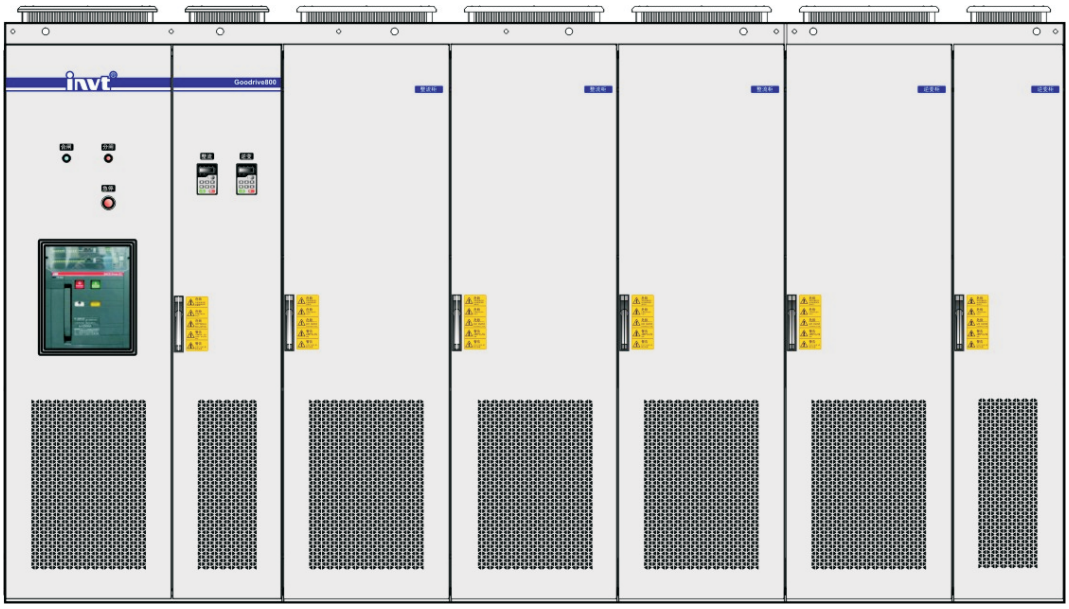
Operation Manual

Goodrive800 Series
Inverter Software Manual



SHENZHEN INVT ELECTRIC CO., LTD.

Preface

Thank you for purchasing our products.

Please read this manual carefully before any application.

Goodrive800 series products are developed for sophisticated application market which needs high overload capacity, high reliability and continuous operations. Its rated current is especially designed for various heavy-load applications such as metallurgy, port machinery, lifting, shore power, petroleum, petrochemical, municipal, chemical, electric power, building materials, mining, ship-building, paper-making and other industries and devices.

Goodrive800 series products apply international module, providing rectifier unit, IGBT, filter unit or whole cabinet to meet requirements of end-users and clients of OEM and integrated system. Different modules can be combined flexibly according to different requirements on the basis of standard configuration. Not only the user can control machines at high precision, but also present the excellent product reliability. Various solution applications are also provided to improve the convenient application at a great rate.

There are hardware manual, software manual, commissioning manual, installation and maintenance manual and application manual, to provide detailed instructions of installation and commissioning, electrical connections, parameters setting, common troubleshooting and routine maintenance. Please read corresponding manual during installation, commissioning and application to ensure proper use and long service life of the product.

If the product is ultimately used for military affairs or manufacture of weapon, it will be listed on the export control formulated by ***Foreign Trade Law of the People's Republic of China***. Rigorous review and necessary export formalities are needed when exported.

Our company reserves the right to update the information of our products. Information may be subject to change without notice during product improving.

The manuals of Goodrive800 include (according to actual order):

Software Manual of Goodrive800 Series Inverters;

Hardware Manual of Goodrive800 Series Inverters;

Software Manual of Goodrive800 Series PWM Rectifiers;

Installation and Maintenance Manual of Goodrive800 Series Products and***;***

Application Manual of Goodrive800 Series Products.

Content

Chapter 1 Safety precautions

Please read this manual carefully and follow all safety precautions before moving, installing, operating and maintaining the inverter. If ignored, physical injury or death may occur, or damage may occur to the devices.

If any physical injury or death or damage to the devices occurs for ignoring to the safety precautions in the manual, our company will not be responsible for any damage and we are not legally bound in any manner.

1.1 Safety definition

Danger: Serious physical injury or even death may occur if not follow relevant requirements.

Warning: Physical injury or damage to the devices may occur if not follow relevant requirements.

Note: Physical hurt may occur if not follow relevant requirements.

Qualified electricians: People working on the device should take part in professional electrical and safety training, receive the certification and be familiar with all steps and requirements of installing, commissioning, operating and maintaining the device to avoid any emergency.

1.2 Warning symbols

Warnings caution you about conditions which can result in serious injury or death and/or damage to the equipment, and advice on how to avoid the danger. Following warning symbols are used in this manual:

Symbols	Name	Instruction	Abbreviation
 Danger	Danger	Serious physical injury or even death may occur if not follow the relative requirements	
 Warning	Warning	Physical injury or damage to the devices may occur if not follow the relative requirements	
 Do not	Electrostatic discharge	Damage to the PCBA board may occur if not follow the relative requirements	
 Hot sides	Hot sides	Sides of the device may become hot. Do not touch.	
Note	Note	Physical hurt may occur if not follow the relative requirements	**Note**

1.3 Safety guidelines

<table>
<tr><td>  </td><td>✧ Only qualified electricians are allowed to operate the inverter.
✧ Do not carry out any wiring and inspection or changing components when the power supply is applied. Ensure all input power supply is disconnected before wiring and checking and always wait for at least the time designated on the inverter or until the DC bus voltage is less than 36V. Below is the table of the waiting time:
<table>
<tr><th>Voltage degree of Goodrive800 series products</th><th>Minimum waiting time</th></tr>
<tr><td>380V</td><td rowspan="3">15 minutes</td></tr>
<tr><td>500V</td></tr>
<tr><td>660V</td></tr>
</table></td></tr>
<tr><td>  </td><td>✧ Do not refit Goodrive800 series products unauthorized; otherwise, fire, electric shock or other injury may occur.</td></tr>
<tr><td>  </td><td>✧ The base of the radiator may become hot during running. Do not touch to avoid hurt.</td></tr>
<tr><td>  </td><td>✧ The electrical parts and components inside Goodrive800 series products are electrostatic. Take measures to avoid electrostatic discharge during relevant operation.</td></tr>
</table>

1.3.1 Delivery and installation

<table>
<tr><td>  </td><td>✧ Use special tools to install and remove the unit.
✧ Use crane to install the whole machine.
✧ Do not install Goodrive800 series products on combustible materials and avoid them to contact any combustible materials.
✧ Connect the optional parts and components (braking resistors, braking units and feedback units) according to the wiring diagram.
✧ Prevent dumping in installation because the gravity of the unit is high.
✧ Ensure no other objects, such as screws and cables, left in the cabinet or Goodrive800 series products after installation or maintenance; otherwise, damage may occur.
✧ Do not operate if there is any damage or components loss.
✧ Do not touch Goodrive800 series products with wet items or some part of the body, electric shock may occur.</td></tr>
</table>

Note:

✧ Select appropriate moving and installing tools to ensure a safe and normal running of the product and avoid physical injury or death. For physical safety, the erector should take some mechanical protective measures, such as wearing exposure shoes and working uniforms.

✧ Ensure to avoid physical shock or vibration during delivery and installation.

✧ Install away from children and other public places.

✧ Goodrive800 series products cannot meet the requirements of low voltage protection in IEC61800-5-1 if the sea level of installation site is above 2000m.

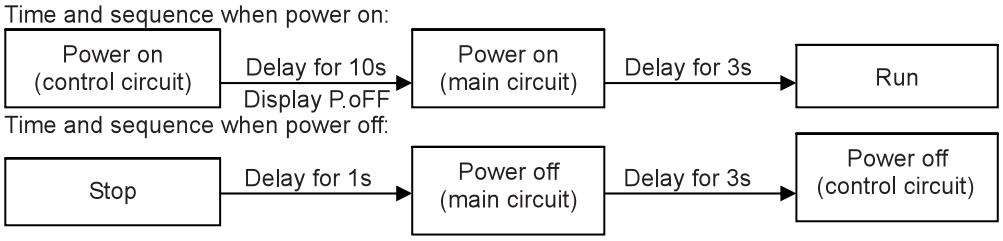
✧ Please use it in appropriate environment (refer to the installation environment).

✧ The leakage current of Goodrive800 series products may be above 3.5mA during operation.

✧ The conductivity of PE grounding conductor is shown below:

Cross sectional area of power conductor S mm^2	Cross sectional area of grounding conductor mm^2
S≤16	S
16<S≤35	16
35<S	S/2

1.3.2 Time and sequence when power on/off



1.3.3 Commissioning and running

- ✧ Disconnect all power supplies applied to Goodrive800 series products before the terminal wiring and wait for at least the designated time after disconnecting the power supply.
- ✧ Check the cable connection before power on.
- ✧ If the auxiliary control power of Goodrive800 series products is provided by external device, all power supplies are not disconnected after switching off. Check according to the diagram because voltage may be present when the device is not started; otherwise, physical injury may occur.
- ✧ The operator can not touch the electrical parts in the cabinet directly. Pay attention when process the metal shield.
- ✧ Do not carry out any withstand-voltage test in unit connection. Disconnect the motor cable before any isolation or withstand voltage test to the motor or motor cable.
- ✧ High voltage is present inside the product during running. Do not open the cabinet door.
- ✧ The inverter may start up by itself when P01.21=1. Do not get close to the product and motor.
- ✧ Voltage is also present on the motor terminals even if the motor does not rotate when the main circuit does not power off.
- ✧ The device cannot be used for “E-stop” independently.
- ✧ The device cannot be used to break the motor suddenly. A mechanical braking device should be provided.
- ✧ Follow below precautions:
  1. All input power supplies are disconnected (including the main and control power supply).
  2. Permanent magnet synchronous motor has stopped and the measured output voltage of Goodrive800 series products is less than 36V.
  3. The waiting time after permanent magnet synchronous motor stopping is no less than the designated time on Goodrive800 series products and the measured

	voltage between (+) and (-) is less than 36V. 4. Ensure the motor does not rotate again during operation. It is recommended to install external braking devices or switch off the direct electrical connection between permanent magnet synchronous motor and Goodrive800 series products.

Note:

- ✧ Do not switch on or off the input power supply of Goodrive800 series products frequently.
- ✧ For Goodrive800 series products that have been stored for a long time, check and fix the capacitance and try to run it again before utilization (see Installation and Maintenance Manual).
- ✧ Cover the cabinet door before running; otherwise, electric shock may occur.

1.3.4 Maintenance and replacement of components

	✧ Only qualified electricians are allowed to perform the maintenance, inspection, and components replacement of Goodrive800 series products. ✧ Disconnect all power supplies to Goodrive800 series products before the terminal wiring. Wait for at least the time designated on Goodrive800 series products after disconnection. ✧ Take measures to avoid screws, cables and other conductive matters to fall into Goodrive800 series products during maintenance and component replacement. ✧ Be carefully during optical fiber operation. Do not touch the conduction-section (glass fiber) when plugging and inserting, because the fiber optic section (glass fiber) is extremely sensitive to dirt. The minimum bend radius of the optical fiber is 35 mm.

Note:

- ✧ Please select proper torque to tighten screws.
- ✧ Keep the inverter, parts and components away from combustible materials during maintenance and component replacement.
- ✧ Do not carry out any isolation and voltage test on the inverter and do not measure the control circuit of the inverter by megameter.
- ✧ Take right measures to avoid static electric for the product or internal parts and components during the maintenance and replacement.

1.3.5 What to do after scrapping

	✧ There are heavy metals in Goodrive800 series products. Deal with it as industrial effluent.

Chapter 2 Quick start-up

2.1 Unpacking inspection

Check as follows after receiving the products:

1. Check the equipment that you ordered is complete and the package is not damaged or damp. If not, please contact with local dealers or INVT offices.
2. Check the information on the type designation label outside the package to verify that the model is correct. If not, please contact with local dealers or INVT offices.
3. Check there are no signs of water inside the package and damage or crackles to the housing of the equipment. If not, please contact with local dealers or INVT offices.
4. Check the information on the type designation label outside the package to verify that the nameplate is correct. If not, please contact with local dealers or INVT offices.
5. Check the accessories inside (including operation manuals, keypads and extension cards) are complete. If not, please contact with local dealers or INVT offices.

2.2 Application confirmation

Check before using the inverter:

1. Check the load type to verify that there is no overload of the inverter during work and check whether the inverter needs to enlarge the power degree.
2. Check the actual current of the motor is lower than the rated current of the inverter.
3. Check the grid voltage is in the range of the allowable input rated voltage of the inverter.
4. Check whether the communication needs optional cards or not.

2.3 Environment confirmation

Check as follows before actual installation and usage:

1. Check that the ambient temperature of the inverter is below 40°C. If above 40°C, derate 2% of current for every additional 1°C. Do not use the inverter if the ambient temperature is above 50°C.
2. Check that the ambient temperature of the inverter is above -10°C. If below -10°C, add heating devices.
3. Check that the altitude of actual site is below 1000m. If above 1000m, derate 1% of current for every additional 100m.
4. Check that the humidity of the actual usage site is below 90% and condensation is not allowed. If not, add additional protection.
5. Check that the actual site is away from direct sunlight and foreign objects cannot enter the inverter. If not, add additional protection.
6. Check that there is no dust or flammable gas in the actual site. If not, add additional protection.

2.4 Installation confirmation

Check as follows after the installation:

1. Check that the carrying capacity of input power cables and motor cables meets the requirements of actual load.
2. Check that the accessories of the inverter, including input and output reactors, input and output filters, DC reactors, braking units and braking resistors, are selected and installed correctly, and the installation cables meet the requirements of carrying capacity.

3. Check that the inverter is installed on non-flammable materials and the calorific accessories such as reactors and braking resistors are away from flammable materials.
4. Check that all control cables and power cables run separately, and the cabling complies with EMC requirements.
5. Check that all grounding systems are grounded properly.
6. Check that all installation distances of the inverter agree with the manual.
7. Check that the external wiring terminals are tight and the torque is appropriate.
8. Take protective measures to ensure that no screws, cables or other conductive objects enter the inverter.

Chapter 3 Keypad operation procedure

3.1 Keypad introduction

The keypad, an important human-machine interface, is used for operation control, parameters displaying and setting of Goodrive800 series inverters.

Fig 3-1 Keypad

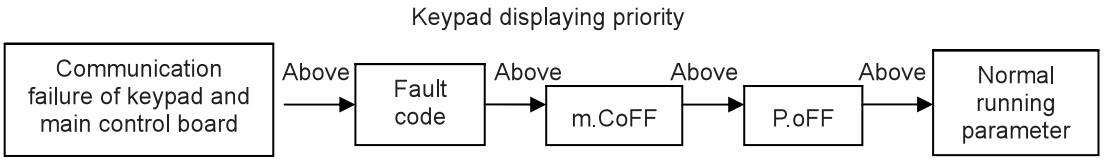
No.	Name	Description		
1	State LED	RUN/TUNE	LED off means the inverter is in stopping state; LED flickering means the inverter is in parameter autotuning state; LED on means the inverter is in running state.	
		FWD/REV	FED/REV LED LED off means the inverter is in forward rotation state; LED on means the inverter is in reverse rotation state.	
		LOCAL/REMOT	LED for keypad operation, terminal operation and remote communication control; LED off means the inverter is in keypad operation state; LED flickering means the inverter is in terminal operation state; LED on means the inverter is in remote communication control state.	
		TRIP	LED for faults; LED on when the inverter is in fault state; LED off in normal state; LED flickering means the inverter is in pre-alarm state.	
2	Unit LED	Mean the unit displayed currently		
			Hz	Frequency unit
			RPM	Rotating speed unit
			A	Current unit
			%	Percentage
			V	Voltage unit

<table>
<tr><th>No.</th><th>Name</th><th colspan="3">Description</th></tr>
<tr><td>3</td><td>Code displaying zone</td><td colspan="3">5-figure LED display for various monitoring data and alarm codes such as set frequency and output frequency:
<table>
<tr><th>Displayed letter</th><th>Corresponding letter</th><th>Displayed letter</th><th>Corresponding letter</th><th>Displayed letter</th><th>Corresponding letter</th></tr>
<tr><td>0</td><td>0</td><td>1</td><td>1</td><td>2</td><td>2</td></tr>
<tr><td>3</td><td>3</td><td>4</td><td>4</td><td>5</td><td>5</td></tr>
<tr><td>6</td><td>6</td><td>7</td><td>7</td><td>8</td><td>8</td></tr>
<tr><td>9</td><td>9</td><td>A</td><td>A</td><td>b</td><td>b</td></tr>
<tr><td>C</td><td>C</td><td>d</td><td>d</td><td>E</td><td>E</td></tr>
<tr><td>F</td><td>F</td><td>H</td><td>H</td><td>I</td><td>I</td></tr>
<tr><td>L</td><td>L</td><td>N</td><td>N</td><td>n</td><td>n</td></tr>
<tr><td>o</td><td>o</td><td>P</td><td>P</td><td>r</td><td>r</td></tr>
<tr><td>S</td><td>S</td><td>t</td><td>t</td><td>U</td><td>U</td></tr>
<tr><td>v</td><td>v</td><td></td><td>.</td><td></td><td>-</td></tr>
</table></td></tr>
<tr><td rowspan="10">4</td><td rowspan="10">Buttons</td><td>PRG ESC</td><td>Programming key</td><td>Enter or escape from the first level menu and remove the parameter quickly.</td></tr>
<tr><td>DATA ENT</td><td>Entry key</td><td>Enter the menu step by step and confirm parameters.</td></tr>
<tr><td>∧</td><td>UP key</td><td>Increase data or function code progressively.</td></tr>
<tr><td>∨</td><td>DOWN key</td><td>Decrease data or function code progressively.</td></tr>
<tr><td>SHIFT</td><td>Right-shift key</td><td>Move right to select the displaying parameter circularly in stopping and running mode. Select the digit during parameter modification.</td></tr>
<tr><td>RUN</td><td>Run key</td><td>The key is used to operate the inverter in keypad operation mode.</td></tr>
<tr><td>STOP RST</td><td>Stop/Reset key</td><td>The key is used to stop in running state and it is limited by function code P07.04. The key is used to reset all control modes in fault alarm state.</td></tr>
<tr><td>QUICK JOG</td><td>Quick key</td><td>The key is confirmed by function code P07.02.</td></tr>
<tr><td>RUN + STOP RST</td><td>Combination</td><td>The inverter will coast to stop when both RUN and STOP/RST are pressed at the same time.</td></tr>
</table>

3.2 Keypad displaying

The keypad displaying states of Goodrive800 series inverters are divided into stopping state parameters, running state parameters, function code editing state and fault alarm state and so on.

The keypad displaying is of priority. The communication failure of keypad and main control board enjoys the highest priority, fault code is the second, m.CoFF is the third, P.oFF is the fourth and normal running parameter is the last.



3.2.1 Displayed state of stopping parameters

When the inverter is in stopping state, the keypad will display stopping parameters shown in Fig 3-2.
In stopping state, various parameters can be displayed. Select the parameters to be displayed or not by the function code P07.07. See the instructions of P07.07 for the detailed definition of each bit.
In stopping state, there are 13 stopping state parameters of P07.07 to be selected to be displayed or not. They are set frequency, bus voltage, input terminal state, output terminal state, PID reference, PID feedback, torque set value, AI1, AI2, AI3, high-speed pulse S8 frequency, PLC and current step of multi-step speeds, and pulse count value. 》/SHIFT can shift the selected parameters from left to right and QUICK/JOG(P07.02=2) can shift the selected parameters from right to left.

3.2.2 Displayed state of running parameters

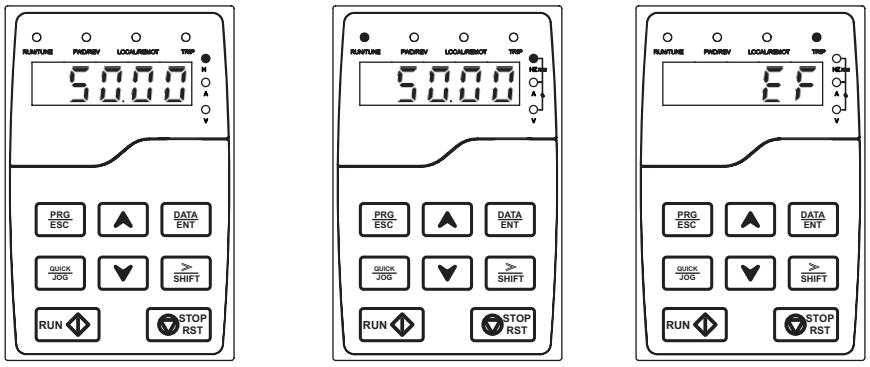
After receiving valid running commands, the inverter will enter into running state and the keypad will display running parameters. RUN/TUNE LED on the keypad is on while FWD/REV LED is decided by the current running direction, which is shown in Fig 3-2.
In running state, there are 27 parameters for P07.05 and P07.06 to be selected to be displayed or not. They are running frequency, set frequency, bus voltage, output voltage, output current, rotating speed, output power, output torque, PID reference, PID feedback, input terminal state, output terminal state, torque set value, pulse count value, length value (Reserved), PLC and current step of multi-step speeds, AI1, AI2, AI3, high-speed pulse S8 frequency, percentage of motor overload, percentage of inverter overload, ramp reference and linear speed. 》/SHIFT can shift the selected parameters from left to right and QUICK/JOG(P07.02=2) can shift the selected parameters from right to left.

3.2.3 Displayed state of faults

If the inverter detects any fault signal, it will enter into fault pre-alarm display state. The keypad will display the fault code by flickering and with TRIP LED on. The fault reset can be operated by STOP/RST on the keypad, control terminals or communication commands. If the fault still exists, the keypad will continue to display the fault code.

3.2.4 Displayed state of function code editing

In the state of stopping, running or fault pre-alarm, press PRG/ESC to enter into editing state (if there is a password, see P07.00). The editing state is displayed on two-level menu and the order is: function code group/ function code number→function code parameter, press DATA/ENT to enter into display state. Under this state, press DATA/ENT to save the parameters or press PRG/ESC to exit.



Stopping parameters Running parameters Faults

Fig 3-2 Displayed states

3.3 Keypad operation

Operate the inverter via the keypad. See the detailed structure description of function codes in the brief diagram of function codes.

3.3.1 How to modify function codes

The inverter has three-level menu:

1. Group number of function code (first level menu)
2. Tab of function code (second level menu)
3. Set value of function code (third level menu)

Remarks: Press PRG/ESC and DATA/ENT to return to the second level menu from the third level menu. The difference: pressing DATA/ENT will save the set parameters into the control board and then return to the second level menu with shifting to the next function code automatically while pressing PRG/ESC will directly return to the second level menu without saving the parameters and keep staying at the current function code.

Under the third level menu, if the parameter has no flicker bit, it means the function code cannot be modified. The possible reasons could be:

1) This function code is unmodifiable parameter, such as actual detected parameter and operation records;

2) This function code is unmodifiable in running state but modifiable in stopping state.

Example: Set function code P00.01 from 0 to 1.

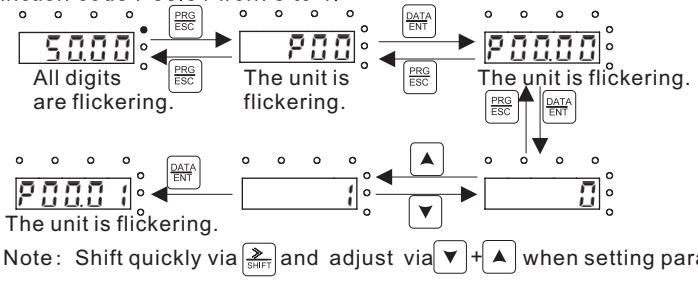


Fig 3-3 Sketch map of modifying parameters

3.3.2 How to set the password

Goodrive800 series inverters provide password protection function for users. When P07.00 is not set to zero, it is the user password and the password protection becomes valid instantly after quitting from the function code editing state. Press PRG/ESC again to back into the state, "0.0.0.0.0" will be displayed. Unless inputting the correct password, the operator cannot enter into.

Set P07.00 to zero to cancel the password protection function.

The password protection becomes valid in a minute after quitting from the function code editing state. Press PRG/ESC again back into the state, "0.0.0.0.0" will be displayed. Unless inputting the correct

password, the operator cannot enter into.

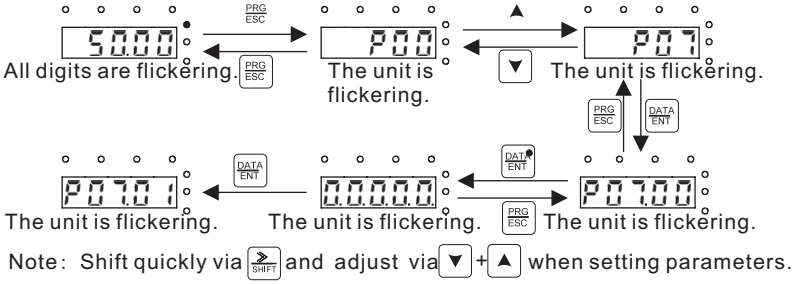


Fig 3-4 Sketch map of password setting

3.3.3 How to check the inverter state through function codes

Goodrive800 series inverters provide groups of P17 and P18 as state inspection groups. Users can enter into P17 and P18 directly to check the state.

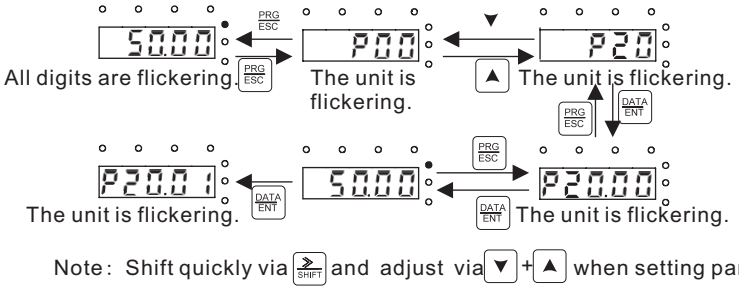


Fig 3-5 Sketch map of state checking

Chapter 4 Detailed function parameters

P00 Group Basic functions

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P00.00	Speed control mode	0: Sensorless vector control 0 1: Sensorless vector control 1 2: SVPWM control mode 3: Close loop vector control mode	0~3	2

0: Sensorless vector control 0 (suitable for AM, SM)

It does not need to install encoder and is suitable in cases requiring high precision of rotating speed and torque. Compared with sensorless vector control 1, this mode is more suitable for low power.

1: Sensorless vector control 1 (suitable for AM)

It does not need to install encoder and is suitable in cases requiring high speed control precision. It is available for all power and achieves high precision of rotating speed and torque.

2: SVPWM control mode

No need to install encoder, strong versatility, stable running, it can raise low-frequency torque and restrain current oscillation effectively. The functions of slip compensation and automatic voltage adjustment improve control precision. For specific setting, please refer to P04.

3: Close loop vector control mode

It needs to install encoder and is suitable in cases requiring large low-frequency torque and high speed control precision. It achieves high precision of rotating speed and torque.

Note: AM-asynchronous motor SM-synchronous motor

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P00.01	Running command channel	0: Keypad running command channel (LED off) 1: Terminal running command channel (LED flickering) 2: Communication running command channel (LED on)	0~2	0

Select control command channels of the inverter.

Control commands of the inverter: start, stop, forward running, reverse running, jogging and fault reset

0: Keypad running command channel (“LOCAL/REMOT” LED off)

Carry out the control commands by RUN and STOP/RST on the keypad. In running state, press both RUN and STOP/RST simultaneously to make the inverter coast to stop.

1: Terminal running command channel (“LOCAL/REMOT” LED flickering)

Carry out the running control commands by forward rotation, reverse rotation, forward jogging and reverse jogging of the multi-function input terminals.

2: Communication running command channel (“LOCAL/REMOT” LED on)

The upper computer controls running command via communication.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P00.02	Communication running command	0: MODBUS communication channel 1: PROFIBUS/CANopen communication channel 2: Ethernet communication channel 3: Reserved 4: DEVICE_NET communication channel (Reserved)	0~4	0

Channels to select communication commands of the inverter;

Note: 1, 2, 3 and 4 are extension functions which can be only used with corresponding extension cards.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P00.03	Max output frequency	P00.04~400.00Hz	P00.04~400.00	50.00Hz

Users should pay attention that the parameter used to set the maximum output frequency is the basis of frequency setting, acceleration and deceleration.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P00.04	Upper limit of running frequency	P00.05~ P00.03(Max frequency)	P00.05~P00.03	50.0Hz

The upper limit of running frequency is the upper limit of output frequency of the inverter which is lower than or equal to the maximum output frequency.

If the set frequency is above the upper limit, the inverter runs at the upper limit.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P00.05	Lower limit of running frequency	0.00Hz~P00.04 (Upper limit of running frequency)	0.00~P00.04	0.00 Hz

The lower limit of running frequency is the lower limit of output frequency of the inverter.

If the set frequency is lower than the lower limit, the inverter runs at the lower limit.

Note: Max output frequency ≥ Upper limit frequency ≥ Lower limit frequency

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P00.06	A frequency command	0: Keypad data setting 1: AI1 setting	0~13	0

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P00.07	B frequency command	2: AI2 setting 3: AI3 setting 4: S8 pulse setting 5: Simple PLC program setting 6: Multi-step speed running setting 7: PID control setting 8: MODBUS communication setting 9: PROFIBUS/CANopen communication setting (Extension card) 10: Ethernet communication setting (Extension card) 11: Reserved 12: DEVICE_NET communication setting (Extension card) (Reserved) 13: Master-slave PID output	0~12	1

0: Keypad data setting

Modify the value P00.10 (set frequency by keypad) to set the frequency by keypad.

1: AI1 setting

2: AI2 setting

3: AI3 setting

Set the frequency by analog input terminals. Goodrive800 inverters provide 3 channel analog input terminals, among which AI1/AI2 is the voltage/current option (0~10V/0~20mA) and can be shifted by jumpers while AI3 is the voltage input (-10V~+10V).

Note: When the analog AI1/AI2 selects 0~20mA input, the corresponding voltage of 20mA is 10V.

100.0% of the analog input setting corresponds to the max output frequency (P00.03) and -100.0% corresponds to the max output frequency (P00.03).

4: S8 pulse setting

The frequency is set by the high-speed pulse terminals. Goodrive800 inverters provide 1 channel high-speed pulse input in the range of 0.00~50.00 kHz.

100.0% of the high-speed pulse input setting corresponds to the max output frequency (P00.03) in forward direction and -100.0% corresponds to the max output frequency (P00.03) in reverse direction.

Note: The pulse setting can be only input by S8. Set P05.00 (S8 input type selection) to pulse input and P05.46 (S8 pulse input function) to frequency setting input.

5: Simple PLC program setting

When P00.06 or P00.07 is equal to 5, the inverter runs at simple PLC program mode. Set parameters of P10 group (Simple PLC and multi-step speed control group) to select corresponding running frequency, running direction, time of acceleration and deceleration, and duration. Please refer to the description of P10 group functions.

6: Multi-step speed running setting

When P00.06 or P00.07 is equal to 6, the inverter runs at multi-step speed mode. Set multi-step speed terminals by P05 to select the current running step and select the current running frequency by parameters of P10.

When P00.06 or P00.07 is not equal to 6, the multi-step speed setting has the priority, but the set step can be only 1~15. When P00.06 or P00.07 is equal to 6, the set step is 0~15.

7: PID control setting

When P00.06 or P00.07 is equal to 7, the running mode of the inverter is process PID control. It is

necessary to set P09 (PID control). The running frequency of the inverter is the value after PID effect. As for PID preset source, preset value and feedback source, refer to the description of P09 PID functions.

8: MODBUS communication setting

The frequency is set by MODBUS communication. See P20 function description.

9: PROFIBUS/CANopen communication setting

The frequency is set by PROFIBUS/CANopen communication. For PROFIBUS communication, see P21 function description and PROFIBUS communication card is optional. For CANopen communication, see P21 function description and CANopen communication card is optional.

10: Ethernet communication setting

The frequency is set by Ethernet communication. See P22 function description and Ethernet communication card is optional.

11: Reserved

12: DEVICE_NET communication setting (Reserved)

The frequency is set by DEVICE_NET communication. DEVICE_NET communication card is optional.

13: Master-slave PID output

Under master-slave mode, the master set the frequency of the slaves via PID, which is only suitable for A frequency command.

Note: A and B frequency can not be set to the same frequency reference mode.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P00.08	B frequency command reference	0: Max output frequency 1: A frequency command	0~1	0

Select B frequency command reference.

0: Max output frequency: 100% of B frequency setting corresponds to max output frequency.

1: A frequency command: 100% of B frequency setting corresponds to max output frequency. If it is necessary to adjust on basis of A frequency command, select this setting.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P00.09	Setting source combination	0: A 1: B 2: (A+B) 3: (A-B) 4: Max(A, B) 5: Min(A, B)	0~5	0

Select setting source combination.

0: A, the current frequency is set to A frequency command.

1: B, the current frequency is set to B frequency command.

2: A+B, the current frequency is set to A+B frequency command.

3: A-B, the current frequency is set to A-B frequency command.

4: Max (A, B): Take the larger value between A and B frequency commands as the set frequency.

5: Min (A, B): Take the smaller value between A and B frequency commands as the set frequency.

Note: The combination can be shifted by terminal functions (P05).

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P00.10	Keypad set frequency	0.00 Hz~P00.03 (Max frequency)	0.00~P00.03	50.00Hz

When A and B frequency commands are selected as “keypad setting”, the function code value is the initial value of the inverter frequency.

Note: A and B frequency can not be set to the same frequency reference mode.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P00.11	ACC time1	0.0~3600.0s	0.0~3600.0	Depend on model
P00.12	DEC time1	0.0~3600.0s	0.0~3600.0	Depend on model

ACC time refers to the time that the inverter needs to accelerate from 0 Hz to max output frequency (P00.03).

DEC time refers to the time that the inverter needs to decelerate from max output frequency (P00.03) to 0 Hz.

Goodrive800 series inverters totally define four groups of ACC/DEC time which can be selected via input terminals (P05). The default value of ACC/DEC time is the first group.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P00.13	Running direction	0: Run in default direction 1: Run in opposite direction 2: Forbid reverse running	0~2	0

0: Run in default direction: the inverter runs in forward direction. FWD/REV LED is off.

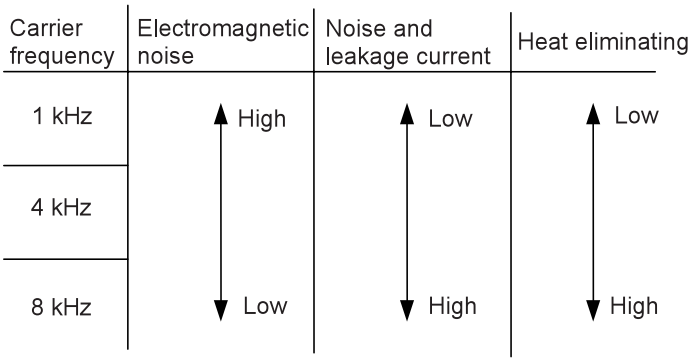
1: Run in opposite direction: the inverter runs in reverse direction. FWD/REV LED is on.

The rotation direction of the motor can be shifted by changing the function code. The effect is equivalent to the switchover of the rotation directions by adjusting arbitrary two motor lines (U, V and W). When the running channel is set under the keypad control, the rotation direction can be changed by QUICK/JOG on the keypad. Refer to P07.02 (P07.02=3) for detailed information.

Note: After the function parameter returns to the default value, the running direction of the motor will restore to the factory default state. It should be used with caution in the cases where the rotation direction of the motor cannot be changed after commissioning.

2: Forbid reverse running: forbid the inverter to run in reverse direction. It is suitable in special cases forbidding reverse running.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P00.14	Carrier frequency setting	1.0~8.0kHz	1.0~8.0	Depend on model



The advantages of the high carrier frequency: ideal current waveform, little current harmonic and motor noise;

The disadvantages of the high carrier frequency: The switch loss and temperature of the inverter increase, so the output ability of the inverter is affected. Under the high carrier frequency, the inverter is used by derating. Simultaneously, the leakage current increase of the inverter causes more electromagnetic interference to the environment.

Applying low carrier frequency is contrary to the above. Too low carrier frequency will cause unstable running, torque decreasing and even oscillation. The manufacturer has set proper carrier frequency in factory. Generally, there is no need for users to modify the parameters. In case of above the default carrier frequency, users should derate 10% for each additional 1k carrier frequency.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P00.15	Motor parameter autotuning	0: No operation 1: Rotation autotuning 2: Static autotuning 3: Simple autotuning	0~3	0

Select the mode of motor parameter autotuning.

0: No operation

1: Rotation autotuning: comprehensive motor parameter autotuning, the method is recommended when high control precision is needed.

2: Static autotunnig: the method is suitable in the cases where the motor cannot decouple from load.

3: Simple autotuning: when the current motor is motor 1, autotune P02.06, P02.07 and P02.08; when the current motor is motor 2, autotune P12.06, P12.07 and P12.08; when the current motor is motor 3, autotune P13.06, P13.07 and P13.08; when the current motor is motor 4, autotune P14.06, P14.07 and P14.08.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P00.16	AVR function	0: Invalid 1: Valid during the whole process	0~1	1

Enable AVR function.

0: Invalid

1: Valid during the whole process

The output voltage auto-adjusting function of the inverter can eliminate the impact from the bus voltage fluctuation.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P00.17	Application	0: Heavy overload application 1: Light overload application	0~1	0

Set the application case of the inverter.

0: Heavy overload application: suitable for the constant torque load of specified rated parameter.

1: Light overload application: suitable for the variable torque load of specified rated parameter (fans and water pumps).

Goodrive800 series inverters apply two-in-one type of heavy overload and light overload. The available motor power at heavy overload is one smaller than that at light overload.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P00.18	Function parameter restoring	0: No operation 1: Restore the default value 2: Cancel the fault record	0~2	0

Note: The function code will automatically restore to 0 after finishing the selected function operation.

Note: Please use the function code with caution because restoring the default value will cancel the user password.

P01 Group Start-up and stop control

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P01.00	Start-up mode	0: Start-up directly 1: Start-up after DC braking 2: Start-up after rotating speed tracking	0~2	0

0: Start-up directly: start from the starting frequency P01.01

1: Start-up after DC braking: start the motor from the starting frequency after DC braking (Set the parameters P01.03 and P01.04). It is suitable in cases where reverse rotation may occur to the small inertia load during starting.

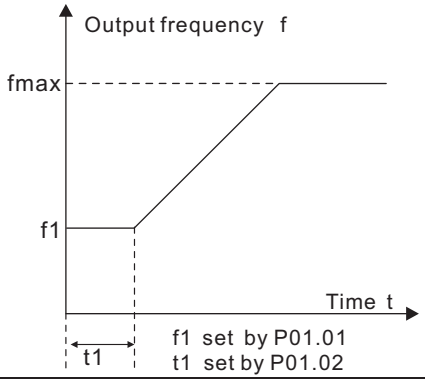
2: Start-up after rotating speed tracking: automatically track the rotating speed and direction of the motor, and start the rotating motor smoothly. It is suitable in cases where reverse rotation may occur to the large inertia load during starting.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P01.01	Starting frequency of direct start-up	0.00~50.00Hz	0.00~50.00	0.50Hz

The starting frequency of direct start-up refers to the original frequency during the inverter starting. See detailed information in the function code P01.02 (Retention time of starting frequency).

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P01.02	Retention time of starting frequency	0.0~60.0s	0.0~60.0	0.0s

Set up proper starting frequency to increase the torque during the motor starting. In the retention time of starting frequency, the output frequency of the inverter is the starting frequency. Then the inverter runs from the starting frequency to the set frequency. If the set frequency is lower than the starting frequency, the inverter will stop running and keep in the stand-by state. The starting frequency is not limited in the lower limit value.



Function code	Name	Detailed instruction of parameters	Setting range	Default value
P01.03	Braking current before start-up	0.0~100.0% (Motor rated current)	0.0~100.0	0.0%
P01.04	Braking time before start-up	0.0~60.0s	0.0~60.0	0.0s

The inverter will carry out DC braking at the braking current set before start-up and it will speed up after

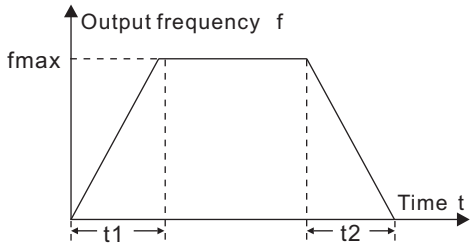
DC braking time. If the set DC braking time is 0, the DC braking is invalid.

The higher the DC braking current, the bigger the braking power. The DC braking current before start-up refers to the rated current percentage of the inverter.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P01.05	ACC/DEC type	0: Linear type 1: S curve type	0~1	0

The changing mode of the frequency during start-up and running;

0: Linear type: the output frequency increases or decreases linearly.

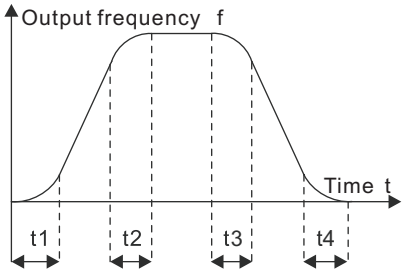


1: S curve type: the output frequency increases or decreases in S curve.

The S curve is generally used in cases requiring smooth start-up and stop such as elevators and conveyors.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P01.06	S curve beginning proportion	0.0~50.0% (ACC/DEC time)	0.0~50.0	30.0%
P01.07	S curve end proportion	0.0~50.0% (ACC/DEC time)	0.0~50.0	30.0%

The curvature of the S curve is determined by accelerating range, ACC/DEC time, beginning time and end time.



t1=P01.06XACC time（P00. 11）
t2=P01.07XACC time（P00. 11）
t3=P01.06XDEC time（P00. 12）
t4=P01.07XDEC time（P00. 12）

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P01.08	Stop mode	0: Decelerate to stop 1: Coast to stop	0~1	0

0: Decelerate to stop: after the stop command becomes valid, the inverter decelerates to decrease output frequency during the set time. When the frequency decreases to 0Hz, the inverter will stop.

1: Coast to stop: after the stop command becomes valid, the inverter immediately ceases the output. The load coasts to stop at the mechanical inertia.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P01.09	Starting frequency of DC braking	0.00~P00.03 (Max frequency)	0.00~P00.03	0.00Hz

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P01.10	Waiting time before DC braking	0.0~60.0s	0.0~60.0	0.0s
P01.11	DC braking current	0.0~100.0% (Motor rated current)	0.0~100.0	0.0%
P01.12	DC braking time	0.0~60.0s	0.0~60.0	0.0s

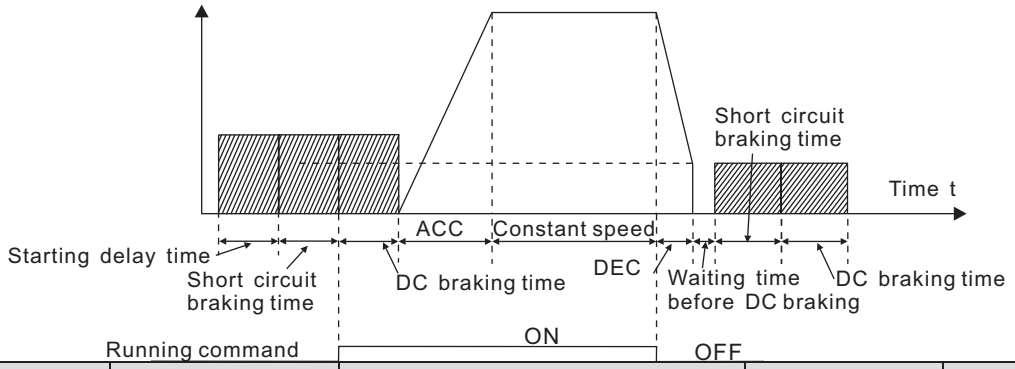
When P01.09 is not set to zero, the DC braking and short circuit braking are valid; while the short circuit braking (P15.13) is priorer than the DC braking. The DC braking works after finishing the short circuit braking.

Starting frequency of DC braking: start the DC braking when running frequency reaches the starting frequency during stop.

Waiting time before DC braking: the inverter blocks the output before starting DC braking. Start the DC braking after the waiting time to prevent overcurrent fault caused by DC braking at high speed.

DC braking current refers to the added DC braking. The higher the current, the greater the braking effect.

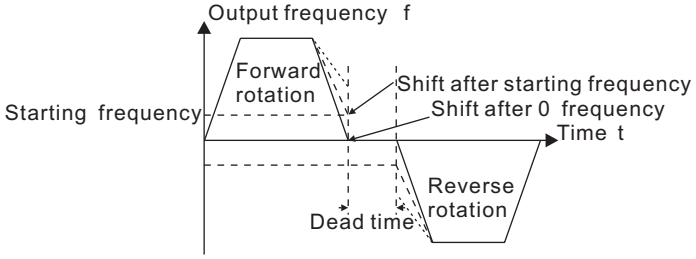
DC braking time refers to the retention time of DC braking. If the time is 0, DC braking is invalid and the inverter will stop at the set deceleration time.



Function code	Name	Detailed instruction of parameters	Setting range	Default value
P01.13	Dead time of FWD/REV rotation	0.0~3600.0s	0.0~3600.0	0.0s
P01.14	Shifting between FWD/REV rotation	0: Switch after 0 frequency 1: Switch after starting frequency 2: Switch after delay at stop speed (Reserved)	0~2	0

Set the shifting between FWD/REV rotation of the inverter.

Set the transient time by P01.13 during the process of switching FWD/REV rotation, which is shown in following figure:



Function code	Name	Detailed instruction of parameters	Setting range	Default value
P01.15	Stop speed	0.00~100.00Hz	0.00~100.00	0.50 Hz
P01.16	Detection of stop speed	0: Speed set value 1: Speed detecting value	0~1	0
P01.17	Detection time of feedback speed	0.0~100.0 s	0.0~100.0	0.5s

Set the detection of stopping speed of the inverter.

0: Speed set value (delay without stopping) (the only detection method in SVPWM control)

1: Speed detecting value (only valid under vector control)

In SVPWM control or P01.17=0, when the ramp reference frequency is less than or equal to the set value of P01.15 and passes delay time of stop speed P01.24, the inverter will coast to stop immediately.

In vector control or P01.17=1, when the actual frequency is less than or equal to the set value of P01.15, the inverter will coast to stop immediately; when the frequency is larger than the set value, the inverter will stop after the delay time of P01.17.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P01.18	Terminal running protection when power on	0: Terminal running command is invalid when power on 1: Terminal running command is valid when power on	0~1	0

When the running command channel is the terminal control, the system will detect the state of the running terminal during power on.

0: Terminal running command is invalid when power on. Even the running command is detected to be valid during power on, the inverter will not run and the system keeps in running protection state until the running command is canceled and enabled again.

1: Terminal running command is valid when power on. If the running command is detected to be valid during power on, the system will automatically start the inverter after finishing the initialization.

Note: The function should be used with caution, or serious result may follow.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P01.19	The running frequency is lower than the lower limit one (valid if the lower limit frequency is above 0)	0: Run at the lower-limit frequency 1: Stop 2: Hibernation	0~2	0

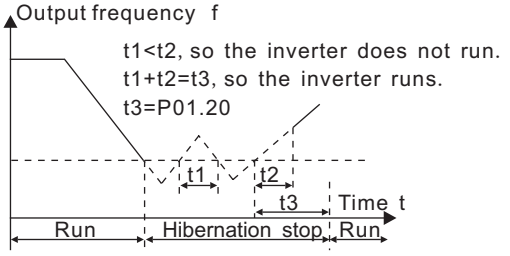
This function code determines the running state of the inverter when the set frequency is lower than the lower-limit one.

