Operation Manual

Goodrive 300-01 Series
Inverter for Air Compressor

SHENZHEN INVT ELECTRIC CO., LTD.

Preface

Goodrive300-01 series inverter for air compressor is developed based on Goodrive300 hardware platform and can be widely applied in air compressor industry. The inverter is equipped with terminal board to provide abundant external terminals for multiple control modes and support PT100 temperature signal detection. Additionally, the product's reliability and environment adaptability as well as the customized and industrialized design make the products optimal in function, flexible in application and stable in performance.

With special control functions and touch screen, Goodrive300-01 series inverters for air compressor achieve the integrated control solution. The master inverter provides PID constant pressure air supply, controls magnetic valve loading as well as fan inverter start-stop and frequency and processes external logic signals, completing all control and protect functions instead of traditional PLC functions. The fan inverters realize speed regulation to maintain the machine in constant temperature (oil temperature) and develop the lubricant in optimal characteristics.

When used in combination with our PP100 power module specific for air compressor, its phase sequence detection function can effectively prevent the fan from rotating reversely. The 2nd channel temp detection is available to provide more convenience for temp detection and protection. Meanwhile, 24Vdc and 220Vac are provided to supply power for touch screen, IoT module, solenoid valve and contactor.

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.

Content

Chapter 1 Safety Precautions

1.1 Contents of this chapter

Please read this manual carefully and follow all safety precautions before moving, installing, operating and servicing 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 due to ignoring of the safety precautions in the manual, our company will not be responsible for any damages and we are not legally bound in any manner.

1.2 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:	Procedures taken to ensure correct operation.
Qualified electricians:	People working on the device should have received professional electrical and safety training and passed relevant examination, and be familiar with all steps and requirements of installing, commissioning, operating and maintaining the device to avoid any emergency.

1.3 Warning symbols

Warnings caution you about conditions which can result in serious injury or death and/or damage to the device, 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	The base of the device may become hot. Do not touch.	
Note	Note	Procedures taken to ensure correct operation.	Note

1.4 Safety guidelines

<table>
<tr><td>  </td><td>✧Only qualified electricians are allowed to operate on the inverter.
✧Do not carry out any wiring, inspection or component replacement when the power supply is applied. Ensure all input power supplies are disconnected before wiring and inspection 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 colspan="2">Inverter module</th><th>Minimum waiting time</th></tr>
<tr><td>380V</td><td>0.75kW-315kW</td><td>5 minutes</td></tr>
</table></td></tr>
<tr><td>  </td><td>✧Do not refit the inverter unless authorized; 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 the inverter are electrostatic-sensitive. Take measurements to avoid electrostatic discharge during relevant operation.</td></tr>
</table>

1.4.1 Delivery and installation

<table>
<tr><td>  </td><td>✧Please install the inverter on fire-retardant material and keep the inverter away from combustible materials.
✧Connect the optional braking parts (braking resistors, braking units or feedback units) according to the wiring diagram.
✧ Do not operate on the inverter if damage or components missing occurred to the inverter.
✧ Do not touch the inverter with wet items or body, otherwise electric shock may occur.</td></tr>
</table>

Note:

- ✧ Select appropriate moving and installing tools to ensure a safe and normal running of the inverter and avoid physical injury or death. For physical safety, the installer 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.
- ✧ Do not carry the inverter by its front cover in case the cover falls off.
- ✧ Install away from children and other public places.
- ✧ The inverter cannot meet the requirements of low voltage protection in IEC61800-5-1 if the altitude of installation site is above 2000m.
- ✧ The inverter should be used in proper ambient environment
- ✧ Prevent screws, cables and other conductive objects from falling into the inverter.
- ✧ The leakage current of the inverter may exceed 3.5mA during operation. Ground with proper techniques and ensure the grounding resistor is less than 10Ω. The conductivity of PE

grounding conductor is the same as that of the phase conductor (with the same cross sectional area).

✧ R, S and T are power input terminals, while U, V and W are output motor terminals. Please connect the input power cables and motor cables correctly; otherwise the damage to the inverter may occur.

1.4.2 Commissioning and running

	✧ Disconnect all power supplies applied to the inverter before the terminal wiring and wait for at least the time designated on the inverter after disconnecting the power supply. ✧ High voltage is present inside the inverter during running. Do not carry out any operation except for the keypad setting. ✧ The inverter may start up by itself when starting at power-off is activated (P01.21=1). Do not get close to the inverter and motor. ✧ The inverter cannot be used as “Emergency-stop device”. ✧ The inverter cannot be used as the motor brake under emergencies. A mechanical brake device must be installed.

Note:

✧ Do not switch on or off the input power supply of the inverter frequently.

✧ For inverters that have been stored for a long time, check and adjust the capacitance and perform pilot run before operating on the inverter

✧ Cover the front board before running, otherwise electric shock may occur.

1.4.3 Maintenance and replacement of components

	✧ Only qualified electricians are allowed to perform maintenance, inspection, and component replacement of the inverter. ✧ Disconnect all power supplies to the inverter before the terminal wiring. Wait for at least the time designated on the inverter after disconnection. ✧ Take measures to prevent screws, cables and other conductive matters from falling into the inverter during maintenance and component replacement.

Note:

✧ Please select proper torque to tighten the screws.

✧ Keep the inverter, its components and parts away from combustible materials during maintenance and component replacement.

✧ Do not carry out any insulation and voltage endurance test on the inverter and do not measure the control circuit of the inverter by megameter.

✧ Proper measures must be taken against static electricity during maintenance and component replacement.

1.4.3 What to do after disposal

	✧ The heavy metals in the inverter should be disposed as industrial waste.

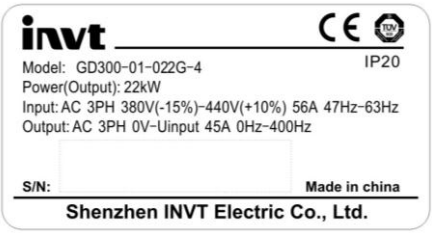
Chapter 2 Product overview

2.1 Product specification

Function		Specification
Power input	Input voltage (V)	AC 3PH 380V (-15%)~440V (+10%)
	Input current (A)	Refer to *the rated value*
	Input frequency (Hz)	50Hz or 60Hz, allowed range: 47~63Hz
Power output	Output voltage (V)	0~input voltage
	Output current (A)	Refer to *the rated value*
	Output power (kW)	Refer to *the rated value*
	Output frequency (Hz)	0~400Hz
Technical control feature	Control mode	SVPWM, sensorless vector control
	Motor type	Asynchronous motor and permanent magnet synchronous motor
	Adjustable-speed ratio	Asynchronous motor 1:200 (SVC), synchronous motor 1:20 (SVC)
	Speed control accuracy	±0.2% (sensorless vector control)
	Speed fluctuation	± 0.3% (sensorless vector control)
	Torque response	<20ms (sensorless vector control)
	Torque control accuracy	10% (sensorless vector control)
	Starting torque	Asynchronous motor: 0.25Hz/150% (sensorless vector control) Synchronous motor: 2.5 Hz/150% (sensorless vector control)
	Special function	No-load hibernation and wakeup, pressure setting, closed-loop temperature control for the start-stop of the fan, no-load frequency, pre-alarm for no-load delay time, minimum hibernation time, loading delay time, pressure and temperature, power correction and the state group for air compressor
	Overload capacity	150% of rated current: 1 minute 180% of rated current: 10 seconds 200% of rated current: 1 second
Running control feature	Frequency setting method	Digital setting, analog setting, pulse frequency setting, multi-step speed running setting, simple PLC setting, PID setting and MODBUS communication setting. Switch between the combination and setting channel.
	Auto-adjustment of the voltage	Keep constant voltage automatically when the grid voltage changes

Function		Specification
	Fault protection	Provide more than 30 fault protection functions: overcurrent, overvoltage, undervoltage, overheating, phase loss and overload, etc.
	Restart after rotating speed tracking	Smooth starting of the rotating motor
Peripheral interface	Terminal analog input resolution	< 20mV
	Terminal switch input resolution	< 2ms
	Analog input	2 (AI1, AI2)0~10V/0~20mA, 1 (AI3)-10~10V
	Analog output	2 (AO1, AO2)0~10V /0~20mA
	Temperature signal detection	3-wire PT100 signal input, -20~150°C
	Digital input	8 common inputs, the Max. frequency: 1kHz, internal impedance: 3.3kΩ; 1 high speed input, the Max. frequency: 50kHz
	Relay output	2 programmable NO outputs, 2 programmable NO/NC outputs Contact capacity: 3A/AC250V, 1A/DC30V
Others	Installation manner	Wall, floor and flange mounting
	Temperature of the running environment	-10~50°C, derate above 40°C
	Protection level	IP20
	Pollution level	2
	Cooling mode	Air-cooling
	Braking unit	Built-in for inverters of 380V (≤30kW) External for others
	EMC filter	Built-in C3 filter: meet the degree requirement of IEC61800-3 C3 External filter: meet the degree requirement of IEC61800-3 C2

2.2 Nameplate



Note: It is the example of Goodrive300-01 standard name plate format and the CE\TUV\IP20

will be labeled according to the actual certification.

2.3 Type designation key

GD300–01- 018G – 4

① ② ③

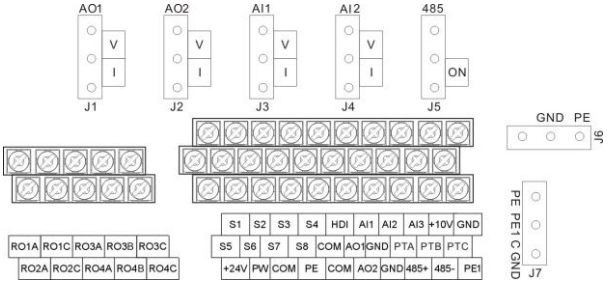
Key	No.	Detailed description	Detailed content
Abbreviation	①	Product abbreviation	Goodrive300-01 is shorted as GD300-01. Goodrive300-01: Specific for air compressor
Rated power	②	Power range + Load type	018G -18.5kW G—Constant torque load
Voltage degree	③	Voltage degree	4: AC 3PH 380V (-15%)~440V (+10%)

2.4 Rated specifications

Model	Rated output power (kW)	Rated input current (A)	Rated output current (A)
GD300-01-7R5G-4	7.5	25	18.5
GD300-01-011G-4	11	32	25
GD300-01-015G-4	15	32	32
GD300-01-018G-4	18.5	47	38
GD300-01-022G-4	22	56	45
GD300-01-030G-4	30	70	60
GD300-01-037G-4	37	80	75
GD300-01-045G-4	45	94	92
GD300-01-055G-4	55	128	115
GD300-01-075G-4	75	160	150
GD300-01-090G-4	90	190	180
GD300-01-110G-4	110	225	215
GD300-01-132G-4	132	265	260
GD300-01-160G-4	160	310	305
GD300-01-185G-4	185	345	340
GD300-01-200G-4	200	385	380
GD300-01-220G-4	220	430	425
GD300-01-250G-4	250	485	480
GD300-01-280G-4	280	545	530
GD300-01-315G-4	315	610	600

2.5 Wiring diagram

2.5.1 Terminal arrangement

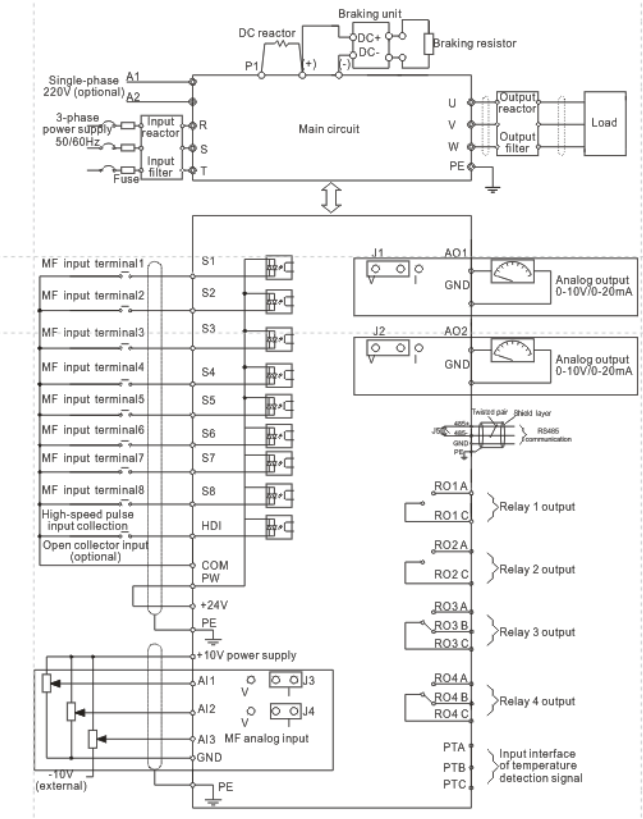


2.5.2 Terminal instruction

Name	Instruction
RO1A	RO1 relay output, RO1A NO, RO1C common terminal
RO1C	Contact capacity: 3A/AC250V, 1A/DC30V
RO2A	RO2 relay output, RO2A NO, RO2C common terminal
RO2C	Contact capacity: 3A/AC250V, 1A/DC30V
RO3A	RO3 relay output, RO3A NO, RO3B NC, RO3C common terminal
RO3B	Contact capacity: 3A/AC250V, 1A/DC30V
RO3C	
RO4A	RO4 relay output, RO4A NO, RO4B NC, RO4C common terminal
RO4B	Contact capacity: 3A/AC250V, 1A/DC30V
RO4C	
+10V	Local power supply +10V
GND	+10V reference null potential
AI1	1. Input range: AI1/AI2 voltage and current can be chosen: 0~10V/0~20mA; AI1 can be shifted by J3; AI2 can be shifted by J4; AI3: -10V~+10V 2. Input impedance: Voltage input: 20kΩ; current input: 500Ω 3. Resolution: 5mV when 10V corresponds to 50Hz 4. Deviation ±1%, 25°C
AI2	
AI3	
AO1	1. Output range: 0~10V or 0~20mA; the voltage or the current output depends on the jumper; AO1 can be shifted by J1; AO2 can be shifted by J2 2. Deviation ±1%, 25°C
AO2	
PTA	1. Input interface of PT100 temperature detection signal 2. Range of temperature detection: -30~120°C, detection precision: 1°C 3. PTA and PTB are input terminals of sampling analog signal, PTC is reference signal input terminal 4. PTB and PTC terminals are short circuited inside PCB, removing the need for external short circuit cap.
PTB	
PTC	

Name	Instruction	
PE	Grounding terminal, PE can be short circuited with GND by J6. Please note that PE is not short circuited with GND by default.	
PW	Provide the input switch working power supply from external to internal Voltage range: 12~24V	
24V	The inverter provides the power supply for users with a maximum output current 200mA	
COM	+24V common terminal	
S1	Switch input 1	1. Internal impedance: 3.3kΩ 2. 12~30V voltage input is available 3. The terminal is the dual-direction input terminal supporting both NPN and PNP. 4. Max input frequency: 1kHz 5. All are programmable digital input terminals. Users can set the terminal function through function codes.
S2	Switch input 2	
S3	Switch input 3	
S4	Switch input 4	
S5	Switch input 5	
S6	Switch input 6	
S7	Switch input 7	
S8	Switch input 8	
HDI	Besides S1~S8, this terminal can be used as high frequency input channel Max. input frequency: 50kHz	
COM	+24Vcommon terminal	
485+	485 communication interface and 485 differential signal interface If it is the standard 485 communication interface, please use the twisted pair or shield cable.	
485-		
PE1	485 communication shielded connection terminal. Select to connect shielded layer to PE or isolate CGND by jumper J7.	

2.5.3 Wiring diagram



Chapter 3 Function parameters

For the convenience of function codes setting, the function group number corresponds to the first level menu, the function code corresponds to the second level menu and the function code corresponds to the third level menu.

1. Below is the instruction of the function lists:

The first line “Function code”: codes of function parameter group and parameters;

The second line “Name”: full name of the function parameters;

The third line “Detailed instruction of parameters”: detailed instruction of the function parameters; the function parameter will restore to the default value during default parameters restoring, but the detected parameter or recorded value will not be refreshed.

The fourth line “Default value”: the original factory values of the function parameters;

The fifth line “Modify”: the modifying attribute of the function codes (the parameters can be modified or not), below is the instruction:

“○”: means the setting value of the parameter can be modified at stopping and running state;

“◎”: means the setting value of the parameter cannot be modified at running state;

“●”: means the value of the parameter is the real detection value which cannot be modified;

(The modification attribute of all parameters are inspected and restricted automatically by the inverter to avoid mal-modification of users.)

