.17	Local accumulative running time	0~65535h	0	■	0011
Note: P00.15 group only seven units IGBT module is valid					

## 5-1-3 P01 Group: Basic function group

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
P01.00	Speed Control mode	0: Sensorless vector control 1: V/F control 2: Reserved	1	□	0012
P01.01	Run command channel	0: Keypad running command channel 1: Terminal running command channel 2: Communication running command channel	0	□	0013
P01.02	Keypad  and  Terminal UP/DOWN setting	0: valid; and the value can be saved when the inverter is powered off 1: valid; and the value can not be saved when the inverter is powered off 2: UP/DOWN setting is invalid	0	◇	0014

Chapter 5 Funtion Parameter Description

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
P01.03	Frequency command source	0: Keypad 1: Analog AI1 2: Multi-step speed running setting 3: PID control Setting 4: Modbus communication setting 5: Keypad potentiometer setting 6:Analog AI1 + UP/DOWN setting 7: Keypad potentiometer+UP/DOWN setting	5	◇	0015
P01.04	Max. output frequency	10.00~600.00Hz	50.00Hz	□	0016
P01.05	Upper limit of the running frequency	P01.06~P01.04 (the max. frequency)	50.00Hz	◇	0017
P01.06	lower limit of the running frequency	0.00Hz~P01.05(Upper limit of the running frequency)	0.00Hz	◇	0018
P01.07	Keypad set frequency	0.00 Hz~P01.04(the max. frequency)	50.00Hz	◇	0019
P01.08	ACC time 1	0.1~3600.0s	Depend on model	◇	001A
P01.09	DEC time 1	0.1~3600.0s	Depend on model	◇	001B
P01.10	Running direction	0: Runs at the default direction 1: Runs at the reverse direction 2: Forbid to run in reverse direction	0	□	001C
P01.11	Carrier frequency setting	0.5~15.0kHz	Depend on model	◇	001D
P01.12	Function restore parameter	0: No operation 1: Restore the default value, Not including the group of AC motor's parameters 2: Restore the default value, including the group of AC motor's parameters 3: Clear the fault records	0	□	001E

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
P01.13	AVR function selection	0: Invalid 1: Valid during the whole procedure 2: Invalid only during the deceleration procedure	2	◇	001F

## 5-1-4 P02 Group: Start-up and stop Control

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
P02.00	Operation mode	0: start-up directly 1: start-up after DC braking 2: start-up after speed tracking	0	□	0020
P02.01	Starting frequency	0.00~10.00Hz	0.50Hz	◇	0021
P02.02	Retention time of starting frequency	0.0~50.0s	0.0s	◇	0022
P02.03	The braking current before starting	0.0~150.0%	0.0%	◇	0023
P02.04	The braking time before starting	0.0~50.0s	0.0s	◇	0024
P02.05	Stop selection	0: Deceleration to stop 1: Coast to stop	0	◇	0025
P02.06	Starting frequency of DC braking	0.00~P01.04(the max. Frequency)	0.00Hz	◇	0026
P02.07	Waiting time of DC braking	0.0~50.0s	0.0s	◇	0027
P02.08	DC braking current	0.0~150.0%	0.0%	◇	0028
P02.09	DC braking time	0.0~50.0s	0.0s	◇	0029
P02.10	Dead time of FWD/REV rotation	0.0~3600.0s	1.0s	◇	002A
P02.11	Terminal running protection when powering on	0: terminal running command is invalid when powering on 1: terminal running command is valid when powering on	0	◇	002B

## Chapter 5 Funtion Parameter Description

### 5-1-5 P03 Group: AC motor parameters

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
P03.00	Inverter type	0:G type (load type of constant torque) 1:P type ( load type of fan and pump)	Depend on model	<input type="checkbox"/>	002C
P03.01	Rated power of AC motor	0.4~900.0KW	Depend on model	<input type="checkbox"/>	002D
P03.02	Rated frequency of AC motor	0.01Hz~P01.04 (the max. frequency)	50.00Hz	<input type="checkbox"/>	002E
P03.03	Rated speed of AC motor	0~3600RPM	Depend on model	<input type="checkbox"/>	002F
P03.04	Rated voltage of AC motor	0~460V	Depend on model	<input type="checkbox"/>	0030
P03.05	Rated current of AC motor	0.1~2000.0A	Depend on model	<input type="checkbox"/>	0031
P03.06	Stator resistor of AC motor	0.001~65.535Ω	Depend on model	<input type="checkbox"/>	0032
P03.07	Rotor resistor of AC motor	0.001~65.535Ω	Depend on model	<input type="checkbox"/>	0033
P03.08	Leakage inductance of AC motor	0.1~6553.5mH	Depend on model	<input type="checkbox"/>	0034
P03.09	Mutual inductance of AC motor	0.1~6553.5mH	Depend on model	<input type="checkbox"/>	0035
P03.10	Non-load current of AC motor	0.01~655.35A	Depend on model	<input type="checkbox"/>	0036
P03.11	Motor parameter autotuning	0: No operation 1: Rotation autotuning 2: Static autotuning	0	<input type="checkbox"/>	0037

