GUIDE Inverter GF630N01 Series

Instruction Manual Version: 1.01

Foreword

Thank you for choosing GUIDE inverter! You will enjoy the comprehensive and sincere services that we offer!

GUIDE inverter GF630N01 series is a high-performance vector control inverter, which is mainly used for three-phase AC asynchronous motor speed regulation. Utilizing high performance current vector control technology, GF630N01 inverter is characterized by its high-torque output at low speeds, rapid dynamic response, and robust overload capacity. It is equipped with a Modbus485 communication bus as standard, offering extensive functionality and stable performance, and can be widely utilized for the asynchronous motor drive of various automation equipment.

To fully leverage the exceptional performance of this product and ensure the safety of both users and equipment, it is imperative to thoroughly review this manual prior to use.

This Instruction Manual is an attachment sent with the product. Please be sure to keep it properly after use, so that it can be used for inspection and maintenance of the inverter in the future.

If you have any questions or special requirements regarding the use of this inverter, please feel free to contact our local offices or distributors, or you can directly contact our headquarters after-sales service center. We will be dedicated to serving you.

The contents of this manual are subject to change without prior notice.

Wuhan Guide Technology Co., Ltd.

Safety Precautions

Safety statement

1） Please read and observe the safety precautions before installation, operation, and maintenance of the product.

2） To ensure personal and equipment safety, please follow all safety precautions indicated on the product and described in the manual during installation, operation, and maintenance of the product.

3） The "CAUTION", "WARNING" and "DANGER" in this manual do not represent all the safety precautions to be observed, but only serve as a supplement to all safety precautions.

4） This product shall be used in an environment that meets the requirements of the design specifications, otherwise it may cause malfunctions. Functional abnormalities or component damage caused by failure to comply with relevant regulations are not within the scope of product quality assurance.

5） Our company will not bear any legal responsibility for personal safety accidents, property losses, etc. caused by illegal operation of products.

Safety level

Symbol	Symbol description
Danger	◆ "DANGER" means that death or serious bodily injury will result if the operation is not carried out as specified
CAUTION	◆ "CAUTION" indicates a critical step, which needs to be operated according to the prompts and specifications
WARNING	◆ "WARNING" means that death or serious bodily injury may result if the operation is not carried out as specified

Safety instructions

Important notes

Danger

- Do not touch the radiator by hand after ten minutes of power-on or within a period of time after power-off to prevent burns.
- Do not power on and off the inverter frequently, and do not power on again within five minutes after power off.
- Do not remove the cover of the inverter or touch the printed circuit board when it is powered on to prevent electric shock.
- Wiring, inspection and other operations must be carried out 10 minutes after the power is turned off.
- The grounding terminal of the inverter must be well grounded!
- No foreign matters are allowed to fall into the inverter.

WARNING

- The inverter must not be installed on flammable materials.
- This series of inverters are not suitable for flammable and explosive environments. If necessary, please order a special inverter from the manufacturer.
- It is forbidden to disassemble, assemble or modify the inverter without permission!
- It is strictly forbidden to connect the AC power supply to the output terminals U, V and W of the inverter.
- When the inverter is powered on, do not open the cover or carry out wiring operations.

Unpacking acceptance

CAUTION

- Before unpacking, please check whether the outer packaging of the product is intact, whether there is damage, soaking, moisture, deformation, etc.
- Please open the package in accordance with the specified hierarchical order. It is strictly prohibited to handle it with excessive force!
- When unpacking, please check whether there is any damage, rust, or dents on the surface of the product and its accessories.
- After unpacking, please carefully check whether the quantity and data of the product and its accessories are complete against the packing list.

WARNING

- Upon unpacking, refrain from installing the product if water has infiltrated the product, any parts are missing, or any parts are damaged!
- If the product and its accessories are found to have damage, rust, signs of use and other problems during unpacking, do not install them!
- Please carefully check against the packing list, and do not install if the packing list does not match the product name!

Storage and transportation

CAUTION

- Please store and transport the product according to the storage and transportation conditions, and the storage temperature and humidity shall meet the requirements.
- Avoid storage and transportation in places where water splashes, rain, direct sunlight, intense electric field, strong magnetic field, strong vibration, etc.
- Avoid storing the product for more than 3 months. If the storage time is too long, please carry out closer protection and necessary inspection.
- Please pack the product strictly before vehicle transportation. Closed boxes must be used for long-distance transportation.
- It is strictly forbidden to transport this product together with equipment or articles that may affect or damage this product.

WARNING

- Be sure to use professional loading and unloading equipment to handle large or heavy equipment and products!
- When handling the product by hands, be sure to hold the product housing firmly to avoid falling product parts, otherwise there is a risk of injury!
- When handling the product, be sure to lift and place it gently, and always be mindful of objects underfoot to prevent tripping or falling, otherwise there is a risk of injury or product damage!
- When the equipment is being lifted by lifting tools, no individuals are permitted to stand or remain beneath the equipment.

Installation

WARNING

- Be sure to read the product instruction manual and safety precautions carefully before installation!
- It is strictly forbidden to modify this product!
- It is strictly forbidden to screw the fixing bolts of product parts and components and the bolts marked in red!
- Do not install this product in places with intense electric field or strong electromagnetic wave interference!
- When this product is installed in a cabinet or terminal equipment, the cabinet or terminal equipment shall be provided with corresponding protective devices such as fireproof enclosure, electrical protective enclosure and mechanical protective enclosure, and the protection grade shall meet the requirements of relevant IEC standards and local laws and regulations.

Danger

- Non-professionals are strictly prohibited from product installation, wiring, maintenance, inspection or component replacement!
- The installation, wiring, maintenance, inspection or component replacement of this product can only be carried out by professionals who have received relevant training on electrical equipment and have sufficient electrical knowledge.
- The installation personnel must be familiar with the product installation requirements and relevant technical data.
- When it is necessary to install transformers and other equipment with strong electromagnetic interference, please install shielding protection devices to avoid malfunction of this product!

Wiring

Danger

- Non-professionals are strictly prohibited from equipment installation, wiring, maintenance, inspection or component replacement!
- Do not perform wiring operations when the power is on, otherwise there will be a risk of electric shock.
- Before wiring, cut off the power supply of all equipment. After the power is cut off, there is residual voltage in the internal capacitor of the equipment. Please wait at least 10 minutes before wiring.
- Ensure that the equipment and products are properly grounded, otherwise there will be a risk of electric shock.
- Please adhere to the procedures outlined in the Electrostatic Discharge (ESD)

prevention guidelines and wear an electrostatic wrist strap during wiring and other operations to prevent damage to the internal circuitry of the equipment or product.

WARNING

- It is strictly forbidden to connect the input power supply to the output terminals of the equipment or product, as this may cause equipment damage or even lead to a fire.
- When connecting the driver to the motor, be sure to ensure that the phase sequence of the driver and the motor terminals is accurate and consistent to avoid reverse rotation of the motor.
- The cables used in wiring must meet the corresponding requirements for diameter and shielding, and the shielding layer of shielded cables must be reliably grounded at one end!
- After wiring, make sure that there are no falling screws or exposed cables inside the equipment and product.

Power up

WARNING

- Before powering up, please confirm that the equipment and products are installed properly, the wiring is firm, and the motor device is allowed to be restarted.
- Before powering up, please confirm that the power supply meets the requirements of the equipment to avoid equipment damage or fire!
- When powering up, the mechanical device of the equipment or product may act suddenly. Please stay away from the mechanical device.
- After powering up, do not open the equipment cabinet door or product protective cover, otherwise there will be a risk of electric shock!
- It is strictly prohibited to touch any wiring terminals of the equipment while it is powered on, otherwise there will be a risk of electric shock!
- It is strictly prohibited to disassemble any devices or components of the equipment and products while they are powered on, otherwise there will be a risk of electric shock!

Running

Danger

- It is strictly prohibited to touch any wiring terminals of the equipment while it is in running state, otherwise there will be a risk of electric shock!
- It is strictly prohibited to disassemble any devices or components of the equipment and products while they are in running state, otherwise there will be a risk of electric shock!

- It is strictly forbidden to touch the equipment housing, fan or resistance to test the temperature, otherwise it may cause burns!
- It is strictly forbidden for non-professional technicians to detect signals during running, otherwise it may cause personal injury or equipment damage!

WARNING

- During running, avoid other articles or metal objects from falling into the equipment, otherwise the equipment will be damaged!
- Do not use the contactor on-off method to control the start and stop of the equipment, otherwise the equipment will be damaged!

Maintenance

WARNING

- Before powering up, please confirm that the equipment and products are installed properly, the wiring is firm, and the motor device is allowed to be restarted.
- Before powering up, please confirm that the power supply meets the requirements of the equipment to avoid equipment damage or fire!
- When powering up, the mechanical device of the equipment or product may act suddenly. Please stay away from the mechanical device.
- After powering up, do not open the equipment cabinet door or product protective cover, otherwise there will be a risk of electric shock!
- It is strictly prohibited to touch any wiring terminals of the equipment while it is powered on, otherwise there will be a risk of electric shock!
- It is strictly prohibited to disassemble any devices or components of the equipment and products while they are powered on, otherwise there will be a risk of electric shock!

Scrapping

WARNING

- Please scrap equipment and products in accordance with relevant national regulations and standards to avoid property losses or casualties!
- Scrapped equipment and products shall be treated and recycled in accordance with industrial waste treatment standards to avoid environmental pollution.

Precaution instructions

1) Residual current operated protective device

In running state, the equipment may produce a significant leakage current that flows through the protective grounding conductor. When utilizing a residual current operated protective device (RCD) or a residual current monitor (RCM), it is imperative to employ an RCD or RCM with a response delay or one that is capable of filtering higher order current harmonics.

Please install a Type B residual current device (RCD) on the primary side of the power supply. When selecting a residual current device (RCD), consider the transient and steady-state ground leakage currents that may occur during the startup and running of the equipment. Select a dedicated RCD with measures to suppress high-order harmonics, or a general RCD with a larger residual current.

2) Motor insulation inspection

When the motor is used for the first time or used again after a long time, the motor insulation inspection shall be carried out to prevent the inverter from being damaged due to the insulation failure of the motor winding. During the motor insulation inspection, please disconnect the connecting wire between the motor and the inverter. It is recommended to use a 500V voltage type megohmmeter to ensure that the measured insulation resistance of the motor is not less than 5MΩ.

3) Use other than rated voltage value

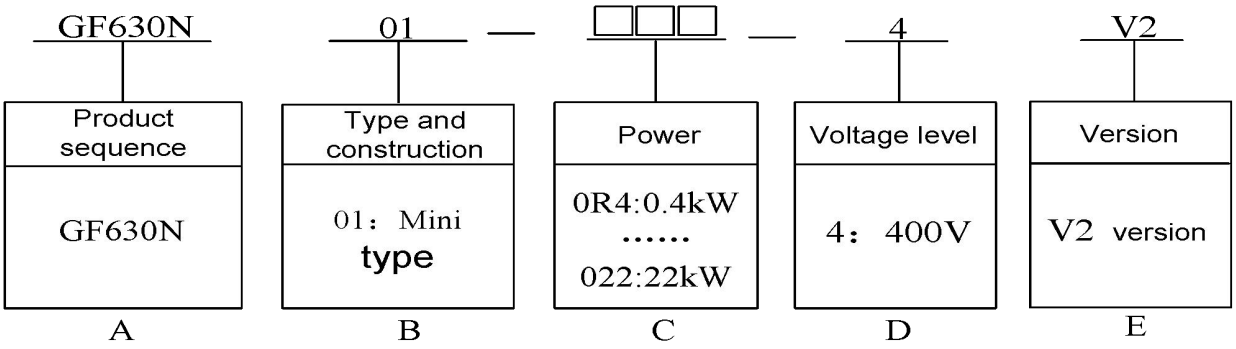
If the inverter is used outside the allowable working voltage range specified in the manual, it is easy to cause internal damage to the inverter. If necessary, use a step-up or step-down device to transform the power supply and connect it to the inverter.

Table of Contents

Chapter 1 Product Information

1.1 Nameplate and model

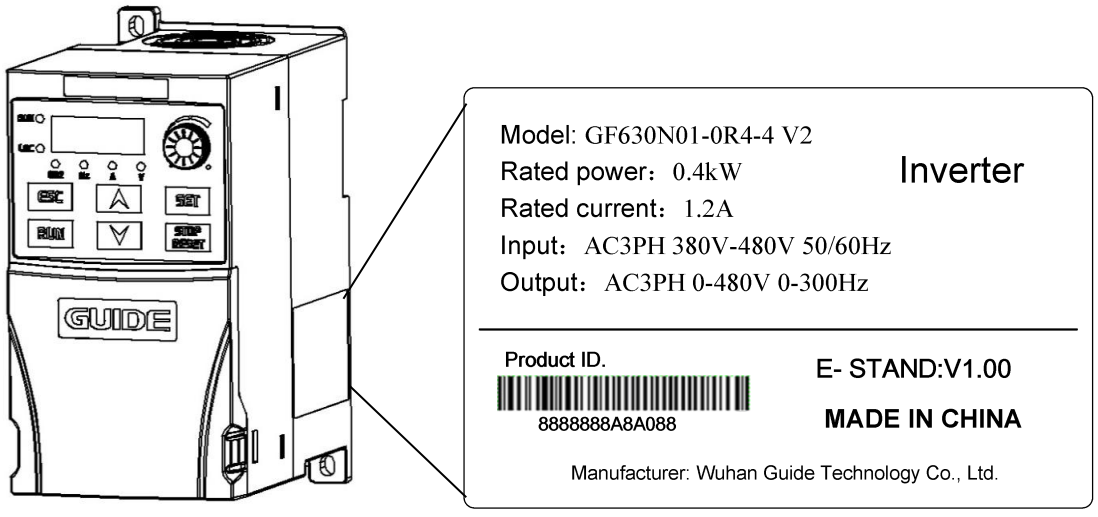
Meaning of inverter model:



System product model field description

Field ID	Field Description
A	Product serial number: GF630N
B	Type and construction 01: Mini type
C	Power: 0R4:0.4kW 7R5:7.5kW 022:22kW
D	Voltage level 4:400V
E	V2: Version

The nameplate of the GF630N01 series inverter is illustrated in the figure (with 0.4kW as an example)



Product nameplate description

Model: GF630N01-0R4-4 V2 indicates that the rated power of GF630 N01 series inverter is 0.4 kW and the voltage level is 400 V.

AC indicates AC power input and output.

3PH indicates three-phase input and output.

380V-480V 50/60Hz indicates the input voltage range and frequency.

0-480V 0-300Hz indicates the output voltage range and output frequency range of the inverter.

List of GF630N01 Inverter Products

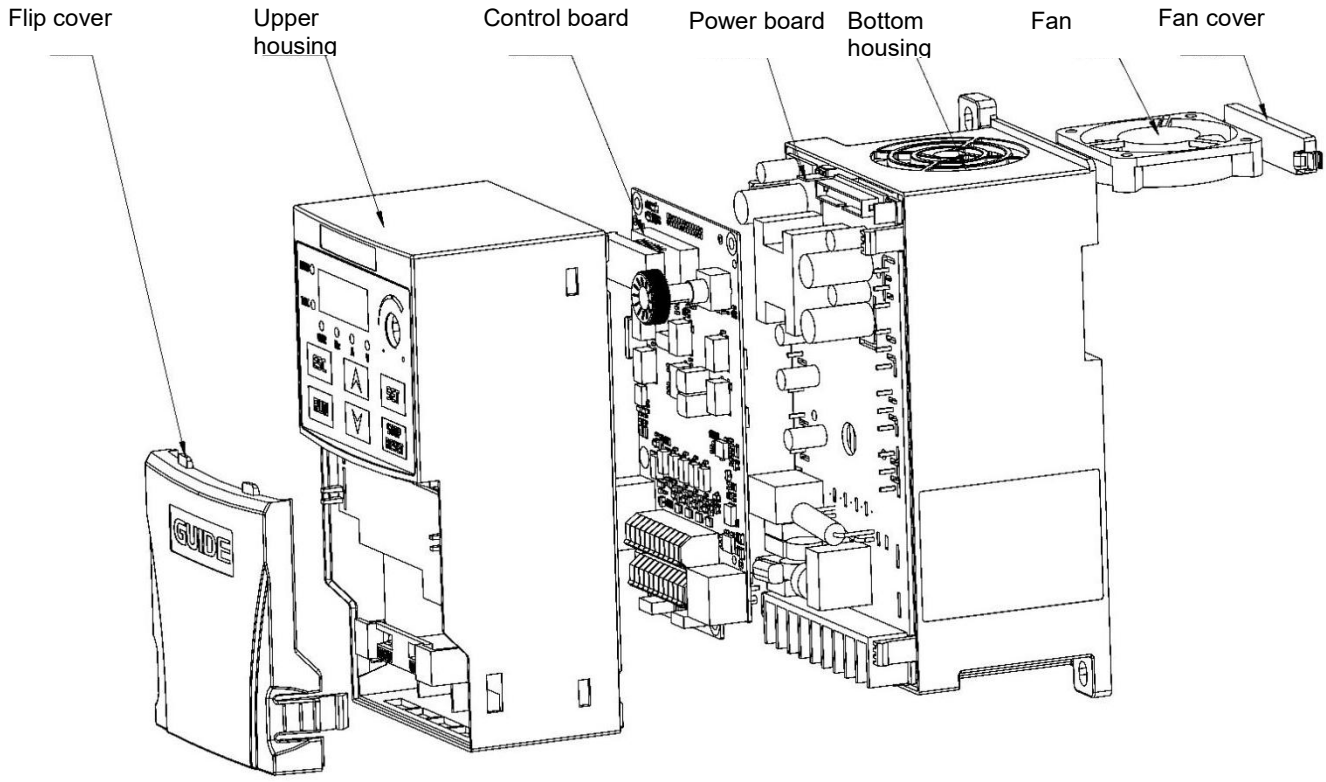
Model	Output current [A]	Applicable motor power [kW]	Model
GF630N01-0R4-4 V2	1.2	0.4	R1
GF630N01-0R7-4 V2	2.5	0.75	
GF630N01-1R1-4 V2	3	1.1	
GF630N01-1R5-4 V2	3.7	1.5	
GF630N01-2R2-4 V2	5	2.2	
GF630N01-3R7-4 V2	9	3.7	R2
GF630N01-5R5-4 V2	13	5.5	
GF630N01-7R5-4 V2	17	7.5	R3
GF630N01-011-4 V2	24	11	
GF630N01-015-4 V2	32	15	R4
GF630N01-018-4 V2	37	18.5	
GF630N01-022-4 V2	45	22	

Note:

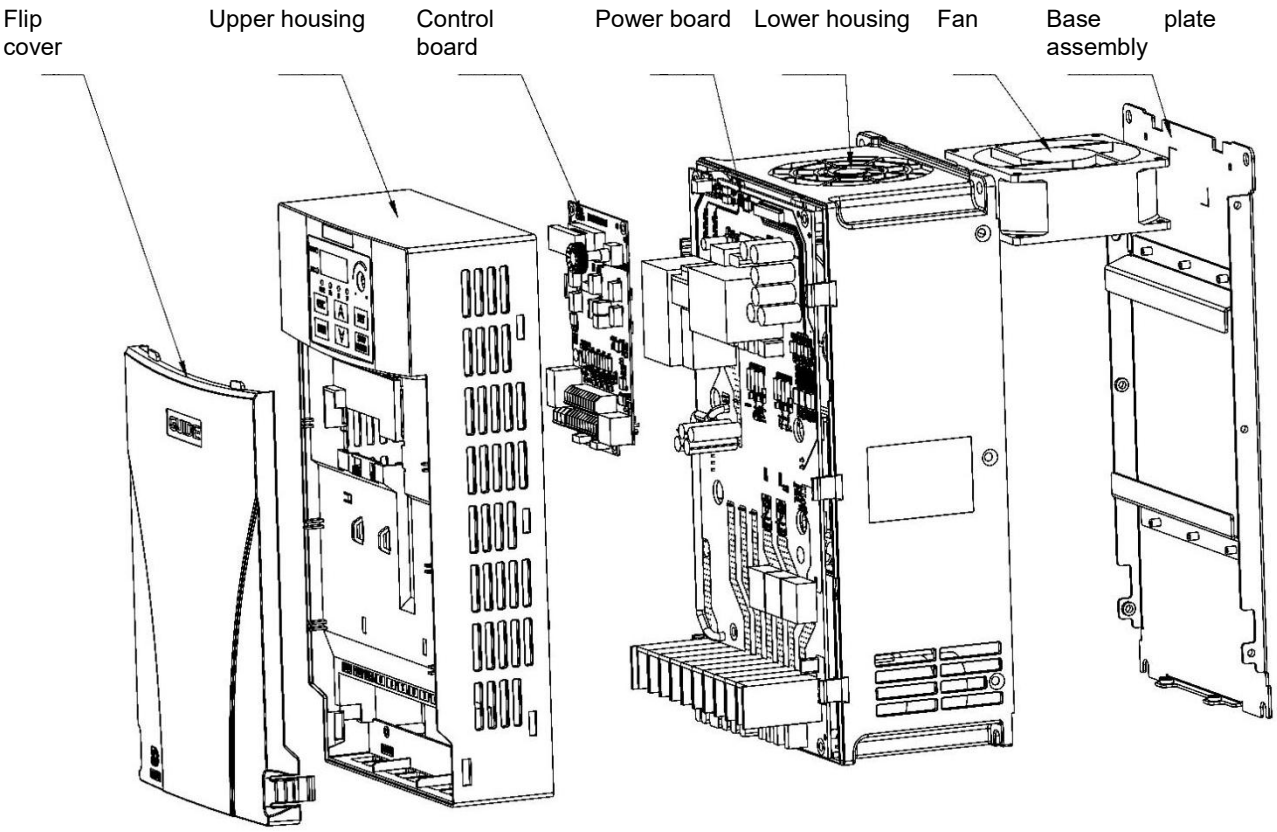
1. Built-in braking unit;
2. LED digital display panel.

1.2 Component description

The GF630N01 series inverter is divided into two structural types based on power ratings, as illustrated in the figure below:

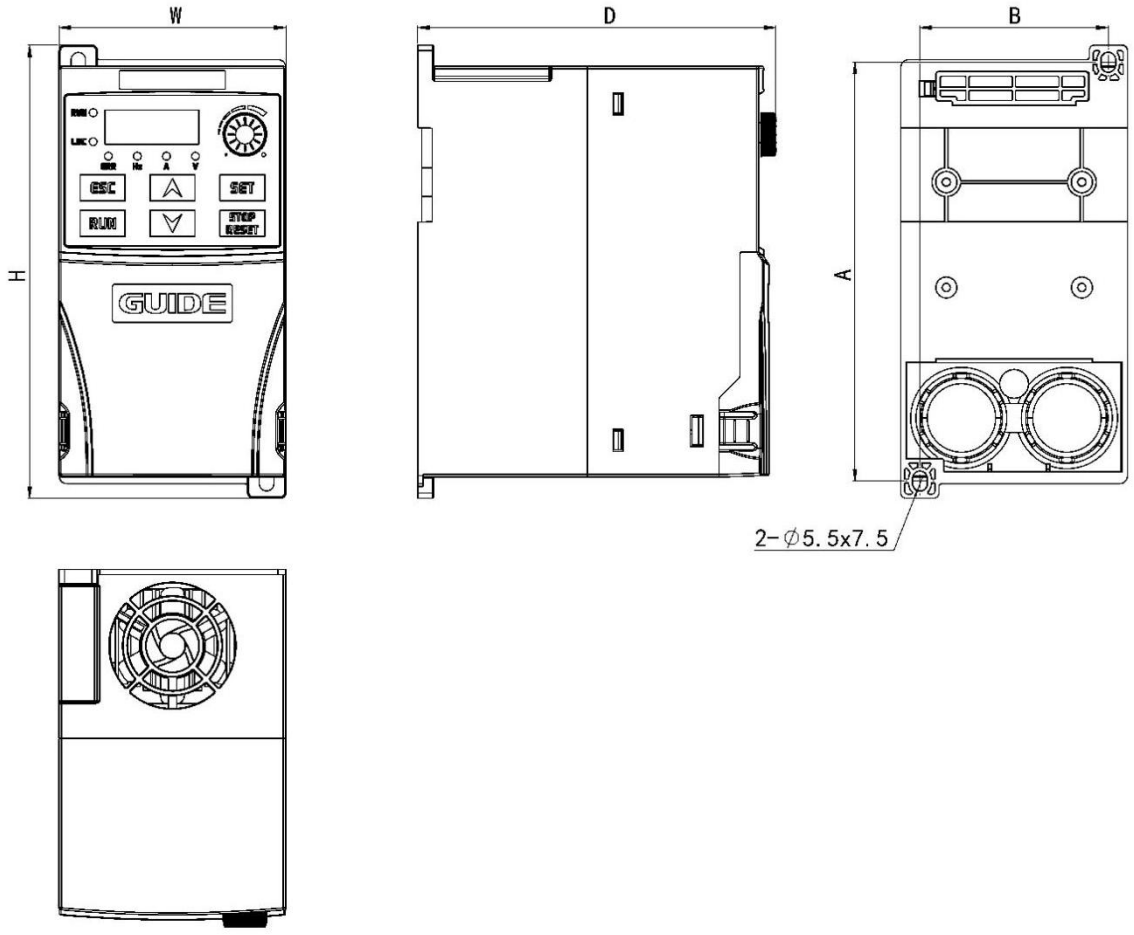


Schematic Diagram of R1/R2 Product Components (Three-phase 380V ~ 480V, 0.4kW ~ 5.5kW)

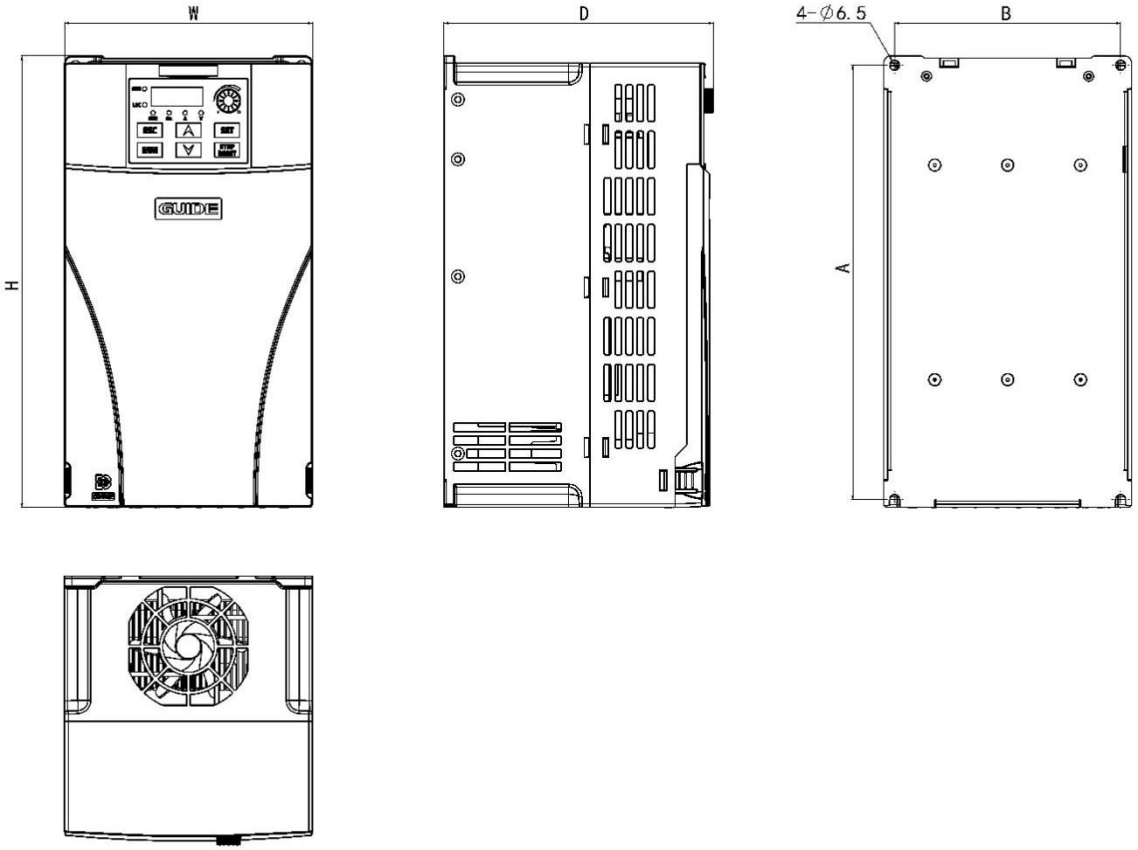


Schematic Diagram of R3/R4 Product Components (Three-phase 380V ~ 480V, 7.5kW ~ 22kW)

1.3 Overall size



Schematic Diagram of R1/R2 Model Dimensions and Installation Dimensions (0.4kW~5.5kW)



Schematic Diagram of R3/R4 Model Dimensions and Installation Dimensions (7.5kW~22kW)

1.4 Overall dimensions and installation dimensions

Model	Power	Overall dimensions (mm)			Installation dimensions (mm)		Mounting hole diameter	Recommended mounting bolt Grade 8.8	Weight (kg)
		H	W	D	A	B	φ	M	
R1	0.4kW	172	86	136	159	71.4	2-φ5.5	2-M5	1.3
	0.75k								
	1.1kW								
	1.5kW								
	2.2kW								
R2	3.7kW	203	98	156	190	86.5	4-φ5.5	4-M5	2
	5.5kW								
R3	7.5kW	240	128	167	228.5	114	4-φ6.5	4-M5	3
	11kW								
R4	15kW	310	170	185	298	155	4-φ6.5	4-M5	6
	18.5k								
	22kW								

1.5 Comprehensive performance indicators of the product

Item		Description
Input	Input voltage	Three-phase 380V~480V
	Rated frequency	50/60Hz
	Allowable voltage fluctuation	-15%～+10%
	Allowable frequency fluctuation	The permissible frequency variation range is fLN ± 2% (± 4% for an independent power supply network). Frequency change rate: ≤ 2% fLN/s.
Output	Output voltage range	0~input voltage, equal to input voltage, error less than 5%
	Asymmetry of output voltage	Under normal use conditions, the asymmetry of the output three-phase voltage shall not exceed 2% in the case of symmetrical

		load of each phase within the whole output frequency adjustment range.
	Output frequency range	0～300Hz
Control Characteristics	Running command mode	Panel control, terminal control, and communication control
	Carrier frequency	0.5 KHz~16 kHz, adjustable according to temperature and load characteristics
	Frequency resolution	Digital setting:0.01 Hz, analog setting: maximum frequency x 0.1%
	Control mode	Open-loop vector control (SVC), V/F control
	V/F control	Straight line, multi-point, and square type
	Torque control	No PG torque control
	Maximum speed	300Hz, depending on the electrical and mechanical characteristics of the motor
	Starting torque	0.5Hz/150%(SVC)
	Speed regulation range	1:100(SVC)
	Speed accuracy	±0.5% rated speed (SVC)
	Overload capacity	The overload capacity is 150% of the rated output current, and the overload is allowed for 1 minute every 5 minutes
	Torque compensation	Automatic torque compensation function
	Acceleration and deceleration mode	Straight line, user-defined multi-point curve
	Automatic voltage regulation	When the power grid fluctuates, it can automatically keep the output voltage constant
	DC braking mode	DC braking during startup and DC braking during shutdown
	Built-in process PID	Closed-loop control system that facilitates the realization of process quantities (pressure, temperature, flow, etc.
	Bus option	Support Modbus bus, and other buses can be customized

	Special functions	No shutdown in case of instantaneous power outage: In case of instantaneous power outage, the bus voltage drop is compensated by frequency reduction feedback energy to maintain the inverter without undervoltage fault shutdown in a short time; Virtual DIDO: Simple logic control can be realized through virtual DIDO; Timing function: The inverter will stop automatically after the run time reaches the set time; Fast current limiting: Fast current limiting in a single carrier cycle to prevent frequent overcurrent faults of the inverter
Input Output Terminal	Input terminal	7 digital inputs, 2 analog inputs (1 voltage 0~+10V and 1 current 4mA~20mA) 1 high-speed pulse input (0-50KHz)
	Output terminal	3 digital outputs (1 relay output, 2 smart digital outputs), 1 high-speed pulse output (0-50KHz), 1 analog output (voltage 0~+10V or current 4mA~20mA)
Man-machine Interface	Operation panel LED	Relevant parameters can be set, and output frequency, output voltage, output current and other parameters can also be displayed; The running state, fault state, and parameter setting state shall all have corresponding displays. Content: function, data, and unit.
Protection function		Overcurrent protection, overvoltage protection, undervoltage protection, overheating protection, overload protection, etc.
Place of use		Protected from direct sunlight, dust and corrosive environment
Environment	Altitude	Below 1000 m, no derating is required. For places with an altitude of more than 1,000 m, please reduce the rated voltage and rated output current by 1% for each additional 100 m. Consult the manufacturer for guidance when the altitude exceeds 3,000 m.
	Ambient temperature	-10°C ~ +40°C, when the ambient temperature exceeds 40°C, it needs to be derated for use. For every 1°C increase in ambient temperature, the derating will be 1%. Consult the manufacturer for guidance when the ambient temperature exceeds 50°C. If the ambient temperature is lower than -10°C, additional auxiliary heating equipment is required.
	Humidity	Less than 95%RH, no condensation of water droplets
	Storage	Storage temperature: -20℃~+60℃. Simultaneously, due to the inherent characteristics of the electrolytic capacitor, if the storage duration exceeds six months, it is necessary to power up the inverter for 10-30 minutes every six months to charge the

		electrolytic capacitor.
Other	Efficiency	＞98%
	Other interfaces	Interface for external keyboard
	Protection level	IP20
	Cooling mode	Forced air cooling
	Pollution level	2
	Noise	≤65db

1.6 Main technical characteristics

(1) The motor parameter self-learning can be completed in one step, with simple operation and strong adaptability to motors with different characteristics;

(2) Strong load capacity, able to start with load under 150% load condition;

(3) Good dynamic characteristics, strong resistance to load disturbance, and small speed fluctuation in case of sudden load change.

1.7 Heat output of inverter

Model	Applicable motor capacity [kW]	Heat output [kW]
GF630N01-0R4-4 V2	0.4	0.026
GF630N01-0R7-4 V2	0.75	0.033
GF630N01-1R1-4 V2	1.1	0.035
GF630N01-1R5-4 V2	1.5	0.040
GF630N01-2R2-4 V2	2.2	0.048
GF630N01-3R7-4 V2	3.7	0.132
GF630N01-5R5-4 V2	5.5	0.160
GF630N01-7R5-4 V2	7.5	0.191
GF630N01-011-4 V2	11	0.261
GF630N01-015-4 V2	15	0.351
GF630N01-018-4 V2	18.5	0.414
GF630N01-022-4 V2	22	0.532

1.8 Storage, transportation and installation of inverter

WARNING!

1. **Personnel who are untrained or unqualified to work on the devices or systems of the inverter, or who fail to adhere to the relevant provisions outlined in the "WARNING," may result in significant personal injury or substantial property damage. Only certified and qualified professionals, who have undergone training in the design, installation, commissioning, and running of the equipment, are authorized to work on the components and systems of this equipment.**
2. **The input power cord is only allowed to be permanently fastened, and the equipment must be reliably grounded.**
3. **Even if the inverter is not working, the following terminals may still carry dangerous voltages:**

- Power terminals R, S, and T

-Connected to the motor terminals U, V, and W

4. **After the power switch is disconnected, wait at least 10 minutes for the inverter to discharge completely before starting the installation operation.**
5. **The minimum cross-sectional area of the grounding conductor must be equal to or greater than that of the power supply cable.**

CAUTION!

1. **Hold the bottom of the body during handling.**

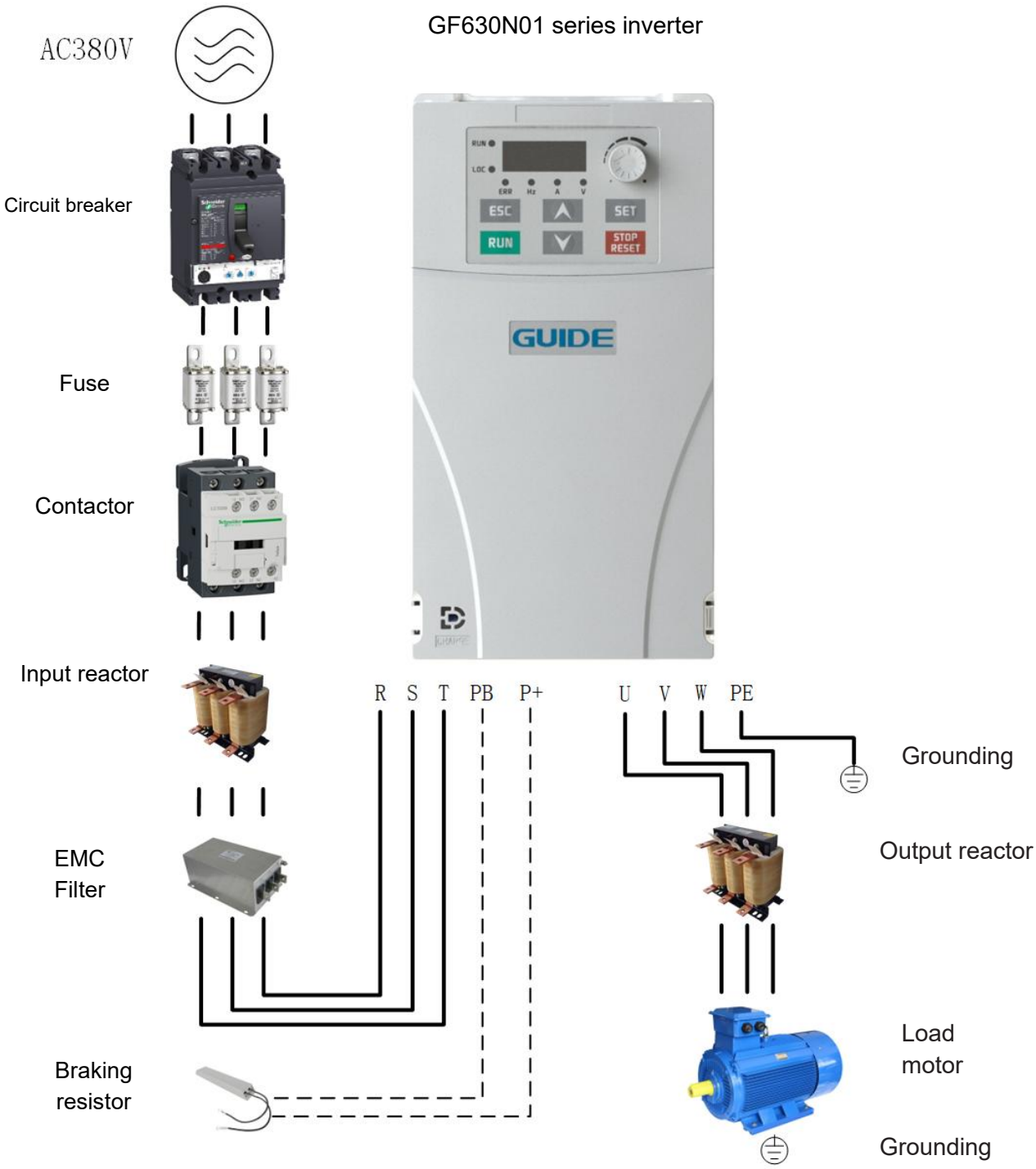
   If the panel alone is held, there is a risk of injury from the body falling onto your feet.
2. **Please install it on a plate of non-flammable material such as metal.**

   There is a risk of fire when installed on flammable materials.
3. **When more than two inverters are installed in the same control cabinet, please set a cooling fan and keep the air temperature at the air inlet below 40℃.**

   Fire and other accidents may occur due to overheating.

Chapter 2 System Connection

2.1System connection diagram



Instructions for use of peripheral electrical components of GF630N01 inverter system

2.2 System configuration description

Accessory name	Installation position	Function description
Circuit breaker	Between the power supply and the input side of the inverter	Short circuit breaker:cut off the power supply in case of overcurrent of downstream equipment to prevent accidents
		Leakage protection circuit breaker: high-frequency leakage current may be generated when the inverter is working. In order to prevent electric shock accidents and induced fires, please select and install a suitable leakage protection circuit breaker according to the site conditions.
Fuse	Between the power supply and the input side of the inverter	Prevent accidents due to short circuit and protect the subsequent semiconductor devices.
Contactor	Between the circuit breaker and the input side of the inverter	When the inverter is powered on and off, frequent power-up and power-off operations (with an interval of not less than one hour) or direct starting operations of the inverter through the contactor shall be avoided.
Input reactor	Input side of the inverter	Increase the power factor on the input side; Effectively eliminate high-order harmonics on the input side to prevent damage to other equipment due to voltage waveform distortion; Eliminate the input current imbalance caused by the phase imbalance of the power supply.
EMC filter	Input side of the inverter	Reduce the external conducted and radiated interference of the inverter; Reduce the conducted interference from the power supply end to the inverter and improve the anti-interference ability of the inverter.
Braking resistor	Output side of the inverter	Please select and use the braking resistor according to the manual; The motor consumes regenerative energy through the braking resistor during deceleration.
Output reactor	Between the output side of the inverter and the motor, installed close to the inverter	The output side of the inverter generally contains many higher harmonics. When the distance between the motor and the inverter is long, there is a large distributed capacitance in the line. One of the harmonics may produce resonance in the loop, which has two effects: a) The insulation performance of the motor is compromised, which may lead to long-term damage to the motor. b) Large leakage current is generated, causing frequent

		protection of the inverter. Generally, if the distance between the inverter and the motor exceeds 100m, it is recommended to install an output AC reactor.
Dv/dt reactor	Installed close to the inverter on the output side of the inverter	Optional dv/dt reactors protect motor insulation and reduce bearing current.
Output magnetic ring	Installed close to the inverter on the output side of the inverter	The output magnetic ring is mainly used to reduce the bearing current.
Motor	Output side of the inverter	Please select the suitable motor as recommended.

◆ Do not install a capacitor or surge suppressor on the output side of the inverter, otherwise it will cause the inverter to fail or the capacitor and surge suppressor to be damaged.

◆ The input/output (main circuit) of the inverter contains harmonic components, which may interfere with the communication equipment near the inverter.

◆ Anti-interference filters can be installed to minimize interference.

2.3 Wiring specification description

Power	Circuit breaker (A) Reference current	Input line/output line (mm2) (CEFR single-core cable 40% cycle operation)	Contactor (A) Rated operating current (AC-3)
0.4 kW	1.2	2.5	9
0.75 kW	2.5	2.5	9
1.1 kW	3	2.5	9
1.5 kW	3.7	2.5	9
2.2 kW	5	2.5	9
3.7 kW	9	2.5	12
5.5 kW	13	2.5	12

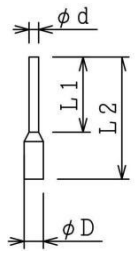
7.5 KW	17	2.5	18
11 KW	24	2.5	18
15 KW	32	4	32
18.5	37	4	50
22 KW	45	6	50

2.4 Control line wiring

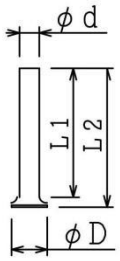
1. Recommended terminal

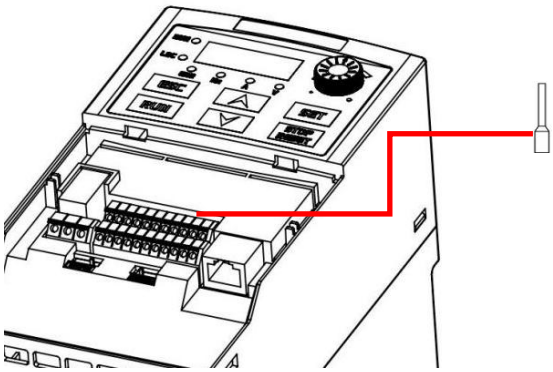
In order to facilitate wiring or better connectivity, it is recommended to use the following rod terminals for signal lines.