3.1 Basic function parameters

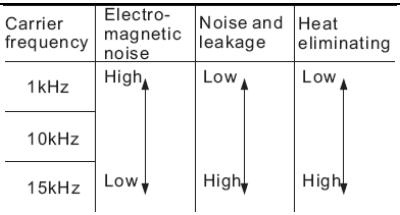
Function code	Name	Detailed instruction of parameters	Default value	Modify
P00 Group Basic function group				
P00.00	Speed control mode	0: Sensorless vector control mode 0 (apply to AM and SM) No need to install encoders. It is suitable in cases with low frequency, big torque and high speed control accuracy for accurate speed and torque control. Relative to mode 1, this mode is more suitable for medium and small power. 1: Sensorless vector control mode 1 (apply to AM) No need to install encoders. It is suitable in cases with high speed control accuracy for accurate speed and torque control at all power ratings. 2: SVPWM control No need to install encoders. It can improve the control accuracy with the advantages of stable operation, valid low-frequency torque boost and current vibration suppression and the functions of slip compensation and voltage adjustment. 3. PMSM	0	◎

Function code	Name	Detailed instruction of parameters	Default value	Modify
		Note: AM-Asynchronous motor **SM-Synchronous motor**		
P00.01	Run command channel	Select the run command channel of the inverter. The control command of the inverter includes: start-up, stop, forward, reverse, jogging and fault reset. 0: Keypad run command channel ("LOCAL/REMOT" light off) Carry out the command control by RUN, STOP/RST on the keypad. Set the multi-function key QUICK/JOG to FWD/REVC shifting function (P07.02=3) to change the running direction; **press RUN and STOP/RST simultaneously in running state to make the inverter coast to stop**. 1: Terminal run command channel ("LOCAL/REMOT" flickering) Carry out the run command control by the forward rotation, reverse rotation and forward jogging and reverse jogging of the multi-function input terminals. 2: Communication run command channel ("LOCAL/REMOT" on); The run command is controlled by the upper computer via communication.	0	○
P00.02	Communication run commands	Select the controlling communication command channel of the inverter. 0: MODBUS communication 1~3: Reserved	0	○
P00.03	Max. output frequency	This parameter is used to set the maximum output frequency of the inverter. Users should pay attention to this parameter because it is the foundation of the frequency setting and the speed of acceleration and deceleration. The setting range: P00.04~400.00Hz	50.00Hz	◎
P00.04	Upper limit of running frequency	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.	50.00Hz	◎

Function code	Name	Detailed instruction of parameters	Default value	Modify
		The setting range: P00.05~P00.03 (Max. output frequency)		
P00.05	Lower limit of running frequency	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** The setting range: 0.00Hz~P00.04 (Upper limit of running frequency)	0.00Hz	◎
P00.06	A frequency command	**Note**: Frequency A and frequency B cannot use the same frequency setting mode. The frequency source can be set by P00.09. 0: Keypad Modify the value P00.10 (set the frequency by keypad) to modify the frequency by the keypad. 1: AI1 2: AI2 3: AI3 Set the frequency by analog input terminals. Goodrive300-01 series inverters provide 3 analog input terminals as the standard configuration, of which AI1/AI2 are the voltage/current option (0~10V/0~20mA) which can be shifted by jumpers; AI3 is voltage input (-10V~+10V). **Note: When analog AI1/AI2 select 0~20mA input, the corresponding voltage of 20mA is 10V.** 100.0% of the analog input setting corresponds to the maximum output frequency (P00.03) in forward direction and -100.0% corresponds to the maximum frequency (P00.03) in reverse direction. 4: High-speed pulse HDI The frequency is set by high-speed pulse terminals. Goodrive300-01 series inverters provide 1 high speed pulse input as the standard configuration. The pulse frequency range is 0.0~50.00kHz. 100.0% of the high-speed pulse input setting corresponds to the maximum output frequency (P00.03) in forward direction and -100.0%	0	○
P00.07	B frequency command		2	○

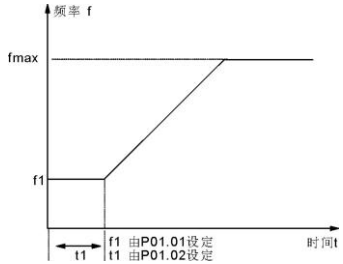
Function code	Name	Detailed instruction of parameters	Default value	Modify
		corresponds to the maximum frequency (P00.03) in reverse direction. **Note: The pulse setting can only be input by multi-function input terminals HDI. Set P05.00 (HDI input selection) to high-speed pulse input, and set P05.49 (HDI high-speed pulse input function selection) to frequency setting input.** 5: Simple PLC program The inverter runs at simple PLC program mode when P00.06=5 or P00.07=5. Set P10 (simple PLC and multi-step speed control) to select the running frequency, running direction, ACC/DEC time and the keeping time of corresponding step. See the function description of P10 for detailed information. 6: multi-step speed running The inverter runs at multi-step speed mode when P00.06=6 or P00.07=6. Set P05 to select the current running step, and set P10 to select the current running frequency. The multi-step speed has the priority when P00.06 or P00.07 does not equal to 6, but the setting step can only be the 1~15 step. The setting step is 0~15 if P00.06 or P00.07 equals to 6. 7: PID control The running mode of the inverter is procedure PID control when P00.06=7 or P00.07=7. It is necessary to set P09. The running frequency of the inverter is the value after PID effect. See P09 for the detailed information for the reference source, reference value, and feedback source of PID. 8: MODBUS communication The frequency is set by MODBUS communication. See P14 for detailed information. 9: Reserved 10: Reserved 11: Reserved		
P00.08	B frequency command reference	0: Maximum output frequency 100% of B frequency setting corresponds to the maximum output frequency.	0	○

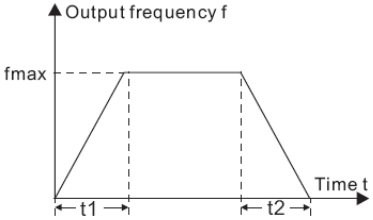
Function code	Name	Detailed instruction of parameters	Default value	Modify
		1: A frequency command 100% of B frequency setting corresponds to the maximum output frequency. Select this setting if it needs to adjust on the base of A frequency command.		
P00.09	Combination of the setting source	0: A, the current frequency setting is A frequency command 1: B, the current frequency setting is B frequency command 2: A+B, the current frequency setting is A frequency command + B frequency command 3: A-B, the current frequency setting is A frequency command - B frequency command 4: Max (A, B): The bigger one between A frequency command and B frequency is the set frequency. 5: Min (A, B): The lower one between A frequency command and B frequency is the set frequency. **Note: The combination manner can be shifted by P5 (terminal function).**	0	○
P00.10	Keypad setting frequency	When A and B frequency commands are selected as "Keypad setting", the value of the function code is the original setting one of the frequency data of the inverter. The setting range: 0.00 Hz~P00.03 (Max. output frequency)	50.00Hz	○
P00.11	ACC time 1	ACC time means the time needed if the inverter speeds up from 0Hz to the Max. one (P00.03).	Depend on model	○
P00.12	DEC time 1	DEC time means the time needed if the inverter speeds down from the Max. output frequency (P00.03) to 0Hz. Goodrive300-01 series inverters define four groups of ACC/DEC time which can be selected by P05. The factory default ACC/DEC time of the inverter is the first group. The setting range of P00.11 and P00.12: 0.0~3600.0s	Depend on model	○
P00.13	Running direction	0: Runs at the default direction, the inverter runs in the forward direction. FWD/REV indicator is off. 1: Runs at the reverse direction, the inverter runs in	2	○

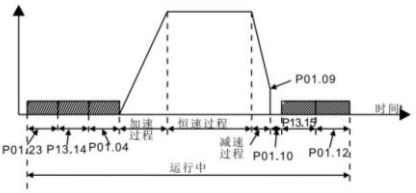
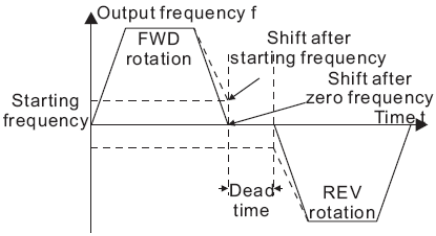
<table>
<tr><th>Function code</th><th>Name</th><th>Detailed instruction of parameters</th><th>Default value</th><th>Modify</th></tr>
<tr><td></td><td></td><td>the reverse direction. FWD/REV indicator is on.
Modify the function code to shift the rotation direction of the motor. This effect equals to the shifting the rotation direction by adjusting either two of the motor lines (U, V and W). The motor rotation direction can be changed by QUICK/JOG on the keypad. Refer to parameter P07.02.
Note: When the function parameter restores to the default value, the motor's running direction will restore to the factory default state. In some cases it should be used with caution after commissioning if the change of rotation direction is disabled.
2: Forbid to run in reverse direction: It can be used in some special cases if the reverse running is disabled.</td><td></td><td></td></tr>
<tr><td>P00.14</td><td>Carrier frequency setting</td><td> 

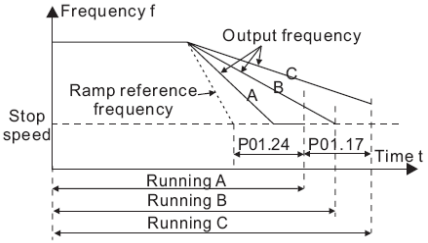
The relation between the device model and carrier frequency:
<table>
<tr><th colspan="2">Model</th><th>Default value of carrier frequency</th></tr>
<tr><td rowspan="3">380V</td><td>18.5~75kW</td><td>4kHz</td></tr>
<tr><td>90~160kW</td><td>4kHz</td></tr>
<tr><td>Above 160kW</td><td>4kHz</td></tr>
</table>
The advantage of high carrier frequency: ideal current waveform, little current harmonic wave and motor noise.
The disadvantage of high carrier frequency: increasing the switch loss, increasing inverter temperature and the impact to the output capability. The inverter needs to derate on high carrier frequency. At the same time, the leakage and electrical magnetic interference will increase.
Applying low carrier frequency is contrary to the</td><td>Depend on model</td><td>○</td></tr>
</table>

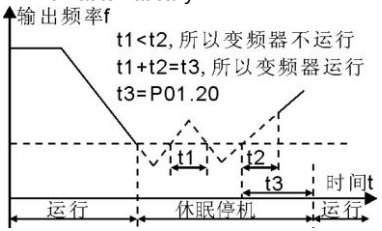
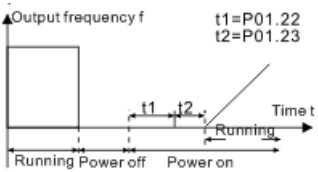
Function code	Name	Detailed instruction of parameters	Default value	Modify
		above, too low carrier frequency will cause unstable running, torque decreasing and surge. The manufacturer has set a reasonable carrier frequency when the inverter is in factory. In general, users do not need to change the parameter. When the frequency in use exceeds the default carrier frequency, the inverter needs to derate 10% for each additional 1k carrier frequency. The setting range: 1.0~15.0kHz		
P00.15	Motor parameter autotuning	0: No operation 1: Rotation autotuning Comprehensive motor parameter autotuning It is recommended to use rotation autotuning when high control accuracy is needed. 2: Static autotuning 1 (autotune totally) It is suitable in the cases when the motor cannot decouple from the load. 3: Static autotuning 2 (autotune partially) When the current motor is motor 1, autotune P02.06, P02.07, P02.08; when the current motor is motor 2, autotune P12.06, P12.07, P12.08.	0	◎
P00.16	AVR function selection	0: Invalid 1: Valid during the whole procedure The auto-adjusting function of the inverter can cancel the impact on the output voltage of the inverter because of the bus voltage fluctuation.	1	○
P00.17	Reserved	Reserved	0	◎
P00.18	Function parameters restore	0: No operation 1: Restore to the default value 2: Cancel the fault record **Note: The function code will restore to 0 after finishing the operation of the selected function code. Restoring to the default value will cancel the user password, please use this function with caution.**	0	◎
P01 Group Start-up and stop control				
P01.00	Start mode	0: Start-up directly: start from the starting frequency P01.01 1: Start-up after DC braking: start the motor from the	0	◎

Function code	Name	Detailed instruction of parameters	Default value	Modify
		starting frequency after DC braking (set the parameter P01.03 and P01.04). It is suitable in the cases where reverse rotation may occur to the low inertia load during starting. 2: Start-up after speed tracking: start the rotating motor smoothly after tracking the rotation speed and direction automatically. It is suitable in the cases where reverse rotation may occur to the big inertia load during starting.		
P01.01	Starting frequency of direct start	Starting frequency of direct start-up means the original frequency during the inverter starting. See P01.02 for detailed information. The setting range: 0.00~50.00Hz	0.50Hz	◎
P01.02	Retention time of the starting frequency	 Set a proper starting frequency to increase the torque of the inverter during starting. During the retention time of the starting frequency, the output frequency of the inverter is the starting frequency. And then, the inverter will run 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 frequency. The setting range: 0.0~50.0s	0.0s	◎
P01.03	The braking current before starting	The inverter will carry out DC braking at the set braking current before starting and it will speed up after the DC braking time. If the DC braking time is set to 0, the DC braking is invalid. The stronger the braking current, the bigger the braking power. The DC braking current before starting means the percentage of the rated current of	0.0%	◎
P01.04	The braking time before starting		0.00s	◎

Function code	Name	Detailed instruction of parameters	Default value	Modify
		the inverter. The setting range of P01.03: 0.0~100.0% The setting range of P01.04: 0.00~50.00s		
P01.05	ACC/DEC selection	The changing mode of the frequency during start-up and running. 0: Linear type The output frequency increases or decreases linearly.  1: Reserved	0	◎
P01.06	Reserved		Reserved	◎
P01.07	Reserved		Reserved	◎
P01.08	Stop mode	0: Decelerate to stop: after the stop command becomes valid, the inverter decelerates to decrease the output frequency during the set time. When the frequency decreases to P01.15, the inverter stops. 1: Coast to stop: after the stop command becomes valid, the inverter ceases the output immediately. And the load coasts to stop at the mechanical inertia.	0	○
P01.09	Starting frequency of DC braking	The starting frequency of stop braking: the inverter will carry on stop DC braking when the frequency is arrived during the procedure of decelerating to stop. The waiting time of stop braking: before the stop DC braking, the inverter will close output and begin to carry on the DC braking after the waiting time. This function is used to avoid the overcurrent fault caused by DC braking when the speed is too high. Stop DC braking current: the DC brake added. The stronger the current, the bigger the DC braking effect. The braking time of stop braking: the retention time of DC brake. If the time is 0, the DC brake is invalid. The inverter will stop at the set deceleration time.	0.00Hz	○
P01.10	Waiting time of DC braking		0.00s	○
P01.11	DC braking current		0.0%	○
P01.12	DC braking time		0.00s	○

Function code	Name	Detailed instruction of parameters	Default value	Modify
		 The setting range of P01.09: 0.00Hz~P00.03 (Max. output frequency) The setting range of P01.10: 0.00~50.00s The setting range of P01.11: 0.0~100.0% The setting range of P01.12: 0.00~50.00s		
P01.13	Dead time of FWD/REV rotation	During the procedure of switching FWD/REV rotation, set the threshold by P01.14, which is shown as the table below:  The setting range: 0.0~3600.0s	0.0s	○
P01.14	Shifting between FWD/REV rotation	Set the threshold point of the inverter: 0:Switch after zero frequency 1:Switch after the starting frequency 2: Switch after the speed reaches P01.15 and delays for P01.24	0	◎
P01.15	Stop speed	0.00~100.00Hz	0.50Hz	◎
P01.16	Detection of stopping speed	0: Detect according to speed setting (no stopping delay) 1: Detect according to speed feedback (only valid for vector control)	1	◎
P01.17	Detection time of feedback speed	If set P01.16 to 1, the feedback frequency is less than or equal to P01.15 and detect in the set time of P01.17, the inverter will stop; otherwise the inverter will stop after the set time of P01.17.	0.50s	◎

Function code	Name	Detailed instruction of parameters	Default value	Modify
		 The setting range: 0.00~100.00 (only valid when P01.16=1)		
P01.18	Terminal running protection when powering on	When the run commands are controlled by the terminal, the system will detect the state of the running terminal during powering on. 0: The terminal run command is invalid when powering on. Even the run command is detected to be valid during powering on, the inverter will not run and the system keeps in the protection state until the run command is canceled and enabled again. 1: The terminal run command is valid when powering on. If the run command is detected to be valid during powering on, the system will start the inverter automatically after the initialization. **Note: This function should be selected with cautions, or serious result may follow.**	0	○
P01.19	Action if running frequency< lower limit frequency (valid >0)	This function code determines the running state of the inverter when the set frequency is lower than the lower-limit one. 0: Run at the lower-limit frequency 1: Stop 2: Hibernation The inverter will coast to stop when the set frequency is lower than the lower-limit one; if the set frequency is above the lower-limit one again and it lasts for the time set by P01.20, the inverter will restore to the running state automatically.	0	◎
P01.20	Hibernation restore delay time	This function code determines the hibernation delay time. When the running frequency of the inverter is lower than the lower limit one, the inverter will pause to stand by.	0.0s	○

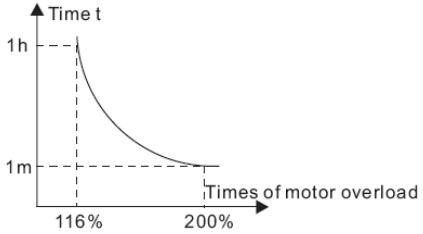
Function code	Name	Detailed instruction of parameters	Default value	Modify
		When the set frequency is above the lower limit one again and it lasts for the time set by P01.20, the inverter will run automatically.  The setting range: 0.0~3600.0s (valid when P01.19=2)		
P01.21	Restart after power off	This function can enable the inverter to start or not after power off and then power on. 0: Disabled 1: Enabled; if the starting need is met, the inverter will run automatically after waiting for the time defined by P01.22.	0	○
P01.22	The waiting time of restart after power off	The function determines the waiting time before the automatic running of the inverter after power off and then power on.  The setting range: 0.0~3600.0s (valid when P01.21=1)	1.0s	○
P01.23	Start delay time	The function determines the brake release after the run command is given, and the inverter is in a stand-by state and wait for the delay time set by P01.23 The setting range: 0.0~60.0s	0.0s	○
P01.24	Delay time of stop speed	The setting range: 0.0~100.0 s	0.0s	○
P01.25	0Hz output selection	Select the output mode at 0Hz. 0: Output without voltage	0	○

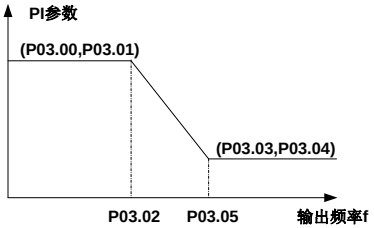
Function code	Name	Detailed instruction of parameters		Default value	Modify
		1: Output with voltage 2: Output at DC braking current at stopping			
P02 Group Motor 1					
P02.00	Motor type 1	0:Asynchronous motor 1:Synchronous motor **Note: Switch the current motor by the switching channel of P08.31.**		1	◎
P02.01	Rated power of AM1	0.1~3000.0kW	Set the parameters of the controlled asynchronous motor. To guarantee the control performance, be sure to set P02.01~P02.05 correctly according to the name plate of the motor. The accuracy of parameter autotuning for Goodrive300-01 inverters depends on correct setting of motor parameters on the name plate. To guarantee the control performance, configure the motor as the standard motor. If the motor power has a great gap between the standard, the control performance of the inverter will decrease obviously. **Note: Resetting the motor rated power (P02.01) will initialize P02.02~P02.05.**	Depend on model	◎
P02.02	Rated frequency of AM1	0.01Hz~P00.03 (Max. output frequency)		50.00Hz	◎
P02.03	Rated speed of AM1	1~36000rpm		Depend on model	◎
P02.04	Rated voltage of AM1	0~1200V		Depend on model	◎
P02.05	Rated current of AM1	0.8~6000.0A		Depend on model	◎
P02.06	Stator resistor of AM1	0.001~65.535Ω	After motor parameter autotuning, the settings of P02.06~P02.10 update automatically. As basic parameters for high performance vector control, the parameters have a direct	Depend on model	○
P02.07	Rotor resistor of AM1	0.001~65.535Ω		Depend on model	○
P02.08	Leakage inductance of AM1	0.1~6553.5mH		Depend on model	○

Function code	Name	Detailed instruction of parameters		Default value	Modify
P02.09	Mutual inductance of AM1	0.1~6553.5mH	impact on the control performance.	Depend on model	○
P02.10	Non-load current of AM1	0.1~6553.5A	**Note: Users should not change the parameters of the group.**	Depend on model	○
P02.11	Magnetic saturation coefficient 1 of AM1 iron core	0.0~100.0%		80.0%	◎
P02.12	Magnetic saturation coefficient 2 of AM1 iron core	0.0~100.0%		68.0%	◎
P02.13	Magnetic saturation coefficient 3 of AM1iron core	0.0~100.0%		57.0%	◎
P02.14	Magnetic saturation coefficient 4 of AM1 iron core	0.0~100.0%		40.0%	◎
P02.15	Rated power of SM1	0.1~3000.0kW	Set the parameters of the controlled synchronous motor. To guarantee the control performance, be sure to set P02.15~P02.19 correctly according to motor nameplate. The accuracy of parameter autotuning for Goodrive300-01 inverters depends on correct setting of	Depend on model	◎
P02.16	Rated frequency of SM1	0.01Hz~P00.03 (Max. output frequency)		50.00Hz	◎
P02.17	Number of poles pairs for SM1	1~50		2	◎
P02.18	Rated voltage of SM1	0~1200V		Depend on model	◎