### 5-1-6 P04 Group: Vector control

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
P04.00	Speed loop proportional gain 1	0~100	30	<input type="checkbox"/>	0038
P04.01	Speed loop integral time 1	0.01~10.00s	0.50s	<input type="checkbox"/>	0039
P04.02	Switching low frequency	0.00Hz~10Hz	5.00Hz	<input type="checkbox"/>	003A
P04.03	Speed loop	0~100	20	<input type="checkbox"/>	003B

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
	proportional gain 2				
P04.04	Speed loop integral time 2	0.01~10.00s	1.00s	◇	003C
P04.05	Switching high point frequency	10Hz~P01.04 (the max.frequency)	10.00Hz	◇	003D
P04.06	Vector control compensation coefficient	50%~200%	100%	◇	003E
P04.07	Upper setting of torque	0.0~200.0%(rated current of inverter)	150.0%	◇	003F

## 5-1-7 P05 Group: V/F control



Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
P05.00	V/F curve setting	0: straight line V/F curve 1:multi-dots V/F curve 2:1.25 <sup>th</sup> power low torque V/F curve 3:1.75 <sup>th</sup> power low torque V/F curve 4:2 <sup>th</sup> power low torque V/F curve	0	◇	0040
P05.01	Torque boost	0.0%:(automatic)0.1%~30.0%	3.0%	□	0041
P05.02	Torque boost close	0.0%~50.0%(relative rated frequency of AC motor)	20.0%	◇	0042
P05.03	V/F frequency point 0(F0)	0.00~P05.05	0.00Hz	◇	0043
P05.04	V/F voltage point 0(V0)	0.0%~100.0%	0.0%	◇	0044
P05.05	V/F frequency point 1(F1)	P05.03~50.07	0.00Hz	◇	0045
P05.06	V/F voltage point 1(V1)	0.0%~100.0%	0.0%	◇	0046
P05.07	V/F frequency point 2(F2)	P05.05~P05.07	0.00Hz	◇	0047
P05.08	V/F voltage point 2(V2)	0.0~100.0%	0.0%	◇	0048
P05.09	V/F frequency point 3(F3)	P05.07~P03.02	0.00Hz	◇	0049
P05.10	V/F voltage point 3(V3)	0.0~100.0%	0.0%	◇	004A
P05.11	V/F slip compensation	0.0~200.0%	0.0%	◇	004B

Chapter 5 Funtion Parameter Description

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
P05.12	Threshold point of vibration control at low frequency	0~500	15	◇	004C
P05.13	Threshold point of vibration control at high frequency	0~500	15	◇	004D
P05.14	Amplitude of vibration control	0~100.00	20.00	◇	004E
P05.15	Threshold frequency of vibration control	0.00Hz~P01.04 (The max. frequency)	12.50Hz	◇	004F
P05.16	Vibration control enable	0: enable 1:disable	0	◇	0050
P05.17	PWM mode	0x0~0x122	0x0	□	0051
P05.18	Non-load current compensation coefficient	0~9.999	0.5	□	0052
P05.19	Energy-saving operation	0: No operation 1: Automatic energy-saving operation	0	□	0053

5-1-8 P06 Group Input terminals



Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
P06.00	DI1 Terminals function selection	0: No function 1: Forward rotation operation 2: Reverse rotation operation	1	□	0054
P06.01	DI2 Terminals function selection	3: 3-wire control operation 4: Forward rotation jogging 5: Reverse rotation jogging	2	□	0055
P06.02	DI3 Terminals function selection	6: Coast to stop 7: Fault reset 8: External fault input	4	□	0056
P06.03	DI4 Terminals function selection	9: Increasing frequency setting(U P) 10: Decreasing frequency setting(DOWN) 11: Frequency setting clear 12: Multi-step speed terminal 1 13: Multi-step speed terminal 2	0	□	0057