(1) Sheathed rod terminal

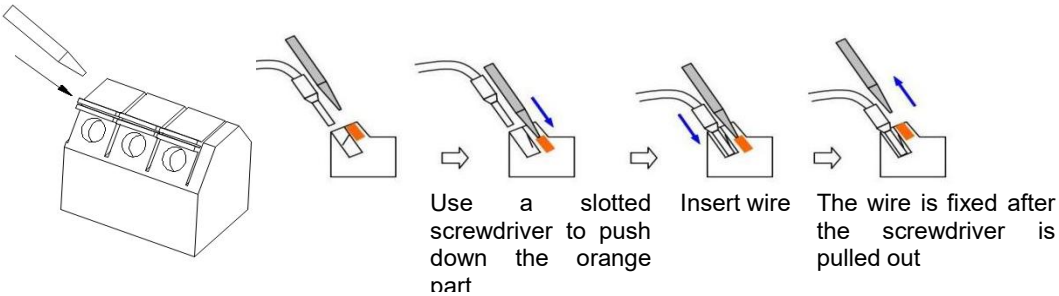
Wire specification mm^2 （AWG）	Rod terminal model*	L1 （mm）	L2（mm）	Φd（mm）	ΦD（mm）	
0.25（24）	AI 0.25-8YE	8	12.5	0.8	2	
0.34（22）	AI 0.34-8TQ	8	12.5	0.8	2	
0.5（20）	AI 0.5-8WH	8	14	1.1	2.5	
0.75（18）	AI 0.75-8GE	8	14	1.3	2.8	

(2) Unsheathed rod terminal

Wire specification mm^2 （AWG）	Rod terminal model*	L1 （mm）	L2（mm）	Φd（mm）	ΦD（mm）	
0.5（24）	A 0.5-8	7.3	8	1.0	2.1	
0.75（18）	AI 0.75-8	7.3	8	1.2	2.3	



2. Wiring method
(1) Use a slotted screwdriver to push down the orange part of the control loop terminal block. (Wire insertion port open)
(2) Use a screwdriver to push and insert the wire or rod terminal into the round hole.
(3) The wire is fixed automatically after the screwdriver is pulled out.



Note: To pull out the wire, do the same as above, and pull out the wire after the wire insertion port is opened.

2.5 Input and output AC reactor selection

Power	Input reactor 2% input voltage drop		Output reactor 1% output voltage drop	
	Current (A)	Inductance (mH)	Current (A)	Inductance (mH)
0.4 kW	2.2	6.37	1.8	3.89
0.75kW	3.0	4.67	2.6	2.69
1.1kW	4.0	3.50	3.3	2.12
1.5 kW	4.8	2.92	4	1.75
2.2 kW	6.8	2.06	5.7	1.22
3.7 kW	12.0	1.17	10.2	0.69
5.5kW	18.0	0.78	15	0.47
7.5KW	21.0	0.67	18	0.39
11KW	28.0	0.5	24	0.29
15KW	38.0	0.37	32	0.22
18.5KW	45.0	0.31	38	0.18
22KW	54.0	0.26	47	0.15

2.6 Braking resistor selection

Inverter Capacity	Braking resistor			
	Recommended resistance (Ω)	**Minimum resistance (Ω)**	**Power (KW) （30% Kc）**	**Power (KW) （50% Kc）**
0.4 kW	750	100	≥0.2	≥0.3
0.75kW	750	100	≥0.2	≥0.35
1.1 kW	400	100	≥0.4	≥0.5

1.5 kW	400	100	≥0.5	≥0.7
2.2 kW	250	78	≥0.8	≥1
3.7 kW	100	64	≥2.0	≥2.5
5.5kW	100	40	≥2.0	≥2.5
7.5KW	75	40	≥3.0	≥3.5
11kW	50	40	≥4.0	≥5.2
15kW	40	32	≥5	≥6.5
18.5kW	32	24	≥6	≥8.0
22kW	22	18	≥8	≥11

Note: 1. The inverter has a built-in braking unit, corresponding to 100% braking torque;

2. Kc: braking frequency, which refers to the proportion of the regeneration process in the whole motor working process;

3. The braking resistor power can be adjusted appropriately according to the actual application conditions.

Chapter 3 Installation and Wiring

3.1 Environmental requirements for running, storage and transportation of inverter

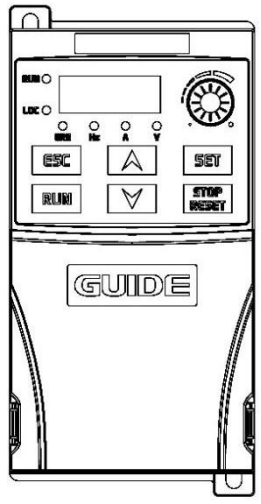
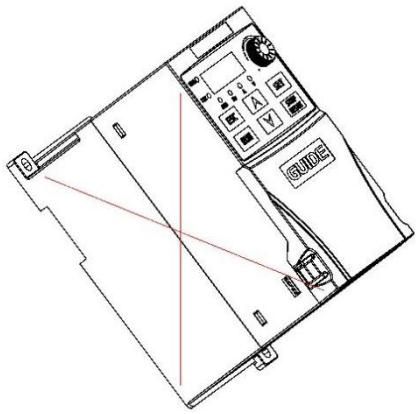
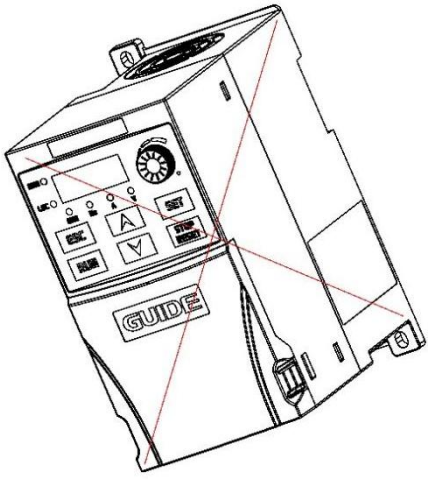
	Running	Storage	Transportation
Packaging	Fixed installation	In protective packaging	In manufacturer's standard packing case
Place	Place of installation: It shall be installed vertically on a solid base indoors, with a space of at least 10 cm at the inlet and outlet and at least 5 cm on the left and right sides of the case. The cooling medium is air. Avoid direct sunlight and external biological invasion. If the requirements cannot be met, additional protection is required.	Place of storage: Store in a clean, dry indoor place. The total delivery and storage duration shall not exceed 6 months.	Means of transport: In standard packing cases, vehicles, trains, airplanes, ships and other similar tools can be used for transportation.
Environment Temperature	-10°C ~ +40°C, when the ambient temperature exceeds 40°C, it needs to be derated for use. For every 1°C increase in ambient temperature, the derating will be 1%. Consult the manufacturer for guidance when the ambient temperature exceeds 50°C. If the ambient temperature is lower than -10°C, additional auxiliary heating equipment is required.	-20℃~+60℃, the air temperature change is less than 1℃/min.	-20℃～+60℃
Atmosphere Pressure	70～106 kPa 0.7~1.05 atmospheric pressure	70～106 kPa 0.7~1.05 atmospheric pressure	60～106 kPa 0.6~1.05 atmospheric pressure

Vibration	Sinusoid 10Hz≤f≤57Hz: amplitude:0.075mm 57Hz≤f≤150Hz: acceleration:9.8 m/s2	Sinusoid 10Hz≤f≤57Hz: amplitude:0.075mm 57Hz≤f≤150Hz: acceleration:9.8 m/s2	Random vibration: Random vibration severity level II for road transportation
Impact	Not allowed	Maximum value 100m/s2, 11ms	Maximum value 100m/s2, 11ms
Freedom Drop	Not allowed	250mm, when weight <100kg; 100mm, when weight ≥100kg.	250mm, when weight <100kg; 100mm, when weight ≥100kg.
Relative Humidity	Less than 95%RH, no condensation of water droplets		
Installation Height	Below 1000 m, no derating is required. For places with an altitude of more than 1,000 m, please reduce the rated voltage and rated output current by 1% for each additional 100 m. Consult the manufacturer for guidance when the altitude exceeds 3,000 m.		
Pollution level	Pollution level 2		
Gas Pollution	The place of use shall be free of oil mist, metal dust, dust suspension, corrosive gas, flammable and explosive gas. If it cannot be met, additional protection shall be provided.		

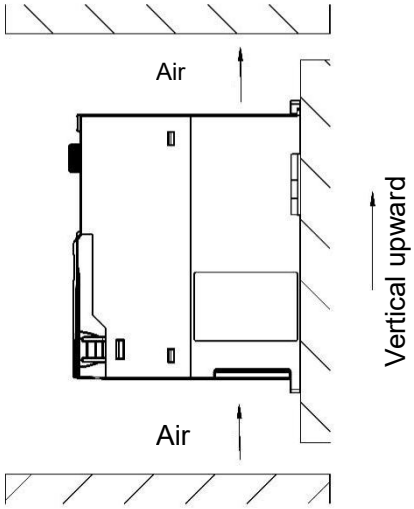
3.2 Installation space and direction

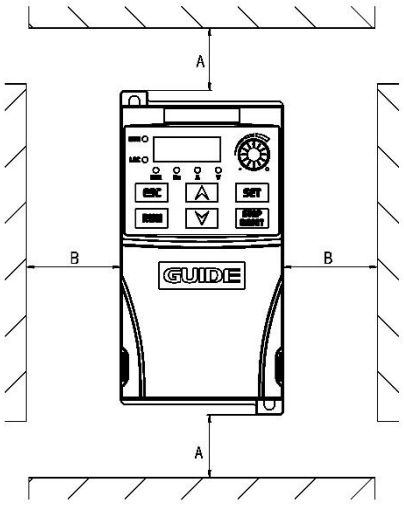
3.2.1 Installation direction

In order to facilitate the heat dissipation of the inverter, the inverter shall be installed in a vertical direction. Please check the installation position according to the following requirements.

Correct installation method	Incorrect installation method	
		

3.2.2 Installation method



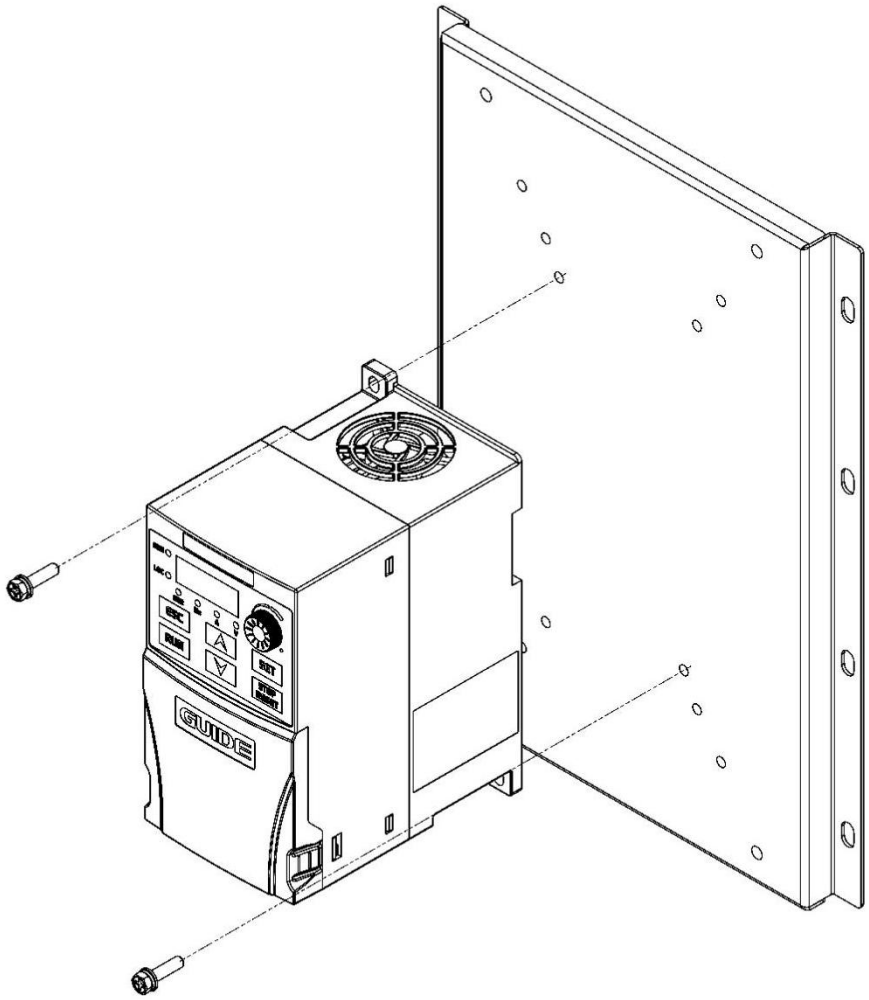


Model	Power range	Dimensional requirements (unit: mm)	
R1	0.4kW～2.2kW	A≥100	B≥20
R2	3.7kW～5.5kW	A≥100	B≥20
R3	7.5kW～11kW	A≥100	B≥20
R4	15kW～22kW	A≥200	B≥20

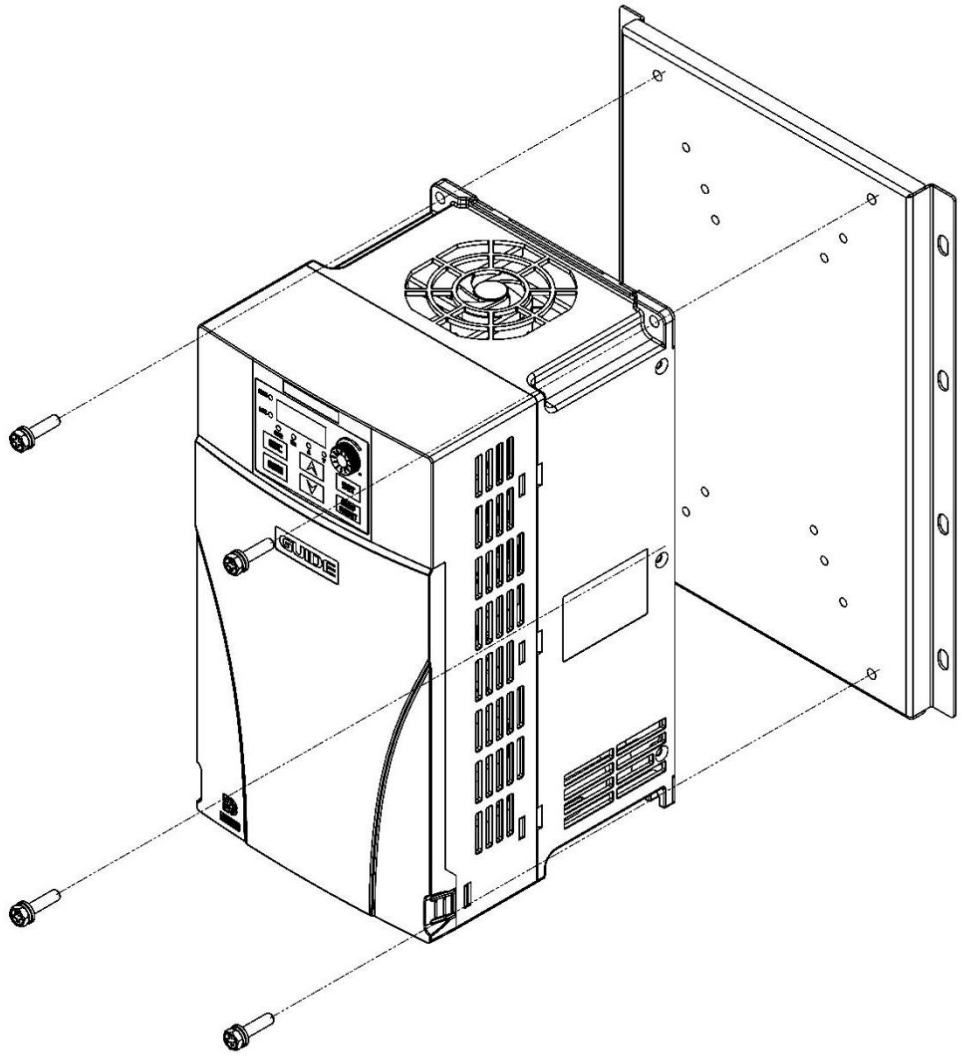
3.2.3 Installation guide

According to different power applications, space and other factors, please install the product according to the following installation guide.

Wall-mounted installation of R1 products:



Wall-mounted installation of R2/R3/R4 products:

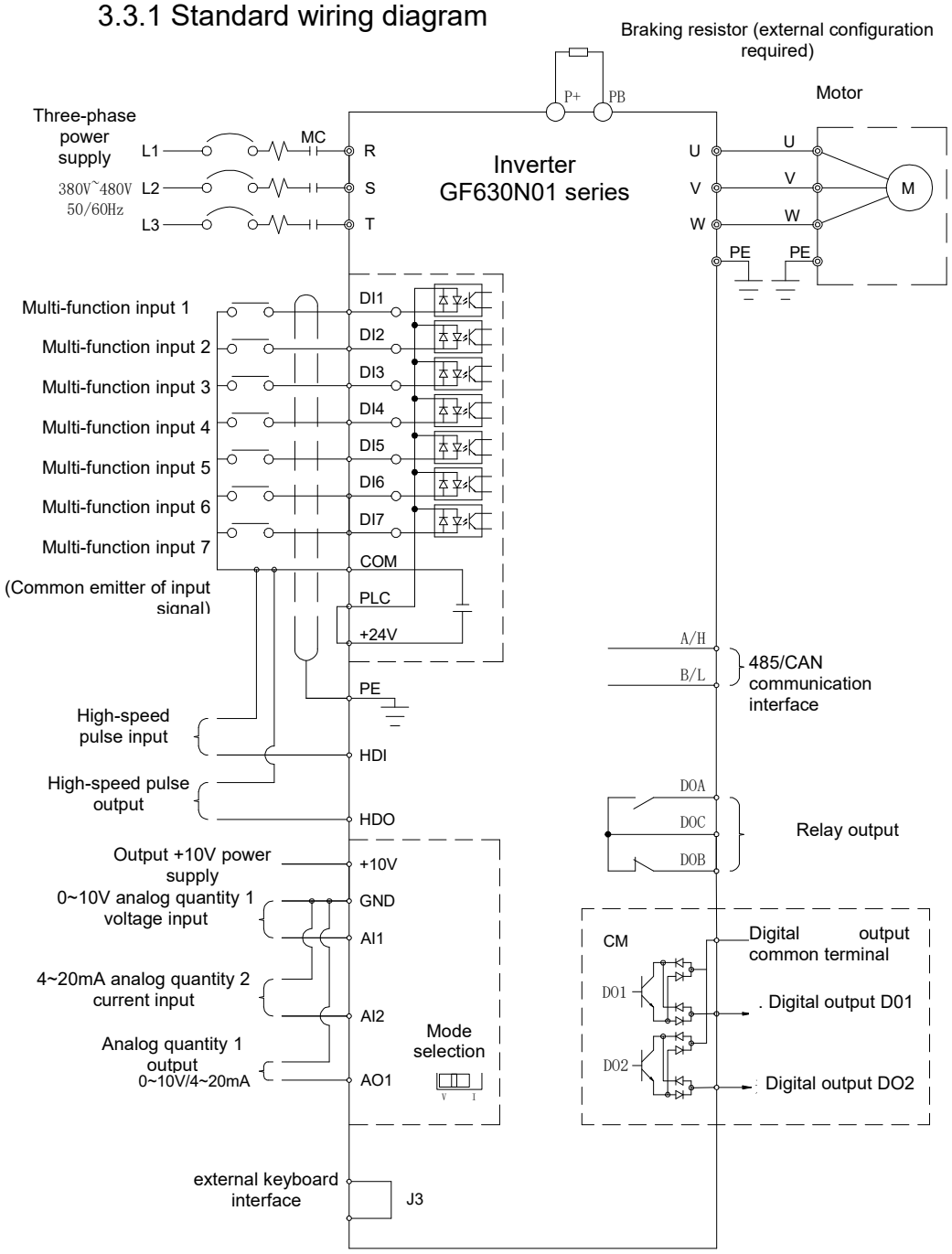


S/N	Applicable models	Power range	Fastening screw
1	R1	0.4kW～2.2kW	2-M5
2	R2	3.7kW～5.5kW	4-M5
3	R3	7.5kW～11kW	4-M5
4	R4	15kW～22kW	4-M5

Note: Installation torque M5: 20±2KGF.CM;

3.3 Wiring

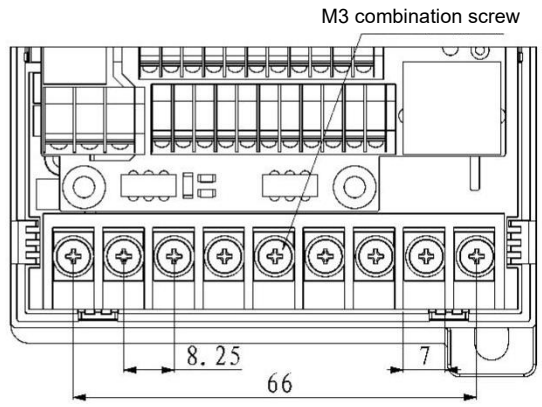
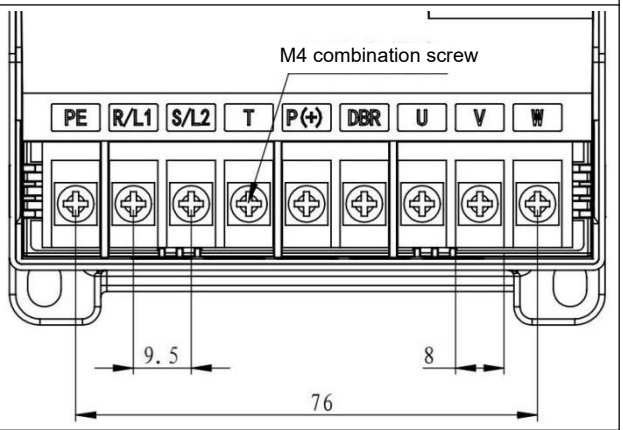
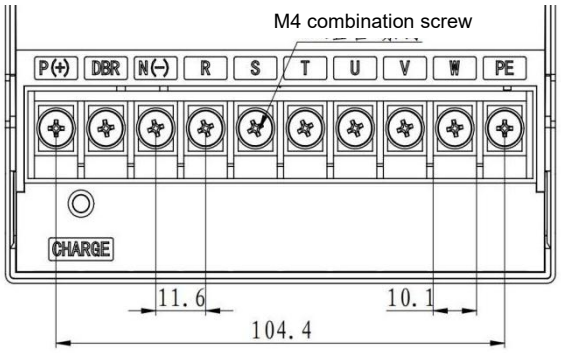
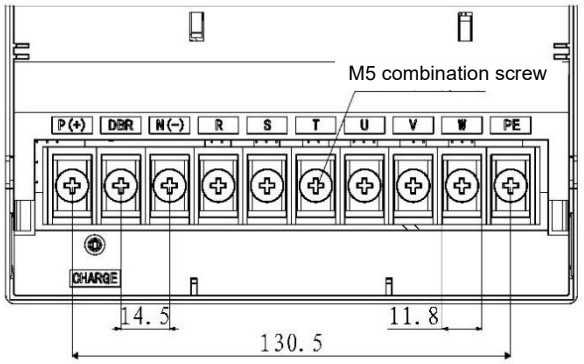
3.3.1 Standard wiring diagram



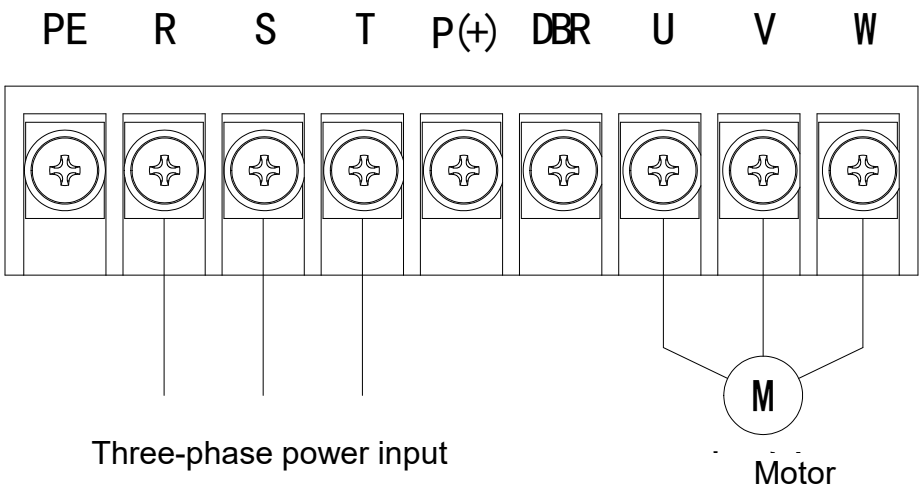
Typical wiring diagram of three-phase 380 ~480V

Note: - Shielding layer.

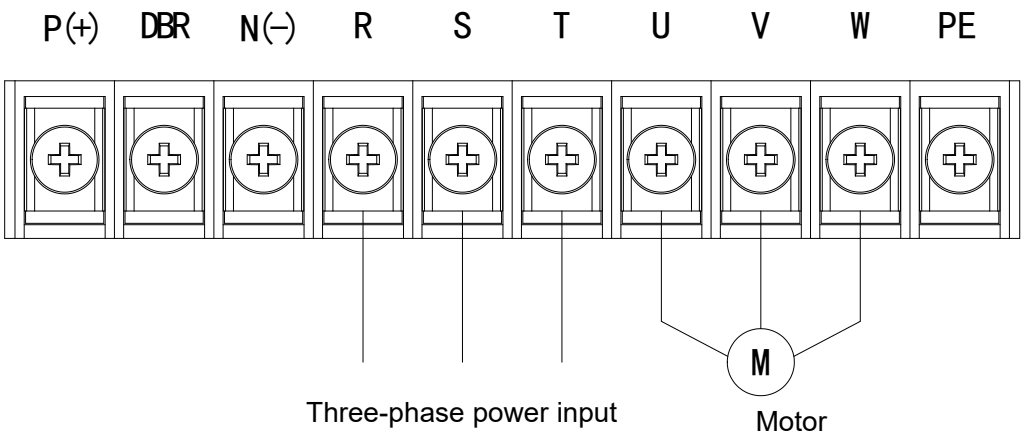
3.3.1 Main circuit terminal

Terminal distribution diagram of R1 main circuit	Terminal distribution diagram of R2 main circuit
	
Terminal distribution diagram of R3 main circuit	**Terminal distribution diagram of R4 main circuit**
	

The main wiring terminals of R1/R2 models are shown in the figure below:



The main wiring terminals of R3/R4 models are shown in the figure below:



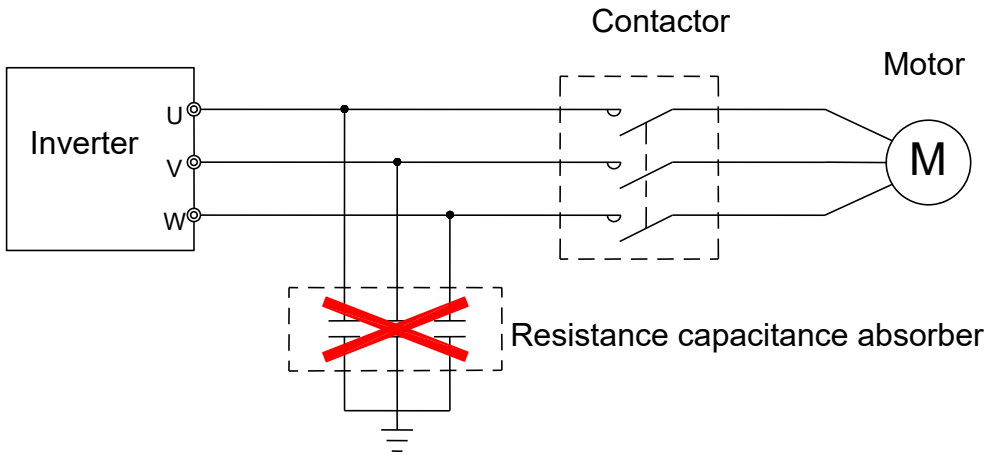
Terminal symbol	Function description
P(+)	DC side voltage positive terminal
N(-)	DC side voltage negative terminal
R. S. T	Three-phase AC input terminal, connected to the power grid
U. V. W	Three-phase AC output terminal, generally connected to the motor
DBR	Braking resistor terminal
PE	Grounding terminal

3.3.2 Precautions for wiring

S/N	Precautions for wiring	Remarks
1	Wiring must be carried out by qualified professional technicians.	
2	Before wiring, make sure that the power supply has been completely cut off for more than 10 minutes, otherwise there is a risk of electric shock.	
3	It is absolutely forbidden to connect the power cord to the output terminals U, V and W of the inverter.	
4	The inverter and the motor must be safely grounded.	
5	Ensure that an intermediate circuit breaker is connected between the inverter and the power supply to avoid expansion of the accident when the	

	inverter fails.	
6	When installing an electromagnetic contactor between the inverter and the motor, be sure to ensure the action timing of the contactor. The contactor can only act when the inverter has no output.	
7	The output terminals of the inverter U, V and W shall not be equipped with absorption capacitors or other resistance capacitance absorbers.	As shown in the figure below.
8	In order to reduce electromagnetic interference, please connect surge absorbers to the coils of electromagnetic contactors, relays and other devices in the circuits around the inverter.	
9	Use multi-core shielded cables or twisted pairs to connect the control terminals. During wiring, the control cable shall be more than 10 cm away from the main circuit and strong current lines (including power cords, motor lines, relays, contactor lines, etc.).	
10	The input and output circuits of the relay shall be wired with stranded wires or shielded wires of more than 0.75 mm^2. The shielding layer shall be connected to the grounding terminal of the inverter, and the wiring length shall be less than 50 m.	
11	The control line shall be separated from the main circuit power line, the parallel wiring shall be more than 10 cm apart, and the cross wiring shall be vertical.	
12	The connection between the inverter and the motor shall be less than 50 m. When the connection length is greater than 50 m, it is recommended to add an output reactor.	
13	All leads must be adequately fastened to the terminals to ensure good contact. The lead of the main circuit shall be cable or copper bar. When using cables, wiring must be carried out after cold pressing or welding with lugs of corresponding	

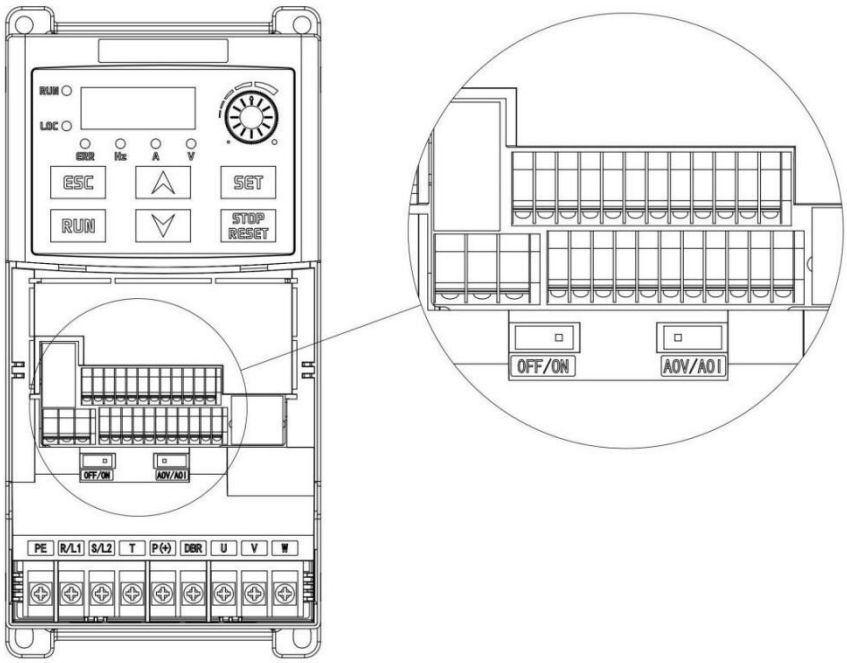
	sections.	
14	The withstand voltage of all leads must be consistent with the voltage level of the inverter.	
15	It is recommended to use shielded cables when the output cable (the connection between the inverter and the motor) is greater than 30 m.	



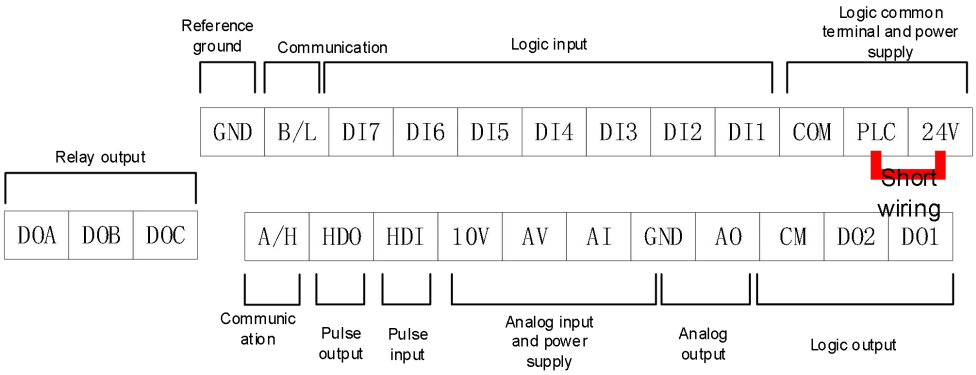
It is forbidden to connect the resistance capacitance absorber at the output end

3.3.3 Control board

3.3.3.1 Configuration of control loop terminal



Control terminal arrangement

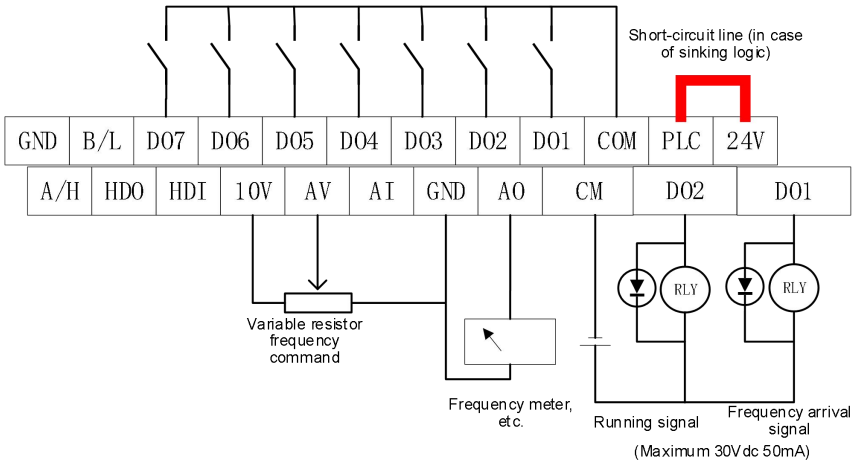


DIP switch arrangement

Category	Terminal identification	Terminal name	Terminal function description
Electric Source	10V—GND	10V reference power supply	Provide a 10V reference power supply externally, with a maximum output current of 10mA. It is generally used as an external potentiometer regulating power supply, and the potentiometer resistance is more than 5kΩ.
	24V—COM	24V power supply	Provide a 24V ±10% power supply externally, with a maximum output current of 200mA. Generally, it is used as a digital input and output working power supply or an external sensor power supply.
Analog input and output	AV—GND	Analog voltage input	1. Input range: voltage 0~10V 2. Input impedance:20kΩ 3. Resolution: When 10V corresponds to 50Hz, the minimum resolution is 0.01V. 4. Error ±1%, 25℃.
	AI—GND	Analog current input	1. Input range: current 4~20mA 2. Input impedance:250Ω 3. Resolution: When 20mA corresponds to 50Hz, the minimum resolution is 0.01mA. 4. Error ±1%, 25℃.
	AO—GND	Analog output	1. Output range:0~10V voltage or 4~20mA current 2. The voltage or current output is set by the DIP switch. 3. Resolution: 10-bit resolution with 1% accuracy. 4. Error ±1%, 25℃.
Digital input/output	DI1	Digital input 1	1. Internal impedance:3.3kΩ 2. Acceptable 12~30V voltage input 3. This terminal is a bidirectional input terminal 4. Maximum input frequency:1KHz. 5. It can be connected with 24V or COM through PLC to form NPN type or PNP type input
	DI2	Digital input 2	
	DI3	Digital input 3	
	DI4	Digital input 4	
	DI5	Digital input 5	
	DI6	Digital input 6	
	DI7	Digital input 7	
	HDI-COM	Digital input	High frequency pulse input channel. Maximum input frequency:50kHz Duty cycle: 20%~80%.
	DO1-CM	Smart digital output	1. Open interface output 2. Switch capacity:50mA/30V 3. Output frequency range:0~1kHz 4. When each terminal and CM are ON, the voltage drops below 4V
	DO2-CM	Smart digital output	

	HDO-COM	High-speed pulse output (FMP)	1. Maximum output frequency: 50kHZ; 1、Duty cycle: 30%~70%; 3. Open collector output, voltage range 0-30V
Relay output	DOA-D0C	Relay normally open contact	Relay output Contact capacity:3A/AC250V
	DOB-DOC	Relay normally closed contact	
485 communication	485+(A)/CAN-H	485 communication port	485 communication port, differential signal port, standard 485 communication interface using twisted pair or shielded wire (485 or CAN need to be specified when ordering)
	485-(B)/CAN-L		
RJ45 interface	RJ45 Interface	External keyboard interface	For external keyboard (LED)

(1) Wiring example of control loop terminals (sinking logic scenario)

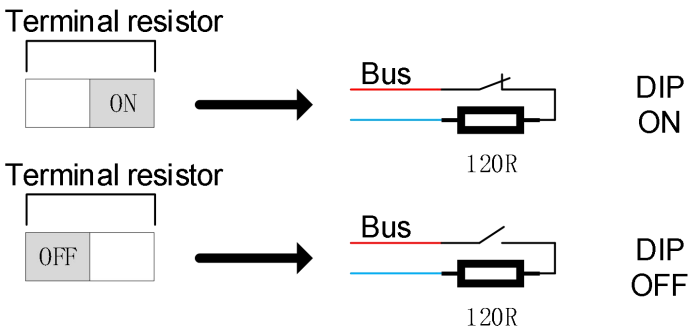


(Note) Calculate the resistance of the variable resistor when connecting it. If it is too small, the AI terminal may be damaged.
(Note) When using relays on smart output terminals (DO1, DO2), connect diodes for surge absorption in parallel on the coils. Because the surge voltage when the relay is ON and OFF will cause the output circuit to fail.

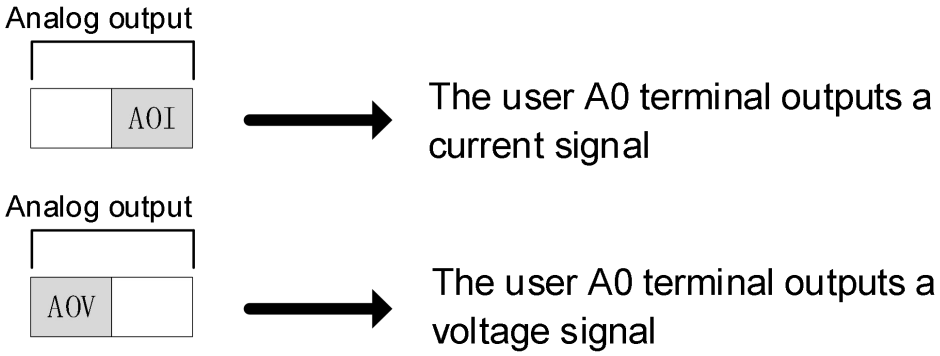
(2) Control logic switching method of smart input terminal
The factory setting of the smart input terminals is sinking logic. When switching the input control logic to sourcing logic, please remove the short-circuit line between the 24V terminal of the control loop and the PLC, and connect it between the PLC and COM.

Sinking logic Sourcing logic

(Note) Calculate the resistance of the variable resistor when connecting it. If it is too small, the AI terminal may be damaged.
(Note) When using relays on smart output terminals (DO1, DO2), connect diodes for surge absorption in parallel on the coils. Because the surge voltage when the relay is ON and OFF will cause the output circuit to fail.
(3) Operation method of terminal resistor DIP switch
The 485/CAN communication terminal resistor DIP switch is below the user terminal. When the driver is at the end of the bus, when the communication is unstable or the communication is not available, the terminal resistor DIP button can be toggled to ON position, and the terminal resistor is connected to the end of the bus; When the driver is in the middle of the communication bus, it is forbidden to fluctuate the terminal resistor DIP switch to ON position.



(4) Operation method of analog output DIP switch
The analog output selection terminal is below the user terminal. When the analog output DIP switch is toggled to the AOI position, the user AO terminal outputs a 4-20mA current signal; When the analog output DIP switch is toggled to the AOV position, the user AO terminal outputs a 0-10V voltage signal.



3.3.3.2 Control loop wiring description

Principles to be followed

Analog input AI, output AO signals, digital input DI, output DO signals, relay output signals, when wiring the control loop, need to be separated from the main circuit RST, UVW, and other power cables or electrical cables by at least 20CM, otherwise, the control signals will be interfered with.