When the set frequency is lower than the lower-limit one, the inverter will coast to stop; when the set frequency is higher than the lower limit one again and it lasts over the time set by P01.20, the inverter will come back to the running state automatically.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P01.20	Hibernation restore delay time	0.0~3600.0s (valid when P01.19=2)	0.0~3600.0	0.0s

The function code determines the hibernation stand-by delay time. When the running frequency of the inverter is lower than the lower-limit one, the inverter will pause to stand by.

When the set frequency of the inverter is above the lower-limit one again and it lasts for the time set by P01.20, the inverter will run automatically.



Function code	Name	Detailed instruction of parameters	Setting range	Default value
P01.21	Restart after power off	0: Disabled 1: Enabled	0~1	0

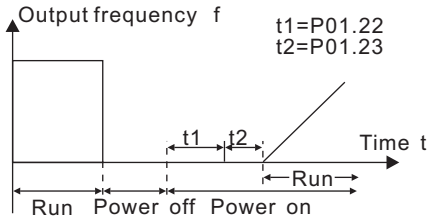
The function determines the inverter to start or not after power off and then power on.

0: Disabled

1: Enabled: during power off and then power on, if meeting the starting conditons, the inverter will automatically run after waiting for the time defined by P01.22.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P01.22	Waiting time of restart after power off	0.0~3600.0s (valid when P01.21=1)	0.0~3600.0	1.0s

The function determines the waiting time before the inverter runs automatically when power off and then power on.

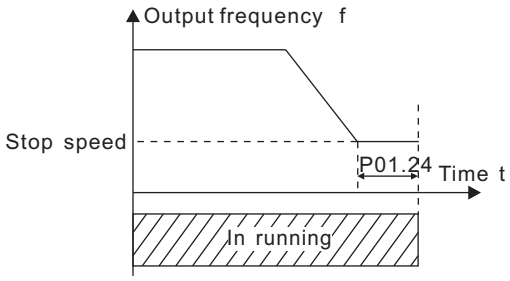


Function code	Name	Detailed instruction of parameters	Setting range	Default value
P01.23	Start delay time	0.0~60.0s	0.0~60.0	0.0s

The function determines the inverter is in stand-by state after the running command is given and then restart after the delay time set by P01.23 so as to release the brake.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P01.24	Delay time of stop speed	0.0~60.0s	0.0~60.0	0.0s

Set the delay time of stop speed of the inverter. When the actual output frequency of the inverter is equal to P01.15 and it lasts over the time set by P01.24, the inverter will stop.



Function code	Name	Detailed instruction of parameters	Setting range	Default value
P01.25	Inverter type	0: Common inverter 1: Four-quadrant inverter	0~1	1

Set the inverter type to position accurately during speed tracking.

P02 Group Motor 1 parameters

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P02.00	Motor 1 type	0: Asynchronous motor 1: Synchronous motor	0~1	0

Select the type of motor 1.

Note: Goodrive800 inverters provide 4 groups of motor parameters. Switch the motor by channels of P08.31.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P02.01	Asynchronous motor 1 rated power	0.1~3000.0kW	0.1~3000.0	Depend on model
P02.02	Asynchronous motor 1 rated frequency	0.01Hz~P00.03 (Max frequency)	0.01~P00.03	50.00Hz
P02.03	Asynchronous motor 1 rated speed	1~36000rpm	1~36000	Depend on model
P02.04	Asynchronous motor 1 rated voltage	0~1200V	0~1200	Depend on model
P02.05	Asynchronous motor 1 rated current	0.8~6000.0A	0.8~6000.0	Depend on model

Set the parameters of the asynchronous motor under control.

To ensure control performance, please set values of P02.01~P02.05 correctly in accordance with the parameters on the nameplate of the asynchronous motor.

Goodrive800 inverters provide parameter autotuning function from proper parameter setting of the nameplate.

To ensure control performance, please configure the motor according to the standard motor of the inverter. If the power is quite different from the standard motor, inverter control performance will decrease obviously.

Note: Reset the rated power of the motor (P02.01) to initialize the parameters of P02.02~P02.10.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P02.06	Asynchronous motor 1 stator resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model
P02.07	Asynchronous motor 1 rotor resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model
P02.08	Asynchronous motor 1 leakage inductance	0.01~655.35mH	0.01~655.35	Depend on model
P02.09	Asynchronous motor 1 mutual inductance	0.01~655.35mH	0.01~655.35	Depend on model

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P02.10	Asynchronous motor 1 non-load current	0.1~6553.5A	0.1~6553.5	Depend on model

Note: Arbitrary modification on the parameters is not allowed.

After the motor finishes the parameter autotuning normally, the set values of P02.06~P02.10 will automatically update. These parameters are the fundamental parameters of high performance vector control and directly influence control performance.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P02.11	Magnetic saturation coefficient 1 for the iron core of AM 1	0.0~100.0%	0.0~100.0	88.0%
P02.12	Magnetic saturation coefficient 2 for the iron core of AM 1	0.0~100.0%	0.0~100.0	81.0%
P02.13	Magnetic saturation coefficient 3 for the iron core of AM 1	0.0~100.0%	0.0~100.0	75.0%
P02.14	Magnetic saturation coefficient 4 for the iron core of AM 1	0.0~100.0%	0.0~100.0	50.0%

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P02.15	Synchronous motor 1 rated power	0.1~3000.0kW	0.1~3000.0	Depend on model
P02.16	Synchronous motor 1 rated frequency	0.01Hz~P00.03 (Max frequency)	0.01~P00.03	50.00Hz
P02.17	Synchronous motor 1 pole pairs	1~50	1~50	2
P02.18	Synchronous motor 1 rated voltage	0~1200V	0~1200	Depend on model
P02.19	Synchronous motor 1 rated current	0.8~6000.0A	0.8~6000.0	Depend on model

Note: Reset the rated power of the motor (P02.15) to initialize the parameters of P02.16~P02.19.

To ensure control performance, please set values of P02.15~P02.19 correctly in accordance with the parameters on the nameplate of the synchronous motor.

Goodrive800 inverters provide parameter autotuning function from proper parameter setting of the nameplate.

To ensure control performance, please configure the motor according to the standard motor of the inverter. If the power is quite different from the standard motor, control performance will decrease obviously.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P02.20	Synchronous motor 1 stator resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model
P02.21	Synchronous motor 1 direct axis inductance	0.01~655.35mH	0.01~655.35	Depend on model
P02.22	Synchronous motor 1 quadrature axis inductance	0.01~655.35mH	0.01~655.35	Depend on model
P02.23	Synchronous motor 1 back EMF constant	0~10000V	0~10000	300V

After the motor finishes the parameter autotuning normally, the set values of P02.20~P02.22 will automatically update. These parameters are the fundamental parameters of high performance vector control and directly influence control performance.

When P00.15=1 (rotation autotuning), the set value of P02.23 will automatically update by autotuning and there is no need to change P02.23; when P00.15=2 (static autotuning), the set value of P02.23 can not update by autotuning, so please calculate the value of P02.23 and update by manual.

When P00.15=2 (static autotuning), the set value of P02.23 can not update by autotuning, so please calculate according to following methods:

There are three methods to calculate back EMF constant on basis of the parameters on the nameplate of the motor.

1. If EMF coefficient is labeled as Ke on the nameplate, calculate as follows:

$E=(Ke*n_N*2\pi)/60$

2. If EMF is labeled as E' (V/1000r/min) on the nameplate, calculate as follows:

$E=E'*n_N/1000$

3. If the above two parameters are not labeled on the nameplate, calculate as follows:

$E=P/(\sqrt{3}*I)$

In above formulas, n_N is rated speed, P is rated power and I is rated current.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P02.24	Synchronous motor1 initial magnetic pole position	0.00~359.99	0.00~359.99	0.00
P02.25	Synchronous motor1 magnetic pole position amplitude gain	0.50~1.50	0.50~1.50	1.00
P02.26	Synchronous motor1 C phase magnetic pole position offset	0~9999	0~9999	2230

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P02.27	Synchronous motor1 D phase magnetic pole position offset	0~9999	0~9999	2230

When the motor selects the parameters of the synchronous motor, the parameters will automatically update after autotuning.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P02.29	Synchronous motor1 overload protection	0: No protection 1: Common motor (with low speed compensation) 2: Frequency conversion motor (without low speed compensation)	0~2	2

0: No protection

1: Common motor (with low speed compensation): because the heat dissipation effect of the common motor at low speed will be weakened, the corresponding electric heat protection will be adjusted properly. The low speed compensation characteristic mentioned here means reducing the threshold of the overload protection of the motor whose running frequency is below 30Hz.

2: Frequency conversion motor (without low speed compensation): because the heat dissipation effect of the special motor for the inverter is not affected by the speed, there is no need to adjust the protection value during low speed running.

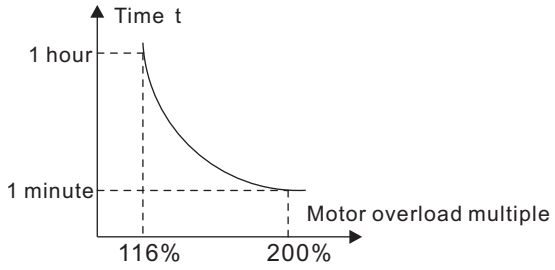
Function code	Name	Detailed instruction of parameters	Setting range	Default value
P02.30	Synchronous motor1 overload protection coefficient	20.0%~120.0%	20.0~120.0	100.0%

Motor overload multiple M=Iout/(In*K)

In: motor rated current, Iout: inverter output current, K: motor overload protection coefficient

The smaller K, the larger M, more easily to protect.

M=116%, protect after motor overload for 1h; M=200%, protect after motor overload for 60s; M>=400%, protect immediately.



Function code	Name	Detailed instruction of parameters	Setting range	Default value
P02.31	Synchronous motor1 parameter display	0: Display according to motor type 1: Display all parameters	0~1	0

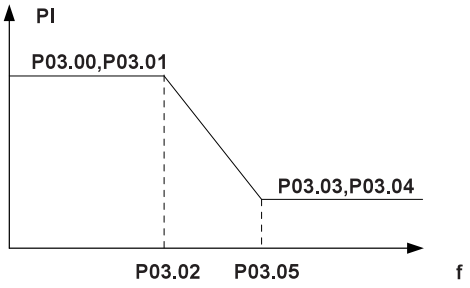
0: Display according to motor type: only display related parameters of motor types for easy operation.

1: Display all parameters: display the parameters of all motors.

P03 Group Vector control

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P03.00	Speed loop proportional gain 1	0~200.0	0~200.0	10.0
P03.01	Speed loop integral time 1	0.001~10.000s	0.001~10.000	0.500s
P03.02	Switching low frequency	0.00Hz~P03.05	0.00~P03.05	5.00Hz
P03.03	Speed loop proportional gain 2	0~200.0	0~200.0	10.0
P03.04	Speed loop integral time 2	0.001~10.000s	0.001~10.000	0.500s
P03.05	Switching high frequency	P03.02~P00.03(Max frequency)	P03.02~P00.03	10.00Hz

Parameters of P03.00~P03.05 are only applicable to vector control mode. Below the switching frequency 1 (P03.02), the speed loop PI parameters are P03.00 and P03.01. Above the switching frequency 2 (P03.05), the speed loop PI parameters are P03.03 and P03.04. Between the switching frequency 1 and 2, the PI parameters are achieved by the linear variation of two group parameters, as shown below:



The speed loop dynamic response characteristic of vector control can be adjusted by setting the proportional coefficient and integral time of the speed regulator. Either increasing proportional gain or decreasing integral time will speed up the dynamic response while too high proportional gain or too low integral time will easily cause system oscillation and overshoot. Too low proportional gain will also easily cause system oscillation and speed static deviation.

Paremeters of the speed loop PI relate to the system inertia closely. Adjust the parameters on basis of default PI parameters for different load characteristics to meet requirements in various cases.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P03.06	Speed loop output filter	0~8 (corresponding to 0~2^8/10ms)	0~8	0

Set the filter time of the speed loop.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P03.07	Vector control slip compensation coefficient (Electromotion)	50~200%	50~200	100%

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P03.08	Vector control slip compensation coefficient (Power generation)	50~200%	50~200	100%

Slip compensation coefficient is used to adjust the slip frequency of vector control and improve the speed control precision. Adjusting the parameters properly can prevent speed static deviation.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P03.09	Current loop proportional coefficient P	0~65535	0~65535	1000
P03.10	Current loop integral coefficient I	0~65535	0~65535	1000

Note:

1 Adjusting the two parameters is to adjust PI parameters of the current loop, which directly influences system dynamic response and control precision. Generally, there is no need to change the default value.

2 Only applicable to sensorless vector control 0 (P00.00=0).

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P03.11	Torque setting method	0: Invalid torque control 1: Keypad setting (P03.12) 2: AI1 setting 3: AI2 setting 4: AI3 setting 5: S8 pulse frequency setting 6: Multi-step setting 7: MODBUS communication setting 8: PROFIBUS/CANopen communication setting 9: Ethernet communication setting 10: Reserved 11: DEVICE_NET communication setting 12: Internal setting of the slave (transmit from the master) 13: PID control setting 14~15: Reserved	0~15	0

Enable the torque control mode and set the torque setting method.

Note: 100% of the setting methods 2~15 corresponds to 3 times of motor rated current.

Note: Part of above methods need to use extension cards.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P03.12	Keypad setting torque	-300.0%~300.0% (Motor rated current)	-300.0~300.0	50.0%

When P03.11=1, the keypad sets the torque.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P03.13	Torque given filter time	0.000~10.000s	0.000~10.000	0.100s

Set the torque given filter time.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P03.14	Torque control forward rotation upper-limit frequency setting source selection	0: Keypad setting (P03.16 sets P03.14 and P03.17 sets P03.15) 1: AI1 setting 2: AI2 setting 3: AI3 setting 4: S8 pulse frequency setting 5: Multi-step setting 6: MODBUS communication setting 7: PROFIBUS/CANopen communication setting 8: Ethernet communication setting 9: Reserved 10: DEVICE_NET communication setting (Reserved) 11~13: Reserved	0~13	0
P03.15	Torque control reverse rotation upper-limit frequency setting source selection		0~13	0

Note: 100% of the setting methods 1~13 corresponds to the maximum frequency.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P03.16	Keypad defined value of torque control forward rotation upper-limit frequency	0.00Hz~P00.03	0.00~P00.03	50.00 Hz
P03.17	Keypad defined value of torque control reverse rotation upper-limit frequency	0.00 Hz~P00.03	0.00~P00.03	50.00Hz

The function code is used to set upper limit of the frequency, 100% corresponding to the maximum frequency. P03.16 sets P03.14 and P03.17 sets P03.15.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P03.18	Electromotion torque upper-limit setting source	0: Keypad setting (P03.20 sets P03.18 and P03.21 sets P03.19) 1: AI1 setting 2: AI2 setting 3: AI3 setting 4: S8 pulse frequency setting 5: MODBUS communication setting 6: PROFIBUS/CANopen communication setting 7: Ethernet communication setting 8: Reserved 9: DEVICE_NET communication setting (Reserved) 10~12: Reserved	0~12	0
P03.19	Braking torque upper-limit setting source		0~12	0

The function code is used to select electromotion and braking torque upper-limit setting source.

Note: 100% of the setting methods 1~13 corresponds to 3 times of motor rated current.

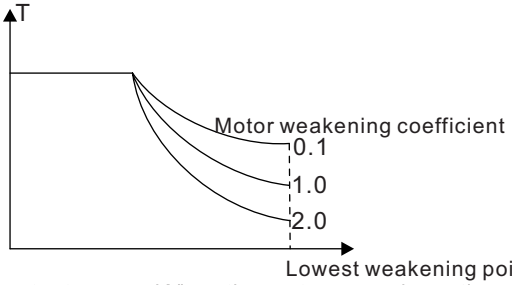
Function code	Name	Detailed instruction of parameters	Setting range	Default value
P03.20	Electromotion torque upper-limit keypad setting	0.0~300.0% (Motor rated current)	0.0~300.0	180.0%
P03.21	Braking torque upper-limit keypad setting	0.0~300.0% (Motor rated current)	0.0~300.0	180.0%

The function code is used to set upper limit of the torque via keypad.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P03.22	Weakening coefficient in constant power field	0.01~2.00	0.01~2.00	1.00
P03.23	Lowest weakening point in constant power field	10%~100%	10~100	10%

P03.22 is only valid to the vector mode 1 and close loop vector.

The motor is used in weakening control.



P03.22 and P03.23 are valid at constant power. When the motor runs above the rated rotating speed, it

comes into weakening state. The curvature of weakening curve can be changed by modifying the control coefficient. The larger the coefficient is, the steeper the curve is.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P03.24	Max voltage limit	0.0~120.0% (Motor rated voltage)	0.0~120.0	103.0%
P03.25	Pre-exciting time	0.000~10.000s	0.000~10.000	0.000s
P03.26	Weak magnetic proportional gain	0~8000	0~8000	1200

P03.24 sets the maximum voltage the inverter can output, which is decided by practical situations.

P03.25: the inverter carries out motor pre-exciting at starting and sets up magnetic field inside the motor to improve the torque performance during starting.

P03.26: The parameters are valid in weak magnetic control. The running performance of the motor can be improved by adjusting the parameters properly.

P03.24~P03.26 are invalid to vector control mode 1 and SVPWM control.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P03.27	Vector control speed display	0: Display the actual value 1: Display the set value	0~1	0

Set the vector control speed display of the inverter.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P03.28	Motor temperature compensation enabling	0: Disabled 1: Motor temperature compensating rotor resistor 2: Rotor resistor online identification enabling (only valid when asynchronous motors in close loop control)	0~2	0
P03.29	Motor temperature compensating starting temperature	0~60.0°C	0~60.0	40.0°C
P03.30	Motor temperature compensating coefficient	0.0~200.0%	0.0~200.0	100.0%

The function codes are used to compensate impact on rotor resistor variation at different temperature points and the motor temperature sensor must be installed.

P04 Group SVPWM control

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P04.00	Motor 1 and 3 V/F curve setting	0: Straight line V/F curve 1: Multi-dot V/F curve 2: 1.3th power low torque V/F curve 3: 1.7th power low torque V/F curve 4: 2.0th power low torque V/F curve 5: Customized V/F(V/F separation)	0~5	0

These function codes define the V/F curves of Goodrive800 series motor 1 and 3 to meet different requirements of load features.

0: Straight line V/F curve: suitable for constant torque load

1: Multi-dot V/F curve

2: 1.3th power low torque V/F curve

3: 1.7th power low torque V/F curve

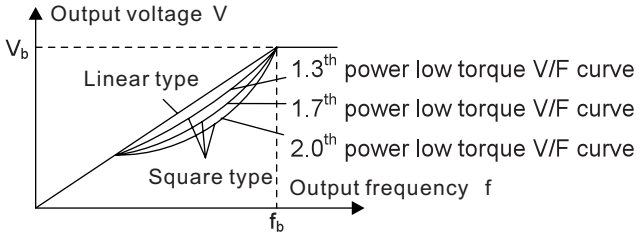
4: 2.0th power low torque V/F curve

Curves 2~4 are suitable for variable torque load such as fans and water pumps. Users can adjust according to load features to achieve the most effective energy saving.

5: Customized V/F (V/F separation)

V and F separate in the mode. The feature of the curve changes either by the frequency channel of P00.06 adjusting F or by the voltage channel of P04.27 adjusting V.

Note: In below figure, V_b is motor rated voltage and f_b is motor rated frequency.



Function code	Name	Detailed instruction of parameters	Setting range	Default value
P04.01	Motor 1 and 3 torque boost	0.0%: (Automatic) 0.1%~10.0%	0.0~10.0	0.0%
P04.02	Motor 1 and 3 torque boost close	0.0%~50.0% (Relative to motor 1 rated frequency)	0.0~50.0	20.0%

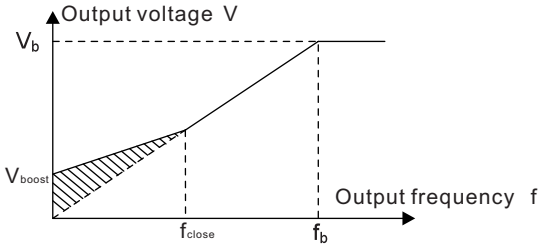
Boost and compensate the output voltage for the features of low frequency torque. P04.01 is compared with the maximum output voltage V_b.

P04.02 defines the percentage of closing frequency of manual torque to f_b. The torque boost can improve the low frequency torque feature of V/F.

Torque boost should be selected according to the load. When the load is big, boost the torque. But too big torque boost is inappropriate because the motor will run with over magnetic, the output current of the inverter will increase, the heat of the motor will be high and the efficiency will decrease.

When the torque boost is set to 0.0%, the inverter is in automatic torque boost.

Torque boost threshold: below the frequency point, the torque boost is effective, but over the set frequency, the torque boost is ineffective.

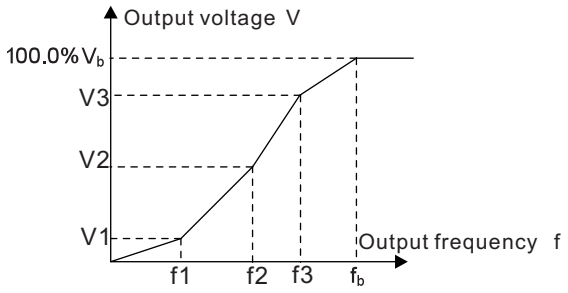


Function code	Name	Detailed instruction of parameters	Setting range	Default value
P04.03	Motor 1 and 3 V/F frequency point 1	0.00Hz~P04.05	0.00~P04.05	0.00Hz
P04.04	Motor 1 and 3 V/F voltage point 1	0.0%~110.0% (Rated voltage of motor 1)	0.0~110.0	00.0%
P04.05	Motor 1 and 3 V/F frequency point 2	P04.03~ P04.07	P04.03~ P04.07	00.00Hz
P04.06	Motor 1 and 3 V/F voltage point 2	0.0%~110.0% (Rated voltage of motor 1)	0.0~110.0	00.0%
P04.07	Motor 1 and 3 V/F frequency point 3	P04.05~ P02.02 (Rated frequency of motor 1)	P04.05~ P02.02	00.00Hz
P04.08	Motor 1 and 3 V/F voltage point 3	0.0%~110.0% (Rated voltage of motor 1)	0.0~110.0	00.0%

When P04.00=1 (multi-dot V/F curve), set the V/F curve by P04.03~P04.08.

The V/F curve is usually set according to the load feature of the motor.

Note: V1< V2< V3, f1< f2< f3. Too high low frequency voltage may cause motor overheat or burnout, inverter overcurrent speed loss or overcurrrent protection.



Function code	Name	Detailed instruction of parameters	Setting range	Default value
P04.09	Motor 1 and 3 V/F slip compensation gain	0.0~200.0%	0.0~200.0	100.0%

This function code is used to compensate the change of the rotating speed caused by the change of load at V/F control to improve mechanical rigidity of the motor. The rated slip frequency of the motor should be calculated as follows:

$\Delta f=f_b-n*p/60$

Of which, f_b is motor rated frequency, corresponding to the function code P02.02; n is motor rated speed, corresponding to the function code P02.03; p is motor pole pair, 100.0% corresponding to the rated slip frequency Δf.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P04.10	Motor 1 and 3 low frequency oscillation control factor	0~100	0~100	10
P04.11	Motor 1 and 3 high frequency oscillation control factor	0~100	0~100	10
P04.12	Motor 1 and 3 oscillation control threshold	0.00Hz~P00.03 (Max frequency)	0.00~P00.03	30.00Hz

Under SVPWM control mode, especially the motor with big power, current oscillation may occur to some frequency, causing unstable running of the motor or even inverter overcurrent. Eliminate the results by adjusting the parameters properly.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P04.13	Motor 2 and 4 V/F curve setting	0: Straight line V/F curve 1: Multi-dot V/F curve 2: 1.3th power low torque V/F curve 3: 1.7th power low torque V/F curve 4: 2.0th power low torque V/F curve 5: Customized V/F(V/F separation)	0~5	0
P04.14	Motor 2 and 4 V/F torque boost	0.0%: (Automatic) 0.1%~10.0%	0.0~10.0	0.0%
P04.15	Motor 2 and 4 V/F torque boost close	0.0%~50.0% (Relative to rated frequency of motor 2)	0.0~50.0	20.0%
P04.16	Motor 2 and 4 V/F frequency point 1	0.00Hz~ P04.18	0.00~P04.18	0.00Hz
P04.17	Motor 2 and 4 V/F voltage point 1	0.0%~110.0% (Rated voltage of motor 2)	0.0~110.0	00.0%
P04.18	Motor 2 and 4 V/F frequency point 2	P04.16~ P04.20	P04.16~ P04.20	00.00Hz
P04.19	Motor 2 and 4 V/F voltage point 2	0.0%~110.0% (Rated voltage of motor 2)	0.0~110.0	00.0%
P04.20	Motor 2 and 4 V/F frequency point 3	P04.18~P12.02 (Rated frequency of motor 2)	P04.18~P12.02	00.00Hz
P04.21	Motor 2 and 4 V/F voltage point 3	0.0%~110.0%(Rated voltage of the motor 2)	0.0~110.0	00.0%
P04.22	Motor 2 and 4 V/F slip compensation gain	0.0~200.0%	0.0~200.0	100.0%

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P04.23	Motor 2 and 4 low frequency oscillation control factor	0~100	0~100	10
P04.24	Motor 2 and 4 high frequency oscillation control factor	0~100	0~100	10
P04.25	Motor 2 and 4 oscillation control threshold	0.00Hz~P00.03(Max frequency)	0.00~P00.03	30.00Hz

The function codes define the setting way of Goodrive800 series motor 2 and 4 to to meet different requirements of load features. See specific information in P04.00~P04.12.

Note: P04 group includes V/F parameters of four motors which can be displayed simultaneously and will be valid to the selected motor. The motor can be selected by the channels defined in the function code P08.31.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P04.26	Energy-saving operation	0: No action 1: Automatic energy-saving operation	0~1	0

The motor will automatically adjust the output voltage under light load to save energy.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P04.27	Voltage setting channel	0: Keypad setting (Determined by P04.28) 1: AI1 setting 2: AI2 setting 3: AI3 setting 4: S8 pulse setting 5: Multi-step setting (Determined by the multi-step speed parameter of P10) 6: PID setting 7: MODBUS communication setting 8: PROFIBUS/CANopen communication setting 9: Ethernet communication setting 10: Reserved 11: DEVICE_NET communication setting (Reserved) 12~14: Reserved	0~14	0

Select the output voltage setting channel at V/F curve separation.

Note: 100% corresponds to motor rated voltage.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P04.28	Keypad setting voltage	0.0%~100.0% (Motor rated voltage)	0.0~100.0	100.0%

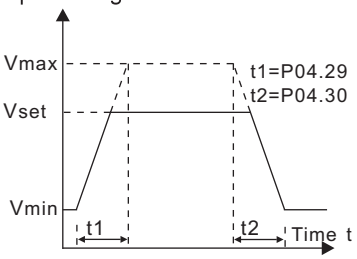
The function code is the voltage digital set value when the voltage setting channel is selected as “keypad setting” (P04.27=0).

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P04.29	Voltage increasing time	0.0~3600.0s	0.0~3600.0	5.0s
P04.30	Voltage decreasing time	0.0~3600.0s	0.0~3600.0	5.0s

Voltage increasing time is the time required by the inverter which accelerates from 0V to the rated voltage. Voltage decreasing time is the time required by the inverter which decelerates from the rated voltage to 0V.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P04.31	Max output voltage	P04.32~100.0% (Motor rated voltage)	P04.32~100.0	100.0%
P04.32	Min output voltage	0.0%~ P04.31 (Motor rated voltage)	0.0~ P04.31	0.0%

Set the upper and lower limit of the output voltage.



Function code	Name	Detailed instruction of parameters	Setting range	Default value
P04.33	Forward feedback voltage compensation coefficient	0.00~100.00	0.00~100.00	0.00

Compensate the voltage drop of the transformer or reactor.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P04.34	Forward feedback voltage amplitude limit	0.0~80.0%	0.0~80.0	0.0%

Limit the compensated forward feedback voltage amplitude, 100% corresponding to motor rated voltage.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P04.35	EPS enabling selection	0: Disabled 1: Enabled	0~1	0

Enable EPS function.

P05 Group Input terminals

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P05.00	S8 input type	0: S8 is pulse input. 1: S8 is switch input.	0~1	0

Set the S8 input type.

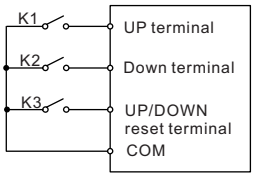
Function code	Name	Detailed instruction of parameters	Setting range	Default value
P05.01	S1 terminal function	0: No function	0~63	0
P05.02	S2 terminal function	1: Forward rotation operation	0~63	0
P05.03	S3 terminal function	2: Reverse rotation operation	0~63	0
P05.04	S4 terminal function	3: 3-wire control operation	0~63	0
P05.05	S5 terminal function	4: Forward rotation jogging	0~63	0
P05.06	S6 terminal function	5: Reverse rotation jogging	0~63	0
P05.07	S7 terminal function	6: Coast to stop	0~63	0
P05.08	S8 terminal function	7: Fault reset 8: Operation pause 9: External fault input 10: Increasing frequency setting (UP) 11: Decreasing frequency setting (DOWN) 12: Cancel the frequency change setting 13: Shift between A setting and B setting 14: Shift between combination setting and A setting 15: Shift between combination setting and B setting 16: Multi-step speed terminal 1 17: Multi-step speed terminal 2 18: Multi-step speed terminal 3 19: Multi-step speed terminal 4 20: Multi- step speed pause 21: ACC/DEC time option 1 22: ACC/DEC time option 2 23: Simple PLC stop reset 24: Simple PLC pause 25: PID control pause 26: Traverse pause (Stop at the current frequency) 27: Traverse reset (Return to the center frequency) 28: Counter reset 29: Torque control prohibition	0~63	0

Function code	Name	Detailed instruction of parameters	Setting range	Default value
		30: ACC/DEC prohibition 31: Counter trigger 32: Length reset 33: Cancel the frequency change setting temporarily 34: DC brake 35: Brake feedback 36: Shift the command to the keypad 37: Shift the command to the terminals 38: Shift the command to the communication 39: Pre-exciting command 40: Clear the power 41: Keep the power 42: Shift the torque upper-limit setting 43: Motor set option 1 44: Motor set option 2 45: Snag protection input 46: Safe stop 1 (SS1) 47: Safe limit speed (SLS) 48~63: Reserved		

The parameters are used to set the corresponding functions of digital multi-functional input terminals.

Note: Two different multi-functional input terminals cannot be set to the same function.

Set value	Function	Instruction
0	No function	The inverter will not work even when there are signals to input. The terminals out of use may be set with no function in case of malfunction.
1	Forward rotation operation (FWD)	Both the forward rotation and reverse rotation of the inverter are controlled by external terminals.
2	Reverse rotation operation (REV)	
3	3-wire control operation (Sln)	The terminal is used to ensure the running mode of the inverter is 3-wire control. See specific information in the description of 3-wire control mode in P05.12.

<table>
<tr><th>Set value</th><th>Function</th><th>Instruction</th></tr>
<tr><td>4</td><td>Forward rotation jogging</td><td rowspan="2">As for the frequency and ACC/DEC time at jogging, refer to the detailed descriptions in P08.06, P08.07 and P08.08.</td></tr>
<tr><td>5</td><td>Reverse rotation jogging</td></tr>
<tr><td>6</td><td>Coast to stop</td><td>The inverter blocks the output, so the motor is out of control of the inverter during stopping. The way is usually applied to large load and no stop time limit. The definition is the same with that in P01.08 and the function is applicable to remote control.</td></tr>
<tr><td>7</td><td>Fault reset</td><td>External fault reset function is the same with the function of STOP/RST on the keypad and it can realize remote fault reset.</td></tr>
<tr><td>8</td><td>Operation pause</td><td>The inverter slows down to stop but all running parameters are in memory state, such as PLC parameters, traverse parameters and PID parameters. When the signals disappear, the inverter will restore to the state before stopping.</td></tr>
<tr><td>9</td><td>External fault input</td><td>After the external fault signal is sent to the inverter, the inverter will alarm the fault and stop.</td></tr>
<tr><td>10</td><td>Increasing frequency setting (UP)</td><td rowspan="3">The external terminals modify increasing and decreasing commands of the inverter when the terminals set the frequency.
 

The reset terminals of increasing and decreasing frequency setting can clear the auxiliary channel frequency set by the internal UP/DOWN of the inverter so that the frequency reference restores to the value from the main frequency setting channel.</td></tr>
<tr><td>12</td><td>Decreasing frequency setting (DOWN)</td></tr>
<tr><td>12</td><td>Cancel the frequency change setting</td></tr>
<tr><td>13</td><td>Shift between A setting and B setting</td><td rowspan="3">The function mainly realizes the shift between frequency setting channels.
The shift between A and B setting channels can be realized by 13. The shift between combination setting and A setting channels set by P00.09 can be realized by 14. The shift between combination setting and B setting channels set by P00.09 can be realized by 15.</td></tr>
<tr><td>14</td><td>Shift between combination setting and A setting</td></tr>
<tr><td>15</td><td>Shift between combination setting and B setting</td></tr>
<tr><td>16</td><td>Multi-step speed terminal 1</td><td rowspan="4">16-step speed setting can be realized by the digital combination of four terminals.
Note: Multi-step speed 1 is low bit while multi-step speed 4 is high bit.
<table>
<tr><td>Multi-step speed 4</td><td>Multi-step speed 3</td><td>Multi-step speed 2</td><td>Multi-step speed 1</td></tr>
<tr><td>BIT3</td><td>BIT2</td><td>BIT1</td><td>BIT0</td></tr>
</table></td></tr>
<tr><td>17</td><td>Multi-step speed terminal 2</td></tr>
<tr><td>18</td><td>Multi-step speed terminal 3</td></tr>
<tr><td>19</td><td>Multi-step speed terminal 4</td></tr>
<tr><td>20</td><td>Multi-step speed pause</td><td>Shield the functions of multi-step speed terminals to keep the set value at current state.</td></tr>
<tr><td>21</td><td>ACC/DEC time</td><td>Select 4 groups of ACC/DEC time by the combination of two</td></tr>
</table>

<table>
<tr><th>Set value</th><th>Function</th><th>Instruction</th></tr>
<tr><td></td><td>option 1</td><td>terminals.</td></tr>
<tr><td>22</td><td>ACC/DEC time option 2</td><td>
<table>
<tr><th>Terminal1</th><th>Terminal 2</th><th>ACC/DEC time</th><th>Corresponding parameter</th></tr>
<tr><td>OFF</td><td>OFF</td><td>ACC/DEC time 1</td><td>P00.11/P00.12</td></tr>
<tr><td>ON</td><td>OFF</td><td>ACC/DEC time 2</td><td>P08.00/P08.01</td></tr>
<tr><td>OFF</td><td>ON</td><td>ACC/DEC time 3</td><td>P08.02/P08.03</td></tr>
<tr><td>ON</td><td>ON</td><td>ACC/DEC time 4</td><td>P08.04/P08.05</td></tr>
</table>
</td></tr>
<tr><td>23</td><td>Simple PLC stop reset</td><td>Reset the simple PLC process to clear previous memory information of PLC.</td></tr>
<tr><td>24</td><td>Simple PLC pause</td><td>PLC pauses in the process of operation and runs at current speed. After canceling the function, simple PLC continues to run.</td></tr>
<tr><td>25</td><td>PID control pause</td><td>PID becomes invalid temporarily and the inverter keeps current frequency output.</td></tr>
<tr><td>26</td><td>Traverse pause (Stop at the current frequency)</td><td>The inverter stops at current frequency temporarily. After canceling the function, it will traverse to run at current frequency.</td></tr>
<tr><td>27</td><td>Traverse reset (Return to the center frequency)</td><td>The set frequency of the inverter returns to the center frequency.</td></tr>
<tr><td>28</td><td>Counter reset</td><td>Reset the counter.</td></tr>
<tr><td>29</td><td>Torque control prohibition</td><td>The inverter shifts from torque control mode into speed control mode.</td></tr>
<tr><td>30</td><td>ACC/DEC prohibition</td><td>Ensure there is no external signal impact on the inverter (Except stop command) to keep current frequency output.</td></tr>
<tr><td>31</td><td>Counter trigger</td><td>Enable the pulse counting of the counter.</td></tr>
<tr><td>32</td><td>Length reset</td><td>Reset the length value. (Reserved)</td></tr>
<tr><td>33</td><td>Cancel the frequency change setting temporarily</td><td>When the terminal switches on, the frequency set by UP/DOWN can be cleared and all frequency references restore to the values set by the channels. When the terminal switches off, the frequency comes back the values after increasing or decreasing setting.</td></tr>
<tr><td>34</td><td>DC brake</td><td>In the process of slowing down to stop, after the command becomes valid, the inverter will decrease to P01.15 (stop speed) and then begin DC braking immediately. The braking time is not limited by P01.12 (DC braking time at stopping).</td></tr>
<tr><td>35</td><td>Brake feedback</td><td>After P24.04 selects effective braking control, the brake will feedback the signal to the input terminals. If the brake feedbacks the wrong signal, the inverter will alarm brake feedback fault (FAE).</td></tr>
<tr><td>36</td><td>Shift the command to the keypad</td><td>When the terminal is valid, the running command will compel to shift to keypad running command. When the terminal is invalid, the running command returns to the original state.</td></tr>
<tr><td>37</td><td>Shift the command to the terminals</td><td>When the terminal is valid, the running command will compel to shift to terminal running command. When the terminal is invalid, the running command returns to the original state.</td></tr>
</table>

<table>
<tr><th>Set value</th><th>Function</th><th>Instruction</th></tr>
<tr><td>38</td><td>Shift the command to the communication</td><td>When the terminal is valid, the running command will compel to shift to communication running command. When the terminal is invalid, the running command returns to the original state.</td></tr>
<tr><td>39</td><td>Pre-exciting command</td><td>Start pre-exciting command of the motor until the terminal becomes invalid.</td></tr>
<tr><td>40</td><td>Clear the power</td><td>When the command is valid, the power of the inverter will be cleared.</td></tr>
<tr><td>41</td><td>Keep the power</td><td>When the command is valid, the current running of the inverter will not influence the power.</td></tr>
<tr><td>42</td><td>Shift the torque upper limit setting</td><td>When the command is valid, the torque upper limit setting can be shifted by terminals.</td></tr>
<tr><td>43</td><td>Motor set 1</td><td rowspan="2">Select parameters of 4 motors by the combination of two terminals.
<table><tr><th>Terminal 1</th><th>Terminal 2</th><th>Motor</th><th>Corresponding parameter</th></tr><tr><td>OFF</td><td>OFF</td><td>Motor 1</td><td>P02</td></tr><tr><td>ON</td><td>OFF</td><td>Motor 2</td><td>P12</td></tr><tr><td>OFF</td><td>ON</td><td>Motor 3</td><td>P13</td></tr><tr><td>ON</td><td>ON</td><td>Motor 4</td><td>P14</td></tr></table></td></tr>
<tr><td>44</td><td>Motor set 2</td></tr>
<tr><td>45</td><td>Snag protection input</td><td>When the command is valid, the inverter can be forced to stop at the fastest speed.</td></tr>
<tr><td>46</td><td>Safe stop 1(SS1)</td><td>When the command is valid, the inverter will stop at the DEC time set by P24.17.</td></tr>
<tr><td>47</td><td>Safe limit speed(SLS)</td><td>When the command is valid, limit the speed of the inverter by the frequency and DEC time set in P24.15 and P24.16.</td></tr>
<tr><td>48~60</td><td>Reserved</td><td></td></tr>
</table>

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P05.09	Polarity of input terminals	0x0000~0x00FF	0x0000~0x00FF	0x0000

The function code is used to set the polarity of the input terminals.

Set the bit to 0, the input terminal is anode.

Set the bit to 1, the input terminal is cathode.

BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
S8	S7	S6	S5	S4	S3	S2	S1

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P05.10	ON-OFF filter time	0.000~1.000s	0.000~1.000	0.010s

Set the sample filter time of S1~S8 terminals. If the interference is strong, increase the parameter to avoid the incorrect operation.

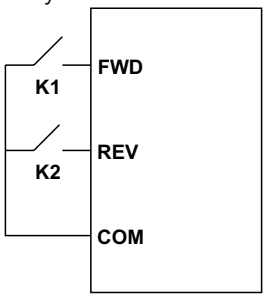
Function code	Name	Detailed instruction of parameters	Setting range	Default value
P05.11	Virtual terminal setting	0: Virtual terminals are invalid. 1: MODBUS communication virtual terminals are valid. 2: PROFIBUS/CANopen communication virtual terminals are valid. 3: Ethernet communication virtual terminals are valid. 4: Reserved	0~4	0

Enable the input function of virtual terminals at communication modes.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P05.12	Terminal control running mode	0: 2-wire control 1 1: 2-wire control 2 2: 3-wire control 1 3: 3-wire control 2	0~3	0

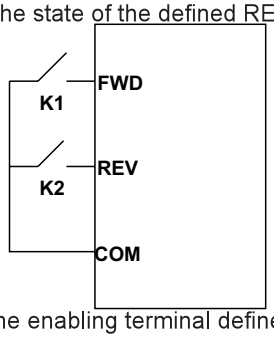
Set the running mode of the terminal control.

0: 2-wire control 1, comply the enable with the direction. This mode is widely used. It determines the rotation direction of the motor by defined FWD and REV terminal commands.



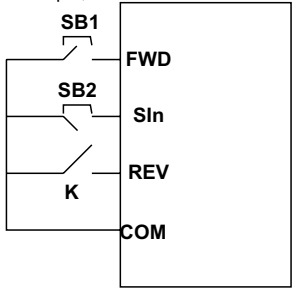
FWD	REV	Running command
OFF	OFF	Stop
ON	OFF	FWD running
OFF	ON	REV running
ON	ON	Hold

1: 2-wire control 2: Separate the enable from the direction. FWD defined by this mode is the enabling one. The direction depends on the state of the defined REV.



FWD	REV	Running command
OFF	OFF	Stop
ON	OFF	FWD running
OFF	ON	Stop
ON	ON	REV running

2: 3-wire control 1: SIn is the enabling terminal defined by the mode, the running command is caused by FWD and the direction is controlled by REV. When the inverter runs, SIn needs to be in the closed state. FWD generates a rising-edge signal. When the inverter starts running, the state of REV decides the direction. When the inverter stops, SIn needs be disconnected.

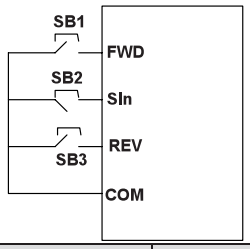


The running direction is:

SIn	REV	Previous running direction	Current running direction
ON	OFF→ON	Forward running	Reverse running
		Reverse running	Forward running
ON	ON→OFF	Reverse running	Forward running
		Forward running	Reverse running
ON→OFF	ON	Decelerate to stop	
	OFF		

SIn: 3-wire running control, FWD: forward running, REV: reverse running

3: 3-wire control 2: SIn is the enabling terminal defined by the mode, the running command is caused by FWD or REV and both of them control the running direction. When the inverter runs, SIn needs to be in the closed state. FWD or REV generates a rising-edge signal to control the running and direction of the inverter. When the inverter stops, SIn needs be disconnected.



SIn	FWD	REV	Running direction
ON	OFF→ON	ON	Forward running
		OFF	Forward running
ON	ON	OFF→ON	Reverse running
	OFF		Reverse running
ON→OFF			Decelerate to stop

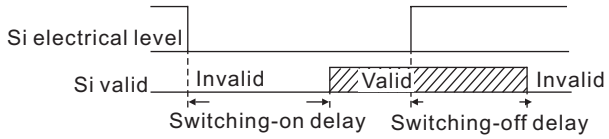
SIn: 3-wire running control, FWD: forward running, REV: reverse running

Note: For the 2-wire running mode, when the FWD/REV terminal is valid, the inverter will stop because of the stop command from other sources. Even though the FWD/REV control terminal keeps valid, the inverter will not run when the stop command is canceled. Only when FWD/REV is relaunched, the inverter can start again. For example, the effective STOP/RST stop at PLC single cycle stop, fixed-length stop and terminal control (See P07.04).

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P05.13	S1 terminal switching-on delay time	0.000~60.000s	0.000~60.000	0.000s
P05.14	S1 terminal switching-off delay time	0.000~60.000s	0.000~60.000	0.000s
P05.15	S2 terminal switching-on delay time	0.000~60.000s	0.000~60.000	0.000s
P05.16	S2 terminal switching-off delay	0.000~60.000s	0.000~60.000	0.000s

Function code	Name	Detailed instruction of parameters	Setting range	Default value
	time			
P05.17	S3 terminal switching-on delay time	0.000~60.000s	0.000~60.000	0.000s
P05.18	S3 terminal switching-off delay time	0.000~60.000s	0.000~60.000	0.000s
P05.19	S4 terminal switching-on delay time	0.000~60.000s	0.000~60.000	0.000s
P05.20	S4 terminal switching-off delay time	0.000~60.000s	0.000~60.000	0.000s
P05.21	S5 terminal switching-on delay time	0.000~60.000s	0.000~60.000	0.000s
P05.22	S5 terminal switching-off delay time	0.000~60.000s	0.000~60.000	0.000s
P05.23	S6 terminal switching-on delay time	0.000~60.000s	0.000~60.000	0.000s
P05.24	S6 terminal switching-off delay time	0.000~60.000s	0.000~60.000	0.000s
P05.25	S7 terminal switching-on delay time	0.000~60.000s	0.000~60.000	0.000s
P05.26	S7 terminal switching-off delay time	0.000~60.000s	0.000~60.000	0.000s
P05.27	S8 terminal switching-on delay time	0.000~60.000s	0.000~60.000	0.000s
P05.28	S8 terminal switching-off delay time	0.000~60.000s	0.000~60.000	0.000s

The function code defines the corresponding delay time of the electrical level variation of programmable input terminals from switching-on to switching-off.