Function code	Name	Detailed instruction of parameters		Default value	Modify
P02.19	Rated current of SM1	0.8~6000.0A	motor parameters on the name plate. To guarantee the control performance, configure the motor as the standard motor. If the motor power has a great gap between the standard, the control performance of the inverter will decrease obviously. **Note: Resetting the motor rated power (P02.15) will initialize P02.16~P02.19.**	Depend on model	◎
P02.20	Stator resistor of SM1	0.001~65.535Ω	After motor parameter autotuning, the settings of P02.20~P02.22 update automatically. As basic parameters for high performance vector control, the parameters have a direct impact on the control performance. When P00.15=1 (rotation autotuning), in no need of change, P02.23 will update via autotuning; when P00.15=2 (static autotuning), P02.23 cannot update via autotuning, so calculate the value and update it by manual.	Depend on model	○
P02.21	Direct axis inductance of SM1	0.01~655.35mH		Depend on model	○
P02.22	Quadrature axis inductance of SM1	0.01~655.35mH		Depend on model	○
P02.23	Back EMF constant of SM1	When P00.15=2, the set value of P02.23 cannot be updated by autotuning, please count according to the following method. The counter-electromotive force constant can be counted according to the parameters on the name plate of the motor. There are three ways to count: 1. If the name plate designates the EMF constant Ke, then: $E=(Ke*n_N*2\pi)/60$ 2. If the name plate		350	○

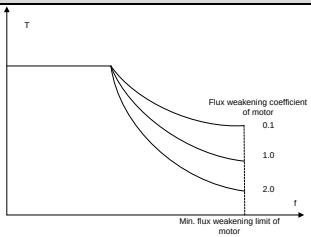
Function code	Name	Detailed instruction of parameters	Default value	Modify
		designates the EMF constant E'(V/1000r/min), then: $E=E'*n_N/1000$ 3. If the name plate does not designate the above parameters, then: $E=P/\sqrt{3}*I$ In the above formulas: n_N is the rated rotation speed, P is the rated power and I is the rated current. The setting range: 0~10000		
P02.24	Initial pole position of SM1 (reserved)	0x0000~0xFFFF	0	●
P02.25	Identification current of SM1 (reserved)	0%~50% (rated current of the motor)	10%	●
P02.26	Motor 1 overload protection	0:No protection 1: Common motor (with low speed compensation) Because the heat-releasing effect of the common motors 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: Variable frequency motor (without low speed compensation) Because the heat-releasing effect of the specific motors will not be impacted by rotation speed, there is no need to adjust the protection value during low-speed running.	2	◎
P02.27	Motor 1 overload protection coefficient	Times of motor overload M=Iout/(In*K) In is the rated current of the motor, Iout is the output current of the inverter and K is the motor overload	100.0%	○

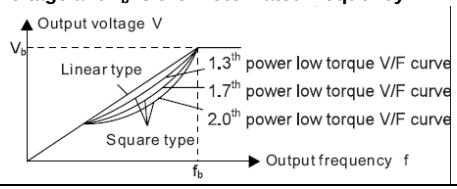
Function code	Name	Detailed instruction of parameters	Default value	Modify
		protection coefficient. So, the bigger the value of K is, the smaller the value of M is. When M=116%, the fault will be reported after 1 hour; when M=200%, the fault will be reported after 1 minute; when M>=400%, the fault will be reported instantly.  The setting range: 20.0%~120.0%		
P02.28	Correction coefficient of motor 1 power	Correct the power displaying of motor 1. Only impact the displaying value other than the control performance of the inverter. The setting range: 0.00~3.00	1.00	○
P02.29	Parameter display of motor 1	0: Display according to the motor type; in the mode, only display the related parameters of current motor type for the convenience of operation 1: Display all; in the mode, display all motor parameters	0	○
P03 Group Vector control				
P03.00	Speed loop proportional gain1	The parameters P03.00~P03.05 only apply 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. PI parameters are gained according to the linear change of two groups of parameters. It is shown as below:	20.0	○
P03.01	Speed loop integral time1		0.200s	○
P03.02	Low switching frequency		5.00Hz	○
P03.03	Speed loop proportional gain 2		20.0	○
P03.04	Speed loop integral time 2		0.200s	○
P03.05	High switching frequency		10.00Hz	○

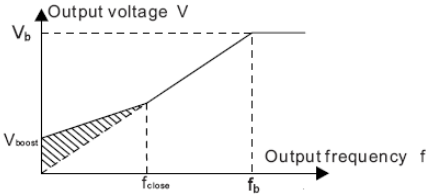
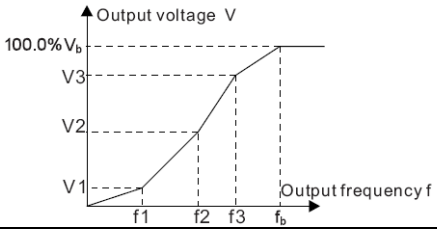
Function code	Name	Detailed instruction of parameters	Default value	Modify
		 Setting the proportional coefficient and integral time of the adjustor can change the dynamic response performance of vector control speed loop. Increasing the proportional gain and decreasing the integral time can speed up the dynamic response of the speed loop. But too high proportional gain and too low integral time may cause system vibration and overshoot. Too low proportional gain may cause system vibration and speed static deviation. PI has a close relationship with the inertia of the system. Adjust on the base of PI according to different loads to meet various demands. The setting range of P03.00: 0~200.0 The setting range of P03.01: 0.000~10.000s The setting range of P03.02: 0.00Hz~P03.05 The setting range of P03.03: 0~200.0 The setting range of P03.04: 0.000~10.000s The setting range of P03.05: P03.02~P00.03 (Max. output frequency)		
P03.06	Speed loop output filter	0~8 (corresponds to 0~2^8/10ms)	0	○
P03.07	Compensation coefficient of electromotion slip in vector control	Slip compensation coefficient is used to adjust the slip frequency of vector control and improve the speed control accuracy of the system. Adjusting the parameter properly can control the speed offset. The setting range: 50~200%	100%	○
P03.08	Compensation coefficient of braking slip in vector control		100%	○
P03.09	Current loop percentage	**Note:** **1 The two parameters adjust the PI adjustment**	2000	○

<table>
<tr><th>Function code</th><th>Name</th><th>Detailed instruction of parameters</th><th>Default value</th><th>Modify</th></tr>
<tr><td></td><td>coefficient P</td><td>parameter of the current loop which affects the dynamic response speed and control accuracy directly. Generally, users do not need to change the default value.
2 Only apply to sensorless vector control mode 0 (P00.00=0).</td><td></td><td></td></tr>
<tr><td>P03.10</td><td>Current loop integral coefficient 1</td><td>The setting range: 0~65535
<table><tr><th>P03.09 value (reference only)</th><th>P03.10 value (reference only)</th><th>Motor power</th></tr><tr><td>2000</td><td>1000</td><td>7.5~22kW</td></tr><tr><td>2500</td><td>1500</td><td>30~37kW</td></tr><tr><td>3000</td><td>1500</td><td>45~90kW</td></tr><tr><td>3500</td><td>2000</td><td>110~132kW</td></tr><tr><td>4000</td><td>2000</td><td>160~200 kW</td></tr></table></td><td>1000</td><td>○</td></tr>
<tr><td>P03.11</td><td>Torque setting</td><td>This parameter is used to enable the torque control mode and set the torque.
0:Torque control is invalid
1:Keypad (P03.12)
2: AI1
3: AI2
4: AI3
5:Pulse frequency HDI
6:Multi-step
7:MODBUS communication
8:Reserved
9:Reserved
10:Reserved
Note: Setting modes 2~10, 100% corresponds to three times of motor rated current.</td><td>0</td><td>○</td></tr>
<tr><td>P03.12</td><td>Keypad setting torque</td><td>The setting range: -300.0%~300.0% (motor rated current)</td><td>50.0%</td><td>○</td></tr>
<tr><td>P03.13</td><td>Torque reference filter time</td><td>0.000~10.000s</td><td>0. 010s</td><td>○</td></tr>
<tr><td>P03.14</td><td>Upper frequency source of FWD rotation in torque control</td><td>0:Keypad (P03.16 sets P03.14, P03.17 sets P03.15)
1: AI1
2: AI2
3: AI3
4:Pulse frequency HDI
5:Multi-step</td><td>0</td><td>○</td></tr>
<tr><td>P03.15</td><td>Upper frequency</td><td></td><td>0</td><td>○</td></tr>
</table>

Function code	Name	Detailed instruction of parameters	Default value	Modify
	source of REV rotation in torque control	6:MODBUS communication 7: Reserved 8: Reserved 9: Reserved **Note: Setting mode 1~9, 100% corresponds to the maximum frequency.**		
P03.16	Keypad setting for upper frequency of FWD rotation in torque control	This function is used to set the upper limit of the frequency. P03.16 sets the value of P03.14; P03.17 sets the value of P03.15. The setting range: 0.00 Hz~P00.03 (Max. output frequency)	50.00 Hz	○
P03.17	Keypad setting for upper frequency of REV rotation in torque control		50.00 Hz	○
P03.18	Upper electromotion torque source	This function code is used to select the electromotion and braking torque upper-limit source. 0: Keypad (P03.20 sets P03.18, P03.21 sets P03.19)	0	○
P03.19	Upper braking torque source	1: AI1 2: AI2 3: AI3 4: Pulse frequency HDI 5:MODBUS communication 6: Reserved 7: Reserved 8: Reserved **Note: Setting mode 1~9, 100% corresponds to three times of the motor current.**	0	○
P03.20	Keypad setting of electromotion torque	The function code is used to set the limit of the torque. The setting range: 0.0~300.0% (motor rated current)	180.0%	○
P03.21	Keypad setting of braking torque		180.0%	○
P03.22	Weakening coefficient in constant power zone	The usage of motor in weakening control	0.3	○
P03.23	Lowest weakening point		20%	○

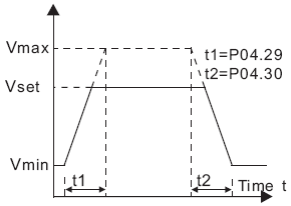
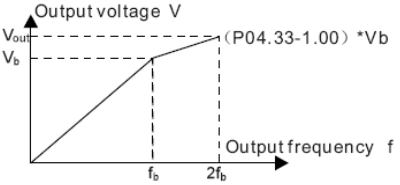
Function code	Name	Detailed instruction of parameters	Default value	Modify
	in constant power zone	 Function code P03.22 and P03.23 are effective at constant power. The motor will enter into the weakening state when the motor runs at rated speed. Change the weakening curve by modifying the weakening control coefficient. The bigger the weakening control coefficient is, the steeper the weak curve is. P03.22 is only valid for vector control mode 1. The setting range of P03.22: 0.1~2.0 The setting range of P03.23: 10%~100%		
P03.24	Max. voltage limit	P03.24 sets the maximum voltage of the inverter, which is dependent on the site situation. The setting range: 0.0~120.0%	100.0%	◎
P03.25	Pre-exciting time	Carry out motor pre-excitation when the inverter starts up. Build up a magnetic field inside the inverter to improve the torque performance during the starting process. The setting range: 0.000~10.000s	0.300s	○
P03.26	Flux weakening proportional gain	0~4000 **Note: P03.24~P03.26 are invalid for vector control mode 1.**	300	○
P03.27	Vector control speed display	0: Display the actual value 1: Display the setting value	0	○
P03.28	Start pull in total current	0.0~100.0%	80.0%	○
P03.29	Coefficient of inductance	0.2~4.0	1.0%	○
P04 Group SVPWM control				
P04.00	Motor 1V/F curve setting	The function codes define the V/F curve of Goodrive300- 01 series motors 1 to meet the need of different loads.	0	◎

Function code	Name	Detailed instruction of parameters	Default value	Modify
		0: Straight line V/F curve; apply to the constant torque load 1: Multi-dots V/F curve 2: Torque-stepdown V/F curve (1.3 order) 3: Torque-stepdown V/F curve (1.7 order) 4: Torque-stepdown V/F curve (2.0 order) Curves 2~4 apply to the torque loads such as fans and water pumps. Users can adjust according to the features of the loads to achieve a best energy-consuming effect. 5: Customized V/F(V/F separation); on this mode, V and F can be separated and the feature of the curve will be changed either by adjusting F through the frequency reference channel set by P00.06 or by adjusting V through the voltage reference channel set by P04.27. **Note: V_b in the below picture is the motor rated voltage and f_b is the motor rated frequency.** 		
P04.01	Torque boost of motor 1	To compensate the feature of low-frequency torque, carry out torque boost on the output voltage. P04.01 is for the maximum output voltage V_b. P04.02 defines the percentage of closing frequency of manual torque to f_b. Torque boost can improve the feature of low-frequency torque of SVPWM control. Torque boost should be selected according to the load. The bigger the load is, the bigger the boost is. Too big torque boost is inappropriate because the motor will run with over-excitation, and the current of the inverter will increase to raise the temperature of the inverter and decrease the efficiency. When the torque boost is set to 0.0%, the inverter is automatic torque boost. Torque boost threshold: under the threshold, the torque boost is valid, but over the threshold, the	0.0%	○
P04.02	Torque boost close of motor 1		20.0%	○

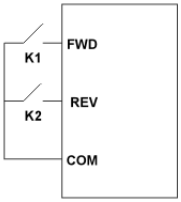
Function code	Name	Detailed instruction of parameters	Default value	Modify
		torque boost is invalid.  The setting range of P04.01: 0.0%: (automatic) 0.1%~10.0% The setting range of P04.02: 0.0%~50.0%		
P04.03	V/F frequency 1 of motor 1	When P04.00 =1, the user can set V/F curve through P04.03~P04.08. V/F is generally set according to the load of the motor. **Note:V1 < V2 < V3,f1 < f2 < f3. Too high low frequency voltage will cause overheat or even burnout of the motor and overcurrent stall or protection of the inverter.** The setting range of P04.03: 0.00Hz~P04.05 The setting range of P04.04: 0.0%~110.0% (the rated voltage of motor 1) The setting range of P04.05: P04.03~ P04.07 The setting range of P04.06: 0.0%~110.0% (the rated voltage of motor 1) The setting range of P04.07: P04.05~ P02.02 (the rated frequency of motor 1) or P04.05~ P02.16 (the rated frequency of motor 1) The setting range of P04.08: 0.0%~110.0% (the rated voltage of motor 1)  	0.00Hz	○
P04.04	V/F voltage 1 of motor 1		00.0%	○
P04.05	V/F frequency 2 of motor 1		00.00Hz	○
P04.06	V/F voltage 2 of motor 1		00.0%	○
P04.07	V/F frequency 3 of motor 1		00.00Hz	○
P04.08	V/F voltage 3 of motor 1		00.0%	○
P04.09	V/F slip	This function code is used to compensate the	100.0%	○

Function code	Name	Detailed instruction of parameters	Default value	Modify
	compensation gain of motor 1	change of the rotation speed caused by load during SVPWM control compensation to improve the rigidity of the motor. It can be set to the rated slip frequency of the motor which is counted as below: $\triangle f=f_b-n*p/60$ Of which, f_b is the rated frequency of the motor, its function code is P02.02; n is the rated rotating speed of the motor and its function code is P02.03; p is the pole pair of the motor. 100.0% corresponds to the rated slip frequency $\triangle f$. The setting range: 0.0~200.0%		
P04.10	Vibration control factor at low frequency of motor 1	In SVPWM control mode, current fluctuation may occur to the motor at some frequency, especially the motor with big power. The motor cannot run stably or overcurrent may occur. These phenomena can be canceled by adjusting this parameter. The setting range of P04.10: 0~100 The setting range of P04.11: 0~100 The setting range of P04.12: 0.00Hz~P00.03 (Max. output frequency)	10	○
P04.11	Vibration control factor at high frequency of motor 1		10	○
P04.12	Vibration control threshold of motor 1		30.00 Hz	○
P04.13	Motor 2 V/F curve setting	This group of parameters defines the V/F setting means of Goodrive300-01 motor 2 to meet various requirements of different loads. See P04.00~P04.12 for the detailed function code instruction. **Note: P04 group includes two sets of V/F parameters of the motor which cannot display simultaneously, only valid for the selected motor. Motor selection can be defined by the channel of P08.31 or the terminal function 35 "the shift between motor 1 and motor 2".**	0	◎
P04.14	Torque boost of motor 2		0.0%	○
P04.15	Torque boost close of motor 2		20.0%	○
P04.16	V/F frequency 1 of motor 2		0.00Hz	○
P04.17	V/F voltage 1 of motor 2		00.0%	○
P04.18	V/F frequency 2 of motor 2		00.00Hz	○
P04.19	V/F voltage 2 of motor 2		00.0%	○
P04.20	V/F frequency 3 of motor 2		00.00Hz	○

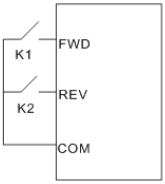
Function code	Name	Detailed instruction of parameters	Default value	Modify
P04.21	V/F voltage 3 of motor 2		00.0%	○
P04.22	V/F slip compensation gain of motor 2		100.0%	○
P04.23	Vibration control factor at low frequency of motor 2	In SVPWM control mode, current fluctuation may occur to the motor on some frequency, especially the motor with big power. The motor cannot run stably or overcurrent may occur. These phenomena can be canceled by adjusting this parameter. The setting range of P04.23: 0~100 The setting range of P04.24: 0~100 The setting range of P04.25: 0.00Hz~P00.03 (Max. output frequency)	10	○
P04.24	Vibration control factor at high frequency of motor 2		10	○
P04.25	Vibration control threshold of motor 2		30.00Hz	○
P04.26	Energy-saving operation	0:No operation 1:Automatic energy-saving operation Motors will automatically adjust the output voltage to save energy at light loads.	0	◎
P04.27	Voltage setting channel	Select the output voltage setting channel at V/F curve separation. 0: Keypad: the output voltage is determined by P04.28. 1: AI1; 2: AI2; 3: AI3; 4: HDI; 5: Multi-step speed; 6: PID; 7:MODBUS communication; 8: Reserved 9: Reserved 10: Reserved **Note: 100% corresponds to the rated voltage of the motor.**	0	○
P04.28	Keypad setting voltage	The function code is the voltage displaying when the voltage is set through keypad. The setting range: 0.0%~100.0%	100.0%	○