Analog input terminal AV and AI wiring

Weak analog signals are susceptible to external interference. The cabling shall be as far away from the interference source as possible, and the wiring distance shall be as short as possible, not more than 20 m. In some occasions where analog signals are seriously interfered, filter capacitors or ferrite cores shall be added to the analog signal source side; As shown in the figure below

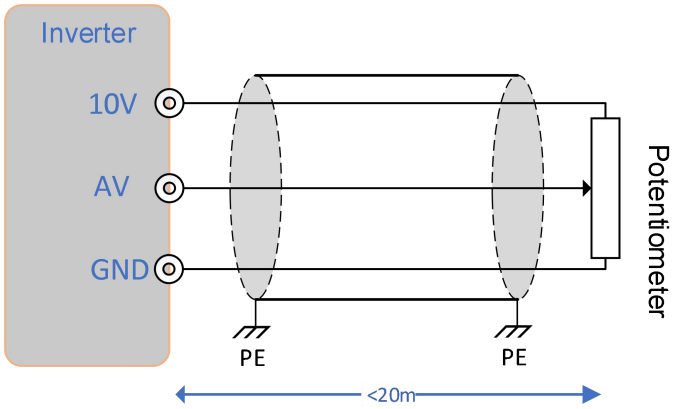


Diagram of AV wiring

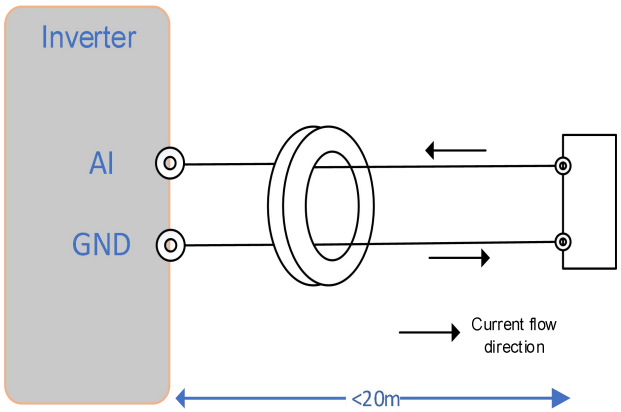
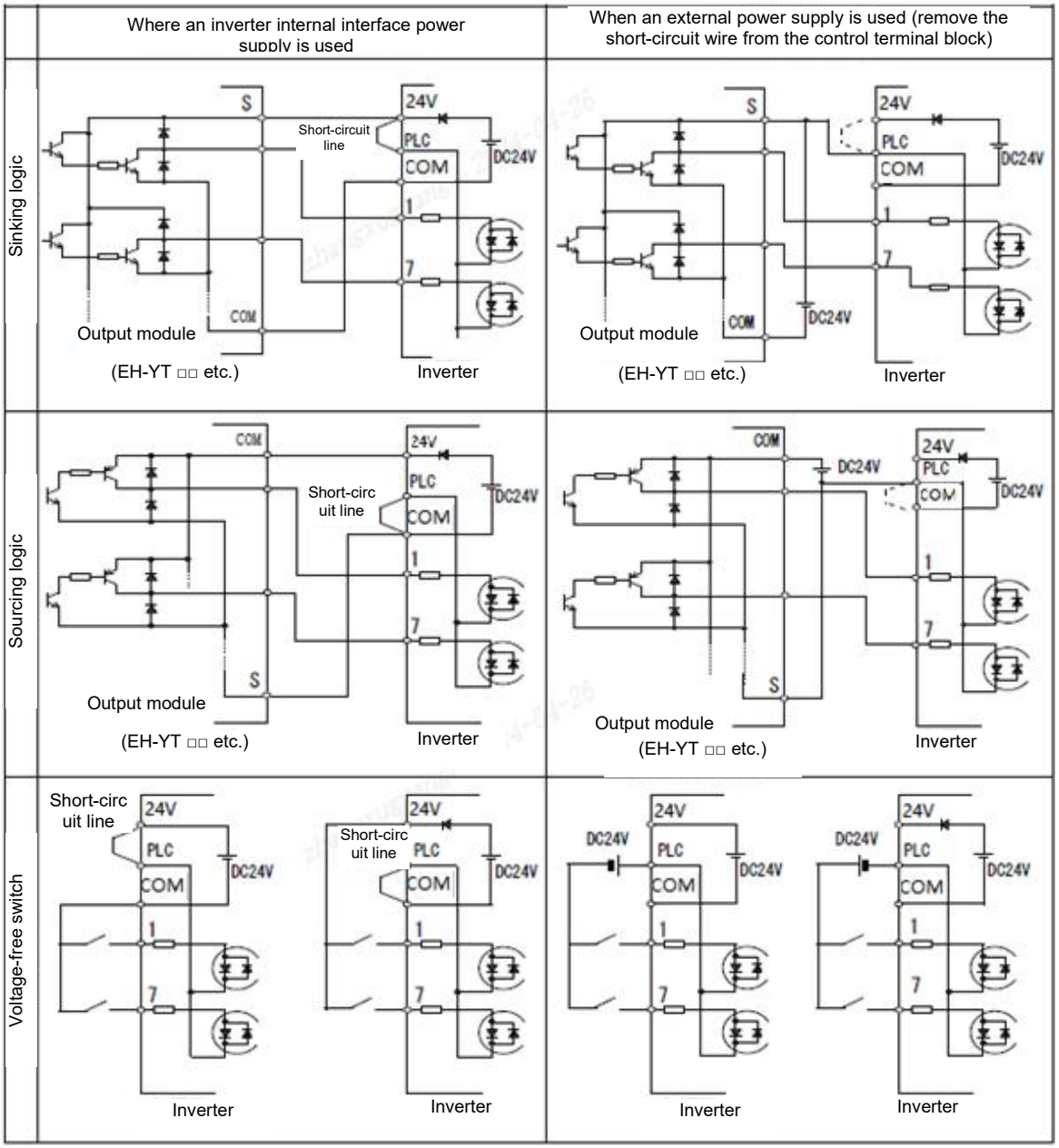


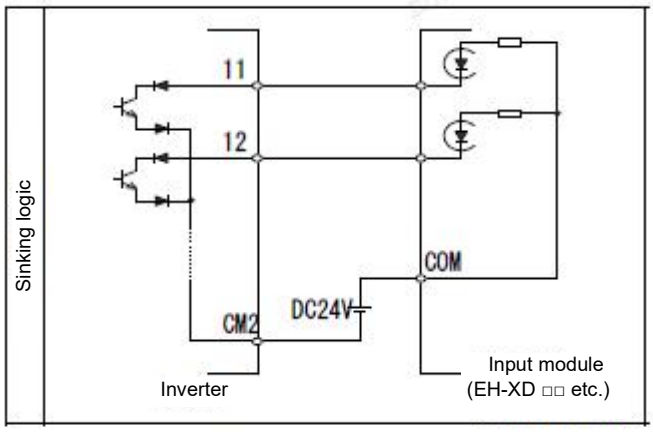
Diagram of AI wiring

Note: The signal lines need to pass through or wind 2~3 turns in the same direction

3.3.3.3 Connection of input terminal and logic control system



3.3.3.4 Connection of output terminal and logic control system

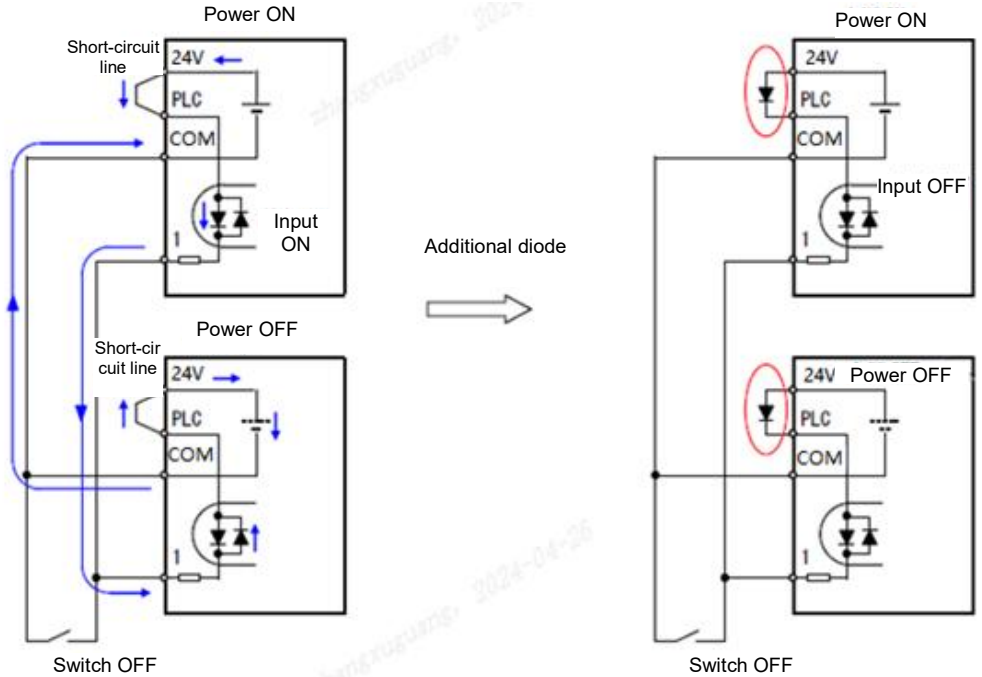


Note: The smart output terminal is an open collector output, the power supply is externally powered (24~30V), and the maximum current is 50mA.

3.3.3.5 Precautions for using multiple inverters

When multiple inverters use a common input (switch, etc.) and the power is turned on at different time points, the current backflow as shown in the figure below may occur. Although the input is OFF, it may be distinguished as ON. In this case, connect a diode (rated 50V/0.1A) in the circle shown in the figure below to prevent current backflow.

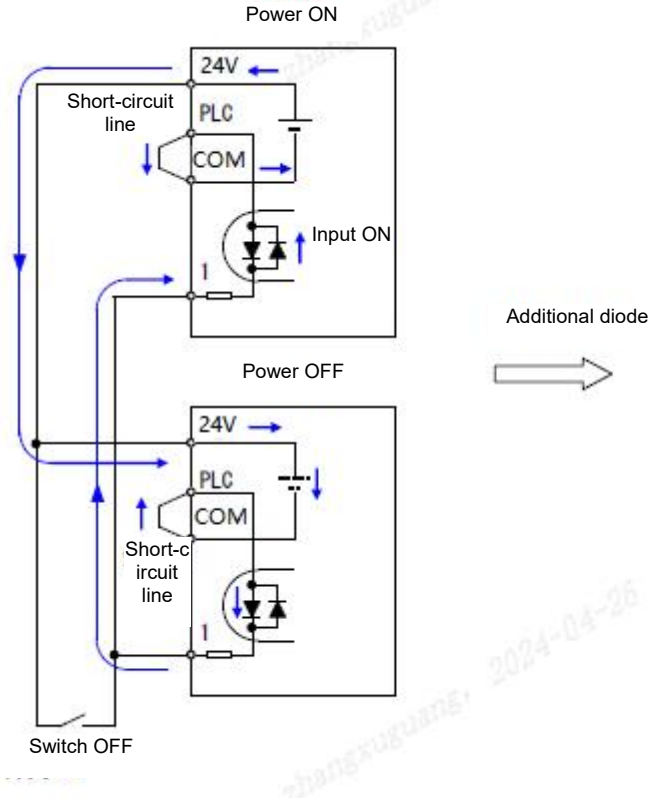
Case of sinking logic



When the switch is OFF and there is no diode, it will cause backflow, causing the input to be recognized as ON

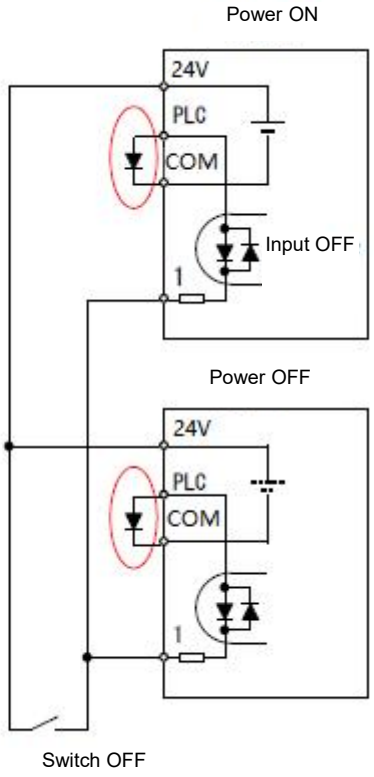
To prevent current backflow, replace the short-circuit line with a diode

Case of sourcing logic



When the switch is OFF and there is no diode, it will cause backflow, causing the input to be recognized as ON

Additional diode

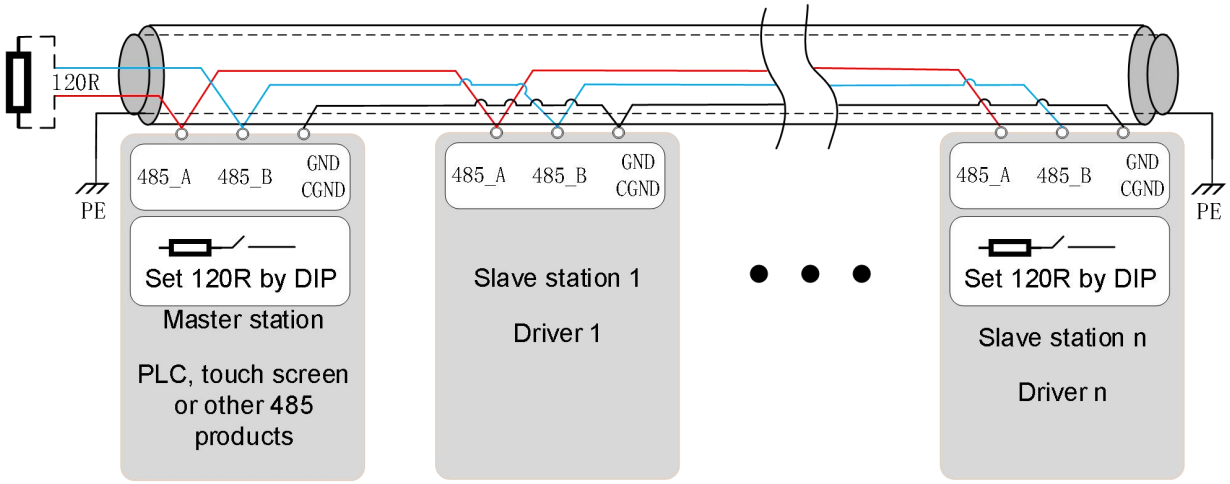


To prevent current backflow, replace the short-circuit line with a diode

3.3.4 Communication cable

3.3.4.1 RS485 communication cable

For the RS485 bus, please use a standard 120 ohm impedance three-core shielded cable. This product has three connecting cables, which are connected to terminals 485_A, 485_B and GND in turn. 485_A and 485_B are connected by twisted pair, the other cable is connected to the 485 reference ground GND, and the shielding layer is connected to the equipment ground. In the electrical system shown in the figure below, the terminal resistance of the left equipment is set by DIP or external, and the terminal resistance of the right device is set by DIP. The 485 wiring is hand-in-hand daisy-chained. It is forbidden to connect multiple drives to a node to form a star connection.



RS485 bus connection topology

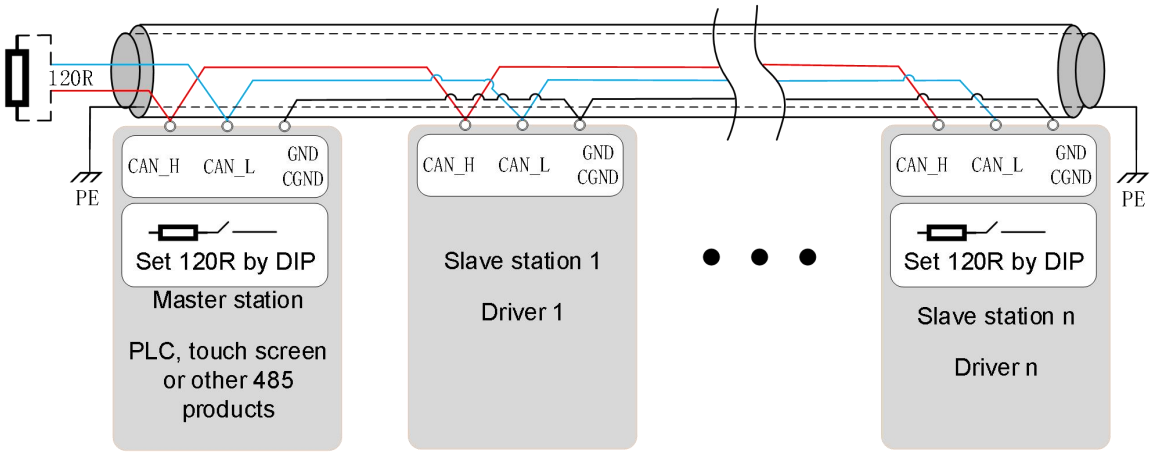
The maximum number of nodes and transmission distance supported by our standard RS485 circuit at different rates are shown in the table below. In cases of strong interference and extremely harsh electromagnetic environments, it is recommended to appropriately add relays or other filtering equipment.

Transmission distance (m)	Rate (kbps)	Number of nodes (pcs)	Wire diameter
100	115.2	128	AWG26
1000	19.2	128	AWG26

RS485 bus transmission distance and number of nodes

3.3.4.2 CAN communication cable

The CAN bus must be connected in the form of daisy chain, and the connection topology is shown in the figure below. It is recommended to use shielded twisted pair for CAN bus, and CANH and CANL are connected by twisted pair. In the figure below, the terminal resistance on the left is set by DIP or external, and the terminal resistance on the right is set by DIP. The CAN signal reference ground of all nodes is connected together, and up to 64 nodes are connected.



CAN bus connection topology diagram

The transmission distance of the CAN bus is directly related to the baud rate and communication cable. The relationship between the maximum bus length and the baud rate is shown in the table below. In the case of strong interference and extremely harsh electromagnetic environment, it is recommended to add relay or other filtering equipment appropriately.

Transmission distance (m)	Rate (kbps)	Number of nodes (pcs)	Wire diameter (mm2)
25	1000	64	0.205
95	500	64	0.34
560	100	64	0.5
1100	50	64	0.75

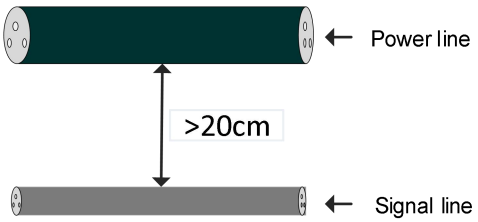
CAN bus transmission distance and number of nodes

3.3.5 Cable routing

3.3.5.1 Specification description

●Main circuit wiring requirements

The power input lines of the inverter and the motor cables generate strong electromagnetic interference. To avoid the electromagnetic interference caused by the coupling of strong interference cables and the control loop running in parallel for long distances, the main circuit cables and signal cables shall be spaced more than 20 cm apart during wiring. Common main circuit cables include input RST line, output UVW line, DC bus and brake cable, and signal cables include IO signal line and communication line. The cables and trunking must be well connected and grounded. The aluminum trunking can guarantee the equipotential of the equipment. The inverter and motor shall be well lapped with the system (machinery or device), the installed part shall be sprayed for protection, and the conductive metal shall be fully contacted.



Cable routing diagram

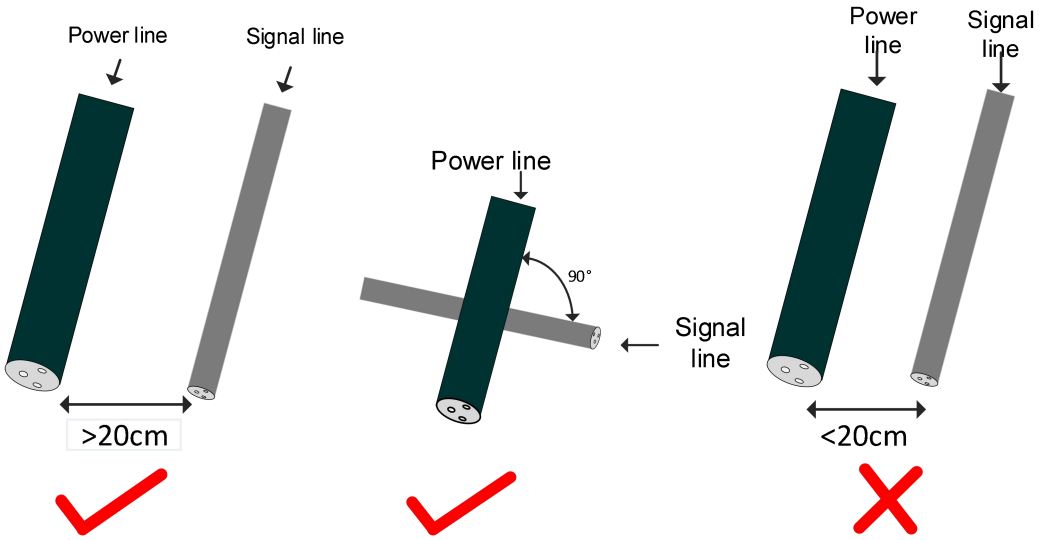
●IO signal wiring requirements

IO signals include analog input AI and output AO signals, digital input DI and output DO signals, and relay output signals. When wiring the IO signal cables, they shall be separated from the main circuit wiring (RST, UVW) and other power lines or power lines by at least 20 cm, otherwise the IO signal will be interfered.

3.3.5.2 Recommendations for wiring

●Routing of interfering cables and sensitive wires

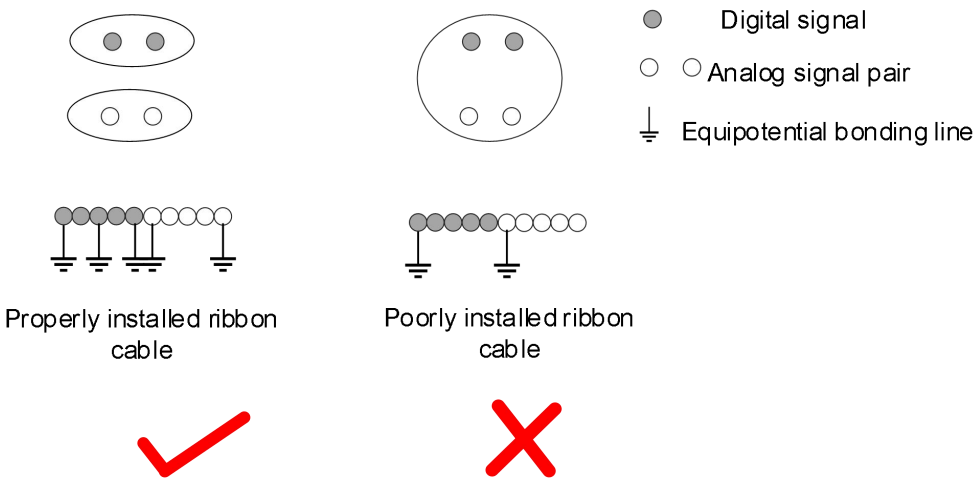
Cables transmitting different types of signals shall be separated during wiring. A certain distance must be kept between interference cables and sensitive cables. If the wiring space is sufficient, a distance of 20 cm is recommended; If the two types of cables must cross, they shall be intersected at right angles to avoid interference, as shown in the figure below.



● Routing of different types of signal cables

It is recommended that different types of signal cables be arranged separately and separated from each other by equipotential signals. For the cable arrangement of the same type of signal, the outer layer is the equipotential signal cable, and as much equipotential signal arrangement as possible is considered in the middle, as shown in the figure below.

Diagram of different types of signal cable routing



●Multi-core cable routing

For multi-core cables, it is recommended that one cable transmit a single type of signal. If it is necessary to transmit different types of signals with one cable, a cable with shielded internal core must be used, as shown in the figure below.

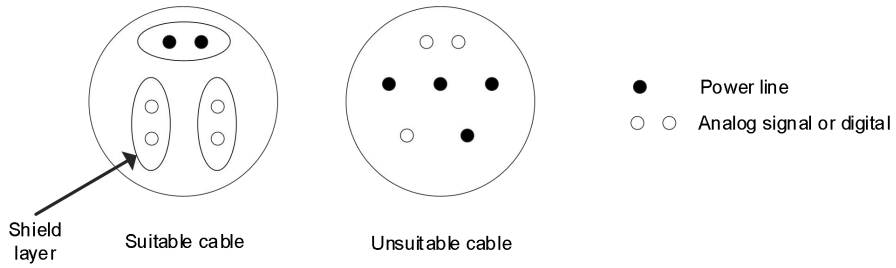


Diagram of multi-core cable routing

Chapter 4 Operation Panel

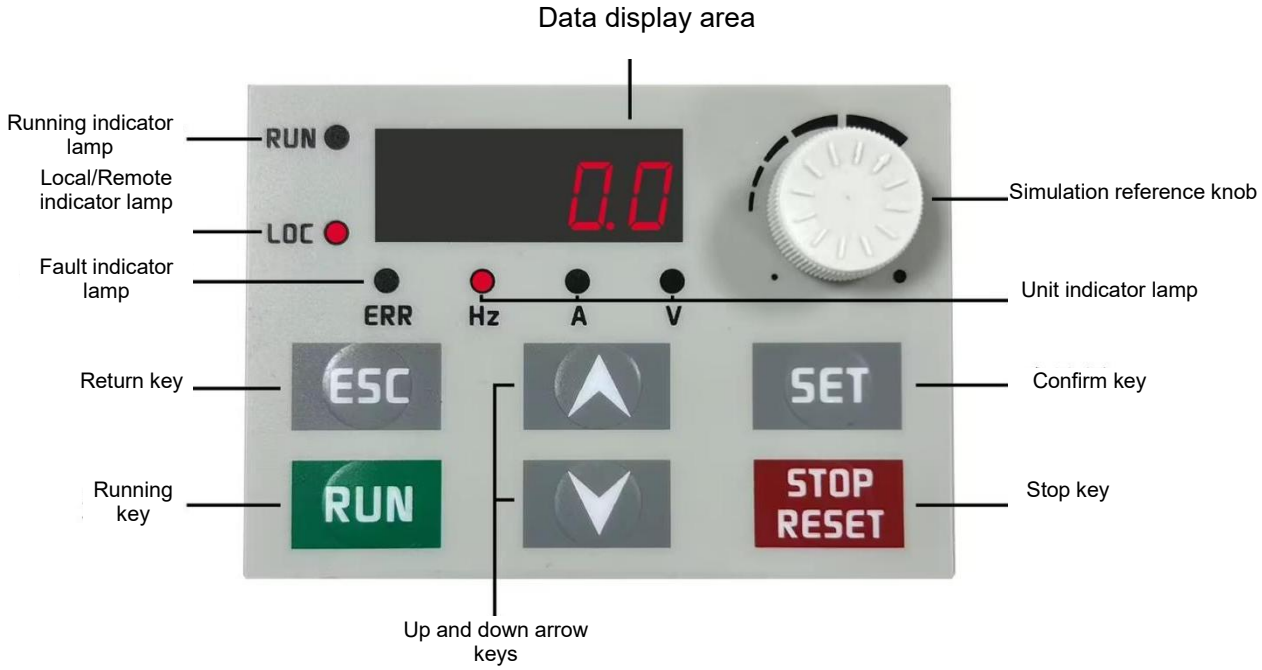
4.1 Description of operation panel

The GF630N01 series inverter allows for parameter viewing, modification, and other functions through the LED operation panel.

4.2 LED operation panel

4.2.1 Introduction to LED operation panel interface

The following figure shows the appearance of the operation panel and the introduction of key functions



(1) LED operation panel indicator lamp

Status indicator lamp:

"RUN" indicator lamp:It comes on when the motor is running, otherwise it goes out

"REV" running direction indicator lamp: It comes on when the motor rotates reversely, otherwise it goes out

"LOCAL" local/remote indicator lamp: It comes on when the local mode is selected, and off when the remote mode is selected

"ERR" fault/tuning indicator lamp: It flashes when the system fails or parameter self-learning is in progress, and goes out in other cases

Unit indicator lamp:

"HZ" indicator lamp: It comes on when the current display parameter unit is Hz or RPM, otherwise it goes out

"A" indicator lamp: It comes on when the current display parameter unit is A, RPM, or %, otherwise it goes out

"V" indicator lamp: It comes on when the current display parameter unit is V or %, otherwise it goes out

(2) LED operation panel LED display

Data display area

There are 5 LED displays on the operation panel, which can display the set frequency, output frequency, various monitoring data and alarm codes. The following figure shows the corresponding table with LED display

Display text	LED display	Display text	LED display	Display text	LED display	LED display text	LED display
0		A		K		U	
1		B		L		V	
2		C		M	No	W	No
3		D		N		X	No
4		E		O		Y	
5		F		P		Z	No
6		G		Q			
7		H		R			
8		I		S			
9		J		T			

Keyboard keys area

Keys	Key name	Key function
	Menu key	Press this key to enter or exit the primary menu. Press the ESC key in the monitoring interface to enter the primary menu, and press the ESC key in the primary menu interface to return to the monitoring display interface.
	Frequency reference adjustment	After the parameter is initialized, adjust this knob to change the reference frequency

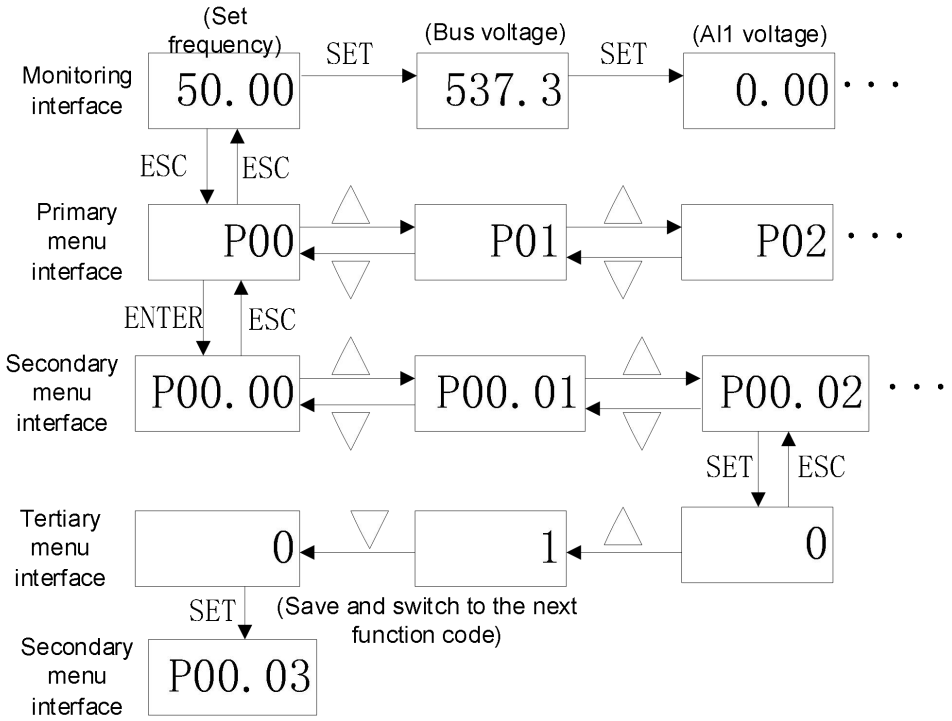
	knob	
	Up key	Scroll up the menu or set the parameter+1
	Down key	Scroll down the menu or set parameters-1
	OK key	Enter the menu interface step by step and set the parameters. Press the SET key in Level 0 menu to switch the displayed parameters.
	Running key	Start the motor
	Stop key	Stop motor/Fault reset

4.2.2 Composition description of LED operation panel menu

（1） Standby state and no user password set

In the standby state, the LED panel display is in the monitoring interface or function code view/edit interface. The switching logic between the key and the display interface is shown in the following figure:

Key and display interface switching logic description



Key and display interface switching logic description

In the standby state, the monitoring interface is entered by default after power up and the set frequency is displayed. Press the SET key in the monitoring interface to switch to display other parameters. The parameters that can be displayed in the standby state are set by the function code P02.05.

In the monitoring interface, press the ESC key to enter the primary menu interface of the function code, and press the up (▲)/down (▼) arrow key in the primary menu interface to modify the group number of the function code to be viewed. Press the ESC key on the primary menu interface to return to the monitoring interface.

In the primary menu interface, press the SET key to enter the secondary menu interface. In the secondary menu interface, press the Up (▲)/Down (▼) arrow key to modify the function code number and group number to be viewed. The default edit bit of the secondary menu interface (the edit bit corresponding to the flashing digital tube) is ones digit. In the secondary menu interface, press the Up (▲) + Down (▼) keys simultaneously to switch the edit bit to the hundreds digit, and then press the Up (▲)/Down (▼) arrow keys to edit the hundreds digit; After the hundreds digit editing is completed, press the SET key to switch the edit bit to the tens digit, and then press the Up (▲)/Down (▼) arrow key to edit the tens digit; After the tens digit editing is completed, press the SET key to switch the edit bit to the ones digit, and then press

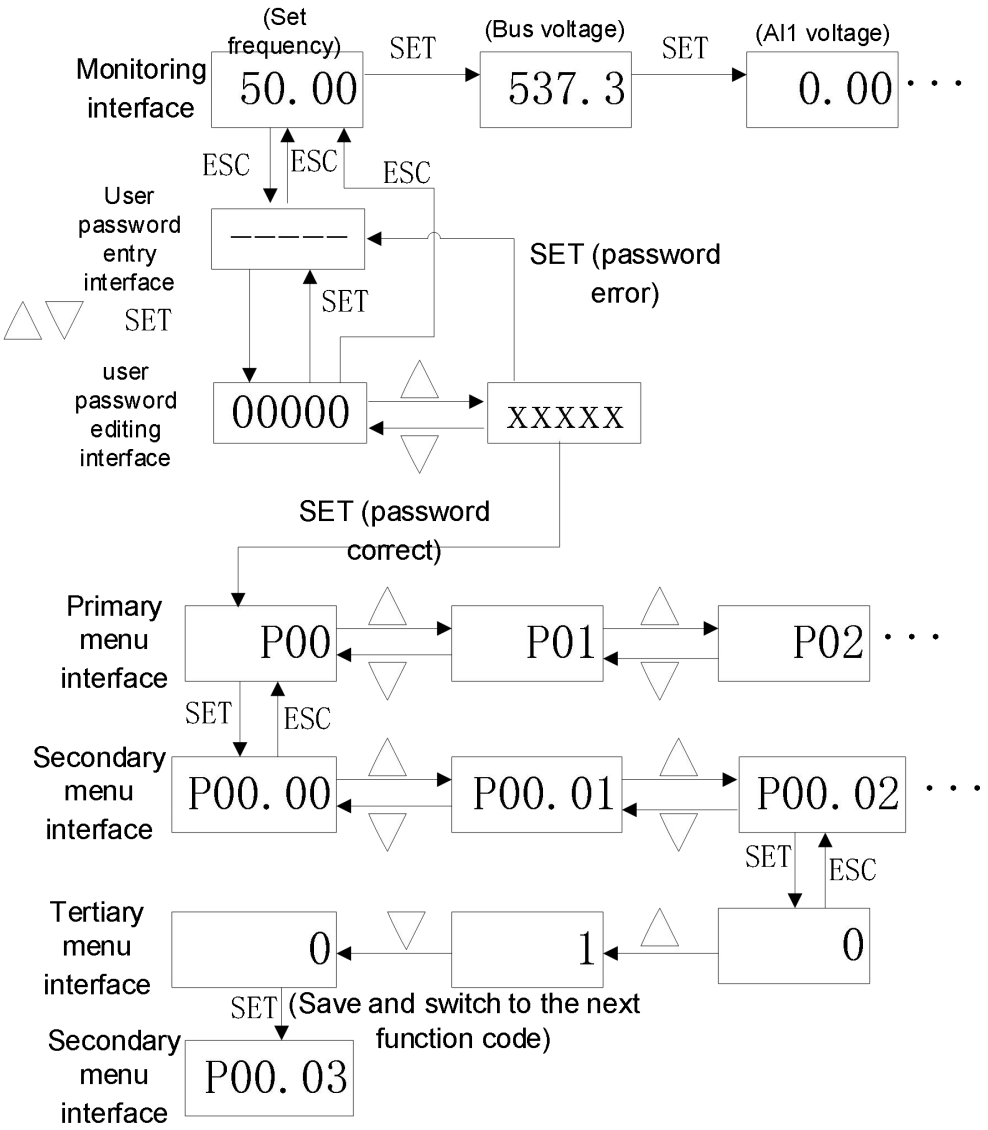
the Up (▲)/Down (▼) arrow key to edit the ones digit; After the ones digit editing is completed, press the SET key to enter the tertiary menu and display the value of the function code. In the secondary menu interface, press the ESC key to return to the primary menu interface.

In the secondary menu interface, press the SET key to enter the tertiary menu interface and display the current function code value and unit (unit indicator). If the current function code is editable, press the Up (▲)/Down (▼) arrow keys to modify the function code value. The default edit bit of the tertiary menu interface (the edit bit corresponding to the flashing digital tube) is ones digit. In the tertiary menu interface, press the Up (▲) + Down (▼) keys simultaneously to switch the edit bit to the leftmost highest digit. Assuming the tertiary menu displays a total of 5 digits, press the Up (▲) + Down (▼) keys simultaneously to switch the edit bit to the myriabit, and then press the Up (▲)/Down (▼) arrow keys to edit the myriabit; After the myriabit editing is completed, press the SET key to switch the edit bit to the thousands digit, and then press the Up (▲)/Down (▼) arrow key to edit the thousands digit; After the thousands digit editing is completed, press the SET key to switch the edit bit to the hundreds digit, and then press the Up (▲)/Down (▼) arrow key to edit the hundreds digit; After the hundreds digit editing is completed, press the SET key to switch the edit bit to the tens digit, and then press the Up (▲)/Down (▼) arrow key to edit the tens digit; After the tens digit editing is completed, press the SET key to switch the edit bit to the ones digit, and then press the Up (▲)/Down (▼) arrow key to edit the ones digit; After the ones digit editing is completed, press the SET key to save the modified value and automatically switch to the secondary menu interface corresponding to the next function code. In the tertiary menu interface, press the ESC key to discard the current changes and return to the secondary menu interface.

（2） Standby state and user password set

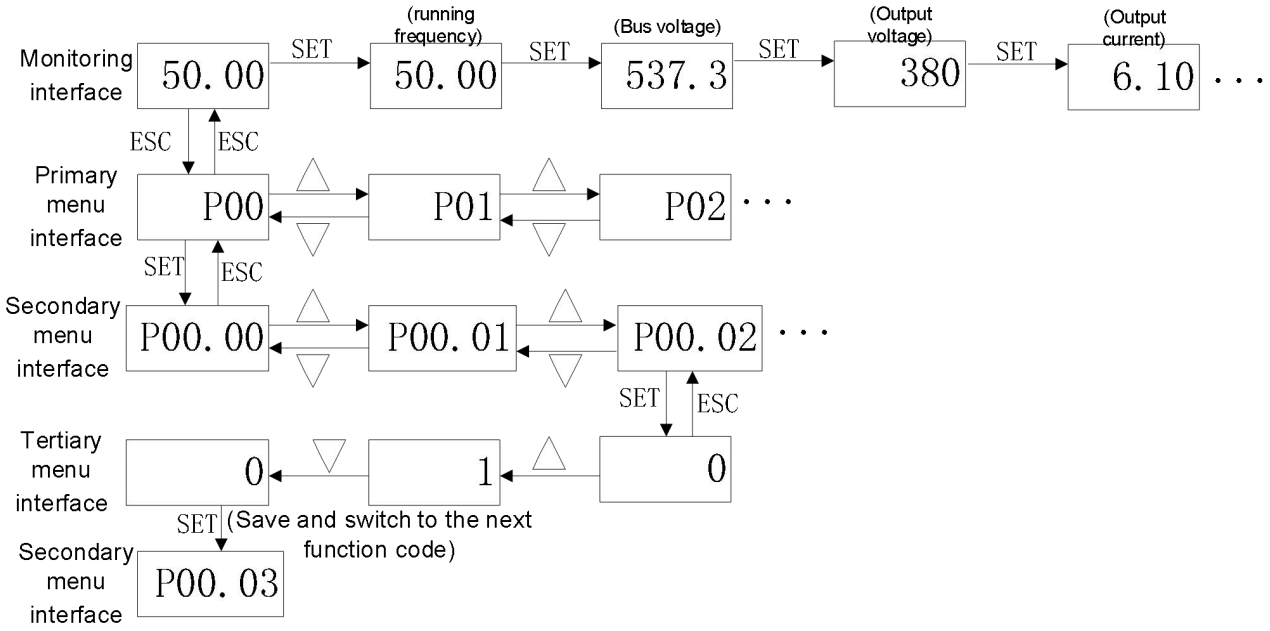
If a user password is set, it is required to enter the user password when switching from the monitoring interface to the function code primary menu interface in the standby state. In the monitoring interface, press the ESC key to enter the user password entry interface. In the user password entry interface, press any key in Up (▲)/Down (▼)/SET to enter the user password editing interface. The default edit bit of

the interface (the edit bit corresponding to the flashing digital tube) is ones digit. Press the Up (▲) + Down (▼) keys simultaneously to switch the edit bit to the myriabit, and then press the Up (▲)/Down (▼) arrow keys to edit the myriabit; After the myriabit editing is completed, press the SET key to switch the edit bit to the thousands digit, and then press the Up (▲)/Down (▼) arrow key to edit the thousands digit; After the thousands digit editing is completed, press the SET key to switch the edit bit to the hundreds digit, and then press the Up (▲)/Down (▼) arrow key to edit the hundreds digit; After the hundreds digit editing is completed, press the SET key to switch the edit bit to the tens digit, and then press the Up (▲)/Down (▼) arrow key to edit the tens digit; After the tens digit editing is completed, press the SET key to switch the edit bit to the ones digit, and then press the Up (▲)/Down (▼) arrow key to edit the ones digit; After the ones digit editing is completed, press the SET key, and if the password is correct, it will automatically enter the primary menu interface. Operation and display logic of other keys are the same as above.


(Set frequency)
Monitoring interface
50. 00
SET
(Bus voltage)
537. 3
SET
(AI1 voltage)
0. 00
ESC
ESC
ESC
User password entry interface
SET
SET
SET (password error)
user password editing interface
00000
XXXXX
SET (password correct)
Primary menu interface
P00
P01
P02
SET
ESC
Secondary menu interface
P00. 00
P00. 01
P00. 02
SET
ESC
Tertiary menu interface
0
1
0
SET
(Save and switch to the next function code)
Secondary menu interface
P00. 03

（3） Running state

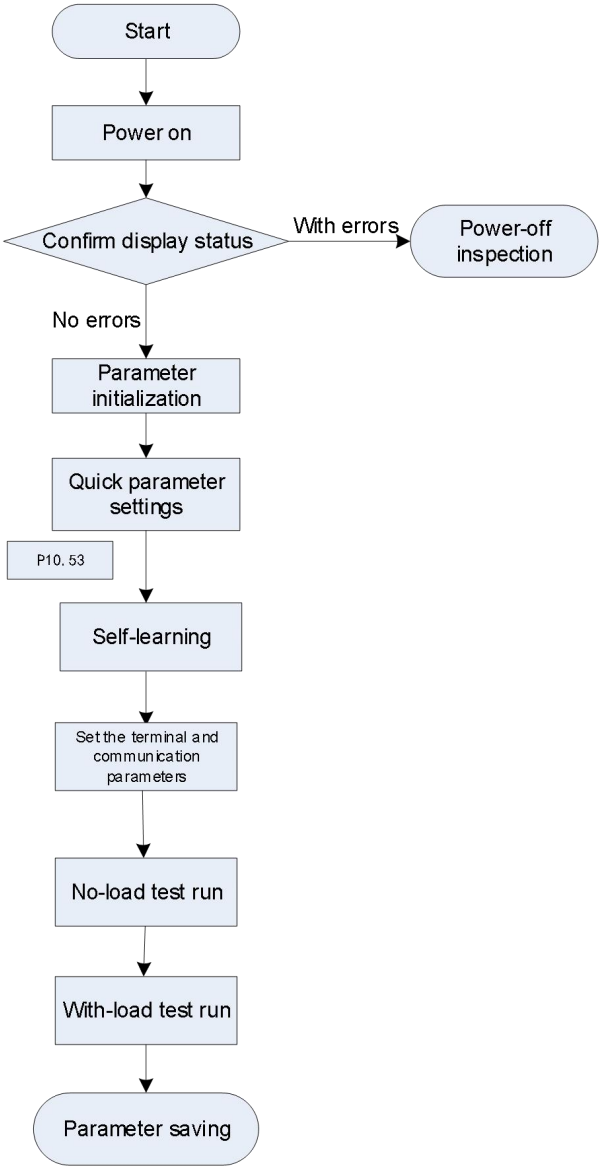
In the running state, the LED panel display is in the monitoring interface or function code view/edit interface. The switching logic between the key and the display interface is similar to that in the standby state, but the parameter categories that can be displayed on the monitoring interface in the running state are different from those in the standby state. In the running state, the parameters that can be displayed on the monitoring interface are set by function codes P02.03 and P02.04.



Chapter 5 System Commissioning of Inverter

5.1 Test run sequence of inverter

Please carry out the test run according to the flow chart shown below.



5.2 Confirmation items before power on

Please make sure to confirm the following items before turning on the power. Please make sure to confirm the following items before turning on the power.

Item	Description
Confirmation of power supply voltage	Whether the power supply voltage is within the allowable range, three-phase AC380~480V 50/60Hz;
Confirmation of the connection between the output terminals of the frequency converter and the motor terminals	Is the connection between the output terminals (U, V, W) of the motor and the motor good;
Confirm the connection with terminals of the frequency converter control circuit	Whether the control terminals of the frequency converter are well connected to other control devices;
Load confirmation	Whether the motor is in the no-load state (mechanical state not connected).

5.3 Confirmation of display status and initialization of parameters after power on

Display status of LED operation panel:

When the power is turned on, the keyboard digital tube displays the default frequency of 50.00 under normal conditions.

When a fault occurs, the keyboard digital tube displays the corresponding DTC, which starts with E.

Parameter initialization

By setting the function code P00.01, the parameters can be initialized and the parameter values can be restored to the default values.

Function code	Setting range	Factory default
P00.01	0: No operation 1: Restore factory parameters (excluding motor parameters) 2: Clear the recorded information (historical fault, cumulative run time, etc.)	0

5.4 Quick parameter settings

In open-loop vector mode, set the following parameters to start parameter self-learning.