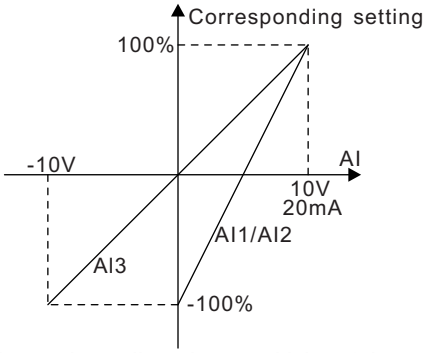
Function code	Name	Detailed instruction of parameters	Setting range	Default value
P05.29	AI1 lower limit	0.00V~P05.31	0.00~P05.31	0.00V
P05.30	Corresponding setting of AI1 lower limit	-100.0%~100.0%	-100.0~100.0	0.0%
P05.31	AI1 upper limit	P05.29~10.00V	P05.29~10.00	10.00V
P05.32	Corresponding setting of AI1 upper limit	-100.0%~100.0%	-100.0~100.0	100.0%
P05.33	AI1 input filter time	0.000s~10.000s	0.000~10.000	0.100s
P05.34	AI2 lower limit	0.00V~P05.36	0.00~P05.36	0.00V
P05.35	Corresponding setting of AI2 lower limit	-100.0%~100.0%	-100.0~100.0	0.0%
P05.36	AI2 upper limit	P05.34~10.00V	P05.34~10.00	10.00V
P05.37	Corresponding setting of AI2 upper limit	-100.0%~100.0%	-100.0~100.0	100.0%
P05.38	AI2 input filter time	0.000s~10.000s	0.000~10.000	0.100s
P05.39	AI3 lower limit	-10.00V~P05.41	-10.00~ P05.41	-10.00V
P05.40	Corresponding setting of AI3 lower limit	-100.0%~100.0%	-100.0~100.0	-100.0%
P05.41	Middle value of AI3	P05.39~ P05.43	P05.39~ P05.43	0.00V
P05.42	Corresponding setting of AI3 middle value	-100.0%~100.0%	-100.0~100.0	0.0%
P05.43	AI3 upper limit	P05.41~10.00V	P05.41~10.00	10.00V
P05.44	Corresponding setting of AI3 upper limit	-100.0%~100.0%	-100.0~100.0	100.0%
P05.45	AI3 input filter time	0.000s~10.000s	0.000~10.000	0.100s

The function code defines the relationship between the analog input voltage and its corresponding set value. If the analog input voltage exceeds the set minimum or maximum input value, calculate with the minimum or maximum input value.

When the analog input is current input, the current of 0~20mA corresponds to the voltage of 0~10V.

In different cases, the corresponding nominal value of 100.0% analog setting is different. See specific information in each section.

The figure below illustrates different situations:



Input filter time: this parameter is used to adjust the sensitivity of the analog input. Increasing the value properly can enhance the anti-interference of the analog input, but will weaken the sensitivity of the analog input

Note: Analog AI1 and AI2 can support 0~10V/0~20mA input. When AI1 and AI2 select 0~20mA input, the corresponding voltage of 20mA is 10V. AI3 can support -10V~+10V input.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P05.46	S8 pulse input function	0: Frequency setting input 1: Counter input 2: Reserved	0~2	0

S8 terminal is the function selection of pulse input.

0: Frequency setting input: the input of frequency, torque, PID reference and PID feedback. The corresponding relationship is determined by the function codes of P05.47~ P05.51.

1: Counter input: input of count pulse.

2: Reserved

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P05.47	S8 lower-limit frequency	0.00 kHz ~ P05.49	0.00~P05.49	0.00kHz
P05.48	Corresponding setting of S8 lower-limit frequency	-100.0%~100.0%	-100.0~100.0	0.0%
P05.49	S8 upper-limit frequency	P05.47 ~50.00kHz	P05.47~50.00	50.00kHz
P05.50	Corresponding setting of S8 upper-limit frequency	-100.0%~100.0%	-100.0~100.0	100.0%
P05.51	Input filter time of S8 pulse frequency	0.000s~10.000s	0.000~10.000	0.100s

The function code defines the corresponding relations when the pulse is the setting input. It is similar to AI functions (P05.29~P05.33).

P06 Group Output terminals

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P06.00	Y2 output type	0: Y2 open collector output 1: Y2 pulse output	0~1	0

Select the Y2 output type.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P06.01	Y1 output	0: Invalid 1: In operation 2: Forward rotation operation 3: Reverse rotation operation 4: Jogging operation 5: Inverter fault 6: Frequency degree test FDT1 7: Frequency degree test FDT2 8: Frequency arrival 9: Zero speed running 10: Upper limit frequency arrival 11: Lower limit frequency arrival 12: Ready for operation 13: Pre-excitation 14: Overload pre-alarm 15: Underload pre-alarm 16: Completion of simple PLC step 17: Completion of simple PLC cycle 18: Setting count value arrival 19: Defined count value arrival 20: External fault valid 21: Length arrival (Reserved) 22: Running time arrival 23: MODBUS communication virtual terminal output 24: PROFIBUS/CANopen communication virtual terminal output 25: Ethernet communication virtual terminal output 26: Bus voltage setup 27: Brake control 28~63: Reserved	0~63	0
P06.02	Y2 output		0~63	0
P06.03	Relay RO1 output		0~63	0
P06.04	Relay RO2 output		0~63	0
P06.05	Relay RO3 output		0~63	0
P06.06	Relay RO4 output **Note: When either H1 or H2 of STO terminals is valid, RO4 will compel to output.**		0~63	0

The below table is the options of function parameters which permit selecting the same output terminal function.

Set value	Function	Instruction
0	Invalid	There are no functions of output terminals.
1	In operation	When the inverter runs, the frequency output is valid.

Set value	Function	Instruction
2	Forward rotation operation	When the inverter runs forward, the frequency output is valid.
3	Reverse rotation operation	When the inverter runs reversely, the frequency output is valid.
4	Jogging operation	When the inverter jogs, the output is valid.
5	Inverter fault	When there is an inverter fault, the frequency output is valid.
6	Frequency degree test FDT1	Refer to Function code P08.32 and P08.33 for detailed information.
7	Frequency degree test FDT2	Refer to Function code P08.34 and P08.35 for detailed information.
8	Frequency arrival	Refer to Function code P08.36 for detailed information.
9	Zero speed running	The output is valid when both the output frequency and frequency reference of the inverter are equal to zero.
10	Upper limit frequency arrival	The output is valid when the running frequency reaches the upper limit.
11	Lower limit frequency arrival	The output is valid when the running frequency reaches the lower limit.
12	Ready for operation	The output is valid when the power of the primary loop and control loop is set up, and the inverter is ready for operation without carrying out protection functions.
13	Pre-excitation	The output is valid at pre-excitation.
14	Overload pre-alarm	The output is valid after the inverter exceeds the pre-alarm time on basis of the overload pre-alarm point. Refer to the function codes P11.08~P11.10 for specific information.
15	Underload pre-alarm	The output is valid after the inverter exceeds the pre-alarm time on basis of the underload pre-alarm point. Refer to the function codes P11.11~P11.12 for specific information.
16	Completion of simple PLC step	The output is valid after the simple PLC current step is completed.
17	Completion of simple PLC cycle	The output is valid after one simple PLC cycle is completed.
18	Setting count value arrival	The output is valid when the count value is beyond the value set in P08.25.
19	Defined count value arrival	The output is valid when the count value is beyond the value set in P08.26.
20	External fault valid	The output is valid when the external fault (EF) appears.
21	Length arrival (Reserved)	Reserved
22	Running time arrival	The output is valid after the accumulated running time of the inverter exceeds the time set in P08.27.
23	MODBUS communication virtual terminal output	Output corresponding signals according to MODBUS set values, 1 for ON signal and 0 for OFF signal.
24	POROFIBUS/CANopen	Output corresponding signals according to

Set value	Function	Instruction
	communication virtual terminal output	PROFIBUS/CANopen set values, 1 for ON signal and 0 for OFF signal.
25	Ethernet communication virtual terminal output	Output corresponding signals according to Ethernet set values, 1 for ON signal and 0 for OFF signal.
26	Bus voltage setup	When the bus voltage reaches the undervoltage point of the inverter, output is valid.
27	Brake control	After P8.04 selects the brake control, output the signals (ON: brake release; OFF: brake).
28~63	Reserved	

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P06.07	Polarity of output terminals	0~0x3F	0~0x3F	0x00

The function code is used to set the polarity of the output terminals.

Set the bit to 0, the output terminal is positive.

Set the bit to 1, the output terminal is negative.

BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
RO4	RO3	RO2	RO1	Y2	Y1

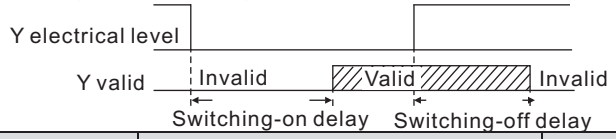
Note: When either H1 or H2 of STO terminals is valid, RO4 can be only positive.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P06.08	Y1 switching-on delay time	0.000~60.000s	0.000~60.000	0.000s
P06.09	Y1 switching-off delay time	0.000~60.000s	0.000~60.000	0.000s
P06.10	Y2 switching-on delay time	0.000~60.000s	0.000~60.000	0.000s
P06.11	Y2 switching-off delay time	0.000~60.000s	0.000~60.000	0.000s
P06.12	Relay RO1 switching-on delay time	0.000~60.000s	0.000~60.000	0.000s
P06.13	Relay RO1 switching-off delay time	0.000~60.000s	0.000~60.000	0.000s
P06.14	Relay RO2 switching-on delay time	0.000~60.000s	0.000~60.000	0.000s
P06.15	Relay RO2 switching-off delay time	0.000~60.000s	0.000~60.000	0.000s
P06.16	Relay RO3 switching-on delay time	0.000~60.000s	0.000~60.000	0.000s

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P06.17	Relay RO3 switching-off delay time	0.000~60.000s	0.000~60.000	0.000s
P06.18	Relay RO4 switching-on delay time	0.000~60.000s	0.000~60.000	0.000s
P06.19	Relay RO4 switching-off delay time	0.000~60.000s	0.000~60.000	0.000s

Note: When either H1 or H2 of STO terminals is valid, delay time of RO4 is invalid.

The function code defines the corresponding delay time of the electrical level variation of programmable output terminals from switching-on to switching-off.



Function code	Name	Detailed instruction of parameters	Setting range	Default value
P06.20	AO1 output	0: Running frequency	0~30	0
P06.21	AO2 output	1: Set frequency	0~30	0
P06.22	Y2 pulse output	2: Ramp reference frequency 3: Running rotating speed 4: Output current (Relative to inverter) 5: Output current (Relative to motor) 6: Output voltage 7: Output power 8: Set torque value 9: Output torque 10: AI1 input value 11: AI2 input value 12: AI3 input value 13: S8 pulse frequency input value 14: MODBUS communication set value 1 15: MODBUS communication set value 2 16: PROFIBUS/CANopen communication set value 1 17: PROFIBUS/CANopen communication set value 2 18: Ethernet communication set value 1 19: Ethernet communication set value 2	0~30	0

Function code	Name	Detailed instruction of parameters	Setting range	Default value
		20: Torque current reference 21: Reserved 22: Torque current (Relative to motor rated current) 23: Exciting current (Relative to motor rated current) 24: PID reference 25: PID feedback 26~30: Reserved		

Instructions to output functions:

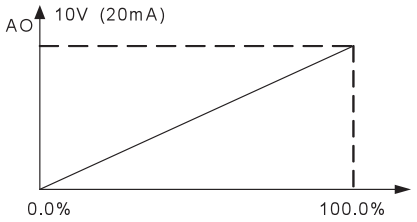
Set value	Function	Instruction
0	Running frequency	0~ Max output frequency
1	Set frequency	0~ Max output frequency
2	Ramp reference frequency	0~ Max output frequency
3	Running rotating speed	0~2 times motor rated synchronous rotating speed
4	Output current (Relative to inverter)	0~2 times inverter rated current
5	Output current (Relative to motor)	0~2 times motor rated current
6	Output voltage	0~1.5 times motor rated voltage
7	Output power	0~2 times motor rated power
8	Set torque value	0~2 times motor rated current
9	Output torque	0~2 times motor rated current
10	AI1 input value	0~10V/0~20mA
11	AI2 input value	0~10V/0~20mA
12	AI3 input value	-10V~10V
13	S8 pulse frequency input value	0.00~50.00kHz
14	MODBUS communication set value 1	-1000~1000, 1000 corresponding to 100.0%
15	MODBUS communication set value 2	-1000~1000, 1000 corresponding to 100.0%
16	PROFIBUS/CANopen communication set value 1	-1000~1000, 1000 corresponding to 100.0%
17	PROFIBUS/CANopen communication set value 2	-1000~1000, 1000 corresponding to 100.0%
18	Ethernet communication set value 1	-1000~1000, 1000 corresponding to 100.0%
19	Ethernet communication set value 2	-1000~1000, 1000 corresponding to 100.0%
20	Torque current reference	0~2 times motor rated current
21	Reserved	
22	Torque current (Relative to motor rated current)	0~2 times motor rated current
23	Exciting current (Relative to motor rated current)	0~2 times motor rated current
24	PID reference	
25	PID feedback	
26~30	Reserved	

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P06.23	Lower limit of AO1 output	0.0%~100.0%	0.0~100.0	0.0%
P06.24	Corresponding AO1 output to lower limit	0.00V~10.00V	0.00~10.00	0.00V
P06.25	Upper limit of AO1 output	0.0%~100.0%	0.0~100.0	100.0%
P06.26	Corresponding AO1 output to upper limit	0.00V~10.00V	0.00~10.00	10.00V
P06.27	AO1 output filter time	0.000s~10.000s	0.000~10.000	0.000s
P06.28	Lower limit of AO2 output	-100.0%~100.0%	-100.0~100.0	0.0%
P06.29	Corresponding AO2 output to lower limit	-10.00V~10.00V	-10.00~10.00	0.00V
P06.30	Upper limit of AO2 output	-100.0%~100.0%	-100.0~100.0	100.0%
P06.31	Corresponding AO2 output to upper limit	-10.00V~10.00V	-10.00~10.00	10.00V
P06.32	AO2 output filter time	0.000s~10.000s	0.000~10.000	0.000s
P06.33	Lower limit of Y2 output	-100.0%~100.0%	-100.0~100.0	0.0%
P06.34	Corresponding Y2 output frequency to lower limit	0.00~50.00kHz	0.00~50.00	0.00kHz
P06.35	Upper limit of Y2 output	-100.0%~100.0%	-100.0~100.0	100.0%
P06.36	Corresponding Y2 output frequency to upper limit	0.00~50.00kHz	0.00~50.00	50.00kHz
P06.37	Y2 output filter time	0.000s~10.000s	0.000~10.000	0.000s

The function code defines the relationship between the output value and its corresponding analog output. If the output value exceeds the set minimum or maximum output value, calculate it as the lower limit or upper limit of output.

When the analog output is current output, the current of 1mA is equivalent to the voltage of 0.5V.

In different cases, the corresponding analog output to 100% of output value is different. See specific information in each section.



P07 Group Human-machine interface

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P07.00	User password	0~65535	0~65535	0

The password protection will be valid when setting any non-zero number.

00000: Clear the previous user password and make the password protection invalid.

After the user password becomes valid, if the password is incorrect, the user cannot enter the parameter menu. Only correct password can make the user check or modify the parameters. Please remember the user password.

Retreat the editing state of the function code and the password protection will become valid in 1 minute. If the password is available, press PRG/ESC to enter the editing state of the function code, and then "0.0.0.0.0" will be displayed. Unless inputting the correct password, the user can not enter it.

Note: Restoring to the default value may clear the user password, so please use it with caution.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P07.01	Parameter copy	0: No operation 1: Upload the local function parameters to the keypad 2: Download the function parameters of the keypad to the local address (including the motor parameters) 3: Download the function parameters of the keypad to the local address (excluding the motor parameters) 4: Download the function parameters of the keypad to the local address (only for the motor parameters)	0~4	0

The function code determines the function parameter copy mode.

Note: After completing the 1~4 operations, the parameter will come back to 0 automatically, and the functions of upload and download exclude the factory parameters of P29.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P07.02	QUICK/JOG function selection	0: No function 1: Jogging running 2: Shift the display state by the shifting key 3: Shift between forward rotation and reverse rotation 4: Clear UP/DOWN setting 5: Coast to stop 6: Shift the running command sources in sequence 7: Quick commission mode (according to the non-factory	0~7	1

Function code	Name	Detailed instruction of parameters	Setting range	Default value
		parameter commissioning)		

Select the functions of QUICK/JOG.

0: No function

1: Jogging running: Press QUICK/JOG to begin the jogging running.

2: Shift the display state by the shifting key: Press QUICK/JOG to shift the displayed function code from right to left.

3: Shift between forward rotation and reverse rotation: Press QUICK/JOG to shift the direction of the frequency commands. This function is only valid in the keypad command channels.

4: Clear UP/DOWN setting: Press QUICK/JOG to clear the set values of UP/DOWN.

5: Coast to stop: Press QUICK/JOG to coast to stop.

6: Shift the running command sources in sequence: Press QUICK/JOG to shift the running command sources in sequence.

7: Quick commission mode (According to the non-factory parameter commissioning)

Note: When QUICK/JOG is used to shift between forward rotation and reverse rotation, the inverter does not record the state after shifting during power off. The inverter will run according to the running direction set by P00.13 during next power on.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P07.03	QUICK shifting sequence of running command channel	0: Keypad control→terminal control →communication control 1: Keypad control←→terminal control 2: Keypad control←→ communication control 3: Terminal control←→ communication control	0~3	0

When P07.02=6, set the shifting sequence of running command channel.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P07.04	STOP/RST stop function	0: Only valid for keypad control 1: Both valid for keypad and terminal control 2: Both valid for keypad and communication control 3: Valid for all control modes	0~3	0

Select the stop function by STOP/RST. STOP/RST is effective in any state for the fault reset.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P07.05	Parameter selection 1 at running state	BIT0: Running frequency (Hz on) BIT1: Set frequency (Hz flickering) BIT2: Bus voltage (V on) BIT3: Output voltage(V on) BIT4: Output current(A on)	0x0000~0xFFFF	0x03FF

Function code	Name	Detailed instruction of parameters	Setting range	Default value
		BIT5: Running rotating speed (rpm on) BIT6: Output power(% on) BIT7: Output torque(% on) BIT8: PID reference(% flickering) BIT9: PID feedback(% on) BIT10: Input terminal state BIT11: Output terminal state BIT12: Torque set value(% on) BIT13: Pulse count value BIT14: Reserved BIT15: PLC and current step in multi-step speed		
P07.06	Parameter selection 2 at running state	BIT0: AI1 value (V on) BIT1: AI2 value (V on) BIT2: AI3 value (V on) BIT3~BIT4: Reserved BIT5: High-speed pulse S8 frequency BIT6: Reserved BIT7: Motor overload percentage (% on) BIT8: Inverter overload percentage (% on) BIT9: Ramp reference frequency (Hz on) BIT10: Linear speed BIT11~15: Reserved	0x0000~0x FFFF	0x0000

The parameter of Goodrive800 series inverters at running state determined by P7.06 is the 16-bit binary figure. If one bit of the figure is 1, the corresponding parameter of the bit can be checked through >>/SHIFT at running state. If the bit is 0, the corresponding parameter will not be displayed. When setting the function codes of P07.05 and P07.06, shift 2-bit into 16-bit and then input it into the function code.

P07.05	BIT15	BIT14	BIT13	BIT12	BIT11	BIT10	BIT9	BIT8
	PLC and current step in multi-step speed	Reserved	Pulse count value	Torque set value	Output terminal state	Input terminal state	PID feedback	PID reference
	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
	Output torque	Output power	Running rotating speed	Output current	Output voltage	Bus voltage	Set frequency	Running frequency
P07.06	BIT15	BIT16	BIT13	BIT12	BIT11	BIT10	BIT9	BIT8
	Reserved	Reserved	Reserved	Reserved	Reserved	Linear speed	Ramp reference frequency	Inverter overload percentage
	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
	Motor overload percentage	Reserved	High-speed pulse S8 frequency	Reserved	Reserved	AI3 value	AI2 value	AI1 value

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P07.07	The parameter at stop state	BIT0: Set frequency (Hz on, frequency flickering slowly) BIT1: Bus voltage (V on) BIT2: Input terminal state BIT3: Output terminal state BIT4: PID reference(% flickering) BIT5: PID feedback(% on) BIT6: Torque set value(% on) BIT7: AI1 value (V on) BIT8: AI2 value (V on) BIT9: AI3 value (V on) BIT10: Reserved BIT11: Reserved BIT12: High-speed pulse S8 frequency BIT13: Reserved BIT14: PLC and current step in multi-step speed BIT15: Pulse count value	0x0000~0xFFFF	0x00FF

The setting way of P07.07 is the same with that of P07.06. When Goodrive800 series inverters are at stop state, the parameter display is influenced by P7.07.

BIT15	BIT14	BIT13	BIT12	BIT11	BIT10	BIT9	BIT8
Pulse count value	PLC and current step in multi-step speed	Reserved	High-speed pulse S8 frequency	Reserved	Reserved	AI3 value	AI2 value
BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
AI1 value	Torque set value	PID feedback	PID reference	Output terminal state	Input terminal state	Bus voltage	Set frequency

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P07.08	Frequency coefficient	0.01~10.00	0.01~10.00	1.00
P07.09	Rotating speed coefficient	0.1~999.9%	0.1~999.9	100.0%
P07.10	Linear speed coefficient	0.1~999.9%	0.1~999.9	1.0%

Displayed frequency=Running frequency* P07.08

Mechanical rotating speed=120*displayed running frequency×P07.09/motor pole pairs

Linear speed= Mechanical rotating speed×P07.10。

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P07.11	Rectifier bridge module temperature	-20~120.0°C		
P07.12	Converter module temperature	-20~120.0°C		
P07.13	Software version of control board	1.00~655.35		
P07.14	Local accumulative running time	0~65535h		

The parameters above can be read but cannot be modified.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P07.15	High bit of power consumption	0~65535°(*1000)		
P07.16	Low bit of power consumption	0.0~999.9°		

Display the power consumption of the inverter.

The power consumption of the inverter=P07.15*1000+P07.16

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P07.17	Application	0: Heavy overload application 1: Light overload application		
P07.18	Inverter rated power	0.4~6000.0kW		
P07.19	Inverter rated voltage	50~1200V		
P07.20	Inverter rated current	0.1~6000.0A		
P07.21	Factory bar code 1	0x0000~0xFFFF		
P07.22	Factory bar code 2	0x0000~0xFFFF		
P07.23	Factory bar code 3	0x0000~0xFFFF		
P07.24	Factory bar code 4	0x0000~0xFFFF		
P07.25	Factory bar code 5	0x0000~0xFFFF		
P07.26	Factory bar code 6	0x0000~0xFFFF		

The parameters above can be read but cannot be modified.

P08 Group Enhanced functions

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.00	ACC time 2	0.0~3600.0s	0.0~3600.0	Depend on model
P08.01	DEC time 2	0.0~3600.0s	0.0~3600.0	Depend on model
P08.02	ACC time 3	0.0~3600.0s	0.0~3600.0	Depend on model
P08.03	DEC time 3	0.0~3600.0s	0.0~3600.0	Depend on model
P08.04	ACC time 4	0.0~3600.0s	0.0~3600.0	Depend on model
P08.05	DEC time 4	0.0~3600.0s	0.0~3600.0	Depend on model

Refer to P00.11 and P00.12 for detailed definitions.

Goodrive800 series define four groups of ACC/DEC time which can be selected by the multi-function digital input terminals (P05). The first group of ACC/DEC time is the factory default one.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.06	Jogging frequency	0.00~P00.03 (Max frequency)	0.00~P00.03	5.00Hz

The parameter is used to define the frequency reference during jogging.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.07	Jogging ACC time	0.0~3600.0s	0.0~3600.0	Depend on model
P08.08	Jogging DEC time	0.0~3600.0s	0.0~3600.0	Depend on model

Jogging ACC time is the time required by the inverter which accelerates from 0Hz to the maximum frequency (P00.03).

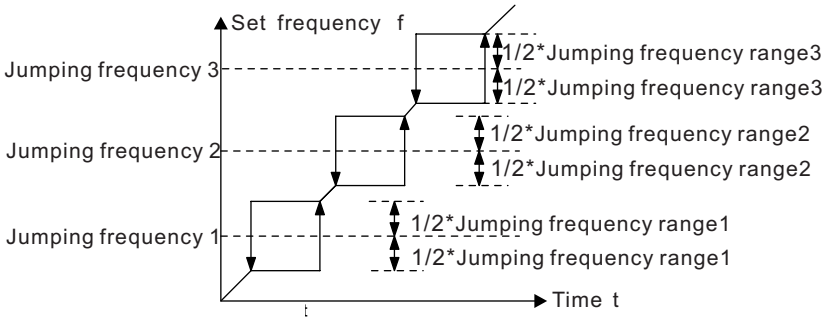
Jogging DEC time is the time required by the inverter which decelerates from the maximum frequency (P00.03) to 0Hz.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.09	Jumping frequency 1	0.00~P00.03 (Max frequency)	0.00~P00.03	0.00Hz
P08.10	Jumping frequency range 1	0.00~P00.03 (Max frequency)	0.00~P00.03	0.00Hz
P08.11	Jumping frequency 2	0.00~P00.03 (Max frequency)	0.00~P00.03	0.00Hz
P08.12	Jumping frequency range 2	0.00~P00.03 (Max frequency)	0.00~P00.03	0.00Hz
P08.13	Jumping frequency 3	0.00~P00.03 (Max frequency)	0.00~P00.03	0.00Hz

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.14	Jumping frequency range 3	0.00~P00.03 (Max frequency)	0.00~P00.03	0.00Hz

When the set frequency is in the range of the jumping frequency, the inverter will run at the edge of the jumping frequency.

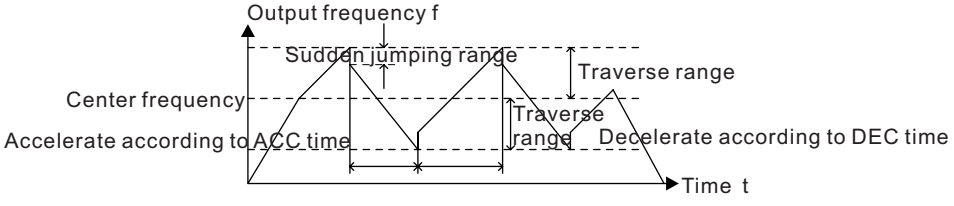
The inverter can avoid the mechanical resonance point by setting the jumping frequency. The inverter can set three jumping frequency points. But this function will be invalid if all jumping points are 0.



Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.15	Traverse range	0.0~100.0% (Relative to set frequency)	0.0~100.0	0.0%
P08.16	Sudden jumping frequency range	0.0~50.0% (Relative to traverse range)	0.0~50.0	0.0%
P08.17	Traverse boost time	0.1~3600.0s	0.1~3600.0	5.0s
P08.18	Traverse declining time	0.1~3600.0s	0.1~3600.0	5.0s

This function applies to the industries where traverse and convolution functions are required such as textile and chemical fiber.

The traverse function means that the output frequency of the inverter is fluctuated with the set frequency as its center. The route of the running frequency is illustrated as below, of which the traverse range is set by P08.15. When P08.15=0, that is the traverse range=0, traverse does not work.



Traverse range: The traverse running frequency is limited by the upper and lower limit frequency.

The traverse range relative to the center frequency (set frequency): Traverse range AW＝center frequency × traverse range P08.15.

Sudden jumping frequency＝traverse range AW × sudden jumping frequency range P08.16. When the traverse runs, the sudden jumping frequency is relative to the value of the traverse range.

The raising time of the traverse frequency: The time from the lowest point to the highest one.

The declining time of the traverse frequency: The time from the highest point to the lowest one.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.19	Proportional coefficient of high-frequency current loop	0~65535	0~65535	1000
P08.20	Integral coefficient of high-frequency current loop	0~65535	0~65535	1000

Under close loop vector control mode (P0.00=3), if below motor rated frequency, current loop PI parameters are P03.09 and P03.10; if above motor rated frequency, current loop PI parameters are P08.19 and P08.20;

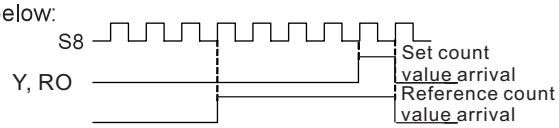
Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.25	Set count value	P08.26~65535	P08.26~65535	0
P08.26	Reference count value	0~P08.25	0~P08.25	0

The counter works by the input pulse signals of S8 terminals.

When the counter achieves a fixed value, the multi-function output terminal will output the signal of “reference count value arrival” and the counter will go on working; when the counter achieves a set value, the multi-function output terminal will output the signal of “set count value arrival”, and then the counter will clear all numbers and continue to recount before the next pulse.

The reference count value P08.26 should be no more than the set count value P08.25.

The function is illustrated as below:



Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.27	Set running time	0~65535min	0~65535	0min

Preset the running time of the inverter. When the accumulative running time achieves the set time, the multi-function digital output terminal will output the signal of “running time arrival”.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.28	Fault reset times	0~10	0~10	0
P08.29	Interval time of automatic fault reset	0.1~100.0s	0.1~100.0	1.0s

Fault reset times: Set the fault reset times when selecting this function. If the continuous reset times exceed this set value, the inverter will stop for the fault and wait to be repaired.

Interval time of automatic fault reset: The interval between the time when the fault occurs and the time when the reset action occurs.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.30	Frequency decreasing ratio of dropping control	0.00~30.00Hz	0.00~30.00	0.00Hz

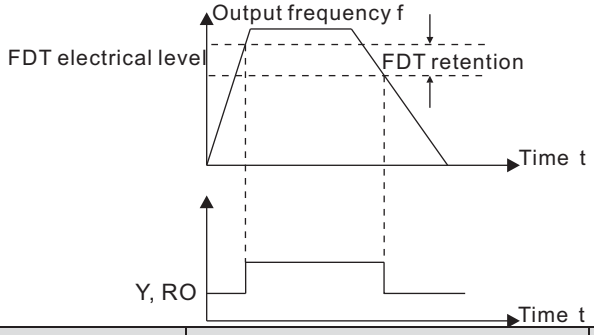
The output frequency of the inverter changes along with the load variation. And it is mainly used to balance the power when several motors simultaneously drive one load.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.31	Shifting channel of motors	0: Terminal shifting 1: MODBUS communication shifting 2: PROFIBUS/CANopen communication shifting	0~2	0

Goodrive800 series inverters support the shifting among four motors and the function code is used to shift the channels.

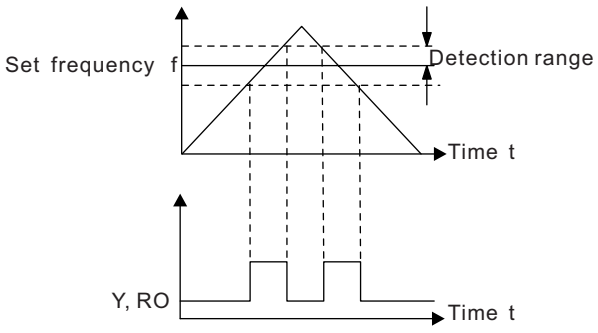
Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.32	FDT1 electrical level detection value	0.00~P00.03 (Max frequency)	0.00~ P00.03	50.00Hz
P08.33	FDT1 retention detection value	0.0~100.0% (FDT1 electrical level)	0.0~100.0	5.0%
P08.34	FDT2 electrical level detection value	0.00~P00.03 (Max frequency)	0.00~P00.03	50.00Hz
P08.35	FDT2 retention detection value	0.0~100.0% (FDT2 electrical level)	0.0~100.0	5.0%

When the output frequency exceeds the corresponding frequency of FDT electrical level, the multi-function digital output terminal will output the signal of "frequency level detection FDT". The signal is invalid until the output frequency decreases to a value lower than (FDT electrical level—FDT retention detection value) the corresponding frequency. Below is the waveform diagram:



Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.36	Frequency arrival detection value	0.0~P00.03 (Max frequency)	0.0~P00.03	0.00Hz

When the output frequency is among the below or above range of the set frequency, the multi-function digital output terminal will output the signal of "frequency arrival". See the diagram below for detailed information:



Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.37	Energy braking enable	0: Disabled 1: Enabled	0~1	0

Enable energy braking.

Note: After enabling the energy braking, the overvoltage speed loss point automatically raise at 20V. The parameter is only applicable to the type with built-in braking pipe.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.38	Threshold voltage of energy braking	200.0~2000.0V	200.0~2000.0	220V voltage: 380.0V 380V voltage: 700.0V 660V voltage: 1120.0V

After setting the original bus voltage for the energy braking, adjust this parameter appropriately to achieve effective load braking. The default value changes with different voltage grades.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.39	Running mode of cooling fan	0: Normal running mode 1: The fan keeps running after power on all the time.	0~1	0

The function code is used to set the running mode of the cooling fan.

0: Normal running mode: the cooling fan runs when the rectifier receives the running command or the module detection temperature reaches above 45°C or the the module current exceeds 20% rated value.

1: The fan keeps running after power on all the time. (The mode is generally applied to high temperature and humidity situations, but in other cases it is not recommended.)

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.40	PWM	LED ones: PWM mode 0: PWM mode 1, 3-phase commission and 2-phase commission 1: PWM mode 2, 3-phase commission LED tens: Low-frequency carrier limit mode 0: Low-frequency carrier limit mode 1: No limit	LED ones: 0~1 LED tens: 0~1	0x01

Set the PWM mode.

LED ones: PWM mode

0: PWM PWM mode 1, 3-phase commission and 2-phase commission

1: PWM mode 2, 3-phase commission

LED tens: Low-frequency carrier limit mode

0: Low-frequency carrier limit mode

1: No limit

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.41	Over modulation selection	LED ones: Over modulation selection 0: Invalid 1: Valid LED tens: Modulation depth coefficient 0~9	LED ones: 0~1 LED tens: 0~9	0x01

The function code is used to enable the over modulation function.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.42	Keypad data control	LED ones: Frequency enabling selection 0: Both ∧/∨ and digital potentiometer adjustments are effective. 1: Only ∧/∨ is effective. 2: Only digital potentiometer adjustment is effective. 3: Neither∧/∨ nor digital potentiometer adjustments is effective. LED tens: Frequency control selection 0: Only effective when P00.06=0 or P00.07=0 1: Effective for all frequency setting manners 2: Ineffective for multi-step speed when multi-step speed has the priority LED hundreds: Action selection during stopping 0: Effective setting 1: Effective during running, cleared after stopping 2: Effective during running, cleared after receiving the stop command LED thousands: ∧/∨ and digital potentiometer integral function 0: Effective integral function 1: Ineffective integral function **Note: There are no digital potentiometers for standard keypads of Goodrive800 inverters.**	LED ones: 0~3 LED tens: 0~2 LED hundreds: 0~2 LED thousands: 0~1	0x0000

Set the control functions of the keypad.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.44	UP/DOWN terminal control	LED ones: Frequency control selection 0: UP/DOWN terminal setting effective 1: UP/DOWN terminal setting ineffective LED tens: Frequency control selection 0: Only effective when P00.06=0 or P00.07=0 1: Effective for all frequency setting manners 2: Ineffective for multi-step speed when multi-step speed has the priority LED hundreds: Action selection during stopping 0: Effective setting 1: Effective during running, cleared after stopping 2: Effective during running, cleared after receiving the stop command	LED ones: 0~1 LED tens: 0~2 LED hundreds: 0~2	0x000

Set the control functions of UP/DOWN terminals.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.45	UP terminal frequency changing ratio	0.01~50.00s	0.01~50.00	0.50s
P08.46	DOWN terminal frequency changing ratio	0.01~50.00s	0.01~50.00	0.50s

Set the frequency changing ratio of UP/DOWN terminals.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.47	Action when the frequency setting is at power off	LED ones: Action selection when the digital adjusting frequency is at power off 0: Save when the power is off 1: Clear when the power is off LED tens: Action selection when MODBUS setting frequency is at power off 0: Save when the power is off 1: Clear when the power is off LED hundreds: Action selection when other communication setting frequency is at power off 0: Save when the power is off 1: Clear when the power is off	LED ones: 0~1 LED tens: 0~1 LED hundreds: 0~1	0x000

The function code is the way to deal with set frequency at power off.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.48	High bit of initial power consumption	0~59999°(*1000)	0~59999	0°
P08.49	Low bit of initial power consumption	0.0~999.9°	0~999.9	0.0°

Set the initial value of power consumption.

Initial value of power consumption=P08.48*1000+P08.49

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.50	Magnetic flux braking	0: Invalid 100~150	0~150	0

This function code is used to enable magnetic flux braking.

0: Invalid

100~150: The larger the coefficient is, the stronger the braking is.

This inverter can slow down the motor by increasing the magnetic flux. In this way, the energy generated by the motor during braking can be transformed into heat energy.

The inverter monitors the state of the motor continuously even during the magnetic flux braking period. So the magnetic flux braking can be used in the motor stop, as well as to change the rotating speed of the motor. The other advantages are:

Brake immediately after the stop command. It does not need to wait until the magnetic flux weakens.

The cooling effect becomes better. The current of the stator other than that of the rotor increases during magnetic flux braking, while the cooling of the stator is more effective than the cooling of the rotor.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P08.51	Input power factor of the inverter	0.00~1.00	0.00~1.00	0.56

Adjust the displayed current value of the input side of the inverter at AC input.

Note: The function is not applicable at DC input.

P09 Group PID control

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P09.00	PID reference source	0: Keypad digital setting (P09.01) 1: AI1 setting 2: AI2 setting 3: AI3 setting 4: S8 pulse setting 5: Multi-step speed setting 6: MODBUS communication setting 7: PROFIBUS/CANopen communication setting 8: Ethernet communication setting 9: Reserved 10: DEVICE_NET setting (Reserved) 11~13: Reserved	0~13	0

The parameter decides the setting target channel of procedure PID. When the frequency command selection (P00.06, P00. 07) is 7 or the voltage setting channel (P04.27) is 6, the running mode of the inverter is procedure PID control.

The setting target of procedure PID is a relative one, 100% of the setting corresponds to 100% of the feedback signal of the controlled system.

The system is calculated according to the relative value (0~100.0%) all along.

Note: Multi-step speed reference can be realized by setting parameters of P10 group.

PROFIBUS, Ethernet, CANopen and DEVICE_NET settings can be used only after inserting corresponding extension cards.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P09.01	Keypad PID preset	-100.0%~100.0%	-100.0~100.0	0.0%

When P09.00=0, the keypad sets the parameter.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P09.02	PID feedback source	0: AI1 feedback 1: AI2 feedback 2: AI3 feedback 3: S8 pulse feedback 4: MODBUS communication feedback 5: PROFIBUS/CANopen communication feedback 6: Ethernet communication feedback 7: Reserved 8: DEVICE_NET feedback (Reserved) 9~11: Reserved	0~11	0

Select PID feedback channel by the parameter.

Note: The reference channel and feedback channel cannot coincide; otherwise, PID cannot control effectively.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P09.03	PID output feature	0: PID output is positive. 1: PID output is negative.	0~1	0

Select PID output feature.

0: PID output is positive. When the feedback signal exceeds the PID reference, the output frequency of the inverter will decrease to balance PID. For example, rewind the strain PID control.

1: PID output is negative. When the feedback signal exceeds the PID reference, the output frequency of the inverter will increase to balance PID. For example, unwind the strain PID control.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P09.04	Proportional gain (Kp)	0.00~100.00	0.00~100.00	1.00

The function is applicable to the proportional gain P of PID input.

P determines the strength of the whole PID adjuster. Larger P, stronger the adjustment.The parameter of 100 means that when the offset of PID feedback and reference value is 100%, the adjusting range of PID adjuster is the maximum frequency (ignoring integral and differential function).

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P09.05	Integral time(Ti)	0.01~10.00s	0.01~10.00	0.10s

This parameter determines the speed of the integral adjustment on the deviation of PID feedback and reference from PID adjuster.

When the deviation of PID feedback and reference is 100%, the integral adjuster works continuously during the time (ignoring proportional and differential function) to achieve the maximum output frequency (P00.03) or the maximum voltage (P04.31). Shorter the integral time, stronger the adjustment.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P09.06	Differential time(Td)	0.00~10.00s	0.00~10.00	0.00s

This parameter determines the strength of the change ratio adjustment on the deviation of PID feedback and reference from PID adjuster.

If the PID feedback changes 100% during the time, the adjustment of integral adjuster (ignoring proportional and integral function) is the maximum output frequency (P00.03) or the maximum voltage (P04.31). Longer the differential time, stronger the adjustment.

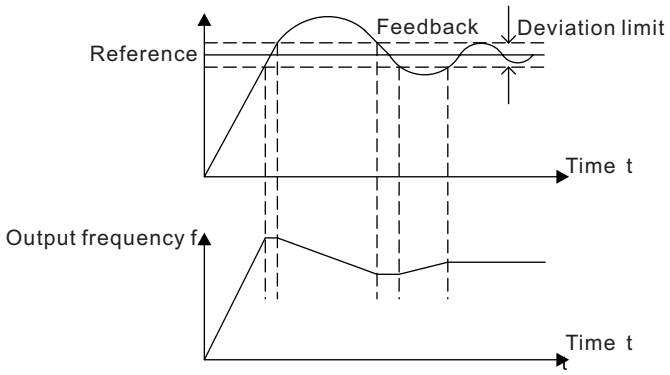
Function code	Name	Detailed instruction of parameters	Setting range	Default value
P09.07	Sampling cycle (T)	0.001~10.000s	0.001~10.000	0.010s

The sampling cycle is 1ms at 0.00s.

This parameter means the sampling cycle of the feedback. The adjuster calculates in each sampling cycle. The longer the sampling cycle is, the slower the response is.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P09.08	PID control deviation limit	0.0~100.0%	0.0~100.0	0.0%

The output of PID system is relative to the maximum deviation of the close loop reference. As shown in the diagram below, PID adjuster stops regulating in the range of deviation limit. Set the function code properly to adjust the accuracy and stability of PID system.

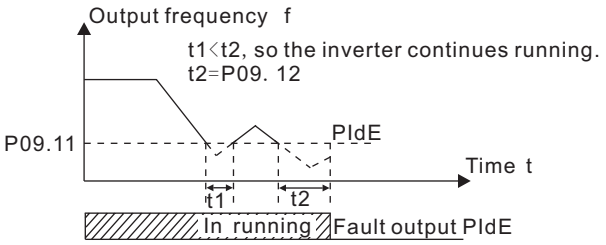


Function code	Name	Detailed instruction of parameters	Setting range	Default value
P09.09	Upper limit of PID output	P09.10~100.0% (Max frequency or voltage)	P09.10~100.0	100.0%
P09.10	Lower limit of PID output	-100.0%~P09.09 (Max frequency or voltage)	-100.0~P09.09	0.0%

The function code is used to set the upper and lower limit of PID adjuster output setting.
100.0% corresponds to the maximum output frequency (P00.03) or the maximum voltage (P04.31).

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P09.11	Feedback offline detection value	0.0~100.0%	0.0~100.0	0.0%
P09.12	Feedback offline detection time	0.0~3600.0s	0.0~3600.0	1.0s

Set the PID feedback offline detection value. When the value is smaller than or equal to the feedback offline detection value and the duration exceeds the value set in P09.12, the inverter will alarm “PID feedback offline fault” and the keypad will display PIDE.



Function code	Name	Detailed instruction of parameters	Setting range	Default value
P09.13	PID adjustment	LED ones: 0: Keep the integral adjustment when the frequency reaches the upper and lower limit 1: Stop the integral adjustment when the frequency reaches the upper and lower limit LED tens: Reserved	LED ones: 0~1 LED tens: 0~1	0x00

LED ones:

0: Keep the integral adjustment when the frequency reaches the upper and lower limit: the integration responses the changes between the reference and feedback unless it reaches the internal integral limit. When the size between the reference and feedback changes, it needs more time to offset the impact of continuous working integration and the integration can change with the trend.

1: Stop the integral adjustment when the frequency reaches the upper and lower limit: if the integration keeps stable and the size between the reference and feedback changes, the integration will change along with the trend quickly.

LED tens:

Reserved

P10 Group Simple PLC and multi-step speed control

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P10.00	Simple PLC	0: Stop after running once 1: Run at the final value after running once 2: Cycle running	0~2	0

Set the simple PLC running mode.

0: Stop after running once: it is necessary to give the inverter the running command again after it finishes a single cycle and automatically stops.

1: Run at the final value after running once: the inverter automatically keeps the running frequency and direction of the last step after finishing a single cycle.

2: Cycle running: the inverter automatically enters into next cycle after finishing a single cycle and the system will not stop until there is a stop command.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P10.01	Simple PLC memory	0: Power loss without memory 1: Power loss with memory	0~1	0

Set simple PLC memory manners when power loss.

0: Power loss without memory

1: Power loss with memory: PLC will memorize the running step and frequency when power loss.

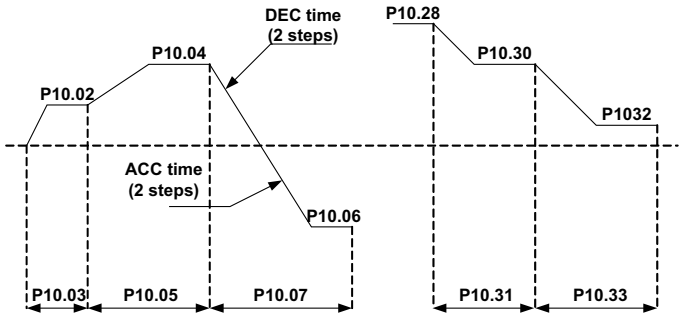
Function code	Name	Detailed instruction of parameters	Setting range	Default value
P10.02	Multi-step speed 0	-100.0~100.0%	-100.0~100.0	0.0%
P10.03	Running time of step 0	0.0~6553.5s (min)	0.0~6553.5	0.0s
P10.04	Multi-step speed 1	-100.0~100.0%	-100.0~100.0	0.0%
P10.05	Running time of step 1	0.0~6553.5s (min)	0.0~6553.5	0.0s
P10.06	Multi-step speed 2	-100.0~100.0%	-100.0~100.0	0.0%
P10.07	Running time of step 2	0.0~6553.5s (min)	0.0~6553.5	0.0s
P10.08	Multi-step speed 3	-100.0~100.0%	-100.0~100.0	0.0%
P10.09	Running time of step 3	0.0~6553.5s (min)	0.0~6553.5	0.0s
P10.10	Multi-step speed 4	-100.0~100.0%	-100.0~100.0	0.0%
P10.11	Running time of step 4	0.0~6553.5s (min)	0.0~6553.5	0.0s
P10.12	Multi-step speed 5	-100.0~100.0%	-100.0~100.0	0.0%
P10.13	Running time of step 5	0.0~6553.5s (min)	0.0~6553.5	0.0s
P10.14	Multi-step speed 6	-100.0~100.0%	-100.0~100.0	0.0%
P10.15	Running time of step 6	0.0~6553.5s (min)	0.0~6553.5	0.0s
P10.16	Multi-step speed 7	-100.0~100.0%	-100.0~100.0	0.0%

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P10.17	Running time of step 7	0.0~6553.5s (min)	0.0~6553.5	0.0s
P10.18	Multi-step speed 8	-100.0~100.0%	-100.0~100.0	0.0%
P10.19	Running time of step 8	0.0~6553.5s (min)	0.0~6553.5	0.0s
P10.20	Multi-step speed 9	-100.0~100.0%	-100.0~100.0	0.0%
P10.21	Running time of step 9	0.0~6553.5s (min)	0.0~6553.5	0.0s
P10.22	Multi-step speed 10	-100.0~100.0%	-100.0~100.0	0.0%
P10.23	Running time of step 10	0.0~6553.5s (min)	0.0~6553.5	0.0s
P10.24	Multi-step speed 11	-100.0~100.0%	-100.0~100.0	0.0%
P10.25	Running time of step 11	0.0~6553.5s (min)	0.0~6553.5	0.0s
P10.26	Multi-step speed 12	-100.0~100.0%	-100.0~100.0	0.0%
P10.27	Running time of step 12	0.0~6553.5s (min)	0.0~6553.5	0.0s
P10.28	Multi-step speed 13	-100.0~100.0%	-100.0~100.0	0.0%
P10.29	Running time of step 13	0.0~6553.5s (min)	0.0~6553.5	0.0s
P10.30	Multi-step speed 14	-100.0~100.0%	-100.0~100.0	0.0%
P10.31	Running time of step 14	0.0~6553.5s (min)	0.0~6553.5	0.0s
P10.32	Multi-step speed 15	-100.0~100.0%	-100.0~100.0	0.0%
P10.33	Running time of step 15	0.0~6553.5s (min)	0.0~6553.5	0.0s

100% of the frequency setting corresponds to the maximum output frequency P00.03.