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
		14: Multi-step speed terminal 3 15: ACC/DEC time terminal option 1 16: ACC/DEC time terminal option 2 17: ACC/DEC time terminal option 3 18: PID Control Pause 19: Traverse pause (stop at the current frequency) 20: Traverse reset (return to the center frequency) 21: ACC/DEC prohibition 22: Torque Control prohibition 23: Cancel the frequency change setting temporarily			
P06.04	Switch filter time	1~10	5	◇	0058
P06.05	Terminals control running mode	0: 2-wire control 1 1: 2-wire control 2 2: 3-wire control 1 3: 3-wire control 2	0	□	0059
P06.06	Keyboard  /  and UP/DOWN terminals frequency increasing+/decreasing-changing ratio	0.01~50.00Hz/s	0.50Hz/s	◇	005A
P06.07	A11 Upper limit value	0.00V~10.00V	0.00V	◇	005B
P06.08	A11 Upper limit setting	-100.0%~100.0%	0.0%	◇	005C
P06.09	A11 Upper limit value	0.00V~10.00V	10.00V	◇	005D
P06.10	A11 Upper limit setting	-100.0%~100.0%	100.0%	◇	005E
P06.11	A11 Input filter time	0.00s~10.00s	0.10s	◇	005F



## Chapter 5 Funtion Parameter Description

### 5-1-9 P07 Group Human-Machine Interface

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
P07.00	User's password	0~65535	0	◇	0060
P07.01	 Function selection	0:jogging 1:shift between forward rotations and reverse rotations 2:clear UP/DOWN terminals setting	0	□	0061
P07.02	 stop function selection	0:only valid for the keypad control 1:both valid for the keypad and terminals control 2:both valid for the keypad and communication control 3:valid for all control modes	0	◇	0062
P07.03	The parameters selection of running state	0~7 F F F BIT0: Running frequency BIT1: Set frequency BIT2: DC Bus voltage BIT3:Output voltage BIT4:Output current BIT5: Running rotation speed BIT6:Output Power BIT7:Output torque BIT8:PID reference BIT9:PID Feedback value BIT10: Input terminals state BIT11: Output terminals state BIT12: Analog AI1 value BIT13: Reserved BIT14: Current stage in multi-step speed BIT15: Reserved	00FF	◇	0063
P07.04	The parameters selection of the stop state	1~0 3 F F BIT0:set frequency BIT1:DC bus voltage BIT2: Input terminals state BIT3: Output terminals state BIT4: PID reference BIT5: PID Feedback value BIT6: Analog AI1 value BIT7: Reserve BIT8: Current stage in multi-stage speed BIT9: Torque Setting value BIT10~ BIT15: Reserved	0xFF	◇	0064
P07.05	Previous 2 fault	0~2 4		■	0065

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
	type	0:No fault			
P07.06	Previous fault type	1:Reserved 2:Reserved 3:Reserved 4:ACC overcurrent(E.OC1) 5:DEC overcurrent(E.OC2) 6:Constant speed overcurrent(E.OC3) 7 :ACC overvoltage(E.oU1) 8 :DEC overvoltage(E oU2) 9 :Constant speed overvoltage ( E.oU3 ) 10:DC bus undervoltage fault(E.LU) 11:Motor overload ( E.OL1 ) 12:Inverter overload ( E.OL2 ) 13:Input side phase loss ( E.SPI ) 14:Output side phase loss(E.SPO) 15:The rectifier module overheat fault (E.OH1) 16:The inverter module overheat fault(E.OH2) 17:External fault(E.SET) 18:RS485 communication fault(E.CE) 19:Current detection fault(E.OCC) 20:Asynchronous motor autotune fault(E.TE) 21:EEPROM operation fault(E.EEP) 22:PID response offline fault(E.PId) 23:Braking unit fault(E.bCE) 24:Reserved		■	0066
P07.07	Current fault type			■	0067
P07.08	Running frequency at current fault		0.00Hz	■	0068
P07.09	Output current at current fault		0.0A	■	0069
P07.10	DC bus voltage at current fault		0.0V	■	006A

Chapter 5 Funtion Parameter Description

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
P07.11	Input terminals state at current fault		0	■	006B
P07.12	Output terminals state at current fault		0	■	006C