Function code	Name	Description	Set value
P08.10	Maximum frequency (Hz)	The maximum frequency is the default reference set by analog quantity/multi-segment speed/pulse/communication, and also the default reference of acceleration/deceleration time	50[Hz]
P08.12	Upper limit frequency (Hz)	Upper limit of frequency set by the inverter	
P10.17	Motor rated power (KW)	Set the motor rated power with reference to the motor nameplate	
P10.18	Motor rated voltage (V)	Set the motor rated voltage with reference to the motor nameplate	
P10.19	Motor rated current (A)	Set the motor rated current with reference to the motor nameplate	
P10.20	Motor rated frequency (Hz)	Set the motor rated frequency with reference to the motor nameplate	
P10.21	Motor rated speed	Set the motor rated speed (r/min) with reference to the motor nameplate	
P08.01	Control mode selection	[0] Open-loop vector [1] Closed-loop vector [2] V/F control Set according to requirements	0

In V/F mode, set the following parameters to test run the motor.

Function code	Name	Description	Set value
P08.1	Maximum frequency	The maximum frequency is the default	50[Hz]

0	(Hz)	reference set by analog quantity/multi-segment speed/pulse/communication, and also the default reference of acceleration/deceleration time	
P08.12	Upper limit frequency (Hz)	Upper limit of frequency set by the inverter	
P10.17	Motor rated power (KW)	Set the motor rated power with reference to the motor nameplate	
P10.18	Motor rated voltage (V)	Set the motor rated voltage with reference to the motor nameplate	
P10.19	Motor rated current (A)	Set the motor rated current with reference to the motor nameplate	
P10.20	Motor rated frequency (Hz)	Set the motor rated frequency with reference to the motor nameplate	
P10.21	Motor rated speed (r/min)	Set the motor rated speed with reference to the motor nameplate	
P08.01	Control mode selection	[0] Open-loop vector [1] Reserved [2] V/F control Set according to requirements	2

5.5 Motor parameter self-learning and test run

Self-learning mode	Key operation points	Remarks
On-load self-learning	1. Set the control mode and motor parameters; 2. Set P10.53 to 1, press the ENTER key, the panel displays TUNE, and enter the parameter self-learning interface; 3. Press the RUN key to start the parameter self-learning. During the self-learning process, the ERR status light flashes slowly, and it automatically returns to the standby interface after the self-learning	The on-load self-learning is applicable to non-light-load occasions where the motor cannot be disconnected from the load. The following motor parameters can be obtained through on-load self- learning: 1. Asynchronous motor stator resistance (P10.22); 2. Asynchronous motor rotor resistance (P10.23); 3. Asynchronous motor leakage inductance (P10.24).

No-load self-learning	1. Set the control mode and motor parameters; 2. Set P10.53 to 2, press the ENTER key, the panel displays TUNE, and enter the parameter self-learning interface; 3. Press the RUN key to start the parameter self-learning. During the self-learning process, the ERR status light flashes slowly, and it automatically returns to the standby interface after the self-learning	The no-load self-learning is applicable to occasions where the motor can be disconnected from the load or the load is light. The following motor parameters can be obtained through no-load self-learning: 1. Asynchronous motor stator resistance (P10.22); 2. Asynchronous motor rotor resistance (P10.23); 3. Asynchronous motor leakage inductance (P10.24); 4. Asynchronous motor mutual inductance (P10.25); 5. Asynchronous motor no-load current (P10.26);

（1） Precautions before implementing self-learning mode

The GF630N01 series inverter provides parameter self-learning function. Accurate parameter self-learning comes from the correct setting of motor nameplate parameters. In order to ensure the control performance, please configure the motor according to the standard adaptive motor of the inverter. If the difference between the motor power and the standard adaptive motor is too large, the control performance of the inverter will decrease significantly.

Please confirm the following four items before motor self-learning

Inspection items	Inspection precautions
Whether the motor shaft is connected to other mechanical equipment	If the motor shaft can be disconnected from the load, it is recommended to perform no-load self-learning; If the motor shaft cannot be disconnected from the load, it is recommended to perform on-load self-learning.
Whether the motor capacity and the inverter capacity are greatly different	If the motor power is too small compared with the inverter power, the motor self-learning may not be completed normally (the motor power shall not be less than 1/5 of the inverter power).

Confirm whether the motor parameter input is correct	Whether the parameters of group P10 are consistent with the motor nameplate parameters, such as rated power, voltage, current and speed. If the input is incorrect, the self-learning may fail or the motor cannot run normally.

（2） No-load test run:

The following describes the test run method of the motor under no-load condition.

Before running, confirm the safety around the motor and machinery, and confirm whether the emergency stop circuit and mechanical safety device can act correctly. During running, confirm whether the rotation of the motor is normal (whether there is abnormal sound and vibration), and whether the acceleration and deceleration of the motor are normal.

The operation steps when using the operation panel are as follows

	Operation	**Precautions**
Step 1	Turn on the power supply and display the initial screen	
Step 2	If local control is selected, the LOCAL indicator lamp will light up;	
Step 3	Press the UP/DOWN key on the operation panel to set the reference speed to 5 Hz	
Step 4	Press the RUN key to run the inverter. The RUN indicator lamp is on, and the motor rotates forward	Confirm that the motor rotates in the correct direction and the inverter has no fault display;
Step 5	If there is no fault in step 4, gradually increase the frequency reference value to 50Hz	Confirm the output current through the operation panel to ensure that the current does not exceed the rated current of the motor;
Step 6	After confirmation, press the STOP key to stop running.	

（3） With-load test run:

The following describes the test run method of the motor under load condition.

Description		Operation	Remarks
Mechanical system connection		Please confirm the safety around the motor and machinery	
		Please confirm that the motor stops completely	
		Please connect the mechanical system	
		Please confirm whether the mounting screws are loose and fix the motor shaft and mechanical system firmly	
		Please confirm whether the emergency stop circuit and mechanical side safety device act correctly	
		To prevent abnormal situations, please be prepared to press the STOP key on the operation panel at any time	
Running steps	Step 1	Turn on the power supply and display the initial screen	
	Step 2	If local control is selected, the LOCAL indicator lamp will light up	
	Step 3	Press the UP/DOWN key on the operation panel to set the reference speed to 5 Hz	
	Step 4	Press the RUN key to run the inverter. The RUN indicator lamp is on, and the motor rotates forward	Confirm that the motor rotates in the correct direction and the inverter has no fault display;
	Step 5	If there is no fault in step 4, gradually increase the frequency reference value to 50Hz	Confirm the output current through the operation panel to ensure that the current does not exceed the rated current of the motor;
	Step 6	After confirmation, press the STOP key to stop running.	
		Whether the acceleration and deceleration of the motor are normal	

Running confirmation items	Whether the mechanical movement direction is correct (whether the rotation direction of the motor is correct);
	Whether the acceleration and deceleration of the motor are normal.
	Confirm whether the output current is too high
	Change the frequency command and rotation direction to confirm whether there is abnormal sound and vibration

Chapter 6 Inverter Function Code Parameter Table

The grouping of function codes for GF630N01 Inverter is as follows:

Function group	Description	Function grou	Description
P0	Parameter control group	P13	Motor 2 vector control group
P2	Panel settings group	P14	Basic communication parameter group
P3	Digital input terminal group	P15	PID module group
P4	Digital output terminal group	P16	Mathematical operation module
P5	Analog and pulse input terminal group	P19	Analog advanced settings
P6	Analog and pulse output terminal group	P20	Torque control
P7	Protection parameter group	P21	Advanced control parameters
P8	Motor start-stop control group	P23	Status monitoring group
P9	Swing frequency and segment speed group	P28	Motor 3 parameter group
P10	V/F and motor 1 parameter group	P29	Motor 4 parameter group
P11	Motor 2 parameter group	P30	Motor 3 vector control group
P12	Motor 1 vector control group	P31	Motor 4 vector control group

The symbols in the function table are described as follows

"☆": It indicates that the set value of this parameter can be changed when the inverter is in the shutdown or running state;

"★": It indicates that the set value of this parameter cannot be changed when the inverter is in the running state;

"●": It indicates that the value of this parameter is the actual test record value and

cannot be changed;

"*": It indicates that the parameter is a "manufacturer parameter", which is only set by the manufacturer and forbidden to be operated by the user;

6.1 Parameter control P0

Function code	Name	Setting range	Factory defaul	Change
P00.00	User password	0～65535	0	☆
P00.01	Parameter initialization	0: No operation 01: Restore factory parameters, excluding motor parameters 02: Clear record information	0	★
P00.02	Function parameter group display selection	Ones digit: Groups P23 and P27 display selection 0: No display 1: Display Tens digit: Groups P11, P13, P16, P19, P20, P28, P29, P30, and P31 display selection	11	☆
P00.03	Reserved			
P00.04	Function code modification attributes	0: Modifiable 1: Not modifiable	0	☆

6.2 Panel settings group P2

Function	Name	Setting range	Factory	Change
P02.00	Reserved			
P02.02	STOP key function	0: The STOP key shutdown function is valid only in the keyboard operation mode 1: The STOP key shutdown function is valid in any operation mode	1	☆
P02.03	LED running display parameter 1	0000～FFFF Bit00: running frequency 1 (Hz) Bit01: Set frequency (Hz) Bit02: Bus voltage (V) Bit03: Output voltage (V) Bit04: Output current (A) Bit05: Output power (kW) Bit06: Output torque (%) Bit07: DI input state Bit08: DO output state Bit09: AI1 voltage (V) Bit10: AI2 voltage (V) Bit11: AI3 (knob) voltage (V) Bit12: Count value Bit13: Length value Bit14: Load speed display Bit15: PID setting	1F	☆

P02.04	LED running display parameter 2	0000～FFFF Bit00: PID feedback Bit01: PLC stage Bit02: PULSE input pulse frequency (kHz) Bit03: running frequency 2 (Hz) Bit04: remaining run time Bit05: AI1 voltage before calibration (V) Bit06: AI2 voltage before calibration (V) Bit07: AI3 (knob) voltage before calibration (V) Bit08: Linear velocity Bit09: Current power-up time (Hour) Bit10: current run time (Min) Bit11: PULSE input pulse frequency (Hz) Bit12: Communication setting value Bit13: Encoder feedback speed (Hz) Bit14: Main frequency X display (Hz) Bit15: Auxiliary frequency Y display (Hz)	0	☆
P02.05	LED shutdown display parameter	0000～FFFF Bit00: Set frequency (Hz) Bit01: Bus voltage (V) Bit02: DI input status Bit03: DO output status Bit04: AI1 voltage (V) Bit05: AI2 voltage (V) Bit06: AI3 (knob) voltage (V) Bit07: Count value Bit08: Length value Bit09: PLC stage Bit10: Load speed Bit11: PID setting Bit12: PULSE input pulse frequency (kHz)	33	☆
P02.06	Load speed indication factor	0.0001～6.5000	1	☆

P02.07	Inverter module radiator temperature	0.0℃～100.0℃	-	●
P02.08	Reserved			
P02.09	Cumulative run time	0h～65535h	-	●
P02.10	Product No.	-	-	●
P02.11	Software version number	-	-	●
P02.12	Load speed display decimal place	0: 0 decimal place 1: 1 decimal place 2: 2 decimal places 3: 3 decimal places	1	☆
P02.13	Cumulative power-up time	0h～65535h	-	●
P02.14	Cumulative power consumption	0~65535°	-	●

6.3 Digital input terminal group P3

Function	Name	Setting range	Factory d	Change
P03.00	Digital input terminal 1	0: Disabled 1: Forward running 2: Reverse running 3: Three-line running 4: Forward jog 5: Reverse jog 6: Frequency UP 7: Frequency DOWN 8: Coast to Stop (CST) 9: Fault reset 10: Running pause 11: External fault normally open input 12: Multi-segment speed 1 13: Multi-segment speed 2 14: Multi-segment speed 3	1	★
P03.01	Digital input terminal 2		4	★
P03.02	Digital input terminal 3		9	★

P03.03	Digital input terminal 4	15: Multi-segment speed 4 16: Select acceleration/deceleration time 1 17: Select acceleration/deceleration time 2 18: Speed reference source switching 19: Frequency UP/DOWN setting clear (terminal, keyboard) 20: Start source switching 1 21: Acceleration/deceleration prohibited 22: PID pause 23: PLC state reset 24: Swing frequency pause 25: Counter input 26: Counter reset 27: Length count input 28: Length reset 29: Torque control disabled 30: (pulse) frequency input (Only valid for DI5) 31: Reserved 32: DC braking 33: External fault normally closed input 34: Frequency modification enable 35: PID acting direction reversed 36: External shutdown signal 1 37: Start source switching 2 38: PID integral pause 39: Main speed reference source X and preset frequency switching 40: Auxiliary speed reference source Y and preset frequency switching	12	★
P03.04	HDI terminal		13	★
P03.05	Digital input terminal 5		0	★
P03.06	Digital input terminal 6		0	★
P03.07	Digital input terminal 7		0	★
P03.08	Reserved		0	★
P03.09	Reserved		0	★

		41: Select motor 1 42: Select motor 2 43: PID parameter switching 44: Custom fault 1 45: Custom fault 2 46: Speed control/torque control switching 47: Emergency Stop (E-Stop) 48: External shutdown signal 2 49: Deceleration DC braking 50: Current run time reset 51.59: Reserved		
P03.10	Digital input terminal filtering time	0.000s～1.000s	0.010s	☆
P03.11	Digital input terminal command type	0: Two-wire type 1 1: Two-wire type 2 2: Three-wire type 1 3: Three-wire type 2	0	★
P03.12	Frequency UP/DOWN	0.001Hz/s～65.535Hz/s	1.00Hz/s	☆
P03.13	DI1 delay time	0.0s～3600.0s	0.0s	☆
P03.14	DI2 delay time	0.0s～3600.0s	0.0s	☆
P03.15	DI3 delay time	0.0s～3600.0s	0.0s	☆
P03.16	DI terminal active mode selection 1	0: Active high level 1: Active low level Ones digit: DI1 Tens digit: DI2 Hundreds digit: DI3 Thousands digit: DI4 Myriabit: HDI	0	★

P03.17	DI terminal active mode selection 2	0: Active high level 1: Active low level Ones digit: DI5 Tens digit: DI6 Hundreds digit: DI7 Thousands digit: reserved Myriabit: reserved	0	★

6.4 Digital output terminal group P4

Function	Name	Setting range	Factory d	Change
P04.00	HDO digital output terminal type selection	0: Pulse output (FMP) 1: Digital output (FMR)	0	☆
P04.01	Digital output function setting	0: Disabled 1: Running signal 2: Fault output 3: Frequency level detection FDT1 output 4: Frequency arrival 5: Zero-speed running 1 6: Motor overload pre-alarm 7: Inverter overload pre-alarm 8: Set count value arrival 9: Specified count value arrival 10: Set length arrival 11: PLC cycle completed 12: Cumulative run time arrival 13: Speed limiting 14: Torque limiting 15: Ready to run	0	☆
P04.02	Relay 1 output function setting		2	☆

P04.03	Reserved	16: AI1 greater than AI2 17: Upper limit frequency arrival 18: Lower limit frequency arrival (running related) 19: Undervoltage 20: Communication setting 21: (Reserved) 22: (Reserved) 23: Zero-speed running 2 (also output during shutdown) 24: Cumulative power-up time arrival 25: Frequency level detection FDT2 output 26: Frequency 1 arrival output 27: Frequency 2 arrival output 28: Current 1 arrival output 29: Current 2 arrival output 30: Timer arrival output 31: AI1 input value out of range 32: Load shedding 33: Reverse running 34: Zero current state 35: Module temperature arrival 36: Output current exceeds limit value 37: Output lower limit frequency (also output during shutdown) 38: Warning 39: Overtemperature warning 40: Current run time arrival	0	☆
P04.04	Digital output terminal DO1		1	☆
P04.05	Digital output terminal DO2		4	☆
P04.06	Digital output delay	0.0s～3600.0s	0.0s	☆
P04.07	Relay 1 output delay	0.0s～3600.0s	0.0s	☆
P04.08	Reserved			
P04.09	Digital output terminal 1 delay time	0.0s～3600.0s	0.0s	☆

P04.10	Digital output terminal 2 delay time	0.0s～3600.0s	0.0s	☆
P04.11	Valid logic setting of digital output terminal	0: Positive logic 1: Reverse logic Ones digit: HDO Tens digit: Relay 1 Hundreds digit: Reserved Thousands digit: DO1 Myriabit: DO2	0	☆

6.5 Analog and pulse input terminal group P5

Function	Name	Setting range	Factory d	Change
P05.00	AI curve 1 minimum	0V～P05.02	0.00V	☆
P05.01	AI curve 1 minimum	-100.0%～+100.0%	0.00%	☆
P05.02	AI curve 1 maximum	P05.00～+10.00V	10.00V	☆
P05.03	AI curve 1 maximum	-100.0%～+100.0%	100.00%	☆
P05.04	AI curve 1 filtering	0.00s～10.00s	0.10s	☆
P05.05	AI curve 2 minimum	0V～P05.07	0.00V	☆
P05.06	AI curve 2 minimum	-100.0%～+100.0%	0.00%	☆
P05.07	AI curve 2 maximum	P05.05～+10.00V	10.00V	☆
P05.08	AI curve 2 maximum	-100.0%～+100.0%	100.00%	☆
P05.09	AI curve 2 filtering	0.00s～10.00s	0.10s	☆
P05.10	AI curve 3 minimum	0V～P05.12	-10.00V	☆
P05.11	AI curve 3 minimum	-100.0%～+100.0%	-100.00%	☆
P05.12	AI curve 3 maximum	P05.10～+10.00V	10.00V	☆
P05.13	AI curve 3 maximum	-100.0%～+100.0%	100.00%	☆
P05.14	AI curve 3 filtering	0.00s～10.00s	0.10s	☆
P05.15	High-speed pulse	0.00kHz～P05.17	0.00kHz	☆
P05.16	High-speed pulse	-100.0%～100.0%	0.00%	☆
P05.17	High-speed pulse	P05.15～50.00kHz	50.00kHz	☆
P05.18	High-speed pulse	-100.0%～100.0%	100.00%	☆
P05.19	High-speed pulse	0.00s～10.00s	0.10s	☆

P05.20	AI curve selection	Ones digit: AI1 curve selection 1: Curve 1 (2 points, see P05.00~P05.03) 2: Curve 2 (2 points, see P05.05~P05.08) 3: Curve 3 (2 points, see P05.10~P05.13) 4: Curve 4 (4 points, see P19.00~P19.07)	321	☆
P5.21	Select when AI is lower than the minimum input value	Ones digit: AI1 lower than minimum input setting selection 0: Corresponds to the minimum input setting 1:0.0% Tens digit: AI2 lower than minimum input setting selection,	0	☆

6.6 Analog and pulse output terminal group P6

Function	Name	Setting range	Factory d	Change
P06.00	Pulse output function setting	0: Running frequency 1: Frequency reference 2: Output current 3: Output torque 4: Output power 5: Output voltage 6: Pulse input (100.% corresponds to 50.0 kHz) 7：AI1 8：AI2 9: AI3 (knob) 10: Length 11: Count value 12: Communication setting 13: Motor speed 14: Output current (100.0% corresponds to 1000.0A) 15: Output voltage (100.0% corresponds to 1000.0V)	0	☆
P06.01	AO1 output setting		0	☆
P06.02	Reserved			

		16: Reserved		
P06.03	Pulse output	0.01kHz～50.00kHz	50.00kHz	☆
P06.04	AO1 deviation	-100.0%～+100.0%	0.00%	☆
P06.05	AO1 gain	-10.00～+10.00	1	☆
P06.06	Reserved			
P06.07	Reserved			
P06.08	Reserved			
P06.09	Reserved			
P06.10	Reserved			

6.7 Protection parameter group P7

Function	Name	Setting range	Factory	Change
P07.00	Motor overload protection selection	0: Prohibited 1: Allowed	1	☆
P07.01	Motor overload	0.20～10.00	1	☆
P07.02	Motor overload	50%～100%	80%	☆
P07.03	Overvoltage stall gain	0～100	0	☆
P07.04	Overvoltage stall	120%～150%	130%	☆
P07.05	Overcurrent stall gain	0～100	20	☆
P07.06	Overcurrent stall	100%～200%	150%	☆
P07.07	Power-up to ground short circuit protection selection	0: Invalid 1: Valid	1	☆
P07.08	Reserved			
P07.09	Fault automatic reset	0～20	0	☆
P07.10	Fault DO action selection during	0: No action 1: Action	0	☆

P07.11	Fault automatic reset	0.1s～100.0s	1.0s	☆
P07.12	Input phase loss protection	0: Prohibited 1: Allowed	00	☆
P07.13	Output phase loss protection	0: Prohibited 1: Allowed	01	☆
P07.14	Type of first fault	0: No fault 1: Inverter unit protection 3: Deceleration overcurrent 4: Constant speed overcurrent 8: Buffer resistor overload 11: Motor overload 15: External fault 18: Current detection abnormality 21: Parameter reading and writing abnormality 22: Inverter hardware abnormality 24: Reserved 25: Reserved 26: Run time arrival 27: User-defined fault 1 28: User-defined fault 2 29: Power-up time arrival 30: Load shedding 31: PID feedback lost during running 40: Fast current limiting timeout 41: Motor switching during running 45: Motor overtemperature 51: Initial position error 100: Acceleration overvoltage 101: Deceleration overvoltage	—	●
P07.15	Type of second fault		—	●

P07.16	Type of third (latest) fault	102: Constant speed overvoltage 105: Undervoltage 108: Contactor abnormality 110: Acceleration overcurrent 111: Inverter overload 112: Motor short circuited to ground 113: Input phase loss 114: Output phase loss 115: Motor overspeed 118: Encoder/PG card abnormality 119: Excessive speed deviation 120: Module overheating 170: Motor tuning abnormality 202: Communication abnormality	—	●
P07.17	Frequency at the third (latest) fault	—	—	●
P07.18	Current at the third (latest) fault	—	—	●
P07.19	Bus voltage at the third (latest) fault	—	—	●
P07.20	Input terminal status at the third (latest) fault	—	—	●
P07.21	Output terminal status at the third (latest) fault	—	—	●
P07.22	Inverter status at the third (latest) fault	—	—	●
P07.23	Power-up time at the third (latest) fault	—	—	●
P07.24	Run time at the third (latest) failure	—	—	●
P07.25	Reserved	—	—	●
P07.26	Reserved			
P07.27	Frequency at the	—	—	●

P07.28	Current at the second	—	—	●
P07.29	Bus voltage at the	—	—	●
P07.30	Input terminal status	—	—	●
P07.31	Output terminal status	—	—	●
P07.32	Inverter status at the	—	—	●
P07.33	Power-up time at the	—	—	●
P07.34	Run time at the	—	—	●
P07.35	Reserved	—	—	●
P07.36	Reserved			
P07.37	Frequency at the first	—	—	●
P07.38	Current at the first	—	—	●
P07.39	Bus voltage at the first	—	—	●
P07.40	Input terminal status at the first fault	—	—	●
P07.41	Output terminal status at the first fault	—	—	●
P07.42	Inverter status at the first fault	—	—	●
P07.43	Power-up time at the	—	—	●
P07.44	Run time at the first	—	—	●
P07.45	Reserved			
P07.46	Reserved			
P07.47	Fault protection action selection 1	Ones digit: Motor overload (11) 0: Coast to Stop (CST) 1: Shutdown according to shutdown mode 2: Continue running Tens digit: Input phase loss (113) Hundreds digit: Output phase loss (114) Thousands digit: External fault (15) Myriabit: Communication abnormality (202)	0	☆

P07.48	Fault protection action selection 2	Ones digit: Reserved 0: Coast to Stop (CST) Tens digit: Function code read/write abnormality (21) 0: Coast to Stop (CST) 1: Shutdown according to shutdown mode Hundreds digit: Inverter overload (111) Thousands digit: Motor overheating (45) Myriabit: Run time arrival (26)	0	☆
P07.49	Fault protection action selection 3	Ones digit: User-defined fault 1 (27) 0: Coast to Stop (CST) 1: Shutdown according to shutdown mode 2: Continue running Tens digit: User-defined fault 2 (28) 0: Coast to Stop (CST) 1: Shutdown according to shutdown mode 2: Continue running Hundreds digit: Power-up time arrival (29) 0: Coast to Stop (CST) 1: Shutdown according to shutdown mode 2: Continue running Thousands digit: Load shedding (30) 0: Coast to Stop (CST) 1: Ramp to Stop (RTS) 2: Decelerate to 7% of the rated frequency of the motor and continue	0	☆

P07.50	Fault protection action selection 4	Ones digit: Excessive speed deviation (119) 0: Coast to Stop (CST) 1: Shutdown according to shutdown mode 2: Continue running Tens digit: Motor overspeed (115) Hundreds digit: Initial position error (51)	0	☆
P07.51	Fault protection action			
P07.52	Fault indication			
P07.53	Fault indication			
P07.54	Selection of running frequency during failure	0: Run at current running frequency 1: Run at set frequency 2: Run at upper limit frequency 3: Run at lower limit frequency 4: Run at abnormal standby	0	☆
P07.55	Abnormal standby frequency	0.0%~100.0% (100.0% corresponds to the maximum frequency P08.10)	100.00 %	☆
P07.56	Reserved			
P07.57	Reserved			
P07.58	Reserved			
P07.59	Instantaneous power outage action selection	0: Invalid 1: Deceleration 2: Ramp to Stop (RTS)	0	☆
P07.60	Instantaneous stop	80.0% ～ 100.0%	90.00%	☆
P07.61	Instantaneous power	0.00s～100.00s	0.50s	☆
P07.62	Instantaneous power	60.0% ~ 100.0% (standard bus	80.00%	☆
P07.63	Load shedding protection selection	0: Invalid 1: Valid	0	☆
P07.64	Load shedding	0.0～100.0％	10.00%	☆
P07.65	Load shedding	0.0～60.0s	1.0s	☆
P07.66	Reserved			
P07.67	Overspeed detection	0.0% ~ 50.0% (maximum frequency)	20.00%	☆

P07.68	Overspeed detection	0.0s～60.0s	1.0s	☆
P07.69	Excessive speed	0.0% ~ 50.0% (maximum frequency)	20.00%	☆
P07.70	Excessive speed	0.0s～60.0s	5.0s	☆

6.8 Motor start-stop control group P8

Function code	Name	Setting range	Factory default	Change
P08.00	Reserved			
P08.01	Motor 1 control mode	0: Sensorless vector control (SVC) 1: Reserved 2: V/F control	2	★
P08.02	Start source selection	0: Operation panel command channel (LED off) 1: Terminal command channel (LED on) 2: Communication command channel (LED flashing)	0	☆
P08.03	Main speed reference source X selection	0: Digital setting (preset frequency P08.08, UP/DOWN modifiable, no power down memory) 1: Digital setting (preset frequency P08.08, UP/DOWN modifiable, power down memory) 2：AI1 3：AI2 4: AI3 (knob) 5: PULSE pulse setting (DI5) 6: Multi-segment command 7: Simple PLC 8：PID 9: Communication reference	4	★
P08.04	Auxiliary speed reference source Y selection	Same as P08.03 (main speed reference source X selection)	0	★
P08.05	Auxiliary speed source Y range selection during	0: Relative to maximum frequency 1: Relative to speed source X	0	☆

	superposition			
P08.06	Auxiliary speed source Y range during superposition	0%～150%	100%	☆
P08.07	Speed source superposition selection	Ones digit: Frequency source selection 0: Main speed reference source X 1: Main and auxiliary operation results (The operation relationship is determined by the tens digit) 2: Switching between main speed reference source X and auxiliary speed reference source Y 3: Switching between main speed reference source X and main-auxiliary operation result 4: Switching between auxiliary speed reference source Y and main-auxiliary operation result Tens digit: Speed source main and auxiliary operation relationship 0: Main + auxiliary 1: Main - auxiliary 2: Maximum of the two 3: Minimum of the two	0	☆
P08.08	Preset frequency	0.00Hz~maximum frequency (P08.10)	50.00Hz	☆
P08.09	Motor running direction	0: Consistent direction 1: Reverse direction	0	☆
P08.10	Maximum frequency	50.00Hz～320.00Hz	50.00Hz	★
P08.11	Upper limit frequency source	0: P08.12 setting 1：AI1 2：AI2 3: AI3 (knob) 4: PULSE pulse setting 5: Communication reference	0	★

P08.12	Upper limit frequency	Lower limit frequency P08.14 ~ maximum frequency P08.10	50.00Hz	☆
P08.13	Upper limit frequency offset	0.00Hz~maximum frequency P08.10	0.00Hz	☆
P08.14	Lower limit frequency	0.00Hz~upper limit frequency P08.12	0.00Hz	☆
P08.15	Carrier frequency	0.5kHz～16.0kHz	Model determination	☆
P08.16	Carrier frequency adjustment with temperature	0: No 1: Yes	1	☆
P08.17	Acceleration time 1	0.00s～6500.0s	Model determination	☆
P08.18	Deceleration time 1	0.00s～6500.0s	Model determination	☆
P08.19	Acceleration/deceleration time multiple	0: 1 s 1: 0.1 s 2: 0.01 s	1	★
P08.20	Reserved			
P08.21	Auxiliary speed reference source bias frequency during superposition	0.00Hz~maximum frequency P08.10	0.00Hz	☆
P08.22	Speed reference resolution	1：0.1Hz 2：0.01Hz	2	★
P08.23	Digital reference speed shutdown memory selection	0: No memory 1: Memory	0	☆
P08.24	Motor selection	0: Motor 1 1: Motor 2 2: Motor 3 3: Motor 4	0	★
P08.25	Acceleration/deceleration time reference	0: Maximum frequency (P08.10) 1: Set frequency	0	★

	frequency	2：100Hz		
P08.26	Frequency UP/DOWN operation reference during running	0: Running frequency 1: Set frequency	0	★
P08.27	Start source and speed source combination setting	Ones digit: Speed source combination setting when starting from the operation panel 0: No binding 1: Digital set frequency 2：AI1 3：AI2 4: AI3 (knob) 5: PULSE pulse setting (DI5) 6: Multi-segment speed 7: Simple PLC 8：PID 9: Communication reference Tens digit: speed source combination setting when terminal is started Hundreds digit: speed source combination set when communication is started Thousands digit: speed source combination settings when automatic running	0	☆
P08.28	Start mode	0: Direct start 1: Speed tracking restart 2: Pre-excitation start (AC asynchronous motor)	0	☆
P08.29	Speed tracking mode	0: Start from shutdown frequency 1: Start from zero speed 2: Start from maximum frequency	0	★
P08.30	Speed tracking rate	1～100	20	☆
P08.31	Starting frequency	0.00Hz～10.00Hz	0.00Hz	☆
P08.32	Starting frequency holding time	0.0s～100.0s	0.0s	★
P08.33	Start DC braking current/pre-excitation	0%～100%	0%	★

	current			
P08.34	Start DC braking time/pre-excitation time	0.0s～100.0s	0.0s	★
P08.35	Acceleration and deceleration mode	0: Linear acceleration and deceleration 1: S curve acceleration and deceleration A 2: S curve acceleration and deceleration B	0	★
P08.36	Proportion of S-curve start time	0.0%～（100.0%- P08.37）	30.00%	★
P08.37	Proportion of S-curve end time	0.0%～（100.0%- P08.36）	30.00%	★
P08.38	Shutdown mode	0: Ramp to Stop (RTS) 1: Coast to Stop (CST)	0	☆
P08.39	Shutdown DC braking start frequency	0.00Hz~maximum frequency	0.00Hz	☆
P08.40	Shutdown DC braking waiting time	0.0s～100.0s	0.0s	☆
P08.41	Shutdown DC braking current	0%～100%	0%	☆
P08.42	Shutdown DC braking time	0.0s～100.0s	0.0s	☆
P08.43	Brake utilization rate	0%～100%	100%	☆

6.9 Swing frequency and segment speed group P9

Function c	Name	Description	Setting range	Default val
P09.00	Swing frequency setting method	0: Relative to center frequency 1: Relative to maximum frequency	0	☆
P09.01	Swing frequency amplitude	0.0%～100.0%	0.00%	☆
P09.02	Jump frequency amplitude	0.0%～50.0%	0.00%	☆
P09.03	Swing frequency period	0.1s～3000.0s	10.0s	☆
P09.04	Triangular wave rise time of swing frequency	0.1%～100.0%	50.00%	☆
P09.05	Set length	0m～65535m	1000m	☆
P09.06	Actual length	0m～65535m	0m	☆
P09.07	Number of pulses per meter	0.1～6553.5	100	☆
P09.08	Set count value	1～65535	1000	☆
P09.09	Specified count value	1～65535	1000	☆
P09.10	Multi-segment command 0	-100.0%～100.0%	0.00%	☆
P09.11	Multi-segment command 1	-100.0%～100.0%	0.00%	☆
P09.12	Multi-segment command 2	-100.0%～100.0%	0.00%	☆
P09.13	Multi-segment command 3	-100.0%～100.0%	0.00%	☆
P09.14	Multi-segment command 4	-100.0%～100.0%	0.00%	☆
P09.15	Multi-segment command 5	-100.0%～100.0%	0.00%	☆
P09.16	Multi-segment command 6	-100.0%～100.0%	0.00%	☆

P09.17	Multi-segment command 7	-100.0%～100.0%	0.00%	☆
P09.18	Multi-segment command 8	-100.0%～100.0%	0.00%	☆
P09.19	Multi-segment command 9	-100.0%～100.0%	0.00%	☆
P09.20	Multi-segment command 10	-100.0%～100.0%	0.00%	☆
P09.21	Multi-segment command 11	-100.0%～100.0%	0.00%	☆
P09.22	Multi-segment command 12	-100.0%～100.0%	0.00%	☆
P09.23	Multi-segment command 13	-100.0%～100.0%	0.00%	☆
P09.24	Multi-segment command 14	-100.0%～100.0%	0.00%	☆
P09.25	Multi-segment command 15	-100.0%～100.0%	0.00%	☆
P09.26	Simple PLC running mode	0: Shutdown at the end of a single run 1: Maintain the final value at the end of a single run 2: Continuous cycle	0	☆
P09.27	Simple PLC power-down memory selection	Ones digit: Power-down memory selection 0: No power down memory 1: Power down memory Tens digit: Shutdown memory selection 0: No shutdown memory 1: Shutdown memory	0	☆
P09.28	Simple PLC segment 0 run time	0.0s（h）～6553.5s（h）	0.0s（h）	☆

P09.29	Simple PLC segment 0 acceleration and deceleration time selection	0～3	0	☆
P09.30	Simple PLC segment 1 run time	0.0s（h）～6553.5s（h）	0.0s（h）	☆
P09.31	Simple PLC segment 1 acceleration and deceleration time selection	0～3	0	☆
P09.32	Simple PLC segment 2 run time	0.0s（h）～6553.5s（h）	0.0s（h）	☆
P09.33	Simple PLC segment 2 acceleration and deceleration time selection	0～3	0	☆
P09.34	Simple PLC segment 3 run time	0.0s（h）～6553.5s（h）	0.0s（h）	☆
P09.35	Simple PLC segment 3 acceleration and deceleration time selection	0～3	0	☆
P09.36	Simple PLC segment 4 run time	0.0s（h）～6553.5s（h）	0.0s（h）	☆
P09.37	Simple PLC segment 4 acceleration and deceleration time selection	0～3	0	☆
P09.38	Simple PLC segment 5 run time	0.0s（h）～6553.5s（h）	0.0s（h）	☆
P09.39	Simple PLC segment 5 acceleration and deceleration time selection	0～3	0	☆

P09.40	Simple PLC segment 6 run time	0.0s（h）～6553.5s（h）	0.0s（h）	☆
P09.41	Simple PLC segment 6 acceleration and deceleration time selection	0～3	0	☆
P09.42	Simple PLC segment 7 run time	0.0s（h）～6553.5s（h）	0.0s（h）	☆
P09.43	Simple PLC segment 7 acceleration and deceleration time selection	0～3	0	☆
P09.44	Simple PLC segment 8 run time	0.0s（h）～6553.5s（h）	0.0s（h）	☆
P09.45	Simple PLC segment 8 acceleration and deceleration time selection	0～3	0	☆
P09.46	Simple PLC segment 9 run time	0.0s（h）～6553.5s（h）	0.0s（h）	☆
P09.47	Simple PLC segment 9 acceleration and deceleration time selection	0～3	0	☆
P09.48	Simple PLC segment 10 run time	0.0s（h）～6553.5s（h）	0.0s（h）	☆
P09.49	Simple PLC segment 10 acceleration and deceleration time selection	0～3	0	☆
P09.50	Simple PLC segment 11 run time	0.0s（h）～6553.5s（h）	0.0s（h）	☆

P09.51	Simple PLC segment 11 acceleration and deceleration time selection	0～3	0	☆
P09.52	Simple PLC segment 12 run time	0.0s（h）～6553.5s（h）	0.0s（h）	☆
P09.53	Simple PLC segment 12 acceleration and deceleration time selection	0～3	0	☆
P09.54	Simple PLC segment 13 run time	0.0s（h）～6553.5s（h）	0.0s（h）	☆
P09.55	Simple PLC segment 13 acceleration and deceleration time selection	0～3	0	☆
P09.56	Simple PLC segment 14 run time	0.0s（h）～6553.5s（h）	0.0s（h）	☆
P09.57	Simple PLC segment 14 acceleration and deceleration time selection	0～3	0	☆
P09.58	Simple PLC segment 15 run time	0.0s（h）～6553.5s（h）	0.0s（h）	☆
P09.59	Simple PLC segment 15 acceleration and deceleration time selection	0～3	0	☆
P09.60	Simple PLC run time unit	0: s (seconds) 1: h (hours)	0	☆

P09.61	Multi-segment command reference mode 0	0: Function code P09.10 reference 1：AI1 2：AI2 3: AI3 (knob) 4: PULSE pulse 5：PID 6: Preset frequency (P08.08) reference, UP/DOWN can be modified	0	☆

6.10 V/F and motor 1 parameter group P10

Function code	Name	Setting range	Factory default	Change
P10.00	VF curve setting	0: Straight line V/F 1: Multipoint V/F 2: Square V/F 3: 1.2 power V/F 4: 1.4 power V/F 6: 1.6 power V/F 8: 1.8 power V/F 9: Reserved 10: VF full separation mode 11: VF semi-separation mode	0	★
P10.01	Torque boost	0.0%: (automatic torque boost) 0.1%～30.0%	Model determination	☆
P10.02	Torque boost cut-off frequency	0.00Hz~maximum frequency	50.00Hz	★
P10.03	VF frequency point 1	0.00Hz～P10.05	0.00Hz	★
P10.04	VF voltage point 1	0.0%～100.0%	0.00%	★
P10.05	VF frequency point 2	P10.03～P10.07	0.00Hz	★
P10.06	VF voltage point 2	0.0%～100.0%	0.00%	★
P10.07	VF frequency point 3	P10.05 ~ motor rated frequency (P10.20)	0.00Hz	★

P10.08	VF voltage point 3	0.0%～100.0%	0.00%	★
P10.09	VF slip compensation gain	0.0%～200.0%	0.00%	☆
P10.10	VF overexcitation gain	0～200	64	☆
P10.11	VF oscillation suppression gain	0～100	Model determination	☆
P10.12	Reserved			
P10.13	Voltage source for VF separation	0: Digital setting (P10.14) 1：AI1 2：AI2 3: AI3 (knob) 4: PULSE pulse setting (DI5) 5: Multi-segment command 6: Simple PLC 7：PID 8: Communication reference Note: 100.0% corresponds to the motor rated voltage	0	☆
P10.14	Digital setting of voltage for VF separation	0V～Motor rated voltage	0V	☆
P10.15	Voltage rise time of VF separation	0.0s～1000.0s Note: It indicates the time from 0V to motor rated voltage	0.0s	☆
P10.16	Motor type selection	0: Common asynchronous motor 1: Variable frequency asynchronous motor 2: Reserved	0	★
P10.17	Motor rated power	0.1kW～1000.0kW	Model determination	★
P10.18	Motor rated voltage	1V～2000V	Model determination	★
P10.19	Motor rated current	0.01A~655.35A (inverter power <=55kW) 0.1A~6553.5A (inverter power >55kW)	Model determination	★
P10.20	Motor rated frequency	0.01Hz~maximum frequency	Model determination	★
P10.21	Motor rated speed	1rpm～65535rpm	Model determination	★
P10.22	Asynchronous motor stator resistance	0.001Ω~65.535Ω (inverter power <=55kW) 0.0001Ω~6.5535Ω (inverter power >55kW)	Tuning parameters	★

P10.23	Asynchronous motor rotor resistance	0.001 Ω ~ 65.535 Ω (inverter power <=55kW) 0.0001 Ω - 6.5535 Ω (inverter power >55kW)	Tuning parameters	★
P10.24	Asynchronous motor leakage inductance	0.01mH ~ 655.35mH (inverter power <=55kW) 0.001mH ~ 65.535mH (inverter power >55kW)	Tuning parameters	★
P10.25	Asynchronous motor mutual inductance	0.1MH ~ 6553.5mH (inverter power <=55kW) 0.01mH ~ 655.35mH (inverter power >55kW)	Tuning parameters	★
P10.26	Asynchronous motor no-load current	0.01A~P10.19 (inverter power <=55kW) 0.1A~P10.19 (inverter power >55kW)	Tuning parameters	★
P10.27 ~P10.52	Reserved			
P10.53	Tuning selection	0: No operation 1: Static tuning of asynchronous motor 2: Complete tuning of asynchronous motor	0	★

6.11 Motor 2 parameter group P11

Function code	Name	Setting range	Factory default	Change
P11.00	Motor 2 type selection	0: Common asynchronous motor 1: Variable frequency asynchronous motor 2: Reserved	0	★
P11.01	Motor rated power	0.1kW～6553.5kW	Model determination	★
P11.02	Motor rated voltage	1V～2000V	Model determination	★
P11.03	Motor rated current	0.01A~655.35A (inverter power<=55kW) 0.1A~6553.5A (inverter power >55kW)	Model determination	★
P11.04	Motor rated frequency	0.01Hz~maximum frequency	Model determination	★
P11.05	Motor rated speed	1rpm～65535rpm	Model determination	★

P11.06	Asynchronous motor stator resistance	0.001Ω~65.535Ω (inverter power <=55kW) 0.0001Ω~6.5535Ω (inverter power >55kW)	Tuning parameters	★
P11.07	Asynchronous motor rotor resistance	0.001Ω~65.535Ω (inverter power <=55kW) 0.0001Ω~6.5535Ω (inverter power >55kW)	Tuning parameters	★
P11.08	Asynchronous motor leakage inductance	0.01mH ~ 655.35mH (inverter power <=55kW) 0.001mH ~ 65.535mH (inverter power >55kW)	Tuning parameters	★
P11.09	Asynchronous motor mutual inductance	0.1MH ~ 6553.5mH (inverter power <=55kW) 0.01mH ~ 655.35mH (inverter power >55kW)	Tuning parameters	★
P11.10	Asynchronous motor no-load current	0.01A~P11.03 (inverter power <=55kW) 0.1A~P11.03 (inverter power >55kW)	Tuning parameters	★
P11.11~ P11.15	Reserved			
P11.37	Tuning selection	0: No operation 1: Static tuning of asynchronous motor 2: Complete tuning of asynchronous motor 11: Reserved	0	★

6.12 Motor 1 vector control group P12

Function code	Name	Setting range	Factory default	Change
P12.00	Speed loop proportional gain 1	1～100	30	☆
P12.01	Speed loop integration time 1	0.01s～10.00s	0.50s	☆
P12.02	Switching frequency 1	0.00～P12.05	5.00Hz	☆
P12.03	Speed loop proportional gain 2	1～100	20	☆

P12.04	Speed loop integration time 2	0.01s～10.00s	1.00s	☆
P12.05	Switching frequency 2	P12.02~maximum frequency	10.00Hz	☆
P12.06	Vector control slip gain	50%～200%	100%	☆
P12.07	Speed loop filter time constant	0.000s～0.100s	0.000s	☆
P12.08	Vector control overexcitation gain	0～200	64	☆
P12.09	Torque upper limit source (electric) in speed control mode	0: P12.10 setting 1：AI1 2：AI2 3: AI3 (knob) 4: PULSE pulse 5: Communication reference 6：MIN(AI1,AI2) 7：MAX(AI1,AI2) Full scale of options 1-7 corresponds to P12.10	0	☆
P12.10	Torque upper limit digital setting (electric) in speed control mode	0.0%～200.0%	150.00%	☆
P12.11	Reserved			
P12.12	Reserved			
P12.13	Excitation regulation proportional gain	0～60000	2000	☆
P12.14	Excitation regulation integral gain	0～60000	1300	☆
P12.15	Torque regulation proportional gain	0～60000	2000	☆
P12.16	Torque regulation integral gain	0～60000	1300	☆
P12.17	Speed loop integral attribute	Ones digit: integral separation 0: Invalid 1: Valid	0	☆
P12.18	Reserved			