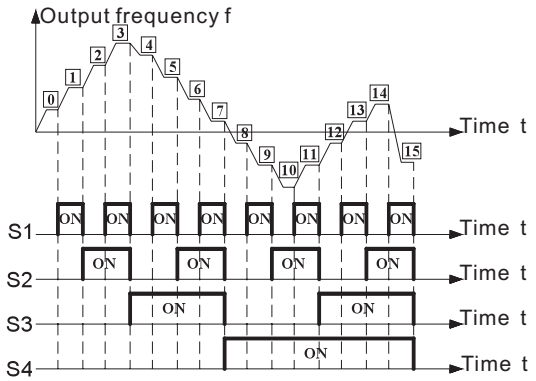
It is necessary for simple PLC to set P10.02~P10.33 to ensure the running frequency and direction of each step.

Note: The sign of multi-step speed decides the running direction of simple PLC. Value with minus indicates reverse running.



Multi-step speed can be set continuously in the range of f_{min}~f_{max}

Goodrive800 inverters can be set with 16-step speed selected by the combined codes of 1~4 multi-step terminals, corresponding to multi-step speed 0~15 separately.



When S1=S2=S3=S4=OFF, the output way of the frequency is selected by the function code P00.06 or P00.07. When not all S1=S2=S3=S4 terminals are off, the inverter runs at multi-step speed and the multi-step speed has the priority over the keypad, analog values, high-speed pulse, PLC and communication frequency input. Select at most 16-step speed via the the combined codes of S1, S2, S3 and S4.

The start-up and stop of multi-step speed is determined by the function code P00.01. The relationship between the terminals of S1, S2, S3 and S4 and the multi-step speed is shown as follows:

S1	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON
S2	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON
S3	OFF	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	ON
S4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON	ON
Step	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P10.34	Simple PLC 0~7 step ACC/DEC time	0x0000~0xFFFF	00000~FFFF	0x0000
P10.35	Simple PLC 8~15 step ACC/DEC time	0x0000~0xFFFF	00000~FFFF	0x0000

See the detailed instruction in following table:

Function code	Binary bit		Step	ACC/DEC time 1	ACC/DEC time 2	ACC/DEC time 3	ACC/DEC time 4
P10.34	BIT1	BIT0	0	00	01	10	11
	BIT3	BIT2	1	00	01	10	11
	BIT5	BIT4	2	00	01	10	11
	BIT7	BIT6	3	00	01	10	11
	BIT9	BIT8	4	00	01	10	11
	BIT11	BIT10	5	00	01	10	11
	BIT13	BIT12	6	00	01	10	11
	BIT15	BIT14	7	00	01	10	11
P10.35	BIT1	BIT0	8	00	01	10	11
	BIT3	BIT2	9	00	01	10	11
	BIT5	BIT4	10	00	01	10	11
	BIT7	BIT6	11	00	01	10	11
	BIT9	BIT8	12	00	01	10	11
	BIT11	BIT10	13	00	01	10	11
	BIT13	BIT12	14	00	01	10	11
	BIT15	BIT14	15	00	01	10	11

After selecting corresponding ACC/DEC time, users have to convert the combined 16 binary bit into the decimal bit and set the related function codes.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P10.36	PLC restart	0: Restart from the first step 1: Continue to run from the stop frequency	0~1	0

Set the restart manners of PLC.

0: Restart from the first step: the inverter will restart from the first step after stop (caused by the stop command, faults or power loss).

1: Continue to run from the stop frequency: the inverter will record the running time at current step after stop (caused by the stop command or faults), automatically enter into the step and then remain to run at the frequency defined by the step.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P10.37	Multi-step time unit	0: Second 1: Minute	0~1	0

Set the time unit.

0: Second: the running time of all steps is counted by second.

1: Minute: the running time of all steps is counted by minute.

P11 Group Protective parameters

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P11.00	Phase loss protection	LED ones: 0: Disable input phase loss protection 1: Enable input phase loss protection LED tens: 0: Disable output phase loss protection 1: Enable output phase loss protection	LED ones: 0~1 LED tens: 0~1	11

Enable the function of phase loss protection.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P11.01	Instantaneous power loss frequency decreasing	0: Disabled 1: Enabled	0~1	0

Enable instantaneous power loss frequency-decreasing function.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P11.02	Frequency decreasing ratio of instantaneous power loss	0.00Hz/s~P00.03/s (Max frequency)	0.00~P00.03	10.00Hz/s

After the power loss of the grid, when the bus voltage drops to the instantaneous power loss frequency-decreasing point, the inverter begins to decrease the running frequency according to the decreasing ratio (P11.02) to make the motor generate power again. The feedback power can maintain the bus voltage to ensure the continuous running of the inverter until the recovery of power.

Voltage degree	380V	660V
Frequency-decreasing point of instantaneous power loss	460V	800V

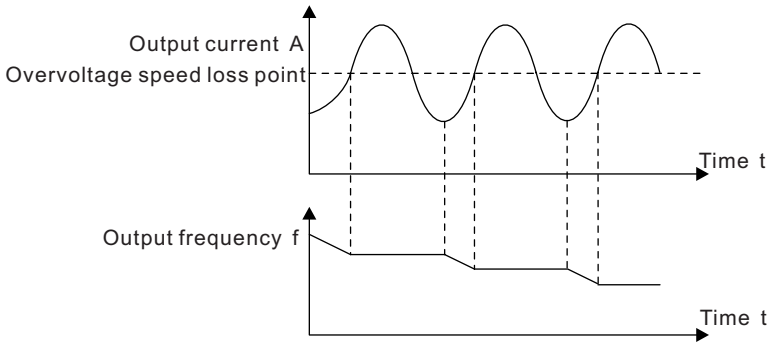
Note:

1. Adjusting the parameter properly can prevent the stop caused by the inverter protection during shifting the grid.

2. The function can be enabled only by disabling input phase loss protection.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P11.03	Overvoltage speed loss protection	0: Disabled 1: Enabled	0~1	0

Enable the function of overvoltage speed loss protection.



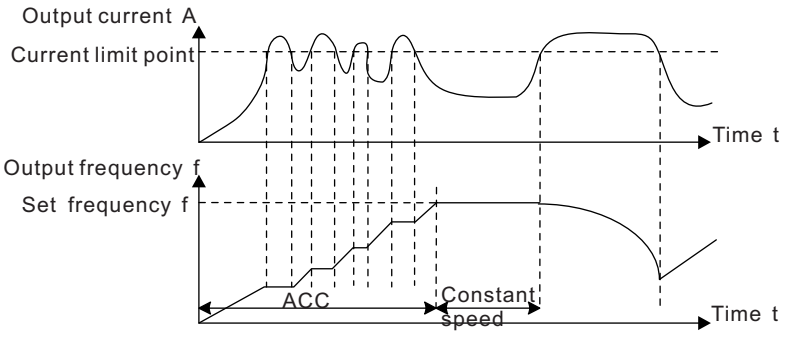
Function code	Name	Detailed instruction of parameters	Setting range	Default value
P11.04	Overvoltage speed loss protection	120~150% (100% corresponds to 1.414 * inverter rated voltage (P07.19))	120~150	140%

Set the protection point of overvoltage speed loss.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P11.05	Current limit action	0: Invalid 1: Valid all the time	0~1	1
P11.06	Automatic current limit level	50.0~200.0% (100% corresponds to rated current)	50.0~200.0	Heavy overload: 160.0% Light overload: 120.0%
P11.07	Frequency decreasing ratio during current limit	0.00~50.00Hz/s	0.00~50.00	10.00Hz/s

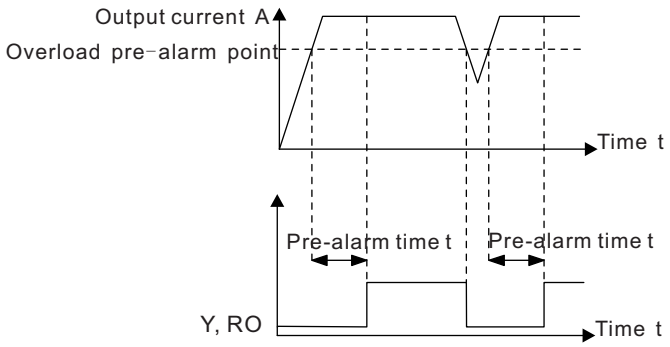
During ACC running of the inverter, due to heavy load, the actual increasing ratio of the motor speed is lower than the increasing ratio of output frequency. The trips of the inverter will be caused by the ACC overcurrent fault if there are not any measures.

During the running of the inverter, this function will detect the output current and compare it with the limit level defined in P11.06. If it exceeds the level, the inverter will run at stable frequency during ACC running, while the inverter will derate to run during the constant running. If it exceeds the level continuously, the output frequency will keep decreasing to the lower limit. If the detected output current is lower than the limit level, the inverter will continue ACC running.



Function code	Name	Detailed instruction of parameters	Setting range	Default value
P11.08	Inverter/Motor underload and overload pre-alarm	LED ones: 0: Motor underload and overload pre-alarm, relative to motor rated current 1: Inverter underload and overload pre-alarm, relative to inverter rated current LED tens: 0: Inverter continues running after underload and overload pre-alarm 1: Inverter continues running after underload pre-alarm and stop running after overload fault 2: Inverter continues running after overload pre-alarm and stop running after underload fault 3: Inverter stops running after underload and overload alarm LED hundreds: 0: Detect all the time 1: Detect in constant running	LED ones: 0~1 LED tens: 0~3 LED hundreds: 0~1	000
P11.09	Detection level of overload pre-alarm	P11.11~200%	P11.11~200	Heavy overload: 150% Light overload: 120%
P11.10	Detection time of overload pre-alarm	0.1~60.0s	0.1~60.0	1.0s
P11.11	Detection level of underload pre-alarm	0%~P11.09	0~P11.09	50%
P11.12	Detection time of underload pre-alarm	0.1~60.0s	0.1~60.0	1.0s

Overload pre-alarm signals will be output when the output current of the inverter or motor is higher than the detection level of overload pre-alarm (P11.09) and the duration exceeds the detection time of overload pre-alarm (P11.10).



Underload pre-alarm signals will be output when the output current of the inverter or motor is lower than the detection level of underload pre-alarm (P11.11) and the duration exceeds the detection time of underload pre-alarm (P11.12).

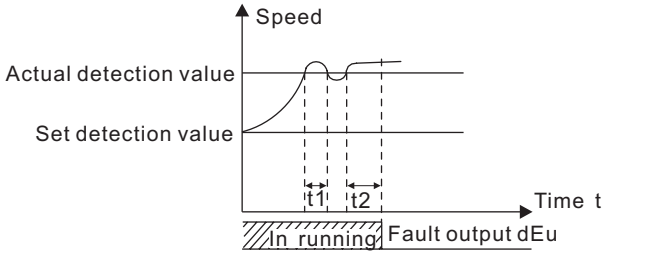
Note: The set value of underload pre-alarm detection level (P11.11) should be smaller than the set value of overload pre-alarm detection level (P11.09).

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P11.13	Output terminal action during undervoltage and auto-reset	LED ones: 0: Action at undervoltage 1: No action at undervoltage LED tens: 0: Action during auto-reset 1: No action during auto-reset	LED ones: 0~1 LED tens: 0~1	0x00

The function code is used to select the action of fault output terminals (Y1~Y3, RO1~RO8 setting as 5: inverter fault) during undervoltage and auto-reset.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P11.14	Detection value of speed deviation	0.0~50.0%	0.0~50.0	10.0%
P11.15	Detection time of speed deviation	0.0~10.0s (No speed deviation protection at 0.0)	0.0~10.0	1.0s

Set the detection time of speed deviation.



t1<t2, so the inverter continues running.
t2=P11.15

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P11.16	Valid selection of units	0x00~0x3F	0x00~0x3F	0x3F

Each bit stands for one unit, when BIT0 is 1, unit 1 is valid.

BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
Unit 6	Unit 5	Unit 4	Unit 3	Unit 2	Unit 1

The function code is limited to P18.60. The unit set by the function code is valid only when the corresponding bit of P18.60 is 1.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P11.17	Motor overheat protection	0: Disabled 1: Enabled	0~1	0
P11.18	Motor overheat protection point	0~150.0°C	0~150.0	100.0°C
P11.19	Motor temperature detection selection	0: Invalid 1: PT100 2: NTC (Reserved) 3: PTC (Reserved)	0~3	0

Enable the function of motor overheat protection.

When P11.19 is not 0, the temperature of the motor can be detected.

When P11.17=1, if the detected temperature of the motor exceeds the set value of P11.18, the inverter will alarm motor overheat fault (OH).

P12 Group Motor 2 parameters

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P12.00	Motor 2 type	0: Asynchronous motor 1: Synchronous motor	0~1	0
P12.01	Asynchronous motor 2 rated power	0.1~3000.0kW	0.1~3000.0	Depend on model
P12.02	Asynchronous motor 2 rated frequency	0.01Hz~P00.03 (Max frequency)	0.01~P00.03	50.00Hz
P12.03	Asynchronous motor 2 rated speed	1~36000rpm	1~36000	Depend on model
P12.04	Asynchronous motor 2 rated voltage	0~1200V	0~1200	Depend on model
P12.05	Asynchronous motor 2 rated current	0.8~6000.0A	0.8~6000.0	Depend on model
P12.06	Asynchronous motor 2 stator resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model
P12.07	Asynchronous motor 2 rotor resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model
P12.08	Asynchronous motor 2 leakage inductance	0.01~655.35mH	0.01~655.35	Depend on model
P12.09	Asynchronous motor 2 mutual inductance	0.01~655.35mH	0.01~655.35	Depend on model
P12.10	Asynchronous motor 2 non-load current	0.1~6553.5A	0.1~6553.5	Depend on model
P12.11	Magnetic saturation coefficient 1 for the iron core of AM 2	0.0~100.0%	0.0~100.0	88%
P12.12	Magnetic saturation coefficient 2 for the iron core of AM 2	0.0~100.0%	0.0~100.0	81%
P12.13	Magnetic saturation coefficient 3 for the iron core of AM 2	0.0~100.0%	0.0~100.0	75%
P12.14	Magnetic saturation coefficient 4 for the iron core of AM 2	0.0~100.0%	0.0~100.0	50%
P12.15	Synchronous motor 2 rated power	0.1~3000.0kW	0.1~3000.0	Depend on model
P12.16	Synchronous motor 2 rated frequency	0.01Hz~P00.03 (Max frequency)	0.01~P00.03	50.00Hz
P12.17	Synchronous motor 2 pole pairs	1~50	1~50	2
P12.18	Synchronous motor 2 rated voltage	0~1200V	0~1200	Depend on model

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P12.19	Synchronous motor 2 rated current	0.8~6000.0A	0.8~6000.0	Depend on model
P12.20	Synchronous motor 2 stator resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model
P12.21	Synchronous motor 2 direct axis inductance	0.01~655.35mH	0.01~655.35	Depend on model
P12.22	Synchronous motor 2 quadrature axis inductance	0.01~655.35mH	0.01~655.35	Depend on model
P12.23	Synchronous motor 2 back EMF constant	0~10000V	0~10000	300
P12.24	Synchronous motor 2 initial magnetic pole position	0.00~359.99	0.00~359.99	0.00
P12.25	Synchronous motor 2 magnetic pole position amplitude gain	0.50~1.50	0.50~1.50	1.00
P12.26	Synchronous motor 2 C phase magnetic pole position offset	0~9999	0~9999	2230
P12.27	Synchronous motor 2 D phase magnetic pole position offset	0~9999	0~9999	2230
P12.28	Synchronous motor 2 current identification(Reserved)	0%~50% (Motor rated current)	0~50	10%
P12.29	Synchronous motor 2 overload protection	0: No protection 1: Common motor (with low speed compensation) 2: Frequency conversion motor (without low speed compensation)	0~2	2
P12.30	Synchronous motor 2 overload protection coefficient	20.0%~120.0%	20.0~120.0	100.0%
P12.31	Synchronous motor 2 parameter display	0: Display according to motor type 1: Display all parameters	0~1	0

For the parameter settings of synchronous motor 2, refer to the settings of synchronous motor 1 in P02 group.

P13 Group Motor 3 parameters

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P13.00	Motor 3 type	0: Asynchronous motor 1: Synchronous motor	0~1	0
P13.01	Asynchronous motor 3 rated power	0.1~3000.0kW	0.1~3000.0	Depend on model
P13.02	Asynchronous motor 3 rated frequency	0.01Hz~P00.03 (Max frequency)	0.01~P00.03	50.00Hz
P13.03	Asynchronous motor 3 rated speed	1~36000rpm	1~36000	Depend on model
P13.04	Asynchronous motor 3 rated voltage	0~1200V	0~1200	Depend on model
P13.05	Asynchronous motor 3 rated current	0.8~6000.0A	0.8~6000.0	Depend on model
P13.06	Asynchronous motor 3 stator resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model
P13.07	Asynchronous motor 3 rotor resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model
P13.08	Asynchronous motor 3 leakage inductance	0.01~655.35mH	0.01~655.35	Depend on model
P13.09	Asynchronous motor 3 mutual inductance	0.01~655.35mH	0.01~655.35	Depend on model
P13.10	Asynchronous motor 3 non-load current	0.1~6553.5A	0.1~6553.5	Depend on model
P13.11	Magnetic saturation coefficient 1 for the iron core of AM 3	0.0~100.0%	0.0~100.0	88%
P13.12	Magnetic saturation coefficient 2 for the iron core of AM 3	0.0~100.0%	0.0~100.0	81%
P13.13	Magnetic saturation coefficient 3 for the iron core of AM 3	0.0~100.0%	0.0~100.0	75%
P13.14	Magnetic saturation coefficient 4 for the iron core of AM 3	0.0~100.0%	0.0~100.0	50%
P13.15	Synchronous motor 3 rated power	0.1~3000.0kW	0.1~3000.0	Depend on model
P13.16	Synchronous motor 3 rated frequency	0.01Hz~P00.03 (Max frequency)	0.01~P00.03	50.00Hz
P13.17	Synchronous motor 3 pole pairs	1~50	1~50	2
P13.18	Synchronous motor 3 rated voltage	0~1200V	0~1200	Depend on model

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P13.19	Synchronous motor 3 rated current	0.8~6000.0A	0.8~6000.0	Depend on model
P13.20	Synchronous motor 3 stator resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model
P13.21	Synchronous motor 3 direct axis inductance	0.01~655.35mH	0.01~655.35	Depend on model
P13.22	Synchronous motor 3 quadrature axis inductance	0.01~655.35mH	0.01~655.35	Depend on model
P13.23	Synchronous motor 3 back EMF constant	0~10000V	0~10000	300
P13.24	Synchronous motor 3 initial magnetic pole position	0.00~359.99	0.00~359.99	0.00
P13.25	Synchronous motor 3 magnetic pole position amplitude gain	0.50~1.50	0.50~1.50	1.00
P13.26	Synchronous motor 3 C phase magnetic pole position offset	0~9999	0~9999	2230
P13.27	Synchronous motor 3 D phase magnetic pole position offset	0~9999	0~9999	2230
P13.28	Synchronous motor 3 current identification(Reserved)	0%~50% (Motor rated current)	0~50	10%
P13.29	Synchronous motor 3 overload protection	0: No protection 1: Common motor (with low speed compensation) 2: Frequency conversion motor (without low speed compensation)	0~2	2
P13.30	Synchronous motor 3 overload protection coefficient	20.0%~120.0%	20.0~120.0	100.0%
P13.31	Synchronous motor 3 parameter display	0: Display according to motor type 1: Display all parameters	0~1	0

For the parameter settings of synchronous motor 3, refer to the settings of synchronous motor 1 in P02 group.

P14 Group Motor 4 parameters

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P14.00	Motor 4 type	0: Asynchronous motor 1: Synchronous motor	0~1	0
P14.01	Asynchronous motor 4 rated power	0.1~3000.0kW	0.1~3000.0	Depend on model
P14.02	Asynchronous motor 4 rated frequency	0.01Hz~P00.03 (Max frequency)	0.01~P00.03	50.00Hz
P14.03	Asynchronous motor 4 rated speed	1~36000rpm	1~36000	Depend on model
P14.04	Asynchronous motor 4 rated voltage	0~1200V	0~1200	Depend on model
P14.05	Asynchronous motor 4 rated current	0.8~6000.0A	0.8~6000.0	Depend on model
P14.06	Asynchronous motor 4 stator resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model
P14.07	Asynchronous motor 4 rotor resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model
P14.08	Asynchronous motor 4 leakage inductance	0.01~655.35mH	0.01~655.35	Depend on model
P14.09	Asynchronous motor 4 mutual inductance	0.01~655.35mH	0.01~655.35	Depend on model
P14.10	Asynchronous motor 4 non-load current	0.1~6553.5A	0.1~6553.5	Depend on model
P14.11	Magnetic saturation coefficient 1 for the iron core of AM 4	0.0~100.0%	0.0~100.0	88%
P14.12	Magnetic saturation coefficient 2 for the iron core of AM 4	0.0~100.0%	0.0~100.0	81%
P14.13	Magnetic saturation coefficient 3 for the iron core of AM 4	0.0~100.0%	0.0~100.0	75%
P14.14	Magnetic saturation coefficient 4 for the iron core of AM 4	0.0~100.0%	0.0~100.0	50%
P14.15	Synchronous motor 4 rated power	0.1~3000.0kW	0.1~3000.0	Depend on model
P14.16	Synchronous motor 4 rated frequency	0.01Hz~P00.03 (Max frequency)	0.01~P00.03	50.00Hz
P14.17	Synchronous motor 4 pole pairs	1~50	1~50	2
P14.18	Synchronous motor 4 rated voltage	0~1200V	0~1200	Depend on model

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P14.19	Synchronous motor 4 rated current	0.8~6000.0A	0.8~6000.0	Depend on model
P14.20	Synchronous motor 4 stator resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model
P14.21	Synchronous motor 4 direct axis inductance	0.01~655.35mH	0.01~655.35	Depend on model
P14.22	Synchronous motor 4 quadrature axis inductance	0.01~655.35mH	0.01~655.35	Depend on model
P14.23	Synchronous motor 4 back EMF constant	0~10000V	0~10000	300
P14.24	Synchronous motor 4 initial magnetic pole position	0.00~359.99	0.00~359.99	0.00
P14.25	Synchronous motor 4 magnetic pole position amplitude gain	0.50~1.50	0.50~1.50	1.00
P14.26	Synchronous motor 4 C phase magnetic pole position offset	0~9999	0~9999	2230
P14.27	Synchronous motor 4 D phase magnetic pole position offset	0~9999	0~9999	2230
P14.28	Synchronous motor 4 motor1 current identification(Reserved)	0%~50% (Motor rated current)	0~50	10%
P14.29	Synchronous motor 4 overload protection	0: No protection 1: Common motor (with low speed compensation) 2: Frequency conversion motor (without low speed compensation)	0~2	2
P14.30	Synchronous motor 4 overload protection coefficient	20.0%~120.0%	20.0~120.0	100.0%
P14.31	Synchronous motor 4 parameter display	0: Display according to motor type 1: Display all parameters	0~1	0

For the parameter settings of synchronous motor 4, refer to the settings of synchronous motor 1 in P02 group.

P15 Group Synchronous motor control

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P15.00	Reduction factor of source current	0.0%~100.0% (Motor rated current)	0.0~100.0	80.0%

Set the reduction factor of source current for the inverter.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P15.01	Detection means of initial magnetic pole	0: Source current 1: High frequency superposition (Reserved) 2: Pulse superposition	0~2	0

Set the detection means of initial magnetic pole.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P15.02	Source current 1	0.0%~100.0% (Motor rated current)	0.0~100.0	20.0%

The source current is the orientated current of magnetic pole position and the source current 1 is valid at the lower limit of the frequency shifting point of source current. If it is necessary to increase the starting torque, please enlarge the value.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P15.03	Source current 2	0.0%~100.0% (Motor rated current)	0.0~100.0	10.0%

The source current is the orientated current of magnetic pole position and the source current 2 is valid at the upper limit of the frequency shifting point of source current. There is no need to change the value.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P15.04	Shifting frequency of source current	0.0%~80.0% (Rated frequency)	0.0~80.0	20.0%

Valid frequency shifting points between source current 1 and 2

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P15.05	High frequency superposition (Reserved)	200Hz~1000Hz	200~1000	500Hz
P15.06	Pulse superposition voltage	0.0~150.0% (Motor rated voltage)	0.0~150.0	50.0%

When P15.01=2, it is the pulse superposition voltage.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P15.08	Control parameter 1	0~FFFF	0~FFFF	0
P15.09	Control parameter 2	0~50.00	0~50.00	2.00

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P15.11	Maladjustment detection time	0.0~10.0s	0.0~10.0	0.5s

Adjust to prevent the responsivity of maladjustment function. Due to large load inertia, it is necessary to enlarge the value. However, the responsivity will become slow.

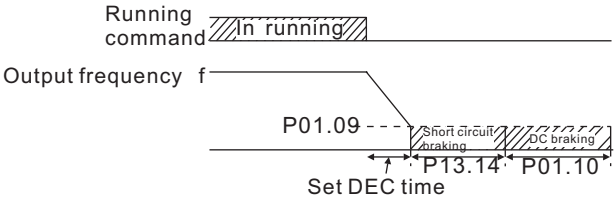
Function code	Name	Detailed instruction of parameters	Setting range	Default value
P15.12	High frequency compensation coefficient	0~100.0%	0~100.0	0.0%

If the motor runs at the rated speed, the parameter is effective. If an oscillation happens, please adjust the parameter.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P15.13	Short circuit braking current	0.0~150.0% (Inverter)	0.0~150.0	0.0%
P15.14	Braking retention time before starting	0.0~50.0s	0.0~50.0	0.0s
P15.15	Braking retention time when stopping	0.0~50.0s	0.0~50.0	0.0s

When P01.00=0 during the starting of the inverter, set P15.14 to the non-zero value and enter into short circuit braking.

When the running frequency is lower than P01.09 during the stopping of the inverter, set P13.15 to the non-zero value and enter into short circuit braking. After that, carry out DC braking at the time set in P01.12.



P16 Group Encoders

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P16.00	Encoder type	0: Increment encoder 1: UVW encoder 2: SIN/COS encoder 3: Rotary encoder	0~3	0

Select the encoder type.

Note: It is necessary to select the optional card.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P16.01	Encoder pulse number	0~8192	0~8192	1024

Set the encoder pulse number per each rotation.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P16.02	Encoder direction	LED ones: AB direction 0: Forward 1: Reverse LED tens: Z pulse direction 0: Forward 1: Reverse LED hundreds: UVW direction 0: Forward 1: Reverse	LED ones: 0~1 LED tens: 0~1 LED hundreds: 0~1	0x000

Note: Please set the encoder pulse number correctly under the close loop vector control mode (P16.01); otherwise, the motor will not run properly. If it still cannot run properly after parameter setting of the encoder, change the encoder direction (P16.02).

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P16.03	Encoder offline detection time	0.0~100.0s	0.0~100.0	1.0s
P16.04	Encoder reverse detection time	0.0~100.0s	0.0~100.0	1.0s
P16.05	Encoder detection filter times	Bit0~3: Low-speed filter times Bit4~7: High-speed filter times	0~0x99	0x33

P16.03 defines encoder offline detection time. When the offline time exceeds the set time, the inverter will alarm encoder offline fault (ENCIO). When the reverse detection time exceeds the set time, the inverter will alarm encoder reverse fault (ENCID).

Note: Adjusting above parameters will influence the flexibility of encoder fault protection and sometimes abnormal actions may occur, so adjust carefully.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P16.06	Speed ratio between motor and encoder	0.000~65.535	0~65.535	1.000

Set the speed ratio between motor and encoder according to actual conditions.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P16.07	Synchronous motor control	Bit0: Z pulse check enabling Bit1: Encoder angle check enabling Bit2: SVC speed detection enabling Bit3: Rotary speed detection mode Bit4: Z pulse capture mode Bit12: Z pulse arrival signal at stop Bit15: 0: Without Z pulse autotuning 1: With Z pulse autotuning	0~0xFFFF	3
P16.08	Z pulse initial angle	0.00~359.99	0.00~359.99	0.00

Define the Z pulse initial angle.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P16.09	Z pulse offline detection enabling	0: Disabled 1: Enabled	0~1	0

Enable the function of Z pulse offline detection.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P16.10	Magnetic pole initial angle autotuning	1: Rotation autotuning 2: Static autotuning (suitable for rotary encoder feedback) (Reserved)	0~2	0

After P16.10 is set to 1 or 2, the keypad will display "-RUN-". Press the "RUN" key to enter magnetic pole initial angle autotuning. The autotuning will be over until the keypad displays "-END-".

When the encoder is the SIN/COS encoder or rotary encoder (P16.00=2 or 3): for motor 1, autotune P02.24 and P16.08; for motor 2, autotune P12.24 and P16.08; for motor 3, autotune P13.24 and P16.08; for motor 4, autotune P14.24 and P16.08.

When the encoder is the UVW encoder (P16.00=1): for motor 1, autotune P02.24 and P16.17; for motor 2, autotune P12.24 and P16.17; for motor 3, autotune P13.24 and P16.17; for motor 4, autotune P14.24 and P16.17.

In rotary autotuning, the magnetic pole initial angle is accurate. When adopting rotary autotuning, decouple the load of the motor.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P16.11	Encoder actual measured frequency	Display encoder actual measured frequency -3276.8~3276.7Hz	-3276.8~3276.7	0.0Hz
P16.12	Encoder position count value	Display encoder position count value 0~65535	0~65535	0
P16.13	Encoder Z pulse count value	Display encoder Z pulse count value 0~65535	0~65535	0
P16.14	Value of rotor identification	Display the value of rotor identification 0.0000~6.5535Ω	0.0000~6.5535	0.0000Ω
P16.15	Z pulse angle of synchronous motor	Display corresponding magnetic pole angle of Z pulse 0.00~359.99	0.00~359.99	0.00
P16.16	UVW signal state	Display the current UVW signal state 0~65535	0~65535	0
P16.17	U pulse initial angle	0.00~359.99	0.00~359.99	0.00

P17 Group Monitoring functions

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P17.00	Set frequency	Display current set frequency of the inverter. 0.00Hz~P00.03	0.00~P00.03	0.00Hz
P17.01	Output frequency	Display current output frequency of the inverter. 0.00Hz~P00.03	0.00~P00.03	0.00Hz
P17.02	Ramp reference frequency	Display current ramp reference frequency of the inverter. 0.00Hz~P00.03	0.00~P00.03	0.00Hz
P17.03	Output voltage	Display current output voltage of the inverter. 0~1200V	0~1200	0V
P17.04	Output current	Display current output current of the inverter. 0.0~5000.0A	0.0~5000.0	0.0A
P17.05	Motor speed	Display current motor speed. 0~65535RPM	0~65535	0 RPM
P17.06	Torque current	Display current torque current of the inverter. 0.0~5000.0A	0.0~5000.0	0.0A
P17.07	Exciting current	Display current exciting current of the inverter. 0.0~5000.0A	0.0~5000.0	0.0A
P17.08	Motor power load coefficient	Display current motor power. 100% corresponds to motor rated power, positive value for electromotion state, negative value for power generation state. -300.0~300.0% (Relative to motor rated power)	-300.0~300.0	0.0%
P17.09	Output torque load coefficient	Display current output torque of the inverter. 100% corresponds to motor rated torque, positive value for electromotion state, negative value for power generation state. -250.0~250.0%	-250.0~250.0	0.0%
P17.10	Evaluated motor frequency	Display the evaluated rotor frequency under open loop vector control. 0.00~ P00.03	0.00~P00.03	0.00Hz
P17.11	DC bus voltage	Display current DC bus voltage of the inverter. 0.0~2000.0V	0.0~2000.0	0V
P17.12	ON-OFF input terminal state	Display current ON-OFF input terminal state of the inverter. 0000~FFFF	0000~FFFF	0
P17.13	ON-OFF output terminal state	Display current ON-OFF output terminal state of the inverter. 0000~FFFF	0000~FFFF	0
P17.14	Digital adjustment	Display the digital adjustment of the	0.00~ P00.03	0.00Hz

Function code	Name	Detailed instruction of parameters	Setting range	Default value
		inverter. 0.00Hz~P00.03		
P17.15	Torque reference	Display the torque reference, relative to the percentage of current rated torque of the motor. -300.0%~300.0% (Motor rated current)	-300.0~300.0	0.0%
P17.16	Linear speed	Display current linear speed of the inverter. 0~65535	0~65535	0
P17.17	Length (Reserved)	Display current inverter length. 0~65535	0~65535	0
P17.18	Count value	Display current count value of the inverter. 0~65535	0~65535	0
P17.19	AI1 input voltage	Display AI1 input voltage. 0.00~10.00V	0.00~10.00	0.00V
P17.20	AI2 input voltage	Display AI2 input voltage. 0.00~10.00V	0.00~10.00	0.00V
P17.21	AI3 input voltage	Display AI3 input voltage. -10.00~10.00V	-10.00~10.00V	0.00V
P17.22	S8 input frequency	Display S8 input frequency when S8 is pulse input. 0.00~50.00kHz	0.00~50.00	0.00 kHz
P17.23	PID reference	Display PID reference. -100.0~100.0%	-100.0~100.0	0.0%
P17.24	PID feedback	Display PID feedback. -100.0~100.0%	-100.0~100.0	0.0%
P17.25	Power factor of the motor	Display current power factor of the motor. -1.00~1.00	-1.00~1.00	0.0
P17.26	Current running time	Display current running time of the inverter. 0~65535m	0~65535	0m
P17.27	Simple PLC and current step of multi-step speed	Display simple PLC and current step of multi-step speed. 0~15	0~15	0
P17.28	ASR controller output	Display ASR controller output in vector control mode, relative to the percentage of motor rated torque. -300.0%~300.0% (Motor rated current)	-300.0~300.0	0.0%
P17.29	Synchronous motor magnetic pole angle	Display the synchronous motor magnetic pole angle. 0.0~360.0	0.0~360.0	0.0
P17.30	Synchronous motor phase compensation	Display the synchronous motor phase compensation. -180.0~180.0	-180.0~180.0	0.0

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P17.31	Synchronous motor high-frequency superposition current	Display the synchronous motor high-frequency superposition current. 0.0%~200.0% (Motor rated current)	0.0~200.0	0.0
P17.32	Magnetic flux linkage	Display the magnetic flux linkage of the motor. 0.0%~200.0%	0.0~200.0	0.0%
P17.33	Exciting current reference	Display the exciting current reference in vector control mode. -3000.0~3000.0A	-3000.0~3000.0	0.0A
P17.34	Torque current reference	Display the torque current reference in vector control mode. -3000.0~3000.0A	-3000.0~3000.0	0.0A
P17.35	AC incoming current	Display the AC incoming current. 0.0~5000.0A	0.0~5000.0	0.0A
P17.36	Output torque	Display the output torque, positive value for electromotion state, negative value for power generation state. -3000.0Nm~3000.0Nm	0~65535	0.0Nm
P17.37	Count value of motor overload	Display the count value of motor overload 0~100 (100 reports OL1 fault.)	0~100	0
P17.38	Fault code	Display current fault code. 0~65535	0~65535	0
P17.39	DP command	Display DP command. 0~65535	0~65535	0
P17.40	Reserved			
P17.41	Reserved			
P17.42	Motor temperature	Display the motor temperature. -200.0~200.0°C	-200.0~200.0	0.0°C
P17.43	Frequency of the external master	Display the frequency of the external master. 0.00Hz~P00.03	0.00~P00.03	0.00Hz
P17.44	Torque of the external master	Display current motor power.100% corresponds to motor rated current, positive value for electromotion state, negative value for power generation state. -300.0%~300.0% (Motor rated current)	-300.0~300.0	0.0%
P17.45	Command of the external master	Display the command of the external master. 0~65535	0~65535	0
P17.46	Torque tracing frequency	Display the torque tracing frequency. -3276.7~3276.7Hz	-3276.7~3276.7	0.0Hz

P18 Group Unit state

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P18.00	Unit 1 current	Display the valid current of unit 1. 0.0~2000.0A	0.0~2000.0	0.0A
P18.01	Unit 1 bus voltage	Display the sampling DC current of unit 1. 0.0~2000.0V	0.0~2000.0	0V
P18.02	Unit 1 rectifier bridge temperature	Display the rectifier bridge temperature of inverter unit 1. 0~100.0°C	0~100.0	0.0°C
P18.03	Unit 1 IGBT temperature	Display the IGBT temperature of inverter unit 1. 0~100.0°C	0~100.0	0.0°C
P18.05	Unit 1 fault code	Display the fault code of inverter unit 1, each bit corresponding to one fault. 0x00~0xFFFF	0x0000~0xFFFF	0x0000
P18.08	Unit 1 DSP version	Display the software version of inverter unit 1. 1.00~655.35	1.00~655.35	1.00
P18.09	Unit 1 FPGA version	Display the software version of inverter unit 1. 1.00~655.35	1.00~655.35	1.00

Display the state of unit 1.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P18.10	Unit 2 current	Display the valid current of unit 2. 0.0~2000.0A	0.0~2000.0	0.0A
P18.11	Unit 2 bus voltage	Display the sampling DC current of unit 2. 0.0~2000.0V	0.0~2000.0	0V
P18.12	Unit 2 rectifier bridge temperature	Display the rectifier bridge temperature of inverter unit 2. 0~100.0°C	0~100.0	0.0°C
P18.13	Unit 2 IGBT temperature	Display the IGBT temperature of inverter unit 2. 0~100.0°C	0~100.0	0.0°C
P18.15	Unit 2 fault code	Display the fault code of inverter unit 2, each bit corresponding to one fault. 0x00~0xFFFF	0x0000~0xFFFF	0x0000
P18.18	Unit 2 DSP version	Display the software version of inverter unit 2. 1.00~655.35	1.00~655.35	1.00
P18.19	Unit 2 FPGA version	Display the software version of inverter unit 2. 1.00~655.35	1.00~655.35	1.00

Display the state of unit 2.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P18.20	Unit 3 current	Display the valid current of unit 3. 0.0~2000.0A	0.0~2000.0	0.0A

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P18.21	Unit 3 bus voltage	Display the sampling DC current of unit 3. 0.0~2000.0V	0.0~2000.0	0V
P18.22	Unit 3 rectifier bridge temperature	Display the rectifier bridge temperature of inverter unit 3. 0~100.0°C	0~100.0	0.0°C
P18.23	Unit 3 IGBT temperature	Display the IGBT temperature of inverter unit 3. 0~100.0°C	0~100.0	0.0°C
P18.25	Unit 3 fault code	Display the fault code of inverter unit 3, each bit corresponding to one fault. 0x00~0xFFFF	0x0000~0xFFFF	0x0000
P18.28	Unit 3 DSP version	Display the software version of inverter unit 3. 1.00~655.35	1.00~655.35	1.00
P18.29	Unit 3 FPGA version	Display the software version of inverter unit 3. 1.00~655.35	1.00~655.35	1.00

Display the state of unit 3.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P18.30	Unit 4 current	Display the valid current of unit 4. 0.0~2000.0A	0.0~2000.0	0.0A
P18.31	Unit 4 bus voltage	Display the sampling DC current of unit 4. 0.0~2000.0V	0.0~2000.0	0V
P18.32	Unit 4 rectifier bridge temperature	Display the rectifier bridge temperature of inverter unit 4. 0~100.0°C	0~100.0	0.0°C
P18.33	Unit 4 IGBT temperature	Display the IGBT temperature of inverter unit 4. 0~100.0°C	0~100.0	0.0°C
P18.35	Unit 4 fault code	Display the fault code of inverter unit 4, each bit corresponding to one fault. 0x00~0xFFFF	0x0000~0xFFFF	0x0000
P18.38	Unit 4 DSP version	Display the software version of inverter unit 4. 1.00~655.35	1.00~655.35	1.00
P18.39	Unit 4 FPGA version	Display the software version of inverter unit 4. 1.00~655.35	1.00~655.35	1.00

Display the state of unit 4.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P18.40	Unit 5 current	Display the valid current of unit 5. 0.0~2000.0A	0.0~2000.0	0.0A
P18.41	Unit 5 bus voltage	Display the sampling DC current of unit 5. 0.0~2000.0V	0.0~2000.0	0V
P18.42	Unit 5 rectifier bridge temperature	Display the rectifier bridge temperature of inverter unit 5. 0~100.0°C	0~100.0	0.0°C

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P18.43	Unit 5 IGBT temperature	Display the IGBT temperature of inverter unit 5. 0~100.0°C	0~100.0	0.0°C
P18.45	Unit 5 fault code	Display the fault code of inverter unit 5, each bit corresponding to one fault. 0x00~0xFFFF	0x0000~0xFFFF	0x0000
P18.48	Unit 5 DSP version	Display the software version of inverter unit 5. 1.00~655.35	1.00~655.35	1.00
P18.49	Unit 5 FPGA version	Display the software version of inverter unit 5. 1.00~655.35	1.00~655.35	1.00

Display the state of unit 5.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P18.50	Unit 6 current	Display the valid current of unit 6. 0.0~2000.0A	0.0~2000.0	0.0A
P18.51	Unit 6 bus voltage	Display the sampling DC current of unit 6. 0.0~2000.0V	0.0~2000.0	0V
P18.52	Unit 6 rectifier bridge temperature	Display the rectifier bridge temperature of inverter unit 6. 0~100.0°C	0~100.0	0.0°C
P18.53	Unit 6 IGBT temperature	Display the IGBT temperature of inverter unit 6. 0~100.0°C	0~100.0	0.0°C
P18.55	Unit 6 fault code	Display the fault code of inverter unit 6, each bit corresponding to one fault. 0x00~0xFFFF	0x0000~0xFFFF	0x0000
P18.58	Unit 6 DSP version	Display the software version of inverter unit 6. 1.00~655.35	1.00~655.35	1.00
P18.59	Unit 6 FPGA version	Display the software version of inverter unit 6. 1.00~655.35	1.00~655.35	1.00

Display the state of unit 6.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P18.60	Factory valid unit	Display the factory valid unit. 0x00~0x3F	0x00~0x3F	0x00
P18.61	Unit rated power	Display unit rated power. 0.1~3000.0kW	0.1~3000.0	0.1kW
P18.62	Unit rated current	Display unit rated current. 0.0~2000.0A	0.0~2000.0	0.0A
P18.63	FPGA version of main control board	Display the FPGA version of master control board. 1.00~655.35	1.00~655.35	1.00

P19 Group Fault information

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P19.00	Current fault type	0: No fault 1~3: Reserved 4: ACC overcurrent (OC1) 5: DEC overcurrent (OC2) 6: Constant speed overcurrent (OC3) 7: ACC overvoltage (OV1) 8: DEC overvoltage (OV2) 9: Constant speed overvoltage (OV3) 10: Bus undervoltage (LV) 11: Motor overload (OL1) 12: Inverter overload (OL2) 13: Input side phase loss (SPI) 14: Output side phase loss (SPO) 15: Reserved 16: Reserved 17: External fault (EF) 18: 485 communication fault (E_485) 19: Current detection fault (ItE) 20: Motor autotuning fault (tE) 21: EEPROM operation fault (EEP) 22: PID feedback offline fault (PIdE) 23: Braking unit fault (bCE) 24: Running time arrival (ENd) 25: Electronic overload (OL3) 26: Keypad communication error (PCE) (Reserved) 27: Parameter uploading fault (UPE) 28: Parameter downloading fault (DNE) 29: PROFIBUS communication fault (E_dP) 30: Ethernet communication fault (E_NEt) 31: CANopen communication fault (E_CAN) 32: Grounding short circuit fault 1 (EtH1) (Reserved) 33: Reserved 34: Speed deviation fault (dEU) 35: Maladjustment (STE) 36: Underload fault (LL) 37: Encoder offline fault (ENC1o) 38: Encoder reverse fault (ENC1d)		
P19.01	Previous fault type			
P19.02	Previous 2 fault type			
P19.03	Previous 3 fault type			
P19.04	Previous 4 fault type			
P19.05	Previous 5 fault type			

Function code	Name	Detailed instruction of parameters	Setting range	Default value
		39: STO fault (E_STo) 40: Braking action fault (FAE) 41: Master-slave communication fault (E_ASC) 42: Slave fault (E_SLE) 43: DSP and FPGA communication fault (dF_CE) 44: Control power failure (CPoE) 45: Motor overheat (oH) 46: Torque verification fault (tCE) Unit fault: m.n m.01: No. m U-phase Vce detection fault (m. oUt1) m.02: No. m V-phase Vce detection fault (m. oUt2) m.03: No. m W-phase Vce detection fault (m. oUt3) m.04: No. m hardware overcurrent (m.oC) m.05: No. m current detection fault (m.ItE) m.06: No. m current unbalance (m.IbC) m.07: No. m rectifier bridge overheat (m.oH1) m.08: No. m IGBT overheat (m.oH2) m.09: No. m fan overheat (m.EF1) m.10: No. m filter unit overheat (m.EF2) m.11: No. m inverter unit input phase loss (m.EF3) m.12: No. m bus overvoltage (m.oV) m.13: No. m bus undervoltage (m.Lv) m.14: No. m down communication fault (m.dn_C) m.15: No. m up communication fault (m.UP_C) m.16: No. m power failure (m.PEr)		

Display the fault codes of the inverter. Refer to the fault analysis for detailed information.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P19.06	Running frequency at current fault			0.00Hz

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P19.07	Ramp reference frequency at current fault			0.00Hz
P19.08	Output voltage at current fault			0V
P19.09	Output current at current fault			0.0A
P19.10	Bus voltage at current fault			0.0V
P19.11	The Max temperature at current fault			0.0°C
P19.12	Input terminal state at current fault			0
P19.13	Output terminal state at current fault			0

Display the states at current fault.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P19.14	Running frequency at previous fault			0.00Hz
P19.15	Ramp reference frequency at previous fault			0.00Hz
P19.16	Output voltage at previous fault			0V
P19.17	Output current at previous fault			0.0A
P19.18	Bus voltage at previous fault			0.0V
P19.19	The Max temperature at previous fault			0.0°C
P19.20	Input terminal state at previous fault			0
P19.21	Output terminal state at previous fault			0

Display the states at previous fault.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P19.22	Running frequency at previous 2 fault			0.00Hz

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P19.23	Ramp reference frequency at previous 2 fault			0.00Hz
P19.24	Output voltage at previous 2 fault			0V
P19.25	Output current at previous 2 fault			0.0A
P19.26	Bus voltage at previous 2 fault			0.0V
P19.27	The highest temperature at previous 2 fault			0.0°C
P19.28	Input terminal state at previous 2 fault			0
P19.29	Output terminal state at previous 2 fault			0

Display the states at previous 2 fault.

P20 Group Serial communication

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P20.00	Local communication address	1~247, 0 is broadcast communication address	1~247	1

When the master is at write frame and the communication address of the slave is set to 0 (broadcast communication address), all the slaves of the MODBUS will accept the frame without response.

Local communication address is unique in communication network and it is the foundation to achieve point-to-point communication between the upper computer and inverter.

Note: The address of the slave cannot be set to 0.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P20.01	Communication baud rate	0: 1200BPS 1: 2400BPS 2: 4800BPS 3: 9600BPS 4: 19200BPS 5: 38400BPS	0~5	4

Set the data baud rate between the upper computer and inverter.