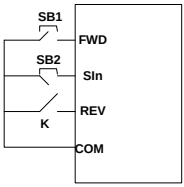
Function code	Name	Detailed instruction of parameters	Default value	Modify
P04.29	Voltage increasing time	Voltage increasing time is the time when the inverter accelerates from the output minimum voltage to the output maximum voltage. Voltage decreasing time is the time when the inverter decelerates from the output maximum voltage to the output minimum voltage. The setting range: 0.0~3600.0s	5.0s	○
P04.30	Voltage decreasing time		5.0s	○
P04.31	Maximum output voltage	Set the upper and low limit of the output voltage.  The setting range of P04.31: P04.32~100.0% (motor rated voltage) The setting range of P04.32: 0.0%~P04.31	100.0%	◎
P04.32	Minimum output voltage		0.0%	◎
P04.33	Flux weakening coefficient at constant power	The parameter is used to adjust the output voltage of inverter in SVPWM control mode at flux weakening. **Note: Invalid in constant torque mode.**  The setting range of P04.33: 1.00~1.30	1.00	○
P04.34	Reactive close-loop proportionality coefficient	0~3000	60	○
P04.35	Reactive close-loop integral coefficient	0~3000	20	○
P05 Group Input terminals				
P05.00	Reserved		0	◎
P05.01	S1 terminals function selection	0: No function 1: Forward rotation operation (FWD)	0	◎

Function code	Name	Detailed instruction of parameters	Default value	Modify
P05.02	S2 terminals function selection	2: Reverse rotation operation (REV) 3: 3-wire control operation (Sln) 4: Forward jogging 5: Reverse 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: Frequency setting clear 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 1 22: ACC/DEC time 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 disabling 30: ACC/DEC disabling 31: Counter triggering 32: Length reset 33: Cancel the frequency change setting temporarily 34: DC brake 35: Shift the motor 1 into motor 2 36: Shift the command to the keypad 37: Shift the command to the terminals 38: Shift the command to the communication 39: Pre-magnetized command 40: Power consumption clear 41: Power consumption hold 42: Air filter blockage signal	0	◎
P05.03	S3 terminals function selection		0	◎
P05.04	S4 terminals function selection		0	◎
P05.05	S5 terminals function selection		0	◎
P05.06	S6 terminals function selection		0	◎
P05.07	S7 terminals function selection		0	◎
P05.08	S8 terminals function selection		0	◎
P05.09	Reserved		0	◎

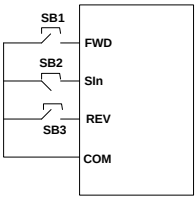
<table>
<tr><th>Function code</th><th>Name</th><th>Detailed instruction of parameters</th><th>Default value</th><th>Modify</th></tr>
<tr><td></td><td></td><td>43: Oil filter blockage signal
44: Separator blockage signal
45: Precision separator signal
46: External fault 1
47: External fault 2
48~63: Reserved</td><td></td><td></td></tr>
<tr><td>P05.10</td><td>Polarity selection</td><td>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.
<table>
<tr><td></td><td>BIT8</td><td>BIT7</td><td>BIT6</td><td>BIT5</td></tr>
<tr><td></td><td>HDI</td><td>S8</td><td>S7</td><td>S6</td></tr>
<tr><td>BIT4</td><td>BIT3</td><td>BIT2</td><td>BIT1</td><td>BIT0</td></tr>
<tr><td>S5</td><td>S4</td><td>S3</td><td>S2</td><td>S1</td></tr>
</table>
The setting range: 0x000~0x1FF</td><td>0x000</td><td>○</td></tr>
<tr><td>P05.11</td><td>ON-OFF filter time</td><td>Set the sample filter time of S1~S8 and HDI terminals. If the interference is strong, increase the parameter to avoid the misoperation.
0.000~1.000s</td><td>0.300s</td><td>○</td></tr>
<tr><td>P05.12</td><td>Virtual terminals setting</td><td>Enable the input function of virtual terminals at the communication mode.
0: Virtual terminals are invalid
1: MODBUS communication virtual terminals are valid
2: Reserved
3: Reserved
4: Reserved</td><td>0</td><td>◎</td></tr>
<tr><td>P05.13</td><td>Terminals control running mode</td><td>Set the operation mode of the terminals control
0:2-wire control 1, comply the enable with the direction. This mode is widely used. It determines the rotation direction by the defined FWD and REV terminals command.
 

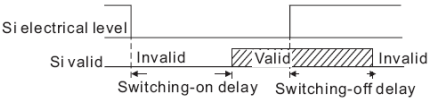
<table>
<tr><th>FWD</th><th>REV</th><th>Running command</th></tr>
<tr><td>OFF</td><td>OFF</td><td>Stop</td></tr>
<tr><td>ON</td><td>OFF</td><td>FWD running</td></tr>
<tr><td>OFF</td><td>ON</td><td>REV running</td></tr>
<tr><td>ON</td><td>ON</td><td>Hold</td></tr>
</table></td><td>0</td><td>◎</td></tr>
</table>

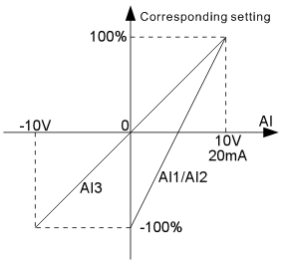
<table>
<tr><th>Function code</th><th>Name</th><th>Detailed instruction of parameters</th><th>Default value</th><th>Modify</th></tr>
<tr><td></td><td></td><td>
1:2-wire control 2; Separate the enable from the direction. FWD defined by this mode is the enabling ones. The direction depends on the state of the defined REV.


<table>
<tr><th>FWD</th><th>REV</th><th>Running command</th></tr>
<tr><td>OFF</td><td>OFF</td><td>Stop</td></tr>
<tr><td>ON</td><td>OFF</td><td>FWD running</td></tr>
<tr><td>OFF</td><td>ON</td><td>Stop</td></tr>
<tr><td>ON</td><td>ON</td><td>REV running</td></tr>
</table>
2:3-wire control 1; Sin is the enabling terminal on this mode, and the running command is caused by FWD and the direction is controlled by REV. Sin is natural closed.


The direction control is as below during operation:
<table>
<tr><th>Sin</th><th>REV</th><th>Previous direction</th><th>Current direction</th></tr>
<tr><td rowspan="2">ON</td><td rowspan="2">OFF→ON</td><td>Forward</td><td>Reverse</td></tr>
<tr><td>Reverse</td><td>Forward</td></tr>
<tr><td rowspan="2">ON</td><td rowspan="2">ON→OFF</td><td>Reverse</td><td>Forward</td></tr>
<tr><td>Forward</td><td>Reverse</td></tr>
<tr><td rowspan="2">ON→OFF</td><td>ON</td><td colspan="2" rowspan="2">Decelerate to stop</td></tr>
<tr><td>OFF</td></tr>
</table>
3:3-wire control 2; Sin is the enabling terminal on this mode, and the running command is caused by SB1 or SB3 and both of them control the running direction.NC SB2 generates the stop command.
</td><td></td><td></td></tr>
</table>

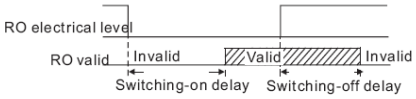
<table>
<tr><th>Function code</th><th>Name</th><th>Detailed instruction of parameters</th><th>Default value</th><th>Modify</th></tr>
<tr><td></td><td></td><td>


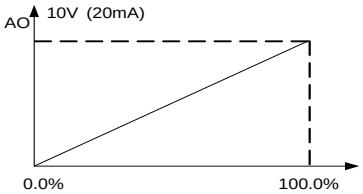
<table>
<tr><th>SIn</th><th>FWD</th><th>REV</th><th>Direction</th></tr>
<tr><td rowspan="2">ON</td><td rowspan="2">OFF→ON</td><td>ON</td><td>Forward</td></tr>
<tr><td>OFF</td><td>Reverse</td></tr>
<tr><td rowspan="2">ON</td><td>ON</td><td rowspan="2">OFF→ON</td><td>Forward</td></tr>
<tr><td>OFF</td><td>Reverse</td></tr>
<tr><td rowspan="2">ON→OFF</td><td></td><td></td><td rowspan="2">Decelerate to stop</td></tr>
<tr><td></td><td></td></tr>
</table>
Note: for the 2-wire running mode, when FWD/REV terminal is valid, the inverter stop because of the stopping command from other sources, even the control terminal FWD/REV keeps valid; the inverter won't work when the stopping command is canceled. Only when FWD/REV is relaunched, the inverter can start again. For example, the valid STOP/RST stop when PLC signal cycles stop, fixed-length stop and terminal control (see P07.04).
</td><td></td><td></td></tr>
<tr><td>P05.14</td><td>Switch-on delay of S1 terminal</td><td rowspan="8">The function code defines the corresponding delay time of electrical level of the programmable terminals from switching on to switching off.
 
The setting range: 0.000~50.000s</td><td>0.200s</td><td>○</td></tr>
<tr><td>P05.15</td><td>Switch-off delay of S1 terminal</td><td>0.200s</td><td>○</td></tr>
<tr><td>P05.16</td><td>Switch-on delay of S2 terminal</td><td>0.000s</td><td>○</td></tr>
<tr><td>P05.17</td><td>Switch-off delay of S2 terminal</td><td>0.000s</td><td>○</td></tr>
<tr><td>P05.18</td><td>Switch-on delay of S3 terminal</td><td>0.000s</td><td>○</td></tr>
<tr><td>P05.19</td><td>Switch-off delay of S3 terminal</td><td>0.000s</td><td>○</td></tr>
<tr><td>P05.20</td><td>Switch-on delay of S4 terminal</td><td>0.000s</td><td>○</td></tr>
<tr><td>P05.21</td><td>Switch-off delay of S4 terminal</td><td>0.000s</td><td>○</td></tr>
</table>

Function code	Name	Detailed instruction of parameters	Default value	Modify
P05.22	Switch-on delay of S5 terminal		0.000s	○
P05.23	Switch-off delay of S5 terminal		0.000s	○
P05.24	Switch-on delay of S6 terminal		0.000s	○
P05.25	Switch-off delay of S6 terminal		0.000s	○
P05.26	Switch-on delay of S7 terminal		0.000s	○
P05.27	Switch-off delay of S7 terminal		0.000s	○
P05.28	Switch-on delay of S8 terminal		0.000s	○
P05.29	Switch-off delay of S8 terminal		0.000s	○
P05.30	Reserved		0.000s	○
P05.31	Reserved		0.000s	○
P05. 32	Lower limit of AI1	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, the inverter will count at the minimum or maximum one. When the analog input is the current input, the corresponding voltage of 0~20mA is 0~10V. In different cases, the corresponding rated value of 100.0% is different. See the application for detailed information. The figure below illustrates different applications: 	0.00V	○
P05.33	Corresponding setting of the lower limit of AI1		0.0%	○
P05.34	Upper limit of AI1		10.00V	○
P05.35	Corresponding setting of the upper limit of AI1		100.0%	○
P05.36	AI1 input filter time		0.100s	○
P05.37	Lower limit of AI2		0.00V	○
P05.38	Corresponding setting of the lower limit of AI2		0.0%	○
P05.39	Upper limit of AI2		10.00V	○
P05.40	Corresponding setting of the upper limit of AI2		100.0%	○

Function code	Name	Detailed instruction of parameters	Default value	Modify
P05.41	AI2 input filter time	Input filter time: The parameter is used to adjust the sensitivity of the analog input. Increasing the value properly can enhance the anti-interference of the analog, but weaken the sensitivity of the analog input. **Note: Analog AI1 and AI2 can support 0~10V/0~20mA input, when AI1 and AI2 selects 0~20mA input, the corresponding voltage of 20mA is 10V. AI3 can support the output of -10V~+10V.** The setting range of P05.32: 0.00V~P05.34 The setting range of P05.33: -100.0%~100.0% The setting range of P05.34: P05.32~10.00V The setting range of P05.35: -100.0%~100.0% The setting range of P05.36: 0.000s~10.000s The setting range of P05.37: 0.00V~P05.39 The setting range of P05.38: -100.0%~100.0% The setting range of P05.39: P05.37~10.00V The setting range of P05.40: -100.0%~100.0% The setting range of P05.41: 0.000s~10.000s The setting range of P05.42: -10.00V~P05.44 The setting range of P05.43: -100.0%~100.0% The setting range of P05.44: P05.42~P05.46 The setting range of P05.45: -100.0%~100.0% The setting range of P05.46: P05.44~10.00V The setting range of P05.47: -100.0%~100.0% The setting range of P05.48: 0.000s~10.000s	0.100s	○
P05.42	Lower limit of AI3		-10.00V	○
P05.43	Corresponding setting of the lower limit of AI3		-100.0%	○
P05.44	Middle value of AI3		0.00V	○
P05.45	Corresponding middle setting of AI3		0.0%	○
P05.46	Upper limit of AI3		10.00V	○
P05.47	Corresponding setting of the upper limit of AI3		100.0%	○
P05.48	AI3 input filter time		0.100s	○
P05.49, P05.50, P05.51, P05.52, P 05.53 and P05.54 are reserved.				○
P06 Group Output terminals				
P06.00	Reserved			
P06.01	Relay RO3 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	0	○
P06.02	Relay RO4 output		0	○
P06.03	Relay RO1 output		27	○
P06.04	Relay RO2 output		28	○

<table>
<tr><th>Function code</th><th>Name</th><th>Detailed instruction of parameters</th><th>Default value</th><th>Modify</th></tr>
<tr><td></td><td></td><td>8: Frequency arrival
9: Zero speed running
10: Upper limit frequency arrival
11: Lower limit frequency arrival
12: Ready for operation
13: Pre-magnetizing
14: Overload pre-alarm
15: Underload pre-alarm
16: Completion of simple PLC stage
17: Completion of simple PLC cycle
18: Setting count value arrival
19: Defined count value arrival
20: External fault valid
21: Length arrival
22: Running time arrival
23: MODBUS communication virtual terminals output
24: Reserved
25: Reserved
26: Reserved
27: Start-up and stop control of auxiliary motor (specific for air compressor)
28: Output control of magnetic valve (specific for air compressor)
29: Main motor cooling fan control (specific for air compressor)
30: System fault (specific for air compressor)</td><td></td><td></td></tr>
<tr><td>P06.05</td><td>Polarity of output terminals</td><td>The function code is used to set the polarity of the output terminal.
When the current bit is set to 0, input terminal is positive.
When the current bit is set to 1, input terminal is negative.
<table><tr><td>BIT3</td><td>BIT2</td><td>BIT1</td><td>BIT0</td></tr><tr><td>RO2</td><td>RO1</td><td>RO4</td><td>RO3</td></tr></table>The setting range: 00~0F</td><td>00</td><td>○</td></tr>
<tr><td>P06.06</td><td>RO3 switch-on delay time</td><td rowspan="2">The function code defines the corresponding delay time of the electrical level change during the programmable terminal switching on and off.</td><td>0.000s</td><td></td></tr>
<tr><td>P06.07</td><td>RO3 switch-off delay time</td><td>0.000s</td><td>○</td></tr>
</table>

Function code	Name	Detailed instruction of parameters	Default value	Modify
P06.08	RO4 switch-on delay time	 The setting range: 0.000~50.000s	0.000s	○
P06.09	RO4 switch-off delay time		0.000s	○
P06.10	RO1 switch-on delay time		0.000s	○
P06.11	RO1 switch-off delay time		0.000s	○
P06.12	RO2 switch-on delay time		0.000s	○
P06.13	RO2 switch-off delay time		0.000s	○
P06.14	AO1 output	0: Running frequency	24	○
P06.15	AO2 output	1: Set frequency	0	○
P06.16	Reserved	2: Ramp reference frequency 3: Running rotation speed 4: Output current (relative to twice the inverter rated current) 5: Output current (relative to twice the motor rated current) 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: High-speed pulse HDI input value 14: MODBUS communication set value 1 15: MODBUS communication set value 2 16~21: Reserved 22: Torque current (relative to triple the motor rated current) 23: Ramp reference frequency (with sign) 24: PID temperature output 25~30:Reserved	0	○
P06.17	Lower output limit of AO1	The above function codes define the relative relationship between the output value and analog	0.0%	○

<table>
<tr><th>Function code</th><th>Name</th><th>Detailed instruction of parameters</th><th>Default value</th><th>Modify</th></tr>
<tr><td>P06.18</td><td>Corresponding AO1 output of lower limit</td><td rowspan="15">output. When the output value exceeds the range of set maximum or minimum output, it will count according to the low-limit or upper-limit output.
When the analog output is current output, 1mA equals to 0.5V.
In different cases, the corresponding analog output of 100% of the output value is different.
 

The setting range of P06.17: -100.0%~P06.19
The setting range of P06.18: 0.00~10.00V
The setting range of P06.19: P06.17~100.0%
The setting range of P06.20: 0.00V~10.00V
The setting range of P06.21: 0.000~10.000s
The setting range of P06.22: -100.0%~P06.24
The setting range of P06.23: 0.00~10.00V
The setting range of P06.24: P06.22~100.0%
The setting range of P06.25: 0.00~10.00V
The setting range of P06.26: 0.000~10.000s
P06.27~P6.31: Reserved</td><td>0.00V</td><td>○</td></tr>
<tr><td>P06.19</td><td>Upper output limit of AO1</td><td>100.0%</td><td>○</td></tr>
<tr><td>P06.20</td><td>The corresponding AO1 output of upper limit</td><td>10.00V</td><td>○</td></tr>
<tr><td>P06.21</td><td>AO1 output filter time</td><td>0.000s</td><td>○</td></tr>
<tr><td>P06.22</td><td>Lower output limit of AO2</td><td>0.0%</td><td>○</td></tr>
<tr><td>P06.23</td><td>Corresponding AO2 output of lower limit</td><td>0.00V</td><td>○</td></tr>
<tr><td>P06.24</td><td>Upper output limit of AO2</td><td>100.0%</td><td>○</td></tr>
<tr><td>P06.25</td><td>The corresponding AO2 output of upper limit</td><td>10.00V</td><td>○</td></tr>
<tr><td>P06.26</td><td>AO2 output filter time</td><td>0.000s</td><td>○</td></tr>
<tr><td>P06.27</td><td>Reserved</td><td></td><td>●</td></tr>
<tr><td>P06.28</td><td>Reserved</td><td></td><td>●</td></tr>
<tr><td>P06.29</td><td>Reserved</td><td></td><td>●</td></tr>
<tr><td>P06.30</td><td>Reserved</td><td></td><td>●</td></tr>
<tr><td>P06.31</td><td>Reserved</td><td></td><td>●</td></tr>
<tr><td colspan="5">P07 Group Human-machine interface</td></tr>
<tr><td>P07.00</td><td>User password</td><td>0~65535
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 set user password becomes valid, if the password is incorrect, users cannot enter the</td><td>0</td><td>○</td></tr>
</table>

Function code	Name	Detailed instruction of parameters	Default value	Modify
		parameter menu. Only correct password can make the user check or modify the parameters. Please remember all user passwords. Retreat the editing state of the function codes and the password protection will become valid in a minute. If the valid password is available, press PRG/ESC to enter into the editing state of the function codes, and then "0.0.0.0.0" will be displayed. The operator cannot enter into it unless inputting the right password. **Note: Restoring to the default value can clear the password, please use it with caution.**		
P07.01	Parameter copy	The function code determines the manner of parameters copy. 0: No operation 1: Upload the local function parameter to the keypad 2: Download the keypad function parameter to local address (including the motor parameters) 3: Download the keypad function parameter to local address (excluding the motor parameter of P02 and P12 group) 4: Download the keypad function parameters to local address (only for the motor parameter of P02 and P12 group) Note: After completing the 1~4 operations, the parameter will restore to 0 automatically; the function of upload and download excludes the factory parameters of P29.	0	◎
P07.02	QUICK/JOG function selection	0: No function 1: Jogging. 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 settings. Press QUICK/JOG to	1	◎