P12.19	Reserved			
P12.20	Maximum weak magnetic current	1%～300%	50%	★
P12.21	Automatic weak magnetic adjustment gain	10%～500%	100%	☆
P12.22	Weak magnetic integral multiple	2～10	2	☆

6.13 Motor 2 vector control group P13

Function code	Name	Setting range	Factory default	Change
P13.00	Speed loop proportional gain 1	1～100	30	☆
P13.01	Speed loop integration time 1	0.01s～10.00s	0.50s	☆
P13.02	Switching frequency 1	0.00～P13.05	5.00Hz	☆
P13.03	Speed loop proportional gain 2	1～100	20	☆
P13.04	Speed loop integration time 2	0.01s～10.00s	1.00s	☆
P13.05	Switching frequency 2	P13.02~maximum frequency	10.00Hz	☆
P13.06	Vector control slip gain	50%～200%	100%	☆
P13.07	Speed loop filter time constant	0.000s～0.100s	0.000s	☆
P13.08	Vector control overexcitation gain	0～200	64	☆

P13.09	Torque upper limit source (electric) in speed control mode	0: P13.10 setting 1：AI1 2：AI2 3: AI3 (knob) 4: PULSE pulse 5: Communication reference 6：MIN(AI1,AI2) 7：MAX(AI1,AI2) Full scale of option 1.7 corresponds to P13.10 digital setting	0	☆
P13.10	Torque upper limit digital setting (electric) in speed control mode	0.0% ～ 200.0%	150.00%	☆
P13.11	Reserved			
P13.12	Reserved			
P13.13	Excitation regulation proportional gain	0～60000	2000	☆
P13.14	Excitation regulation integral gain	0～60000	1300	☆
P13.15	Torque regulation proportional gain	0～60000	2000	☆
P13.16	Torque regulation integral gain	0～60000	1300	☆
P13.17	Speed loop integral attribute	Ones digit: integral separation 0: Invalid 1: Valid	0	☆
P13.18	Reserved			
P13.19	Reserved			
P13.20	Maximum weak magnetic current	1%～300%	50%	☆
P13.21	Automatic weak magnetic adjustment gain	10%～500%	100%	☆
P13.22	Weak magnetic integral multiple	2～10	2	☆
P13.23	Motor 2 control mode	0: Sensorless vector control (SVC)	0	★

		1: Reserved 2: V/F control		
P13.24	Motor 2 acceleration and deceleration time selection	0: Same as motor 1 1: Acceleration/deceleration time 1 2: Acceleration/deceleration time 2 3: Acceleration/deceleration time 3 4: Acceleration/deceleration time 4	0	☆
P13.25	Torque boost	0.0%: (automatic torque boost) 0.1%～30.0%	Model determination	☆
P13`.26	Reserved			
P13.27	Oscillation suppression gain	0～100	Model determination	☆

6.14 Basic communication parameter group P14

Function code	Name	Setting range	Factory default	Change
P14.00	Communication expansion card type	0: Modbus communication card 1: Reserved 2: Reserved	0	☆
P14.01	Baud rate	Ones digit: MODBUS 0：300BPS 1：600BPS 2：1200BPS 3：2400BPS 4：4800BPS 5：9600BPS 6：19200BPS 7：38400BPS 8：57600BPS 9：115200BPS Tens digit: Reserved Hundreds digit: Reserved Thousands digit: reserved	6009	☆
P14.02	MODBUS data format	0: No check (8-N-2) 1: Even check (8-E-1) 2: Odd check (8-O-1) 3: No check (8-N-1) (MODBUS valid)	3	☆
P14.03	Local address	1~247, 0 is the broadcast address	1	☆
P14.04	Response delay	0ms～20ms	2	☆

P14.05	Communication timeout	0.0 (invalid), 0.1 s~60.0 s	0	☆
P14.06	Data transmission format selection	Ones digit: MODBUS 0: Non-standard MODBUS protocol 1: Standard MODBUS protocol Tens digit: Reserved	31	☆
P14.07	Communication reading current resolution	0：0.01A 1：0.1A	0	☆
P14.08	Communication master-slave mode	0,1	0	

6.15 PID module group P15

Function code	Name	Setting range	Factory default	Change
P15.00	PID reference source	0: P15.01 setting 1：AI1 2：AI2 3: AI3 (knob) 4: PULSE pulse setting (DI5) 5: Communication reference 6: Multi-segment command	0	☆
P15.01	PID value reference	0.0%～100.0%	50.00%	☆
P15.02	PID feedback source	0：AI1 1：AI2 2: AI3 (knob) 3：AI1.AI2 4: PULSE pulse setting (DI5) 5: Communication reference 6：AI1+AI2 7：MAX（|AI1|, |AI2|） 8：MIN（|AI1|, |AI2|）	0	☆
P15.03	PID action direction	0: Positive action 1: Negative action	0	☆
P15.04	PID reference	0～65535	1000	☆
P15.05	Proportional gain Kp1	0.0～100.0	20	☆
P15.06	Integration time Ti1	0.01s～10.00s	2.00s	☆

P15.07	Differential time Td1	0.000s～10.000s	0.000s	☆
P15.08	PID reversal cut-off	0.00~maximum frequency	2.00Hz	☆
P15.09	PID deviation limit	0.0%～100.0%	0.00%	☆
P15.10	PID differential limit	0.00%～100.00%	0.10%	☆
P15.11	PID reference change	0.00～650.00s	0.00s	☆
P15.12	PID feedback filtering	0.00～60.00s	0.00s	☆
P15.13	PID output filtering	0.00～60.00s	0.00s	☆
P15.14	Reserved	-	-	☆
P15.15	Proportional gain Kp2	0.0～100.0	20	☆
P15.16	Integration time Ti2	0.01s～10.00s	2.00s	☆
P15.17	Differential time Td2	0.000s～10.000s	0.000s	☆
P15.18	PID parameter switching conditions	0: Not switching 1: Switching via DI terminal 2: Automatic switching according to deviation	0	☆
P15.19	PID parameter	0.0%～P15.20	20.00%	☆
P15.20	PID parameter	P15.19～100.0%	80.00%	☆
P15.21	PID initial value	0.0%～100.0%	0.00%	☆
P15.22	PID initial value	0.00～650.00s	0.00s	☆
P15.23	Maximum forward	0.00%～100.00%	1.00%	☆
P15.24	Maximum reverse	0.00%～100.00%	1.00%	☆
P15.25	PID integral attribute	Ones digit: integral separation 0: Invalid 1: Valid Tens digit: Whether to stop integration after outputting to the limit value	0	☆
P15.26	PID feedback loss detection value	0.0%: feedback loss is not judged 0.1%～100.0%	0.00%	☆
P15.27	PID feedback loss detection time	0.0s～20.0s	0.0s	☆

P15.28	PID shutdown operation	0: Shutdown without operation 1: Operation during shutdown	0	☆

6.16 Digital operation module group P16

Function code	Name	Setting range	Factory default	Change
P16.00	Virtual VDI1 terminal	0～59	0	★
P16.01	Virtual VDI2 terminal	0～59	0	★
P16.02	Virtual VDI3 terminal	0～59	0	★
P16.03	Virtual VDI4 terminal	0～59	0	★
P16.04	Virtual VDI5 terminal	0～59	0	★
P16.05	Virtual VDI terminal status setting mode	0: Whether the VDI is valid is determined by the status of the virtual VDOx 1: Whether the VDI is valid is determined by the setting of the function code P16.06 Ones digit: Virtual VDI1 Tens digit: Virtual VDI2 Hundreds digit: Virtual VDI3	0	★
P16.06	Virtual VDI terminal status setting	0: Invalid 1: Valid Ones digit: Virtual VDI1 Tens digit: Virtual VDI2 Hundreds digit: Virtual VDI3 Thousands digit: Virtual VDI4 Myriabit: Virtual VDI5	0	★
P16.07	AI1 terminal function selection when used as DI	0～59	0	★
P16.08	AI2 terminal function selection when used as DI	0～59	0	★

P16.09	AI3 terminal function selection when used as DI	0～59	0	★
P16.10	Active mode selection for AI terminal when used as DI	0: Active high level 1: Active low level Ones digit: AI1 Tens digit: AI2 Hundreds digit: AI3 (knob)	0	★
P16.11	Virtual VDO1 output function selection	0: Internal short circuit to physical DIx 1~40: See P04 group physical DO output selection	0	☆
P16.12	Virtual VDO2 output function selection	0: Internal short circuit to physical DIx 1~40: See P04 group physical DO output selection	0	☆
P16.13	Virtual VDO3 output function selection	0: Internal short circuit to physical DIx 1~40: See P04 group physical DO output selection	0	☆
P16.14	Virtual VDO4 output function selection	0: Internal short circuit to physical DIx 1~40: See P04 group physical DO output selection	0	☆
P16.15	Virtual VDO5 output function selection	0: Internal short circuit to physical DIx 1~40: See P04 group physical DO output selection	0	☆
P16.16	VDO1 output delay	0.0s～3600.0s	0.0s	☆
P16.17	VDO2 output delay	0.0s～3600.0s	0.0s	☆
P16.18	VDO3 output delay	0.0s～3600.0s	0.0s	☆
P16.19	VDO4 output delay	0.0s～3600.0s	0.0s	☆
P16.20	VDO5 output delay	0.0s～3600.0s	0.0s	☆

P16.21	VDO output terminal valid state selection	0: Positive logic 1: Reverse logic Ones digit: VDO1 Tens digit: VDO2 Hundreds digit: VDO3 Thousands digit: VDO4 Myriabit: VDO5	0	☆

6.17 Analog advanced settings group P19

Function code	Name	Setting range	Factory default	Change
P19.00	AI curve 4 minimum input	-10.00V～	0.00V	☆
P19.01	AI curve 4 minimum input	-100.0%～	0.00%	☆
P19.02	AI curve 4 inflection point 1 input	P19.00～P19.04	3.00V	☆
P19.03	AI curve 4 inflection point 1 input	-100.0%～	30.00%	☆
P19.04	AI curve 4 inflection point 2 input	P19.02～P19.06	6.00V	☆
P19.05	AI curve 4 inflection point 2 input	-100.0%～	60.00%	☆
P19.06	AI curve 4 maximum input	P19.04～	10.00V	☆
P19.07	AI curve 4 maximum input	-100.0%～	100.00%	☆
P19.08	AI curve 5 minimum input	-10.00V～	-10.00V	☆
P19.09	AI curve 5 minimum input	-100.0%～	-100.00%	☆
P19.10	AI curve 5 inflection point 1 input	P19.08～P19.12	-3.00V	☆
P19.11	AI curve 5 inflection point 1 input	-100.0%～	-30.00%	☆
P19.12	AI curve 5 inflection point 2 input	P19.10～P19.14	3.00V	☆
P19.13	AI curve 5 inflection point 2 input	-100.0%～	30.00%	☆
P19.14	AI curve 5 maximum input	P19.12～	10.00V	☆
P19.15	AI curve 5 maximum input	-100.0%～	100.00%	☆
P19.16~ P19.23	Reserved			
P19.24	AI1 set jump point	-100.0%～	0.00%	☆
P19.25	AI1 set jump amplitude	0.0%～100.0%	0.50%	☆
P19.26	AI2 set jump point	-100.0%～	0.00%	☆

P19.27	AI2 set jump amplitude	0.0%～100.0%	0.50%	☆
P19.28	AI3 set jump point	-100.0%～	0.00%	☆
P19.29	AI3 set jump amplitude	0.0%～100.0%	0.50%	☆
P19.30	AI1 measured voltage 1	0.500V ～ 4.000V	Factory calibration	☆
P19.31	AI1 displayed voltage 1	0.500V ～ 4.000V	Factory calibration	☆
P19.32	AI1 measured voltage 2	6.000V ～ 9.999V	Factory calibration	☆
P19.33	AI1 displayed voltage 2	6.000V ～ 9.999V	Factory calibration	☆
P19.34	AI2 measured current 1	0.000V ～ 20.000mA	Factory calibration	☆
P19.35	AI2 displayed current 1	0.000V ～ 20.000mA	Factory calibration	☆
P19.36	AI2 measured current 2	0.000V ～ 20.000mA	Factory calibration	☆
P19.37	AI2 displayed current 2	0.000V ～ 20.000mA	Factory calibration	☆
P19.38	Reserved		Factory calibration	☆
P19.39	Reserved		Factory calibration	☆
P19.40	Reserved		Factory calibration	☆
P19.41	Reserved		Factory calibration	☆
P19.42	AO1 target voltage 1	0.500V ～ 4.000V	Factory calibration	☆
P19.43	AO1 measured voltage 1	0.500V ～ 4.000V	Factory calibration	☆
P19.44	AO1 target voltage 2	6.000V ～ 9.999V	Factory calibration	☆
P19.45	AO1 measured voltage 2	6.000V ～ 9.999V	Factory calibration	☆
P19.46	Reserved			
P19.47	Reserved			
P19.48	Reserved			
P19.49	Reserved			

6.18 Torque control group P20

Function code	Name	Setting range	Factory default	Change
P20.00	Speed/torque control mode selection	0: Speed control 1: Torque control	0	★
P20.01	Torque setting source selection in torque control mode	0: Digital setting 1 (P20.03) 1：AI1 2：AI2 3: AI3 (knob) 4: High-speed pulse 5: Communication reference 6：MIN（AI1,AI2） 7：MAX（AI1,AI2） (Full scale of options 1-7 corresponds to P20.03 digital setting)	0	★
P20.02	Reserved			
P20.03	Digital torque setting in torque control mode	-200.0%～200.0%	150.00%	☆
P20.04	Torque filtering	0～10.00	0.00%	
P20.05	Torque control forward maximum frequency	0.00Hz~maximum frequency	50.00Hz	☆
P20.06	Torque control reverse maximum frequency	0.00Hz~maximum frequency	50.00Hz	☆
P20.07	Torque control	0.00s～650.00s	0.00s	☆
P20.08	Torque control	0.00s～650.00s	0.00s	☆

6.19 Advanced control parameter group P21

Function code	Name	Setting range	Factory default	Change
P21.00	Jog running frequency	0.00Hz~maximum frequency	2.00Hz	☆
P21.01	Jog acceleration time	0.0s～6500.0s	20.0s	☆
P21.02	Jog deceleration time	0.0s～6500.0s	20.0s	☆

P21.03	Acceleration time 2	0.0s～6500.0s	Model determination	☆
P21.04	Deceleration time 2	0.0s～6500.0s	Model determination	☆
P21.05	Acceleration time 3	0.0s～6500.0s	Model determination	☆
P21.06	Deceleration time 3	0.0s～6500.0s	Model determination	☆
P21.07	Acceleration time 4	0.0s～6500.0s	Model determination	☆
P21.08	Deceleration time 4	0.0s～6500.0s	Model determination	☆
P21.09	Jump frequency 1	0.00Hz~maximum frequency	0.00Hz	☆
P21.10	Jump frequency 2	0.00Hz~maximum frequency	0.00Hz	☆
P21.11	Jump frequency amplitude	0.00Hz~maximum frequency	0.00Hz	☆
P21.12	Forward and reverse dead time	0.0s～3000.0s	0.0s	☆
P21.13	Reverse control enable	0: Allowed 1: Prohibited	0	☆
P21.14	Running mode with set frequency lower than lower limit frequency	0: Run at lower limit frequency 1: Shutdown 2: Zero-speed running	0	☆
P21.15	Droop control	0.00Hz～10.00Hz	0.00Hz	☆
P21.16	Set cumulative power-up arrival time	0h～65000h	0h	☆
P21.17	Set cumulative running arrival time	0h～65000h	0h	☆
P21.18	Start protection selection	0: Not protected 1: Protected	0	☆
P21.19	Frequency detection value (FDT1)	0.00Hz~maximum frequency	50.00Hz	☆

P21.20	Frequency detection hysteresis (FDT1)	0.0% ~ 100.0% (FDT1 level)	5.00%	☆
P21.21	Frequency arrival detection width	0.0% ~ 100.0% (maximum frequency)	0.00%	☆
P21.22	Whether the jump frequency is valid during acceleration and deceleration	0: Invalid 1: Valid	0	☆
P21.23	Reserved			
P21.24	Reserved			
P21.25	Switching frequency point between acceleration time 1 and acceleration time 2	0.00Hz~maximum frequency	0.00Hz	☆
P21.26	Switching frequency point between deceleration time 1 and deceleration time 2	0.00Hz~maximum frequency	0.00Hz	☆
P21.27	Terminal jog priority	0: Invalid 1: Valid	0	☆
P21.28	Frequency detection value (FDT2)	0.00Hz~maximum frequency	50.00Hz	☆
P21.29	Frequency detection hysteresis (FDT2)	0.0% ~ 100.0% (FDT2 level)	5.00%	☆
P21.30	Arbitrary arrival frequency detection value 1	0.00Hz~maximum frequency	50.00Hz	☆
P21.31	Arbitrary arrival frequency detection width 1	0.0% ~ 100.0% (maximum frequency)	0.00%	☆
P21.32	Arbitrary arrival frequency detection value 2	0.00Hz~maximum frequency	50.00Hz	☆
P21.33	Arbitrary arrival frequency detection width 2	0.0% ~ 100.0% (maximum frequency)	0.00%	☆
P21.34	Zero current detection level	0.0%～300.0% 100.0% corresponding motor rated current	5.00%	☆
P21.35	Zero current detection delay time	0.01s～600.00s	0.10s	☆

P21.36	Output current over limit value	0.0% (not detected) 0.1% ~ 300.0% (motor rated current)	200.00%	☆
P21.37	Output current over limit detection delay time	0.00s～600.00s	0.00s	☆
P21.38	Arbitrary arrival current 1	0.0% ~ 300.0% (motor rated current)	100.00%	☆
P21.39	Arbitrary reach current 1 width	0.0% ~ 300.0% (motor rated current)	0.00%	☆
P21.40	Arbitrary arrival current 2	0.0% ~ 300.0% (motor rated current)	100.00%	☆
P21.41	Arbitrary reach current 2 width	0.0% ~ 300.0% (motor rated current)	0.00%	☆
P21.42	Timing function selection	0: Invalid 1: Valid	0	★
P21.43	Timed run time selection	0: P21.44 setting 1：AI1 2：AI2 3: AI3 (knob) Analog input range corresponds to P21.44	0	★
P21.44	Timed run time	0.0Min～6500.0Min	0.0Min	★
P21.45	AI1 input voltage protection value lower limit	0.00V～P21.46	3.10V	☆
P21.46	AI1 input voltage protection value upper limit	P21.45～11.00V	6.80V	☆
P21.47	Module temperature arrival	0℃～100℃	75℃	☆
P21.48	Cooling fan control	0: Fan works during running 1: The fan runs all the time	0	★
P21.49	Wake-up frequency	Sleep frequency (P21.51) ~ maximum frequency (P08.10)	0.00Hz	☆
P21.50	Wake-up delay time	0.0s～6500.0s	0.0s	☆
P21.51	Sleep frequency	0.00 Hz ~ wake-up frequency (P21.49)	0.00Hz	☆

P21.52	Sleep delay time	0.0s～6500.0s	0.0s	☆
P21.53	Current running arrival time setting	0.0Min～6500.0Min	0.0Min	★
P21.54	DPWM switching upper limit frequency	0.00Hz～15.00Hz	12.00Hz	☆
P21.55	PWM modulation mode	0: Asynchronous modulation 1: Synchronous modulation	0	☆
P21.56	Dead band compensation mode selection	0: No compensation 1: Compensation mode 1 2: Compensation mode 2	1	☆
P21.57	Random PWM depth	0: Random PWM invalid 1~10: PWM carrier frequency random depth	0	☆
P21.58	Fast current limiting enable	0: Not enabled 1: Enabled	1	☆
P21.59	Current detection delay compensation	0 ～ 100	5	☆
P21.60	Undervoltage point setting	60% ～ 140%	100.00%	☆
P21.61	SVC optimization mode selection	0: Not optimized 1: Optimization mode 1 2: Optimization mode 2	1	★
P21.62	Dead time adjustment	100% ～ 200%	150%	★
P21.63	Overvoltage point setting	200.0V ～ 2500.0V	Model determination	★

6.20 Status monitoring group P23

Function code	Name	Minimum unit	Communication address	
P23.00	Running frequency (Hz)	0.01Hz	7000H	
P23.01	Set frequency (Hz)	0.01Hz	7001H	
P23.02	Bus voltage (V)	0.1V	7002H	
P23.03	Output voltage (V)	1V	7003H	
P23.04	Output current (A)	0.01A	7004H	
P23.05	Output power (kW)	0.1kW	7005H	
P23.06	Output torque (%)	0.10%	7006H	
P23.07	DI input status	1	7007H	
P23.08	DO output status	1	7008H	
P23.09	AI1 voltage (V)	0.01V	7009H	
P23.10	AI2 voltage (V)/current (mA)	0.01V/0.01mA	700AH	
P23.11	AI3 voltage (V)	0.01V	700BH	
P23.12	Count value	1	700CH	
P23.13	Length value	1	700DH	
P23.14	Load speed display	1	700EH	
P23.15	PID setting	1	700FH	
P23.16	PID feedback	1	7010H	
P23.17	PLC stage	1	7011H	
P23.18	PULSE input pulse frequency (Hz)	0.01kHz	7012H	
P23.19	Feedback speed (Hz)	0.01Hz	7013H	
P23.20	Remaining run time	0.1Min	7014H	
P23.21	AI1 voltage before correction	0.001V	7015H	
P23.22	AI2 voltage (V)/current (mA) before correction	0.001V/0.01mA	7016H	
P23.23	AI3 voltage before correction	0.001V	7017H	
P23.24	Linear speed	1m/Min	7018H	
P23.25	Current power-up time	1Min	7019H	

P23.26	Current run time	0.1Min	701AH	
P23.27	PULSE input pulse frequency	1Hz	701BH	
P23.28	Communication setting value	0.01%	701CH	
P23.29	Reserved			
P23.30	Main frequency X display	0.01Hz	701EH	
P23.31	Auxiliary frequency Y display	0.01Hz	701FH	
P23.32	View any memory address value	1	7020H	
P23.33	Reserved			
P23.34	Motortemperature value	1℃	7022H	
P23.35	Target torque (%)	0.10%	7023H	
P23.36	Reserved			
P23.37	Power factor angle	0.1°	7025H	
P23.38	Reserved			
P23.39	VF separation target voltage	1V	7027H	
P23.40	VF separation output voltage	1V	7028H	
P23.41	Visual display of DI input status	1	7029H	
P23.42	Visual display of DO input status	1	702AH	
P23.43	Visual display of DI function status 1 (function 01- function 40)	1	702BH	
P23.44	Visual display of DO function statu s 2 (function 41 - function 80)	1	702CH	
P23.45	Fault information	1	702DH	
P23.46	Master-slave control host transmits		702EH	
P23.47~ P23.57	Reserved			
P23.58	Reserved			
P23.59	Set frequency (%)	0.01%	703BH	
P23.60	Running frequency (%)	0.01%	703CH	
P23.61	Inverter status	1	703DH	
P23.62	Current fault code	1	703EH	
P23.63	Point-to-point communication sendi	0.01%	703FH	

P23.64	Number of slave stations	1	7040H	

6.21 Motor 3 parameter group P28

Function code	Name	Setting range	Factory default	Change
P28.00	Motor type selection	0: Common asynchronous motor 1: Variable frequency asynchronous motor 2: Reserved	0	★
P28.01	Motor rated power	0.1kW～6553.5kW	Model determination	★
P28.02	Motor rated voltage	1V～2000V	Model determination	★
P28.03	Motor rated current	0.01A~655.35A (inverter power <=55kW) 0.1A~6553.5A (inverter power > 55kW)	Model determination	★
P28.04	Motor rated frequency	0.01Hz~maximum frequency	Model determination	★
P28.05	Motor rated speed	1rpm～65535rpm	Model determination	★
P28.06	Asynchronous motor stator resistance	0.001Ω~65.535Ω (inverter power <=55kW) 0.0001Ω~6.5535Ω (inverter power >55kW)	Tuning parameters	★
P28.07	Asynchronous motor rotor resistance	0.001Ω~65.535Ω (inverter power <=55kW) 0.0001Ω~6.5535Ω (inverter power >55kW)	Tuning parameters	★
P28.08	Asynchronous motor leakage inductance	0.01mH ~ 655.35mH (inverter power <=55kW) 0.001mH ~ 65.535mH (inverter power >55kW)	Tuning parameters	★

P28.09	Asynchronous motor mutual inductance	0.1MH ~ 6553.5mH (inverter power <=55kW) 0.01mH ~ 655.35mH (inverter power >55kW)	Tuning parameters	★
P28.10	Asynchronous motor no-load current	0.01A~P28.03 (inverter power <= 55kW) 0.1A~P28.03 (inverter power >5	Tuning parameters	★
P28.11~ P28.36	Reserved			
P28.37	Tuning selection	0: No operation 1: Static tuning of asynchronous motor 2: Complete tuning of asynchro	0	★

6.22 Motor 4 parameter group P29

Function code	Name	Setting range	Factory default	Change
P29.00	Motor type selection	0: Common asynchronous motor 1: Variable frequency asynchronous motor 2: Reserved	0	★
P29.01	Motor rated power	0.1kW～6553.5kW	Model determination	★
P29.02	Motor rated voltage	1V～2000V	Model determination	★
P29.03	Motor rated current	0.01A~655.35A (inverter power <= 55kW) 0.1A~6553.5A (inverter power >55kW)	Model determination	★
P29.04	Motor rated frequen	0.01Hz~maximum frequency	Model determination	★
P29.05	Motor rated speed	1rpm～65535rpm	Model determination	★
P29.06	Asynchronous motor stator resistance	0.001Ω~65.535Ω (inverter power <=55kW) 0.0001Ω~6.5535Ω (inverter power >55kW)	Tuning parameters	★

P29.07	Asynchronous motor rotor resistance	0.001Ω~65.535Ω (inverter power <=55kW) 0.0001Ω~6.5535Ω (inverter power >55kW)	Tuning parameters	★
P29.08	Asynchronous motor leakage inductance	0.01mH ~ 655.35mH (inverter power <=55kW) 0.001mH ~ 65.535mH (inverter power >55kW)	Tuning parameters	★
P29.09	Asynchronous motor mutual inductance	0.1MH ~ 6553.5mH (inverter power <=55kW) 0.01mH ~ 655.35mH (inverter power >55kW)	Tuning parameters	★
P29.10	Asynchronous motor no-load current	0.01A~P29.03 (inverter power <=55kW) 0.1A~P29.03 (inverter power >55 kW)	Tuning parameters	★
P29.11~ P29.36	Reserved			
P29.37	Tuning selection	0: No operation 1: Static tuning of asynchronous motor	0	★

6.23 Motor 3 vector control group P30

Function code	Name	Setting range	Factory default	Change
P30.00	Speed loop	1～100	30	☆
P30.01	Speed loop integratio	0.01s～10.00s	0.50s	☆
P30.02	Switching frequency	0.00～P30.05	5.00Hz	☆
P30.03	Speed loop proportio	1～100	20	☆
P30.04	Speed loop integratio	0.01s～10.00s	1.00s	☆
P30.05	Switching frequency	P30.02~maximum frequency	10.00Hz	☆
P30.06	Vector control slip g	50%～200%	100%	☆
P30.07	Speed loop filter tim	0.000s～0.100s	0.000s	☆
P30.08	Vector control overex	0～200	64	☆

P30.09	Torque upper limit source (electric) in speed control mode	0: P30.10 setting 1： AI1 2： AI2 3： AI3 4: PULSE pulse 5: Communication reference 6： MIN(AI1,AI2) 7： MAX(AI1,AI2) Full scale of options 1-7 corresponds to P30.10 digital setting	0	☆
P30.10	Upper torque limit in speed control mode	0.0% ～ 200.0%	150.00%	☆
P30.11	Reserved			
P30.12	Reserved			
P30.13	Excitation regulation	0～60000	2000	☆
P30.14	Excitation regulation	0～60000	1300	☆
P30.15	Torque regulation pr	0～60000	2000	☆
P30.16	Torque regulation int	0～60000	1300	☆
P30.17	Speed loop integral attribute	Ones digit: integral separation 0: Invalid 1: Valid	0	☆
P30.18	Reserved			
P30.19	Reserved			
P30.20	Maximum weak mag	1%～300%	50%	☆
P30.21	Automatic weak mag	10%～500%	100%	☆
P30.22	Weak magnetic integ	2～10	2	☆
P30.23	Motor 3 control mode	0: Sensorless vector control (SVC) 1: Reserved	0	★

P30.24	Motor 3 acceleration and deceleration time selection	0: Same as motor 1 1: Acceleration/deceleration time 1 2: Acceleration/deceleration time 2	0	☆
P30.25	Torque boost	0.0%: (automatic torque boost) 0.1%～30.0%	Model determination	☆
P30.26	Reserved			
P30.27	Oscillation suppression gain	0～100	Model determination	☆

6.24 Motor 3 vector control group P31

Function code	Name	Setting range	Factory default	Change
P31.00	Speed loop	1～100	30	☆
P31.01	Speed loop integratio	0.01s～10.00s	0.50s	☆
P31.02	Switching frequency	0.00～P31.05	5.00Hz	☆
P31.03	Speed loop proportio	1～100	20	☆
P31.04	Speed loop integratio	0.01s～10.00s	1.00s	☆
P31.05	Switching frequency	P31.02~maximum frequency	10.00Hz	☆
P31.06	Vector control slip g	50%～200%	100%	☆
P31.07	Speed loop filter tim	0.000s～0.100s	0.000s	☆
P31.08	Vector control overex	0～200	64	☆
P31.09	Torque upper limit source (electric) in speed control mode	0: P31.10 setting 1： AI1 2： AI2 3： AI3 4: PULSE pulse 5: Communication reference 6： MIN(AI1,AI2) 7： MAX(AI1,AI2) Full scale of options 1-7 corresponds to P31.10 digital setting	0	☆
P31.10	Upper torque limit in speed control mode	0.0% ～ 200.0%	150.00%	☆

P31.11	Reserved			
P31.12	Reserved			
P31.13	Excitation regulation	0～60000	2000	☆
P31.14	Excitation regulation	0～60000	1300	☆
P31.15	Torque regulation pr	0～60000	2000	☆
P31.16	Torque regulation int	0～60000	1300	☆
P31.17	Speed loop integral attribute	Ones digit: integral separation 0: Invalid 1: Valid	0	☆
P31.18	Reserved			
P31.19	Reserved			
P31.20	Maximum weak mag	1%～300%	50%	☆
P31.21	Automatic weak mag	10%～500%	100%	☆
P31.22	Weak magnetic integ	2～10	2	☆
P31.23	Motor 4 control mode	0: Sensorless vector control (SVC) 1: Reserved	0	★
P31.24	Motor 4 acceleration and deceleration time selection	0: Same as motor 1 1: Acceleration/deceleration time 1 2: Acceleration/deceleration time 2	0	☆
P31.25	Torque boost	0.0%: (automatic torque boost) 0.1%～30.0%	Model determination	☆
P31.26	Reserved			
P31.27	Oscillation suppressi	0～100	Model de	☆

Chapter 7 Detailed Parameter Function Description

7.1 Parameter control P0

P00.00	User password	Factory default	0
	Setting range	0～65535	

If P00.00 is set to any non-zero number, the password protection function will take effect. When entering the menu next time, you must enter the password correctly, otherwise you cannot view and modify the function parameters. Please remember the set user password.

If P00.00 is set to 00000, the set user password will be cleared and the password protection function will be invalid.

P00.01	Parameter initialization		Factory default	0
	Setting range	0	No operation	
		1	Restore factory parameters, excluding motor parameters	
		2	Clear record information	

1. Restore factory settings, excluding motor parameters

After setting P00.01 to 1, most of the function parameters of the inverter are restored to the factory parameters, but the following parameters are not restored:

1）Manufacturer parameters (group P1);

2）Parameter control group: P00.00, P00.01;

3）Fault record information: P07.14~P07.44;

4）Motor parameters: P10.16~P10.52, P11.00~P11.36, P28.00~P28.36, and P29.00 ~ P29.36;

5）Cumulative run time (P02.09), cumulative power-up time (P02.13), and cumulative power consumption (P02.14);

6）Maximum frequency (P08.10), upper limit frequency (P08.12);

7）Vector control parameters: P12.13~P12.16, P13.13~P 13.16, P30.13~P30.16, P 31.13 ~ P31.16;

2. Clear record information

Clear inverter fault record information, cumulative run time (P02.09), cumulative power-up time (P02.13), and cumulative power consumption (P02.14).

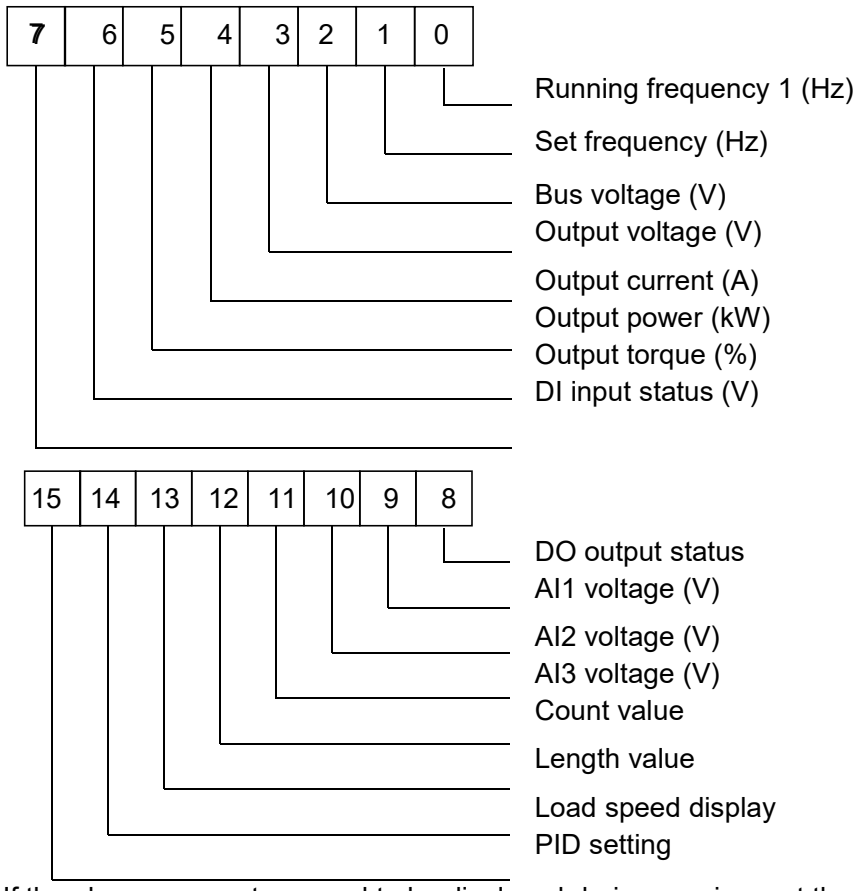
P00.02	Function parameter mode display attributes		Factory default	11
	Setting range	Ones digit	Groups P23 and P27 display selection	
		0	No display	
		1	Display	
		Tens digit	Groups P11, P13, P16, P19, P20, P28, P29, P30, and P31 display selection	
		0	No display	
		1	Display	

P00.04	Function code modification attributes		Factory default	0
	Setting range	0	Modifiable	
		1	Not modifiable	

The user can set whether the function code parameters can be modified to prevent the function parameter from being mistakenly altered.

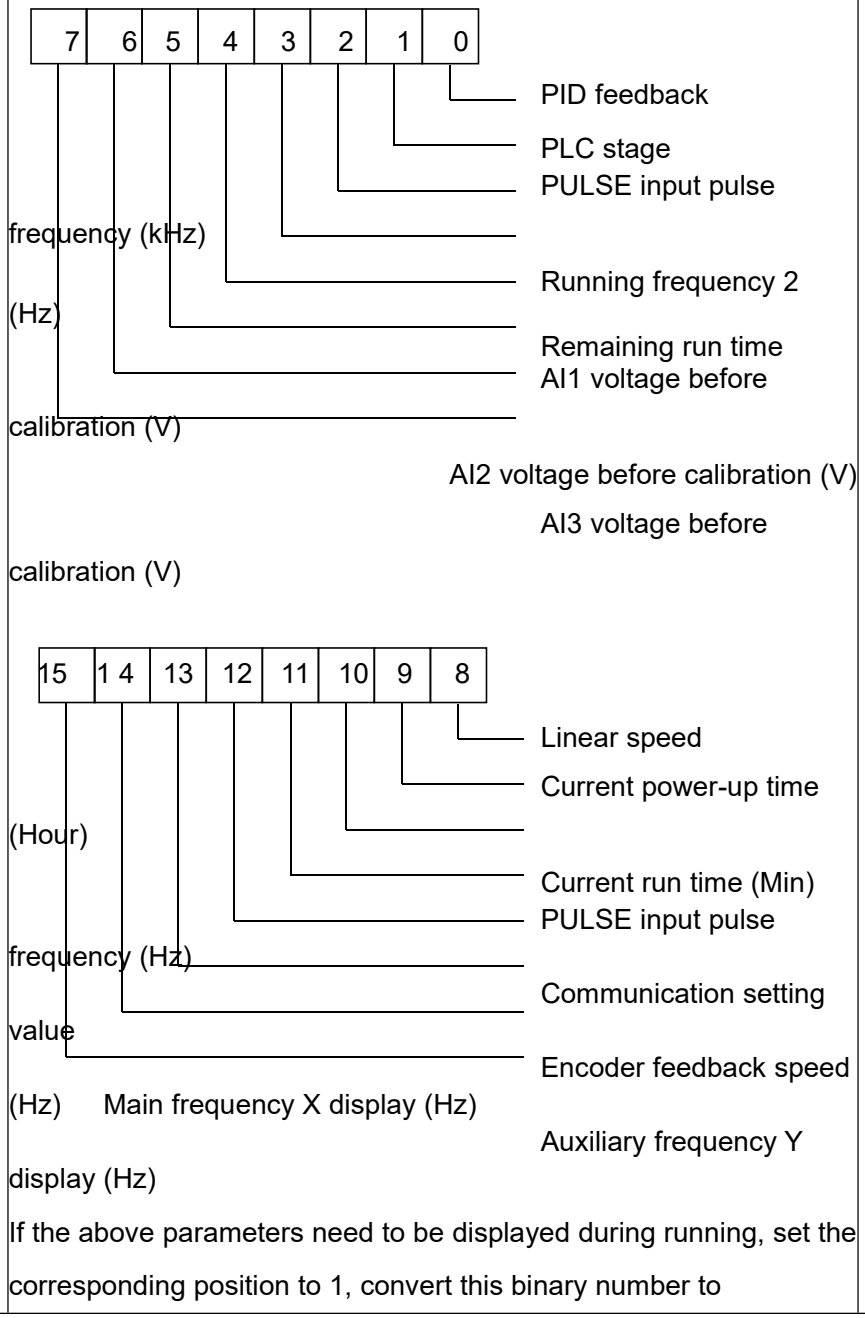
If this function code is set to 0, all function codes can be modified; When it is set to 1, all function codes can only be viewed and cannot be modified.

7.2 Panel settings P2

<table>
<tr><td></td><td colspan="2">LED running display parameter 1</td><td>Factory default</td><td>1F</td></tr>
<tr><td>P02.03</td><td>Set Fixed Fan Enclosure</td><td>0000 ～ FFFF</td><td colspan="3"> 

If the above parameters need to be displayed during running, set the corresponding position to 1, convert this binary number to hexadecimal and set it to P02.03.</td></tr>
</table>

<table>
<tr><td rowspan="3">P02.02</td><td colspan="2">STOP/RESET key function</td><td>Factory default</td><td>1</td></tr>
<tr><td rowspan="2">Setting range</td><td>0</td><td colspan="2">The STOP/RES key shutdown function is valid only in the keyboard operation mode</td></tr>
<tr><td>1</td><td colspan="2">The STOP/RES key shutdown function is valid in any operation mode</td></tr>
</table>

LED running display parameter 2			Factory	0	
Set Fixed Fan Enclosure	0000 ～ FFFF				P02.04

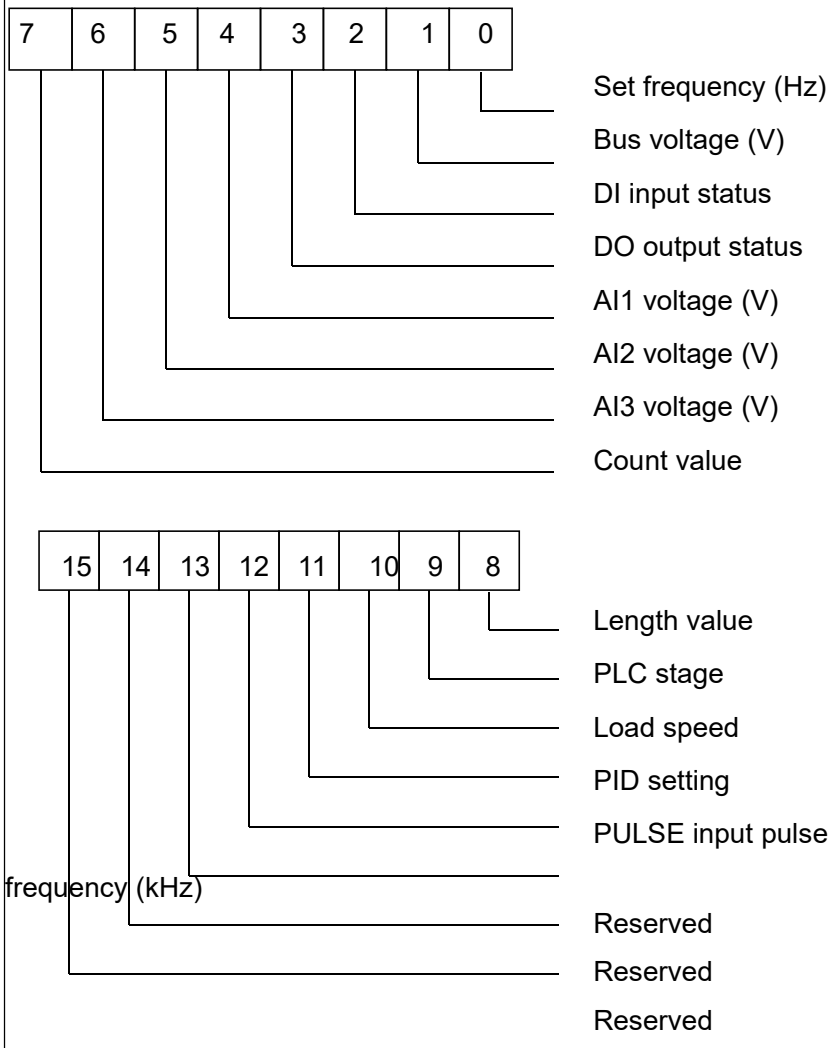
If the above parameters need to be displayed during running, set the corresponding position to 1, convert this binary number to

Running display parameters are used to set the parameters that can be viewed when the inverter is in the running state.

The maximum number of status parameters that can be viewed is 32. The status parameters to be displayed are selected according to the binary bits of P02.03 and P02.04 parameter values, and the display sequence starts from the lowest bit of

P02.03.

P02.05	LED shutdown display parameter		Factory default	0
	Set Fixed Fan Enclosure	0000 ～ FFFF		



If the above parameters need to be displayed during running, set the corresponding position to 1, convert this binary number to hexadecimal and set it to P02.05.

P02.06	Load speed indication factor	Factory default	1.0000
	Setting range	0.0001～6.5000	

When the load speed needs to be displayed, adjust the corresponding relationship between the output frequency of the inverter and the load speed through this parameter. Please refer to the description of P02.12 for specific correspondence.

P02.07	Inverter module radiator temperature	Factory default	0
	Setting range	0.0℃～100.0℃	

Display the inverter module IGBT temperature.