Note: The baud rates set by the upper computer and inverter should agree with each other; otherwise, the communication is disabled. The larger the baud rate is, the faster the communication is.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P20.02	Data bit checkout	0: No check (N, 8, 1) for RTU 1: Even check (E, 8, 1) for RTU 2: Odd check (O, 8, 1) for RTU 3: No check (N, 8, 2) for RTU 4: Even check (E, 8, 2) for RTU 5: Odd check (O, 8, 2) for RTU	0~5	1

The data formats set by the upper computer and inverter should agree with each other; otherwise, the communication is disabled.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P20.03	Communication response delay	0~200ms	0~200	5

The function code refers to the interval when the inverter receives data and sends response to the upper computer. If the response delay is shorter than the processing time, take the processing time as the standard. If the response delay is longer than the processing time, delay and wait to send data to the upper computer until the response delay arrival after the system finishes processing data.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P20.04	Fault time of communication timeout	0.0 (invalid), 0.1~60.0s	0.0~60.0	0.0s

When the function code is set to 0.0, the parameter will be invalid.

When the function code is set to non-zero and the interval between the current and next communication exceeds the communication timeout, the system will alarm 485 communication fault (E_485). Generally, set the parameter to be invalid. The parameter setting can monitor communication state in continous communication system.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P20.05	Transmission fault processing	0: Alarm and coast to stop 1: Continue to run without alarm 2: Stop according to stop way without alarm (only in communication control mode) 3: Stop according to stop way without alarm (in all control modes)	0~3	0

Set the processing ways for transmission fault.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P20.06	Communication processing action	LED ones: 0: With response to write operation 1: Without response to write operation LED tens: 0: Communication encryption setting is invalid 1: Communication encryption setting is valid	LED ones: 0~1 LED tens: 0~1	0x00

Select communication processing actions.

LED ones:

0: With response to write operation: there are responses to write and read commands of the upper computer.

1: Without response to write operation: there is response only to read command and no response to the write command, which can improve the communication efficiency.

LED tens:

0: Communication encryption setting is invalid;

1: Communication encryption setting is valid.

P21 Group PROFIBUS/CANopen function

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P21.00	Module type	0: PROFIBUS/CANopen 1: Reserved	0~1	0

Select the communication protocol.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P21.01	PROFIBUS/ CANopen module address	0~127	0~127	2

The function code is used to identify the address of the inverter during serial communication.

Note: 0 is the broadcast address only for receiving and carrying out broadcast command of upper computer rather than response.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P21.02	PZD2 receiving	0: Invalid 1: Set frequency 2: PID reference 3: PID feedback 4: Torque set value 5: Set value of forward rotation upper-limit frequency 6: Set value of reverse rotation upper-limit frequency 7: Electromotion torque upper limit 8: Braking torque upper limit 9: Virtual input terminal command 10: Virtual output terminal command 11: Voltage set value (special for V/F separation) 12: AO output set value 1 13: AO output set value 2 14: External ACC time 15: External DEC time 16: Pre-torque setting 17~20: Reserved	0~20	0
P21.03	PZD3 receiving		0~20	0
P21.04	PZD4 receiving		0~20	0
P21.05	PZD5 receiving		0~20	0
P21.06	PZD6 receiving		0~20	0
P21.07	PZD7 receiving		0~20	0
P21.08	PZD8 receiving		0~20	0
P21.09	PZD9 receiving		0~20	0
P21.10	PZD10 receiving		0~20	0
P21.11	PZD11 receiving		0~20	0
P21.12	PZD12 receiving		0~20	0

For the second PZD in PROFIBUS-DP communication and master communication (receiving), see detailed information as follows:

Function code	Name	Illustration
0	Invalid	
1	Set frequency	0~Fmax (Unit: 0.01Hz)
2	PID reference	0~1000, 1000 corresponding to100.0%
3	PID feedback	0~1000, 1000 corresponding to100.0%
4	Torque set value	-3000~3000, 1000 corresponding to 100.0% motor rated current
5	Set value of forward rotation upper-limit	0~Fmax (Unit: 0.01Hz)

Function code	Name	Illustration
	frequency	
6	Set value of reverse rotation upper-limit frequency	0~Fmax (Unit: 0.01Hz)
7	Electromotion torque upper limit	0~3000, 1000 corresponding to100.0% motor rated current
8	Braking torque upper limit	0~2000, 1000 corresponding to100.0% motor rated current
9	Virtual input terminal command	0x000~0x0FF
10	Virtual output terminal command	0x00~0x3F
11	Voltage set value	Special for V/F separation, Range(0~1000, 1000 corresponding to100.0% motor rated voltage)
12	AO output set value 1	-1000~1000, 1000 corresponding to100.0%
13	AO output set value 2	-1000~1000, 1000 corresponding to100.0%
14	External ACC time	0~3600.0s
15	External DEC time	0~3600.0s
16	Pre-torque setting	-100.0%~100.0%
17~20	Reserved	

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P21.13	PZD2 sending	0: Invalid 1: Running frequency 2: Set frequency 3: Bus voltage 4: Output voltage 5: Output current 6: Output torque actual value 7: Output power actual value 8: Running rotating speed 9: Running linear speed 10: Ramp reference frequency 11: Fault code 12: AI1 value 13: AI2 value 14: AI3 value 15: Reserved 16: Reserved 17: S8 frequency 18: PG card speed (with sign) 19: Input state of terminals 20: Output state of terminals 21: PID reference 22: PID feedback 23: Motor rated torque	0~23	0
P21.14	PZD3 sending		0~23	0
P21.15	PZD4 sending		0~23	0
P21.16	PZD5 sending		0~23	0
P21.17	PZD6 sending		0~23	0
P21.18	PZD7 sending		0~23	0
P21.19	PZD8 sending		0~23	0
P21.20	PZD9 sending		0~23	0
P21.21	PZD10 sending		0~23	0
P21.22	PZD11 sending		0~23	0
P21.23	PZD12 sending		0~23	0

For the second PZD in PROFIBUS-DP communication and master communication (sending), see detailed information as follows:

Function code	Name	Illustration
0	Invalid	
1	Running frequency	0~40000 (Unit: 0.01Hz)
2	Set frequency	0~40000 (Unit: 0.01Hz)
3	Bus voltage	0~15000 (Unit: 0.1V)
4	Output voltage	0~1200 (Unit: 1V)
5	Output current	0~65535 (Unit: 0.1A)
6	Output torque actual value	-3000~3000 (Unit: 0.1%)
7	Output power actual value	-32767~32767 (Unit: 0.1kW), negative value for power generation state
8	Running rotating speed	0~65535 (Unit: 0.1RPM)
9	Running linear speed	0m/s~10000m/s (Unit: 0.1/s)
10	Ramp reference frequency	0~40000 (Unit: 0.01Hz)
11	fault code	0~700 (Hundreds for unit number)
12	AI1 value	-1000~1000 (0.01V)
13	AI2 value	-1000~1000 (0.01V)
14	AI3 value	-1000~1000 (0.01V)
15	Reserved	Reserved
16	Reserved	Reserved
17	S8 frequency	0~5000 (0.01kHz)
18	PG card speed (with sign)	-32768~32767 (0.1Hz)
19	Input state of terminals	0~0xFFFF
20	Output state of terminals	0~0xFFFF
21	PID reference	0~1000 (0.1%)
22	PID feedback	0~1000 (0.1%)
23	Motor rated torque	0.0~6553.5 (0.1N.m)

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P21.24	Temporary variable	0~65535	0~65535	0

The function code is use as the temporary variable when PZD sends data.

The function code P12.24 is enabled to write at any state.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P21.25	Fault time of DP communication timeout	0.0: Invalid 0.1~60.0s	0.0~60.0	0.0s

When the function code is set to 0.0s, the fault time of communication timeout will be invalid.

When the function code is set to non-zero (Actual value, unit: second) and the interval between the current and next communication exceeds the communication timeout, the system will alarm DP communication fault (E-dP).

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P21.29	CANopen baud rate	0: 1000k 1: 800k 2: 500k 3: 250k 4: 125k 5: 100k 6: 50k 7: 20k	0~7	2

The parameter is used to set the data baud rate between two inverters with CANopen bus.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P21.30	Fault time of CANopen communication timeout	0.0 (invalid) 0.1~100.0s	0.1~100.0	0.0s

When the function code=0.0s, the communication timeout fault will be invalid.

When the function code=non-zero and the interval between the current and next communication exceeds the communication timeout, the system will alarm communication fault (E-CAN). Generally, set the parameter to be invalid. The parameter setting can monitor the state in continous communication system.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P21.32	External ACC/DEC time enabling	0: Disabled 1: Enabled	0~1	0

0: Disabled

1: Enabled: When external ACC/DEC time (14 and 15 of P21.02~P21.12) is larger than set ACC/DEC time, choose external ACC/DEC time for the system.

P22 Group Ethernet function

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P22.00	Ethernet communication speed setting	0: Self-adapting 1: 100M full-duplex 2: 100M half-duplex 3: 10M full-duplex 4: 10M half-duplex	0~4	0

The function code is used for Ethernet communication speed setting. Generally, select the default value.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P22.01	IP address 1	0~255	0~255	192
P22.02	IP address 2	0~255	0~255	168
P22.03	IP address 3	0~255	0~255	0
P22.04	IP address 4	0~255	0~255	1
P22.05	Subnet mask 1	0~255	0~255	255
P22.06	Subnet mask 2	0~255	0~255	255
P22.07	Subnet mask 3	0~255	0~255	255
P22.08	Subnet mask 4	0~255	0~255	0

The function codes are used to set the IP addresses and subnet masks for Ethernet communication.

IP address format: P22.01.P22.02.P22.03.P22.04

For example: IP address is 192.168.0.1.

Subnet mask format: P22.05.P22.06.P22.07.P22.08

For example: Subnet mask is 255.255.255.0.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P22.09	Gateway 1	0~255	0~255	192
P22.10	Gateway 2	0~255	0~255	168
P22.11	Gateway 3	0~255	0~255	1
P22.12	Gateway 4	0~255	0~255	1

Set the gateway for Ethernet communication.

P23 Group Master-slave control

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P23.00	Master-slave control mode	0: Invalid 1: The local is the master. 2: The local is the slave. 3~4: Reserved	0~4	0

Select the master-slave control mode.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P23.01	Master-slave communication data	0: Optical communication power balance 1: Optical communication expansion 2: Reserved	0~2	0

Select the master-slave communication data.

0: Optical communication power balance: the mode is generally used for loaded rigid connection and it can keep the output current of the master and slave the same.

1: Optical communication expansion: the mode can expand the power capacity of the inverter.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P23.02	Data sent from master to slave enabling	0: Disabled 1: Enabled	0~1	0

Enable the master to send data to the slave. When the function code is valid (P23.02=1), the master will send data to the slave.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P23.03	Reference signal sent from master to slave	0: Output torque of the master 1: Output current of the master	0~1	0

0: Output torque of the master

The reference signal from the master to the slave is the output torque signal of the master.

1: Output current of the master

The reference signal from the master to the slave is the output current signal of the master.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P23.04	Running channel of the slave	0: Internal channel of the master 1: P00.01 is valid	0~1	0

Select the running channel of the slave.

0: Internal channel of the master: the running channel of the slave is determined by the master.

1: P00.01 is valid: the running channel of the slave is set by P00.01.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P23.05	Reference frequency gain of the slave	0.01~100.00	0.01~100.00	1.00

In master-slave control, reference frequency gain of the slave = frequency of the master×P23.05, which facilitates the user to adjust the speed between the master and the slave flexibly.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P23.06	Reference signal gain of the slave	0.01~100.00	0.01~100.00	1.00

In master-slave control, reference signal gain of the slave = signal of the master×P23.06, which facilitates the user to adjust the relationship between the master and the slave at different power flexibly.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P23.07	PID proportional coefficient of the slave	0.00~100.00	0.00~100.00	1.00
P23.08	PID integral coefficient of the slave	0.00~100.00	0.00~100.00	1.00

P23.07: PID proportional coefficient of the slave: the slave tracks the master to achieve power balance or synchronous speed. The larger the coefficient is, the faster the system adjusts, but too large coefficient will cause oscillation.

P23.08: PID integral coefficient of the slave: the slave tracks the master to achieve power balance or synchronous speed. The larger the coefficient is, the stronger the integral effect is, but too strong effect will cause oscillation.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P23.09	PID feature of the slave	0: Positive 1: Negative	0~1	0

Positive PID output: When the feedback signal is larger than PID reference, decrease the output frequency or torque of the inverter to achieve PID balance.

Negative PID output: When the feedback signal is larger than PID reference, increase the output frequency or torque of the inverter to achieve PID balance.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P23.10	PID output buffer time of the slave	0.000~10.000s	0.000~10.000	0.000s

PID output buffer time of the slave is to deal with the PID result by filter and prevent the impact from frequent jittering interference signals on the system. However, too long filter time will influence the flexibility of adjustment.

P24 Group Hoisting

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P24.00	Pre-torque input signal	0: Invalid 1: AI1 2: AI2 3: AI3 4: MODBUS communication 5: Reserved 6: PROFIBUS/CANopen communication 7: Internal reference 8~10: Reserved	0~10	0

Pre-torque input signal mainly used for pre-torque compensation can output the torque in accordance with load beforehand to avoid motor pulling back or slipping at starting and improve the starting hoisting comfort.

Note: Do not share the same analog input source between the pre-torque signal and the speed command (P00.01 and P00.02).

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P24.01	Pre-torque offset	-100.0~100.0%	-100.0~100.0	0.0%
P24.02	Drive side gain	0.000~7.000	0.000~7.000	1.000
P24.03	Braking side gain	0.000~7.000	0.000~7.000	1.000

When the mechanical hoisting starts, pre-torque output can achieve quickly-balanced load, reduce impact and improve the starting hoisting comfort. Only when P24.00=non-zero, will the pre-torque compensation function work.

For hoisting with additional weight, calculate the pre-torque offset which is used to compensate the impact from additional weight on pre-torque. For hoisting without additional weight, directly compensate at pre-torque.

Pre-torque compensation=K*(pre-torque input signal - pre-torque offset). During electromotion, K=P24.02. During power generation, K=P24.03. The pre-torque direction is determined by BIT0 bit of P24.04.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P24.04	Pre-torque direction and braking control	LED ones: 0: FWD pre-torque 1: REV pre-torque LED tens: 0: Invalid braking control 1: Valid braking control	LED ones: 0~1 LED tens: 0~1	0x00

Select the pre-torque direction and braking control.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P24.05	Brake release delay	0.000~5.000s	0.000~5.000	0.000s

Brake release delay means that the inverter starts from stop to run and the brake release command

outputs after delay of P24.05. Setting the parameter is to make the inverter enter into running state before opening brake, avoid motor slipping at starting and thus improve the comfort.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P24.06	Brake close frequency	0.00~50.00Hz	0.00~50.00	0.00Hz
P24.07	Brake close delay	0.000~5.000s	0.000~5.000	0.000s

Brake close delay refers to the delay when the output frequency of the inverter reaches P24.09 (brake close frequency) until the brake close command outputs. Setting the parameter is to improve the comfort at stop.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P24.08	Brake feedback detection time	0.000~20.000s	0.000~20.000	1.000s

When the selection of brake control is valid and on-off input terminal selects brake feedback detection, the inverter will alarm brake feedback fault (FAE) after the brake action error lasts over P24.08.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P24.09	Torque verification	0: Invalid 1: Judge by current percentage 2: Judge by torque percentage	0~2	0
P24.10	Keypad setting during torque verification	0.0~100.0% (Relative to motor rated current /rated torque, invalid at 0.0%)	0.0~100.0	0.0%
P24.11	Fault detection time during torque verification	0.000~10.000s	0.000~10.000	0.500s

Enable the functions of torque verification. When the output torque or current of the inverter (selected by P24.09) is smaller than P24.10 and the duration is longer than the fault detection time (P24.11) at running state, the inverter will stop due to torque verification fault and display the fault (TCE) on the keypad.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P24.12	Braking torque of snag protection	0.0%~300.0% (Motor rated current)	0.0~300.0	0.0%
P24.13	ACC/DEC time of braking torque	0.000~10.000s	0.000~10.000	0.200s
P24.14	End frequency of braking torque	0.00~30.00Hz	0.00~30.00	0.10Hz

Snag protection is used when the inverter outputs a reverse torque to make the motor stop fastest.

P24.12 is used to set the braking torque.

P24.13 is used to brake the ACC/DEC time. The smaller the value is, the faster the braking speed is. When the motor decreases its speed to reach the end frequency of braking torque (P24.14), the inverter will stop.

Note: The inverter also stops when the motor brakes toward reverse rotation.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P24.15	Safe limited speed frequency	0.00~30.00Hz	0.00~30.00	1.00Hz
P24.16	DEC time at safe limited speed	0.0~100.0s	0.0~100.0	2.0s

When the safe limited speed (SLS) is valid, the motor will decrease from current frequency to safe limited speed frequency and the DEC time is shown in P24.16.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P24.17	Safe stop 1 DEC time	0.0~100.0s	0.0~100.0	5.0s

When the safe stop 1 (SS1) is valid, the motor will decrease according to the DEC time set in P24.17.

Chapter 5 Fault tracking

This chapter tells how to reset faults and view fault history. It also lists all alarm and fault messages including the possible causes and corrective actions.

✧ Only qualified electricians are allowed to maintain the inverter. Read the safety instructions in ***Safety precautions*** before working on the inverter.

5.1 Alarm and fault indications

Faults are indicated by LEDs. See Keypad Operation Procedure. When TRIP LED is on, an alarm or fault message displayed on the keypad indicates abnormal inverter state. Using the information reference in this chapter, most alarm and fault causes can be identified and corrected. If not, contact with the local INVT office.

5.2 How to reset

The inverter can be reset by pressing STOP/RST key, through digital input, or by switching the power light. When the fault has been removed, the motor can be restarted.

5.3 Fault history

Function codes P19.00~P19.05 record 6 recent fault types. Function codes P19.06~P19.17, P19.22~P19.33, P19.38~P19.49 show the operation data of PWM rectifier when the latest 3 faults occur.

5.4 Fault instruction and solution

Do as follows after the inverter fault:

1. Check to ensure there is nothing wrong with the keypad. If not, please contact with INVT or the local INVT office.
2. If there is nothing wrong, please check P07 and ensure the corresponding recorded fault parameters to confirm the real state when the current fault occurs by all parameters.
3. See the following table for the detailed solution and check the corresponding abnormal state.
4. Eliminate the fault or ask for help.
5. Check to eliminate the fault and carry out fault reset to run the inverter.

5.4.1 Fault of complete cabinet

Fault code	Fault type	Possible cause	Corrective action
ov1	ACC overvoltage	Abnormal input voltage; Great energy feedback	Check input power; Check whether the DEC time at load is too short, the motor starts during rotation or the power consumption braking components are needed.
ov2	DEC overvoltage		
ov3	Constant speed overvoltage		
oC1	ACC overcurrent	Too fast ACC/DEC; Too low grid voltage; Too low inverter power; Abrupt load change or abnormal load; Grounding short circuit,	Enlarge ACC/DEC time; Check input power; Select the inverter with larger power; Check short circuit (grounding short circuit or short circuit
oC2	DEC overcurrent		
oC3	Constant speed overcurrent		

Fault code	Fault type	Possible cause	Corrective action
		output phase loss; External strong interference source	between lines) or rotation block; Check the output configuration; Check strong interference
Lv	Bus undervoltage	Too low grid voltage	Check input power
oL1	Motor overload	Too low grid voltage; Incorrect motor rated current setting; Motor stall or abrupt load change	Check input power; Reset motor rated current; Check the load and adjust the torque lifting capacity
oL2	Inverter overload	Too fast ACC; Restart the rotating motor; Too low grid voltage; Too heavy load	Enlarge ACC time; Avoid restart at stop; Check grid voltage; Select the inverter with larger power; Select a proper motor
SPI	Input side phase loss	Phase loss or great fluctuation at R,S,T	Check input power; Check the wiring
SPO	Output side phase loss	Phase loss at U,V,W (or three phase asymmetry)	Check the output wiring; Check the motor and cable
EF	External fault	SI external fault input terminal action	Check the external input device
E_485	485 communication fault	Incorrect baud rate setting; Communication wiring fault; Wrong communication address; Strong interference	Set proper baud rate; Check the wiring at communication port; Set correct communication address; Change or replace the wiring to improve anti-interference capability
ItE	Current detection fault	Bad connection of the control board; Hoare components damage; Abnormal amplifying circuit	Check the connector and plug in again; Change the Hoare; Change the main control board
tE	Motor autotuning fault	The motor capacity does not matches with the inverter capability; Incorrect motor parameters setting; Large deviation between parameters after autotuning and standard parameters; Autotuning timeout	Change the inverter model; Set the motor type and the parameters of the nameplate correctly; Make the motor non-load and re-indentify; Check the motor connection and parameter setting; Check if the upper-limit frequency is above 2/3 of the rated frequency
EEP	EEPROM operation fault	Write and read error of control parameters; EEPROM damage	Press STOP/RST to reset; Change the main control board
PIdE	PID feedback offline fault	PID feedback offline; PID feedback source	Check the PID feedback signal; Check the PID feedback source

Fault code	Fault type	Possible cause	Corrective action
		disappears	
bCE	Braking unit fault	Braking circuit fault or braking pipes damage; Too low braking resistance for external connection	Check the braking unit and change new braking pipes ; Increase the braking resistance
ENd	Running time arrival	The actual running time of the inverter is larger than the internal set time.	Contact with the manufacturer to adjust the set running time.
oL3	Electronic overload	The inverter will report overload pre-alarm according to the set value.	Check the load and the overload pre-alarm point.
PCE	Keypad communication error	Bad connection of keypad wires or offline; Too long keypad wires and strong interference; Circuit fault of keypad or main board communication	Check the keypad wires and ensure there is no fault; Check the ambient to eliminate interference source; Change the hardware and ask for maintenance service
UPE	Parameter uploading fault	Bad connection of the keypad wires or offline; Too long keypad wires and strong interference; Circuit fault of keypad or main board communication	Check the ambient to eliminate interference source; Change the hardware and ask for maintenance service
dNE	Parameter downloading fault	Bad connection of the keypad wires or offline; Too long keypad wires and strong interference; Keypad data storage error	Check the ambient to eliminate interference source; Change the hardware and ask for maintenance service; Back up the data in the keypad
E_dP	PROFIBUS communication fault	Incorrect ommunication address; Corresponding resistor is not dialed well; The files of master station GSD are not set well; Strong ambient interference	Check related settings; Check the ambient to eliminate interference
E_NEt	Ethernet communication fault	Incorrect Ethernet address setting; Incorrect Ethernet communication mode; Strong ambient interference	Check related settings; Check the communication mode selection; Check the ambient to eliminate interference
E_CAN	CANopen communication fault	Bad wires connection; Corresponding resistor is not dialed well; Unequal communication baud rate; Strong ambient interference	Check the connection; Plug out the corresponding resistor; Set the same baud rate; Check the ambient to eliminate interference
EtH1	Grounding short circuit	The inverter output is	Check whether the connection of

Fault code	Fault type	Possible cause	Corrective action
	fault 1	grounding short circuit; There is fault in the current detection circuit.	the motor is normal or not; Change the Hoare; Change the main control board
dEU	Speed deviation fault	Too large load or rotation block	Check the load to ensure it is normal and increase detection time; Check whether the control parameter is proper
STE	Maladjustment	Inproper control parameter setting of the synchronous motor; Incorrect autotuning parameters; The inverter is not connected to the motor.	Check the load to ensure it is normal; Check whether the control parameter is proper; Increase maladjustment detection time
LL	Underload fault	The inverter reports underload pre-alarm according to the set value.	Detect the load and underload pre-alarm point.
ENCIo	Encoder offline fault	Close loop vector control, encoder signal offline; Encoder damage	Check the connection of the encoder and re-connect the wires; Check whether there is output from the encoder or not.
ENCId	Encoder reverse fault	Close loop vector control; The encoder is not connected or damaged; Inverter wiring error	Check and adjust the connection
E_STO	STO fault	STO terminals off	Check the external controller
FAE	Brake action fault	Brake feedback action fault	Check the external contactor
E_ASC	Master-slave communication fault	Incorrect address setting; Incorrect communication mode selection; Bad connection of communication wires	Check related settings; Check the communication mode selection; Check and adjust the connection
E_SLE	Slave fault	Slave fault	Check related settings of the slave and environment
dF_CE	DSP and FPGA communication fault	DSP cannot communicate with FPGA.	Control board fault, ask for maintenance service
CPoE	Control power failure	Too low working voltage of switch mode power supply	Check whether the switch mode power supply is normal; Check whether the power board is normal
oH	Motor overheat	Long-time overload running or abnormal running; Abnormal temperature detecting resistor; Inproper overheat protection point setting	Check and maintain the motor; Check whether the temperature sensor is normal; Reset the overheat protection point
tCE	Torque verification fault	The load of the motor is out	Check whether the connection of

Fault code	Fault type	Possible cause	Corrective action
		of the inverter.	the motor and inverter is good; Due to light load, it is necessary to reduce the torque verification point.
P.oFF	Inverter power off	Bus voltage is lower than undervoltage point.	Check whether the main power is off.

5.4.2 Unit fault

Fault code	Fault type	Possible cause	Corrective action
m. oUt1	No. m U-phase Vce detection fault	Internal corresponding IGBT damage; Strong interference; External short circuit	Ask for service; Check the ambient to eliminate interference source; Check the external circuit to eliminate load fault
m.oUt2	No. m V-phase Vce detection fault		
m. oUt3	No. m W-phase Vce detection fault		
m.oC	No. m hardware overcurrent	Internal IGBT is broken; Too fast ACC; Short circuit at output side	Ask for service; Update parameter settings and run again; Check the external circuit to eliminate short circuit
m.ItE	No. m current detection fault	Current detection component damage; Interference	Ask for service; Check the ambient to eliminate interference source
m.IbC	No. m current unbalance	The 3-phase current amplitude of power unit is quite different. Fault alarms When the difference seriously affects the system performance.	Check input power; Check the wiring
m.oH1	No. m rectifier bridge overheat	Inverter instantaneous overcurrent; Interphase or grounding short circuit of output 3-phase; The air duct is blocked or the fan is damaged; Too high ambient temperature; The wiring or plug-in of the control board is loose; Auxiliary power damage, drive undervoltage; bridge arm conducting of power module; Abnormal control board	Refer to overcurrent measures Reset the wiring; Clean the air duct or change the fan; Reduce the ambient temperature Check and connect again; Ask for service; Ask for service; Ask for service
m.oH2	No. m IGBT overheat		

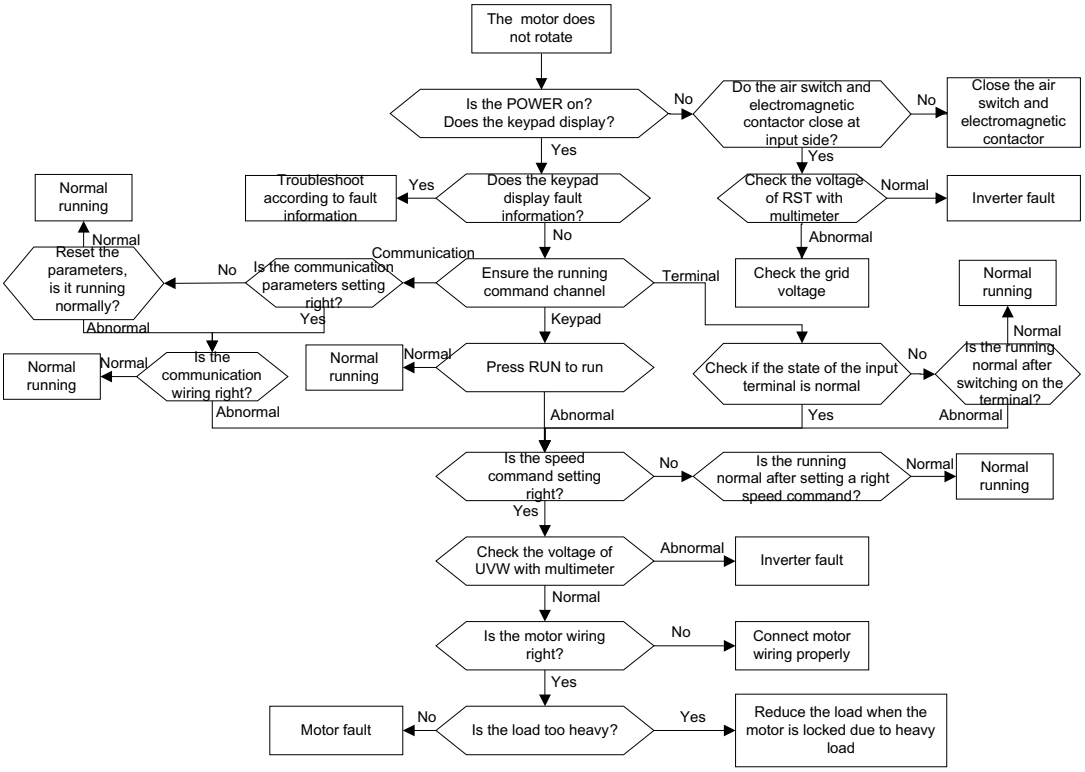
Fault code	Fault type	Possible cause	Corrective action
m. EF1	No. m fan overheat	Continuous overload running; The air duct is blocked.	Check the inverter load and reduce load power; Clean the air duct and solve heat emission
m. EF2	No. m filter unit overheat	Continuous overload running; The air duct is blocked.	Check the inverter load and reduce load power; Clean the air duct and solve heat emission
m.EF3	No. m inverter unit input phase loss	SI external fault input terminal action	Check the external device input
m.ov	No. m bus overvoltage	Too high grid voltage	Check input power
m.Lv	No. m bus undervoltage	Too low grid voltage	Check input power
m.dn_C	No. m down communication fault	The address setting of the master does not match with that of the slave; Incorrect slave communication mode; Bad connection of communication lines	Check related settings; Check communication mode; Check and adjust the connection
m.UP_C	No. m up communication fault	The address setting of the master does not match with that of the slave; Incorrect slave communication mode; Bad connection of communication lines	Check related settings; Check communication mode; Check and adjust the connection
m.PEr	No. m power failure	Too low working voltage of switch mode power supply	Ask for service

5.4.3 Other states

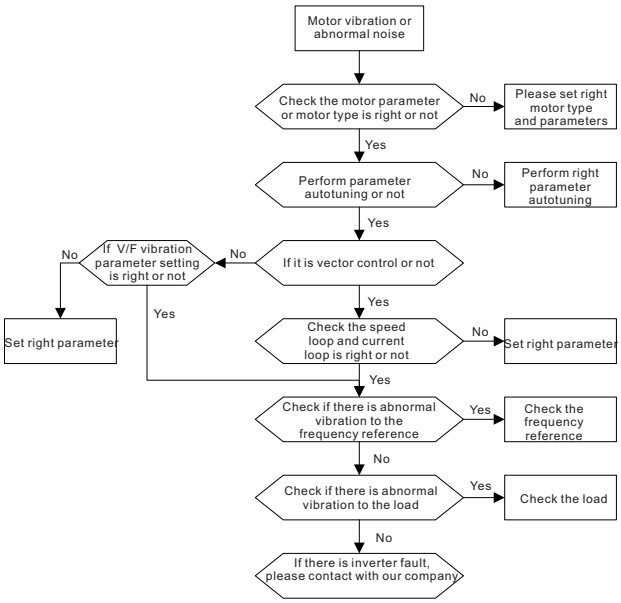
State code	State type	Possible cause	Corrective action
m.CoFF	No. m optical fiber communication failure	The optical fiber is not connected well or damaged	Check the environment or change the optical fiber.
PoFF	Power on failure	Normal optical fiber communication but too low bus voltage	Check the grid environment
	Communication failure between the keypad and main control board	The keypad is not connected properly.	Check installation environment of the keypad.

5.5 Common fault analysis

5.5.1 The motor does not rotate

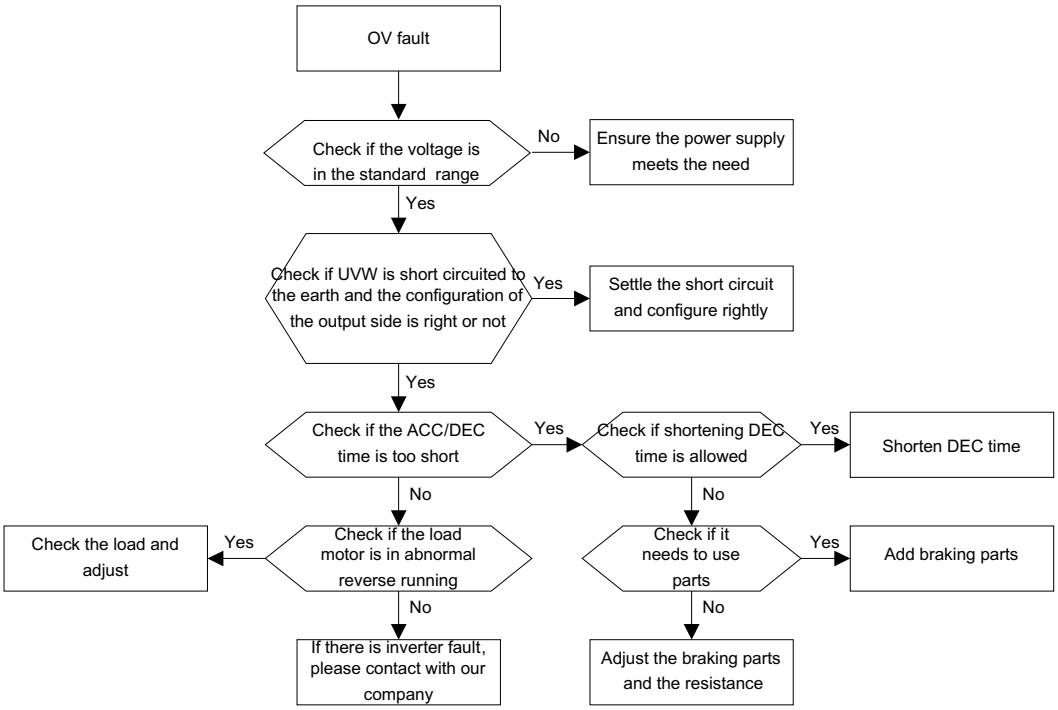


5.5.2 Motor vibration

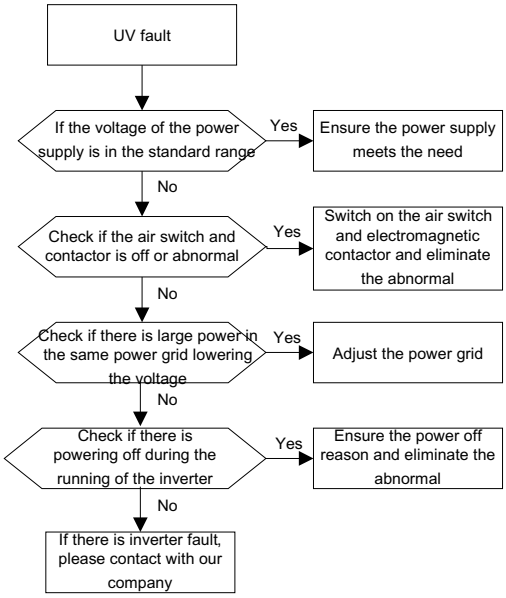


please

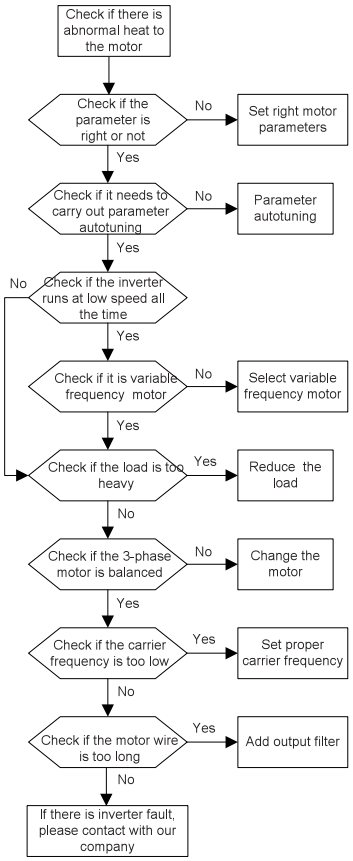
5.5.3 Overvoltage



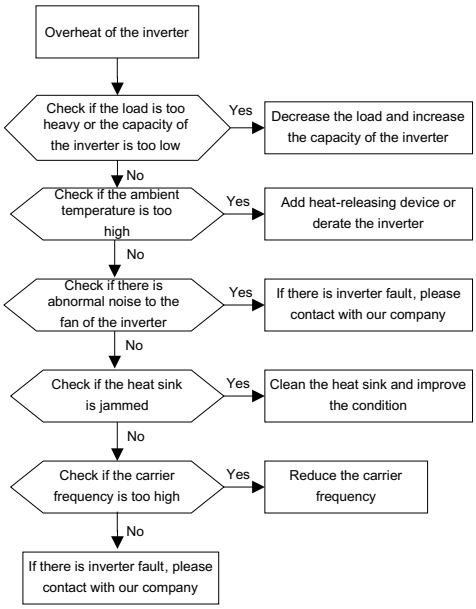
5.5.4 Undervoltage fault



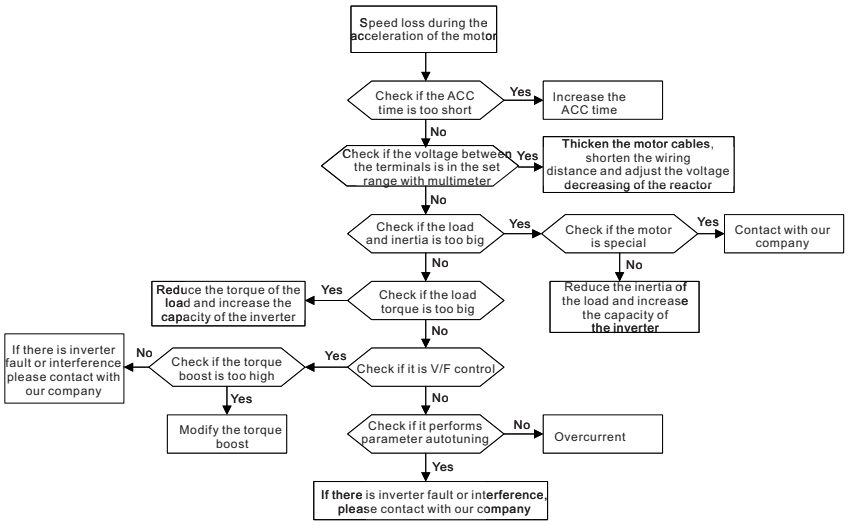
5.5.5 Abnormal heat of the motor



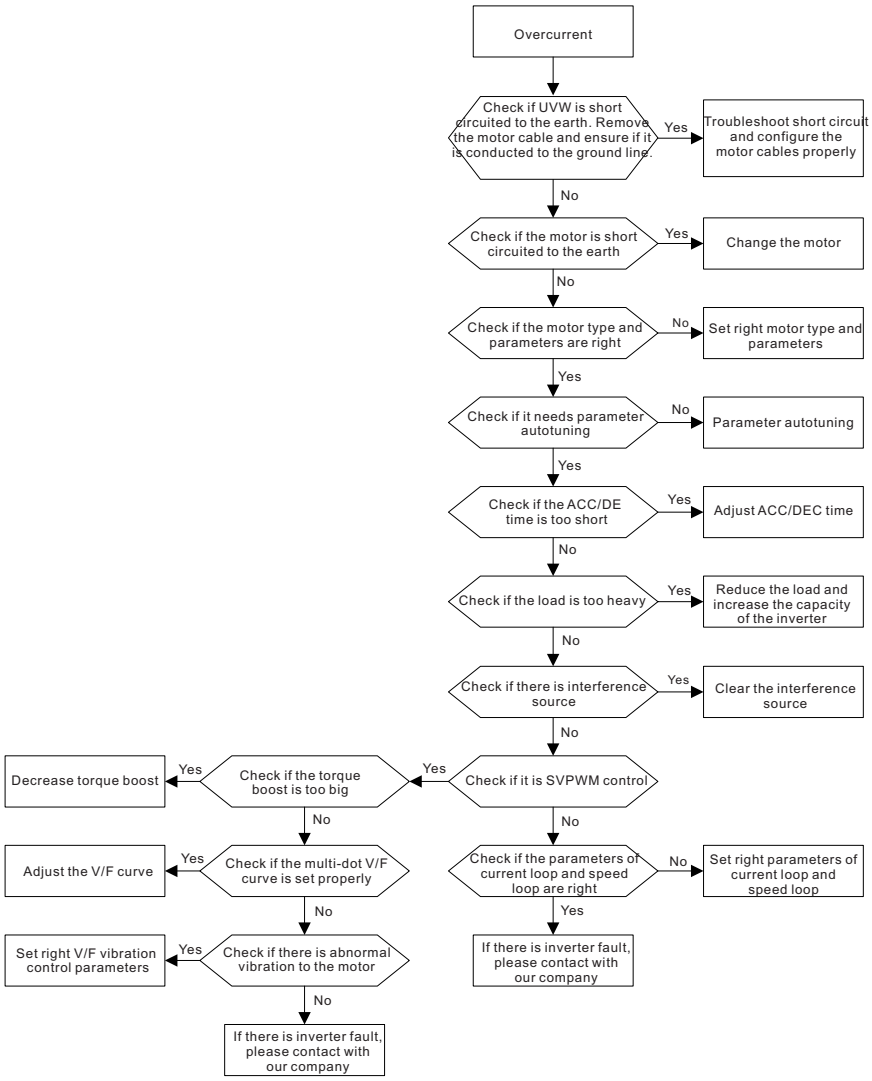
5.5.6 Overheat of the inverter



5.5.7 Speed loss during the acceleration of the motor



5.5.8 Overcurrent



Chapter 6 Communication protocol

6.1 MODBUS protocol

This chapter describes the communication protocol of Goodrive800 series inverters.

The Goodrive800 series inverters provide RS485 communication interface and adopt international standard MODBUS communication protocol to perform master-slave communication. The user can realize centralized control through PC/PLC, upper control PC (Set the control command, running frequency of the inverter, modify relevant function codes, monitor and control the operating state and fault information of the inverter and so on) to meet specific application requirements.

6.1.1 Brief introduction to MODBUS protocol

MODBUS protocol is a software protocol and common language which is applied in the electrical controller. With this protocol, the controller can communicate with other devices via the channel of signal transmission. And with this industrial standard, the controlling devices of different manufacturers can be connected to an industrial network for the centralized monitoring.

There are two transmission modes for MODBUS protocol: ASCII mode and RTU (Remote Terminal Units) mode. In one MODBUS network, all devices should select the same transmission mode and basic parameters, such as baud rate, digital bit, check bit, and end bit.

MODBUS network is a controlling network with single master and multiple slaves, which means that there is only one device performs as the master and the others are the slaves in one MODBUS network. The master can independently achieve communication with a slave as well as send broadcast messages to all slaves. The slave will send back a response to the independent command while there is no need to feed back the broadcast messages sent by the master.

6.1.2 Application of the inverter

The MODBUS protocol of the inverter is RTU mode and the network line is RS485.

6.1.2.1 RS485

The interface of RS485 works on half-duplex and its data signal applies differential transmission which is called balanced transmission, too. It uses the twisted-pair, one of which is defined as A (+) and the other is defined as B (-). Generally, if the positive electrical level between sending drive A and B is among +2~+6V, it is logic“1”; if the electrical level is among -2V~-6V, it is logic“0”.

485+ on the terminal board corresponds to A and 485- to B.

Communication baud rate (P14.01) means the binary bit number transmitted in one second. The unit is bit/s (bps). The higher the baud rate is, the quicker the transmission speed is and the weaker the anti-interference is. If the twisted-pair of 0.56mm（24AWG）is applied as the communication cables, the maximum transmission distance is as below:

Baud rate	Max transmission distance	Baud rate	Max transmission distance
2400BPS	1800m	9600BPS	800m
4800BPS	1200m	19200BPS	600m

It is recommended to use shield cables and make the shield layer as the grounding wires during RS485 remote communication.

In the cases with less devices and shorter distance, it is recommended to use 120Ω terminal resistor as

the performance will be weakened in remote even though the network can perform well without any load resistor.

6.1.2.2 RTU mode

(1)RTU communication frame format

If the controller is set to communicate by RTU mode in Modbus network, every 8 Bit bytes in the message include two 4 Bit hex characters. Compared with ACSII mode, this mode can send more data at the same baud rate.

Code system

- 1 start bit
- 7 or 8 digital bit, the minimum valid bit can be sent firstly. Every 8 bit frame includes two hex characters (0...9, A...F)
- 1 even/odd check bit . If there is no checkout, the even/odd check bit does not exist.
- 1 end bit (with checkout), 2 Bit (no checkout)

Error detection field

- CRC (Cyclic Redundancy Check)

The data format is illustrated as below:

11-bit character frame (BIT1~BIT8 are the digital bits)

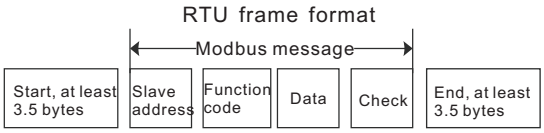
Start bit	BIT1	BIT2	BIT3	BIT4	BIT5	BIT6	BIT7	BIT8	Check bit	End bit

10-bit character frame (BIT1~BIT7 are the digital bits)

Start bit	BIT1	BIT2	BIT3	BIT4	BIT5	BIT6	BIT7	Check bit	End bit

In one character frame, the digital bit takes effect. The start bit, check bit and end bit are used to send the digital bit right to the other device. The digital bit, even/odd checkout and end bit should be set as the same in real application.

In the RTU mode, the minimum idle time between new frames should be no less than 3.5 bytes. In the network whose transmission speed is calculated by baud rate, transmission time of 3.5 bytes can be controlled easily. The data fields are as follows: slave address, operation code, data and CRC checkout, the byte of each field is hex (0...9, A...F). The network device is always monitoring the action of communication bus. When the first field (the address message) is received, each device will confirm the byte. After the final byte is transmitted, there will be another interval time similar to 3.5 bytes to indicate the end of the frame. Later, a new frame will start.



The whole message frame is a continuous data transmission flow. If there is an interval time (more than 1.5 bytes) before the end of the frame, the receiving device will clear the uncompleted message and suppose the next byte as the address field of the new frame. Similarly, if the new frame follows the previous one within the interval time of 3.5 bytes, the receiving device will deal with it as the continuation of the previous frame. If these two phenomena all happen during the transmission, the CRC will generate the wrong checkout and communication fault will occur.

The standard structure of RTU frame:

START	T1-T2-T3-T4 (transmission time of 3.5 bytes)
ADDR	Communication address: 0~247 (decimal system) (00 is the broadcast address)

CMD	03H: read slave parameters 06H: write slave parameters
DATA (N-1) … DATA (0)	The data of 2*N bytes are the main content of the communication as well as the core of data exchanging.
CRC CHK low bit	Detection value: CRC (16BIT)
CRC CHK high bit	
END	T1-T2-T3-T4(Transmission time of 3.5 bytes)

(2) RTU communication frame error checkout

Various factors may cause errors in the data transmission. If there is no error checkout, the receiving devices will not find the message is wrong and they may give an incorrect response which may cause serious impact. So the checkout is essential to the message.

The theme of checkout is that: the sender will calculate the sending data according to a fixed formula, and then send the result with the message. When the receiver gets this message, they will calculate anther result according to the same method and compare it with the sending one. If two results are the same, the message is correct. If not, the message is incorrect.

The error checkout of the frame can be divided into two parts: the bit checkout of the byte (even/odd checkout) and the whole data checkout of the frame (CRC check).

Bit checkout of the byte (even/odd checkout)

The user can select different bit checkouts or non-checkout, which affects the check bit setting of each byte.