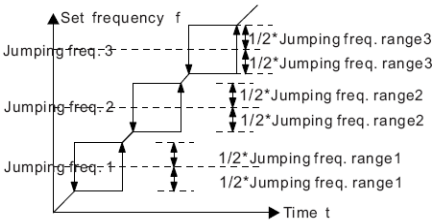
Function code	Name	Detailed instruction of parameters	Default value	Modify
		clear the set value of UP/DOWN. 5: Coast to stop. Press QUICK/JOG to coast to stop. 6: Shift the reference manner of run commands. Press QUICK/JOG to shift the reference manner. 7: Quick commissioning mode (commissioning according to the non-factory parameters) **Note: Press QUICK/JOG to shift between forward rotation and reverse rotation, the inverter does not remember the state after shifting during powering off. The inverter will run in the direction set according to P00.13 during next powering on.**		
P07.03	QUICK/JOG shifting sequence selection	When P07.02=6, set the shifting sequence of run command channels. 0: Keypad control→terminals control →communication control 1: Keypad control←→terminals control 2: Keypad control←→communication control 3: Terminals control←→communication control	0	○
P07.04	STOP/RST stop function selection	The valid selection of STOP/RST stop function, STOP/RST is valid in any state for the fault reset. 0: Only valid for the keypad control 1: Both valid for keypad and terminals control 2: Both valid for keypad and communication control 3: Valid for all control modes	0	○
P07.05	Parameters selection 1 for running state	0x0000~0xFFFF BIT0: running frequency (Hz on) BIT1: set frequency (Hz flickering) BIT2: bus voltage (Hz on) BIT3: output voltage (V on) BIT4: output current (A on) BIT5: running rotation speed (rpm on) BIT6: output power (% on) BIT7: output torque (% on) BIT8: PID reference (% flickering) BIT9: PID feedback value (% on) BIT10: input terminals state BIT11: output terminals state BIT12: torque set value (% on)	0x03FF	○

Function code	Name	Detailed instruction of parameters	Default value	Modify
		BIT13: pulse counter value BIT14: length value BIT15: PLC and the current step in multi-step speed		
P07.06	Parameters selection 2 for running state	0x0000~0xFFFF BIT0: AI1 (V on) BIT1: AI2 (V on) BIT2: AI3 (V on) BIT3: HDI frequency BIT4: motor overload percentage (% on) BIT5: the inverter overload percentage (% on) BIT6: ramp frequency reference (Hz on) BIT7: linear speed BIT8: AC inlet current (A on) BIT9~15: reserved	0x0000	○
P07.07	Parameters for stopping state	0x0000~0xFFFF BIT0: set frequency (Hz on, frequency flickering slowly) BIT1: bus voltage (V on) BIT2: input terminals state BIT3: output terminals state BIT4: PID reference (% flickering) BIT5: PID feedback value (% on) BIT6: torque set value (% on) BIT7: AI1 (V on) BIT8: AI2 (V on) BIT9: AI3 (V on) BIT10: HDI frequency BIT11: PLC and the current step in multi-step speed BIT12: pulse counter value BIT13: length value BIT14~BIT15: reserved	0x00FF	○
P07.08	Frequency coefficient	0.01~10.00 Displayed frequency=running frequency*P07.08	1.00	○
P07.09	Rotation speed coefficient	0.1~999.9% Mechanical rotation speed =120*displayed running frequency×P07.09/motor pole pairs	100.0%	○
P07.10	Linear speed coefficient	0.1~999.9% Linear speed= Mechanical rotation speed×P07.10	1.0%	○
P07.11	Rectifier bridge	-20.0~120.0°C		●

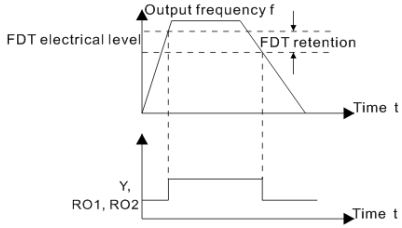
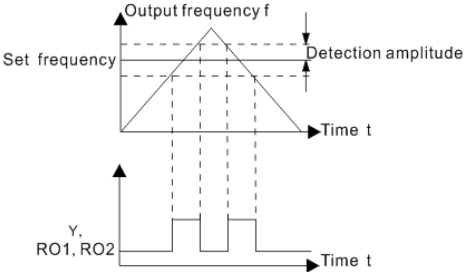
Function code	Name	Detailed instruction of parameters	Default value	Modify
	module temperature			
P07.12	Converter module temperature	-20.0~120.0°C		●
P07.13	Software version	1.00~655.35		●
P07.14	Local accumulative running time	0~65535h		●
P07.15	High bit of power consumption	Display the power used by the inverter The power consumption of the inverter =P07.15*1000+ P07.16 The setting range of P07.15: 0~65535 kWh (*1000) The setting range of P07.16: 0.0~999.9 kWh		●
P07.16	Low bit of power consumption			●
P07.17	Reserved	Reserved		●
P07.18	The rated power of the inverter	0.4~3000.0kW		●
P07.19	The rated voltage of the inverter	50~1200V		●
P07.20	The rated current of the inverter	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		●
P07.27	Current fault type	0: No fault 1: U phase protection of converter unit (OUt1) 2: V phase protection of converter unit (OUt2) 3: W phase protection of converter unit (OUt3) 4: OC1		●
P07.28	Previous fault type			●
P07.29	Previous 2 fault type			●

Function code	Name	Detailed instruction of parameters	Default value	Modify
P07.30	Previous 3 fault type	5: OC2 6: OC3		●
P07.31	Previous 4 fault type	7: OV1 8: OV2		●
P07.32	Previous 5 fault type	9: OV3 10: UV 11: Motor overload (OL1) 12: Inverter overload (OL2) 13: Input side phase loss (SPI) 14: Output side phase loss (SPO) 15: Overheat of rectifier module (OH1) 16: Overheat fault of inverter module (OH2) 17: External fault (EF) 18: 485 communication fault (CE) 19: Current detection fault (ItE) 20: Motor antotuning fault (tE) 21: EEPROM operation fault (EEP) 22: PID response offline fault (PIDE) 23: Braking unit fault (bCE) 24: Running time arrival (END) 25: Electrical overload (OL3) 26: Panel communication fault (PCE) 27: Parameter uploading fault (UPE) 28: Parameter downloading fault (DNE) 29~31: Reserved 32: Grounding short circuit fault 1 (ETH1) 33: Grounding short circuit fault 2 (ETH2) 34: Speed deviation fault (dEu) 35: Maladjustment (STo) 36: Underload fault (LL)		●
P07.33	Running frequency at current fault		0.00Hz	●
P07.34	Ramp reference frequency at current fault		0.00Hz	●
P07.35	Output voltage at current fault		0V	●
P07.36	Output current at current fault		0.0A	●
P07.37	Bus voltage at current fault		0.0V	●
P07.38	Max. temperature at current fault		0.0° C	●
P07.39	Input terminals state at current fault		0	●

Function code	Name	Detailed instruction of parameters	Default value	Modify
P07.40	Output terminals state at current fault		0	●
P07.41	Running frequency at previous fault		0.00Hz	●
P07.42	Ramp reference frequency at previous fault		0.00Hz	●
P07.43	Output voltage at previous fault		0V	●
P07.44	Output current at previous fault		0.0A	●
P07.45	Bus voltage at previous fault		0.0V	●
P07.46	Max. temperature at previous fault		0.0° C	●
P07.47	Input terminals state at previous fault		0	●
P07.48	Output terminals state at previous fault		0	●
P07.49	Running frequency at previous 2 fault		0.00Hz	●
P07.50	Ramp reference frequency at previous 2 fault		0.00Hz	●
P07.51	Output voltage at previous 2 faults		0V	●
P07.52	Output current at previous 2 faults		0.0A	●
P07.53	Bus voltage at previous 2 fault		0.0V	●
P07.54	Max. temperature at previous 2 fault		0.0° C	●
P07.55	Input terminals state at previous 2 fault		0	●
P07.56	Output terminals state at previous 2 fault		0	●
P08 Group Enhanced function				
P08.00	ACC time 2	See P00.11 and P00.12 for detailed definition. Goodrive300-01 series define four groups of ACC/DEC time which can be selected by P5 group. The first group of ACC/DEC time is the factory default one. The setting range: 0.0~3600.0s	Depend on model	○
P08.01	DEC time 2		Depend on model	○
P08.02	ACC time 3		Depend on model	○
P08.03	DEC time 3		Depend on model	○
P08.04	ACC time 4		Depend on model	○
P08.05	DEC time 4		Depend on model	○
P08.06	Jogging frequency	This parameter is used to define the reference frequency during jogging. Setting range: 0.00Hz ~P00.03 (Max. output frequency)	5.00Hz	○
P08.07	Jogging ACC time	The jogging ACC time means the time needed if the inverter runs from 0Hz to P0.03.	Depend on model	○
P08.08	Jogging DEC time	The jogging DEC time means the time needed if the	Depend	○

Function code	Name	Detailed instruction of parameters	Default value	Modify
		inverter goes from P0.03 to 0Hz. Setting range: 0.0~3600.0s	on model	
P08.09	Jumping frequency 1	When the set frequency is in the range of 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. But this function will be invalid if all jumping points are 0.  Setting range: 0.00Hz~P00.03 (Max. output frequency)	0.00Hz	○
P08.10	Jumping frequency range 1		0.00Hz	○
P08.11	Jumping frequency 2		0.00Hz	○
P08.12	Jumping frequency range 2		0.00Hz	○
P08.13	Jumping frequency 3		0.00Hz	○
P08.14	Jumping frequency range 3		0.00Hz	○
P08.15	Bus voltage pre-protection function	Bus voltage pre-protection function: 0~3 BIT0: 1: Enable 0: Close (voltage pre-protection function)	0	○
P08.16	Low-voltage protection threshold	Setting range of P08.16: 0.0V~2000.0V Setting range of P08.17: 0.0V~2000.0V Setting range of P08.18: 0.0~6000.0s Setting range of P08.19: 0.0~6000.0s Coast to stop when bus voltage＞P08.17 or ＜P08.16; Restart automatically when bus voltage is back to normal and the time defined by P08.18 has elapsed. When bus voltage＜P08.16+50V, the upper frequency limit is 1/2 of rated motor frequency. Operation will be back to normal when bus voltage is normal and the time defined by P08.19 has elapsed.	300.0V	○
P08.17	Overvoltage pre-protection threshold		750.0V	○
P08.18	Auto restart delay time		60.0s	○
P08.19	Low voltage frequency-limit running time		60.0s	○
P08.20	Reserved			
P08.21	Reserved			
P08.22	Client code	0~65535	0	○
P08.23	Maintenance	0~8000h	0	○

Function code	Name	Detailed instruction of parameters	Default value	Modify
	time-out period	Maintenance time-out function will be ineffective if it is set to “0”		
P08.24	Motor temp	Range of display: 0~120℃ PT100 on the terminal board is used for detecting motor temp value. When the value defined with P8.25 is exceeded, temp fault OH will be reported and the fault code is 37	0℃	●
P08.25	Motor overtemp protection	0~130℃	0	○
P08.26	Counting mode of maintenance time	0~1 0: Count during motor running 1: Count during motor running and sleeping	0	○
P08.27	Threshold for auto frequency reduction	Setting range: 0~130% Auto frequency reduction will be applied when output current exceeds P08.27	114%	○
P08.28	Fault reset times	Fault reset times: Set the automatic fault reset times.	0	○
P08.29	Interval time of automatic fault reset	If the reset time exceeds this set value, the inverter will stop to wait maintenance. Interval time of automatic fault reset: The interval between the time when the fault occurs and the time when the reset action occurs. Setting range of P08.28: 0~10 Setting range of P08.29: 0.1~3600.0s	1.0s	○
P08.30	Frequency decreasing ratio of the dropping control	The output frequency of the inverter changes as the load. And it is mainly used to balance the power when several inverters drive one load. Setting range: 0.00~50.00Hz	0.00Hz	○
P08.31	Motor shifting	Goodrive300-01 supports the shift between two motors. This function is used to select the shifting channel. LED ones: shifting channel 0: terminal shifting; digital terminal is 35 1: MODBUS communication shifting 2: Reserved 3: Reserved 4: Reserved LED tens: shifting enabling in operation 0: Disabled 1: Enabled	0x00	◎

Function code	Name	Detailed instruction of parameters	Default value	Modify
		0x00~0x14		
P08.32	FDT1 electrical level detection value	When the output frequency exceeds the corresponding frequency of FDT electrical level, the multi-function digital output terminals will output the signal of "frequency degree test FDT" until the output frequency decreases to a value lower than (FDT electrical level—FDT retention detection value) the corresponding frequency, the signal is invalid. Below is the waveform diagram:  Setting range of P08.32: 0.00Hz~P00.03 (Max. output frequency) Setting range of P08.33: -100.0~100.0% (FDT1 electrical level) Setting range of P08.34: 0.00Hz~P00.03 (Max. output frequency) Setting range of P08.35: -100.0~100.0% (FDT2 electrical level)	50.00Hz	○
P08.33	FDT1 retention detection value		5.0%	○
P08.34	FDT2 electrical level detection value		50.00Hz	○
P08.35	FDT2 retention detection value		5.0%	○
P08.36	Frequency arrival detection value	When the output frequency is among the positive or negative detection 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:  Setting range: 0.00Hz~P00.03 (Max. output frequency)	0.00Hz	○

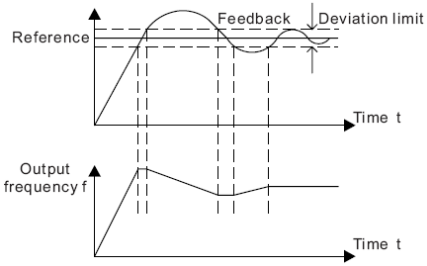
<table>
<tr><th>Function code</th><th>Name</th><th>Detailed instruction of parameters</th><th>Default value</th><th>Modify</th></tr>
<tr><td>P08.37</td><td>Energy braking enable</td><td>This parameter is used to control the internal braking pipe inside the inverter.
0: Disabled
1: Enabled
Note: Only apply to internal braking pipe.</td><td>0</td><td>○</td></tr>
<tr><td>P08.38</td><td>Threshold voltage</td><td>After setting the original bus voltage to brake the energy, adjust the voltage appropriately to brake the load. The default value changes with the voltage level.
The setting range: 200.0~2000.0V
In order to prevent customers set the value is too large, it is recommended setting range:<table><tr><td>voltage</td><td>380V</td><td>500V</td><td>660</td></tr><tr><td>range</td><td>685~750V</td><td>860~950V</td><td>1080~1180V</td></tr></table></td><td>380V voltage: 700.0V
500V voltage: 900.0V
660V voltage: 1120.0V</td><td>○</td></tr>
<tr><td>P08.39</td><td>Cooling fan running mode</td><td>0: Normal mode
1: The fan keeps running after power on</td><td>0</td><td>○</td></tr>
<tr><td>P08.40</td><td>PWM selection</td><td>0x00~0x21
LED ones: PWM mode selection
0: PWM mode 1, three-phase modulation and two-modulation
1: PWM mode 2, three-phase modulation
LED tens: low-speed carrier frequency limit mode
0: Low-speed carrier frequency limit mode 1, the carrier frequency will limit to 2k if it exceeds 2k at low speed
1: Low-speed carrier frequency limit mode 2, the carrier frequency will limit to 4k if it exceeds 4k at low speed
2: No limit</td><td>01</td><td>◎</td></tr>
<tr><td>P08.41</td><td>Overmodulation selection</td><td>LED ones
0: Invalid
1: Valid
LED tens
0: Light overmodulation; in zone 1
1: Heavy overmodulation; in zone 2</td><td>01</td><td>◎</td></tr>
<tr><td>P08.42</td><td>Keypad data control</td><td>0x000~0x1223
LED ones: frequency enable selection
0: Both ∧/∨ keys and digital potentiometer adjustments are valid</td><td>0x0000</td><td>○</td></tr>
</table>

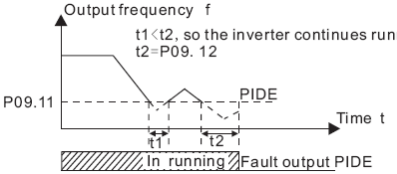
Function code	Name	Detailed instruction of parameters	Default value	Modify
		1: Only ∧/∨ keys adjustment is valid 2: Only digital potentiometer adjustment is valid 3: Neither ∧/∨ keys nor digital potentiometer adjustment is valid LED tens: frequency control selection 0: Only valid when P00.06=0 or P00.07=0 1: Valid for all frequency setting manners 2: Invalid for multi-step speed when multi-step speed has the priority LED hundreds: action selection during stopping 0: Setting is valid 1: Valid during running, cleared after stopping 2: Valid during running, cleared after receiving the stop command LED thousands: ∧/∨ keys and digital potentiometer integral function 0: The integral function is valid 1: The integral function is invalid		
P08.43	Integral ratio of the keypad potentiometer	0.01~10.00s	0.10s	○
P08.44	UP/DOWN terminals control	0x000~0x221 LED ones: frequency enable selection 0: UP/DOWN terminals setting valid 1: UP/DOWN terminals setting invalid LED tens: frequency control selection 0: Only valid when P00.06=0 or P00.07=0 1: All frequency manners are valid 2: When the multi-step has the priority, it is invalid to the multi-step speed. LED hundreds: action selection during stopping 0: Setting is valid 1: Valid during running, cleared after stopping 2: Valid during running, cleared after receiving the stop command	0x000	○
P08.45	UP terminals frequency changing ratio	0.01~50.00Hz/s	0.50 Hz/s	○
P08.46	DOWN terminals	0.01~50.00Hz/s	0.50 Hz/s	○

Function code	Name	Detailed instruction of parameters	Default value	Modify
	frequency changing ratio			
P08.47	Frequency setting at power loss	0x000~0x111 LED ones: action selection when power off in digital setting 0: Save when power off 1: Clear when power off LED tens: action selection when power off in MODBUS setting 0: Save when power off 1: Clear when power off LED hundreds: action selection when power off in other communication settings 0:Save when power off 1:Clear when power off	0x000	○
P08.48	High bit of initial power consumption	This parameter is used to set the original value of the power consumption. The original value of the power consumption = P08.48* 1000 + P08.49 Setting range of P08.48: 0~59999kWh(k) Setting range of P08.49: 0.0~999.9 kWh	0°	○
P08.49	Low bit of initial power consumption		0.0°	○
P08.50	Magnetic flux braking	This function code is used to enable magnetic flux braking. 0: Invalid 100~150: The bigger the coefficient, the stronger the braking is. This inverter is used to increase the magnetic flux to decelerate the motor. The energy generated by the motor during braking can be converted into heat energy by increasing the magnetic flux. The inverter monitors the state of the motor continuously even during the magnetic flux period. So the magnetic flux can be used for motor stop as well as to change the rotation speed of the motor. Its other advantages are: Brake immediately after the stop command. It does not need to wait the magnetic flux weakening. Provide better cooling for motors. The current of the stator other than the rotor increases during magnetic	0	○