5-1-10 P08 Group Output Terminals

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
P08.00	Relay output selection	0:No function 1:Forward rotation operation 2:Reverse rotation operation 3:Inverter fault 4:Frequency degree detection FDT 5:Frequency arrival 6:Zero speed running 7:Upper frequency arrival 8:Lower frequency arrival 9:non-zero running 10:Auxiliary pump 1 11:Auxiliary pump 2 12:Reserved	1	◇	006D
P08.01	AO1 output selection	0:Running frequency 1:Set frequency 2:Running speed 3:Output current 4:Output voltage 5:Output power 6:Output Torque 7: Analog AI1 input value 8:Keypad potentiometer AI2 input value 9~10:Reserved	0	◇	006E
P08.02	Lower output limit of AO1	0.0%~100.0%	0.0%	◇	006F
P08.03	Corresponding AO1 output of lower limit	0.00V ~10.00V	0.00V	◇	0070
P08.04	Upper output	0.0%~100.0%	100.0%	◇	0071

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
	limit of AO1				
P08.05	Corresponding AO1 output of Upper limit	0.00V ~ 10.00V	10.00V	◇	0072

## 5-1-11 P09 Group Enhanced function

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
P09.00	Acceleration time 2	0.1~3600.0s	Depend on model	◇	0073
P09.01	Deceleration time 2	0.1~3600.0s	Depend on model	◇	0074
P09.02	Acceleration time 3	0.1~3600.0s	Depend on model	◇	0075
P09.03	Deceleration time 3	0.1~3600.0s	Depend on model	◇	0076
P09.04	Acceleration time 4	0.1~3600.0s	Depend on model	◇	0077
P09.05	Deceleration time 4	0.1~3600.0s	Depend on model	◇	0078
P09.06	Acceleration time 5	0.1~3600.0s	Depend on model	◇	0079
P09.07	Deceleration time 5	0.1~3600.0s	Depend on model	◇	007A
P09.08	Acceleration time 6	0.1~3600.0s	Depend on model	◇	007B
P09.09	Deceleration time 6	0.1~3600.0s	Depend on model	◇	007C
P09.10	Acceleration time 7	0.1~3600.0s	Depend on model	◇	007D
P09.11	Deceleration time 7	0.1~3600.0s	Depend on	◇	007E

Chapter 5 Funtion Parameter Description

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
			model		
P09.12	Acceleration time 8	0.1~3600.0s	Depend on model	◇	007F
P09.13	Deceleration time 8	0.1~3600.0s	Depend on model	◇	0080
P09.14	Jogging frequency	0.00~P01.04 ( The max. frequency )	5.00Hz	◇	0081
P09.15	Jogging ACC time	0.1~3600.0s	Depend on model	◇	0082
P09.16	Jogging DEC time	0.1~3600.0s	Depend on model	◇	0083
P09.17	Jumping frequency	0.00~P01.04 ( The max. frequency )	0.00Hz	◇	0084
P09.18	Jumping frequency range	0.00~P01.04 ( The max. frequency )	0.00Hz	◇	0085
P09.19	Traserve range	0.0~100.0%(Relative to the set frequency )	0.0%	◇	0086
P09.20	Sudden jumping frequency range	0.0~50.0%(Relative to the swing range )	0.0%	◇	0087
P09.21	Traverse boost time	0.1~3600.0s	10.0s	◇	0088
P09.22	Traverse declining time	0.1~3600.0s	10.0s	◇	0089
P09.23	Fault reset times	0~3	0	◇	008A
P09.24	Interval time of automatic fault reset	0.1~100.0s	1.0s	◇	008B
P09.25	FDT electrical level detection value	0.00~ P01.04 ( Max frequency)	50.00Hz	◇	008C
P09.26	FDT retention detection value	0.0~100.0%(FDT level )	5.0%	◇	008D
P09.27	Frequency arrival detection range	0.0~100.0% ( Max frequency )	0.0%	◇	008E
P09.28	Energy threshold voltage	115.0~140.0% ( standard bus voltage ) ( 380V series )	130.0%	◇	008F
		115.0~140.0% ( standard bus voltage ) ( 220V series )	120.0%	◇	

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communic ation address
P09.29	Rotation speed coefficient	0.1~999.9%Mechanical RPM=120*Running frequency*P09.21/motor pole pairs	100.0%	◇	0090
P09.30	Traverse enable	0:disable 1:enable	0	◇	0091