The definition of even checkout: add an even check bit before the data transmission to illustrate the number of “1” in the data transmission is odd number or even number. When it is even, the check byte is “0”; otherwise, the check byte is”1”. This method is used to stabilize the parity of the data.

The definition of odd checkout: add an odd check bit before the data transmission to illustrate the number of “1” in the data transmission is odd number or even number. When it is odd, the check byte is “0”; otherwise, the check byte is”1”. This method is used to stabilize the parity of the data.

For example, when transmitting “11001110”, there are five “1” in the data. If the even checkout is applied, the even check bit is “1”; if the odd checkout is applied, the odd check bit is “0”. The even and odd check bits are calculated on the check bit position of the frame. In addition, the receiving devices carry out even and odd checkout. If the parity of the receiving data is different from the set value, there is an error in the communication.

CRC check—CRC (Cyclical Redundancy Check)

The checkout uses RTU frame format. The frame includes the frame error detection field which is based on the CRC calculation method. The CRC field is two bytes, including 16-bit binary values. It is added into the frame after calculated by transmitting device. The receiving device recalculates the CRC of the received frame and compares it with the value in the received CRC field. If the two CRC values are different, there is an error in the transmission.

During CRC, 0xFFFF will be stored at first. And then, deal with the continuous 6 above bytes in the frame and the value in the register. Only the 8 bit data in every character is effective to CRC, while the start bit, the end bit and the odd and even check bit are ineffective.

Each 8 bit character xors with the register, the result moves to the lowest effective bit and the highest bit is filled by 0. If LSB is detected to be 1, the register will xor with the preset value. If LSB is 0, the action will not carry on. Repeat 8 times during the whole process. After the last bit is completed, the next 8 bit character will xor with the current value of the register. The final value in the register is the CRC after the completion of operating all bytes.

The calculation of CRC applies the international standard CRC checkout principle. When the user is editing CRC calculation, he or she can refer to the related standard CRC calculation to write the required

CRC calculation program.

Here is a simple function of CRC calculation for the reference (programmed in C language):

```
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);
}
```

In ladder logic, CKSM calculated the CRC value according to the frame with the table inquiry. The method is advanced with easy program and quick calculation speed, but the ROM space occupied by the program is huge. So use it with caution according to the required program space.

6.1.3 RTU command code and communication data illustration

6.1.3.1 Command code: 03H, read N words (Max continuous reading is 16 words)

Command code 03H means that if the master reads data from the inverter, the reading number depends on the “data number” in the command code. The maximum continuous reading number is 16 and the parameter address should be continuous. The byte length of every data is 2 (one word). The following command format is illustrated by hex (a number with “H” means hex) and one hex occupies one byte.

The command code is used to read the working state and parameters of the inverter.

For example, read continuous 2 data content from 0004H with the address of 01H (Read the content of data addresses of 0004H and 0005H); the frame structure is as below:

RTU master command message (from the master to the inverter)

START	T1-T2-T3-T4 (Transmission time of 3.5 bytes)
ADDR(Address)	01H
CMD(command code)	03H
High bit of the start bit	00H
Low bit of the start bit	04H
High bit of data number	00H
Low bit of data number	02H
CRC low bit	85H
CRC high bit	CAH
END	T1-T2-T3-T4 (Transmission time of 3.5 bytes)

T1-T2-T3-T4 (Transmission time of 3.5 bytes) between START and END is to provide at least the time of 3.5 bytes as the leisure time and distinguishes two messages for the avoidance of taking two messages as one message.

ADDR = 01H means the command message is sent to the inverter with the address of 01H and ADDR occupies one byte

CMD=03H means the command message is sent to read data from the inverter and CMD occupies one byte

“Start address” means reading data from the address and it occupies 2 bytes, the high bit in the front and the low bit in the behind.

“Data number” means the reading data number with the unit of word. If the “start address’ is 0004H and the “data number” is 0002H, the data of 0004H and 0005H will be read.

CRC occupies 2 bytes, the high bit is in the front and the low bit is in the behind.

RTU slave response message (from the inverter to the master)

START	T1-T2-T3-T4(Transmission time of 3.5 bytes)
ADDR	01H
CMD	03H
Byte number	04H
Data high bit of address 0004H	13H
Data low bit of address 0004H	88H
Data high bit of address 0005H	00H
Data low bit of address 0005H	00H
CRC low bit	7EH
CRC high bit	9DH
END	T1-T2-T3-T4(Transmission time of 3.5 bytes)

The meaning of the response is that:

ADDR = 01H means the command message is sent to the inverter with the address of 01H and ADDR occupies one byte

CMD=03H means the message is receiced from the inverter to the master for the response of reading command and CMD occupies one byte

“Byte number” means all byte numbers from the byte (excluding) to CRC byte (excluding). 04 means there are 4 bytes of data from the “byte number” to “CRC low bit”, which are “data high bit of address 0004H”, “data low bit of address 0004H”, “data high bit of address 0005H” and “data low bit of address 0005H”.

There are 2 bytes stored in one data with the fact that the high bit is in the front and the low bit is in the behind. The data of data address 0004H is 1388H, and the data of data address 0005H is 0000H.

CRC occupies 2 bytes with the fact that the high bit is in the front and the low bit is in the behind.

6.1.3.2 Command code: 06H, write one word

The command means that the master writes data to the inverter and one command can write one piece of data other than several data. It is used to change the working mode of the inverter.

For example, write 5000 (1388H) to 0004H from the inverter with the slave address of 02H; the frame structure is as below:

RTU master command message (from the master to the inverter)

START	T1-T2-T3-T4 (Transmission time of 3.5 bytes)
ADDR	02H
CMD	06H
High bit of writing data address	00H
Low bit of writing data address	04H
High bit of data content	13H
Low bit of data content	88H
CRC low bit	C5H
CRC high bit	6EH
END	T1-T2-T3-T4 (Transmission time of 3.5 bytes)

RTU slave response message (from the inverter to the master)

START	T1-T2-T3-T4 (Transmission time of 3.5 bytes)
ADDR	02H
CMD	06H
High bit of writing data address	00H
Low bit of writing data address	04H
High bit of data content	13H
Low bit of data content	88H
CRC low bit	C5H
CRC high bit	6EH
END	T1-T2-T3-T4 (Transmission time of 3.5 bytes)

Note: Section 6.1.3.1 and 6.1.3.2 mainly describe the command format, and the detailed application will be mentioned in 6.1.3.7 with examples.

6.1.3.3 Command code: 08H, diagnosis

Meaning of sub-functional code:

Sub-functional code	Illustration
0000	Return to inquiry information data

Example: The inquiry information string is same as the response information string when the loop detection to address 01H of driver is carried out.

RTU master command message

START	T1-T2-T3-T4 (Transmission time of 3.5 bytes)
ADDR	01H
CMD	08H
High bit of sub-functional code	00H
Low bit of sub-functional code	00H
High bit of data content	12H
Low bit of data content	ABH
CRC CHK low bit	ADH
CRC CHK high bit	14H
END	T1-T2-T3-T4 (Transmission time of 3.5 bytes)

RTU slave response message

START	T1-T2-T3-T4 (Transmission time of 3.5 bytes)
ADDR	01H
CMD	08H
High bit of sub-functional code	00H
Low bit of sub-functional code	00H
High bit of data content	12H
Low bit of data content	ABH
CRC CHK low bit	ADH
CRC CHK high bit	14H
END	T1-T2-T3-T4 (Transmission time of 3.5 bytes)

6.1.3.4 Definition of data address

The address definition of the communication data in this part is to control the running of the inverter and get the state information and related function parameters of the inverter.

(1)Address rules of function codes

The address of the function code occupies 2 bytes with the fact that the high bit is in the front and the low bit is in the behind. The range of high and low byte are: high byte—00~ffH; low byte—00~ffH. The high byte is the group number before the radix point of the function code and the low byte is the number after the radix point, but both the high byte and the low byte should be changed into hex. For example, P05.06, the group number before the radix point of the function code is 05, then the high bit of the parameter is 05; the number after the radix point is 06, then the low bit of the parameter is 06, so the function code address is 0506H. Another example: The parameter address of P10.01 is 0A01H.

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify	Serial No.
P10.00	Simple PLC	0: Stop after running once 1: Run at the final value after running once 2: Cycle running	0~2	0	○	354
P10.01	Simple PLC memory	0: Power loss without memory 1: Power loss with memor	0~1	0	○	355

Note: P29 group is the factory parameter which cannot be read or changed. Some parameters cannot be changed when the inverter is at running state and some parameters cannot be changed at any state. Pay attention to the setting range, unit and related instructions when modifying the parameters.

Besides, EEPROM is stored frequently, which may shorten the service life. For users, some functions do not need to be stored under the communication mode. The need can be met only by changing the value in RAM. Changing the high bit of the function code from 0 to 1 can also realize the function. For example, the function code P00.07 cannot be stored into EEPROM. Only by changing the value in RAM can set the address to 8007H. This address can only be used in writing RAM other than reading. If it is used to read, it is an invalid address.

(2) Address instruction of other functions in MODBUS

The master can operate on the parameters of the inverter as well as control the inverter, such as running or stopping or monitoring the working state of the inverter.

Below is the parameter list of other functions:

Function instruction	Address definiton	Data meaning instruction	R/W characteristics
Communication control command	2000H	0001H: forward running	W/R
		0002H: reverse running	
		0003H: forward jogging	
		0004H: reverse jogging	
		0005H: stop	
		0006H: coast to stop (emergency stop)	
		0007H: fault reset	
		0008H: jogging stop	
		0009H: pre-excitation	
Address of the communication set value	2001H	Communication setting frequency (0~Fmax (Unit: 0.01Hz))	W/R
	2002H	PID reference, range (0~1000, 1000 corresponding to 100.0%)	
	2003H	PID feedback, range (0~1000, 1000 corresponding to 100.0%)	W/R
	2004H	Torque set value (-3000~3000, 1000 corresponding to 100.0% of motor rated current)	W/R
	2005H	Set value of forward rotation upper-limit frequency (0~Fmax (Unit: 0.01Hz))	W/R

Function instruction	Address definiton	Data meaning instruction	R/W characteristics
	2006H	Set value of reverse rotation upper-limit frequency (0~Fmax (Unit: 0.01Hz))	W/R
	2007H	Electromotion torque upper limit (0~3000, 1000 corresponding to 100.0% of motor rated current)	W/R
	2008H	Braking torque upper limit (0~3000, 1000 corresponding to 100.0% of motor rated current)	W/R
	2009H	Special control command word Bit0~1: =00: motor 1 =01: motor 2 =10: motor 3 =11: motor 4 Bit2: =1 torque control =0: speed control	W/R
	200AH	Virtual input terminal command, 0x000~0x1FF	W/R
	200BH	Virtual output terminal command, 0x00~0x0F	W/R
	200CH	Voltage set value (special for V/F separation) (0~1000, 1000 corresponding to 100.0% of motor rated voltage)	W/R
	200DH	AO output set value 1 (-1000~1000, 1000 corresponding to 100.0%)	W/R
	200EH	AO output set value 2 (-1000~1000, 1000 corresponding to 100.0%)	W/R
SW 1 of the inverter	2100H	0001H: forward running	R
		0002H: reverse running	
		0003H: stop	
		0004H: fault	
		0005H: POFF	
SW 2 of the inverter	2101H	Bit0: =0: ready for running =1: ready for running Bi1~2: =00: motor 1 =01: motor 2 =10: motor 3 =11: motor 4 Bit3: =0: asynchronous motor =1: synchronous motor Bit4: =0: underload pre-alarm =1: overload pre-alarm Bit5~Bit6: =00: keypad control =01: terminal control =10: communication control	R
Inverter fault code	2102H	See the fault types	R
Inverter identification code	2103H	GD800——0x010F	R
Running frequency	3000H	Compatible with the communication address of CHF100A and CHV100	R
Set frequency	3001H		R
Bus voltage	3002H		R
Output voltage	3003H		R
Output current	3004H		R
Rotating speed	3005H		R

Function instruction	Address definiton	Data meaning instruction	R/W characteristics
Output power	3006H		R
Output torque	3007H		R
Close loop setting	3008H		R
Close loop feedback	3009H		R
Input IO state	300AH		R
Output IO state	300BH		R
Analog input1	300CH		R
Analog input 2	300DH		R
Analog input 3	300EH		R
Analog input 4	300FH		R
Read high pulse1 input	3010H		R
Read high pulse2 input	3011H		R
Read the current step of multi-step speed	3012H		R
External length	3013H		R
External count value	3014H		R
Torque set value	3015H		R
Inverter identification code	3016H		R
fault code	5000H		R

R/W characteristic means the function with read and write characteristics. For example, “communication control command” is write characteristic and control the inverter with write command (06H). R characteristic can only read other than write and W characteristic can only write other than read.

Note: When operating on the inverter with the table above, it is necessary to enable some parameters. For example, the operation of running and stopping, it is necessary to set P00.01 to communication running command channel and set P00.02 to MODBUS communication channel. When operating on “PID reference”, it is necessary to set P09.00 to “MODBUS communication setting”.

The encoding rules for device codes (corresponding to identification code 2103H of the inverter)

Code high 8 bit	Meaning	Code low 8 bit	Meaning
01	Goodrive	0x0E	Goodrive800 series PWM rectifiers
		0x0F	Goodrive800 series inverters

Note: The code is consisted of 16 bits which is high 8 bits and low 8 bits. High 8 bits mean the motor type series and low 8 bits mean the derived motor types series.

6.1.3.5 Fieldbus ratio value

The communication data is expressed by hex in actual application and there is no radix point in hex. For example, 50.12Hz can not be expressed by hex, so 50.12 can be magnified by 100 times into an integer (5012), so hex 1394H can be used to express 50.12.

A non-integer can times a multiple to get an integer and the multiple can be called fieldbus ratio value.

The fieldbus ratio values are referred to the radix point of the setting range or default value in the function parameter list. If there are n figures behind the radix point (n=1), then the fieldbus ratio value m is10^n. Take the below table as the example:

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify	Serial No.
P01.20	Hibernation restore delay time	0.0~3600.0s (valid when P01.19=2)	0.0~3600.0	0.0s	○	39
P01.21	Restart after powering off	0：Disabled 1：Enabled	0~1	0	○	40

If there is one figure behind the radix point in the setting range or the default value, then the fieldbus ratio value is 10. If the data received by the upper computer is 50, then the “hibernation restore delay time” is 5.0 (5.0=50÷10).

MODBUS communication is used to control the “hibernation restore delay time” as 5.0s. Firstly, 5.0 can be magnified by 10 times to integer 50 (32H) and then this data can be sent.

01	06	01 14	00 32	49 E7
Inverter address	Write command	Parameter address	Parameter data	CRC

After the inverter receives the command, it will change 50 into 5.0 according to the fieldbus ratio value and then set the hibernation restore delay time as 5.0s.

Another example, after the upper computer sends the command of reading the parameter of hibernation restore delay time, the response message from the inverter to the master is as following:

01	03	02	00 32	39 91
Inverter address	Read command	2 bytes	Parameter data	CRC

Because the parameter data is 0032H (50) and 50 dividing 10 is 5.0, then the “hibernation restore delay time” is 5.0s.

6.1.3.6 Fault message response

There may be fault in the communication control. For example, some parameter can only be read. If a write message is sent, the inverter will return a fault response message.

The fault message is from the inverter to the master; its code and meaning are as below:

Code	Name	Meaning
01H	Illegal command	The command from the upper computer cannot be executed because this command is only for new devices and this device cannot realize, or the slave is in fault state and cannot execute it.
02H	Illegal data address	Some of the operation addresses from the upper computer are invalid or not allowed to access. Especially the combination of the register address and the transmitting bytes is invalid.
03H	Illegal value	When the receiving data include unallowed value, the value indicates the error in combination request. Note: This error code does not indicate the data value to write out of the range.
04H	Operation failed	The parameter setting in write operation is invalid. For example, the function input terminal cannot be set repeatedly.
05H	Password error	The password written to the password check address is different from the password set by P7.00.
06H	Data frame error	In the frame message sent by the upper computer, the length of the digital frame is incorrect or the count value of CRC check bit in RTU is different from the check count value of the lower computer.
07H	Read only	The parameters changed in write operation of the upper computer can be read only.

Code	Name	Meaning
08H	The parameter cannot be changed in running.	The parameters changed in write operation of the upper computer cannot be changed in running.
09H	Password protection	When the upper computer is writing or reading and the user password is set without password unlocking, it will alarm that the system is locked.

The slave uses the function code fields and fault addresses to indicate it is a normal response or some error occurs (named as objection response). For normal responses, the slave shows corresponding function codes, digital addresses or sub-functional codes as the response. For objection responses, the slave returns a code which equals the normal code, but the first byte is logic 1.

For example: a message from the master to the slave requires to read a group of address data of the inverter function codes, so there will be following function codes:

0 0 0 0 0 1 1 (hex 03H)

For normal responses, the slave responds the same codes; while for objection responses, it will return:

1 0 0 0 0 0 1 1 (hex 83H)

Besides the function codes modification for the objection fault, the slave will respond a byte of abnormal codes which defines the error cause.

When the master receives the response for the objection, typically, it will send the message again or modify the command of corresponding fault.

For example, set the “running command channel” of the inverter (P00.01, parameter address is 0001H) with the address of 01H to 03, the command is as follows:

01	06	00 01	00 03	98 0B
Inverter address	Write command	Parameter address	Parameter data	CRC

But the setting range of “running command channel” is 0~2, 3 will exceed the range, so the inverter will return the fault response message as below:

01	86	04	43 A3
Inverter address	Abnormal response code	Fault code	CRC check

Abnormal response code 86H means the abnormal response to writing command (06H); the fault code is 04H. From above table, its name is operation failed and its meaning is that the parameter setting in parameter writing is invalid.

6.1.3.7 Examples of write and read command

Refer to 6.1.3.1 and 6.1.3.2 for the command format.

(1) Example of read command 03H

Example 1: Read the state word 1 of the inverter with the address of 01H. From the parameter list of other functions, the parameter address of the state word 1 of the inverter is 2100H.

The read command sent to the inverter is:

01	03	21 00	00 01	8E 36
Inverter address	Read command	Parameter address	Data number	CRC

If the response message is as below:

01	03	02	00 03	F8 45
Inverter address	Read command	Byte number	Data content	CRC

The data content responded by the inverter is 0003H, and then the inverter stops.

Example 2: Check “current fault type” to “previous 5 fault type” of the rectifier with address 03H, the

corresponding function code is P19.00~P19.05 and corresponding parameter addresses are 1900H~1905H (continuous 6 from 1300H).

The command sent to the inverter is:

03	03	13 00	00 06	B5 59
Inverter address	Read command	Start address	Total 6 parameters	CRC

If the response message is as below:

03	03	0C	00 23	00 23	00 23	00 23	00 23	00 23	5F D2
Inverter address	Read command	Byte number	Current fault type	Previous fault type	Previous 2 fault type	Previous 3 fault type	Previous 4 fault type	Previous 5 fault type	CRC

See from the returned data, all fault types are 0023H (decimal 35) with the meaning of maladjustment (STE).

(2) Example of write command 06H

Make the inverter with the address of 03H to run forward. From the parameter list of other functions, the address of "communication control command" is 2000H and forward running is 0001. See the table below:

Function instruction	Address definition	Data meaning instruction	R/W characteristics
Communication control command	2000H	0001H: forward running	W/R
		0002H: reverse running	
		0003H: forward jogging	
		0004H: reverse jogging	
		0005H: decelerate to stop	
		0006H: coast to stop (emergency stop)	
		0007H: fault reset	
		0008H: jogging stop	
		0009H: pre-excitation	

The command sent to the inverter is:

03	06	20 00	00 01	42 28
Inverter address	Write command	Parameter address	Forward running	CRC

If the operation is successful, the response message is as below (the same with the command sent by the master):

03	06	20 00	00 01	42 28
Inverter address	Write command	Parameter address	Forward running	CRC

Set the maximum output frequency of the inverter with the address of 03H as 100Hz.

P00.03	Max output frequency	P00.04~400.00Hz (400.00Hz)	P00.04~400.00	50.00Hz	◎	3

See the figures behind the radix point; the fieldbus ratio value of the maximum output frequency (P00.03) is 100. 100Hz times 100 is 10000 and the corresponding hex is 2710H.

The command sent by the master is:

03	06	00 03	27 10	62 14
Inverter address	Write command	Parameter address	Parameter data	CRC

If the operation is successful, the response message is as below (the same with the command sent by the master):

03	06	00 03	27 10	62 14
Inverter address	Write command	Parameter address	Parameter data	CRC

Note: The blank in the above command is for illustration and it cannot be added in the actual application.

(3) Example of MODBUS communication commission

The master is PC which applies the RS232-RS485 converter to transform signals. The PC serial interface is COM1 (RS232 interface) and the commission software is the interface commission assistant

which can be downloaded on the internet. The software with CRC checkout function is the best selection.

At first, select COM1 for the serial interface, keep the baud rate in accordance with P14.01, and digital bits, check bits and end bits the same with P14.02. Due to RTU mode, HEX is selected. It is necessary to tick out ☑ ModbusRTU as well as CRC16 (MODBUSRTU) with the initial byte 1 in order that the software automatically runs along with CRC. Once enabling the CRC function, filling the command with CRC repeatedly will lead to command error.

The commission command is to make the inverter with address 03H run forward (11.4.7.2 example 1):

03	06	20 00	00 01	42 28
Inverter address	Write command	Parameter address	Forward running	CRC

Pay attention:

Set the inverter address (P14.00) to 03;

Set the running command channel (P00.01) to communication running command channel as well as select MODBUS communication channel for P00.02.

Click send; if both the route and setting are correct, the response message from the inverter will be received.

6.1.4 Common communication fault

Common communication faults are: no response to the communication or the inverter returns abnormally.

The possible reasons for no response to the communication:

Select the wrong serial interface. For example, if the converter is COM1, select COM2 during communication;

The baud rate, digital bit, end bit and check bit are not the same with the inverter;

+ and - polarity of RS485 are connected reversely.

6.1.5 Related function codes

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P20.00	Local communication address	1~247, 0 is broadcast address	1~247	1
P20.01	Communication baud rate	0: 1200BPS 1: 2400BPS 2: 4800BPS 3: 9600BPS 4: 19200BPS 5: 38400BPS	0~5	4

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P20.02	Data bit checkout	0: No checkout (N, 8, 1) for RTU 1: Even checkout (E, 8, 1) for RTU 2: Odd checkout (O, 8, 1) for RTU 3: No checkout (N, 8, 2) for RTU 4: Even checkout (E, 8, 2) for RTU 5: Odd checkout (O, 8, 2) for RTU	0~5	1
P20.03	Communication response delay	0~200ms	0~200	5
P20.04	Fault time of communication timeout	0.0 (invalid), 0.1~60.0s	0.0~60.0	0.0s
P20.05	Transmission error processing	0: Alarm and coast to stop 1: Continue to run without alarm 2: Stop without alarm (only under communication control) 3: Stop without alarm (under all control modes)	0~3	0
P20.06	Communication processing action	LED ones: 0: With response to write operation 1: Without response to write operation LED tens: 0: Communication encryption setting is invalid 1: Communication encryption setting is valid	LED ones: 0~1 LED tens: 0~1	0x00

6.2 PROFIBUS protocol

(1) PROFIBUS, the international and open fieldbus standard, can achieve the interchange of data among various automated components. It is widespreadly applied to automation such as manufacture, process industry, building, and transportation power and so on, and provides an effective solution to realize comprehensive automation and intelligent field devices.

(2) PROFIBUS consists of three compatible sections, PROFIBUS-DP (Decentralised Periphery), PROFIBUS-PA (Process Automation) and PROFIBUS-FMS (Fieldbus Message Specification). It uses the master-slave mode to exchange data with the inverter periodically.

(3) The physical transmission medium of the bus is the twisted pair (in accordance with RS-485 standards), paired cable or optical cable and the baud rate is from 9.6kbit/s to 12Mbit/s. The maximum length of bus cable is in the range of 100-1200 meters, depending on the transmission speed (refer to ***Technical Data***). There are at most 31 nodes connected to the same PROFIBUS network segment without using any repeater while the node number (including the repeater and master station) will increase to 127 if the repeater is used.

(4) Under PROFIBUS communication, the token passsing is among master stations and master-slave transmission is between the master station and slave station, so the communication mode supports single master or multi-slave system. Select the node to respond the command of the master by the master station, usually PLC. The cycling master transmits from the user data; for non-cycling master, the main data transmitter can also give commands to several nodes on broadcast. In this case, there is no need for the nodes to send feedback signals to the master. The nodes cannot communicate with each other.

(5) There is detailed description of PROFIBUS protocol in EN 50170 standards. To get more information,

please refer to EN 50170 standards.

6.2.1 System configuration

1. System configuration

After installing EC-TX103 communication card correctly, it is necessary to configure the master station and inverter to set up communication between the master station and EC-TX103 card.

Each slave station on PROFIBUS has a device description file called GSD which is used to describe the characteristics of PROFIBUS-DP devices. The software we offer the user contains device data files (GSD) related to the inverter and the user can also get the defined type files of each master (GSD) from local INVT office.

Parameter No.	Name	Optional setting	Default setting	Remarks
0	Module type	Read only	PROFIBUS-DP	The parameter displays the communication module type detected by the inverter and users cannot adjust the value. If the parameter is not defined, communication cannot be set up between the module and inverter.
1	Node address	0~99	2	Each device corresponds to a unique node address in PROFIBUS network. Use the selective switch of the node address to define the address. Users cannot adjust the parameter and it is only used to display the set node address.
2	Baud rate setting	0: 9.6kbit/s 1: 19.2 kbit/s 2: 45.45 kbit/s 3: 93.75 kbit/s 4: 187.5 kbit/s 5: 500 kbit/s 6: 1.5 Mbit/s 7: 3Mbit/s 8: 6 Mbit/s 9: 9 Mbit/s 10: 12 Mbit/s	6	
3	PZD2	0~65535	0	
4	PZD3	0~65535	0	
…	……	0~65535	0	
10	PZD12	0~65535	0	

2. Module type

The parameter displays the communication module type detected by the inverter and users cannot adjust the value. If the parameter is not defined, communication cannot be set up between the module and inverter.

3. Node address

Each device corresponds to a unique node address in PROFIBUS network. Use the selective switch of the node address to define the address (The switch is not set to 0.) and at this time the parameter is only

used to display the set node address. If the selective switch of the node address is set to 0, the parameter can be used to define the address.

Each device corresponds to a unique node address in PROFIBUS network. Use the selective switch of the node address to define the address. Users cannot adjust the parameter and it is only used to display the set node address.

4. GSD

Each slave station on PROFIBUS has a device description file called GSD which is used to describe the characteristics of PROFIBUS-DP devices. The GSD contains all defined parameters: supportive baud rate, supportive message length, input/output data content and diagnosis data meaning and so on.

We will offer a disk including GSD of fieldbus adapter (with an expanded name .gsd). Users can copy the GSD to the related subcatalog of system configuration tool software and refer to related illustrations for specific operation and PROFIBUS system configuration.

6.2.2 PROFIBUS-DP

1. PROFIBUS-DP

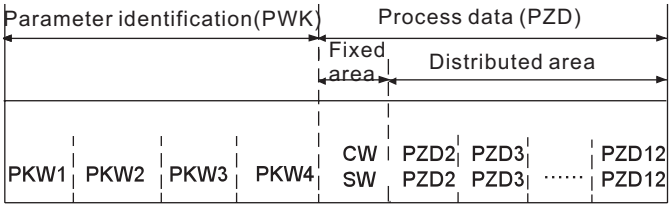
PROFIBUS-DP is a distributed I/O system which enables the master to use many peripheral modules and field devices. Its data transmission is periodical: the master reads the input message from the slave and then responds the feedback signal. EC-TX103 communication card supports PROFIBUS-DP protocol.

2. Service access points

PROFIBUS-DP visits the service of PROFIBUS data link layer (layer 2) through SAP (Service Access Points). Each service access point has the definite defined function. For more information about SAP, please refer to related PROFIBUS master station manual, PROFIBUS model or EN50170 standard (PROFIBUS protocol) for PROFIDRIVE –variable speed drive.

3. PROFIBUS-DP message frame data structure

PROFIBUS-DP allows quick data exchange between the master station and inverter. The access of devices is always in master-slave mode and the devices are the slave stations with definite addresses. PROFIBUS transmits messages periodically in 16 bits. See the structure as follows:



Parameter area:

PKW1– parameter identification

PKW2– Digit group index

PKW3– parameter 1

PKW4– parameter 2

Process data:

CW – control word

SW – status word

PZD– process data (given by the user)

(Output【reference】 from the master to the slave, input【actual value】from the slave to the master)

PZD (process data area): PZD for message communication is designed to control and monitor the inverter. The PZD received from the master station and slave station is always processed with the highest priorty. The PZD processing is prior to PKW processing and usually transmits the latest effective data.

Control word (CW) and status word (SW)

Control word (CW) is the basic way for the fieldbus system to control the devices of the inverter. The

fieldbus system sends it to the devices of the inverter and the adapter acts as the gateway. Then the devices respond according to the code of CW as well as feed back the status to the master through SW. Please refer to the inverter manual for the related code information of devices.

Reference: The devices of the inverter can receive the control command in various ways: analog and digital input terminal, control board of the inverter and one communication module (such as RS485 and EC-TX103 communication card). To ensure PROFIBUS control the devices of the inverter, the communication module must be set as the controller of the devices.

Actual value: The actual value is 16-bit including the information about operation of the devices. The function is defined and monitored by the parameters of the inverter. The integer proportion conversion transmitted to the master depends on the selected function. Please refer to the related manual.

Note: The devices of the inverter always check the bytes of the CW and reference.

Task message (The master station → inverter)

CW is the first byte in task messages. Due to different meanings of CW between PWM rectifying feedback and the inverter, the following two tables will separately describe CW:

Goodrive800 series control word (CW)

Byte	Name	Value	State/Illustration
0~7	COMMAND BYTE	1	Forward running
		2	Reverse running
		3	Forward jogging
		4	Reverse jogging
		5	Stop
		6	Coast to stop (emergency stop)
		7	Fault reset
		8	Jogging stop
		9	Pre-excitation
8	WIRTE ENABLE	1	Write enabling (mainly for PKW1-PKW4)
9~10	MOTOR GROUP SELECTION	00	MOTOR GROUP 1 SELECTION (Select motor 1)
		01	MOTOR GROUP 2 SELECTION (Select motor 2)
		02	MOTOR GROUP 3 SELECTION (Select motor 3)
		03	MOTOR GROUP 4 SELECTION (Select motor 4)
11	TORQUE CONTROL SELECTION	1	Torque control enabling
		0	Torque control disabling
14	Reserved	1	
		0	
15	HEARTBEAT REF	1	Heartbeat enabling
		0	Heartbeat disabling

Reference (REF): The main REF is from the second to the twelfth byte in PZD task messages. The main frequency reference is provided by the main reference signal source. Because there is no main frequency reference in PWM rectifying feedback, the corresponding set value is reserved.

Set values of Goodrive800 series inverters

Byte	Name	Function selection
PZD2 receiving	0: Invalid 1: Set frequency (0~Fmax(Unit: 0.01Hz))	0

Byte	Name	Function selection
PZD3 receiving	2: PID reference, range (0~1000, 1000 corresponding to 100.0%) 3: PID feedback, range (0~1000, 1000 corresponding to 100.0%)	0
PZD4 receiving	4: Torque set value (-3000~3000, 1000 corresponding to 100.0% of motor rated current)	0
PZD5 receiving	5: Set value of forward rotation upper-limit frequency (0~Fmax (Unit: 0.01Hz))	0
PZD6 receiving	6: Set value of reverse rotation upper-limit frequency (0~Fmax (Unit: 0.01Hz))	0
PZD7 receiving	7: Electromotion torque upper limit (0~3000, 1000 corresponding to 100.0% of motor rated current)	0
PZD8 receiving	8: Braking torque upper limit of (0~2000, 1000 corresponding to 100.0% of motor rated current)	0
PZD9 receiving	9: Virtual input terminal command, 0x000~0x1FF 10: Virtual output terminal command, 0x00~0x0F	0
PZD10 receiving	11: Voltage set value (special for V/F separation) (0~1000, 1000 corresponding to 100.0% of motor rated voltage)	0
PZD11 receiving	12: AO output set value 1 (-1000~1000, 1000 corresponding to 100.0%)	0
PZD12 receiving	13: AO output set value 2 (-1000~1000, 1000 corresponding to 100.0%)	0

Response message (The inverter → master station)

Status word (SW): SW is the first byte of PZD response message and it is defined as follows:

Goodrive800 series status word (SW)

Byte	Name	Value	State/Illustration
0~7	RUN STATUS BYTE	1	Forward running
		2	Reverse running
		3	Stop
		4	Fault
		5	POFF
8	DC VOLTAGE ESTABLISH	1	Ready for running
		0	Not ready for running
9~10	MOTOR GROUP FEEDBACK	0	Motor 1 feedback
		1	Motor 2 feedback
		2	Motor 3 feedback
		3	Motor 4 feedback
11	MOTOR TYPE FEEDBACK	1	Synchronous motor
		0	Asynchronous motor
12	OVERLOAD ALARM	1	Overload pre-alarm
		0	Underload pre-alarm
13	FLUX IN EXCITING	1	In exciting
		0	Establish magnetic flux
14	Reserved	1	
		0	
15	HEARTBEAT FEEDBACK	1	Heartbeat feedback
		0	No heartbeat feedback

Actual value (ACT): The main actual value is from the second to the twelfth byte in PZD task messages.

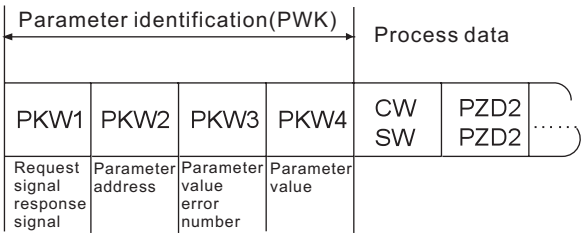
The main frequency actual value is provided by the main actual value signal source.

Goodrive800 series actual values

Byte	Name	Function selection
PZD2 sending	0: Invalid 1: Running frequency (*100, Hz) 2: Set frequency (*100, Hz) 3: Bus voltage (*10, V) 4: Output voltage (*1, V) 5: Output current (*10, A) 6: Actual output torque value (*10, %) 7: Actual output power value (*10, %) 8: Rotating speed (*1, RPM) 9: Linear speed (*1, m/s) 10: Ramp reference frequency 11: Fault code 12: AI1 (*100, V) 13: AI2 (*100, V) 14: AI3 (*100, V) 15~16: Reserved 17: S8 frequency (*100, kHz) 18: Reserved 19: Input state of terminals 20: Output state of terminals 21: PID reference (*100, %) 22: PID feedback (*100, %) 23: Motor rated torque	0
PZD3 sending		0
PZD4 sending		0
PZD5 sending		0
PZD6 sending		0
PZD7 sending		0
PZD8 sending		0
PZD9 sending		0
PZD10 sending		0
PZD11 sending		0
PZD12 sending		0

PKW area (Parameter identification signal PKW1-data area): PKW describes the processing way of parameter identification interface which is not the physical interface but the mechanism to ensure the transmission way between two communication objects, such as read and write the parameters.

PKW structure



Parameter identification area

In periodical PROFIBUS-DP communication, PKW consists of 4 bytes (16 bits). See the definition of each byte in following table:

1st byte PKW1 (16 bits)		
Bit 15~00	Task or response identification signal	0~7
2nd byte PKW2 (16 bits)		
Bit 15~00	Basic parameter address	0~247
3rd byte PKW3 (16 bits)		
Bit 15~00	Parameter value (high bit) or error code of return value	00
4th byte PKW4 (16 bits)		
Bit 15~00	Parameter value (low bit)	0~65535

Note: If the master station requests a parameter value, the values in PKW3 and PKW4 messages toward the inverter will be invalid.

Task request and response: During transmitting data to the slave, the master will use request while the slave will use response to ensure positive or negative.

The definition of task identification PKW1 is shown as follows:

Request signal (from the master to the slave)		Response signal	
Request	Function	Positive	Negative
0	No task	0	—
1	Request the parameter value	1, 2	3
2	Modify the parameter value (single word) [only modify RAM]	1	3 or 4
3	Modify the parameter value (double words) [only modify RAM]	2	3 or 4
4	Modify the parameter value (single word) [both RAM and EEPROM are modified]	1	3 or 4
5	Modify the parameter value (double words) [both RAM and EEPROM are modified]	2	3 or 4

Request “2”-modify the parameter value (single word) [only modify RAM], request “3”-modify the parameter value (double words) [only modify RAM] and request “5”-modify the parameter value (double words) [both RAM and EEPROM are modified] are not supported.

The definition of response signal PKW1 is shown as follows:

Response signal (from the slave to the master)	
No.	Function
0	No response
1	Transmit the parameter value (single word)
2	Transmit the parameter value (double words)
3	The task can not be executed and the below errors are fed back: 0: Illegal parameter number 1: Unmodifiable (read only). 2: Out of the setting range 3: Incorrect subindex number 4: Unallowable setting (reset only). 5: Invalid data type 6: The task cannot be executed due to operating state. 7: Unsupportive request 8: The request cannot be completed due to communication error. 9: Fault during write operation in permanent storage area 10: Request failed due to timeout 11: The parameter cannot be allocated to PZD. 12: The CW bit cannot be allocated. 13: Other errors
4	No parameter modifying right

PKW example:

Example 1: Read the parameter value: read the upper limit of running frequency (The running frequency upper-limit address is 4.) by setting PKW1 to 1 and PKW2 to 4, and the return value is in PKW4.

Request (The master station → inverter):

	PKW1		PKW2		PKW3		PKW4		CW		PZD2		PZD3		…	PZD12	
Request	00	01	00	04	00	00	00	00	xx	xx	xx	xx	xx	xx	…	xx	xx

0004: Parameter address

0001: Request read the parameter value

Response (The inverter → master station):

	PKW1		PKW2		PKW3		PKW4		CW		PZD2		PZD3		…	PZD12	
Response	00	01	00	04	00	00	50	00	xx	xx	xx	xx	xx	xx	…	xx	xx

5000: The parameter value of address 4

0001: Response (The parameter value is refreshed.)

Example 2: Modify the parameter value (both RAM and EEPROM are modified): modify the upper limit of running frequency (The running frequency upper-limit address is 4.) by setting PKW1 to 2 and PKW2 to 4, and the value (50.00) needs modifying in PKW4.

Request (The master station → inverter):

	PKW1		PKW2		PKW3		PKW4		CW		PZD2		PZD3		…	PZD12	
Request	00	02	00	04	00	00	50	00	xx	xx	xx	xx	xx	xx	…	xx	xx

5000: The parameter value of address 4

0004: Modify the parameter value

Response (The inverter → master station):

	PKW1		PKW2		PKW3		PKW4		CW		PZD2		PZD3		…	PZD12	
Response	00	01	00	04	00	00	50	00	xx	xx	xx	xx	xx	xx	…	xx	xx

0001: Response (The parameter value is refreshed.)

PZD example: The PZD transmission is achieved by setting the function codes of the inverter. Refer to the inverter manual for related function codes.

Example 1: Read the process data of the inverter

The inverter parameter selects “8: Rotating speed” of actual values as PZD3 to transmit, which can be realized by setting P21.14 to 8. The operation is mandatory till the parameter is replaced by other options.

Response (The inverter → master station):

	PKW1		PKW2		PKW3		PKW4		CW		PZD2		PZD3		…	PZD12	
Response	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	00	0A	…	xx	xx

Example 2: Write the process data into the devices of the inverter

The inverter parameter selects “2: PID reference” in the reference group from PZD3, which can be realized by setting P21.03 to 2. The parameter in each request frame will refresh via PZD3 until another parameter is selected.

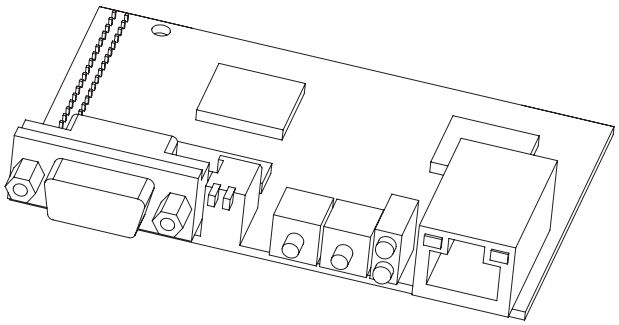
Request (The master station → inverter):

	PKW1		PKW2		PKW3		PKW4		CW		PZD2		PZD3		…	PZD12	
Request	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	00	00	…	xx	xx

Later, PZD3 in each request frame will be given by the traction until another parameter is selected.

6.2.3 Fault

There are two LEDs of EC-TX103 communication card for fault display and their functions are as follows:



LED no.	Name	Color	Function
1	Online	Green	On—The module is on line and data can exchange. Off—The module is not on line.
2	Offline/ Fault	Red	On—The module is off line and data cannot exchange. Off—The module is not off line. Flicker frequency 1Hz-Configuration error: The length of the user parameter dataset is different from the set value in the process of module initialization and network configuration. Flicker frequency 2Hz-User parameter data error: The length or content of the user parameter dataset is different from the set value in the process of module initialization and network configuration. Flicker frequency 4Hz-PROFIBUS communication ASIC initialization error Off-The diagnosis is closed.

6.2.4 Related function codes

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P21.00	Module type	0: PROFIBUS/CANopen 1: Reserved	0~1	0
P21.01	Module address	0~127	0~127	2
P21.02	PZD2 receiving	0: Invalid 1: Set frequency (0~Fmax (Unit: 0.01Hz)) 2: PID reference, range (0~1000, 1000 corresponding to 100.0%) 3: PID feedback, range (0~1000, 1000 corresponding to 100.0%) 4: Torque set value (-3000~3000, 1000 corresponding to 100.0% of motor rated current) 5: Set value of forward rotation upper-limit frequency (0~Fmax (Unit: 0.01Hz)) 6: Set value of reverse rotation upper-limit frequency (0~Fmax (Unit: 0.01Hz)) 7: Electromotion torque upper limit	0~20	0
P15.03	PZD3 receiving		0~20	0
P21.04	PZD4 receiving		0~20	0
P21.05	PZD5 receiving		0~20	0
P21.06	PZD6 receiving		0~20	0
P21.07	PZD7 receiving		0~20	0
P21.08	PZD8 receiving		0~20	0
P21.09	PZD9 receiving		0~20	0
P21.10	PZD10 receiving		0~20	0
P21.11	PZD11 receiving		0~20	0
P21.12	PZD12 receiving		0~20	0

Function code	Name	Detailed instruction of parameters	Setting range	Default value
		(0~3000, 1000 corresponding to 100.0% of motor rated current) 8: Braking torque upper limit of (0~2000, 1000 corresponding to 100.0% of motor rated current) 9: Virtual input terminal command, 0x000~0x1FF 10: Virtual output terminal command, 0x00~0x0F 11: Voltage set value (special for V/F separation) (0~1000, 1000 corresponding to 100.0% of motor rated voltage) 12: AO output set value 1 (-1000~1000, 1000 corresponding to 100.0%) 13: AO output set value 2 (-1000~1000, 1000 corresponding to 100.0%) 16: Pre-torque setting 17~20: Reserved		
P21.13	PZD2 sending	0: Invalid 1: Running frequency (*100, Hz) 2: Set frequency (*100, Hz) 3: Bus voltage (*10, V) 4: Output voltage (*1, V) 5: Output current (*10, A) 6: Actual output torque value (*10, %) 7: Actual output power value (*10, %) 8: Rotating speed (*1, RPM) 9: Linear speed (*1, m/s) 10: Ramp reference frequency	0~23	0
P21.14	PZD3 sending		0~23	0
P21.15	PZD4 sending		0~23	0
P21.16	PZD5 sending		0~23	0
P21.17	PZD6 sending		0~23	0
P21.18	PZD7 sending		0~23	0
P21.19	PZD8 sending		0~23	0
P21.20	PZD9 sending		0~23	0
P21.21	PZD10 sending		0~23	0
P21.22	PZD11 sending		0~23	0
P21.23	PZD12 sending	11: Fault code 12: AI1 (*100,V) 13: AI2 (*100,V) 14: AI3 (*100,V) 15~16: Reserved 17: S8 frequency (*100, kHz) 18: PG card speed (with sign) 19: Input state of terminals 20: Output state of terminals 21: PID reference (*100, %) 22: PID feedback (*100, %) 23: Motor rated torque	0~23	0
P21.24	Temporary variable 1 for PZD sending	0~65535	0~65535	0
P21.25	Fault time of DP communication timeout	0.0 (invalid), 0.1~60.0s	0.0~60.0	0.0s

6.3 CANopen protocol

Please refer to the *Manual of EC-TX105 CANopen Communication Card.*

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P21.29	CANopen baud rate	0: 1000k 1: 800k 2: 500k 3: 250k 4: 125k 5: 100k 6: 50k 7: 20k	0~7	2
P21.30	Fault time of CANopen communication timeout	0.0 (invalid) 0.1~100.0s	0.1~100.0	0.0s
P21.31	Reserved			
P21.32	External ACC/DEC time enabling	0: Disabled 1: Enabled	0~1	0

6.4 DEVICE-NET (Reserved)

6.5 Ethernet communication

The Ethernet communication function is integrated into Goodrive800 series inverters with the CN12 interface. Please use the standard Ethernet RJ45 connecting line as well as the upper computer software INVT offers (downloaded from *www.invt.com.cn*).

The upper computer can easily set, upload or download all parameters of the inverter, and simultaneously monitor over 100 pieces of wave forms in the inverter.

Goodrive800 series inverters possess the function of black box to save the waveform information for 0.2 seconds before the last stop caused by the fault, and then the upper computer gets the information to find out the reason of the fault easily.

Function code	Name	Detailed instruction of parameters	Setting range	Default value
P22.00	Ethernet communication speed setting	0: Self-adapting 1: 100M full-duplex 2: 100M half-duplex 3: 10M full-duplex 4: 10M half-duplex	0~4	0
P22.01	IP address 1	0~255	0~255	192
P22.02	IP address 2		0~255	168
P22.03	IP address 3		0~255	0
P22.04	IP address 4		0~255	1
P22.05	Subnet mask 1	0~255	0~255	255
P22.06	Subnet mask 2		0~255	255
P22.07	Subnet mask 3		0~255	255
P22.08	Subnet mask 4		0~255	0
P22.09	Gateway 1	0~255	0~255	192
P22.10	Gateway 2		0~255	168
P22.11	Gateway 3		0~255	1
P22.12	Gateway 4		0~255	1

Appendix List of function parameters

The function parameters of Goodrive800 series inverters are divided into groups, each of which includes several function codes. The function code adopts the three-level menu, such as P00.08, the eighth function code in P00 group. P29 group is the factory parameters reserved, and users are forbidden to access these parameters.

To facilitate the function code setting, the group number corresponds to the first level menu, the function code to the second level and the parameter to the third level during keypad operation.

1. Below is the instruction of the function lists:

The 1st column “Function code”: codes of the function group and parameters;

The 2nd column “Name”: full names of the function parameters;

The 3rd column “Detailed instruction of parameters”: detailed descriptions of the function parameters;

The 4th column “Setting range”: valid setting ranges for the function parameters, displayed on the keypad LCD;

The 5th column “Default value”: factory default values of the function parameters;

The 6th column “Modify”: modifying features of the function parameters (whether modifiable or not and modifying conditions), see the following instructions:

“○”: Means the set value of the parameter is modifiable at stop or running state.

“◎”: Means the set value of the parameter cannot be modified at running state.

“●”: Means the set value of the parameter is the actual value which cannot be modified.