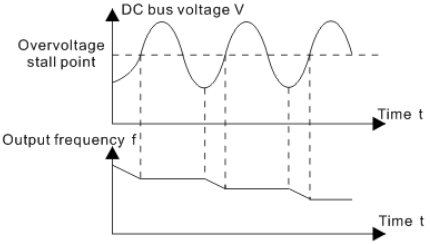
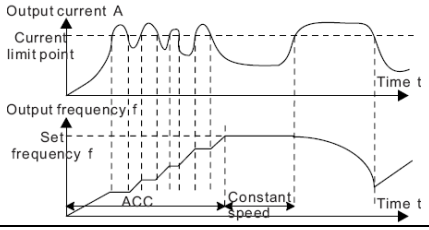
Function code	Name	Detailed instruction of parameters	Default value	Modify
		flux braking, while the cooling of the stator is more effective than the rotor.		
P08.51	Input power factor of the inverter	This function code is used to adjust the displayed current of the AC input side. Setting range: 0.00~1.00	0.56	○
P09 Group PID control				
P09.00	PID reference source	When the frequency command selection (P00.06, P00.07) is 7 or the voltage setting channel selection (P04.27) is 6, the running mode of the inverter is procedure PID control. The parameter determines the target reference channel of procedure PID. 0: Keypad (P09.01) 1: AI1 2: AI2 3: AI3 4: HDI 5: Multi-step speed 6: MODBUS communication 7: Reserved 8: Reserved 9: Reserved 10: Special pressure setting for air compressor The setting target of procedure PID is a relative one, 100% of the setting equals to 100% of the response of the controlled system. The system is calculated according to the relative value (0~100.0%). **Note: Multi-step speed reference, it is realized by setting P10 group.**	0	○
P09.01	Keypad PID preset	When P09.00=0, set the parameter whose basic value is the response value of the system. The setting range: -100.0%~100.0%	0.0%	○
P09.02	PID feedback source	Select the PID feedback channel by the parameter. 0: AI1 1: AI2 2: AI3 3: HDI 4: MODBUS communication	0	○

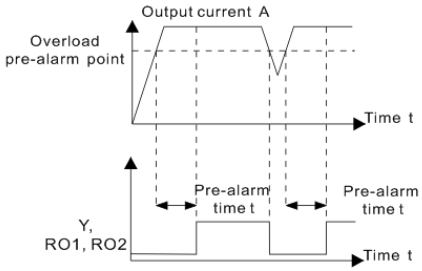
Function code	Name	Detailed instruction of parameters	Default value	Modify
		5: Reserved 6: Reserved 7: Reserved 8: Special pressure feedback for air compressor **Note: The reference and feedback channels cannot coincide; otherwise, PID cannot control effectively.**		
P09.03	PID output feature	0: PID output is positive: When the feedback signal exceeds the PID reference, the output frequency of the inverter will decrease to balance the PID. For example, the strain PID control during wrapup. 1: PID output is negative: When the feedback signal is stronger than the PID given value, the output frequency of the inverter will increase to balance the PID. For example, the strain PID control during wrapdown.	0	○
P09.04	Proportional gain (Kp)	The function is applied to the proportional gain P of PID input. P determines the strength of the whole PID adjuster. The parameter of 100 means that when the deviation of PID feedback and reference is 100%, the adjusting range of PID adjustor is the maximum frequency (ignoring integral and differential effect). The setting range: 0.00~100.00	10.00	○
P09.05	Integral time (Ti)	This parameter determines the speed of PID adjustor to carry out integral adjustment on the deviation of PID feedback and reference. When the deviation of PID feedback and reference is 100%, the integral adjustor works continuously after the time (ignoring the proportional and differential effect) to reach the maximum output frequency (P00.03) or the maximum voltage (P04.31). Shorter the integral time, stronger is the adjustment. Setting range: 0.00~10.00s	2.00s	○
P09.06	Differential time (Td)	This parameter determines the strength of the change ratio when PID adjustor carries out integral adjustment on the deviation of PID feedback and reference. If the PID feedback changes 100% during the time,	0.00s	○

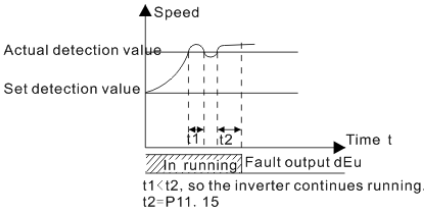
Function code	Name	Detailed instruction of parameters	Default value	Modify
		the adjustment of integral adjustor (ignoring the proportional and differential effect) is the maximum output frequency (P00.03) or the maximum voltage (P04.31). Longer the integral time, stronger the adjustment. Setting range: 0.00~10.00s		
P09.07	Sampling cycle (T)	This parameter means the sampling cycle of the feedback. The adjustor operates each sampling cycle. The longer the sampling cycle, the slower the response. Setting range: 0.001~10. 000s	0.100s	○
P09.08	PID control deviation limit	The output of PID system is the maximum deviation relative to close loop reference. As shown in the diagram below, PID adjustor stops to work during the deviation limit. Set the function properly to adjust the accuracy and stability of the system.  Setting range: 0.0~100.0%	0.0%	○
P09.09	Output upper limit of PID	This parameter is used to set the upper and lower limit of the PID adjustor output. 100.0% corresponds to the maximum output frequency (P00.03) or the maximum voltage (P04.31). Setting range of P09.09: P09.10~100.0% Setting range of P09.10: -100.0%~P09.09	100.0%	○
P09.10	Output lower limit of PID		0.0%	○
P09.11	Detection value of feedback offline	Set the detection value of feedback offline. When the feedback detection value is smaller than or equals to the detected value and the lasting time exceeds the set value in P09.12, the inverter will report “PID feedback offline fault” and the keypad will display PIDE.	0.0%	○
P09.12	Detection time of feedback offline		1.0s	○

Function code	Name	Detailed instruction of parameters	Default value	Modify
		 Setting range of P09.11: 0.0~100.0% Setting range of P09.12: 0.0~3600.0s		
P09.13	PID adjustment	0x00~0x11 LED ones: 0: Keep on integral adjustment when the frequency reaches the upper and low limit; the integration shows the change between the reference and feedback unless it reaches the internal integral limit. When the trend between the reference and feedback changes, it needs more time to offset the impact of continuous working and the integration will change with the trend. 1: Stop integral adjustment when the frequency reaches the upper and low limit. If the integration keeps stable and the trend between the reference and feedback changes, the integration will change with the trend quickly. LED tens: 0: The same with the setting direction; if the output of PID adjustment is different from the current running direction, the internal will output 0 forcedly. 1: Opposite to the setting direction; if the output of PID adjustment is different from the current running direction, conduct the output of close loop adjustment which is opposite to the current running direction.	0x01	○
P09.14	Differential filter times	0~60 Pressure PID modification coefficient which is used to reduce pressure overshoot quantity.	2	○
P09.15	PID coefficient	0~6000	600	○
P11 Group Protective parameters				
P11.00	Phase loss protection	0x00~0x11 LED ones:	0x110	○

<table>
<tr><th>Function code</th><th>Name</th><th>Detailed instruction of parameters</th><th>Default value</th><th>Modify</th></tr>
<tr><td></td><td></td><td>0: Input phase loss protection disabled
1: Input phase loss protection enabled
LED tens:
0: Output phase loss protection disabled
1: Output phase loss protection enabled
LED hundreds:
0: Input phase loss hardware protection disabled
1: Input phase loss hardware protection enabled</td><td></td><td></td></tr>
<tr><td>P11.01</td><td>Frequency decreasing at sudden power loss</td><td>0: Disabled
1: Enabled</td><td>0</td><td>○</td></tr>
<tr><td>P11.02</td><td>Frequency decreasing ratio at sudden power loss</td><td>Setting range: 0.00Hz/s~P00.03 (Max. output frequency)
After the power loss of the grid, the bus voltage drops to the sudden frequency decreasing point and the inverter begins to decrease the running frequency at P11.02 to make the inverter generate power again. The returning power can maintain the bus voltage to ensure a rated running of the inverter until the recovery of power.
<table>
<tr><td>Voltage degree</td><td>220V</td><td>380V</td><td>660V</td></tr>
<tr><td>Frequency decreasing threshold</td><td>260V</td><td>460V</td><td>800V</td></tr>
</table>
Note:
1. Adjust the parameter properly to avoid the stopping caused by inverter protection during the switching of the grid.
2. Disable input phase loss protection to enable this function.</td><td>10.00 Hz/s</td><td>○</td></tr>
<tr><td>P11.03</td><td>Overvoltage stall protection</td><td>0:Disabled
1:Enabled</td><td>1</td><td>○</td></tr>
</table>

Function code	Name	Detailed instruction of parameters	Default value	Modify
				
P11.04	Voltage protection of overvoltage stall	120~150% (standard bus voltage) (220V)	120%	○
		120~150% (standard bus voltage) (380V)	130%	
		120~150% (standard bus voltage) (660V)	120%	
P11.05	Current limit action selection	The actual increasing ratio of motor speed is lower than that of output frequency because of the big load during ACC running. It is necessary to take measures to avoid overcurrent fault and the inverter trips. Ones: current limit action selection 0: Invalid 1: Valid Tens: overload alarm of hardware current limit 0: Valid 1: Invalid	01	◎
P11.06	Automatic current limit	During the running of the inverter, it 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 in ACC running, or the inverter will derate to run during the constant running. If it exceeds the level continuously, the output frequency will keep on decreasing to the lower limit. If the output current is detected to be lower than the limit level, the inverter will accelerate to run.	160.0%	◎
P11.07	Frequency decreasing ratio during current limit		10.00 Hz/s	◎

Function code	Name	Detailed instruction of parameters	Default value	Modify
		Setting range of P11.06: 50.0~200.0% Setting range of P11.07: 0.00~50.00Hz/s		
P11.08	Overload pre-alarm of motor/inverter	The output current of the inverter or the motor is above P11.09 and the lasting time is beyond P11.10, overload pre-alarm will be output.	0x000	○
P11.09	Overload pre-alarm detection level		150%	○
P11.10	Overload pre-alarm detection time	Setting range of P11.08: Enable and define the overload pre-alarm of the inverter or the motor. Setting range: 0x000~0x131 LED ones: 0: Overload pre-alarm of the motor, relative to the rated current of the motor 1: Overload pre-alarm of the inverter, relative to the rated current of the inverter LED tens: 0: The inverter continues to work after overload and underload pre-alarm 1: The inverter continues to work after underload pre-alarm and it stops running after overload fault 2: The inverter continues to work after overload pre-alarm and it stops running after underload fault 3: The inverter stops running after overload and underload pre-alarm LED hundreds : 0: Detection all the time 1: Detection in constant running Setting range of P11.09: P11.11~200% Setting range of P11.10: 0.1~3600.0s	1.0s	○
P11.11	Underload pre-alarm	If the inverter or motor output current is lower than P11.11, and its lasting time is beyond P11.12, the	50%	○

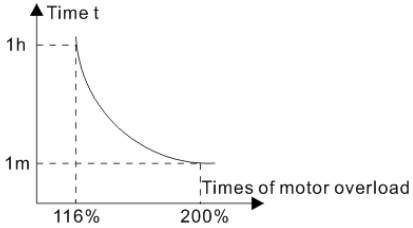
Function code	Name	Detailed instruction of parameters	Default value	Modify
	detection level	inverter will output underload pre-alarm.		
P11.12	Underload pre-alarm detection time	Setting range of P11.11: 0~P11.09 Setting range of P11.12: 0.1~3600.0s	1.0s	○
P11.13	Output terminal action during fault	Select the action of fault output terminals during undervoltage and automatic reset. 0x00~0x11 LED ones: 0: Action during undervoltage 1: No action during undervoltage LED tens: 0: Action during the automatic reset 1: No action during the automatic reset	0x00	○
P11.14	Speed deviation detection	0.0~50.0% Set the speed deviation detection.	10.0%	○
P11.15	Speed deviation detection time	Set the speed deviation detection time.  Setting range of P11.15: 0.0~10.0s	0.0s	○
P11.16	Automatic frequency decreasing at voltage drop	0: Invalid 1: Valid; when the grid voltage drops to the rated voltage, the inverter will decrease the frequency automatically to ensure the rated output torque.	1	○
P12 Group Motor 2				
P12.00	Motor type 2	0:Asynchronous motor 1:Synchronous motor **Note: Switch the current motor by the switching channel of P08.31.**	0	◎
P12.01	Rated power of AM2	0.1~3000.0kW	Depend on model	◎
P12.02	Rated frequency of AM2	0.01Hz~P00.03 (Max. output frequency)	50.00Hz	◎
P12.03	Rated speed of	1~36000rpm	Depend	◎

Set the parameters of the controlled asynchronous motor.
To guarantee the control performance, be sure to set

Function code	Name	Detailed instruction of parameters		Default value	Modify
	AM2		P12.01~P12.05 correctly according to the name plate of the motor.	on model	
P12.04	Rated voltage of AM2	0~1200V		Depend on model	◎
P12.05	Rated current of AM2	0.8~6000.0A	The accuracy of parameter autotuning for Goodrive300-01 inverters depends on correct setting of motor parameters on the name plate. To guarantee the control performance, configure the motor as the standard motor. If the motor power has a great gap between the standard, the control performance of the inverter will decrease obviously. **Note: Resetting the motor rated power (P12.01) will initialize P12.02~P12.05.**	Depend on model	◎
P12.06	Stator resistor of AM2	0.001~65.535Ω	After motor parameter autotuning, the settings of P12.06~P12.10 update automatically. As basic parameters for high performance vector control, the parameters have a direct impact on the control performance. **Note: Users should not change the parameters of the group.**	Depend on model	○
P12.07	Rotor resistor of AM2	0.001~65.535Ω		Depend on model	○
P12.08	Leakage inductance of AM2	0.1~6553.5mH		Depend on model	○
P12.09	Mutual inductance of AM2	0.1~6553.5mH		Depend on model	○
P12.10	Non-load current of AM2	0.1~6553.5A		Depend on model	○
P12.11	Magnetic saturation coefficient 1 of AM2 iron core	0.0~100.0%		80.0%	◎
P12.12	Magnetic saturation coefficient 2 of	0.0~100.0%		68.0%	◎

Function code	Name	Detailed instruction of parameters		Default value	Modify
	AM2 iron core				
P12.13	Magnetic saturation coefficient 3 of AM2 iron core	0.0~100.0%		57.0%	◎
P12.14	Magnetic saturation coefficient 4 of AM2 iron core	0.0~100.0%		40.0%	◎
P12.15	Rated power of SM2	0.1~3000.0kW	Set the parameters of the controlled synchronous motor. To guarantee the control performance, be sure to set P12.15~P12.19 correctly according to the name plate of the motor. The accuracy of parameter autotuning for Goodrive300-01 inverters depends on correct setting of motor parameters on the name plate. To guarantee the control performance, configure the motor as the standard motor. If the motor power has a great gap between the standard, the control performance of the inverter will decrease obviously. **Note: Resetting the motor rated power (P12.15) will initialize P12.16~P12.19.**	Depend on model	◎
P12.16	Rated frequency of SM2	0.01Hz~P00.03 (Max. output frequency)		50.00Hz	◎
P12.17	Number of poles pairs for SM2	1~50		2	◎
P12.18	Rated voltage of SM2	0~1200V		Depend on model	◎
P12.19	Rated current of SM2	0.8~6000.0A		Depend on model	◎
P12.20	Stator resistor of SM2	0.001~65.535Ω	After motor parameter autotuning, the settings of P12.20~P12.22 update automatically. As basic parameters for high	Depend on model	○
P12.21	Direct axis inductance of SM2	0.01~655.35mH		Depend on model	○

Function code	Name	Detailed instruction of parameters		Default value	Modify
P12.22	Quadrature axis inductance of SM2	0.01~655.35mH	performance vector control, the parameters have a direct impact on the control performance. When P00.15=1 (rotation autotuning), in no need of change, P12.23 will update via autotuning; when P00.15=2 (static autotuning), P12.23 cannot update via autotuning, so calculate the value and update it by manual.	Depend on model	○
P12.23	Back EMF constant of SM2	When P00.15=2, the set value of P12.23 cannot be updated by autotuning, please count according to the following method. The counter-electromotive force constant can be counted according to the parameters on the name plate of the motor. There are three ways to count: 1. If the name plate designates the EMF constant Ke, then: $E=(Ke*n_N*2\pi)/60$ 2. If the name plate designates the EMF constant E'(V/1000r/min), then: $E=E'*n_N/1000$ 3. If the name plate does not designate the above parameters, then: $E=P/\sqrt{3}*I$ In the above formulas: n_N is the rated rotation speed, P is the rated power and I is the rated current. The setting range: 0~10000		300	○
P12.24	Initial pole position of SM2	0~FFFFH (reserved)		0x0000	●
P12.25	Identification	0%~50% (rated current of the motor) (reserved)		10%	●

Function code	Name	Detailed instruction of parameters	Default value	Modify
	current of SM2			
P12.26	Motor 2 overload protection	0:No protection 1: Common motor (with low speed compensation) 2: Variable frequency motor (without low speed compensation)	2	◎
P12.27	Motor 2 overload protection coefficient	Times of motor overload M=Iout/(In*K) In is the rated current of the motor, Iout is the output current of the inverter and K is the motor overload protection coefficient. So, the smaller the value of K is, the bigger the value of M is. When M=116%, the fault will be reported after 1 hour; when M=200%, the fault will be reported after 1 minute; when M>=400%, the fault will be reported instantly.  The setting range: 20.0%~120.0%	100.0%	○
P12.28	Correction coefficient of motor 2 power	Correct the power displaying of motor 2. Only impact the displaying value other than the control performance of the inverter. The setting range: 0.00~3.00	1.00	○
P12.29	Parameter display of motor 2	0: Display according to the motor type; in the mode, only display the related parameters of current motor type for the convenience of operation 1: Display all; in the mode, display all motor parameters	0	○
P13 Group Synchronous motor control				
P13.00	Reduction coefficient of source current	0.0~100.0%	80.0%	○
P13.01	Original pole test mode	0: No test 1: High-frequency superposition (reserved) 2: Pulse superposition	0	◎