The inverter module IGBT over-temperature protection values vary across different models.

P02.09	Cumulative run time	Factory default	0h
	Setting range	0h～65535h	

Display the cumulative run time of the inverter. When the run time reaches the set run time P21.17, the multi-function digital output function (12) of the inverter outputs an ON signal.

P02.11	Software version number	Factory default	
	Setting range	Control board software version number.	
P02.12	Load speed display decimal place	Factory default	1
	Setting range	0	0 decimal place
		1	1 decimal place
		2	2 decimal places
		3	3 decimal places

Ones digit:

It is used to set the number of decimal places for load speed display. The following is an example of how the load speed is calculated:

If the load speed display coefficient P02.06 is 2.000 and the load speed decimal places P02.12 is 2 (2 decimal places), when the inverter running frequency is 40.00Hz, the load speed is: 40.00*2.000 = 80.00 (displayed with 2 decimal places).

If the inverter is in shutdown state, the load speed is displayed as the speed corresponding to the set frequency, i.e. "set load speed". Taking the set frequency of

50.00Hz as an example, the load speed in the shutdown state is: 50.0 × 2.000 = 100.00 (displayed with 2 decimal points).

P02.13	Cumulative power-up time	Factory	0h
	Setting range	0h～65535h	

Display the cumulative power-up time of the inverter from the factory.
When this time reaches the set power-up time (P21.17), the multi-function digital output function (24) of the inverter outputs an ON signal.

P02.14	Cumulative power consumption	Factory	-
	Setting range	0~65535°	

Display the cumulative power consumption of the inverter so far.

7.3 Digital input terminal group P3

GF630N01 series inverters are equipped with 8 multi-function digital input terminals (of which HDI can be used as high-speed pulse input terminals) and 2 analog input terminals as standard.

Function code	Name	Factory default	Remarks
P03.00	DI1 terminal function selection	1 (forward running)	Standard configuration
P03.01	DI2 terminal function selection	4 (forward jog)	Standard configuration
P03.02	DI3 terminal function selection	9 (fault reset)	Standard configuration
P03.03	DI4 terminal function selection	12 (Multi-segment speed 1)	Standard configuration
P03.05	DI5 terminal function selection	0	Standard configuration
P03.06	DI6 terminal function selection	0	Standard configuration

P03.07	DI7 terminal function selection	0	Standard configuration

These parameters are used to set the functions of the digital multi-function input terminal, and the functions that can be selected are shown in the following table:

Set value	Function	Description
0	No function	Terminals that are not in use can be set to "no function" to prevent malfunction.
1	Forward running (FWD)	Control the forward and reverse rotation of the inverter through external terminals.
2	Reverse running (REV)	
3	Three-wire running control	Use this terminal to determine whether the inverter is running in the three-wire control mode. For details, please refer to the description of function code P03.11 ("terminal command mode").
4	Forward jog (FJOG)	FJOG is jog forward running, and RJOG is jog reverse running. For jog running frequency and jog acceleration/deceleration time, refer to the description of function codes P21.00, P21.01 and P21.02.
5	Reverse jog (RJOG)	
6	Terminal UP	Modify the frequency increment and decrement commands when the frequency is set by the external terminal. When the frequency source is set to digital setting, the set frequency can be adjusted up or down.
7	Terminal DOWN	
8	Coast to Stop (CST)	The inverter blocks the output, and the motor stop process is not controlled by the inverter at this time. This method has the same meaning as the Coast to Stop (CST) described in P08.38.
9	Fault reset (RESET)	The function of fault reset by using terminals. It has the same function as the RESET key on the keyboard. With this function, remote fault reset can be realized.
10	Running pause	In the case of Ramp to Stop (RTS), but all running parameters of the inverter are memorized. Such as PLC parameters, swing frequency parameters and PID parameters. After the signal from this terminal disappears,

		the inverter returns to the running state before stopping.
11	External fault normally open input	When the signal is sent to the inverter, the inverter will report the fault E015 and handle the fault according to the fault protection action mode (refer to function P07.47 for details).
12	Multi-segment speed terminal 1	The 16 states of these four terminals can be used to set 16 speed segments or 16 other command settings. See the attached table for details.
13	Multi-segment speed terminal 2	
14	Multi-segment speed terminal 3	
15	Multi-segment speed terminal 4	
16	Acceleration/deceleration time selection terminal 1	Four acceleration and deceleration times can be selected through the four states of the two terminals. See the attached table for details.
17	Acceleration/deceleration time selection terminal 2	
18	Frequency source switching	It is used to switch between different frequency sources. According to the setting of the frequency source selection function code (P08.07), when switching between two frequency sources is set as the frequency source, this terminal is used to switch between the two frequency sources.
19	UP/DOWN setting clear (terminal, keyboard)	When the frequency reference is digital frequency reference, this terminal can clear the frequency value changed by terminal UP/DOWN or keyboard UP/DOWNA, so that the reference frequency returns to the value set by P08.08.
20	Run command switching terminal	When the command source is set to terminal control (P08.02=1), this terminal can switch between terminal control and keyboard control. When the command source is set to communication control (P08.02=2), this terminal can switch between

		communication control and keyboard control.
21	Acceleration/deceleration prohibited	Ensure that the inverter is not affected by external signals (except for shutdown commands) and maintain the current output frequency.
22	PID pause	The PID is temporarily invalid, and the inverter maintains the current output frequency and no longer performs PID adjustment of the frequency source.
23	PLC state reset	PLC is suspended during execution. When running again, the inverter can be restored to the initial state of simple PLC through this terminal.
24	Swing frequency pause	The inverter outputs at the center frequency. The swing frequency function is paused.
25	Counter input	Input terminal for counter pulse.
26	Counter reset	Clear the counter status.
27	Length count input	Input terminal for length count.
28	Length reset	Length clear
29	Torque control prohibited	The inverter is prohibited from torque control, and the inverter enters the speed control mode
30	PULSE frequency input (valid for DI5 only)	DI5 functions as a pulse input terminal.
31	Reserved	Reserved
32	Immediate DC braking	When this terminal is valid, the inverter directly switches to the DC braking state
33	External fault normally closed input	When the external fault normally closed signal is sent to the inverter, the inverter reports the fault E015 and stops.
34	Frequency modification enable	If this function is set to active, when the frequency is changed, the inverter will not respond to the frequency change until the terminal status is invalid.
35	PID acting direction reversed	When this terminal is valid, the acting direction of PID is opposite to the direction set in P15.03
36	External stop terminal 1	During keyboard control, this terminal can be used to stop the inverter, which is equivalent to the function of the STOP

		key on the keyboard.
37	Control command switching terminal 2	For switching between terminal control and communication control. If the command source is selected as terminal control, the system switches to communication control when the terminal is valid; The reverse is also true.
38	PID integral pause	When this terminal is valid, the integral adjustment function of PID is paused, but the proportional adjustment and derivative adjustment functions of PID are still valid.
39	Switching between frequency source X and preset frequency	If the terminal is valid, the frequency source X is replaced by the preset frequency (P08.08)
40	Switching between frequency source Y and preset frequency	If the terminal is valid, the frequency source Y is replaced by the preset frequency (P08.08)
41	Motor selection terminal 1	Four groups of motor parameters can be switched through the four states of the two terminals. See the attached table for details.
42	Motor selection terminal 2	
43	PID parameter switching	If the PID parameter switching condition is DI terminal (P15.18=1), when the terminal is invalid, P15.05~P15.07 shall be used for PID parameters; When the terminal is valid, P15.15~P15.17 shall be used;
44	User-defined fault 1	When user-defined faults 1 and 2 are valid, the inverter will alarm E027 and E028 respectively, and the inverter will select the action mode selected by P07.49 according to the fault protection action for processing.
45	User-defined fault 2	
46	Speed control/torque control switching	Switch the inverter between torque control and speed control modes. When this terminal is invalid, the inverter runs in the mode defined by P20.00 (speed/torque control mode). If this terminal is valid, switch to another mode.
47	Emergency Stop (E-Stop)	When this terminal is valid, the inverter stops at the fastest speed, and the current is at the set upper limit during this stop process. This function is used to meet the requirement that the inverter needs to stop as soon as possible when the system is in an emergency state.

48	External stop terminal 2	In any control mode (panel control, terminal control, communication control), this terminal can be used to make the inverter Ramp to Stop (RTS), at which point the deceleration time is fixed as deceleration time 4.
49	Deceleration DC braking	When this terminal is valid, the inverter first decelerates to the shutdown DC braking start frequency, and then switches to the DC braking state.
50	Current run time reset	When this terminal is valid, the current running timing time of the inverter will be cleared. This function needs to be used in conjunction with timing running (P21.42) and current run time arrival (P21.53).

Four multi-segment command terminals can be combined into 16 states, each of which corresponds to 16 command settings. The details are shown in the table:

Running segment	Multi-segment speed terminal 1	Multi-segment speed terminal 2	Multi-segment speed terminal 3	Multi-segment speed terminal 4
Multi-segment speed 1	0	0	0	0
Multi-segment speed 2	1	0	0	0
Multi-segment speed 3	0	1	0	0
Multi-segment speed 4	1	1	0	0
Multi-segment speed 5	0	0	1	0
Multi-segment speed 6	1	0	1	0
Multi-segment speed 7	0	1	1	0
Multi-segment speed 8	1	1	1	0
Multi-segment speed 9	0	0	0	1
Multi-segment speed 10	1	0	0	1
Multi-segment speed 11	0	1	0	1
Multi-segment speed 12	1	1	0	1
Multi-segment speed 13	0	0	1	1
Multi-segment speed 14	1	0	1	1
Multi-segment speed 15	0	1	1	1
Multi-segment speed 16	1	1	1	1

0 represents multi-segment speed terminal OFF 1 represents multi-segment speed terminal ON

Schedule Function Description of Acceleration/Deceleration Time Selection Terminal

Terminal 2	Terminal 1	Acceleration or deceleration time selection	Corresponding parameters
OFF	OFF	Acceleration time 1	P08.17. P08.18
OFF	ON	Acceleration time 2	P21.03. P21.04
ON	OFF	Acceleration time 3	P21.05. P21.06
ON	ON	Acceleration time 4	P21.07. P21.08

Schedule Function Description of Motor Selection Terminal

Terminal 2	Terminal 1	Motor selection	Corresponding parameter group
OFF	OFF	Motor 1	Groups P10 and P12
OFF	ON	Motor 2	Group P11

P03.10	DI filtering time	Factory default	0.010s
	Setting range	0.000s～1.000s	

Set the software filtering time of the DI terminal status. If the input terminal is susceptible to interference and causes malfunction, this parameter can be increased to enhance the anti-interference ability. However, the increase of this filtering time will cause the response of the DI terminal to slow down.

P03.11	Terminal command		Factory	0
	Setting range	0	Two-wire type 1	
		1	Two-wire type 2	
		2	Three-wire type 1	
		3	Three-wire type 2	

This parameter defines four different ways to control the running of the inverter through the external terminals.

Note: For the convenience of explanation, the following three terminals DI1, DI2 and DI3 from the multi-function input terminals DI1 ~ DI5 are arbitrarily selected as external terminals. That is, the functions of the three terminals DI1, DI2 and DI3 are selected by setting the values of P03.00 ~ P03.02. For detailed function definitions, see the setting range of P03.

0: Two-wire mode 1: This mode is the most commonly used two-wire mode. Terminals DIx and DIy determine the forward and reverse running of the motor.

The terminal functions are set as follows:

Terminal	Set value	Description
DIx	1	Forward running (FWD)
DIy	2	Reverse running (REV)

Among them, DIx and DIy are the multi-function input terminals of DI1~DI10, and the level is valid.

1: Two-wire mode 2: In this mode, the DIx terminal function is the run enable terminal, and the DIy terminal function determines the running direction.

The terminal functions are set as follows:

Terminal	Set value	Description
DIx	1	Forward running (FWD)
DIy	2	Reverse running (REV)

Among them, DIx and DIy are the multi-function input terminals of DI1~DI10, and the level is valid.

2: Three-wire control mode 1: In this mode, DIn is the enable terminal, and the direction is controlled by DIx and DIy respectively.

The terminal functions are set as follows:

Terminal	Set value	Description
DIx	1	Forward running (FWD)
DIy	2	Reverse running (REV)
DIn	3	Three-wire running control

When running is required, the DIn terminal must be closed first, and the forward or reverse control of the motor is realized by the pulse rising edge of DIx or DIy.

When stop is required, it must be achieved by disconnecting the DIn terminal signal. Among them, DIx, DIy, and DIn are the multi-function input terminals of DI1~DI10, with DIx and DIy being pulse valid, and DIn being level valid.

3: Three-wire control mode 2: The enable terminal of this mode is DIn, the run command is given by DIx, and the direction is determined by the state of DIy.
The terminal functions are set as follows:

Terminal	Set value	Description
DIx	1	Forward running (FWD)
DIy	2	Reverse running (REV)
DIn	3	Three-wire running control

When running is required, the DIn terminal must be closed first, and the motor running signal is generated by the pulse rising edge of DIx, while the motor direction signal is generated by the state of DIy.

When stop is required, it must be achieved by disconnecting the DIn terminal signal. Among them, DIx, DIy, and DIn are the multi-function input terminals of DI1~DI10, with DIx being pulse valid, and DIy and DIn being level valid.

P03.12	Terminal UP/DOWN change rate	Factory default	1.00Hz/s
	Setting range	0.01Hz/s～65.535Hz/s	

It is used to set the speed of frequency change when the terminal UP/DOWN adjusts the set frequency, that is, the amount of frequency change per second.

When P8.22 (frequency decimal point) is 2, this value ranges from 0.001Hz/s to 65.535Hz/s. When P8.22 (frequency decimal point) is 1, this value ranges from 0.01 Hz/s to 655.35.

P03.13	DI1 delay time	Factory	0.0s
	Setting range	0.0s～3600.0s	
P03.14	DI2 delay time	Factory	0.0s
	Setting range	0.0s～3600.0s	
P03.15	DI3 delay time	Factory	0.0s
	Setting range	0.0s～3600.0s	

It is used to set the delay time of the inverter when the state of the DI terminal changes.

Currently, only DI1, DI2 and DI3 have the function of setting the delay time.

P03.16	DI terminal active mode selection 1	Factory default	00000
	Setting range	Ones digit	Valid state setting of DI1 terminal
		0	Active High Level
		1	Active Low Level
		Tens digit	Valid state setting of DI2 terminal (0-1, same as
		Hundreds digit	Valid state setting of DI3 terminal (0-1, same as
		Thousands digit	Valid state setting of DI4 terminal (0-1, same as
		Myriabit	Valid state setting of HDI terminal (0-1, same as

P03.17	DI terminal active mode selection 2	Factory default	00000
	Setting range	Ones digit	Valid state setting of DI5 terminal
		0	Active High Level
		1	Active Low Level
		Tens digit	Valid state setting of DI6 terminal (0-1, same as
		Hundreds digit	Valid state setting of DI7 terminal (0-1, same as
		Thousands digit	Reserved
		Myriabit	Reserved

Used for setting the valid state mode of digital input terminals. When Active High Level is selected, it is valid when the corresponding DI terminal is connected to COM, and invalid when it is disconnected. When Active Low Level is selected, it is invalid when the corresponding DI terminal is connected to COM, and valid when it is disconnected.

7.4 Digital output terminal group P4

GF630N01 series inverters are equipped with 1 multi-function analog output terminal (AO1), 1 multi-function digital output terminal (HDO), and 2 multi-function relay output terminals (Relay 1, Relay 2) as standard.

P04.00	HDO output mode	Factory	0
	Setting range	0	Pulse output (FMP)
		1	Digital output (FMR)

The HDO terminal is a programmable multiplex terminal that can be used as a high-speed pulse output terminal (FMP) or as a digital output terminal with open collector (FMR).

When FMP is output as a pulse, the maximum frequency of the output pulse is 50kHz. Refer to P06.00 for FMP related functions.

P04.01	HDO digital output function selection	Factory default	0
P04.02	Relay 1 output function setting	Factory default	2
P04.03	Reserved	Factory default	0
P04.04	Digital output terminal DO1	Factory default	1
P04.05	Digital output terminal DO2	Factory default	4

The above function codes are used to select the functions of 4 digital outputs.

The functions of the multi-function output terminals are described as follows:

Set	Function	Description
0	No output	The output terminal has no function
1	Inverter running	Indicates that the inverter is in the running state, with an output frequency (which can be zero), and at this time, the
2	Fault output (fault	When the inverter fails and shuts down due to the fault, the
3	Frequency level detection FDT1 output	Please refer to the description of function codes P21.19 and P21.20.
4	Frequency arrival	Please refer to the description of function code P21.21.
5	Zero-speed running (no output during shutdown)	When the inverter is running and the output frequency is 0, the ON signal is output. When the inverter is in the shutdown state, the signal is OFF.
6	Motor overload pre-alarm	Before the motor overload protection acts, judge according to the overload pre-alarm threshold, and output ON signal after the pre-alarm threshold is exceeded. For motor
7	Inverter overload	The ON signal is output 10s before the inverter overload
8	Set count value arrival	When the count value reaches the value set by P09.08, the
9	Specified count value arrival	When the count value reaches the value set by P09.08, the ON signal is output. For the counting function, refer to the function description of group P9
10	Length arrival	When the actual detected length exceeds the length set by P09.05, the ON signal is output.
11	PLC cycle completed	When the simple PLC running completes a cycle, a pulse signal with a width of 250 ms is output.
12	Cumulative run time arrival	When the cumulative run time of the inverter exceeds the time set in P21.17, the ON signal is output.
13	Frequency limiting	When the set frequency exceeds the upper limit frequency or the lower limit frequency, and the output frequency of the inverter also reaches the upper limit frequency or lower limit
14	Torque limiting	When the inverter is in speed control mode, and the output torque reaches the torque limit value, the inverter is in a stall

15	Ready for running	When the power supply of the main circuit and the control loop of the inverter has stabilized, and the inverter has not detected any fault information, the inverter is in a running
16	AI1>AI2	When the value of analog input AI1 is greater than the input value of AI2, an ON signal is output.
17	Upper limit frequency	When the running frequency reaches the upper limit
18	Lower limit frequency arrival (no output during	When the running frequency reaches the lower limit frequency, the ON signal is output. When in the shutdown
19	Undervoltage state output	When the inverter is in the undervoltage state, the ON signal
20	Communication setting	Refer to the communication protocol.
21	Reserved	Reserved
22	Reserved	Reserved
23	Zero-speed running 2 (also output during shutdown)	When the output frequency of the inverter is 0, the ON signal is output. When in the shutdown state, the signal is also ON.
24	Cumulative power-up time arrival	When the cumulative power-up time (P02.13) of the inverter exceeds the time set in P21.16, an ON signal will be output.
25	Frequency level detection	Please refer to the description of function codes P21.28 and
26	Frequency 1 arrival output	Please refer to the description of function codes P21.30 and
27	Frequency 2 arrival output	Please refer to the description of function codes P21.32 and
28	Current 1 arrival output	Please refer to the description of function codes P21.38 and
29	Current 2 arrival output	Please refer to the description of function codes P21.40 and
30	Timer arrival output	When the timing function selection (P21.42) is valid, the inverter will output ON signal after the current run time
31	AI1 input over limit	When the value of analog input AI1 is greater than P21.46 (AI1 input protection upper limit) or less than P21.45 (AI1
32	Load shedding in progress	When the inverter is in the load shedding state, the ON
33	Reverse running	When the inverter is in reverse running, the ON signal is

34	Zero current state	Please refer to the description of function codes P21.28 and
35	Module temperature arrival	When the temperature of the inverter module radiator (P02.07) reaches the set module temperature value
36	Software current over limit	Please refer to the description of function codes P21.36 and
37	Lower limit frequency arrival (also output during shutdown)	When the running frequency reaches the lower limit frequency, the ON signal is output. When in the shutdown state, the signal is also ON.
38	Alarm output	When the inverter fails and the handling mode is set to Continue running, the inverter will output an alarm.
40	Current run time arrival	When the run time of the inverter this time exceeds the time set in P21.53, the ON signal is output.

P04.06	HDO digital output delay time	Factory default	0.0s
	Setting range	0.0s～3600.0s	
P04.07	Relay 1 output delay time	Factory default	0.0s
	Setting range	0.0s～3600.0s	
P04.09	Digital output terminal 1 delay	Factory default	0.0s
	Setting range	0.0s～3600.0s	
P04.10	Digital output terminal 2 delay	Factory default	
	Setting range	0.0s～3600.0s	

Set the delay time from the state change to the actual output change of HDO digital output terminal, relay 1, digital output terminal 1 and digital output terminal 2.

P04.11	DO output terminal valid state	Factory default	00000
	Setting range	Ones digit	HDO valid state selection
		0	Positive logic
		1	Inverse logic
		Tens digit	Valid state setting of relay 1 (0-1, same as above)

		Hundreds digit	Reserved
		Thousands digit	Valid state setting of digital output terminal 1 (0-1, same
		Myriabit	Valid state setting of digital output terminal 2 (0-1, same

Define the output logic of HDO digital output terminal, relay 1, digital output terminal 1, and digital output terminal 2.

0: Positive logic, the connection between the digital output terminal and the corresponding common terminal is valid, and the disconnection is invalid

7.5 Analog and pulse input terminal group P5

P05.00	AI curve 1 minimum input	Factory default	0.00V
	Setting range	-10.00V～P05.02	
P05.01	AI curve 1 minimum input corresponding setting	Factory default	0.0%
	Setting range	-100.00%～100.0%	
P05.02	AI curve 1 maximum input	Factory default	10.00V
	Setting range	P05.00～10.00V	
P05.03	AI curve 1 maximum input corresponding setting	Factory default	100.0%
	Setting range	-100.00%～100.0%	
P05.04	AI1 filtering time	Factory default	0.10s
	Setting range	0.00s～10.00s	

The above function codes are used to set the relationship between the analog input voltage and the set value it represents.

When the analog input voltage is greater than the set "maximum input" (P05.02), the analog voltage is calculated according to the "maximum input"; Similarly, when the analog input voltage is less than the set "minimum input" (P05.00), it is calculated according to the setting of "AI lower than minimum input setting selection" (P05.21), using either the minimum input or 0.0%.

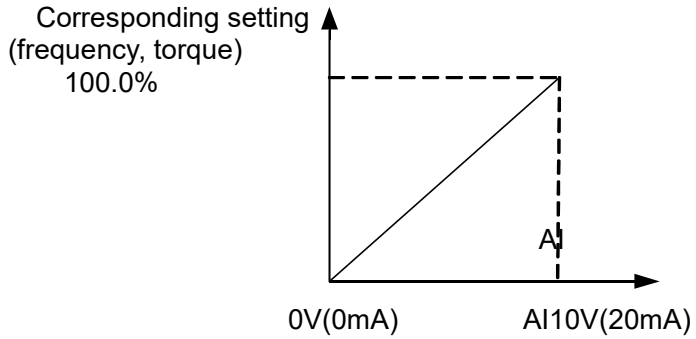
When the analog input is a current input, 1 mA current is equivalent to 0.5 V voltage.

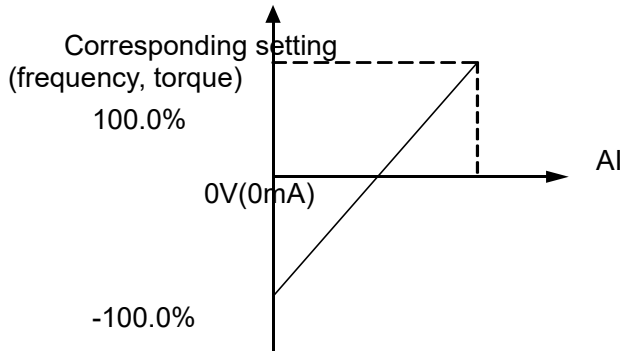
AI1 input filtering time is used to set the software filtering time of AI1. When the on-site analog quantity is easy to be disturbed, please increase the filtering time to make the detected analog quantity tend to be stable. However, the larger the filtering

time, the slower the response speed to analog quantity detection. The setting needs to be weighed according to the actual application situation.

In different applications, the nominal value corresponding to 100.0% of the analog setting has different meanings. For details, please refer to the description of each application section.

The following illustrations show two typical settings:





Corresponding relationship between analog reference and set value

P05.05	AI curve 2 minimum input	Factory	0.00V
	Setting range	-10.00V～P05.07	
P05.06	AI curve 2 minimum input	Factory	0.0%
	Setting range	-100.00%～100.0%	
P05.07	AI curve 2 maximum input	Factory default	10.00V
	Setting range	P05.05～10.00V	
P05.08	AI curve 2 maximum input corresponding setting	Factory default	100.0%

	Setting range	-100.00%～100.0%	
P05.09	AI2 filtering time	Factory	0.10s
	Setting range	0.00s～10.00s	

Please refer to the description of curve 1 for the function and usage of curve 2.

P05.10	AI curve 3 minimum input	Factory default	0.00V
	Setting range	0.00s～P05.12	
P05.11	AI curve 3 minimum input corresponding setting	Factory default	0.0%
	Setting range	-100.00%～100.0%	
P05.12	AI curve 3 maximum input	Factory default	10.00V
	Setting range	P05.10～10.00V	
P05.13	AI curve 3 maximum input corresponding setting	Factory default	100.0%
	Setting range	-100.00%～100.0%	
P05.14	AI3 filtering time	Factory default	0.10s
	Setting range	0.00s～10.00s	

Please refer to the description of curve 1 for the function and usage of curve 3.

P05.15	PULSE minimum input	Factory default	0.00kHz
	Setting range	0.00kHz～P05.17	
P05.16	PULSE minimum input corresponding setting	Factory default	0.0%
	Setting range	-100.00%～100.0%	
P05.17	PULSE maximum input	Factory default	50.00kHz
	Setting range	P05.15～50.00kHz	
P05.18	PULSE maximum input corresponding setting	Factory default	100.0%

	Setting range	-100.00%～100.0%	
P05.19	PULSE filtering time	Factory default	0.10s
	Setting range	0.00s～10.00s	

The function codes in this group are used to set the relationship between the DI5 pulse frequency and the corresponding set value.

The pulse frequency can only be input to the inverter through the DI5 channel. The application of this group of functions is similar to curve 1, please refer to the description of curve 1.

P05.20	AI curve selection		Factory 321
	Setting range	Ones digit	AI1 curve selection
		1	Curve 1 (2 points, see P05.00~P05.03)
		2	Curve 2 (2 points, see P05.05~P05.08)
		3	Curve 3 (2 points, see P05.10~P05.13)
		4	Curve 4 (4 points, see P23.00~P23.07)
		5	Curve 5 (4 points, see P23.08~P23.15)
		Tens digit	AI2 curve selection (1~6, same as above)
		Hundreds digit	AI3 curve selection (1~6, same as above)

The ones digit, tens digit and hundreds digit of this function code are used to select the corresponding setting curves of analog input AI1, AI2 and AI3 respectively. Three analog inputs can be used to select any one of the five curves.

Curves 1, 2 and 3 are all 2-point curves, which are set in the P05 group function code, while curves 4 and 5 are all 4-point curves, and need to be set in the P19 group function code.

The GF630N01 inverter standard unit provides 2 analog input ports.

P05.21	AI lower than minimum input		Factory	000
	Setting range	Ones digit	AI1 lower than minimum input setting selection	
		0	Corresponds to the minimum input setting	
		1		0.0%
		Tens digit		AI2 lower than minimum input setting
		Hundreds digit		AI3 lower than minimum input setting

This function code is used to set how to determine the setting corresponding to the analog quantity when the voltage of the analog quantity input is less than the set "minimum input".

The ones digit, tens digit and hundreds digit of this function code correspond to analog input AI1, AI2 and AI3 respectively.

If 0 is selected, when the AI input is lower than the "minimum input", the setting corresponding to the analog quantity is the curve "minimum input corresponding setting" (P05.01, P05.06, P05.11) determined by the function code.

If 1 is selected, when the AI input is lower than the "minimum input", the setting corresponding to the analog quantity is 0.0%.

7.6 Analog and pulse output terminal group P6

P06.00	FMP output function selection (pulse output terminal)	Factory default	0
P06.01	AO1 output function selection	Factory default	0

FMP terminal output pulse frequency range is 0.01 kHz~P06.03 (FMP output maximum frequency), P06.03 can be set between 0.01kHz~50.00kHz.

The output range of analog output AO1 is 0V~10V, or 0mA~20mA. The calibration relationship between the range of pulse output or analog output and the corresponding function is shown in the following table:

Set value	Function	Functions corresponding to pulse or analog output 0.0%~100.0%
0	Running frequency	0~maximum output frequency
1	Set frequency	0~maximum output frequency
2	Output current	0~2 times the motor rated current

3	Output torque	0~2 times the motor rated torque
4	Output power	0~2 times the rated power
5	Output voltage	0~1.2 times the inverter rated voltage
6	PULSE pulse input	0.01kHz～50.00kHz
7	AI1	0V～10V
8	AI2	0V~10V (or 0~20mA)
9	AI3	0V～10V
10	Length	0~maximum set length
11	Count value	0~maximum count value
12	Communication setting	0.0%～100.0%
13	Motor speed	0~maximum output frequency corresponding speed
14	Output current	0.0A~1000.0A
15	Output voltage	0.0V~1000.0V
16	Output torque (actual value)	-2 times the motor rated torque ~ 2 times the motor rated torque

P06.03	FMP output maximum frequency	Factory default	50.00kHz
	Setting range	0.01kHz～100.00kHz	

When the FM terminal is selected as pulse output, this function code is used to select the maximum frequency value of the output pulse.

P06.04	AO1 zero bias coefficient	Factory default	0.0%
	Setting range	-100.0%～+100.0%	
P06.05	AO1 gain	Factory default	1.00
	Setting range	-10.00～+10.00	

The above function codes are generally used to correct the null drift and output amplitude deviation of the analog output. It can also be used to customize the required AO output curve.

If the zero bias is represented by "b", the gain is represented by k, the actual output is represented by Y, and the standard output is represented by X, the actual output is: Y=kX+b.

Among them, 100% of the zero bias coefficient of AO1 corresponds to 10V (or 20mA),

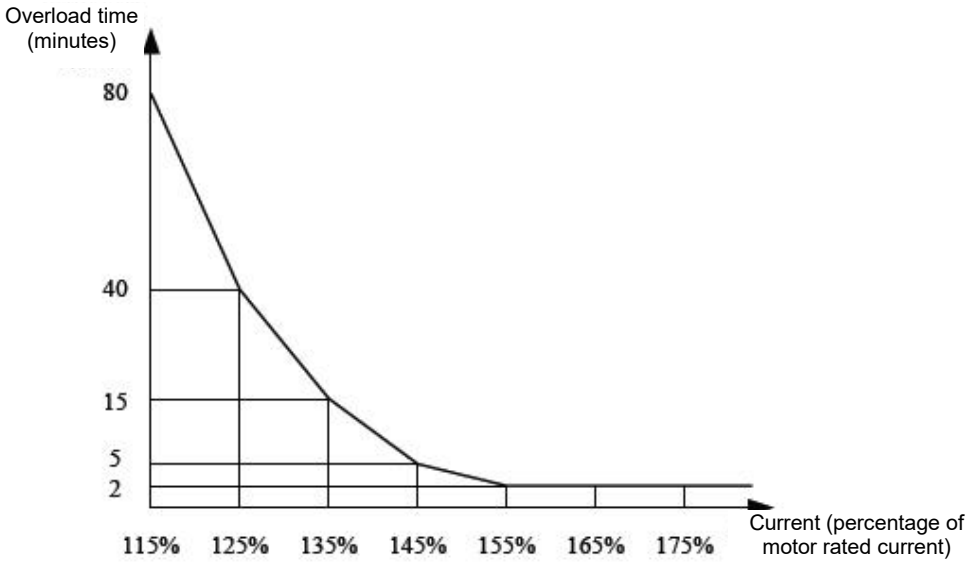
and the standard output refers to the quantity represented by the analog output corresponding to 0V~10V output (or 0mA~20mA) without zero bias and gain correction.

For example, if the analog output content is running frequency, and you want to output 8V at 0 frequency and 3V at maximum frequency, the gain shall be set to "-0.50" and the zero bias shall be set to "80%".

7.7 Protection parameter group P7

P07.00	Motor overload protection selection		Factory default	1
	Setting range	0	Prohibited	
		1	Allowed	
P07.01	Motor overload protection gain		Factory default	1.00
	Setting range		0.20～10.00	

P07.00=0: There is no motor overload protection function, and there may be a risk of motor overheating damage. It is recommended to heat the relay between the inverter and the motor;
P07.00=1: At this time, the inverter judges whether the motor is overloaded according to the inverse time limit curve of the motor overload protection.



For example, if the motor is required to run at 120% motor current for 30 minutes and report overload, calculate the motor current Ix for 30 minutes overload under the default setting first.

According to the motor overload curve, if the 30-minute overload is within the current range of 125% and 135%, the 30-min overload motor current Ix under the default setting can be obtained as follows: (40-30)÷(125%-Ix)=(40-15)÷(125%-135%)

The motor current Ix = 129%, so it can be concluded that the motor needs to report

overload for 30 minutes under the condition of 120% motor current, and the motor overload protection gain is:

P07.01=120%÷Ix=120%÷129%=0.93

Note: The user must accurately set the value of P07.01 in accordance with the actual overload capacity of the motor. If this parameter is set excessively high, it may result in motor overheating and subsequent damage, while the inverter may fail to provide timely alarms and protection!

P07.02	Motor overload pre-warning coefficient	Factory default	80%
	Setting range	50%～100%	

This function is used to send an pre-alarm signal to the control system through DO before the motor overload fault protection. This pre-alarm factor is used to determine how much pre-alarm is given before the motor overload protection. The larger the value is, the smaller the advance warning amount is.

When the cumulative output current of the inverter exceeds the product of the inverse time overload curve and P07.02, the multi-function digital DO output of the inverter outputs an "Motor Overload Pre-Alarm" ON signal.

P07.03	Overvoltage stall gain	Factory default	0
	Setting range	(No overvoltage stall) ~ 100)	
P07.04	Overvoltage stall protection voltage	Factory default	130%
	Setting range	120% ~ 150% (three-phase)	

During the deceleration of the inverter, when the DC bus voltage exceeds the overvoltage stall protection voltage, the inverter stops decelerating and remains at the current running frequency, and continues to decelerate after the bus voltage drops.

The overvoltage stall gain is used to adjust the ability of the inverter to suppress overvoltage during deceleration. The larger the value is, the stronger the ability to suppress overpressure is. Under the premise of no overvoltage, the gain should be set as small as possible.

For loads with small inertia, the overvoltage stall gain should be small, otherwise the dynamic response of the system will be slowed down. For loads with large moment of inertia, this value should be large, otherwise the suppression effect is not good and overvoltage fault may occur.

The overvoltage stall function is canceled when the overvoltage stall gain is set to 0. The overvoltage stall protection voltage is set to 100% and the corresponding base value is 530V;

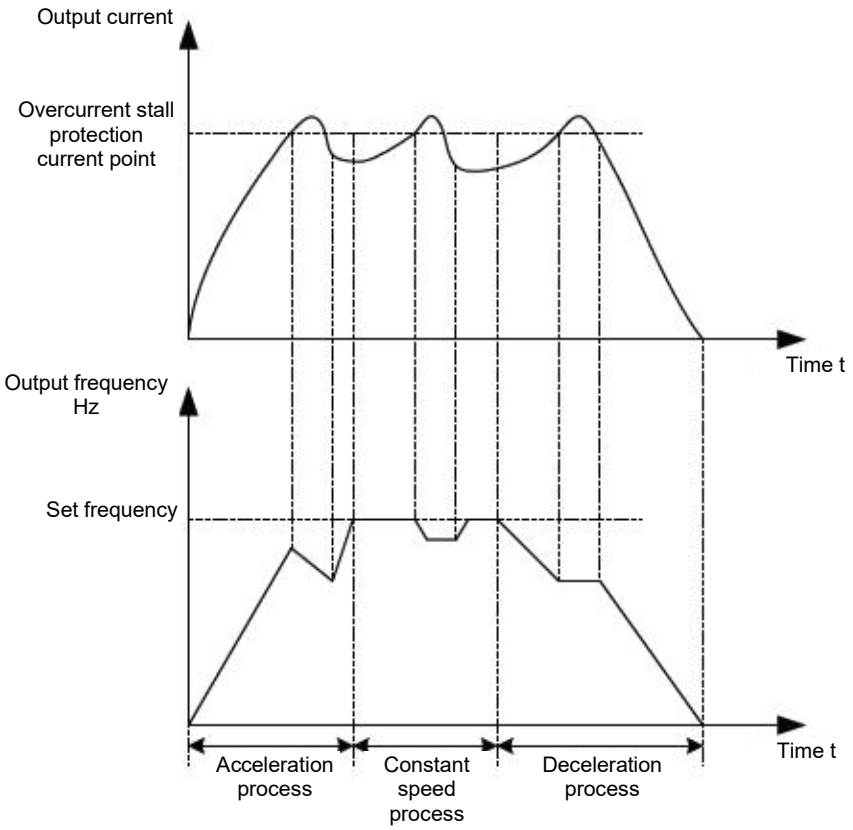
P07.05	Overcurrent stall gain	Factory default	20
	Setting range	0～100	
P07.06	Overcurrent stall protection current	Factory default	150%
	Setting range	100%～200%	

Overcurrent and stall: When the output current of the inverter reaches the set overcurrent and stall protection current (P07.06), the output frequency of the inverter will be reduced when it is running at acceleration; The output frequency will be reduced during running at constant speed; When running at deceleration, the rate of decrease will be slowed down until the current is less than the overcurrent and stall protection current (P07.06), after which the running frequency will return to normal. See the figure for details.

Overcurrent stall protection current: select the current protection point of the overcurrent stall function. When this parameter value is exceeded, the inverter starts to perform the overcurrent stall protection function. This value is a percentage of the rated current of the relative motor.

Overcurrent stall gain: It is used to adjust the ability of the inverter to suppress overcurrent during acceleration and deceleration. The larger the value is, the stronger the ability to suppress overcurrent is. Under the premise of no overcurrent, the gain should be set as small as possible.

For loads with small inertia, the overcurrent stall gain should be small, otherwise the dynamic response of the system will be slowed down. For loads with large moment of inertia, this value should be large, otherwise the suppression effect is not good and overcurrent fault may occur. In the case of very small inertia, it is recommended to set the overcurrent suppression gain less than 20. The overcurrent stall function is canceled when the overcurrent stall gain is set to 0.



P07.07	Power-up to ground short circuit protection selection	Factory default	01
	Setting range	0: Invalid; 1: Valid	

When the inverter is powered up, it can be selected to detect whether the motor is short circuited to ground.

If this function is effective, the UVW end of the inverter will have voltage output for a period of time after power-up.

P07.09	Fault automatic reset times	Factory default	0
	Setting range	0～20	

When the inverter selects automatic fault reset, it is used to set the number of times that can be automatically reset. After this number of times, the inverter remains faulty.

P07.10	Fault DO action selection during automatic fault reset	Factory default	1
	Setting range	0: No action 1: Action	

If the inverter is set with the automatic fault reset function, whether the fault DO acts

during the automatic fault reset can be set through P07.10.

P07.11	Fault automatic reset interval	Factory default	1.0s
	Setting range	0.1s～100.0s	

The waiting time from the inverter fault alarm to the automatic fault reset.

P07.12	Input phase loss protection selection	Factory default	00
	Setting range	0: Prohibited 1: Allowed	

Select whether to protect against input phase loss.

P07.13	Output phase loss protection selection	Factory default	1
	Setting range	0: Prohibited 1: Allowed	

Select whether to protect against output phase loss.

P07.14	Type of first fault	0～999
P07.15	Type of second fault	
P07.16	Type of third (latest) fault	

Record the latest three fault types of the inverter, and 0 means no fault. For the possible causes and solutions of each DTC, please refer to the relevant instructions in Chapter 8.

P07.17	Frequency at the third fault	Frequency at last fault
P07.18	Current at the third fault	Current at last fault
P07.19	Bus voltage at the third fault	Bus voltage at last fault

<table>
<tr><td>P07.20</td><td>Input terminal status at the third fault</td><td>The status of the digital input terminals at the last fault, in the order:
<table><tr><td>BIT9</td><td>BIT8</td><td>BIT7</td><td>BIT6</td><td>BIT5</td><td>BIT4</td><td>BIT3</td><td>BIT2</td><td>BIT1</td><td>BIT0</td></tr><tr><td>Reserved</td><td>Reserved</td><td>DI7</td><td>DI6</td><td>DI5</td><td>HDI</td><td>DI4</td><td>DI3</td><td>DI2</td><td>DI1</td></tr></table>
When the input terminal is ON, the corresponding binary digit is 1, and when it is OFF,
0. The status of all DIs is converted to decimal number display.</td></tr>
<tr><td>P07.21</td><td>Output terminal at the third fault</td><td>The status of all output terminals at the last fault, in the order:
<table><tr><td>BIT4</td><td>BIT3</td><td>BIT2</td><td>BIT1</td><td>BIT0</td></tr><tr><td>DO2</td><td>DO1</td><td>Reserved</td><td>Relay 1</td><td>FMP</td></tr></table>When the input terminal is ON, the corresponding binary digit is 1, and when it is OFF,
0. The status of all DIs is converted to decimal number display.</td></tr>
<tr><td>P07.22</td><td>Inverter status at the third fault</td><td>Reserved</td></tr>
<tr><td>P07.23</td><td>Power-up time at the third fault</td><td>Current power-up time at last fault</td></tr>
<tr><td>P07.24</td><td>Run time at the third fault</td><td>Current run time at last fault</td></tr>
<tr><td>P07.27</td><td>Frequency at the second fault</td><td rowspan="8">Same as P07.17~P07.24</td></tr>
<tr><td>P07.28</td><td>Current at the second fault</td></tr>
<tr><td>P07.29</td><td>Bus voltage at the second fault</td></tr>
<tr><td>P07.30</td><td>Input terminal status at the second fault</td></tr>
<tr><td>P07.31</td><td>Output terminal at the second fault</td></tr>
<tr><td>P07.32</td><td>Inverter status at the second fault</td></tr>
<tr><td>P07.33</td><td>Power-up time at the second fault</td></tr>
<tr><td>P07.34</td><td>Run time at the second fault</td></tr>
<tr><td>P07.37</td><td>Frequency at the first fault</td><td rowspan="4">Same as P07.17~P07.24</td></tr>
<tr><td>P07.38</td><td>Current at the first fault</td></tr>
<tr><td>P07.39</td><td>Bus voltage at the first fault</td></tr>
<tr><td>P07.40</td><td>Input terminal status at the first fault</td></tr>
</table>

P07.41	Output terminal at the first fault	
P07.42	Inverter status at the first fault	
P07.43	Power-up time at the first fault	
P07.44	Run time at the first fault	

P07.47	Fault protection action selection 1		Factory default	00000
	Setting range	Ones digit	Motor overload (E011)	
		0	Coast to Stop (CST)	
		1	Shutdown according to shutdown mode	
		2	Continue running	
		Tens digit	Input phase loss (E113) (same as ones digit)	
		Hundreds digit	Output phase loss (E114) (same as ones digit)	
		Thousands digit	External fault (E015) (same as ones digit)	
		Myriabit	Communication abnormality (E0202) (same as ones digit)	
P07.48	Fault protection action selection 2		Factory default	00000
	Setting range	Ones digit	Encoder fault (E118)	
		0	Coast to Stop (CST)	
		1	Switch to VF and shutdown according to shutdown mode	
		2	Switch to VF and continue running	
		Tens digit	Function code read/write abnormality (E021)	
		0	Coast to Stop (CST)	
		1	Shutdown according to shutdown mode	
		Hundreds digit	Inverter overload (E111) (same as P07.47 ones digit)	
		Thousands digit	Motor overheating (E045) (same as P07.47 ones digit)	

		Myriabit	Run time arrival (Err26) (same as P07.7 ones digit)

P07.49	Fault protection action selection 3		Factory default	00000
	Setting range	Ones digit	User-defined fault 1 (E027) (same as P07.47 ones digit)	
		Tens digit	User-defined fault 2 (E028) (same as P07.47 ones digit)	
		Hundreds digit	Power-up time arrival (E029) (same as P07.47 ones digit)	
		Thousands digit	Load shedding (E030)	
		0	Coast to Stop (CST)	
		1	Shutdown according to shutdown mode	
		2	Decelerate to 7% of the rated frequency of the motor and continue to run, and automatically return to the set frequency if there is no load shedding	
		Myriabit	PID feedback lost during running (E031) (same as P07.47 ones digit)	
P07.50	Fault protection action selection 4		Factory default	00000
	Setting range	Ones digit	Excessive speed deviation (E119) (same as P07.47 ones digit)	
		Tens digit	Motor overspeed (E115) (same as P07.47 ones digit)	
		Hundreds digit	Initial position error (E051) (same as P07.47 ones digit)	
		Thousands digit	Speed feedback error (E052) (same as P07.47 ones digit)	
		Myriabit	Reserved	

When "Coast to Stop (CST)" is selected, the inverter displays E** and stops directly.