(The inverter has limited automatic inspection of the modifying features of the function parameters to avoid incorrect modification.)

2. “Parameter radix” is decimal. If the parameter adopts hex, every data bit will be separated from each other during parameter editing. The setting range of certain bits are 0~F (hex).

3. “Default value” means the function parameter will restore to the default value during default parameters restoring while the actual detected value or record cannot be restored.

4. To protect the parameters effectively, the inverter provides the function codes with password protection. After user password setting (The parameter of P07.00 is set to non-zero.), press PRG/ESC to edit the function code. Display “0. 0. 0. 0. 0.” after the system enters into password verification. Users must input correct password; otherwise, he cannot get into the system. For the factory default values, users have to input the password of the factory. (Note: Do not try to modify the default values. If any parameter is set incorrectly, the inverter will work abnormally or even be damaged.) When the password protection is unlocked, the user password can be changed at any time and the last input will be the password. Setting P07.00 to zero will cancel the user password; if P07.00 is set to non-zero at power on, the parameters will be under password protection.

5. When the function parameters are modified by serial communication, the function of the user password will follow above principles similarly.

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
P00 Group	Basic functions				
P00.00	Speed control mode	0: Sensorless vector control 0 (suitable for AM, SM) 1: Sensorless vector control 1 (suitable for AM)	0~3	2	◎

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
		2: SVPWM control mode 3: Close loop vector control mode			
P00.01	Running command channel	0: Keypad running command channel (LED off) 1: Terminal running command channel (LED flickering) 2: Communication running command channel (LED on)	0~2	0	○
P00.02	Communication running command	0: MODBUS communication channel 1: PROFIBUS/CANopen communication channel 2: Ethernet communication channel 3: Reserved 4: DEVICE_NET communication channel (Reserved)	0~4	0	○
P00.03	Max output frequency	P00.04~400.00Hz (400.00Hz)	P00.04~400.00	50.00Hz	◎
P00.04	Upper limit of running frequency	P00.05~P00.03 (Max frequency)	P00.05~P00.03	50.00Hz	◎
P00.05	Lower limit of running frequency	0.00Hz~P00.04 (Upper limit of running frequency)	0.00~P00.04	0.00Hz	◎
P00.06	A frequency command	0: Keypad data setting 1: AI1 setting 2: AI2 setting 3: AI3 setting 4: S8 pulse setting 5: Simple PLC program setting 6: Multi-step speed running setting 7: PID control setting 8: MODBUS communication setting 9: PROFIBUS/CANopen communication setting (Extension card) 10: Ethernet communication setting (Extension card) 11: Reserved 12: DEVICE_NET communication setting (Extension card) (Reserved) 13: Master-slave PID output	0~13	0	○
P00.07	B frequency command	0: Keypad data setting 1: AI1 setting 2: AI2 setting 3: AI3 setting 4: S8 pulse setting	0~12	1	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
		5: Simple PLC program setting 6: Multi-step speed running setting 7: PID control setting 8: MODBUS communication setting 9: PROFIBUS/CANopen communication setting 10: Ethernet communication setting (Extension card) 11: Reserved 12: DEVICE_NET communication setting (Reserved)			
P00.08	B frequency command reference	0: Max output frequency 1: A frequency command	0~1	0	○
P00.09	Setting source combination	0: A 1: B 2: (A+B) 3: (A-B) 4: Max(A, B) 5: Min(A, B)	0~5	0	○
P00.10	Keypad set frequency	0.00 Hz~P00.03 (Max frequency)	0.00~P00.03	50.00Hz	○
P00.11	ACC time1	0.0~3600.0s	0.0~3600.0	Depend on model	○
P00.12	DEC time1	0.0~3600.0s	0.0~3600.0	Depend on model	○
P00.13	Running direction	0: Run in default direction 1: Run in opposite direction 2: Forbid reverse running	0~2	0	○
P00.14	Carrier frequency setting	1.0~8.0kHz	1.0~8.0	Depend on model	○
P00.15	Motor parameter autotuning	0: No operation 1: Rotation autotuning 2: Static autotuning 3: Simple autotuning	0~3	0	◎
P00.16	AVR function	0: Invalid 1: Valid during the whole process	0~1	1	○
P00.17	Application	0: Heavy overload application 1: Light overload application	0~1	0	◎
P00.18	Function parameter restoring	0: No operation 1: Restore the default value 2: Cancel the fault record	0~2	0	◎
P01 Group Start-up and stop control					
P01.00	Start-up mode	0: Start-up directly	0~2	0	◎

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
		1: Start-up after DC braking 2: Start-up after rotating speed tracking			
P01.01	Starting frequency of direct start-up	0.00~50.00Hz	0.00~50.00	0.50Hz	◎
P01.02	Retention time of starting frequency	0.0~60.0s	0.0~60.0	0.0s	◎
P01.03	Braking current before start-up	0.0~100.0%	0.0~100.0	0.0%	◎
P01.04	Braking time before start-up	0.0~60.0s	0.0~60.0	0.0s	◎
P01.05	ACC/DEC type	0: Linear type 1: S curve type	0~1	0	◎
P01.06	S curve beginning proportion	0.0~50.0% (ACC/DEC time)	0.0~50.0	30.0%	◎
P01.07	S curve end proportion	0.0~50.0% (ACC/DEC time)	0.0~50.0	30.0%	◎
P01.08	Stop mode	0: Decelerate to stop 1: Coast to stop	0~1	0	○
P01.09	Starting frequency of DC braking	0.00~P00.03 (Max frequency)	0.00~P00.03	0.00Hz	○
P01.10	Waiting time before DC braking	0.0~60.0s	0.0~60.0	0.0s	○
P01.11	DC braking current	0.0~100.0%	0.0~100.0	0.0%	○
P01.12	DC braking time	0.0~60.0s	0.0~60.0	0.0s	○
P01.13	Dead time of FWD/REV rotation	0.0~3600.0s	0.0~3600.0	0.0s	○
P01.14	Shifting between FWD/REV rotation	0: Switch after 0 frequency 1: Switch after starting frequency 2: Switch after delay at stop speed (Reserved)	0~2	0	◎
P01.15	Stop speed	0.00~100.00Hz	0.00~100.00	0.50 Hz	◎
P01.16	Detection of stop speed	0: Speed set value (the only detection method in SVPWM control) 1: Speed detecting value	0~1	0	◎
P01.17	Detection time of feedback speed	0.0~100.0 s	0.0~100.0	0.5s	◎
P01.18	Terminal running protection when power on	0: Terminal running command is invalid when power on 1: Terminal running command is valid when power on	0~1	0	○
P01.19	The running frequency is lower	0: Run at the lower-limit frequency 1: Stop	0~2	0	◎

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	than the lower limit one (valid if the lower limit frequency is above 0).	2: Hibernation			
P01.20	Hibernation restore delay time	0.0~3600.0s (valid when P01.19=2)	0.0~3600.0	0.0s	○
P01.21	Restart after power off	0: Disabled 1: Enabled	0~1	0	○
P01.22	Waiting time of restart after power off	0.0~3600.0s (valid when P01.21=1)	0.0~3600.0	1.0s	○
P01.23	Start delay time	0.0~60.0s	0.0~60.0	0.0s	○
P01.24	Delay time of stop speed	0.0~60.0s	0.0~60.0	0.0s	○
P01.25	Inverter type	0: Common inverter 1: Four-quadrant inverter	0~1	1	○
P02 Group	Motor 1 parameters				
P02.00	Motor 1 type	0: Asynchronous motor 1: Synchronous motor	0~1	0	◎
P02.01	Asynchronous motor 1 rated power	0.1~3000.0kW	0.1~3000.0	Depend on model	◎
P02.02	Asynchronous motor 1 rated frequency	0.01Hz~P00.03 (Max frequency)	0.01~P00.03	50.00Hz	◎
P02.03	Asynchronous motor 1 rated speed	1~36000rpm	1~36000	Depend on model	◎
P02.04	Asynchronous motor 1 rated voltage	0~1200V	0~1200	Depend on model	◎
P02.05	Asynchronous motor 1 rated current	0.8~6000.0A	0.8~6000.0	Depend on model	◎
P02.06	Asynchronous motor 1 stator resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model	○
P02.07	Asynchronous motor 1rotor resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model	○
P02.08	Asynchronous motor 1 leakage inductance	0.01~655.35mH	0.01~655.35	Depend on model	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
P02.09	Asynchronous motor 1 mutual inductance	0.01~655.35mH	0.01~655.35	Depend on model	○
P02.10	Asynchronous motor 1 non-load current	0.1~6553.5A	0.1~6553.5	Depend on model	○
P02.11	Magnetic saturation coefficient 1 for the iron core of AM 1	0.0~100.0%	0.0~100.0	88.0%	◎
P02.12	Magnetic saturation coefficient 2 for the iron core of AM 1	0.0~100.0%	0.0~100.0	81.0%	◎
P02.13	Magnetic saturation coefficient 3 for the iron core of AM 1	0.0~100.0%	0.0~100.0	75.0%	◎
P02.14	Magnetic saturation coefficient 4 for the iron core of AM 1	0.0~100.0%	0.0~100.0	50.0%	◎
P02.15	Synchronous motor 1 rated power	0.1~3000.0kW	0.1~3000.0	Depend on model	◎
P02.16	Synchronous motor 1 rated frequency	0.01Hz~P00.03 (Max frequency)	0.01~P00.03	50.00Hz	◎
P02.17	Synchronous motor 1 pole pairs	1~50	1~50	2	◎
P02.18	Synchronous motor 1 rated voltage	0~1200V	0~1200	Depend on model	◎
P02.19	Synchronous motor 1 rated current	0.8~6000.0A	0.8~6000.0	Depend on model	◎
P02.20	Synchronous motor 1 stator resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model	○
P02.21	Synchronous motor 1 direct axis inductance	0.01~655.35mH	0.01~655.35	Depend on model	○
P02.22	Synchronous	0.01~655.35mH	0.01~655.35	Depend on	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	motor 1 quadrature axis inductance			model	
P02.23	Synchronous motor 1 back EMF constant	0~10000V	0~10000	300V	○
P02.24	Synchronous motor1 initial magnetic pole position	0.00~359.99	0.00~359.99	0.00	◎
P02.25	Synchronous motor 1 magnetic pole position amplitude gain	0.50~1.50	0.50~1.50	1.00	○
P02.26	Synchronous motor 1 C phase magnetic pole position offset	0~9999	0~9999	2230	○
P02.27	Synchronous motor 1 D phase magnetic pole position offset	0~9999	0~9999	2230	○
P02.28	Synchronous motor 1 current identification (Reserved)	0%~50% (Motor rated current)	0~50	10%	●
P02.29	Synchronous motor 1 overload protection	0: No protection 1: Common motor (with low speed compensation) 2: Frequency conversion motor (without low speed compensation)	0~2	2	◎
P02.30	Synchronous motor 1 overload protection coefficient	20.0%~120.0%	20.0~120.0	100.0%	○
P02.31	Synchronous motor 1 parameter display	0: Display according to motor type 1: Display all parameters	0~1	0	○
P02.32	Reserved				●
P02.33	Reserved				●
P02.34	Reserved				●
P02.35	Reserved				●
P03 Group Vector control					
P03.00	Speed loop	0~200.0	0~200.0	10.0	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	proportional gain 1				
P03.01	Speed loop integral time 1	0.001~10.000s	0.001~10.000	0.500s	○
P03.02	Switching low frequency	0.00Hz~P03.05	0.00~P03.05	5.00Hz	○
P03.03	Speed loop proportional gain 2	0~200.0	0~200.0	10.0	○
P03.04	Speed loop integral time 2	0.001~10.000s	0.001~10.000	0.500s	○
P03.05	Switching high frequency	P03.02~P00.03 (Max frequency)	P03.02~P00.03	10.00Hz	○
P03.06	Speed loop output filter	0~8 (corresponding to 0~2^8/10ms)	0~8	0	○
P03.07	Vector control slip compensation coefficient (Electromotion)	50~200%	50~200	100%	○
P03.08	Vector control slip compensation coefficient (Power generation)	50~200%	50~200	100%	○
P03.09	Current loop proportional coefficient P	0~65535	0~65535	1000	○
P03.10	Current loop integral coefficient I	0~65535	0~65535	1000	○
P03.11	Torque setting method	0: Invalid torque control 1: Keypad setting (P03.12) 2: AI1 setting (100% corresponding to 3 times motor current) 3: AI2 setting (as above) 4: AI3 setting (as above) 5: S8 pulse frequency setting (as above) 6: Multi-step setting (as above) 7: MODBUS communication setting (as above) 8: PROFIBUS/CANopen communication setting (as above) 9: Ethernet communication setting (as above) 10: Reserved 11: DEVICE_NET communication	0~15	0	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
		setting 12: Internal setting of the slave (transmit from the master) 13: PID control setting 14~15: Reserved			
P03.12	Keypad setting torque	-300.0%~300.0% (Motor rated current)	-300.0~300.0	50.0%	○
P03.13	Torque given filter time	0.000~10.000s	0.000~10.000	0.100s	○
P03.14	Torque control forward rotation upper-limit frequency setting source selection	0: Keypad setting (P03.16) 1: AI1 setting (100% corresponding to 3 times motor current) 2: AI2 setting (as above) 3: AI3 setting (as above) 4: S8 pulse frequency setting (as above) 5: Multi-step setting (as above) 6: MODBUS communication setting (as above) 7: PROFIBUS/CANopen communication setting (as above) 8: Ethernet communication setting (as above) 9: Reserved 10: DEVICE_NET communication setting (as above) 11~13: Reserved	0~13	0	○
P03.15	Torque control reverse rotation upper-limit frequency setting source selection	0: Keypad setting (P03.17) 1: AI1 setting (100% corresponding to 3 times motor current) 2: AI2 setting (as above) 3: AI3 setting (as above) 4: S8 pulse frequency setting (as above) 5: Multi-step setting (as above) 6: MODBUS communication setting (as above) 7: PROFIBUS/CANopen communication setting (as above) 8: Ethernet communication setting (as above) 9: Reserved 10: DEVICE_NET communication setting	0~13	0	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
		11~13: Reserved			
P03.16	Keypad defined value of torque control forward rotation upper-limit frequency	0.00Hz~P00.03	0.00~P00.03	50.00 Hz	○
P03.17	Keypad defined value of torque control reverse rotation upper-limit frequency	0.00 Hz~P00.03	0.00~P00.03	50.00Hz	○
P03.18	Electromotion torque upper-limit setting source	0: Keypad setting (P03.20) 1: AI1 setting (100% corresponding to 3 times motor current) 2: AI2 setting (as above) 3: AI3 setting (as above) 4: S8 pulse frequency setting(as above) 5: MODBUS communication setting (as above) 6: PROFIBUS/CANopen communication setting (as above) 7: Ethernet communication setting (as above) 8: Reserved 9: DEVICE_NET communication setting (as above) 10~12: Reserved	0~12	0	○
P03.19	Braking torque upper-limit setting source	0: Keypad setting (P03.21) 1: AI1 setting (100% corresponding to 3 times motor current) 2: AI2 setting (as above) 3: AI3 setting (as above) 4: S8 pulse frequency setting (as above) 5: MODBUS communication setting (as above) 6: PROFIBUS/CANopen communication setting (as above) 7: Ethernet communication setting (as above) 8: Reserved 9: DEVICE_NET communication setting (as above)	0~12	0	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
		10~12: Reserved			
P03.20	Electromotion torque upper-limit keypad setting	0.0~300.0% (Motor rated current)	0.0~300.0	180.0%	○
P03.21	Braking torque upper-limit keypad setting	0.0~300.0% (Motor rated current)	0.0~300.0	180.0%	○
P03.22	Weakening coefficient in constant power field	0.01~2.00	0.01~2.00	1.00	○
P03.23	Lowest weakening point in constant power field	10%~100%	10~100	10%	○
P03.24	Max voltage limit	0.0~120.0% (Motor rated voltage)	0.0~120.0	103.0%	◎
P03.25	Pre-exciting time	0.000~10.000s	0.000~10.000	0.000s	○
P03.26	Weak magnetic proportional gain	0~8000	0~8000	1200	○
P03.27	Vector control speed display	0: Display the actual value 1: Display the set value	0~1	0	○
P03.28	Motor temperature compensation enabling	0: Disabled 1: Motor temperature compensating rotor resistor 2: Rotor resistor online identification enabling (only valid when asynchronous motors in close loop control)	0~2	0	◎
P03.29	Motor temperature compensating starting temperature	0~60.0°C	0~60.0	40.0°C	◎
P03.30	Motor temperature compensating coefficient	0.0~200.0%	0.0~200.0	100.0%	◎
P04 Group	SVPWM Control				
P04.00	Motor 1 and 3 V/F curve setting	0: Straight line V/F curve 1: Multi-dot V/F curve 2: 1.3th power low torque V/F curve 3: 1.7th power low torque V/F curve 4: 2.0th power low torque V/F curve 5: Customized V/F(V/F separation)	0~5	0	◎
P04.01	Motor 1 and 3	0.0%: (automatic) 0.1%~10.0%	0.0~10.0	0.0%	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	torque boost				
P04.02	Motor 1 and 3 torque boost close	0.0%~50.0% (Relative to motor 1 rated frequency)	0.0~50.0	20.0%	○
P04.03	Motor 1 and 3 V/F frequency point 1	0.00Hz~P04.05	0.00~P04.05	0.00Hz	○
P04.04	Motor 1 and 3 V/F voltage point 1	0.0%~110.0% (Rated voltage of motor 1)	0.0~110.0	00.0%	○
P04.05	Motor 1 and 3 V/F voltage point 2	P04.03~ P04.07	P04.03~ P04.07	00.00Hz	○
P04.06	Motor 1 and 3 V/F voltage point 2	0.0%~110.0% (Rated voltage of motor 1)	0.0~110.0	00.0%	○
P04.07	Motor 1 and 3 V/F frequency point 3	P04.05~P02.02 (Rated frequency of motor 1)	P04.05~ P02.02	00.00Hz	○
P04.08	Motor 1 and 3 V/F voltage point 3	0.0%~110.0% (Rated voltage of motor 1)	0.0~110.0	00.0%	○
P04.09	Motor 1 and 3 V/F slip compensation gain	0.0~200.0%	0.0~200.0	100.0%	○
P04.10	Motor 1 and 3 low frequency vibration control factor	0~100	0~100	10	○
P04.11	Motor 1 and 3 high frequency oscillation control factor	0~100	0~100	10	○
P04.12	Motor 1 and 3 oscillation control threshold	0.00Hz~P00.03 (Max frequency)	0.00~P00.03	30.00Hz	○
P04.13	Motor 2 and 4 V/F curve setting	0: Straight line V/F curve 1: Multi-dot V/F curve 2: 1.3th power low torque V/F curve 3: 1.7th power low torque V/F curve 4: 2.0th power low torque V/F curve 5: Customized V/F(V/F separation)	0~5	0	◎
P04.14	Motor 2 and 4 V/F torque boost	0.0%: (automatic) 0.1%~10.0%	0.0~10.0	0.0%	○
P04.15	Motor 2 and 4 V/F torque boost close	0.0%~50.0% (Relative to rated frequency of motor 2)	0.0~50.0	20.0%	○
P04.16	Motor 2 and 4 V/F frequency point 1	0.00Hz~ P04.18	0.00~P04.18	0.00Hz	○
P04.17	Motor 2 and 4 V/F voltage point 1	0.0%~110.0% (Rated voltage of motor 2)	0.0~110.0	00.0%	○
P04.18	Motor 2 and 4 V/F	P04.16~ P04.20	P04.16~	00.00Hz	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	frequency point 2		P04.20		
P04.19	Motor 2 and 4 V/F voltage point 2	0.0%~110.0% (Rated voltage of motor 2)	0.0~110.0	00.0%	○
P04.20	Motor 2 and 4 V/F frequency point 3	P04.18~ P12.02 or P04.18~ P12.16	P04.18~ P12.02 or P04.18~ P12.16	00.00Hz	○
P04.21	Motor 2 and 4 V/F voltage point 3	0.0%~110.0% (Rated voltage of motor 2)	0.0~110.0	00.0%	○
P04.22	Motor 2 and 4 V/F slip compensation gain	0.0~200.0%	0.0~200.0	100.0%	○
P04.23	Motor 2 and 4 low frequency oscillation control factor	0~100	0~100	10	○
P04.24	Motor 2 and 4 high frequency oscillation control factor	0~100	0~100	10	○
P04.25	Motor 2 and 4 oscillation control threshold	0.00Hz~P00.03 (Max frequency)	0.00~P00.03	30.00Hz	○
P04.26	Energy-saving operation	0: No action 1: Automatic energy-saving operation	0~1	0	◎
P04.27	Voltage setting channel (V/F separation)	0: Keypad setting (Determined by P04.28) 1: AI1 setting 2: AI2 setting 3: AI3 setting 4: S8 pulse setting 5: Multi-step setting (Determined by the multi-step speed parameter of P10) 6: PID setting 7: MODBUS communication setting 8: PROFIBUS/CANopen communication setting 9: Ethernet communication setting 10: Reserved 11: DEVICE_NET communication setting (Reserved) 12~14: Reserved	0~14	0	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
P04.28	Keypad setting voltage	0.0%~100.0%	0.0~100.0	100.0%	○
P04.29	Voltage increasing time	0.0~3600.0s	0.0~3600.0	5.0s	○
P04.30	Voltage decreasing time	0.0~3600.0s	0.0~3600.0	5.0s	○
P04.31	Max output voltage	P04.32~100.0% (Motor rated voltage)	P04.32~100.0	100.0%	◎
P04.32	Min output voltage	0.0%~P04.31 (Motor rated voltage)	0.0~ P04.31	0.0%	◎
P04.33	Forward feedback voltage compensation coefficient	0.00~100.00	0.00~100.00	0.00	○
P04.34	Forward feedback voltage amplitude limit	0.0~80.0%	0.0~80.0	0.0%	○
P04.35	EPS enabling selection	0: Disabled 1: Enabled	0~1	0	◎
P05 Group	Input terminals				
P05.00	S8 input type	0: S8 is pulse input. 1: S8 is switch input.	0~1	0	◎
P05.01	S1 terminal function	0: No function 1: Forward rotation operation 2: Reverse rotation operation 3: 3-wire control operation 4: Forward rotation jogging 5: Reverse rotation jogging 6: Coast to stop 7: Fault reset 8: Operation pause 9: External fault input 10: Increasing frequency setting (UP) 11: Decreasing frequency setting (DOWN) 12: Cancel the frequency change setting 13: Shift between A setting and B setting 14: Shift between combination setting and A setting 15: Shift between combination setting and B setting 16: Multi-step speed terminal 1	0~63	0	◎
P05.02	S2 terminal function		0~63	0	◎
P05.03	S3 terminal function		0~63	0	◎
P05.04	S4 terminal function		0~63	0	◎
P05.05	S5 terminal function		0~63	0	◎
P05.06	S6 terminal function		0~63	0	◎
P05.07	S7 terminal function		0~63	0	◎
P05.08	S8 terminal function		0~63	0	◎

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
		17: Multi-step speed terminal 2 18: Multi-step speed terminal 3 19: Multi-step speed terminal 4 20: Multi- step speed pause 21: ACC/DEC time option 1 22: ACC/DEC time option 2 23: Simple PLC stop reset 24: Simple PLC pause 25: PID control pause 26: Traverse pause (Stop at the current frequency) 27: Traverse reset (Return to the center frequency) 28: Counter reset 29: Torque control prohibition 30: ACC/DEC prohibition 31: Counter trigger 32: Length reset 33: Cancel the frequency change setting temporarily 34: DC brake 35: Brake feedback 36: Shift the command to the keypad 37: Shift the command to the terminals 38: Shift the command to the communication 39: Pre-exciting command 40: Clear the power 41: Keep the power 42: Shift the torque upper-limit setting 43: Motor set option 1 44: Motor set option 2 45: Snag protection input 46: Safe stop 1 (SS1) 47: Safe limit speed (SLS) 48~63: Reserved			
P05.09	Polarity of input terminals	0x0000~0x00FF	0x0000~0x00FF	0x0000	○
P05.10	ON-OFF filter time	0.000~1.000s	0.000~1.000	0.010s	○
P05.11	Virtual terminal setting	0: Virtual terminals are invalid. 1: MODBUS communication virtual terminals are valid.	0~4	0	◎

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
		2: PROFIBUS/CANopen communication virtual terminals are valid. 3: Ethernet communication virtual terminals are valid. 4: Reserved			
P05.12	Terminal control running mode	0: 2-wire control 1 1: 2-wire control 2 2: 3-wire control 1 3: 3-wire control 2	0~3	0	◎
P05.13	S1 terminal switching-on delay time	0.000~60.000s	0.000~60.000	0.000s	○
P05.14	S1 terminal switching-off delay time	0.000~60.000s	0.000~60.000	0.000s	○
P05.15	S2 terminal switching-on delay time	0.000~60.000s	0.000~60.000	0.000s	○
P05.16	S2 terminal switching-off delay time	0.000~60.000s	0.000~60.000	0.000s	○
P05.17	S3 terminal switching-on delay time	0.000~60.000s	0.000~60.000	0.000s	○
P05.18	S3 terminal switching-off delay time	0.000~60.000s	0.000~60.000	0.000s	○
P05.19	S4 terminal switching-on delay time	0.000~60.000s	0.000~60.000	0.000s	○
P05.20	S4 terminal switching-off delay time	0.000~60.000s	0.000~60.000	0.000s	○
P05.21	S5 terminal switching-on delay time	0.000~60.000s	0.000~60.000	0.000s	○
P05.22	S5 terminal switching-off delay time	0.000~60.000s	0.000~60.000	0.000s	○
P05.23	S6 terminal switching-on delay time	0.000~60.000s	0.000~60.000	0.000s	○
P05.24	S6 terminal	0.000~60.000s	0.000~60.000	0.000s	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	switching-off delay time				
P05.25	S7 terminal switching-on delay time	0.000~60.000s	0.000~60.000	0.000s	○
P05.26	S7 terminal switching-off delay time	0.000~60.000s	0.000~60.000	0.000s	○
P05.27	S8 terminal switching-on delay time	0.000~60.000s	0.000~60.000	0.000s	○
P05.28	S8 terminal switching-off delay time	0.000~60.000s	0.000~60.000	0.000s	○
P05.29	AI1 lower limit	0.00V~P05.31	0.00~P05.31	0.00V	○
P05.30	Corresponding setting of AI1 lower limit	-100.0%~100.0%	-100.0~100.0	0.0%	○
P05.31	AI1 upper limit	P05.29~10.00V	P05.29~10.00	10.00V	○
P05.32	Corresponding setting of AI1 upper limit	-100.0%~100.0%	-100.0~100.0	100.0%	○
P05.33	AI1 input filter time	0.000s~10.000s	0.000~10.000	0.100s	○
P05.34	AI2 lower limit	0.00V~P05.36	0.00~P05.36	0.00V	○
P05.35	Corresponding setting of AI2 lower limit	-100.0%~100.0%	-100.0~100.0	0.0%	○
P05.36	AI2 upper limit	P05.34~10.00V	P05.34~10.00	10.00V	○
P05.37	Corresponding setting of AI2 upper limit	-100.0%~100.0%	-100.0~100.0	100.0%	○
P05.38	AI2 input filter time	0.000s~10.000s	0.000~10.000	0.100s	○
P05.39	AI3 lower limit	-10.00V~P05.41	-10.00~ P05.41	-10.00V	○
P05.40	Corresponding setting of AI3 lower limit	-100.0%~100.0%	-100.0~100.0	-100.0%	○
P05.41	Middle value of AI3	P05.39~ P05.43	P05.39~ P05.43	0.00V	○
P05.42	Corresponding setting of AI3 middle value	-100.0%~100.0%	-100.0~100.0	0.0%	○
P05.43	AI3 upper limit	P05.41~10.00V	P05.41~10.00	10.00V	○
P05.44	Corresponding	-100.0%~100.0%	-100.0~100.0	100.0%	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	setting of AI3 upper limit				
P05.45	AI3 input filter time	0.000s~10.000s	0.000~10.000	0.100s	○
P05.46	S8 pulse input function	0: Frequency setting input 1: Counter input 2: Reserved	0~2	0	◎
P05.47	S8 lower-limit frequency	0.00 KHz~P05.49	0.00~P05.49	0.00KHz	○
P05.48	Corresponding setting of S8 lower-limit frequency	-100.0%~100.0%	-100.0~100.0	0.0%	○
P05.49	S8 upper-limit frequency	P05.47 ~50.00KHz	P05.47~50.00	50.00KHz	○
P05.50	Corresponding setting of S8 upper-limit frequency	-100.0%~100.0%	-100.0~100.0	100.0%	○
P05.51	Input filter time of S8 pulse frequency	0.000s~10.000s	0.000~10.000	0.100s	○
P05.52~ P05.59	Reserved	Reserved	Reserved	Reserved	●
P06 Group	Output terminals				
P06.00	Y2 output type	0: Y2 open collector output 1: Y2 pulse output	0~1	0	◎
P06.01	Y1 output	0: Invalid 1: In operation 2: Forward rotation operation 3: Reverse rotation operation 4: Jogging operation 5: Inverter fault 6: Frequency degree test FDT1 7: Frequency degree test FDT2 8: Frequency arrival 9: Zero speed running 10: Upper limit frequency arrival 11: Lower limit frequency arrival 12: Ready for operation 13: Pre-excitation 14: Overload pre-alarm 15: Underload pre-alarm 16: Completion of simple PLC step	0~63	0	○
P06.02	Y2 output		0~63	0	○
P06.03	Relay RO1 output		0~63	0	○
P06.04	Relay RO2 output		0~63	0	○
P06.05	Relay RO3 output		0~63	0	○
P06.06	Relay RO4 output		0~63	0	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
		17: Completion of simple PLC cycle 18: Setting count value arrival 19: Defined count value arrival 20: External fault valid 21: Length arrival (Reserved) 22: Running time arrival 23: MODBUS communication virtual terminal output 24: PROFIBUS/CANopen communication virtual terminal output 25: Ethernet communication virtual terminal output 26: Bus voltage setup 27: Brake control 28~63: Reserved			
P06.07	Polarity of output terminals	0~0x3F	0~0x3F	0x00	○
P06.08	Y1 switching-on delay time	0.000~60.000s	0.000~60.000	0.000s	○
P06.09	Y1 switching-off delay time	0.000~60.000s	0.000~60.000	0.000s	○
P06.10	Y2 switching-on delay time	0.000~60.000s	0.000~60.000	0.000s	○
P06.11	Y2 switching-off delay time	0.000~60.000s	0.000~60.000	0.000s	○
P06.12	Relay RO1 switching-on delay time	0.000~60.000s	0.000~60.000	0.000s	○
P06.13	Relay RO1 switching-off delay time	0.000~60.000s	0.000~60.000	0.000s	○
P06.14	Relay RO2 switching-on delay time	0.000~60.000s	0.000~60.000	0.000s	○
P06.15	Relay RO2 switching-off delay time	0.000~60.000s	0.000~60.000	0.000s	○
P06.16	Relay RO3 switching-on delay time	0.000~60.000s	0.000~60.000	0.000s	○
P06.17	Relay RO3 switching-off delay time	0.000~60.000s	0.000~60.000	0.000s	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
P06.18	Relay RO4 switching-on delay time	0.000~60.000s	0.000~60.000	0.000s	○
P06.19	Relay RO4 switching-off delay time	0.000~60.000s	0.000~60.000	0.000s	○
P06.20	AO1 output	0: Running frequency	0~30	0	○
P06.21	AO2 output	1: Set frequency	0~30	0	○
P06.22	Y2 pulse output	2: Ramp reference frequency 3: Running rotating speed 4: Output current (Relative to inverter) 5: Output current (Relative to motor) 6: Output voltage 7: Output power 8: Set torque value 9: Output torque 10: AI1 input value 11: AI2 input value 12: AI3 input value 13: S8 pulse frequency input value 14: MODBUS communication set value 1 15: MODBUS communication set value 2 16: PROFIBUS/CANopen communication set value 1 17: PROFIBUS/CANopen communication set value 2 18: Ethernet communication set value 1 19: Ethernet communication set value 2 20: Torque current reference 21: Reserved 22: Torque current (Relative to motor rated current) 23: Exciting current (Relative to motor rated current) 24: PID reference 25: PID feedback 26~30: Reserved	0~30	0	○
P06.23	Lower limit of AO1 output	0.0%~100.0%	0.0~100.0	0.0%	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
P06.24	Corresponding AO1 output to lower limit	0.00V~10.00V	0.00~10.00	0.00V	○
P06.25	Upper limit of AO1 output	0.0%~100.0%	0.0~100.0	100.0%	○
P06.26	Corresponding AO1 output to upper limit	0.00V~10.00V	0.00~10.00	10.00V	○
P06.27	AO1 output filter time	0.000s~10.000s	0.000~10.000	0.000s	○
P06.28	Lower limit of AO2 output	-100.0%~100.0%	-100.0~100.0	0.0%	○
P06.29	Corresponding AO2 output to lower limit	-10.00V~10.00V	-10.00~10.00	0.00V	○
P06.30	Upper limit of AO2 output	-100.0%~100.0%	-100.0~100.0	100.0%	○
P06.31	Corresponding AO2 output to upper limit	-10.00V~10.00V	-10.00~10.00	10.00V	○
P06.32	AO2 output filter time	0.000s~10.000s	0.000~10.000	0.000s	○
P06.33	Lower limit of Y2 output	0.0%~100.0%	0.0~100.0	0.00%	○
P06.34	Corresponding Y2 output frequency to lower limit	0.00~50.00kHz	0.00~50.00	0.00kHz	○
P06.35	Upper limit of Y2 output	0.0%~100.0%	0.0~100.0	100.0%	○
P06.36	Corresponding Y2 output frequency to upper limit	0.00~50.00kHz	0.00~50.00	50.00kHz	○
P06.37	Y2 output filter time	0.000s~10.000s	0.000~10.000	0.000s	○
P06.38~ P06.49	Reserved	Reserved	Reserved	Reserved	●
P07 Group Human-machine interface					
P07.00	User password	0~65535	0~65535	0	○
P07.01	Parameter copy	0: No operation 1: Upload the local function parameters to the keypad 2: Download the function parameters of the keypad to the	0~4	0	◎

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
		local address (including the motor parameters) 3: Download the function parameters of the keypad to the local address (excluding the motor parameters of P02, P12, P13 and P14) 4: Download the function parameters of the keypad to the local address (only including the motor parameters of P02, P12, P13 and P14)			
P07.02	QUICK/JOG function selection	0: No function 1: Jogging 2: Shift the display state by the shifting key 3: Shift between forward rotation and reverse rotation 4: Clear UP/DOWN setting 5: Coast to stop 6: Shift the running command sources in sequence 7: Quick commission mode (according to the non-factory parameter commissioning)	0~7	1	◎
P07.03	QUICK shifting sequence of running command channel	0: Keypad control→terminal control →communication control 1: Keypad control←→terminal control 2: Keypad control←→ communication control 3: Terminal control←→ communication control	0~3	0	○
P07.04	STOP/RST stop function	0: Only valid for keypad control 1: Both valid for keypad and terminal control 2: Both valid for keypad and communication control 3: Valid for all control modes	0~3	0	○
P07.05	Parameter selection 1 at running state	BIT0: Running frequency (Hz on) BIT1: Set frequency (Hz flickering) BIT2: Bus voltage (V on) BIT3: Output voltage (V on) BIT4: Output current (A on)	0x0000~0xFFFF	0x03FF	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
		BIT5: Rotating speed (rpm on) BIT6: Output power (% on) BIT7: Output torque (% on) BIT8: PID reference (% flickering) BIT9: PID feedback (% on) BIT10: Input terminal state BIT11: Output terminal state BIT12: Torque set value (% on) BIT13: Pulse count value BIT14: Reserved BIT15: PLC and current step in multi-step speed			
P07.06	Parameter selection 2 at running state	BIT0: AI1 value (V on) BIT1: AI2 value (V on) BIT2: AI3 value (V on) BIT3~BIT4: Reserved BIT5: High-speed pulse S8 frequency BIT6: Reserved BIT7: Motor overload percentage (% on) BIT8: Inverter overload percentage (% on) BIT9: Ramp reference frequency (Hz on) BIT10: Linear speed BIT11~15: Reserved	0x0000~0xFFFF	0x0000	
P07.07	The parameter at stop state	BIT0: Set frequency (Hz on, frequency flickering slowly) BIT1: Bus voltage (V on) BIT2: Input terminal state BIT3: Output terminal state BIT4: PID reference(% flickering) BIT5: PID feedback(% on) BIT6: Torque set value(% on) BIT7: AI1 value (V on) BIT8: AI2 value (V on) BIT9: AI3 value (V on) BIT10: Reserved BIT11: Reserved BIT12: High-speed pulse S8 frequency BIT13: Reserved BIT14: PLC and current step in multi-step speed BIT15: Pulse count value	0x0000~0xFFFF	0x00FF	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
P07.08	Frequency coefficient	0.01~10.00	0.01~10.00	1.00	○
P07.09	Rotating speed coefficient	0.1~999.9%	0.1~999.9	100.0%	○
P07.10	Linear speed coefficient	0.1~999.9%	0.1~999.9	1.0%	○
P07.11	Rectifier bridge module temperature	-20~120.0°C			●
P07.12	Converter module temperature	-20~120.0°C			●
P07.13	Software version of control board	1.00~655.35			●
P07.14	Local accumulative running time	0~65535h			●
P07.15	High bit of power consumption	0~65535° (*1000)			●
P07.16	Low bit of power consumption	0.0~999.9°			●
P07.17	Application	0: Heavy overload application 1: Light overload application			●
P07.18	Inverter rated power	0.4~6000.0kW			●
P07.19	Inverter rated voltage	50~1200V			●
P07.20	Inverter rated current	0.1~6000.0A			●
P07.21	Factory bar code 1	0x0000~0xFFFF			●
P07.22	Factory bar code 2	0x0000~0xFFFF			●
P07.23	Factory bar code 3	0x0000~0xFFFF			●
P07.24	Factory bar code 4	0x0000~0xFFFF			●
P07.25	Factory bar code 5	0x0000~0xFFFF			●
P07.26	Factory bar code 6	0x0000~0xFFFF			●
P08 Group Enhanced functions					
P08.00	ACC time 2	0.0~3600.0s	0.0~3600.0	Depend on model	○
P08.01	DEC time 2	0.0~3600.0s	0.0~3600.0	Depend on model	○
P08.02	ACC time 3	0.0~3600.0s	0.0~3600.0	Depend on model	○
P08.03	DEC time 3	0.0~3600.0s	0.0~3600.0	Depend on model	○
P08.04	ACC time 4	0.0~3600.0s	0.0~3600.0	Depend on	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
				model	
P08.05	DEC time 4	0.0~3600.0s	0.0~3600.0	Depend on model	○
P08.06	Jogging frequency	0.00~P00.03 (Max frequency)	0.00~P00.03	5.00Hz	○
P08.07	Jogging ACC time	0.0~3600.0s	0.0~3600.0	Depend on model	○
P08.08	Jogging DEC time	0.0~3600.0s	0.0~3600.0	Depend on models	○
P08.09	Jumping frequency 1	0.00~P00.03 (Max frequency)	0.00~P00.03	0.00Hz	○
P08.10	Jumping frequency range 1	0.00~P00.03 (Max frequency)	0.00~P00.03	0.00Hz	○
P08.11	Jumping frequency 2	0.00~P00.03 (Max frequency)	0.00~P00.03	0.00Hz	○
P08.12	Jumping frequency range 2	0.00~P00.03 (Max frequency)	0.00~P00.03	0.00Hz	○
P08.13	Jumping frequency 3	0.00~P00.03 (Max frequency)	0.00~P00.03	0.00Hz	○
P08.14	Jumping frequency range 3	0.00~P00.03 (Max frequency)	0.00~P00.03	0.00Hz	○
P08.15	Traverse range	0.0~100.0% (Relative to set frequency)	0.0~100.0	0.0%	○
P08.16	Sudden jumping frequency range	0.0~50.0% (Relative to traverse range)	0.0~50.0	0.0%	○
P08.17	Traverse boost time	0.1~3600.0s	0.1~3600.0	5.0s	○
P08.18	Traverse declining time	0.1~3600.0s	0.1~3600.0	5.0s	○
P08.19	Proportional coefficient of high-frequency current loop	0~65535	0~65535	1000	○
P08.20	Integral coefficient of high-frequency current loop	0~65535	0~65535	1000	○
P08.21	Axis pulse per rotation (Reserved)	1~10000	1~10000	1	○
P08.22	Axis circumference (Reserved)	0.01~100.00cm	0.01~100.00	10.00cm	○
P08.23	Length multiple (Reserved)	0.001~10.000	0.001~10.000	1.000	○
P08.24	Length correction coefficient	0.001~1.000	0.001~1.000	1.000	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	(Reserved)				
P08.25	Set count value	P08.26~65535	P08.26~65535	0	○
P08.26	Reference count value	0~P08.25	0~P08.25	0	○
P08.27	Set running time	0~65535min	0~65535	0min	○
P08.28	Fault reset times	0~10	0~10	0	○
P08.29	Interval time of automatic fault reset	0.1~100.0s	0.1~100.0	1.0s	○
P08.30	Frequency decreasing ratio of dropping control	0.00~30.00Hz	0.00~30.00	0.00Hz	○
P08.31	Shifting channel of motors	0: Terminal shifting 1: MODBUS communication shifting 2: PROFIBUS/CANopen communication shifting	0~2	0	◎
P08.32	FDT1 electrical level detection value	0.00~P00.03 (Max frequency)	0.00~ P00.03	50.00Hz	○
P08.33	FDT1 retention detection value	0.0~100.0% (FDT1 electrical level)	0.0~100.0	5.0%	○
P08.34	FDT2 electrical level detection value	0.00~P00.03 (Max frequency)	0.00~P00.03	50.00Hz	○
P08.35	FDT2 retention detection value	0.0~100.0% (FDT2 electrical level)	0.0~100.0	5.0%	○
P08.36	Frequency arrival detection value	0.0~P00.03 (Max frequency)	0.0~P00.03	0.00Hz	○
P08.37	Energy braking enable	0: Disabled 1: Enabled	0~1	0	○
P08.38	Threshold voltage of energy braking	200.0~2000.0V	200.0~2000.0	220V: 380.0V 380V: 700.0V 660V: 1120.0V	○
P08.39	Running mode of cooling fan	0: Normal running mode 1: The fan keeps running after power on all the time.	0~1	0	○
P08.40	PWM	LED ones: PWM mode 0: PWM mode 1, 3-phase commission and 2-phase commission	0~0x11	0x01	◎

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
		1: PWM mode 2, 3-phase commission LED tens: Low-frequency carrier limit mode 0: Low-frequency carrier limit mode 1: No limit			
P08.41	Over modulation selection	LED ones: Over modulation selection 0: Invalid 1: Valid LED tens: Modulation depth coefficient 0~9	0x00~0x91	0x01	○
P08.42	Keypad data control	LED ones: Frequency enabling selection 0: Both ∧/∨ and digital potentiometer adjustments are effective. 1: Only ∧/∨ is effective. 2: Only digital potentiometer adjustment is effective. 3: Neither∧/∨ nor digital potentiometer adjustments is effective. LED tens: Frequency control selection 0: Only effective when P00.06=0 or P00.07=0 1: Effective for all frequency setting manners 2: Ineffective for multi-step speed when multi-step speed has the priority LED hundreds: Action selection during stopping 0: Effective setting 1: Effective during running, cleared after stopping 2: Effective during running, cleared after receiving the stop command LED thousands: ∧/∨ and digital potentiometer integral function 0: Effective integral function 1: Ineffective integral function	000~1223	0x0000	○
P08.43	Keypad digital	0.01~10.00s	0.01~10.00	0.10s	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	potentiometer integral rate				
P08.44	UP/DOWN terminal control	LED ones: Frequency control selection 0: UP/DOWN terminal setting effective 1: UP/DOWN terminal setting ineffective LED tens: Frequency control selection 0: Only effective when P00.06=0 or P00.07=0 1: Effective for all frequency setting manners 2: Ineffective for multi-step speed when multi-step speed has the priority LED hundreds: Action selection during stopping 0: Effective setting 1: Effective during running, cleared after stopping 2: Effective during running, cleared after receiving the stop command	00~221	0x000	○
P08.45	UP terminal frequency changing ratio	0.01~50.00s	0.01~50.00	0.50s	○
P08.46	DOWN terminal frequency changing ratio	0.01~50.00s	0.01~50.00	0.50s	○
P08.47	Action when the frequency setting is at power off	LED ones: Action selection when the digital adjusting frequency is at powering off 0: Save when the power is off 1: Clear when the power is off LED tens: Action selection when MODBUS setting frequency is at powering off 0: Save when the power is off 1: Clear when the power is off LED hundreds: Action selection when other communication setting frequency is at powering off 0: Save when the power is off	0x000~0x111	0x000	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
		1: Clear when the power is off			
P08.48	High bit of initial power consumption	0~59999°(k)	0~59999	0°	○
P08.49	Low bit of initial power consumption	0.0~999.9°	0~999.9	0.0°	○
P08.50	Magnetic flux braking	100~150 0: Invalid	0~150	0	○
P08.51	Input power factor of the inverter	0.00~1.00	0.00~1.00	0.56	○
P09 Group	PID control				
P09.00	PID reference source	0: Keypad digital setting (P09.01) 1: AI1 setting 2: AI2 setting 3: AI3 setting 4: S8 pulse setting 5: Multi-step speed setting 6: MODBUS communication setting 7: PROFIBUS/CANopen communication setting 8: Ethernet communication setting 9: Reserved 10: DEVICE_NET setting (Reserved) 11~13: Reserved	0~13	0	○
P09.01	Keypad PID preset	-100.0%~100.0%	-100.0~100.0	0.0%	○
P09.02	PID feedback source	0: AI1 feedback 1: AI2 feedback 2: AI3 feedback 3: S8 pulse feedback 4: MODBUS communication feedback 5: PROFIBUS/CANopen communication feedback 6: Ethernet communication feedback 7: Reserved 8: DEVICE_NET feedback (Reserved) 9~11: Reserved	0~11	0	○
P09.03	PID output feature	0: PID output is positive. 1: PID output is negative.	0~1	0	○
P09.04	Proportional gain	0.00~100.00	0.00~100.00	1.00	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	(Kp)				
P09.05	Integral time(Ti)	0.01~10.00s	0.01~10.00	0.10s	○
P09.06	Differential time (Td)	0.00~10.00s	0.00~10.00	0.00s	○
P09.07	Sampling cycle (T)	0.001~10.000s	0.001~10.000	0.010s	○
P09.08	PID control deviation limit	0.0~100.0%	0.0~100.0	0.0%	○
P09.09	Upper limit of PID output	P09.10~100.0% (Max frequency or voltage)	P09.10~100.0	100.0%	○
P09.10	Lower limit of PID output	-100.0%~P09.09 (Max frequency or voltage)	-100.0~P09.09	0.0%	○
P09.11	Feedback offline detection value	0.0~100.0%	0.0~100.0	0.0%	○
P09.12	Feedback offline detection time	0.0~3600.0s	0.0~3600.0	1.0s	○
P09.13	PID adjustment	LED ones: 0: Keep the integral adjustment when the frequency reaches the upper and lower limit 1: Stop the integral adjustment when the frequency reaches the upper and lower limit LED tens: Reserved	00~11	0x00	○
P09.14	Reserved				●
P09.15	Reserved				●
P09.16	Reserved				●
P10 Group	Simple PLC and multi-step speed control				
P10.00	Simple PLC	0: Stop after running once 1: Run at the final value after running once 2: Cycle running	0~2	0	○
P10.01	Simple PLC memory	0: Power loss without memory 1: Power loss with memory	0~1	0	○
P10.02	Multi-step speed 0	-100.0~100.0%	-100.0~100.0	0.0%	○
P10.03	Running time of step 0	0.0~6553.5s (m)	0.0~6553.5	0.0s	○
P10.04	Multi-step speed 1	-100.0~100.0%	-100.0~100.0	0.0%	○
P10.05	Running time of step 1	0.0~6553.5s (m)	0.0~6553.5	0.0s	○
P10.06	Multi-step speed 2	-100.0~100.0%	-100.0~100.0	0.0%	○
P10.07	Running time of step 2	0.0~6553.5s (m)	0.0~6553.5	0.0s	○
P10.08	Multi-step speed 3	-100.0~100.0%	-100.0~100.0	0.0%	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
P10.09	Running time of step 3	0.0~6553.5s (m)	0.0~6553.5	0.0s	○
P10.10	Multi-step speed 4	-100.0~100.0%	-100.0~100.0	0.0%	○
P10.11	Running time of step 4	0.0~6553.5s (m)	0.0~6553.5	0.0s	○
P10.12	Multi-step speed 5	-100.0~100.0%	-100.0~100.0	0.0%	○
P10.13	Running time of step 5	0.0~6553.5s (m)	0.0~6553.5	0.0s	○
P10.14	Multi-step speed 6	-100.0~100.0%	-100.0~100.0	0.0%	○
P10.15	Running time of step 6	0.0~6553.5s (m)	0.0~6553.5	0.0s	○
P10.16	Multi-step speed 7	-100.0~100.0%	-100.0~100.0	0.0%	○
P10.17	Running time of step7	0.0~6553.5s (m)	0.0~6553.5	0.0s	○
P10.18	Multi-step speed 8	-100.0~100.0%	-100.0~100.0	0.0%	○
P10.19	Running time of step 8	0.0~6553.5s (m)	0.0~6553.5	0.0s	○
P10.20	Multi-step speed 9	-100.0~100.0%	-100.0~100.0	0.0%	○
P10.21	Running time of step 9	0.0~6553.5s (m)	0.0~6553.5	0.0s	○
P10.22	Multi-step speed 10	-100.0~100.0%	-100.0~100.0	0.0%	○
P10.23	Running time of step 10	0.0~6553.5s (m)	0.0~6553.5	0.0s	○
P10.24	Multi-step speed 11	-100.0~100.0%	-100.0~100.0	0.0%	○
P10.25	Running time of step 11	0.0~6553.5s (m)	0.0~6553.5	0.0s	○
P10.26	Multi-step speed 12	-100.0~100.0%	-100.0~100.0	0.0%	○
P10.27	Running time of step 12	0.0~6553.5s (m)	0.0~6553.5	0.0s	○
P10.28	Multi-step speed 13	-100.0~100.0%	-100.0~100.0	0.0%	○
P10.29	Running time of step 13	0.0~6553.5s (m)	0.0~6553.5	0.0s	○
P10.30	Multi-step speed 14	-100.0~100.0%	-100.0~100.0	0.0%	○
P10.31	Running time of step 14	0.0~6553.5s (m)	0.0~6553.5	0.0s	○
P10.32	Multi-step speed 15	-100.0~100.0%	-100.0~100.0	0.0%	○
P10.33	Running time of	0.0~6553.5s (m)	0.0~6553.5	0.0s	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	step 15				
P10.34	Simple PLC 0~7 step ACC/DEC time	0x0000~0xFFFF	00000~FFFF	0x0000	○
P10.35	Simple PLC 8~15 step ACC/DEC time	0x0000~0xFFFF	00000~FFFF	0x0000	○
P10.36	PLC restart	0: Restart from the first step 1: Continue to run from the stop frequency	0~1	0	◎
P10.37	Multi-step time unit	0: Second 1: Minute	0~1	0	◎
P11 Group Protective parameters					
P11.00	Phase loss protection	LED ones: 0: Disable input phase loss protection 1: Enable input phase loss protection LED tens: 0: Disable output phase loss protection 1: Enable output phase loss protection	00~11	11	○
P11.01	Instantaneous power loss frequency decreasing	0: Disabled 1: Enabled	0~1	0	○
P11.02	Frequency decreasing ratio of instantaneous power loss	0.00Hz~P00.03/s (Max frequency)	0.00~P00.03	10.00Hz/s	○
P11.03	Overvoltage speed loss protection	0: Disabled 1: Enabled	0~1	0	○
P11.04	Overvoltage speed loss voltage	120~150% (100% corresponds to 1.414 * inverter rated voltage (P07.19))	120~150	140%	○
P11.05	Current limit action	0: Invalid 1: Valid all the time	0~1	1	◎
P11.06	Automatic current limit level	50.0~200.0%	50.0~200.0	Heavy overload: 160.0% Light overload:	◎