Function code	Name	Detailed instruction of parameters	Default value	Modify
P13.02	Source current 1	Source current is the positioning current of the magnetic pole position. Source current 1 is valid under the frequency point of current shifting. Increasing the value can raise the starting torque. Setting range: 0.0%~100.0% (rated current of the motor)	20.0%	○
P13.03	Source current 2	Source current is directional current of the magnetic pole position. Source current 2 is valid under the frequency point of current shifting. There is no need to modify the value generally. Setting range: 0.0%~100.0% (rated current of the motor)	10.0%	○
P13.04	Shift frequency of source current	Valid frequency shifting point between source current 1 and current 2. Setting range: 0.00Hz~P00.03 (Max. output frequency)	30.00 Hz	○
P13.05	Superposition frequency (reserved)	200~1000Hz	500Hz	◎
P13.06	Pulse superposition voltage	0.0~300.0% (rated voltage of the motor)	40.0%	◎
P13.07	Reserved	0~65535	0	○
P13.08	Control parameter 1	0~65535	0	○
P13.09	Control parameter 2	0~655.35	2.00	○
P13.10	Reserved	0~65535	0	○
P13.11	Maladjustment detection time	Adjust the response of anti-maladjustment. Bigger load inertia may increase the value, but the response will be slower. Setting range: 0.0~10.0s	0.5s	○
P13.12	High frequency compensation coefficient	When the motor speed is faster than the rated speed, the parameter is valid, if vibration occurs to the motor, please adjust the parameter. Setting range: 0~100.0%	60.0%	○
P13.13	Braking current of short-circuit	When P01.00=0 during the starting of the inverter, set P13.14 to a non-zero value to enter the short	0.0%	○

Function code	Name	Detailed instruction of parameters	Default value	Modify
P13.14	Braking retention time before starting	circuit braking. When the running frequency is lower than P01.09 during the stopping of the inverter, set 13.15 to a non-zero value to enter into stopping short circuited braking and then carry out the DC braking at the time set by P01.12 (refer to the instruction of P01.09~P01.12) . Setting range of P13.13: 0.0~150.0% (inverter) Setting range of P13.14: 0.00~50.00s Setting range of P13.15: 0.00~50.00s	0.00s	○
P13.15	The braking retention time when stopping		0.00s	○
P14 Group Serial communication				
P14.00	Local communication address	The setting range: 1~247 When the master is writing the frame, the communication address of the slave is set to 0; the address is the communication address. All slaves on the MODBUS bus can receive the frame, but the salve does not respond. The communication of the drive is unique in the communication net. This is the fundamental for the point to point communication between the upper computer and the inverter. **Note: The address of the slave cannot set to 0.**	2	○
P14.01	Communication baud ratio	Set the digital transmission speed between the upper computer and the inverter. 0: 1200BPS 1: 2400BPS 2: 4800BPS 3: 9600BPS 4: 19200BPS 5: 38400BPS 6: 57600BPS 7: 115200BPS **Note: The baud rate between the upper computer and the inverter must be the same. Otherwise, the communication is not applied. The bigger the baud rate, the quicker the communication speed.**	4	○
P14.02	Digital bit checkout	The data format between the upper computer and the inverter must be the same. Otherwise, the communication is not applied.	1	○

Function code	Name	Detailed instruction of parameters	Default value	Modify
		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		
P14.03	Answer delay	0~200ms The interval time when the inverter receives the data and sends it to the upper computer. If the answer delay is shorter than the system processing time, then the answer delay time is the system processing time; if the answer delay is longer than the system processing time, then after the system deals with the data, the inverter will not send the data to the upper computer until reaching the answer delay time.	5	○
P14.04	Fault time of communication overtime	0.0 (invalid), 0.1~60.0s When the function code is set as 0.0, the communication overtime parameter is invalid. When the function code is set as non-zero, if the interval time between two communications exceeds the communication overtime, the system will report “485 communication fault” (CE). Generally, set it as invalid; set the parameter in the continuous communication to monitor the communication state.	0.0s	○
P14.05	Transmission fault processing	0: Alarm and coast to stop 1: No alarm and continue to run 2: No alarm and stop according to the stop mode (only under the communication control) 3: No alarm and stop according to the stop mode (under all control modes)	0	○
P14.06	Communication processing	0x00~0x11 LED ones: 0: Write with response: the inverter will respond to all read and write commands of the upper computer. 1: Write without response: the inverter only responds to the read command other than the write command. The communication efficiency can be increased by this method.	0x00	○

Function code	Name	Detailed instruction of parameters	Default value	Modify
		LED tens: 0: Communication encrypting invalid 1: Communication encrypting valid		
P17 Group Monitoring function				
P17.00	Set frequency	Display current set frequency of the inverter Range: 0.00Hz~P00.03	0.00Hz	●
P17.01	Output frequency	Display current output frequency of the inverter Range: 0.00Hz~P00.03	0.00Hz	●
P17.02	Ramp reference frequency	Display current ramp reference frequency of the inverter Range: 0.00Hz~P00.03	0.00Hz	●
P17.03	Output voltage	Display current output voltage of the inverter Range: 0~1200V	0V	●
P17.04	Output current	Display current output current of the inverter Range: 0.0~3000.0A	0.0A	●
P17.05	Motor speed	Display the rotation speed of the motor Range: 0~65535RPM	0RPM	●
P17.06	Torque current	Display current torque current of the inverter Range: 0.0~3000.0A	0.0A	●
P17.07	Exciting current	Display current exciting current of the inverter Range: 0.0~3000.0A	0.0A	●
P17.08	Motor power	Display current power of the motor. 100.0% corresponds to the rated power of the motor. The positive value is in electromotion state while the negative value is in power generating state. Setting range: -300.0%~300.0% (motor rated power)	0.0%	●
P17.09	Output torque	Display the current output torque of the inverter. 100.0% corresponds to the rated torque of the motor. During FWD rotation, the positive value is in electromotion state while the negative value is in power generating state. During REV rotation, the states are on the contrary. Range: -250.0~250.0%	0.0%	●
P17.10	Evaluated motor frequency	Evaluate the motor rotor frequency on open loop vector Range: 0.00~ P00.03	0.00Hz	●
P17.11	DC bus voltage	Display current DC bus voltage of the inverter Range: 0.0~2000.0V	0V	●

Function code	Name	Detailed instruction of parameters	Default value	Modify
P17.12	Digital input terminals state	Display current switch input terminals state of the inverter Range: 0000~00FF	0	●
P17.13	Digital output terminals state	Display current switch output terminals state of the inverter Range:0000~000F	0	●
P17.14	Digital adjustment	Display the adjustment through the keypad of the inverter. Range: 0.00Hz~P00.03	0.00V	●
P17.15	Torque reference	Display the torque reference, the percentage to the current rated torque of the motor. Setting range: -300.0%~300.0% (motor rated current)	0.0%	●
P17.16	Linear speed	Display the current linear speed of the inverter Range: 0~65535	0	●
P17.17	Length	Display the current length of the inverter Range: 0~65535	0	●
P17.18	Counting value	Display the current counting value of the inverter Range: 0~65535	0	●
P17.19	AI1 input voltage	Display analog AI1 input signal Range: 0.00~10.00V	0.00V	●
P17.20	AI2 input voltage	Display analog AI2 input signal Range: 0.00~10.00V	0.00V	●
P17.21	AI3 input voltage	Display analog AI3 input signal Range: -10.00~10.00V	0.00V	●
P17.22	PT detection voltage	Display PT100 input signal Range: 0.00~10.00V	0.00V	●
P17.23	PID reference	Display PID reference value Range: -100.0~100.0%	0.0%	●
P17.24	PID feedback	Display PID feedback value Range: -100.0~100.0%	0.0%	●
P17.25	Power factor of the motor	Display the current power factor of the motor Range: -1.00~1.00	0.0	●
P17.26	Current running time	Display the current running time of the inverter Range: 0~65535min	0m	●
P17.27	Simple PLC and current step of multi-step speed	Display simple PLC and current step of multi-step speed Range: 0~15	0	●

Function code	Name	Detailed instruction of parameters	Default value	Modify
P17.28	ASR controller output	The percentage of the rated torque of the relative motor, display ASR controller output Range: -300.0%~300.0% (motor rated current)	0.0%	●
P17.29	Magnetic pole angle of SM	Display magnetic pole angle of synchronous motor Range: 0.0~360.0	0.0	●
P17.30	Phase compensation of SM	Display phase compensation of synchronous motor Range: -180.0~180.0	0.0	●
P17.31	High-frequency superposition current of SM	Display high-frequency superposition current of synchronous motor Range: 0.0%~200.0% (motor rated current)	0.0	●
P17.32	Magnetic flux linkage	Display the magnetic flux linkage of the motor Range: 0.0~200.0%	0.0%	●
P17.33	Exciting current reference	Display the exciting current reference in the vector control mode Range: -3000.0~3000.0A	0.0A	●
P17.34	Torque current reference	Display the torque current reference in the vector control mode Range: -3000.0~3000.0A	0.0A	●
P17.35	AC current	Display the value of inlet current at AC side Range: 0.0~5000.0A	0.0A	●
P17.36	Output torque	Display the output torque. During FWD rotation, the positive value is in electromotion state while the negative value is in power generating state. During REV rotation, the states are on the contrary. Range : -3000.0Nm~3000.0Nm	0.0Nm	●
P17.37	Counting value of motor overload	0~100 (100 reports OL1 fault)	0	●
P17.38	PID output	-100.00~100.00%	0.00%	●
P17.39	Wrong download of parameters	0.00~99.99	0.00	●

3.2 Specific function parameters

Function code	Name	Detailed instruction of parameters	Default value	Modify
P18 Group Special function group for air compressor				
P18.00	Control mode	0: Invalid 1: Control mode for air compressor	0	◎

Function code	Name	Detailed instruction of parameters	Default value	Modify
P18.01	Sleep function	0: Invalid 1: Sleep mode 1 2: Sleep mode 2	1	◎
P18.02	Load and unload mode	0X00~0X11 LED ones: 0: Automatic 1: Manual In manual mode, the air compressor is loaded and unloaded by manual after start-up; in automatic mode, the air compressor loads and unloads automatically according to pressure after start-up. LED tens: 0: Auto load mode 1 1: Auto load mode 2	00	◎
P18.03	Channel of temperature sensor	0: PT100 connected to AI2 via temperature transmitter 1: PT100 connected directly	1	◎
P18.04	Upper limit of pressure sensor	0.00~20.00	1.60Mpa	◎
P18.05	Unloading pressure	0.00~ P18.04 Under automatic mode, after the air compressor starts, unload automatically when the air supply pressure is higher than the set value.	0.80Mpa	○
P18.06	Loading pressure	0.00~ P18.04 Under automatic mode, after the air compressor starts, load automatically when the air supply pressure is lower than the set value; wake up automatically at hibernation.	0.60Mpa	○
P18.07	Set pressure	0.00~ P18.04 Set the air supply pressure for air compressor at stable running.	0.70Mpa	○
P18.08	Fan start temperature	-20~150°C When the exhaust temperature is higher than the set value, start the fan.	75°C	○
P18.09	Fan stop temperature	-20~150°C When the exhaust temperature is lower than the set value, stop the fan.	65°C	○
P18.10	Set temperature	-20~150°C Set the exhaust temperature for air compressor at	75°C	○

Function code	Name	Detailed instruction of parameters	Default value	Modify
		stable running.		
P18.11	Lower limit of loading running frequency	P18.12~P00.04 (upper limit of running frequency) During adjusting, allow to output the minimum running frequency when the pressure is above the set pressure and below the unloading pressure.	40.00Hz	○
P18.12	Non-load running frequency	P01.15~P18.11 (Lower limit frequency of loaded running) The allowable output running frequency for air compressor at no load.	38.00Hz	○
P18.13	Non-load delay time	0~3600s Enter into hibernation when non-load running exceeds the set time.	60s	○
P18.14	Stop delay time	0~3600s At stop, run by non-load frequency and then stop after the delay time.	0s	○
P18.15	Loading delay time	0~3600s The master runs for the time before loading operation.	10s	○
P18.16	Restart delay time	0~3600s After stop, the set time is needed for restart.	30s	○
P18.17	Pre-alarm pressure	0.00~ P18.04 Pre-alarm when the air supply pressure is detected above the set pressure.	0.90Mpa	○
P18.18	Alarm pressure	0.00~ P18.04 Alarm and stop when the air supply pressure is detected above the set pressure.	1.00Mpa	○
P18.19	Pre-alarm temperature	-20~150°C Pre-alarm when the exhaust temperature is detected above the set temperature.	105°C	○
P18.20	Alarm temperature	-20~150°C Alarm and stop when the exhaust temperature is detected above the set temperature.	110°C	○
P18.21	Low temperature protection threshold	-20~150°C When the exhaust temperature is detected below the set value, display the temperature is too low, prohibit starting the air compressor and alarm.	-10°C	○
P18.22	Power correction coefficient	0%~200%	100%	○

Function code	Name	Detailed instruction of parameters	Default value	Modify
P18.23	Counting period of PID temperature (Ts)	0.0~10.0s	2.0s	○
P18.24	Gain coefficient (Kp)	0.0~100.0	18.0	○
P18.25	Convergence coefficient (K)	0.00~1.00	0.12	○
P18.26	PID temperature upper limit	0.00~100.00%	100.00%	○
P18.27	PID temperature lower limit	0.00~100.00%	0.00%	○
P18.28	Pt100 temperature compensation	-10.0~10.0°C	0.0°C	○
P18.29	compensation coefficient of Pt100 temperature	0.0~200.0%	100.0%	○
P18.30	Upper-limit frequency decreasing pressure	0.00~ P18.04 When the current pressure is larger than the value, the upper-limit frequency will decrease.	0.70Mpa	○
P18.31	Upper-limit frequency decreasing ratio	0.00Hz~10.00Hz When the current pressure is larger than P18.30, increase 0.01Mpa, corresponding upper-limit frequency reduction.	0.00Hz	○
P19 Group State group for air compressor				
P19.00	Set time for maintenance of component 1	0~65535h Pre-alarm when the accumulated service time of component 1 exceeds the set value; pre-alarm is invalid when the set value=0.	0	●
P19.01	Set time for maintenance of component 2	0~65535h Pre-alarm when the accumulated service time of component 2 exceeds the set value; pre-alarm is invalid when the set value=0.	0	●
P19.02	Set time for maintenance of component 3	0~65535h Pre-alarm when the accumulated service time of component 3 exceeds the set value; pre-alarm is invalid when the set value=0.	0	●
P19.03	Set time for	0~65535h	0	●

Function code	Name	Detailed instruction of parameters	Default value	Modify
	maintenance of component 4	Pre-alarm when the accumulated service time of component 4 exceeds the set value; pre-alarm is invalid when the set value=0.		
P19.04	Set time for maintenance of component 5	0~65535h Pre-alarm when the accumulated service time of component 5 exceeds the set value; pre-alarm is invalid when the set value=0.	0	●
P19.05	Time for use of component 1	0~65535h	0	●
P19.06	Time for use of component 2	0~65535h	0	●
P19.07	Time for use of component 3	0~65535h	0	●
P19.08	Time for use of component 4	0~65535h	0	●
P19.09	Time for use of component 5	0~65535h	0	●
P19.10	Motor actual output power	0.0~6553.6kW	0.0kW	●
P19.11	Current pressure	0.00~655.36Mpa	0.00Mpa	●
P19.12	Current temperature	-20~150°C	0°C	●
P19.13	Signal state 1	BIT0: air filter blockage signal, 1: fault, 0: normal BIT1: oil filter blockage signal, 1: fault, 0: normal BIT2: separator blockage signal, 1: fault, 0: normal BIT3: precision separator blockage signal, 1: fault, 0: normal BIT4: external fault signal 1, 1: fault, 0: normal BIT5: external fault signal 2, 1: fault, 0: normal BIT6: magnetic valve signal state, 1: load, 0: unload BIT7: auxiliary motor state, 1: run, 0: stop BIT8: pressure pre-alarm signal, 1: pressure pre-alarm, 0: normal BIT9: temperature pre-alarm signal, 1: temperature pre-alarm, 0: normal BIT10: pressure alarm signal, 1: pressure alarm, 0: normal BIT11: temperature alarm signal, 1: temperature	0	●

Function code	Name	Detailed instruction of parameters	Default value	Modify
		alarm, 0: normal BIT12: pressure signal, 1: pressure signal fault, 0: normal BIT13: temperature signal, 1: temperature signal fault, 0: normal BIT14: low temperature protection, 1: low temperature alarm, 0: normal BIT15: master state, 1: run, 0: stop		
P19.14	Signal state 2	BIT0: tip for maintenance of component 1, 1: need maintenance, 0: normal BIT1: tip for maintenance of component 2, 1: need maintenance, 0: normal BIT2: tip for maintenance of component 3, 1: need maintenance, 0: normal BIT3: tip for maintenance of component 4, 1: need maintenance, 0: normal BIT4: tip for maintenance of component 5, 1: need maintenance, 0: normal BIT11: Maintenance overtime reminder, 1: Maintenance overtime reminder, 0: Normal BIT13: Low exhaust pressure reminder, 1: Low pressure pre-alarm, 0: Normal	0	●
P19.15	Device state	0: Stand-by 1: Run 2: Fault 3: Emergency stop 4: Undervoltage 5: Alarm 6: Hibernation 7: Stop 8: Restart delay	0	●
P19.16	Accumulative running time	0~65535h	0	●
P19.17	Accumulative running time for loading	0~65535h	0	●
P19.18	Restart countdown	0~3600s	0s	●
P19.19	PID temperature output	0.00~100.00%	0.00%	●

Chapter 4 Commissioning guidelines

4.1 Commissioning procedures for integrated system

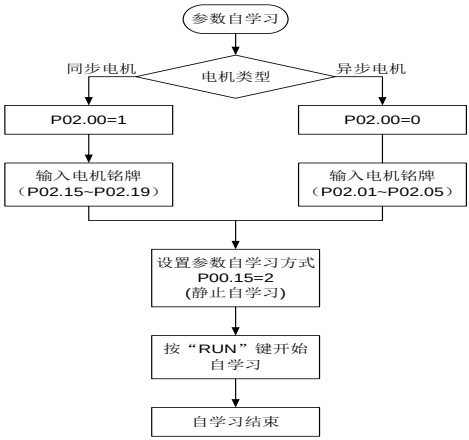
4.1.1 Master inverter commissioning

1. Connect the wires according to the wiring diagram of the system. Before commissioning, disconnect 24V power of the touch screen. Then ensure that the wiring is correct and the ground wires are in good connection (including the grounding of the inverter and the cover).

Note: Pressure, temperature and fan speed control signals are current signals which are selected by corresponding analog input and output terminals.

2. P00.18=1, restore to the factory default state. Set P00.03 according to the parameter settings of the motor, then input the parameters of the motor and start motor autotuning.

Note: If there is no motor rated current on the name plate of the synchronous motor, set P02.19 to inverter rated current or the default value.



3. Press QUICK/JOG for jogging and check the direction. If the direction is incorrect, change the wiring of the motor.

4. Set P01.15 to 25.00Hz, and adjust the control parameters of the motor (current loop mainly). P03.09 will be different in different motor power. Refer to P03.09 and P03.10 configuration table for detailed function parameter instructions.

4.1.2 Fan commissioning

1. Connect the wires according to the wiring diagram of the system and check whether the wiring is correct. Note: The fan speed control signals are 0-20mA current signals, so pay attention to jumper selection for the terminals.