When "Shutdown according to shutdown mode" is selected: the inverter displays A**, and shuts down according to shutdown mode, and E** is displayed after shutdown.

When "Continue running" is selected: the inverter continues to run and displays A**, and the running frequency is set by P07.54.

P07.54	Selection of running frequency during failure		Factory default	0
	Setting range	0	Run at current running frequency	
		1	Run at set frequency	

		2	Run at upper limit frequency	
		3	Run at lower limit frequency	
		4	Run at abnormal standby frequency	
P07.55	Abnormal standby frequency		Factory default	100.0%
	Setting range		0.0%～100.0%	

When a fault occurs during the running of the inverter and the handling mode of the fault is set to Continue running, the inverter will display A** and run at the frequency determined by P07.54.

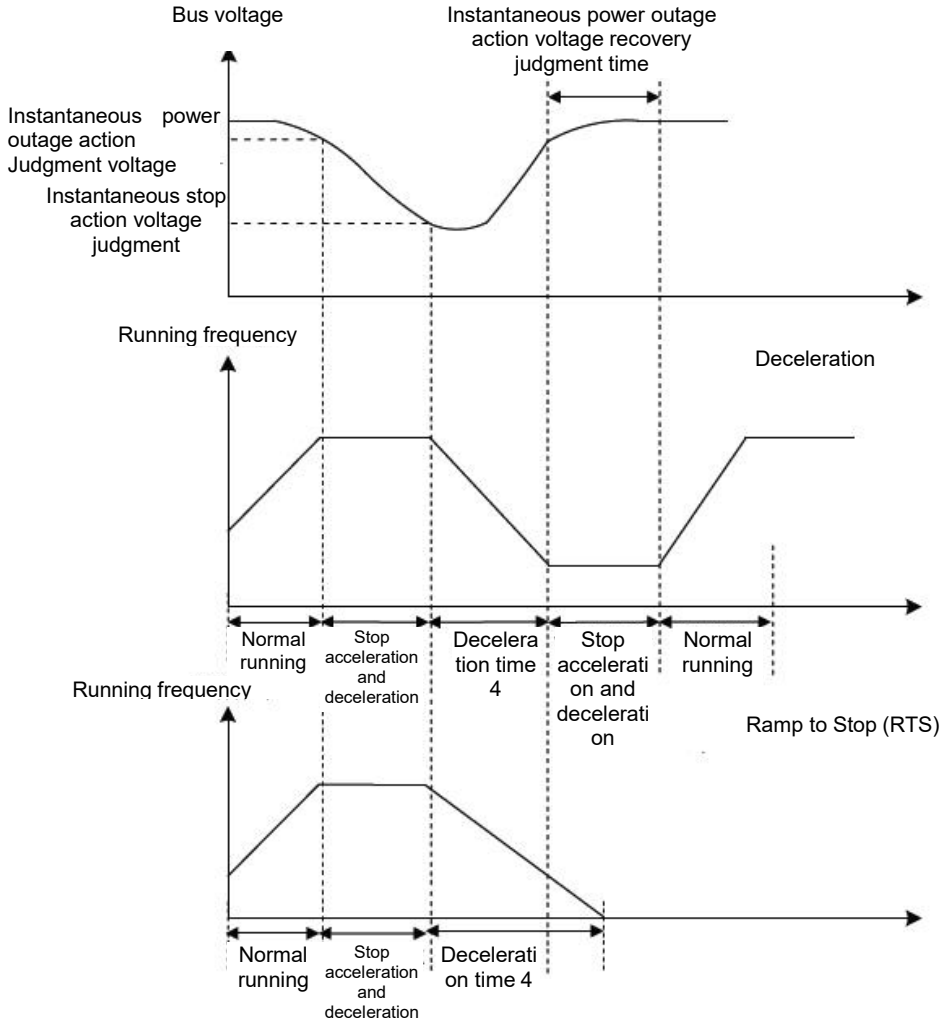
When Run at abnormal standby frequency is selected, the value set by P07.55 is a percentage relative to the maximum frequency.

P07.59	Instantaneous power outage action selection		Factory default	0
	Setting range	0	Invalid	
		1	Deceleration	
		2	Ramp to Stop (RTS)	
P07.60	Instantaneous power outage deceleration frequency switching point		Factory default	0.0%
	Setting range		0.0%～100.0%	
P07.61	Instantaneous power outage voltage recovery judgment time		Factory default	0.50s
	Setting range		0.00s～100.00s	
P07.62	Instantaneous non-stop action voltage judgment		0 Factory default	80.0%
	Setting range		60.0% ~ 100.0% (standard bus voltage)	

This function means that in case of an instantaneous power outage or sudden voltage drop, the inverter will compensate for the drop in the DC bus voltage of the inverter by reducing the output speed and feeding back the load energy to maintain the continuous running of the inverter.

If P07.59=1, in case of instantaneous power outage or sudden voltage drop, the inverter will decelerate. When the bus voltage returns to normal, the inverter will normally accelerate to run at set frequency. The basis for judging that the bus voltage returns to normal is that the bus voltage is normal and the duration exceeds the time set in P07.61

If P07.59=2, in case of instantaneous power outage or sudden voltage drop, the inverter will decelerate until it stops.



Instantaneous power outage action diagram

P07.63	Load shedding protection selection		Factory default	0
	Setting range	0	Invalid	
		1	Valid	
P07.64	Load shedding detection level		Factory default	10.0%
	Setting range		0.0% ~ 100.0% (motor rated current)	
P07.65	Load shedding detection time		Factory default	1.0s
	Setting range		0.0s～60.0s	

If the load shedding protection function is effective, when the inverter output current is less than the load shedding detection level P07.64 and the duration exceeds the load shedding detection time P07.65, the inverter output frequency automatically reduces to 7% of the rated frequency. During the load shedding protection, if the load recovers, the inverter will automatically recover to run at set frequency.

P07.67	Overspeed detection value	Factory default	15.0%
	Setting range	0.0% ~ 50.0% (maximum frequency)	
P07.68	Overspeed detection time	Factory default	1.0s
	Setting range	0.0s～60.0s	

This function is only valid when the inverter is running with speed sensor vector control.

When the inverter detects that the actual motor speed exceeds the set frequency and the excess value is greater than the overspeed detection value P07.67, and the duration exceeds the overspeed detection time P07.68, the inverter triggers fault alarm E115 and handles it according to the fault protection action mode.

P07.69	Excessive speed deviation detection value	Factory default	20.0%
	Setting range	0.0% ~ 50.0% (maximum frequency)	
P07.70	Excessive speed deviation detection time	Factory default	5.0s
	Setting range	0.0s～60.0s	

This function is only valid when the inverter is running with speed sensor vector control.

When the inverter detects that the actual motor speed deviates from the set frequency and the deviation amount is greater than the excessive speed deviation detection value P07.69, and the duration exceeds the excessive speed deviation detection time P07.70, the inverter triggers fault alarm E119 and handles it according to the fault protection action mode.

When the excessive speed deviation detection time is 0.0s, cancel the excessive speed deviation fault detection.

7.8 Motor start-stop control group P8

P08.01	Motor 1 control mode		Factory default	2
	Setting range	0	Sensorless vector control (SVC)	

		1	Reserved
		2	V/F control

0: Sensorless vector control

It refers to open-loop vector control, which is suitable for general high-performance control occasions. One inverter can only drive one motor. Such as machine tools, centrifuges, wire drawing machines, injection molding machines and other loads.

1: Reserved

2: V/F control It is suitable for occasions where the load requirements are not high, or one inverter drives multiple motors, such as fans and pumps. It can be used to drive multiple motors at one time.

Tip: When selecting the vector control mode, the motor parameter identification process must be carried out. Only accurate motor parameters can give full play to the advantages of vector control mode. By adjusting the speed regulator parameter P12 group function code (motor 2 is P13 group), better performance can be obtained.

P08.02	Command source selection		Factory default	0
	Setting range	0	Operation panel command channel (LED off)	
		1	Terminal command channel (LED on)	
		2	Communication command channel (LED flashing)	

Select the input channel of the inverter control command.

The inverter control commands include: start, stop, forward, reverse, jog, etc.

0: Operation panel command channel ("LOCAL" light on); Run command control is carried out by the RUN and STOP/RES keys on the operation panel.

1: Terminal command channel ("LOCAL" light off); Run command control is carried out by multi-function input terminals FWD, REV, JOGF, JOGR, etc.

2: Communication command channel ("LOCAL/REMOT" light flashes): The run command is given by the upper computer through communication. When this option is selected, a communication card must be selected.

P08.03	Main frequency source X selection		Factory default	0
	Setting range	0	Digital setting (preset frequency P08.08, UP/DOWN modifiable, no power down memory)	
		1	Digital setting (preset frequency P08.08, UP/DOWN modifiable, power down memory)	

		2	AI1
		3	AI2
		4	AI3
		5	Pulse setting (DI5)
		6	Multi-segment command
		7	PLC
		8	PID
		9	Communication reference

Select the input channel of the main reference frequency of the inverter. There are 10 main reference frequency channels:

0: Digital setting (no power down memory)

The initial value of the set frequency is the value of P08.08 "preset frequency". The set frequency value of the inverter can be changed by pressing the ▲ and ▼ keys on the keyboard (or UP and DOWN of the multi-function input terminal).

When the inverter is powered down and powered up again, the set frequency value returns to the value of P08.08 "Digital setting preset frequency".

1: Digital setting (power down memory)

The initial value of the set frequency is the value of P08.08 "preset frequency". The set frequency value of the inverter can be changed by pressing ▲ and ▼ keys on the keyboard (or UP and DOWN of the multi-function input terminal).

When the inverter is powered down and powered up again, the set frequency returns to the set frequency at the moment of the last power down, with the correction amount via the ▲, ▼ keys on the keypad or the UP, DOWN terminals being remembered.

It should be reminded that P08.23 is "Digital Set Frequency Shutdown Memory Selection", which is used to select whether the frequency correction is memorized or cleared when the inverter is shut down. P08.23 pertains to shutdown procedures and is not associated with power down memory. Please take note of this distinction in application.

2：AI1

3：AI2

4：AI3

The frequency is determined by the analog input terminal. The GF630N01 control board provides 2 analog input terminals (AI1, AI2), and the option I/O expansion card can provide another analog input terminal (AI3).

Among them, AI1 is 0V~10V voltage input, AI2 is 0/4mA~20mA current input,and AI3 is the knob voltage input.

The corresponding relationship between the input voltage values of AI1, AI2 and AI3 and the target frequency can be freely selected by the user. GF630N01 provides 5 groups of correspondence curves, of which 3 groups of curves are linear (2-point correspondence), and 2 groups of curves are arbitrary curves with 4-point correspondence, which can be set by the user through the function codes of group P05 and group P19.
The function code P05.20 is used to set the AI1~AI3 three-way analog input, and select which of the 5 groups of curves is selected respectively. For the specific corresponding relationship of the 5 curves, please refer to the description of the P05 and P19 groups of function codes.

5: Pulse reference (DI5) The frequency reference is set by terminal pulse. Specification of pulse reference signal: voltage range 9V~30V, frequency range 0kHz~50kHz. The pulse reference can only be input from the multi-function input terminal DI5.
The relationship between the input pulse frequency of the DI5 terminal and the corresponding setting is set through P05.15~P05.18. The correspondence is the linear correspondence of 2 points. The 100.0% of the corresponding setting of the pulse input refers to the percentage of the relative maximum frequency P08.10.

6: Multi-segment command When selecting the multi-segment command operation mode, it is necessary to input different state combinations of the DI terminal through digital quantities, corresponding to different set frequency values. GF630N01 can be set with 4 multi-segment command terminals and 16 states of the 4 terminals. Any 16 "multi-segment commands" can be assigned through the P09 group function code. "Multi-segment command" is the percentage of the relative maximum frequency P08.10.
When using the digital input DI terminal as a multi-segment command terminal function, corresponding settings need to be made in the P3 group. Please refer to the P3 related function parameter description for specific details.

7: Simple PLC
When the frequency source is a simple PLC, the running frequency source of the inverter can be switched between 1~16 arbitrary frequency commands, and the holding time and respective acceleration and deceleration time of 1~16 frequency commands can also be set by the user. For specific content, refer to the relevant instructions of P9 group.

8：PID
Select the output of the process PID control as the running frequency. It is generally used for on-site process closed-loop control, such as constant pressure closed-loop control and constant tension closed-loop control.
When PID is used as the frequency source, the relevant parameters of P15 group "PID function" need to be set.

9: Communication reference means that the main frequency source is set by the upper computer through communication.

P08.04	Auxiliary frequency source Y selection		Factory default	0
	Setting range	0	Digital setting (preset frequency P08.08, UP/DOWN modifiable, no power down memory)	
		1	Digital setting (preset frequency P08.08, UP/DOWN modifiable, power down memory)	
		2	AI1	
		3	AI2	
		4	AI3	
		5	Pulse setting (DI5)	
		6	Multi-segment command	
		7	PLC	
		8	PID	
		9	Communication reference	

When the auxiliary frequency source is used as an independent frequency reference channel (i.e., the frequency source is switched from X to Y), its usage is the same as that of the main frequency source X. The usage method can refer to the relevant instructions in P08.03.

When an auxiliary frequency source is used as a superimposed reference (i.e., frequency source selection is X+Y, X to X+Y switching, or Y to X+Y switching), note that:

1) When the auxiliary frequency source is digital reference, the preset frequency (P08.08) does not work, and the frequency adjustment by the user through the ▲ and ▼ keys in the keyboard (or UP and DOWN of the multi-function input terminal) is directly adjusted on the basis of the main reference frequency.

2) When the auxiliary frequency source is analog input reference (AI1, AI2, AI3) or pulse input reference, 100% of the input setting corresponds to the auxiliary frequency source range, which can be set through P08.05 and P08.06.

3) When the frequency source is pulse input reference, it is similar to analog quantity reference. Tip: The auxiliary frequency source Y selection and the main frequency source X selection cannot be set to the same channel, that is, P08.03 and P08.04 should not be set to the same value, otherwise it is easy to cause confusion.

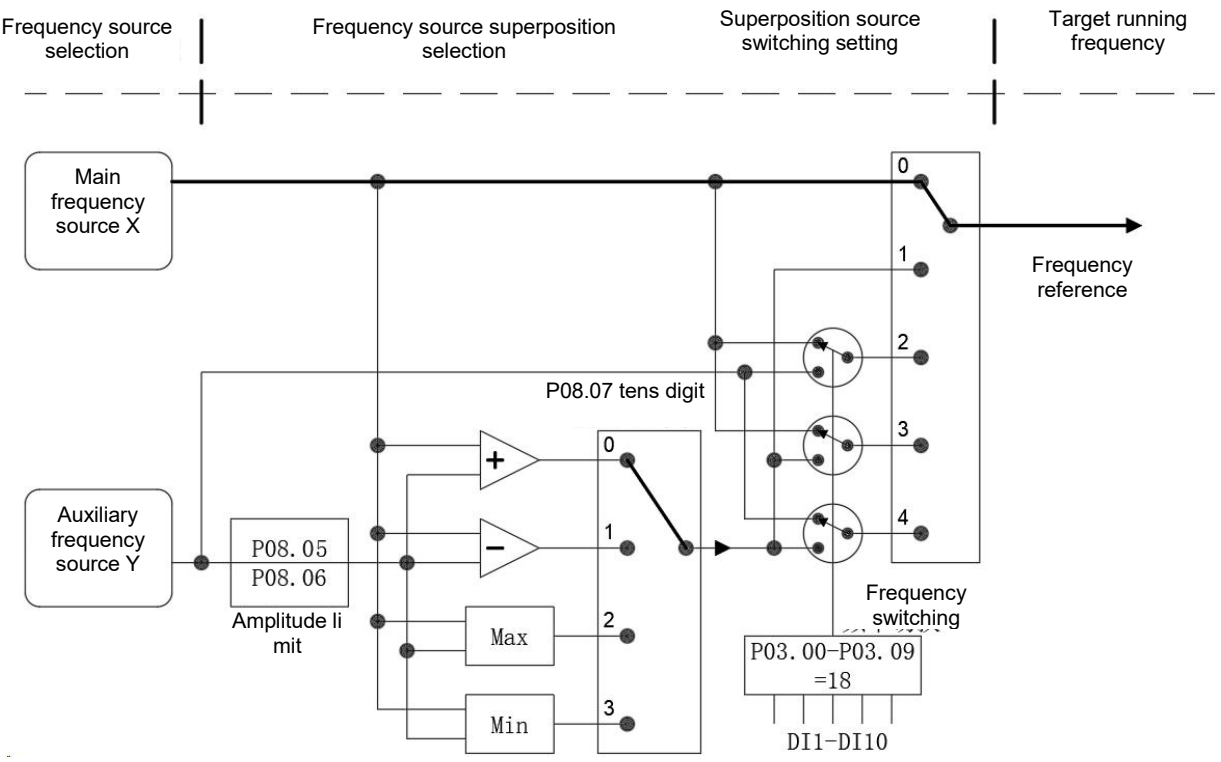
P08.05	Auxiliary frequency source Y range selection during superposition		Factory default	0
	Setting range	0	Relative to maximum frequency	
		1	Relative to main frequency source X	
P08.06	Auxiliary frequency source Y range during superposition		Factory default	0
	Setting range		0%～150%	

These two parameters are used to determine the adjustment range of the auxiliary frequency source when the frequency source is selected as "frequency superposition" (i.e., P08.07 is set to 1, 3, or 4).

P08.05 is used to determine the object corresponding to the auxiliary frequency source range. It can be selected relative to the maximum frequency or relative to the main frequency source X. If it is selected relative to the main frequency, the range of the auxiliary frequency source will change with the main frequency X.

P08.07	Frequency source superposition selection		Factory default 0
	Setting range	Ones digit	Frequency source selection
		0	Main frequency source X
		1	Main and auxiliary operation results (the operation relationship is determined by the
		2	Switching between main frequency source X and auxiliary frequency source Y
		3	Switching between main frequency source X and main-auxiliary operation result
		4	Switching between auxiliary frequency source Y and main-auxiliary operation result
		Tens digit	Frequency source main and auxiliary operation relationship
		0	Main + auxiliary
		1	Main - auxiliary
		2	Maximum of the two
		3	Minimum of the two

Select the frequency reference channel through this parameter. The frequency reference is achieved by combining the main frequency source X and the auxiliary frequency source Y.
Ones digit: Frequency source selection:



0: Main frequency source X

The main frequency X is used as the target frequency.

1: Main and auxiliary operation results The main and auxiliary operation results are used as the target frequency, and the main and auxiliary operation relationship is shown in the "tens digit" description of the function code.

2: Switching between main frequency source X and auxiliary frequency source Y When the multi-function input terminal function 18 (frequency switching) is invalid, the main frequency X is used as the target frequency. When the multi-function input terminal function 18 (frequency source switching) is valid, the auxiliary frequency Y is used as the target frequency.

3: Switching between main frequency source X and main-auxiliary operation result When the multi-function input terminal function 18 (frequency switching) is invalid, the main frequency X is used as the target frequency. When the multi-function input terminal function 18 (frequency switching) is valid, the primary and auxiliary operation result is used as the target frequency.

4: Switching between auxiliary frequency source Y and main-auxiliary operation result When the multi-function input terminal function 18 (frequency switching) is invalid, the auxiliary frequency Y is used as the target frequency. When the multi-function input terminal function 18 (frequency switching) is valid, the primary and auxiliary operation result is used as the target frequency. Tens digit: Frequency source main and

auxiliary operation relationship:

0: Main frequency source X + auxiliary frequency source Y

The sum of the main frequency X and the auxiliary frequency Y is used as the target frequency. Implement frequency superposition reference function.

1: Main frequency source X - auxiliary frequency source Y

The difference between the main frequency X and the auxiliary frequency Y is used as the target frequency.

2: MAX (main frequency source X, auxiliary frequency source Y) Take the maximum absolute value between the main frequency X and the auxiliary frequency Y as the target frequency. Bias frequency for flexibility in response to various needs.

P08.08	Preset frequency	Factory default	50.00Hz
	Setting range	0.00~maximum frequency (valid for digital setting of frequency source selection mode)	

When the frequency source is selected as "Digital Setting" or "Terminal UP/DOWN", this function code value is the initial value of the frequency digital setting of the inverter.

P08.09	Running direction		Factory default	0
	Setting range	0	Consistent direction	
		1	Opposite direction	

By changing this function code, the motor rotation direction can be changed without changing the motor wiring, which is equivalent to adjusting any two wires of the motor (U, V, W) to realize the conversion of the motor rotation direction.

Tip: After the parameters are initialized, the running direction of the motor will return to the original state. It shall be used with caution when it is strictly forbidden to change the motor steering after the system is commissioned.

P08.10	Maximum frequency	Factory default	50.00 Hz
	Setting range	50.00Hz～320.00Hz	

100.0% of analog input, pulse input (DI5), multi-segment command, etc. in GF630N01 are calibrated relative to P08.10 when used as frequency source.

The maximum output frequency of GF630N01 can reach 500Hz. In order to balance the two indicators of frequency command resolution and frequency input range, the number of decimal points of frequency command can be selected through P08.22.

When P08.22 is selected as 1, the frequency resolution is 0.1 Hz, and the setting range of P08.10 is 50.0 Hz ~ 500.0 Hz;

When P08.22 is set to 2, the frequency resolution is 0.01Hz, and the setting range of

P08.10 is 50.00Hz~500.00Hz.

P08.11	Upper limit frequency source		Factory default	0
	Setting range	0	P08.12 setting	
		1	AI1	
		2	AI2	
		3	AI3	
		4	PULSE setting	
		5	Communication setting	

Define the source of the upper limit frequency. The upper limit frequency can come from the digital setting (P08.12) or from the analog input channel. When the upper limit frequency is set with an analog input, 100% of the analog input setting corresponds to P08.12.
For example, when the torque control mode is adopted at the winding control site, in order to avoid the phenomenon of "flying" due to material disconnection, the upper limit frequency can be set with analog quantity. When the inverter runs to the upper limit frequency value, the inverter keeps running at the upper limit frequency.

P08.12	Upper limit frequency	Factory default	50.00Hz
	Setting range	Lower limit frequency P08.14~maximum frequency P08.10	
P08.13	Upper limit frequency offset	Factory default	0.00Hz
	Setting range	0.00Hz~maximum frequency P08.10	

When the upper limit frequency is set by analog quantity or PULSE, P08.13 is used as the offset of the set value, and this offset frequency is superimposed with the upper limit frequency value set by P08.11 as the set value of the final upper limit frequency.

P08.14	Lower limit frequency	Factory default	0.00 Hz
	Setting range	0.00Hz~upper limit frequency P08.12	

When the frequency command is lower than the lower limit frequency set in P08.14, the inverter can stop, run at the lower limit frequency or run at zero speed. The operation mode can be set by P21.14 (operation mode with the set frequency lower than the lower limit).

P08.15	Carrier frequency	Factory default	Related to model power
	Setting range	0.5kHz～16.0kHz	

Adjusting the carrier frequency affects the following performance:

Carrier frequency	Low → High
Motor noise	Large → Small
Output current waveform	Poor → Good
Motor temperature rise	High → Low
Inverter temperature rise	Low → High
Leakage current	Small → Large
External radiated interference	Small → Large

For inverters of different powers, the factory setting of carrier frequency is different. Although the user can modify it as needed, it should be noted that if the carrier frequency is set higher than the factory default, the temperature rise of the inverter radiator will increase. Under such circumstances, the user must derate the inverter to prevent the risk of an overheating alarm.

P08.16	Carrier frequency adjustment with temperature	Factory default	0
	Setting range	0: No 1: Yes	

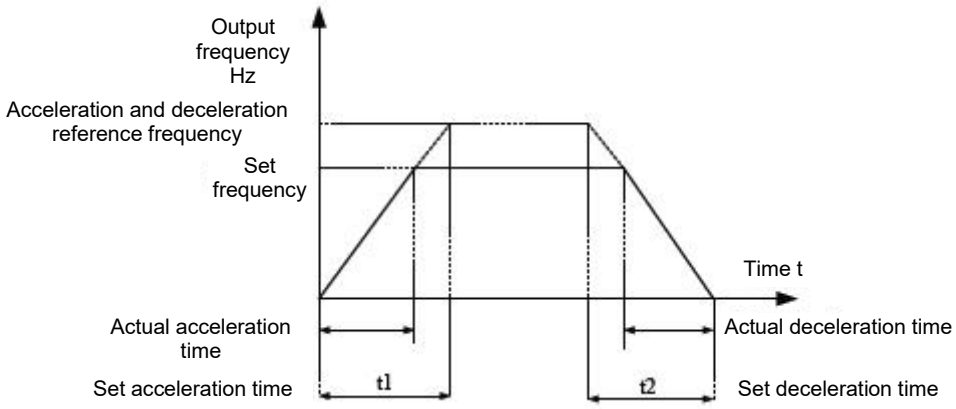
Carrier frequency adjustment with temperature means that when the inverter detects that its radiator temperature is high, it automatically reduces the carrier frequency to reduce the temperature rise of the inverter. When the radiator temperature is low, the carrier frequency gradually returns to the set value. This function can reduce the chance of inverter overheating alarm.

P08.17	Acceleration time 1	Factory default	Related to model power
	Setting range	0.00s～6500.0s	
P08.18	Deceleration time 1	Factory default	Related to model power
	Setting range	0.00s～6500.0s	

The acceleration time refers to the time required for the inverter to accelerate from zero frequency to the acceleration and deceleration reference frequency (determined by P08.25), as shown in t1 in the figure.

The deceleration time refers to the time required for the inverter to decelerate from the

acceleration and deceleration reference frequency (determined by P08.25) to zero frequency, as shown in t2 in the figure.



Acceleration and deceleration time diagram

GF630N01 provides 4 groups of acceleration and deceleration time, which can be switched and selected by the user through the digital input terminal DI. The four groups of acceleration and deletion time can be set by the following function code:

Group 1: P08.17, P08.18;

Group 2: P21.03, P21.04;

Group 3: P21.05, P21.06;

Group 4: P21.07, P21.08.

P08.19	Acceleration and deceleration time unit		Factory default	1
	Setting range	0	1 s	
		1	0.1 s	
		2	0.01 s	

In order to meet the needs of various sites, GF630N01 provides 3 acceleration and deceleration time units, namely 1 s, 0.1 s and 0.01 s.

Note: When modifying this function parameter, the number of decimal places displayed in the acceleration and deceleration time of group P8 will change, and the corresponding acceleration and deceleration time will also change. Special attention shall be paid during application.

P08.21	Auxiliary frequency source bias frequency during superposition	Factory default	0.00Hz
	Setting range	0.00Hz~maximum frequency P08.10	

This function code is only valid when the frequency source is selected as main and auxiliary operation.

When the frequency source is used for the main and auxiliary operation, P8.21 is used as the bias frequency, which is superimposed with the main and auxiliary operation results as the final frequency setting value, so that the frequency setting

can be more flexible.

P08.22	Frequency command resolution		Factory default	2
	Setting range	1	0.1Hz	
		2	0.01Hz	

This parameter is used to determine the resolution of all frequency-related function codes.
When the frequency resolution is 0.1Hz, the maximum output frequency of GF630N01 can reach 500Hz, and when the frequency resolution is 0.01Hz, the maximum output frequency of GF630 N01 is 500.00Hz.
Note: When modifying this function parameter, the number of decimal places for all frequency-related parameters will change, and the corresponding frequency values will also change. Special attention shall be paid during use.

P08.23	Digital set frequency shutdown memory selection		Factory default	0
	Setting range	0	No memory	
		1	Memory	

This function is only valid when the frequency source is set digitally.
"No memory" means that after the inverter stops, the digitally set frequency value returns to the value of P08.08 (preset frequency), and the frequency correction carried out by keys ▲ and ▼ on the keyboard or terminals UP and DOWN is cleared.

"Memory" means that after the inverter is shut down, the digital set frequency remains the set frequency at the last shutdown time, and the frequency correction carried out by keys ▲ and ▼ on the keyboard or terminals UP and DOWN remains valid.

P08.24	Motor selection		Factory default	0
	Setting range	0	Motor 1	
		1	Motor 2	
		2	Motor 3	
		3	Motor 4	

GF630N01 supports the application of the inverter to drag 4 motors in a time-sharing manner. The 4 motors can be set with motor nameplate parameters, independent parameter tuning, different control modes, and parameters related to running performance independently.
The function parameter group corresponding to motor 1 is group P10 and group P12, the function parameter group corresponding to motor 2 is group P11 and group P13, the function parameter group corresponding to motor 3 is group P28 and group P30, and the function parameter group corresponding to motor 4 is group P29 and group

P31.

The user can select the current motor through the P08.24 function code, or switch the motor through the digital input terminal DI. When the function code selection conflicts with the terminal selection, the terminal selection shall prevail.

P08.25	Acceleration/deceleration time reference frequency		Factory default	0
	Setting range	0	Maximum frequency (P08.10)	
		1	Set frequency	
		2	100Hz	

The acceleration and deceleration time refers to the time required to accelerate and decelerate between zero frequency and the frequency set by P08.25.

When P08.25 is selected as 1, the acceleration and deceleration time is related to the set frequency. If the set frequency changes frequently, the acceleration of the motor is changing, and attention should be paid during application

P08.26	Run-time frequency command UP/DOWN reference		Factory default	0
	Setting range	0	Running frequency	
		1	Set frequency	

This parameter is only valid when the frequency source is set digitally.

It is used to determine the method to correct the set frequency when the ▲ and ▼ keys of the keyboard or the terminal UP/DOWN act, that is, whether the target frequency is increased or decreased on the basis of the running frequency or on the basis of the set frequency

The difference between the two settings is evident when the inverter is in the acceleration and deceleration process, that is, if the running frequency of the inverter is different from the set frequency, the different choices of this parameter vary greatly.

P08.27	Command source binding frequency source		Factory default	0
	Setting range	Ones digit	Operation panel command binding frequency source selection	
		0	Not bundled	
		1	Digital set frequency source	

		2	AI1
		3	AI2
		4	AI3
		5	PULSE pulse setting (HDI)
		6	Multi-segment command
		7	Simple PLC
		8	PID
		9	Communication reference
		Tens digit	Terminal command binding frequency source selection (0~9, same as ones digit)
		Hundreds digit	Communication command binding frequency source selection (0~9, same as ones digit)

Define the bundled combination between three run command channels and nine frequency reference channels to facilitate synchronous switching.

The meaning of the above frequency reference channel is the same as that of the main frequency source X selection P08.03. Please refer to the P08.03 function code description. Different run command channels can be bundled with the same frequency reference channel. When the command source has a bound frequency source, the frequency source set by P08.03~P08.07 will no longer work during the validity of the command source.

P08.28	Start mode		Factory default	0
	Setting range	0	Direct start	
		1	Reserved	
		2	Reserved	

0: Direct start

If the starting DC braking time is set to 0, the inverter starts to run from the starting frequency. If the starting DC braking time is not set to 0, DC braking occurs first, and then the inverter starts to run from the starting frequency. Applicable to small inertia loads, where the motor may rotate during starting.

1: Reserved

2: Reserved

P08.31	Starting frequency	Factory default	0.00Hz
	Setting range	0.00Hz～10.00Hz	
P08.32	Starting frequency holding time	Factory default	0.0s
	Setting range	0.0s～100.0s	

In order to ensure the motor torque during starting, please set an appropriate starting frequency. In order to fully establish magnetic flux when the motor is started, the starting frequency needs to be maintained for a certain period of time.

The starting frequency P08.31 is not limited by the lower limit frequency. However, when the set target frequency is lower than the starting frequency, the inverter does not start and remains in standby state.
During the forward and reverse switching process, the starting frequency holding time does not take effect. The starting frequency holding time is not included in the acceleration time, but it is included in the run time of the simple PLC.
Example 1:
P08.31=0 Frequency source is digital reference
P08.08=2.00Hz digital set frequency is 2.00Hz
P08.31=5.00Hz starting frequency is 5.00Hz
P08.32 = 2.0s Starting frequency holding time is 2.0s. At this time, the inverter will be in standby state, and the inverter output frequency will be 0.00Hz.
Example 2:
P08.03=0 Frequency source is digital reference
P08.08=10.00Hz digital set frequency is 10.00Hz
P08.31=5.00Hz starting frequency is 5.00Hz
P08.32=2.0s starting frequency holding time is 2.0s
At this time, the inverter accelerates to 5.00 Hz for 2.0 s, and then accelerates to the reference frequency of 10.00 Hz.

P08.33	Start DC braking current	Factory default	0%
	Setting range	0%～100%	
P08.34	Start DC braking time	Factory default	0.0s
	Setting range	0.0s～100.0s	

Start DC braking, which is generally used to stop and restart the running motor. Pre-excitation is used to establish a magnetic field before starting the asynchronous motor to improve the response speed.
Start DC braking is only valid when the start mode is direct start. At this time, the inverter first performs DC braking according to the set starting DC braking current, and then starts to run after the starting DC braking time. If the DC braking time is set to 0, it will be started directly without DC braking. The greater the DC braking current, the greater the braking force.

Start DC braking current is a percentage of the inverter rated current.

P08.35	Acceleration and deceleration mode		Factory default	0
	Setting range	0	Linear acceleration and deceleration	
		1	S curve acceleration and deceleration A	
		2	S curve acceleration and deceleration B	

Select the frequency change mode of the inverter during start and stop.
0: Linear acceleration and deceleration The output frequency increases or decreases linearly.
1: S-curve acceleration and deceleration A The output frequency increases or decreases following an S-curve pattern.
The S-curve is used in places where smooth startup or shutdown is required, such as elevators and conveyor belts. Function codes P08.36 and P08.37 define the time ratio of the start and end segments of the S curve acceleration and deceleration respectively. When the set frequency is above the rated frequency, the acceleration and deceleration time is:

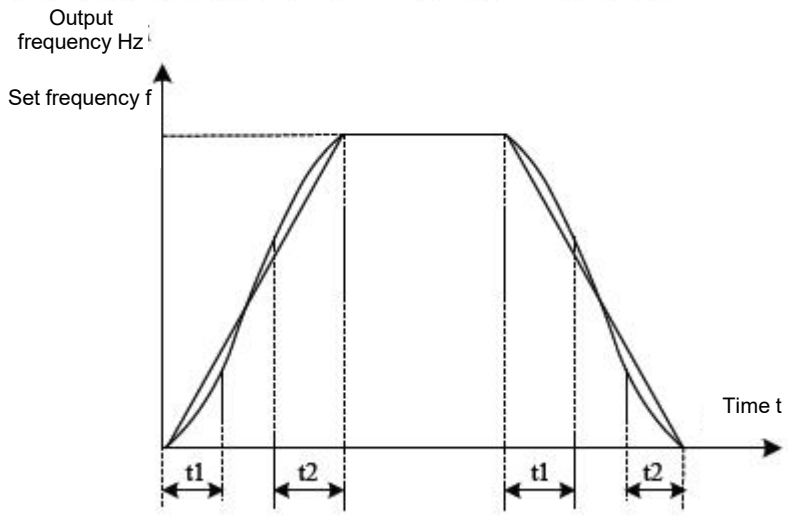
$$t = (\frac{4}{9} \times (\frac{f}{f_b})^2 + \frac{5}{9}) \times T$$

Where, f is the set frequency, f b is the rated frequency of the motor, and T is the time to accelerate from 0 frequency to the rated frequency f b.

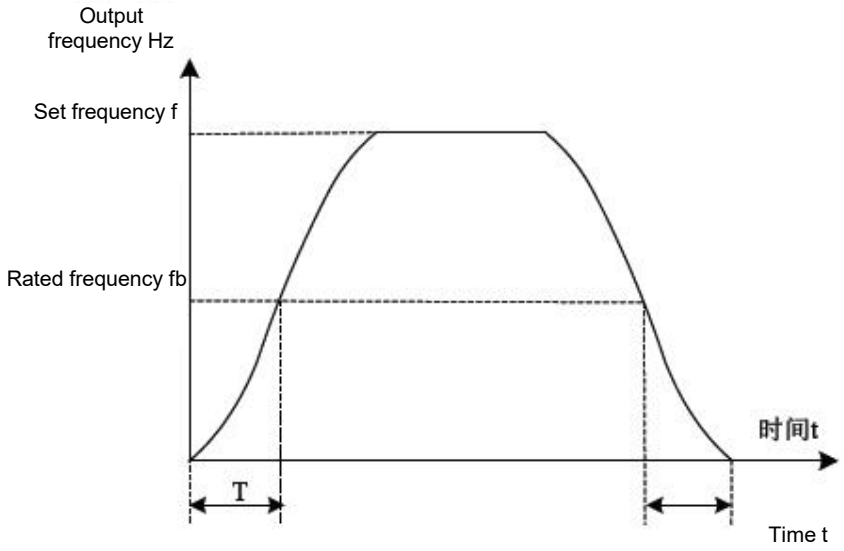
P08.36	Proportion of S-curve start time	Factory default	30.0%
	Setting range	0.0%～（100.0%- P08.37）	
P08.37	Proportion of S-curve end time	Factory default	30.0%
	Setting range	0.0%～（100.0%- P08.36）	

Function codes P08.36 and P08.37 define the time ratio of the start and end segments of the S curve acceleration and deceleration A respectively. The two function codes must satisfy: P08.36 + P08.37 ≤ 100.0%.

In the figure, t1 is the parameter defined by parameter P08.36. During this period, the slope of output frequency change gradually increases. T2 is the time defined by parameter P08.37 during which the slope of the output frequency change gradually changes to 0. During the time between t1 and t2, the slope of the output frequency change is fixed, that is, linear acceleration and deceleration are carried out in this interval.



S curve acceleration and deceleration A diagram



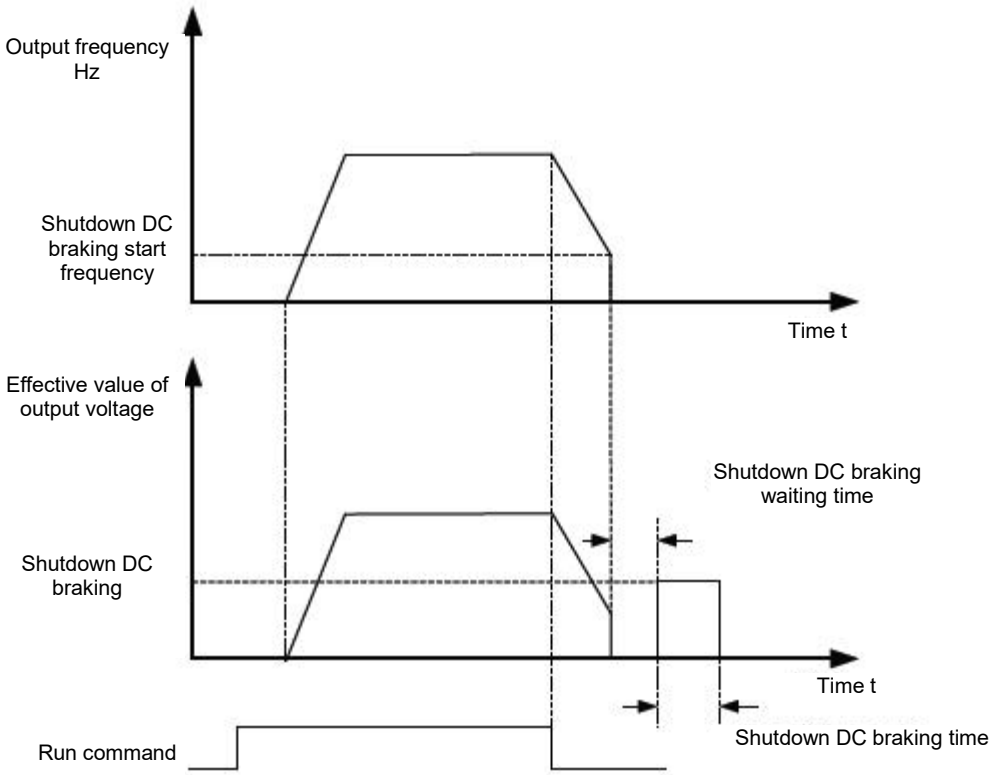
S curve acceleration and deceleration B diagram

P08.38	Shutdown mode		Factory default	0
	Setting range	0	Ramp to Stop (RTS)	
		1	Coast to Stop (CST)	

0: Ramp to Stop (RTS) After the stop command is valid, the inverter reduces the output frequency according to the deceleration time, and stops after the frequency drops to 0.
1: Coast to Stop (CST) After the stop command is valid, the inverter will immediately terminate the output, and the motor will stop freely according to the mechanical inertia.

P08.39	Shutdown DC braking start frequency	Factory default	0.00Hz
	Setting range	0.00Hz~maximum frequency	
P08.40	Shutdown DC braking waiting time	Factory default	0.0s
	Setting range	0.0s～36.0s	
P08.41	Shutdown DC braking current	Factory default	0%
	Setting range	0%～100%	
P08.42	Shutdown DC braking time	Factory default	0.0s
	Setting range	0.0s～36.0s	

Deceleration DC braking start frequency: During the Ramp to Stop (RTS) process, when the running frequency drops to this frequency, the DC braking process starts.
Shutdown DC braking waiting time: After the running frequency is reduced to the start frequency of shutdown DC braking, the inverter stops outputting for a period of time before starting the DC braking process.
Time, and then start the DC braking process. It is used to prevent faults such as overcurrent that may be caused by starting DC braking at higher speeds.
Stop DC braking current: There are two cases of stop DC braking current relative to the base value.
1. When the motor rated current is less than or equal to 80% of the inverter rated current, it is a percentage of the motor rated current as the base value.
2. When the motor rated current is greater than 80% of the inverter rated current, it is a percentage of 80% of the inverter rated current as the base value.
The shutdown DC braking process is shown in the diagram.



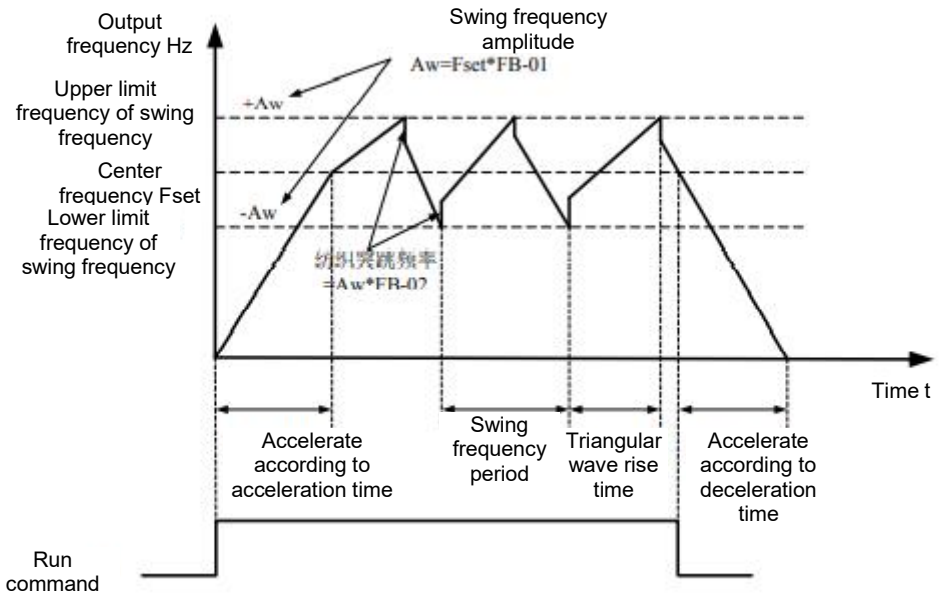
P08.43	Brake utilization rate	Factory default	100%
	Setting range	0%～100%	

It is only valid for the inverter with built-in braking unit.