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
				120.0%	
P11.07	Frequency decreasing ratio during current limit	0.00~50.00Hz/s	0.00~50.00	10.00Hz/s	◎
P11.08	Inverter/Motor underload and overload pre-alarm	LED ones: 0: Motor underload and overload pre-alarm, relative to motor rated current 1: Inverter underload and overload pre-alarm, relative to inverter rated current LED tens: 0: Inverter continues running after underload and overload pre-alarm 1: Inverter continues running after underload pre-alarm and stop running after overload fault 2: Inverter continues running after overload pre-alarm and stop running after underload fault 3: Inverter stops running after underload and overload alarm LED hundreds: 0: Detect all the time 1: Detect in constant running	000~131	0x000	○
P11.09	Detection level of overload pre-alarm	P11.11~200%	P11.11~200	Heavy load 150% Light load 120%	○
P11.10	Detection time of overload pre-alarm	0.1~60.0s	0.1~60.0	1.0s	○
P11.11	Detection level of underload pre-alarm	0%~P11.09	0~P11.09	50%	○
P11.12	Detection time of underload pre-alarm	0.1~60.0s	0.1~60.0	1.0s	○
P11.13	Output terminal action during undervoltage and auto-reset	LED units: 0: Action at undervoltage 1: No action at undervoltage LED tens: 0: Action during auto-reset 1: No action during auto-reset	00~11	0x00	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
P11.14	Detection value of speed deviation	0.0~50.0%	0.0~50.0	10.0%	○
P11.15	Detection time of speed deviation	0.0~10.0s (No speed deviation protection at 0.0)	0.0~10.0	1.0s	○
P11.16	Valid selection of units	0x00~0x3F	0x00~0x3F	0x3F	◎
P11.17	Motor overheat protection	0: Disabled 1: Enabled	0~1	0	○
P11.18	Motor overheat protection point	0~150.0°C	0~150.0	100.0°C	◎
P11.19	Motor temperature detection selection	0: Invalid 1: PT100 2: NTC (Reserved) 3: PTC (Reserved)	0~3	0	○
P11.20	Reserved				●
P12 Group	Motor 2 parameters				
P12.00	Motor 2 type	0: Asynchronous motor 1: Synchronous motor	0~1	0	◎
P12.01	Asynchronous motor 2 rated power	0.1~3000.0kW	0.1~3000.0	Depend on model	◎
P12.02	Asynchronous motor 2 rated frequency	0.01Hz~P00.03 (Max frequency)	0.01~P00.03	50.00Hz	◎
P12.03	Asynchronous motor 2 rated speed	1~36000rpm	1~36000	Depend on model	◎
P12.04	Asynchronous motor 2 rated voltage	0~1200V	0~1200	Depend on model	◎
P12.05	Asynchronous motor 2 rated current	0.8~6000.0A	0.8~6000.0	Depend on model	◎
P12.06	Asynchronous motor 2 stator resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model	○
P12.07	Asynchronous motor 2 rotor resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model	○
P12.08	Asynchronous motor 2 leakage inductance	0.01~655.35mH	0.01~655.35	Depend on model	○
P12.09	Asynchronous	0.01~655.35mH	0.01~655.35	Depend on	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	motor 2 mutual inductance			model	
P12.10	Asynchronous motor 2 non-load current	0.1~6553.5A	0.1~6553.5	Depend on model	○
P12.11	Magnetic saturation coefficient 1 for the iron core of AM 2	0.0~100.0%	0.0~100.0	88%	◎
P12.12	Magnetic saturation coefficient 2 for the iron core of AM 2	0.0~100.0%	0.0~100.0	81%	◎
P12.13	Magnetic saturation coefficient 3 for the iron core of AM 2	0.0~100.0%	0.0~100.0	75%	◎
P12.14	Magnetic saturation coefficient 4 for the iron core of AM 2	0.0~100.0%	0.0~100.0	50%	◎
P12.15	Synchronous motor 2 rated power	0.1~3000.0kW	0.1~3000.0	Depend on model	◎
P12.16	Synchronous motor 2 rated frequency	0.01Hz~P00.03 (Max frequency)	0.01~P00.03	50.00Hz	◎
P12.17	Synchronous motor 2 pole pairs	1~50	1~50	2	◎
P12.18	Synchronous motor 2 rated voltage	0~1200V	0~1200	Depend on model	◎
P12.19	Synchronous motor 2 rated current	0.8~6000.0A	0.8~6000.0	Depend on model	◎
P12.20	Synchronous motor 2 stator resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model	○
P12.21	Synchronous motor 2 direct axis inductance	0.01~655.35mH	0.01~655.35	Depend on model	○
P12.22	Synchronous motor 2 quadrature	0.01~655.35mH	0.01~655.35	Depend on model	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	axis inductance				
P12.23	Synchronous motor 2 back EMF constant	0~10000V	0~10000	300	○
P12.24	Synchronous motor 2 initial magnetic pole position	0.00~359.99	0.00~359.99	0.00	●
P12.25	Synchronous motor 2 magnetic pole position amplitude gain	0.50~1.50	0.50~1.50	1.00	○
P12.26	Synchronous motor 2 C phase magnetic pole position offset	0~9999	0~9999	2230	○
P12.27	Synchronous motor 2 D phase magnetic pole position offset	0~9999	0~9999	2230	○
P12.28	Synchronous motor 2 current identification (Reserved)	0%~50% (Motor rated current)	0~50	10%	●
P12.29	Synchronous motor 2 overload protection	0: No protection 1: Common motor (with low speed compensation) 2: Frequency conversion motor (without low speed compensation)	0~2	2	◎
P12.30	Synchronous motor 2 overload protection coefficient	20.0%~120.0%	20.0~120.0	100.0%	○
P12.31	Synchronous motor 2 parameter display	0: Display according to motor type 1: Display all parameters	0~1	0	○
P12.32	Reserved				●
P12.33	Reserved				●
P12.34	Reserved				●
P12.35	Reserved				●
P12.36	Reserved				●
P12.37	Reserved				●
P13 Group Motor 3 parameters					

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
P13.00	Motor 3 type	0: Asynchronous motor 1: Synchronous motor	0~1	0	◎
P13.01	Asynchronous motor 3 rated power	0.1~3000.0kW	0.1~3000.0	Depend on model	◎
P13.02	Asynchronous motor 3 rated frequency	0.01Hz~P00.03 (Max frequency)	0.01~P00.03	50.00Hz	◎
P13.03	Asynchronous motor 3 rated speed	1~36000rpm	1~36000	Depend on model	◎
P13.04	Asynchronous motor 3 rated voltage	0~1200V	0~1200	Depend on model	◎
P13.05	Asynchronous motor 3 rated current	0.8~6000.0A	0.8~6000.0	Depend on model	◎
P13.06	Asynchronous motor 3 stator resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model	○
P13.07	Asynchronous motor 3 rotor resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model	○
P13.08	Asynchronous motor 3 leakage inductance	0.01~655.35mH	0.01~655.35	Depend on model	○
P13.09	Asynchronous motor 3 mutual inductance	0.01~655.35mH	0.01~655.35	Depend on model	○
P13.10	Asynchronous motor 3 non-load current	0.1~6553.5A	0.1~6553.5	Depend on model	○
P13.11	Magnetic saturation coefficient 1 for the iron core of AM 3	0.0~100.0%	0.0~100.0	88%	◎
P13.12	Magnetic saturation coefficient 2 for the iron core of AM 3	0.0~100.0%	0.0~100.0	81%	◎
P13.13	Magnetic saturation coefficient 3 for the	0.0~100.0%	0.0~100.0	75%	◎

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	iron core of AM 3				
P13.14	Magnetic saturation coefficient 4 for the iron core of AM 3	0.0~100.0%	0.0~100.0	50%	◎
P13.15	Synchronous motor 3 rated power	0.1~3000.0kW	0.1~3000.0	Depend on model	◎
P13.16	Synchronous motor 3 rated frequency	0.01Hz~P00.03 (Max frequency)	0.01~P00.03	50.00Hz	◎
P13.17	Synchronous motor 3 pole pairs	1~50	1~50	2	◎
P13.18	Synchronous motor 3 rated voltage	0~1200V	0~1200	Depend on model	◎
P13.19	Synchronous motor 3 rated current	0.8~6000.0A	0.8~6000.0	Depend on model	◎
P13.20	Synchronous motor 3 stator resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model	○
P13.21	Synchronous motor 3 direct axis inductance	0.01~655.35mH	0.01~655.35	Depend on model	○
P13.22	Synchronous motor 3 quadrature axis inductance	0.01~655.35mH	0.01~655.35	Depend on model	○
P13.23	Synchronous motor 3 back EMF constant	0~10000V	0~10000	300	○
P13.24	Synchronous motor 3 initial magnetic pole position	0.00~359.99	0.00~359.99	0.00	◎
P13.25	Synchronous motor 3 magnetic pole position amplitude gain	0.50~1.50	0.50~1.50	1.00	○
P13.26	Synchronous motor 3 C phase magnetic pole position offset	0~9999	0~9999	2230	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
P13.27	Synchronous motor 3 D phase magnetic pole position offset	0~9999	0~9999	2230	○
P13.28	Synchronous motor 3 current identification (Reserved)	0%~50% (Motor rated current)	0~50	10%	●
P13.29	Synchronous motor 3 overload protection	0: No protection 1: Common motor (with low speed compensation) 2: Frequency conversion motor (without low speed compensation)	0~2	2	◎
P13.30	Synchronous motor 3 overload protection coefficient	20.0%~120.0%	20.0~120.0	100.0%	○
P13.31	Synchronous motor 3 parameter display	0: Display according to motor type 1: Display all parameters	0~1	0	○
P13.32	Reserved				●
P13.33	Reserved				●
P13.34	Reserved				●
P13.35	Reserved				●
P13.36	Reserved				●
P13.37	Reserved				●
P14 Group	Motor 4 parameters				
P14.00	Motor 4 type	0: Asynchronous motor 1: Synchronous motor	0~1	0	◎
P14.01	Asynchronous motor 4 rated power	0.1~3000.0kW	0.1~3000.0	Depend on model	◎
P14.02	Asynchronous motor 4 rated frequency	0.01Hz~P00.03 (Max frequency)	0.01~P00.03	50.00Hz	◎
P14.03	Asynchronous motor 4 rated speed	1~36000rpm	1~36000	Depend on model	◎
P14.04	Asynchronous motor 4 rated voltage	0~1200V	0~1200	Depend on model	◎
P14.05	Asynchronous motor 4 rated	0.8~6000.0A	0.8~6000.0	Depend on model	◎

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	current				
P14.06	Asynchronous motor 4 stator resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model	○
P14.07	Asynchronous motor 4 rotor resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model	○
P14.08	Asynchronous motor 4 leakage inductance	0.01~655.35mH	0.01~655.35	Depend on model	○
P14.09	Asynchronous motor 4 mutual inductance	0.01~655.35mH	0.01~655.35	Depend on model	○
P14.10	Asynchronous motor 4 non-load current	0.01~655.35A	0.01~655.35	Depend on model	○
P14.11	Magnetic saturation coefficient 1 for the iron core of AM 4	0.0~100.0%	0.0~100.0	88%	◎
P14.12	Magnetic saturation coefficient 2 for the iron core of AM 4	0.0~100.0%	0.0~100.0	81%	◎
P14.13	Magnetic saturation coefficient 3 for the iron core of AM 4	0.0~100.0%	0.0~100.0	75%	◎
P14.14	Magnetic saturation coefficient 4 for the iron core of AM 4	0.0~100.0%	0.0~100.0	50%	◎
P14.15	Synchronous motor 4 rated power	0.1~3000.0kW	0.1~3000.0	Depend on model	◎
P14.16	Synchronous motor 4 rated frequency	0.01Hz~P00.03 (Max frequency)	0.01~P00.03	50.00Hz	◎
P14.17	Synchronous motor 4 pole pairs	1~50	1~50	2	◎
P14.18	Synchronous motor 4 rated voltage	0~1200V	0~1200	Depend on model	◎

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
P14.19	Synchronous motor 4 rated current	0.8~6000.0A	0.8~6000.0	Depend on model	◎
P14.20	Synchronous motor 4 stator resistor	0.0001~6.5535Ω	0.0001~6.5535	Depend on model	○
P14.21	Synchronous motor 4 direct axis inductance	0.01~655.35mH	0.01~655.35	Depend on model	○
P14.22	Synchronous motor 4 quadrature axis inductance	0.01~655.35mH	0.01~655.35	Depend on model	○
P14.23	Synchronous motor 4 back EMF constant	0~10000V	0~10000	300	○
P14.24	Synchronous motor 4 initial magnetic pole position	0.00~359.99	0.00~359.99	0.00	◎
P14.25	Synchronous motor 4 magnetic pole position amplitude gain	0.50~1.50	0.50~1.50	1.00	○
P14.26	Synchronous motor 4 C phase magnetic pole position offset	0~9999	0~9999	2230	○
P14.27	Synchronous motor 4 D phase magnetic pole position offset	0~9999	0~9999	2230	○
P14.28	Synchronous motor 4 current identification (Reserved)	0%~50% (Motor rated current)	0~50	10%	●
P14.29	Synchronous motor 4 overload protection	0: No protection 1: Common motor (with low speed compensation) 2: Frequency conversion motor (without low speed compensation)	0~2	2	◎
P14.30	Synchronous motor 4 overload protection	20.0%~120.0%	20.0~120.0	100.0%	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	coefficient				
P14.31	Synchronous motor 4 parameter display	0: Display according to motor type 1: Display all parameters	0~1	0	○
P14.32	Reserved				●
P14.33	Reserved				●
P14.34	Reserved				●
P14.35	Reserved				●
P14.36	Reserved				●
P14.37	Reserved				●
P15 Group Synchronous motor control					
P15.00	Reduction factor of source current	0.0~100.0%	0.0~100.0	80.0%	◎
P15.01	Detection means of initial magnetic pole	0: Source current 1: High frequency superposition (Reserved) 2: Pulse superposition	0~2	0	◎
P15.02	Source current 1	0.0%~100.0% (Motor rated current)	0.0~100.0	20.0%	○
P15.03	Source current 2	0.0%~100.0% (Motor rated current)	0.0~100.0	10.0%	○
P15.04	Shifting frequency of source current	0.0%~80.0% (Rated frequency)	0.0~80.0	20.0%	○
P15.05	High frequency superposition (Reserved)	200Hz~1000Hz	200~1000	500Hz	◎
P15.06	Pulse superposition voltage	0.0~150.0% (Motor rated voltage)	0.0~150.0	50.0%	◎
P15.07	Reserved	0~65535	0~65535	0	○
P15.08	Control parameter 1	0~FFFF	0~FFFF	0	○
P15.09	Control parameter 2	0~50.00	0~50.00	2.00	○
P15.10	Reserved	0~65535	0~65535	0	○
P15.11	Maladjustment detection time	0.0~10.0s	0.0~10.0	0.5s	○
P15.12	High frequency compensation coefficient	0.0~100.0%	0.0~100.0	0.0%	○
P15.13	Short circuit braking current	0.0~150.0%(inverter)	0.0~150.0	0.0%	○
P15.14	Braking retention time before starting	0.0~50.0s	0.0~50.0	0.0s	○
P15.15	Braking retention time when	0.0~50.0s	0.0~50.0	0.0s	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	stopping				
P15.16	Reserved	0~65535	0~65535	0	●
P15.17	Reserved	0~65535	0~65535	0	●
P15.18	Reserved	0~65535	0~65535	0	●
P16 Group Encoders					
P16.00	Encoder type	0: Increment encoder 1: UVW encoder 2: SIN/COS encoder 3: Rotary encoder	0~3	0	◎
P16.01	Encoder pulse number	0~8192	0~8192	1024	◎
P16.02	Encoder direction	LED ones: AB direction 0: Forward 1: Reverse LED tens: Z pulse direction 0: Forward 1: Reverse LED hundreds: UVW direction 0: Forward 1: Reverse	LED ones: 0~1 LED tens: 0~1 LED hundreds: 0~1	0x000	◎
P16.03	Encoder offline detection time	0.0~100.0s	0.0~100.0	1.0s	○
P16.04	Encoder reverse detection time	0.0~100.0s	0.0~100.0	1.0s	○
P16.05	Encoder detection filter times	Bit0~3: Low-speed filter times Bit4~7: High-speed filter times	0~0x99	0x33	○
P16.06	Speed ratio between motor and encoder	0.000~65.535	0~65.535	1.000	○
P16.07	Synchronous motor control	Bit0: Z pulse check enabling Bit1: Encoder angle check enabling Bit2: SVC speed detection enabling Bit3: Rotary speed detection mode Bit4: Z pulse capture mode Bit12: Z pulse arrival signal at stop Bit15: 0: Without Z pulse autotuning 1: With Z pulse autotuning	0~0xFFFF	3	○
P16.08	Z pulse initial angle	0: Disabled 1: Enabled	0~1	0	○
P16.09	Z pulse offline detection enabling	0: Disabled 1: Enabled	0~1	0	○
P16.10	Magnetic pole initial angle autotuning	1: Rotation autotuning 2: Static autotuning (suitable for rotary encoder feedback) (Reserved)	0~2	0	◎
P16.11	Encoder actual	-3276.8~3276.7Hz	-3276.8~3276.7	0.0Hz	●

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	measured frequency				
P16.12	Encoder position count value	0~65535	0~65535	0	●
P16.13	Encoder Z pulse count value	0~65535	0~65535	0	●
P16.14	Value of rotor identification	0.0000~6.5535Ω	0.0000~6.5535	0.0000Ω	●
P16.15	Z pulse angle of synchronous motor	Display corresponding magnetic pole angle of Z pulse 0.00~359.99	0.00~359.99	0.00	●
P16.16	UVW signal state	Display the current UVW signal state 0~65535	0~65535	0	●
P16.17	U pulse initial angle	0.00~359.99	0.00~359.99	0.00	○
P16.18	Reserved	0~65535	0~65535	0	●
P16.19	Reserved	0~65535	0~65535	0	●
P16.20	Reserved	0~65535	0~65535	0	●
P16.21	Reserved	0~65535	0~65535	0	●
P16.22	Reserved	0~65535	0~65535	0	●
P16.23	Reserved	0~65535	0~65535	0	●
P16.24	Reserved	0~65535	0~65535	0	●
P16.25	Reserved	0~65535	0~65535	0	●
P16.26	Reserved	0~65535	0~65535	0	●
P16.27	Reserved	0~65535	0~65535	0	●
P16.28	Reserved	0~65535	0~65535	0	●
P16.29	Reserved	0~65535	0~65535	0	●
P16.30	Reserved	0~65535	0~65535	0	●
P17 Group	Monitoring functions				
P17.00	Set frequency	0.00Hz~P00.03	0.00~P00.03	0.00Hz	●
P17.01	Output frequency	0.00Hz~P00.03	0.00~P00.03	0.00Hz	●
P17.02	Ramp reference frequency	0.00Hz~P00.03	0.00~P00.03	0.00Hz	●
P17.03	Output voltage	0~1200V	0~1200	0V	●
P17.04	Output current	0.0~5000.0A	0.0~5000.0	0.0A	●
P17.05	Motor speed	0~65535RPM	0~65535	0 RPM	●
P17.06	Torque current	0.0~5000.0A	0.0~5000.0	0.0A	●
P17.07	Exciting current	0.0~5000.0A	0.0~5000.0	0.0A	●
P17.08	Motor power load coefficient	-300.0~300.0% (Relative to motor rated power)	-300.0~300.0	0.0%	●
P17.09	Output torque load coefficient	-250.0~250.0%	-250.0~250.0	0.0%	●
P17.10	Evaluated motor frequency	0.00~ P00.03	0.00~600.00	0.00Hz	●

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
P17.11	DC bus voltage	0.0~2000.0V	0.0~2000.0	0V	●
P17.12	ON-OFF input terminal state	0000~FFFF	0000~FFFF	0	●
P17.13	ON-OFF output terminal state	0000~FFFF	0000~FFFF	0	●
P17.14	Digital adjustment	0.00Hz~P00.03	0.00~P00.03	0.00Hz	●
P17.15	Torque reference	-300.0%~300.0% (Motor rated current)	-300.0~300.0	0.0%	●
P17.16	Linear speed	0~65535	0~65535	0	●
P17.17	Length (Reserved)	0~65535	0~65535	0	●
P17.18	Count value	0~65535	0~65535	0	●
P17.19	AI1 input voltage	0.00~10.00V	0.00~10.00	0.00V	●
P17.20	AI2 input voltage	0.00~10.00V	0.00~10.00	0.00V	●
P17.21	AI3 input voltage	-10.00~10.00V	-10.00~10.00V	0.00V	●
P17.22	S8 input frequency	0.00~50.00kHz	0.00~50.00	0.00 kHz	●
P17.23	PID reference	-100.0~100.0%	-100.0~100.0	0.0%	●
P17.24	PID feedback	-100.0~100.0%	-100.0~100.0	0.0%	●
P17.25	Power factor of the motor	-1.00~1.00	-1.00~1.00	0.0	●
P17.26	Current running time	0~65535m	0~65535	0m	●
P17.27	Simple PLC and current step in multi-step speed	0~15	0~15	0	●
P17.28	ASR controller output	-300.0%~300.0% (Motor rated current)	-300.0~300.0	0.0%	●
P17.29	Synchronous motor magnetic pole angle	0.0~360.0	0.0~360.0	0.0	●
P17.30	Synchronous motor phase compensation	-180.0~180.0	-180.0~180.0	0.0	●
P17.31	Synchronous motor high-frequency superposition current	0.0%~200.0% (Motor rated current)	0.0~200.0	0.0	●
P17.32	Magnetic flux linkage	0.0%~200.0%	0.0~200.0	0.0%	●
P17.33	Exciting current reference	-3000.0~3000.0A	-3000.0~3000.0	0.0A	●
P17.34	Torque current reference	-3000.0~3000.0A	-3000.0~3000.0	0.0A	●

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
P17.35	AC incoming current	0.0~5000.0A	0.0~5000.0	0.0A	●
P17.36	Output torque	-3000.0Nm~3000.0Nm	0~65535	0.0Nm	●
P17.37	Count value of motor overload	0~100 (100 reports OL1 fault.)	0~100	0	●
P17.38	Fault code	0~65535	0~65535	0	●
P17.39	DP command	0~65535	0~65535	0	●
P17.40	Reserved				●
P17.41	Reserved				●
P17.42	Motor temperature	-200.0~200.0°C	-200.0~200.0	0.0°C	●
P17.43	Frequency of the external master	0.00Hz~P00.03	0.00~P00.03	0.00Hz	●
P17.44	Torque of the external master	-300.0%~300.0% (Motor rated current)	-300.0~300.0	0.0%	●
P17.45	Command of the external master	0~65535	0~65535	0	●
P17.46	Torque tracing frequency	-3276.7~3276.7Hz	-3276.7~3276.7	0.0Hz	●
P18 Group	Unit state				
P18.00	Unit 1 current	0.0~2000.0A	0.0~2000.0	0.0A	●
P18.01	Unit1 bus voltage	0.0~2000.0V	0.0~2000.0	0V	●
P18.02	Unit1 rectifier bridge temperature	0~100.0°C	0~100.0	0.0°C	●
P18.03	Unit1 IGBT temperature	0~100.0°C	0~100.0	0.0°C	●
P18.04	Reserved				●
P18.05	Unit1 fault code	0x00~0xFFFF	0x0000~0xFFFF	0x0000	●
P18.06	Reserved				●
P18.07	Reserved				●
P18.08	Unit1 DSP version	1.00~655.35	1.00~655.35	1.00	●
P18.09	Unit1 FPGA version	1.00~655.35	1.00~655.35	1.00	●
P18.10	Unit2 current	0.0~2000.0A	0.0~2000.0	0.0A	●
P18.11	Unit2 bus voltage	0.0~2000.0V	0.0~2000.0	0V	●
P18.12	Unit2 rectifier bridge temperature	0~100.0°C	0~100.0	0.0°C	●
P18.13	Unit2 IGBT temperature	0~100.0°C	0~100.0	0.0°C	●
P18.14	Reserved				●
P18.15	Unit2 fault code	0x00~0xFFFF	0x0000~0xFFFF	0x0000	●
P18.16	Reserved				●
P18.17	Reserved				●

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
P18.18	Unit2 DSP version	1.00~655.35	1.00~655.35	1.00	●
P18.19	Unit2 FPGA version	1.00~655.35	1.00~655.35	1.00	●
P18.20	Unit3 current	0.0~2000.0A	0.0~2000.0	0.0A	●
P18.21	Unit3 bus voltage	0.0~2000.0V	0.0~2000.0	0V	●
P18.22	Unit3 rectifier bridge temperature	0~100.0°C	0~100.0	0.0°C	●
P18.23	Unit3 IGBT temperature	0~100.0°C	0~100.0	0.0°C	●
P18.24	Reserved				●
P18.25	Unit3 fault code	0x00~0xFFFF	0x0000~0xFFFF	0x0000	●
P18.26	Reserved				●
P18.27	Reserved				●
P18.28	Unit3 DSP version	1.00~655.35	1.00~655.35	1.00	●
P18.29	Unit3 FPGA version	1.00~655.35	1.00~655.35	1.00	●
P18.30	Unit4 current	0.0~2000.0A	0.0~2000.0	0.0A	●
P18.31	Unit4 bus voltage	0.0~2000.0V	0.0~2000.0	0V	●
P18.32	Unit4 rectifier bridge temperature	0~100.0°C	0~100.0	0.0°C	●
P18.33	Reserved				●
P18.34	Unit4 line voltage	0~1200V	0~1200	0V	●
P18.35	Unit4 fault code	0x00~0xFFFF	0x0000~0xFFFF	0x0000	●
P18.36	Reserved				●
P18.37	Reserved				●
P18.38	Unit4 DSP version	1.00~655.35	1.00~655.35	1.00	●
P18.39	Unit4 FPGA version	1.00~655.35	1.00~655.35	1.00	●
P18.40	Unit5 current	0.0~2000.0A	0.0~2000.0	0.0A	●
P18.41	Unit5 bus voltage	0.0~2000.0V	0.0~2000.0	0V	●
P18.42	Unit5 rectifier bridge temperature	0~100.0°C	0~100.0	0.0°C	●
P18.43	Unit5 IGBT temperature	0~100.0°C	0~100.0	0.0°C	●
P18.44	Reserved				●
P18.45	Unit5 fault code	0x00~0xFFFF	0x0000~0xFFFF	0x0000	●
P18.46	Reserved				●
P18.47	Reserved				●
P18.48	Unit5 DSP version	1.00~655.35	1.00~655.35	1.00	●
P18.49	Unit5 FPGA version	1.00~655.35	1.00~655.35	1.00	●
P18.50	Unit6 current	0.0~2000.0A	0.0~2000.0	0.0A	●

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
P18.51	Unit6 bus voltage	0.0~2000.0V	0.0~2000.0	0V	●
P18.52	Unit6 rectifier bridge temperature	0~100.0°C	0~100.0	0.0°C	●
P18.53	Unit6 IGBT temperature	0~100.0°C	0~100.0	0.0°C	●
P18.54	Reserved				●
P18.55	Unit6 fault code	0x00~0xFFFF	0x0000~0xFFFF	0x0000	●
P18.56	Reserved				●
P18.57	Reserved				●
P18.58	Unit6 DSP version	1.00~655.35	1.00~655.35	1.00	●
P18.59	Unit6 FPGA version	1.00~655.35	1.00~655.35	1.00	●
P18.60	Factory valid unit	0x00~0x3F	0x00~0x3F	0x00	●
P18.61	Unit rated power	0.1~3000.0kW	0.1~3000.0	0.1kW	●
P18.62	Unit rated current	0.0~2000.0A	0.0~2000.0	0.0A	●
P18.63	FPGA version of main control board	1.00~655.35	1.00~655.35	1.00	●
P18.64	Reserved	Reserved		Reserved	●
P18.65	Reserved	Reserved		Reserved	●
P18.66	Reserved	Reserved		Reserved	●
P18.67	Reserved	Reserved		Reserved	●
P18.68	Reserved	Reserved		Reserved	●
P18.69	Reserved	Reserved		Reserved	●
P19 Group Fault information					
P19.00	Current fault type	0: No fault			●
P19.01	Previous fault type	1~3: Reserved			●
P19.02	Previous 2 fault type	4: ACC overcurrent (OC1) 5: DEC overcurrent (OC2)			●
P19.03	Previous 3 fault type	6: Constant speed overcurrent (OC3) 7: ACC overvoltage (OV1)			●
P19.04	Previous 4 fault type	8: DEC overvoltage (OV2) 9: Constant speed overvoltage (OV3)			●
P19.05	Previous 5 fault type	10: Bus undervoltage (LV) 11: Motor overload (OL1) 12: Inverter overload (OL2) 13: Input side phase loss (SPI) 14: Output side phase loss (SPO) 15: Reserved 16: Reserved 17: External fault (EF) 18: 485 communication fault (E_485) 19: Current detection fault (ItE) 20: Motor autotuning fault (tE)			●

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
		21: EEPROM operation fault (EEP) 22: PID feedback offline fault (PIdE) 23: Braking unit fault (bCE) 24: Running time arrival (ENd) 25: Electronic overload (OL3) 26: Keypad communication error (PCE) (Reserved) 27: Parameter uploading fault (UPE) 28: Parameter downloading fault (DNE) 29: PROFIBUS communication fault (E_dP) 30: Ethernet communication fault (E_NEt) 31: CANopen communication fault (E_CAN) 32: Grounding short circuit fault 1 (EtH1) (Reserved) 33: Reserved 34: Speed deviation fault (dEU) 35: Maladjustment (STE) 36: Underload fault (LL) 37: Encoder offline fault (ENC1o) 38: Encoder reverse fault (ENC1d) 39: STO fault (E_STo) 40: Braking action fault (FAE) 41: Master-slave communication fault (E_ASC) 42: Slave fault (E_SLE) 43: DSP and FPGA communication fault (dF_CE) 44: Control power failure (CPoE) 45: Motor overheat (oH) 46: Torque verification fault (tCE) Unit fault: m.n m.01: No. m U-phase Vce detection fault (m. oUt1) m.02: No. m V-phase Vce detection fault (m. oUt2) m.03: No. m W-phase Vce detection fault (m. oUt3) m.04: No. m hardware overcurrent (m.oC) m.05: No. m current detection fault			

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
		(m.ItE) m.06: No. m current unbalance (m.IbC) m.07: No. m rectifier bridge overheat (m.oH1) m.08: No. m IGBT overheat (m.oH2) m.09: No. m fan overheat (m.EF1) m.10: No. m filter unit overheat (m.EF2) m.11: No. m inverter unit input phase loss (m.EF3) m.12: No. m bus overvoltage (m.oV) m.13: No. m bus undervoltage (m.Lv) m.14: No. m down communication fault (m.dn_C) m.15: No. m up communication fault (m.UP_C) m.16: No. m power failure (m.PEr)			
P19.06	Running frequency at current fault			0.00Hz	●
P19.07	Ramp reference frequency at current fault			0.00Hz	●
P19.08	Output voltage at current fault			0V	●
P19.09	Output current at current fault			0.0A	●
P19.10	Bus voltage at current fault			0.0V	●
P19.11	The Max temperature at current fault			0.0°C	●
P19.12	Input terminal state at current fault			0	●
P19.13	Output terminal state at current fault			0	●
P19.14	Running frequency at previous fault			0.00Hz	●
P19.15	Ramp reference frequency at previous fault			0.00Hz	●
P19.16	Output voltage at			0V	●

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	previous fault				
P19.17	Output current at previous fault			0.0A	●
P19.18	Bus voltage at previous fault			0.0V	●
P19.19	The Max temperature at previous fault			0.0°C	●
P19.20	Input terminal state at previous fault			0	●
P19.21	Output terminal state at previous fault			0	●
P19.22	Running frequency at previous 2 fault			0.00Hz	●
P19.23	Ramp reference frequency at previous 2 fault			0.00Hz	●
P19.24	Output voltage at previous 2 fault			0V	●
P19.25	Output current at previous 2 fault			0.0A	●
P19.26	Bus voltage at previous 2 fault			0.0V	●
P19.27	The highest temperature at previous 2 fault			0.0°C	●
P19.28	Input terminal state at previous 2 fault			0	●
P19.29	Output terminal state at previous 2 fault			0	●
P20 Group	Serial communication				
P20.00	Local communication address	1~247 and 0 are broadcast communication addresses.	1~247	1	○
P20.01	Communication baud rate	0: 1200BPS 1: 2400BPS 2: 4800BPS 3: 9600BPS 4: 19200BPS 5: 38400BPS	0~5	4	○
P20.02	Data bit checkout	0: No check (N, 8, 1) for RTU	0~5	1	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
		1: Even check (E, 8, 1) for RTU 2: Odd check (O, 8, 1) for RTU 3: No check (N, 8, 2) for RTU 4: Even check (E, 8, 2) for RTU 5: Odd check (O, 8, 2) for RTU			
P20.03	Communication response delay	0~200ms	0~200	5	○
P20.04	Fault time of communication timeout	0.0(invalid), 0.1~60.0s	0.0~60.0	0.0s	○
P20.05	Transmission fault processing	0: Alarm and coast to stop 1: Continue to run without alarm 2: Stop according to stop way without alarm (only in communication control mode) 3: Stop according to stop way without alarm (in all control modes)	0~3	0	○
P20.06	Communication processing action	LED ones: 0: With response to write operation 1: Without response to write operation LED tens: 0: Communication encryption setting is invalid 1: Communication encryption setting is valid	LED ones: 0~1 LED tens: 0~1	0x00	○
P20.07	Reserved				●
P20.08	Reserved				●
P20.09	Reserved				●
P21 Group PROFIBUS/CANopen function					
P21.00	Module type	0: PROFIBUS/CANopen 1: Reserved	0~1	0	◎
P21.01	PROFIBUS/ CANopen module address	0~127	0~127	2	◎
P21.02	PZD2 receiving	0: Invalid 1: Set frequency (0~Fmax (unit: 0.01Hz)) 2: PID reference, range (0~1000, 1000 corresponding to 100.0%) 3: PID feedback, range (0~1000, 1000 corresponding to 100.0%) 4: Torque set value (-3000~3000,	0~20	0	○
P21.03	PZD3 receiving		0~20	0	○
P21.04	PZD4 receiving		0~20	0	○
P21.05	PZD5 receiving		0~20	0	○
P21.06	PZD6 receiving		0~20	0	○
P21.07	PZD7 receiving		0~20	0	○
P21.08	PZD8 receiving		0~20	0	○
P21.09	PZD9 receiving		0~20	0	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
P21.10	PZD10 receiving	1000 corresponding to 100.0% of motor rated current)	0~20	0	○
P21.11	PZD11 receiving		0~20	0	○
P21.12	PZD12 receiving	5: Set value of forward rotation upper-limit frequency (0~Fmax (unit: 0.01Hz)) 6: Set value of reverse rotation upper-limit frequency (0~Fmax (unit: 0.01Hz)) 7: Electromotion torque upper limit (0~3000, 1000 corresponding to 100.0% of motor rated current) 8: Braking torque upper limit (0~2000, 1000 corresponding to 100.0% of motor rated current) 9: Virtual input terminal command, 0x000~0x0FF 10: Virtual output terminal command, 0x00~0x3F 11: Voltage set value (special for V/F separation) (0~1000, 1000 corresponding to 100.0% of motor rated voltage) 12: AO output set value 1 (-1000~1000, 1000 corresponding to 100.0%) 13: AO output set value 2 (-1000~1000, 1000 corresponding to 100.0%) 16: Pre-torque setting 17~20: Reserved	0~20	0	○
P21.13	PZD2 sending	0: Invalid 1: Running frequency (*100, Hz) 2: Set frequency (*100, Hz) 3: Bus voltage (*10, V) 4: Output voltage (*1, V) 5: Output current (*10, A) 6: Output torque actual value (*10, %) 7: Output power actual value (*10, %) 8: Runing rotating speed (*1, RPM) 9: Running linear speed (*1, m/s) 10: Ramp reference frequency 11: Fault code 12: AI1 value (*100, V) 13: AI2 value (*100, V)	0~23	0	○
P21.14	PZD3 sending		0~23	0	○
P21.15	PZD4 sending		0~23	0	○
P21.16	PZD5 sending		0~23	0	○
P21.17	PZD6 sending		0~23	0	○
P21.18	PZD7 sending		0~23	0	○
P21.19	PZD8 sending		0~23	0	○
P21.20	PZD9 sending		0~23	0	○
P21.21	PZD10 sending		0~23	0	○
P21.22	PZD11 sending		0~23	0	○
P21.23	PZD12 sending		0~23	0	○

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
		14: AI3 value (*100, V) 15: Reserved 16: Reserved 17: S8 frequency (*100, kHz) 18: PG card speed (with sign) 19: Input state of terminals 20: Output state of terminals 21: PID reference (*100, %) 22: PID feedback (*100, %) 23: Motor rated torque			
P21.24	Temporary variable	0~65535	0~65535	0	○
P21.25	Fault time of DP communication timeout	0.0 (invalid), 0.1~60.0s	0.0~60.0	0.0s	○
P21.26	Reserved				●
P21.27	Reserved				●
P21.28	Reserved				●
P21.29	CANopen baud rate	0: 1000k 1: 800k 2: 500k 3: 250k 4: 125k 5: 100k 6: 50k 7: 20k	0~7	2	◎
P21.30	Fault time of CANopen communication timeout	0.0 (invalid), 0.1~100.0s	0.1~100.0	0.0s	◎
P21.31	Reserved				●
P21.32	External ACC/DEC time enabling	0: Disabled 1: Enabled	0~1	0	◎
P21.33	Reserved				●
P21.34	Reserved				●
P22 Group	Ethernet function				
P22.00	Ethernet communication speed setting	0: Self-adapting 1: 100M full-duplex 2: 100M half-duplex 3: 10M full-duplex 4: 10M half-duplex	0~4	0	◎
P22.01	IP address 1	0~255	0~255	192	◎
P22.02	IP address 2	0~255	0~255	168	◎

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
P22.03	IP address 3	0~255	0~255	0	◎
P22.04	IP address 4	0~255	0~255	1	◎
P22.05	Subnet mask 1	0~255	0~255	255	◎
P22.06	Subnet mask 2	0~255	0~255	255	◎
P22.07	Subnet mask 3	0~255	0~255	255	◎
P22.08	Subnet mask 4	0~255	0~255	0	◎
P22.09	Gateway 1	0~255	0~255	192	◎
P22.10	Gateway 2	0~255	0~255	168	◎
P22.11	Gateway 3	0~255	0~255	1	◎
P22.12	Gateway 4	0~255	0~255	1	◎
P22.13	Reserved				◎
P22.14	Reserved				◎
P23 Group	Master-slave control				
P23.00	Master-slave control mode	0: Invalid 1: The local is the master. 2: The local is the slave. 3~4: Reserved	0~4	0	◎
P23.01	Master-slave communication data	0: Optical communication power balance 1: Optical communication expansion 2: Reserved	0~2	0	◎
P23.02	Data sent from master to slave enabling	0: Disabled 1: Enabled	0~1	0	◎
P23.03	Reference signal sent from master to slave	0: Output torque of the master 1: Output current of the master	0~1	0	◎
P23.04	Running channel of the slave	0: Internal channel of the master 1: P00.01 is valid	0~1	0	◎
P23.05	Reference frequency gain of the slave	0.01~100.00	0.01~100.00	1.00	◎
P23.06	Reference signal gain of the slave	0.01~100.00	0.01~100.00	1.00	◎
P23.07	PID proportional coefficient of the slave	0.00~100.00	0~100.00	1.00	○
P23.08	PID integral coefficient of the slave	0.00~100.00	0.00~100.00	1.00	○
P23.09	PID feature of the slave	0: Positive 1: Negative	0~1	0	◎
P23.10	PID output buffer time of the slave	0.000~10.000s	0.000~10.000	0.000s	◎

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
P23.11	Reserved	0~1	0~1	0	◎
P23.12	Reserved	0~65535	0~65535	0	●
P23.13	Reserved	0~65535	0~65535	0	●
P23.14	Reserved	0~65535	0~65535	0	●
P23.15	Reserved	0~65535	0~65535	0	●
P23.16	Reserved	0~65535	0~65535	0	●
P23.17	Reserved	0~65535	0~65535	0	●
P23.18	Reserved	0~65535	0~65535	0	●
P23.19	Reserved	0~65535	0~65535	0	●
P24 Group Hoisting					
P24.00	Pre-torque input signal	0: Invalid 1: AI1 2: AI2 3: AI3 4: MODBUS communication 5: Reserved 6: PROFIBUS/CANopen communication 7: Internal reference 8~10: Reserved	0~10	0	◎
P24.01	Pre-torque offset	-100.0~100.0%	-100.0~100.0	0.0%	○
P24.02	Drive side gain	0.000~7.000	0.000~7.000	1.000	○
P24.03	Braking side gain	0.000~7.000	0.000~7.000	1.000	○
P24.04	Pre-torque direction and braking control	LED ones: 0: FWD pre-torque 1: REV pre-torque LED tens: 0: Invalid braking control 1: Valid braking control	0x00~0x11	0x00	◎
P24.05	Brake release delay	0.000~5.000s	0.000~5.000	0.000s	◎
P24.06	Brake close frequency	0.00~50.00Hz	0.00~50.00	0.00Hz	◎
P24.07	Brake close delay	0.00~5.000s	0.00~5.000	0.000s	◎
P24.08	Brake feedback detection time	0.000~20.000s	0.000~20.000	1.000s	◎
P24.09	Torque verification	0: Invalid 1: Judge by current percentage 2: Judge by torque percentage	0~2	0	◎
P24.10	Keypad setting during torque verification	0.0~100.0% (Relative to motor rated current/ rated torque, invalid at 0.0%)	0.0~100.0	0.0%	◎
P24.11	Fault detection time during torque	0.000~10.000s	0.000~10.000	0.500s	◎

Function code	Name	Detailed instruction of parameters	Setting range	Default value	Modify
	verification				
P24.12	Braking torque of snag protection	0.0%~300.0% (Motor rated current)	0.0~300.0	0.0%	◎
P24.13	ACC/DEC time of braking torque	0.000~10.000s	0.000~10.000	0.200s	◎
P24.14	End frequency of braking torque	0.00~30.00Hz	0.00~30.00	0.10Hz	◎
P24.15	Safe limited speed frequency	0.00~30.00Hz	0.00~30.00	1.00Hz	◎
P24.16	DEC time at safe limited speed	0.0~100.0s	0.0~100.0	2.0s	◎
P24.17	Safe stop 1 DEC time	0.0~100.0s	0.0~100.0	5.0s	◎
P24.18	Reserved	0~65535	0~65535	0	●
P24.19	Reserved	0~65535	0~65535	0	●
P29 Group	Factory function				
P29.00	Factory password	0~65535	0~65535	*****	●

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Industrial Automation: ■ Frequency Inverter ■ Servo & Motion Control ■ Motor & Electric Spindle ■ PLC

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