2. P00.18=1, restore to the factory default state, then input the parameters of the motor, press QUICK/JOG for jogging and check the direction. If the direction is incorrect, change the motor wiring.

4.1.3 System commissioning

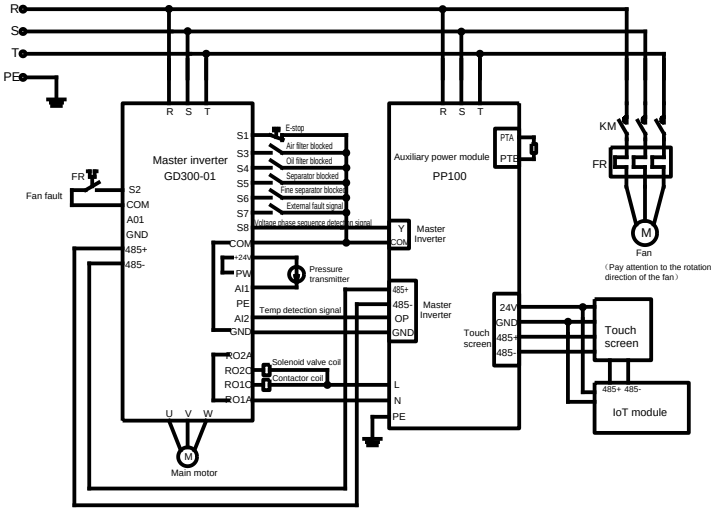
1. Connect the power of the touch screen and wait for the start-up of the system.

2. Enter into the interface of system configuration, set the parameters, including pressure sensor,

temperature sensor and whether the fan variable frequency starts, and press “one-click setting parameters”. The system will finish related configuration automatically.

3. Refer to the touch screen manual, adjust the parameters of the user, factory and maintenance for following running.

4.1.3.1 Wiring diagram for single inverter system



Note:

a) The one-key-to-set key is available once wiring is done according to above diagram.

b) PT100 of GD300-01 in above diagram is selected by P18.03. It is set as temp detection terminal (PTA, PTB and PTC) by default; temp transmitter can be set according to field needs (P18.03=0), however, generally, temp transmitter needs no setup.

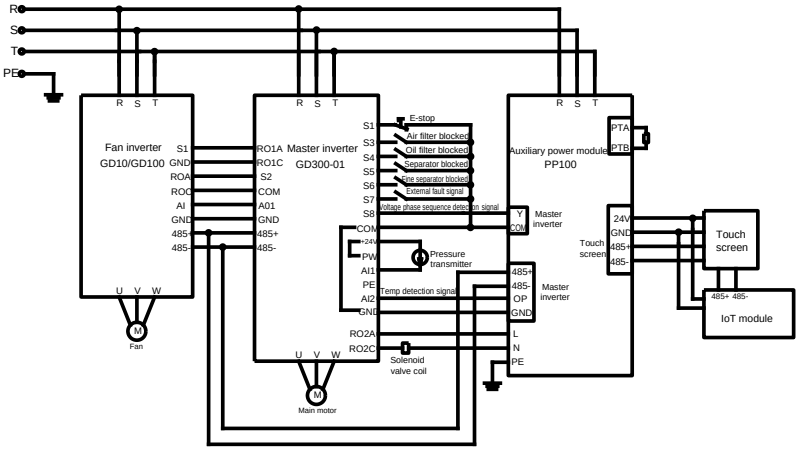
c) Above wiring makes phase sequence detection function available, and users can set this function on the touch screen as needed; phase sequence detection function is embedded into PP100 module, therefore, if PP100 module is not selected, uses will need to install phase sequence protection device by themselves as needed.

d) In the internal 220V power of PP100, there is only 30W power can be used to supply solenoid valve coil and contactor coil, please do not apply large-power load here.

e) Please refer to Operation manual for PP100-01 air compressor power module on how to use PP100 power module.

f) Please refer to User manual for VT6070E series touch screen HMI on how to use the touch screen.

4.1.3.2 Wiring diagram for dual-inverter system



Note:

a) The one-key-to-set key is available once wiring is done according to above diagram.

b) PT100 of GD300-01 in above diagram is selected by P18.03. It is set as temp detection terminal (PTA, PTB and PTC) by default; temp transmitter can be set according to field needs (P18.03=0), however, generally, temp transmitter needs no setup.

c) Above wiring makes phase sequence detection function available, and users can set this function on the touch screen as needed;

d) In the internal 220V power of PP100, there is only 30W power can be used to supply solenoid valve coil and contactor coil, please do not apply large-power load here.

e) Please refer to Operation manual for PP100-01 air compressor power module on how to use PP100 power module.

f) Please refer to User manual for VT6070E series touch screen HMI on how to use the touch screen

Appendix A Communication protocol

A.1 Application mode of the inverter

The Modbus protocol adopted by this inverter is RTU mode and the network line is RS485.

A.1.1 RS485

RS485 interface works on semiduplex and its data signal applies differential transmission which is called balance transmission, too. It uses twisted pairs, 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, the quicker the transmission speed and the weaker the anti-interference ability. If the twisted pairs of 0.56mm (24AWG) is applied as the communication cables, the Max. 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 shielded 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 if the distance increase even though the network can perform well without load resistor.

A.2 RTU command code and communication data

A.2.1 Command code: 03H, read N words (read 16 words continuously at most)

Command code 03H means that if the master read data from the inverter, the number being read (16 words at most) depends on the “data number” in the command and the parameter address being read must be continuous. The byte length of every data is 2 (one word).

This command code is used to read the parameters and working stage of the inverter.

A.2.2 Command code: 06H, write one word

This command means that the master write data to the inverter and one command can write one data only other than multiple data. Its role is to change the parameters and working mode of the inverter.

A.2.3 Command code: 08H, diagnosis function

Meaning of sub-function codes

Sub-function Code	Description
0000	Return to inquire information data

A.2.4 The 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 relative function parameters of the inverter.

A.2.4.1 The rules of address of the function codes

The address of function code occupies 2 bytes with the high bit is in the front and the low bit in behind. The range of high and low byte is: 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 06, then the low bit of the parameter is 06, then the function code address is 0506H and the parameter address of P10.01 is 0A01H.

A.2.4.2 The address instruction of other Modbus function

This part is the address definition for communication data. It is used to control inverter operation, obtain inverter state information as well as relevant inverter parameter setting.

Function instruction	Address definition	Data meaning instruction	R/W characteristic
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	
The address of the communication setting value	2001H	Communication setting frequency (0~Fmax (unit: 0.01Hz))	W/R
	2002H	PID reference, range (0~1000, 1000 corresponds to100.0%)	
	2003H	PID feedback, range (0~1000, 1000 corresponds to100.0%)	W/R
	2004H	Torque setting value (-3000~3000, 1000 corresponds to the 100.0% of the rated current of the motor)	W/R
	2005H	The upper limit frequency setting during forward rotation (0~Fmax (unit: 0.01Hz))	W/R
	2006H	The upper limit frequency setting during reverse rotation (0~Fmax (unit: 0.01Hz))	W/R
	2007H	The upper limit torque of electromotion torque (0~3000, 1000 corresponds to the 100.0% of the rated current of the motor)	W/R
	2008H	The upper limit torque of braking torque (0~3000, 1000 corresponds to the	W/R

Function instruction	Address definition	Data meaning instruction	R/W characteristic
		100.0% of the rated current of the motor)	
	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 Bit3: =1 power consumption clear =0: do not clear power consumption Bit4: =1 pre-exciting =0: pre-exciting prohibited Bit5: =1 DC braking =0: DC braking prohibited	W/R
	200AH	Virtual input terminal command , range: 0x000~0x1FF	W/R
	200BH	Virtual output terminal command , range: 0x00~0x0F	W/R
	200CH	Voltage setting value(specific for V/F separation) (0~1000, 1000 corresponds to the 100.0% of the rated voltage of the motor)	W/R
	200DH	AO output setting value 1 (-1000~1000, 1000 corresponds to 100.0%)	W/R
	200EH	AO output setting value 2 (-1000~1000, 1000 corresponds to 100.0%)	W/R
	200FH	BIT0:=1 Clear the working time of part 1 =0: invalid BIT1:=1 Clear the working time of part 2 =0: invalid BIT2:=1 Clear the working time of part 3 =0: invalid BIT4:=1 Clear the working time of part 5 =0: invalid BIT5=1 Clear the working time of the device	W/R

Function instruction	Address definition	Data meaning instruction	R/W characteristic
		=0: invalid BIT6=1 Solenoid valve loading =0: Solenoid valve unloading	
	2010H	The set time for maintenance on part 1; range: 0~65535	W
	2011H	The set time for maintenance on part 2; range: 0~65535	W
	2012H	The set time for maintenance on part 3; range: 0~65535	W
	2013H	The set time for maintenance on part 4; range: 0~65535	W
	2014H	The set time for maintenance on part 5; range: 0~65535	W
	2015H	Working time of part 1; 0~65535	W
	2016H	Working time of part 2; 0~65535	W
	2017H	Working time of part 3; 0~65535	W
	2018H	Working time of part 4; 0~65535	W
	2019H	Working time of part 5; 0~65535	W
	201AH	Running time of the device; 0~65535	W
SW 1 of the inverter	2100H	0001H: forward running	R
		0002H: reverse running	
		0003H: stop	
		0004H: fault	
		0005H: inverter POFF state	
		0006H: pre-exciting state	
SW 2 of the inverter	2101H	Bit0: =0: not ready to run =1: ready to run Bi1~2: =00:motor 1 =01:motor 2 =10:motor 3 =11:motor 4 Bit3: =0:asynchronous motor =1:synchronous motor Bit4: =0:no overload pre-alarm; =1:overload pre-alarm Bit5~ Bit6: =00: keypad control =01:terminal control =10:communication control	R
Fault code of the inverter	2102H	See the fault type instruction	R
Identification code of the	2103H	GD300-01-----0x010A	R

Function instruction	Address definition	Data meaning instruction	R/W characteristic
inverter			
Operation frequency	3000H	Compatible with communication address of CHF100A, CHV100	R
Setting frequency	3001H		R
Bus voltage	3002H		R
Output voltage	3003H		R
Output current	3004H		R
Operation speed	3005H		R
Output power	3006H		R
Output torque	3007H		R
Close loop setting	3008H		R
Close loop feedback	3009H		R
Closed-loop setting	3008H		R
Closed-loop feedback	3009H		R
Input IO state	300AH		R
Input IO state	300BH		R
AI 1	300CH		R
AI 2	300DH		R
AI 3	300EH		R
AI 4	300FH		R
Read high speed pulse 1 input	3010H		R
Read high speed pulse 2 input	3011H		R
Read current step number of the multi-step speed	3012H		R
External length value	3013H		R
External counting value	3014H		R
Torque setting value	3015H		R
Inverter identification code	3016H		R
Fault code	5000H		R

A.2.5 Fault message response

Code	Name	Meaning
01H	Illegal command	The command from master cannot be executed. The reason maybe: 1. This command is only for new version and this version cannot realize. 2. Slave is in fault state and cannot execute it.
02H	Illegal data address.	Some of the operation addresses are invalid or not allowed to access. Especially the combination of the register and the transmitting bytes are invalid.
03H	Illegal value	When there are invalid data in the message framed received by

Code	Name	Meaning
		slave. **Note:** This error code does not indicate the data value to write exceed the range, but indicate the message frame is an illegal frame.
04H	Operation failed	The parameter setting in parameter writing is invalid. For example, the function input terminal cannot be set repeatedly.
05H	Password error	The password written to the password check address is not same as the password set by P7.00.
06H	Data frame error	In the frame message sent by the upper PC, the length of the digital frame is incorrect or the counting of CRC check bit in RTU is different from the lower monitor.
07H	Written not allowed.	The parameter to be modified by upper PC is read-only.
08H	The parameter cannot be modified during running	The parameter to be modified by upper PC cannot be modified during running.
09H	Password protection	When the upper PC is writing or reading and the user password is set without password unlocking, it will report that the system is locked.

The slave uses functional 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 address or sub-function 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: when the master sends a message to the slave, requiring it to read a group of address data of the inverter function codes, there will be following function codes:

0 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 code which defines the error reason. When the master receives the response for the objection, in a typical processing, it will send the message again or modify the corresponding order

Appendix B Common EMC problems and remedies

B.1 Interference problems of meter switches and sensors

Interference phenomena:

The sensor signal (pressure, temperature, displacement, etc) is collected and displayed via HMI device, the sensor value displayed after inverter starts is wrong, the common errors are listed as below:

- Incorrect display of upper limit or lower limit value, such as 999 or -999;
- The displayed value changes randomly (often occurred to pressure transmitter);
- The displayed value is stable but huge deviation exists eg the displayed temp. value is much higher than the normal value (often occurred to thermocouple);
- The signal collected by the sensor does not display directly but act as feedback signal for drive system operation eg the inverter starts to decelerate once air compressor has reached the upper limit pressure, however, actually the inverter starts to decelerate before upper limit pressure is reached;
- Various meters connected by inverter analog output (AO) (such as frequency meter, current meter, etc), the value displayed by these meters after inverter starts is inaccurate;
- The system adopts proximity switch. The indicator of proximity switch flickers after inverter starts, overturn occurred to output level by mistake.

Solution

- Check and confirm the sensor feedback line is routed with motor cable at a distance of at least 20cm;
- Check and ensure motor ground line has been connected to PE terminal of the inverter (if motor ground line has been connected with the grounding bar of inverter cabinet, measure with multimeter to confirm that the resistance between grounding bar and PE terminal is less than 1.5Ω);
- If there are too many interfered meters/sensor, it is recommended to install external C2 filter at the input power side of the inverter.

B.2 485 communication interference

The 485 communication interference mainly lies in communication delay, out of sync, disconnection or occasional normal after inverter starts.

Abnormal communication is not always caused by interference, which can be ruled out by below means:

- Check if circuit break or poor contact occurred to 485 communication bus;
- Check if the ends of A, B cable of the 485 communication bus are connected reversely.
- Check if the communication protocol (eg baud rate, data bit check, etc)of the inverter is in consistent with that of the upper PC;

If it is confirmed that the abnormality is caused by interference, rule out the problem cause by below means:

- The communication cable cannot be routed with motor cable in the same cable tray;

- In multi-machine application, the connection of inverter communication cables should adopt chrysanthemum mode to improve anti-interference ability;
- In multi-machine application, it is necessary to confirm that the drive capacity of the master is strong enough;
- For multi-machine connection, both ends should be connected with 120Ω terminal resistors.

Solution:

- Check and confirm the motor ground line is connected to PE terminal of the inverter (if motor ground line has been connected with the grounding bar of inverter cabinet, measure with multimeter to confirm that the resistance between grounding bar and PE terminal is less than 1.5Ω);
- Inverter and motor cannot be common grounded with upper PC of communication (PLC, HMI, touch screen, etc). It is recommended to connect the inverter and motor with power GND while the upper PC of communication should be connected to the ground pile separately;
- Try to short circuit reference GND of inverter signal with the reference GND of upper PC controller signal to ensure the ground potential of their communication chips is the same;
- Try to short circuit reference GND of inverter signal with grounding terminal (PE) of the inverter.

B.3 Unable to stop or indicator shimmering caused by coupling of motor cable

Interference phenomena:

- Unable to stop

For inverter system whose start/stop is controlled by S terminal, the motor cable and control cable are routed in the same cable tray. After system starts, it cannot stop via S terminal.

- Shimmering indicator

After inverter starts to run, shimmering, flickering or abnormal noise occurred to below devices:

a) Relay indicator
b) Indicator of distribution box
c) PLC indicator
d) Indicating buzzer

Solution:

- Check and confirm the abnormal signal cable is routed with motor cable motor cable at a distance of at least 20cm;
- Parallelly connect the digital input terminal (S) used for start/stop control with other idle digital input terminals. For instance, S1 terminal is used for start/stop control, S4 terminal is idled, then try to short circuit S1 terminal with S4 terminal.

B.4 Leakage current and residual current device (RCD)

As the inverter outputs high frequency PWM voltage to drive the motor, the distributed capacitance against radiator from internal IGBT and between rotor and stator of the motor may cause the inverter to generate high frequency leakage current against the ground. While the RCD is used to detect the power frequency leakage current when grounding fault occurred to electrical circuit, the application of inverter may cause mal-operation of RCD.

How to select RCD:

Due to the specialty of inverter system, it is required that the rated residual operating current should be above 200mA for regular RCDs at all levels, and the inverter must be grounded with proper technics.

As for the setting time of RCD, the time limit of preceding action should be longer than the secondary action and time gap between them should be set to a value larger than 20ms eg 1s, 0.5s and 0.2s.

It is recommended to use electromagnetic RCD for the electrical circuit of inverter system. Such RCD carries strong anti-interference capacity to prevent the RCD from being affected by high frequency leakage current.

Electronic RCD	Electromagnetic RCD
Low cost, high sensitivity, small size, vulnerable to voltage fluctuation of the grid and ambient temperature, weak anti-interference capacity	Require the zero sequence current transformer to be quite sensitive, precise and stable, made from permalloy material with high permeability, complicated process and high cost, immune to voltage fluctuation of the grid and ambient temp., strong anti-interference capacity

Solution to mal-operation of RCD (on the part of inverter)

a) Try to disassemble the jumper cap in “EMC/J10” (refer to chapter 2.1.1 for the position of J10 jumper)
b) Try to decrease the carrier frequency to 1.5kHz (P00.14=1.5);
c) Try to change the modulation mode to “3-phase modulation and two-phase modulation” (P8.40=00)

Solution to mal-operation of RCD (on the part of system distribution)

a) Check and confirm the power cable is not immersed in water
b) Check and confirm the cable is not broken or switched over;
c) Check and confirm if secondary grounding occurred to the null line;
d) Check and confirm if power cable terminal is in the air switch or the contactor is poorly contacted (loose screws);
e) Check the single-phase electric equipment and confirm if the ground line is misused as null line;
f) Inverter power cable and motor cable should not be shielded ones.

Leakage protection of motor autotuning

During motor autotuning, the measurement on differing motor parameters is conducted step by step, in which the first two steps is to measure the resistance of motor stator/rotor while the inverter will output square wave to motor stator winding at 4kHz (default carrier frequency), as leakage current generated by 4kHz carrier frequency against distributed capacitance between motor rotor and stator during charging/discharging is quite obvious, which may cause mal-operation of RCD. If such problem occurred, bypass RCD first and restore after parameter autotuning is completed.

B.5 Problem of charged device shell

The problem mainly lies in that the device shell carries detectable voltage which gives anyone who touches it a feeling of electrical shock, however, when the inverter is powered up without running, the shell will be uncharged (or the voltage it carries is far lower than human body safety voltage).

Solution:

a) If there is distribution grounding or ground pile on site, grounding the shell of inverter cabinet by power GND or ground pile;

b) If there is no ground connection on site, it is necessary to electrically connect the motor shell with grounding terminal PE of the inverter and confirm that the jumper in “EMC/J10” of the inverter is short circuited (refer to chapter 2.1.2 for the position of EMC/J10 jumper).

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