## 5-1-12 P10 Group PID control

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communic ation address
P10.00	PID referance source	0: keypad 1:AI1 2:Modbus communication set 3:Multi-step speed set	0	◇	0092
P10.01	Keypad PID preset	0.0%~100.0%	0.0%	◇	0093
P10.02	PID feedback source	0: AI1 1:Modbus communication feedback	0	◇	0094
P10.03	PID output feature	0: PID output is positive 1:PID output is negative	0	◇	0095
P10.04	Proportional gain (Kp)	0.00~100.00	1.00	◇	0096
P10.05	Integral time(Ti)	0.01~10.00s	0.10s	◇	0097
P10.06	Differential time(Td)	0.00~10.00s	0.00s	◇	0098
P10.07	Sampling cycle(T)	0.01~100.00s	0.10s	◇	0099
P10.08	PID control deviation limit	0.0~100.0%	0.0%	◇	009A
P10.09	Detection value of feedback offline	0.0~100.0%	0.0%	◇	009B
P10.10	Detection time of feedback offline	0.0~3600.0s	1.0s	◇	009C

## Chapter 5 Funtion Parameter Description

### 5-1-13 P11 Group: Multi-step speed control

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
P11.00	PLC running mode	0:Off PLC function 1:Cycle running 2:Stop after running once 3: Run at the final value after running once	0	◇	009D
P11.01	PLC memory	0:Power failure without memory 1:Power failure memory	0	◇	009E
P11.02	Multi-step time unit	0: second 1: minute	0	◇	009F
P11.03	Multi-step speed 0	-100.0%~100.0%	0	◇	00A0
P11.04	The running time of speed 0	0~6000.0s(M)	2.0	◇	00A1
P11.05	Multi-step speed 1	-100.0%~100.0%	0	◇	00A2
P11.06	The running time of speed 1	0~6000.0s(M)	2.0	◇	00A3
P11.07	Multi-step speed 2	-100.0%~100.0%	0	◇	00A4
P11.08	The running time of speed 2	0~6000.0s(M)	2.0	◇	00A5
P11.09	Multi-step speed 3	-100.0%~100.0%	0	◇	00A6
P11.10	The running time of speed 3	0~6000.0s(M)	2.0	◇	00A7
P11.11	Multi-step speed 4	-100.0%~100.0%	0	◇	00A8
P11.12	The running time of speed 4	0~6000.0s(M)	2.0	◇	00A9
P11.13	Multi-step speed 5	-100.0%~100.0%	0	◇	00AA
P11.14	The running time of speed 5	0~6000.0s(M)	2.0	◇	00AB
P11.15	Multi-step speed 6	-100.0%~100.0%	0	◇	00AC
P11.16	The running time of speed 6	0~6000.0s(M)	2.0	◇	00AD
P11.17	Multi-step speed 7	-100.0%~100.0%	0	◇	00AE
P11.18	The running time of speed 7	0~6000.0s(M)	2.0	◇	00AF
P11.19	ACC/DEC time option 1	0x00~0x7777 Bits:ACC/DEC time of the multi-step 0 Decad: ACC/DEC time of the	0	◇	00B0

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
	ACC/DEC time option 1	multi-step 1 Hundreds:ACC/DEC time of the multi-step 2 Kilobit: ACC/DEC time of the multi-step 3 0 : ACC/DEC time 1 1 : ACC/DEC time 2 2 : ACC/DEC time 3 3 : ACC/DEC time 4 4 : ACC/DEC time 5 5 : ACC/DEC time 6 6 : ACC/DEC time 7 7 : ACC/DEC time 8			
P11.20	ACC/DEC time option 2	0x00~0x7777 Bits:ACC/DEC time of the multi-step 4 Decad: ACC/DEC time of the multi-step 5 Hundreds:ACC/DEC time of the multi-step 6 Kilobit: ACC/DEC time of the multi-step 7 0 : ACC/DEC time 1 1 : ACC/DEC time 2 2 : ACC/DEC time 3 3 : ACC/DEC time 4 4 : ACC/DEC time 5 5 : ACC/DEC time 6 6 : ACC/DEC time 7 7 : ACC/DEC time 8	0	◇	00B1

## 5-1-14 P12 Group Communication control

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
P12.00	Local communication address	1~247, 0 is broadcast address	1	◇	00B2
P12.01	Communication baud ratio	0:1200bpx 1:2400bpx 2:4800bpx 3:9600bpx 4:19200bpx 5:38400bpx	3	◇	00B3
P12.02	Digital bit	0:No check (N,8,1) for RTU	0	◇	00B4



Chapter 5 Funtion Parameter Description

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
	checkout	1:Odd check (E,8,1) for RTU 2:Even check (0,8,1) for RTU 3: No check (N,8,2) for RTU 4: Odd check (E,8,2) for RTU 5: Even check (0,8,2) for RTU 6: No check (N,7,1) for ASCII 7: Odd check (E,7,1) for ASCII 8: Even check (0,7,1) for ASCII 9: No check (N,7,2) for ASCII 10: Odd check (E,7,2) for ASCII 11: Even check (0,7,2) for ASCII 12: No check (N,8,1) for ASCII 13: Odd check (E,8,1) for ASCII 14: Even check (0,8,1) for ASCII 15: No check (N,8,2) for ASCII 16: Odd check (E,8,2) for ASCII 17: Even check (0,8,2) for ASCII			
P12.03	Answer delay	0~200ms	5ms	◇	00B5
P12.04	Fault time of communication Overtime	0.0 (invalid) , 0.1~100.0s	0.0s	◇	00B6
P12.05	Transmission fault Processing	0:Alarm and stop freely 1:No alarm and continue to run 2:No alarm and stop according to the stop mode (only under the communication control) 3: No alarm and stop according to the stop mode (under all control modes)	1	◇	00B7
P12.06	Disposal for transmission response	0: Write with response 1: Write without response	0	◇	00B8

## 5-1-15 P13 Group Protective parameters

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communication address
P13.00	Motor overload protection	0: No protection 1: Common motor (With low speed compensation) 2: Variable frequency motor (Without low speed compensation)	1	□	00B9
P13.01	Motor overload protection coefficient	20.0%~120.0%(rated current of motor)	100.0%	◇	00BA
P13.02	Threshold voltage of frequency decrease at sudden power loss	70.0~110.0%(standard bus voltage)	80.0%	◇	00BB
P13.03	Frequency-decreasing ratio at sudden power loss	0.00Hz~P01.04(The max.frequency)	0.00Hz	◇	00BC
P13.04	Overvoltage stall protection	0: disable 1: enable	0	◇	00BD
P13.05	Voltage protection of overvoltage stall	110~150% (380V series)	130%	◇	00BE
		110~150% (220V series)	115%		
P13.06	Automatic current limit	100~200%	Gtype:16 0% Ptype:12 0%	◇	00BF
P13.07	Frequency-decreasing ratio during current limit	0.00~100.00Hz/s	10.00 Hz/s	◇	00C0
P13.08	Current limit action selection	0: valid at all speed 1: invalid at constant speed	0	◇	00C1

## Chapter 5 Funtion Parameter Description

### 5-1-16 P14 Group Function group of water supply

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communi cation address
P14.00	Number of auxiliary pump	0~2	0	◇	00C2
P14.01	Awake pressure	0~100.0%	20.0%	◇	00C3
P14.02	PID sleep enable	0~1 0:Disable 1:Enable	0	◇	00C4
P14.03	Sleep pressure	0~100.0%	80.0%	◇	00C5
P14.04	Delay time before pump sleep	0~6000.0s	0	◇	00C6
P14.05	Delay time before pump awake	0~600.0s	0	◇	00C7
P14.06	The waiting time of auxiliary pump on	0~6000.0s	0	◇	00C8
P14.07	The waiting time of auxiliary pump off	0~6000.0s	0	◇	00C9

### 5-1-17 P15 Group Manufacturer parameters

Code	Describing LED Keypad display	Setting range	Factory setting	Modify	Communi cation address
P15.00	Manufacturer's password	0~65535	*****	■	00CA

### 5-1-18 Common LED display symbols

In addition to the function code ,one, two and three-level menu, panel shows

some hints of characters during operation ,as follows:

Characters	Meaning	Characters	Meaning
PT150	Showing the PT150 series production	E.PHo	Output side phase loss
E.oC1	ACC overcurrent	E.oH2	The rectifier module overheat
E.oC2	DEC overcurrent	E.SET	External fault
		E.CE	Communication fault

Characters	Meaning		Characters	Meaning
E.oC3	Constant overcurrent		E.OCC	Current detection fault
E.oU1	ACC overvoltage		E.TE	Motor autotune fault
E.oU2	DEC overvoltage		E.EEP	EEPROM operation fault
E.oU3	Constant overvoltage		E.PId	PID feedback offline fault
E.LU	Bus undervoltage fault		E.bCE	Braking unit fault
E.oL1	Motor overload		00000	User's password protection
E.oL2	Inverter overload		END	Reserved

Note: The meanings of displaying 0.0.0.0.0.

If the keypad shows both five "0" and five points, it means there is a password protection that you need to enter the right password. You need to enter the password in P15 group which the manufacturer parameters are reserved and in P07 group which the user's password can be set here

If the characters are not listed in the table above, please contact your local dealer or contact the manufacturer directly.