It is used to adjust the duty cycle of the braking unit. If the brake utilization rate is high, the braking unit action duty cycle is high and the braking effect is strong, but the inverter bus voltage fluctuates greatly during braking.

7.9 Swing frequency and segment speed group P9

The swing frequency function is suitable for textile, chemical fiber and other industries, as well as occasions where traverse and winding functions are required. The swing frequency function refers to the output frequency of the inverter, which swings up and down with the set frequency as the center, and the trajectory of the running frequency on the time axis. The wobble frequency function means that the output frequency of the inverter swings up and down at the set frequency. The trajectory of the running frequency on the time axis is shown in the figure. The swing amplitude is set by P09.00 and P09.01. When P09.01 is set to 0, the swing amplitude is 0, and the swing frequency does not work at this time.



Swing frequency operation diagram

P09.00	Swing amplitude setting method	Factory default	0
	Setting range	0	Relative to center frequency
		1	Relative to maximum frequency

This parameter is used to determine the reference amount of swing amplitude.

0: Relative to center frequency, a variable swing amplitude system. The swing amplitude varies with the center frequency (set frequency).

1: Relative to maximum frequency, a fixed swing amplitude system, that is, the swing amplitude is fixed.

P09.01	Swing frequency amplitude	Factory default	0.0%
	Setting range	0.0%～100.0%	
P09.02	Jump frequency amplitude	Factory default	0.0%
	Setting range	0.0%～50.0%	

This parameter is used to determine the swing amplitude and jump frequency.

When the swing is set relative to the center frequency (P09.00 = 0), the swing AW = frequency source × swing amplitude P09.01.
When the swing is set relative to the maximum frequency (P09.00 = 1), the swing AW = maximum frequency × swing amplitude P09.01.

The hop frequency amplitude is the percentage of the hop frequency relative to the swing amplitude when operating at swing frequency, i.e., hop frequency = swing

amplitude AW × hop frequency amplitude P09.02. If the swing amplitude is selected relative to the center frequency (P09.00=0), the hop frequency is the variation value. If the swing amplitude is selected relative to the maximum frequency (P09.00 = 1), the jump frequency is fixed.
The swing frequency running frequency is constrained by the upper limit frequency and the lower limit frequency.

P09.03	Swing frequency	Factory default	10.0s
	Setting range	0.0s～3000.0s	
P09.04	Triangular wave rise time coefficient	Factory default	50.0%
	Setting range	0.0%～100.0%	

Swing frequency period: The time value of a complete swing frequency period.
The triangular wave rise time coefficient P09.04 is the percentage of the triangular wave rise time relative to the swing frequency period P09.03.
Triangular wave rise time = swing frequency period P09.03 × triangular wave rise time coefficient P09.04, in s.
Triangular wave fall time = swing frequency period P09.03 × (1 - triangular wave rise time coefficient P09.04), in s.

P09.05	Set length	Factory default	1000m
	Setting range	0m～65535m	
P09.06	Actual length	Factory default	0m
	Setting range	0m～65535m	
P09.07	Number of pulses per meter	Factory default	100.0
	Setting range	0.1～6553.5	

The above function codes are used for fixed-length control.

The length information needs to be collected through the multi-function digital input terminal. The number of pulses sampled by the terminal is divided by the number of pulses per meter P09.07, and the actual length P09.06 can be calculated. When the actual length is greater than the set length P09.05, the multi-function digital DO outputs the "length arrival" ON signal.

During the fixed-length control, the length can be reset through the multi-function DI terminal (DI function selection is 28). For details, please refer to P3 group parameters.

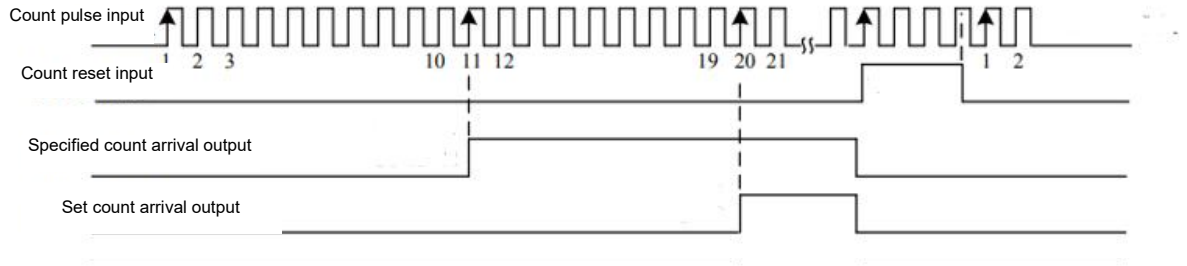
The corresponding input terminal function needs to be set to "length count input" (function 27) in the application, and the HDI port must be used when the pulse frequency is high.

P09.08	Set count value	Factory default	1000
	Setting range	1～65535	
P09.09	Specified count value	Factory default	1000
	Setting range	1～65535	

The count value needs to be collected through the multi-function digital input terminal. The corresponding input terminal function needs to be set to "counter input" (function 25) in the application, and the HDI port must be used when the pulse frequency is high.

When the count value reaches the set count value P09.08, the multi-function digital DO outputs the "set count value arrival" ON signal, and then the counter stops counting.

When the count value reaches the specified count value P09.09, the multi-function digital DO outputs the "specified count value arrival" ON signal, at which point the counter continues counting until the "set count value" is reached, at which time the counter stops.
The designated count value P09.09 shall not be greater than the set count value P09.08. The following figure is a diagram of the set count value arrival and the specified count value arrival functions.



The multi-segment command of GF630N01 has more functions than the usual multi-segment speed. In addition to realizing the multi-segment speed function, it can also be used as a voltage source for VF separation and a reference source for process PID. For this reason, the dimension of multi-segment command is a relative value.
Simple PLC can complete simple combination of multi-segment commands.

P09.10	Multi-segment command 0	Factory default	0.0%
	Setting range	-100.0%～100.0%	
P09.11	Multi-segment command 1	Factory default	0.0%

	Setting range	-100.0%～100.0%	
P09.12	Multi-segment command 2	Factory default	0.0%
	Setting range	-100.0%～100.0%	
P09.13	Multi-segment command 3	Factory default	0.0%
	Setting range	-100.0%～100.0%	
P09.14	Multi-segment command 4	Factory default	0.0%
	Setting range	-100.0%～100.0%	
P09.15	Multi-segment command 5	Factory default	0.0%
	Setting range	-100.0%～100.0%	
P09.16	Multi-segment command 6	Factory default	0.0%
	Setting range	-100.0%～100.0%	
P09.17	Multi-segment command 7	Factory default	0.0%
	Setting range	-100.0%～100.0%	
P09.18	Multi-segment command 8	Factory default	0.0%
	Setting range	-100.0%～100.0%	
P09.19	Multi-segment command 9	Factory default	0.0%
	Setting range	-100.0%～100.0%	
P09.20	Multi-segment command 10	Factory default	0.0Hz
	Setting range	-100.0%～100.0%	
P09.21	Multi-segment command 11	Factory default	0.0%
	Setting range	-100.0%～100.0%	
P09.22	Multi-segment command 12	Factory default	0.0%
	Setting range	-100.0%～100.0%	
P09.23	Multi-segment command 13	Factory default	0.0%

	Setting range	-100.0%～100.0%	
P09.24	Multi-segment command 14	Factory default	0.0%
	Setting range	-100.0%～100.0%	
P09.25	Multi-segment command 15	Factory default	0.0%
	Setting range	-100.0%～100.0%	

The multi-segment command can be used in three situations: as a frequency source, as a voltage source for VF separation, and as a setting source for process PID.

In the three applications, the dimension of the multi-segment command is a relative value, ranging from -100.0% to 100.0%. When it is used as a frequency source, it is a percentage of the relative maximum frequency; As the VF separation voltage source, it is a percentage of the motor rated voltage; Since the PID setting is originally a relative value, the multi-segment command as the PID setting source does not require dimensional conversion.

The multi-segment command needs to be switched according to the different states of the multi-function digital DI. For details, please refer to the relevant instructions of group P3.

7.10 V/F control and motor 1 parameter group P10

P10.17	Rated power	Factory default	Model power determination
	Setting range	0.1kW～1000.0kW	
P10.18	Rated voltage	Factory default	Model power determination
	Setting range	1V～2000V	
P10.19	Rated current	Factory default	Model power determination
	Setting range	0.01A~655.35A (inverter power <=55kW) 0.1A~6553.5A (inverter power >55kW)	
P10.20	Rated frequency	Factory default	Model power determination
	Setting range	0.01Hz~maximum frequency	
P10.21	Rated speed	Factory default	Model power determination
	Setting range	1rpm～65535rpm	

The above function codes are motor nameplate parameters. Whether VF control or vector control is used, relevant parameters need to be accurately set according to the

motor nameplate.

In order to obtain better VF or vector control performance, motor parameter tuning is required, and the accuracy of the adjustment result is closely related to the correct setting of motor nameplate parameters.

P10.22	Asynchronous motor stator resistance	Factory default	Model determination
	Setting range	0.001Ω～30.000Ω	
P10.23	Asynchronous motor rotor resistance	Factory default	Model determination
	Setting range	0.001Ω~65.535Ω (inverter power <=55kW) 0.0001Ω~6.5535Ω (inverter power >55kW)	
P10.24	Asynchronous motor leakage inductance	Factory default	Model determination
	Setting range	0.01mH ~ 655.35mH (inverter power <=55kW) 0.001mH ~ 65.535mH (inverter power >55kW)	
10.25	Asynchronous motor mutual inductance	Factory default	Model determination
	Setting range	0.1MH ~ 6553.5mH (inverter power <=55kW) 0.01mH ~ 655.35mH (inverter power >55kW)	
P10.26	Asynchronous motor no-load current	Factory default	Model determination
	Setting range	0.01A~P10.19 (inverter power <=55kW) 0.1A~P10.19 (inverter power >55kW)	

P10.22 ~ P10.26 are the parameters of the asynchronous motor, which are generally not on the motor nameplate and need to be obtained through automatic tuning of the inverter. Among them, the "static tuning of asynchronous motor" can only obtain the three parameters P10.22~P10.24, while the "complete tuning of induction motor" can obtain all 5 parameters here, as well as the current loop PI parameters.
When the motor rated power (P10.17) or motor rated voltage (P10.18) is changed, the inverter will automatically modify the parameter values of P10.22~P10.26, and restore these 5 parameters to the common standard Y series motor parameters.

If the asynchronous motor cannot be tuned on site, you can enter the above corresponding function code according to the parameters provided by the motor manufacturer.

P10.53	Tuning selection		Factory default	0
	Setting range	0	No operation	
		1	Static tuning of asynchronous motor	
		2	Complete tuning of asynchronous motor	

0: No operation, i.e. tuning is prohibited.
1: Static tuning of asynchronous motor is suitable for occasions where asynchronous motor and load are not easy to be disconnected and complete tuning cannot be carried out. Before static tuning of the asynchronous motor, the motor type and motor nameplate parameters P10.16~P10.21 must be set correctly. During static tuning of the asynchronous motor, the inverter can obtain three parameters P10.22~P10.24.
Action description: set this function code to 1, and then press the RUN key, and the inverter will perform static tuning.
2: Complete tuning of asynchronous motor In order to ensure the dynamic control performance of the inverter, please select complete tuning. At this time, the motor must be disconnected from the load to keep the motor in no-load state.
During the complete tuning process, the inverter first performs static tuning, then accelerates to 80% of the motor rated frequency according to the acceleration time P08.17, maintains for a period of time, decelerates to stop and ends the tuning according to the deceleration time P08.18.
During complete tuning of the asynchronous motor, the inverter can obtain five motor parameters P10.22~P10.26 and vector control current loop PI parameters P12.13~P12.16.
Action description: set this function code to 2, and then press the RUN key, and the inverter will perform full tuning.

7.11 Advanced control parameter P21

P21.00	Jog running frequency	Factory default	2.00Hz
	Setting range	0.00Hz~maximum frequency	
P21.01	Jog acceleration time	Factory default	20.0s
	Setting range	0.0s～6500.0s	
P21.02	Jog deceleration time	Factory default	20.0s
	Setting range	0.0s～6500.0s	

Define the reference frequency and acceleration/deceleration time of the inverter during jog mode.
During jog running, the start mode is fixed as direct start mode (P08.28 = 0), and the stop mode is fixed as Ramp to Stop (RTS) (P08.38 = 0).

P21.03	Acceleration time 2	Factory default	20.0s
	Setting range	0. 0s～6500.0s	
P21.04	Deceleration time 2	Factory default	20.0s

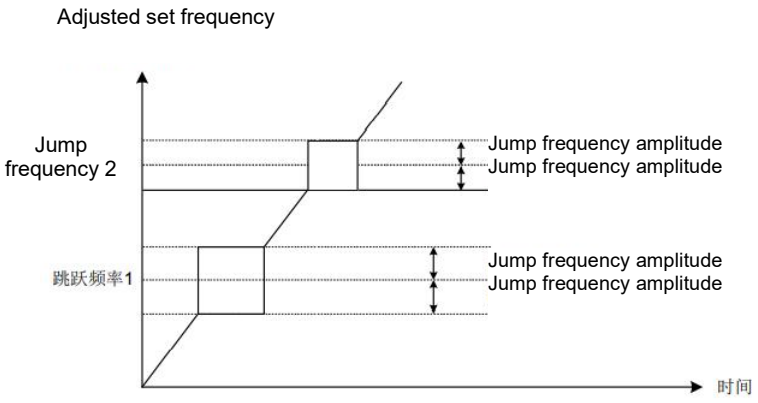
	Setting range	0. 0s～6500.0s	
P21.05	Acceleration time 3	Factory default	20.0s
	Setting range	0. 0s～6500.0s	
P21.06	Deceleration time 3	Factory default	20.0s
	Setting range	0. 0s～6500.0s	
P21.07	Acceleration time 4	Factory default	20.0s
	Setting range	0. 0s～6500.0s	
P21.08	Deceleration time 4	Factory default	20.0s
	Setting range	0. 0s～6500.0s	

GF630N01 provides 4 groups of acceleration and deceleration time, which are P08.17, P08.18, and the aforementioned 3 groups of acceleration and deceleration time.
The definitions of the four groups of acceleration and deceleration times are exactly the same. Please refer to the relevant instructions of P08.17 and P08.18. By using different combinations of the multi-function digital input terminals DI, you can switch and select 4 sets of acceleration and deceleration times. For detailed usage instructions, please refer to the relevant descriptions in function codes P03.01 to P03.05.

P21.09	Jump frequency 1	Factory default	0.00Hz
	Setting range	0.00Hz~maximum frequency	
P21.10	Jump frequency 2	Factory default	0.00Hz
	Setting range	0.00 Hz~maximum frequency	
P21.11	Jump frequency amplitude	Factory default	0.00Hz
	Setting range	0.00~maximum frequency	

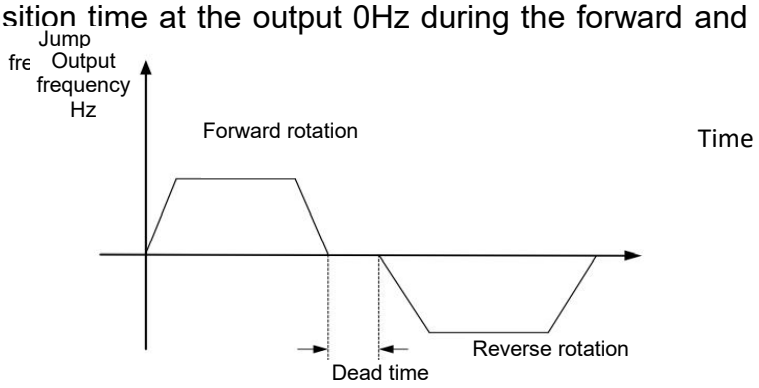
When the set frequency is within the jump frequency range, the actual running frequency will run at a jump frequency closer to the set frequency. By setting the jump frequency, the inverter can avoid the mechanical resonance point of the load.

GF630N01 can set two jump frequency points. If both jump frequencies are set to 0, the jump frequency function will be canceled. For the schematic diagram of jump frequency and jump frequency amplitude, please refer to the following figure



P21.12	Forward and reverse dead time	Factory default	0.0s
	Setting range	0.00s～3000.0s	

Set the transition time at the output 0Hz during the forward and reverse transition of



the inverter, as shown in the figure:

P21.13	Reverse control enable		Factory default	0
	Setting range	0	Allowed	
		1	Prohibited	

This parameter is used to set whether the inverter is allowed to run in the reverse state. If the motor is not allowed to run in reverse, set P21.13 = 1.

P21.14	Running mode with set frequency lower than lower limit frequency		Factory default	0
	Setting range	0	Run at lower limit frequency	
		1	Shutdown	
		2	Zero-speed running	

When the set frequency is lower than the lower limit frequency, the running state of the inverter can be selected through this parameter. GF630N01 provides three running modes to meet various application requirements.

P21.15	Droop control	Factory default	0.00Hz
	Setting range	0.00Hz～10.00Hz	

The droop rate allows a small speed difference between the master and slave stations to avoid conflicts between them. The default value for this parameter is 0.

Only when the master and slave adopt the speed control mode, the droop rate needs to be adjusted. For each transmission process, the appropriate droop rate needs to gradually be found in practice. It is recommended not to set P21.15 too large, otherwise the steady-state speed will drop significantly when the load is large. The droop rate must be set for both the master and slave.

Droop speed = synchronization frequency × output torque × droop rate ÷10

For example: P21.15 = 1.00, synchronization frequency 50Hz, output torque 50%, then:

Droop speed = 50Hz×50%×1.00÷10=2.5Hz

Actual frequency of inverter = 50Hz – 2.5Hz = 47.5Hz

P21.18	Start protection selection	Factory default	1
	Setting range	0: Not protected 1: Protected	

This parameter involves the safety protection function of the inverter.

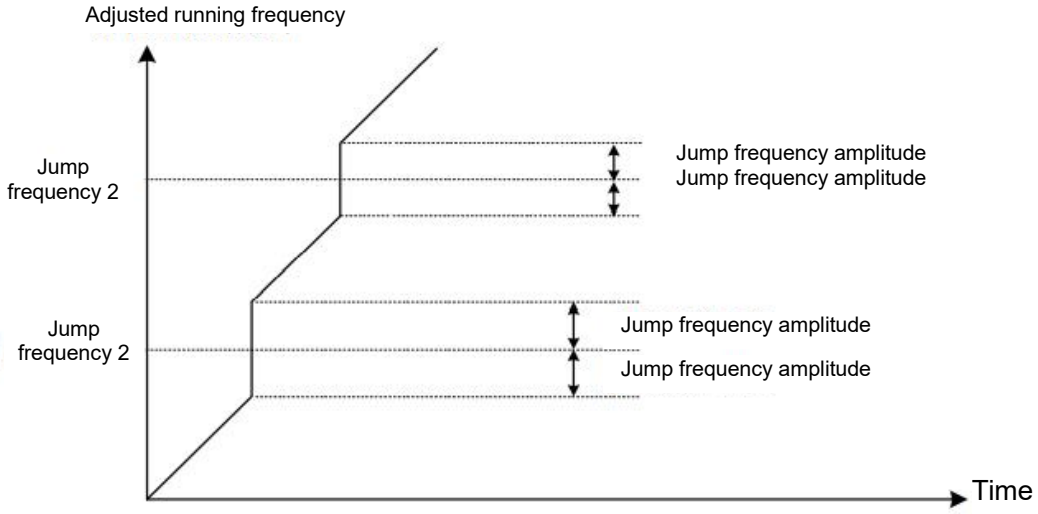
If this parameter is set to 1, if the run command is valid when the inverter is powered up (for example, the terminal run command is closed before power-up), the inverter will not respond to the run command. The run command must be removed once first, and the inverter will respond only after the run command is valid again. Additionally, if this parameter is set to 1, and the run command is valid when the inverter fault is reset, the inverter will also not respond to the run command. The run command must be removed first in order to clear the run protection state. Setting this parameter to 1 can prevent the danger caused by the motor responding to the run command during power-up or fault reset without your awareness.

P21.22	Whether the jump frequency is valid during acceleration and deceleration	Factory default	0
	Setting range	0: Invalid 1: Valid	

This function code is used to set whether the jump frequency is valid during

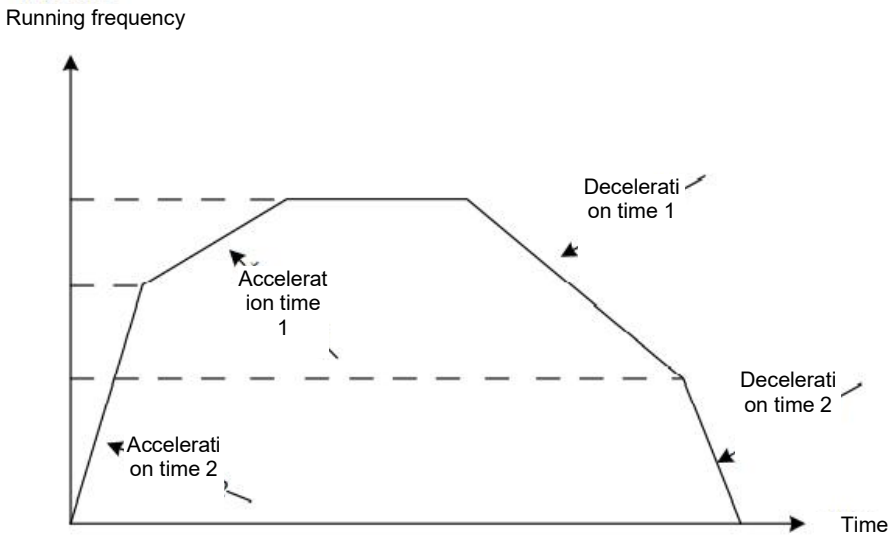
acceleration and deceleration.

When set to effective, if the running frequency is within the jump frequency range, the actual running frequency will skip the set jump frequency boundary. The following figure is a diagram of the valid jump frequency during acceleration and deceleration.



P21.25	Switching frequency point between acceleration time 1 and acceleration time 2	Factory default	0.00Hz
	Setting range	0.00Hz~maximum frequency	
P21.26	Switching frequency point between deceleration time 1 and deceleration time 2	Factory default	0.00Hz
	Setting range	0.00Hz~maximum frequency	

This function is valid when the motor is selected as motor 1 and the acceleration/deceleration time is not selected by DI terminal switching. It is used to select different acceleration and deceleration times according to the running frequency range instead of the DI terminal during the running of the inverter.



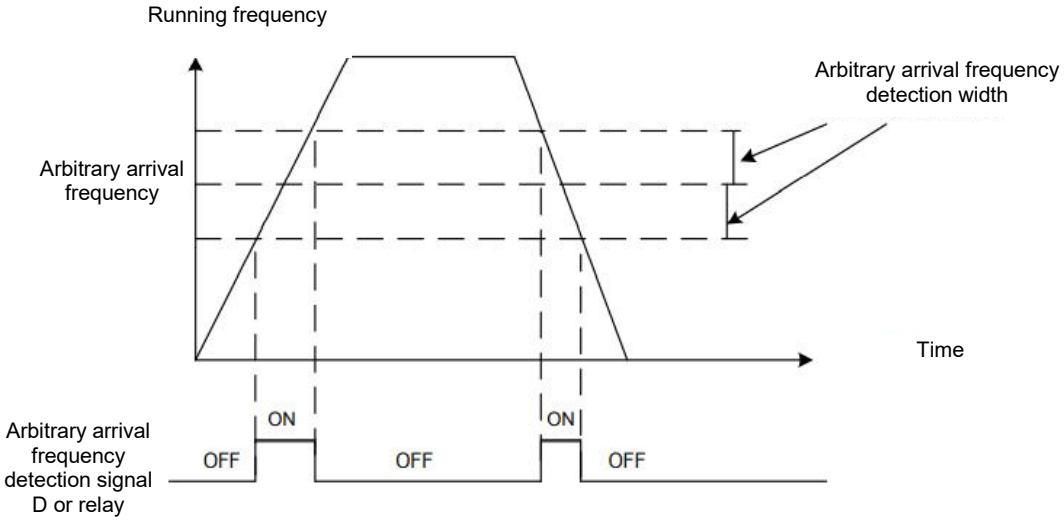
The above figure is a diagram of acceleration and deceleration time switching. During acceleration, if the running frequency is less than P21.25, select acceleration time 2; If the running frequency is greater than P21.25, select acceleration time 1.

During deceleration, select deceleration time 1 if the running frequency is greater than P21.26, and select deceleration time 2 if the running frequency is less than P21.26.

P21.31	Arbitrary arrival frequency detection amplitude 1	Factory default	0.0%
	Setting range	0.0% ~ 100.0% (maximum frequency)	
P21.32	Arbitrary arrival frequency detection value 2	Factory default	50.00Hz
	Setting range	0.00Hz~maximum frequency	
P21.33	Arbitrary arrival frequency detection amplitude 2	Factory default	0.0%
	Setting range	0.0% ~ 100.0% (maximum frequency)	

When the output frequency of the inverter is within the positive and negative detection amplitude range of the frequency detection value, the multi-functional DO outputs the ON signal.

GF630N01 provides two groups of arbitrary arrival frequency detection parameters to set the frequency value and frequency detection range respectively. The following figure is a diagram of the function.



P21.42	Timing function selection		Factory default	0
	Setting range	0	Invalid	
		1	Valid	
P21.43	Timed run time selection		Factory default	0
	Setting range	0	P21.44 setting	
		1	AI1	
		2	AI2	
		3	AI3	
		Analog input range 100% corresponds to P21.44		
P21.44	Timed run time		Factory default	0.0Min
	Setting range	0.0Min～6500.0Min		

This set of parameters is used to complete the timing running function of the inverter.

When the P21.42 timing function selection is valid, the inverter will start timing when it starts. After the set timing run time is reached, the inverter will stop automatically, and the multi-function DO will output ON signal at the same time.
Each time the inverter is started, timing starts from 0, and the remaining timing run time can be viewed through P23.22.
The run time is set by P21.43 and P21.44, and the time unit is minute.

P21.58	Fast current limiting enable		Factory default	1
	Setting range	0	Not enabled	
		1	Enable	

Enabling the fast current limiting function can minimize the over-current fault of the inverter and ensure the uninterrupted running of the inverter. If the inverter remains in a rapid current limiting state for an extended period, the inverter may experience overheating and other damage, which is not permissible. Therefore, when the inverter is in rapid current limiting for a long time, it will trigger fault alarm E040, indicating that the inverter is overloaded and needs to be shut down.

7.12 Analog advanced settings P19

P19.30	AI1 measured voltage 1	Factory default	Factory calibration
	Setting range	0.500V ～ 4.000V	
P19.31	AI1 displayed voltage 1	Factory default	Factory calibration
	Setting range	0.500V ～ 4.000V	
P19.32	AI1 measured voltage 2	Factory default	Factory calibration
	Setting range	6.000V ～ 9.999V	
P19.33	AI1 displayed voltage 2	Factory default	Factory calibration
	Setting range	6.000V ～ 9.999V	
P19.34	AI2 measured current 1	Factory default	Factory calibration
	Setting range	0.000V ～ 20.000mA	
P19.35	AI2 displayed current 1	Factory default	Factory default
	Setting range	0.000V ～ 20.000mA	
P19.36	AI2 measured current 2	Factory default	Factory default
	Setting range	0.000V ～ 20.000mA	
P19.37	AI2 displayed current 2	Factory default	Factory default
	Setting range	0.000V ～ 20.000mA	

This group of function codes is used to calibrate the analog input AI to eliminate the influence of zero bias and gain of the AI input port. The group of function parameters has been calibrated at the factory. When restoring the factory default, it will revert to the values calibrated at the factory. Generally, no correction is required at the application site.

The measured voltage refers to the actual voltage measured by a multimeter and

other measuring instruments, and the displayed voltage refers to the voltage display value sampled by the inverter. See the AI voltage/current (P23.21, P23.22) display before calibration in group P23.

During calibration, input two voltage values at each AI input port, and accurately input the value measured by the multimeter and the value read by the P23 group into the above function code respectively, then the inverter will automatically correct the zero bias and gain of the AI.
For occasions where the user-reference voltage does not match the actual sampling voltage of the inverter, the on-site calibration method can be used to make the sampling value of the inverter consistent with the expected reference value. Take AI1 as an example, the on-site correction method is as follows:
Reference AI1 voltage signal (about 2V),
Measure AI1 voltage value and store it in the function parameter P19.30,
View P23.21 displayed value and save it in the function parameter P19.31,
Reference AI1 voltage signal (about 8V), measure the actual AI1 voltage value, and store it in function parameter P19.32.
View P23.21 displayed value and save it in the function parameter P19.33,
When calibrating AI2, the actual sampling current viewing position is P23.22.
It is recommended to sample at 4 mA and 16 mA as calibration points for AI2.

P23.42	A01 target voltage 1	Factory default	Factory calibration
	Setting range	0.500V～4.000V	
P23.43	A01 measured voltage 1	Factory default	Factory calibration
	Setting range	0.500V～4.000V	
P23.44	A01 target voltage 2	Factory default	Factory calibration
	Setting range	6.000V～9.999V	
P23.45	A01 measured voltage 2	Factory default	Factory calibration
	Setting range	6.000V～9.999V	

This group of function codes is used to calibrate the analog output AO. The group of function parameters has been calibrated at the factory. When restoring the factory default, it will revert to the values calibrated at the factory. Generally, no correction is required at the application site.

The target voltage refers to the theoretical output voltage value of the inverter. The measured voltage refers to the actual output voltage value obtained through instruments such as a multimeter.

Chapter 8 Countermeasures and Inspection

To safeguard the equipment, the inverter is equipped with protection functions such as overcurrent, overvoltage, and low voltage. When the protection function is activated, it will cut off the output of the inverter and stop the motor, and this state will remain until forced reset.

8.1 Diagnostic trouble code (DTC)

The DTC is displayed in the running state.

DTC	Operation panel display	Troubleshooting	Cause and measures
Inverter unit protection	E001	1. The output circuit of the inverter is short-circuited 2. The internal wiring of the inverter is loose 3. The main control board is abnormal 4. The drive board is abnormal 5. The inverter module is abnormal 6. The wiring between the motor and the inverter is too long 7. Module overheating	1. Troubleshoot peripheral faults 2. Plug in all connecting wires 3. Seek technical support 4. Seek technical support 5. Seek technical support 6. Install reactor or output filter 7. Check whether the air duct is blocked, whether the fan works normally and eliminate the existing problems
Deceleration overcurrent	E003	1. The output circuit of the inverter is grounded or short-circuited 2. The control mode is vector without parameter tuning 3. Sudden load application during deceleration 4. Without the installation of a braking unit and a braking resistor 5. Deceleration time is too short 6. Low voltage	1. Troubleshoot peripheral faults 2. Perform motor parameter tuning 3. Cancel sudden load 4. Install braking unit and resistor 5. Increase the deceleration time 6. Adjust the voltage to the normal range
Constant speed overcurrent	E004	1. The output circuit of the inverter is grounded or short-circuited 2. The control mode is vector without parameter tuning 3. Low voltage 4. Whether there is sudden load during running 5. The selected inverter is low in power level	1. Troubleshoot peripheral faults 2. Perform motor parameter tuning 3. Adjust the voltage to the normal range 4. Cancel sudden load 5. Select an inverter with a higher power level
Control power supply Fault	E008	1. The input voltage is not within the range specified in the specification	1. Adjust the voltage to within the range specified in the specification

Motor overload	E011	1. Whether the motor protection parameter P07.10 is set properly 2. Whether the load is too large or the motor is stalled 3. The selected inverter is low in power level	1. Set this parameter correctly 2. Reduce the load and check the motor and mechanical conditions 3. Select an inverter with a higher power level
External equipment Fault	E015	1. Input the external fault signal through the multi-function terminal DI 2. Input external fault signals through the virtual IO function	1. Reset running 2. Reset running
Current detection Fault	E018	1. Check whether the Hall device is abnormal 2. The drive board is abnormal	1. Replace the Hall device 2. Replace the driver
EEPROM read-write fault	E021	1. The EEPROM chip is damaged	1. Replace the main control board
Frequency converter hard Parts fault	E022	1. There is overvoltage 2. There is overcurrent	1. Handle as overvoltage fault 2. Handle as overcurrent fault
Cumulative running Time arrival Fault	E026	1. The cumulative run time reaches the set value	1. Use the parameter initialization function to clear the recorded information
User-defined fault 1	E027	1. Input user-defined fault 1 signal through the multi-function terminal DI 2. Input user-defined fault 1 signals through the virtual IO function	1. Reset running 2. Reset running
User-defined fault 2	E028	1. Input user-defined fault 2 signal through the multi-function terminal DI 2. Input user-defined fault 2 signals through the virtual IO function	1. Reset running 2. Reset running
Cumulative power-up Time arrival Fault	E029	1. The cumulative power-up time reaches the set value	1. Use the parameter initialization function to clear the recorded information
Load shedding fault	E030	1. The running current of the inverter is less than P07.64	1. Confirm whether the load is disengaged or whether the parameter settings of P07.64 and P07.65 conform to the actual running conditions

PID feedback loss fault during running	E031	1. PID feedback is less than the set value of P15.26	1. Check the PID feedback signal or set P15.26 to an appropriate value
Cycle-by-cycle current limiting fault	E040	1. Whether the load is too large or the motor is stalled 2. The selected inverter is low in power level	1. Reduce the load and check the motor and mechanical conditions 2. Select an inverter with a higher power level
Motor switching fault during running	E041	1. During the running of the inverter, the current motor selection is changed through the terminal	1. Switch the motor after the inverter stops
Motor overtemperature fault	E045	1. The temperature sensor wiring is loose 2. Motor temperature is too high	1. Check the temperature sensor wiring and troubleshoot the fault 2. Reduce the carrier frequency or take other heat dissipation measures to dissipate the motor
Braking resistor short circuit fault	E060	Short circuit between PB port and busbar "+" terminal Braking resistor short circuit Braking resistor damage	Check the PB port and "+" wiring and troubleshoot the fault Check whether the braking resistor is short circuited Use a multimeter to check whether the resistance of the braking resistor is correct
Fault of excessive opening time of brake pipe	E061	1. The opening time of brake pipe is greater than the set value of P08.44	1. Investigate the cause of the prolonged opening of the brake pipe, and set P08.44 to 0 to shield this fault
Acceleration overvoltage	E100	1. The input voltage is too high 2. There is an external force dragging the motor to run during acceleration 3. The acceleration time is too short 4. Without the installation of a braking unit and a braking resistor	1. Adjust the voltage to the normal range 2. Cancel external power or install braking resistor 3. Increase the acceleration time 4. Install braking unit and resistor
Deceleration overpower Pressure	E101	1. The input voltage is too high 2. There is an external force dragging the motor to run during deceleration 3. Deceleration time is too short 4. Without the installation of a braking unit and a braking resistor	1. Adjust the voltage to the normal range 2. Cancel external power or install braking resistor 3. Increase the deceleration time 4. Install braking unit and resistor
Constant speed overpower	E102	1. The input voltage is too high 2. There is an external force dragging the motor to run during operation	1. Adjust the voltage to the normal range 2. Cancel external power or install braking resistor

Pressure			
Undervoltage fault	E105	1. Instantaneous power outage 2. The input voltage of the inverter is not within the range specified in the specification 3. The rectifier bridge and buffer resistance are abnormal 4. The drive board is abnormal 5. The bus voltage is abnormal 6. The control board is abnormal	1. Reset fault 2. Adjust the voltage to the normal range 3. Seek technical support 4. Seek technical support 5. Seek technical support 6. Seek technical support
Contactor fault Obstacle	E108	1. The drive board and power supply are abnormal 2. The contactor is abnormal	1. Replace the drive board or power board 2. Replace the contactor
Acceleration overcurrent	E110	1. The output circuit of the inverter is grounded or short-circuited 2. The control mode is vector without parameter tuning 3. Start the rotating motor 4. Sudden load application during acceleration 5. The selected inverter is low in power level 6. The acceleration time is too short 7. Manual torque boost or improper V/F curve 8. Low voltage	1. Troubleshoot peripheral faults 2. Perform motor parameter tuning 3. Select the speed tracking start or wait for the motor to stop before starting 4. Cancel sudden load 5. Select an inverter with a higher power level 6. Increase the acceleration time 7. Adjust manual torque boost or V/F curve 8. Adjust the voltage to the normal range
Frequency converter over Load	E111	1 2. Whether the load is too large or the motor is stalled, and the selected inverter is low in power level	1. Reduce the load and check the motor and mechanical conditions 2. Select an inverter with a higher power level
Short circuit to ground Fault	E112	1. The motor is short circuited to ground	1. Replace the cable or motor
Input phase loss	E113	1. The three-phase input power supply is abnormal 2. The drive board is abnormal 3. The lightning protection board is abnormal 4. The main control board is abnormal	1. Check and troubleshoot the peripheral circuits 2. Seek technical support 3. Seek technical support 4. Seek technical support
Output phase loss	E114	1. The lead from the inverter to the motor is abnormal 2. The three-phase output of the inverter is unbalanced when the motor is running 3. The drive board is abnormal 4. The module is abnormal	1. Troubleshoot peripheral faults 2. Check the motor three-phase winding for normal operation and troubleshoot the fault 3. Seek technical support 4. Seek technical support

Motor overspeed fault	E115	1. No parameter tuning performed 2. The motor overspeed detection parameters P07.67 and P07.68 are set improperly	1. Perform motor parameter tuning 2. Reasonably set the test parameters according to the actual situation
Excessive speed deviation fault	E119	1. No parameter tuning performed 2. The speed deviation detection parameters P07.69 and P07.70 are set improperly	1. Perform motor parameter tuning 2. Reasonably set the test parameters according to the actual situation
Module overheating	E120	1. The ambient temperature is too high 2. The air duct is blocked 3. The fan is damaged 4. The module thermistor is damaged 5. The inverter module is damaged	1. Reduce the ambient temperature 2. Clean the air duct 3. Replace the fan 4. Replace the thermistor 5. Replace the inverter module
Motor with load Tuning fault	E170	1. Torque upper limit P12.10 is set too low 2. Rated frequency or rated speed is set incorrectly 3. Too heavy load	1. Increase the torque upper limit P12.10 2. Check whether the rated frequency or rated speed is set correctly 3. Set the tens digit of P07.72 to 0 to shield this fault, and then retune. If other faults such as overload are still reported, it may be that the motor load is too heavy, and it is recommended to replace it with a larger model
Communication fault	E202	1. The upper computer works abnormally 2. The communication line is abnormal 3. The communication expansion card P14.00 is set incorrectly 3. The communication parameter P14 group is set incorrectly	1. Check the wiring of the upper computer 2. Check the communication cable 3. Correctly set the communication expansion card type 4. Correctly set the communication parameters

8.2 Fault diagnosis

Fault symptom	Inspection precautions	Measures
No power-up display	1. The grid voltage is not available or too low 2. The switching power supply on the inverter drive board is faulty 3. The rectifier bridge is damaged 4. The buffer resistor of the inverter is damaged 5. Control board and keyboard fault 6. The connection between the control board, the drive board and the keyboard is broken	1. Check the input power supply 2. Check the bus voltage 3. Re-plug the 34-core flat cable 4-6. Seek manufacturer service
Power-up display GF630N01	1. Poor contact between the drive board and control board connections 2. Relevant components on the control board are damaged 3. The motor or motor wire is short circuited to ground 4. Hall fault 5. The grid voltage is too low	1. Re-plug the 34-core flat cable 2-5. Seek manufacturer service
Power-up display "E112" alarm	1. The motor or output line is short circuited to ground 2. The inverter is damaged	1. Measure the insulation of the motor and output line with a megger 2. Seek manufacturer service
The display of the inverter is normal after power-up, and "GF630N01" is displayed after running and the machine stops immediately	1. The fan is damaged or stalled 2. The peripheral control terminal wiring is short circuited	1. Replace the fan 2. Troubleshoot external short circuit faults
Frequent E120 (Module overheating) fault alarms	1. The carrier frequency setting is too high 2. The fan is damaged or the air duct is blocked 3. The internal components of the inverter are damaged (thermocouple or others)	1. Reduce the carrier frequency (P08.15) 2. Replace the fan and clean the air duct 3. Seek manufacturer service
After the inverter starts running, the motor does not rotate	1. Motor and motor wire 2. The inverter parameter settings are incorrect (motor parameters) 3. Poor contact between the drive board and control board connections 4. Drive board fault	1. Reconfirm the connection between the inverter and the motor 2. Replace the motor or clear the mechanical fault 3. Check and reset the motor parameters 4. Seek manufacturer service
DI terminal failure	1. Parameter setting error 2. External signal error 3. PW and +24V jumper are loose 4. Control board fault	1. Check and reset the relevant parameters of group P3 2. Reconnect the external signal line 3. Reconfirm PW and +24V jumper 4. Seek manufacturer service

The motor speed cannot be increased during closed-loop vector control	1. Drive board fault	1. Seek manufacturer service
The inverter frequently reports overcurrent and overvoltage faults	1. The motor parameters are set incorrectly 2. Improper acceleration and deceleration time 3. Load fluctuation	1. Reset the motor parameters or perform motor tuning 2. Set appropriate acceleration and deceleration time 3. Seek manufacturer service
Power-up (or running) report E108	1. The soft start contactor is not engaged	1. Check whether the contactor cable is loose 2. Check whether the contactor is faulty 3. Check Whether there is a fault in the 24V power supply of the contactor Whether there is a fault 4. Seek manufacturer service
Power-up display 	1. Relevant components on the control board are damaged	1. Replace the control board

Chapter 9 Maintenance and Service

Danger

1. **Do not touch the terminals of the inverter, because there is a high voltage on the terminals.**
   Danger of electric shock.
2. **Be sure to install the terminal cover before powering on, and be sure to disconnect the power supply when removing the cover.**
   Danger of electric shock.
3. **Cut off the main circuit power supply and confirm that the light-emitting diode is off before maintenance and inspection.**
   Danger of residual voltage on the electrolytic capacitor.
4. **Non-professional technicians are not allowed to carry out maintenance and inspection.**
   Danger of electric shock.

CAUTION

1. **CMOS integrated circuits are installed on the keyboard board, control circuit board and drive circuit board, so please pay special attention when using them.**
   If you touch the circuit board directly with your fingers, electrostatic induction may damage the integrated chip on the circuit board.
2. **Do not change the wiring or remove the terminal wiring during power-on.**
   Danger of electric shock.
3. **Do not check the signal during running.**
   It will damage the equipment.

9.1 Maintenance and service instructions

Since the inverter is a typical product combining power electronics technology and microelectronics technology, it has the dual characteristics of industrial equipment and microelectronic devices. Changes in the use environment of the inverter, such as the influence of temperature, humidity, smoke, etc., as well as the aging of the internal components of the inverter, may cause various faults of the inverter. Therefore, in order to ensure the long-term normal running of this product, it is necessary to carry out daily inspection and regular (at least once every six months) maintenance of the inverter during storage and use.

9.2 Routine maintenance

In order to prevent the inverter from malfunctioning, ensure the normal running of the equipment and prolong the service life of the inverter, it is necessary to carry out routine maintenance on the inverter. The contents of routine maintenance are as follows:

Inspection items	Inspection contents	Judgment criteria
Running environment	1. Temperature and humidity 2. Dust and gas	1. Shut down or reduce the ambient temperature when the temperature is > 40°C Humidity < 95%, no condensation 2. No odor, no flammable or explosive gas
Cooling system	1. Installation environment 2. Inverter body fan	1. The installation environment shall be well-ventilated, with no obstructions in the air ducts. 2. The body fan operates normally without abnormal noise
Inverter body	1. Vibration and temperature rise 2. Noise 3. Wires and terminals	1. Vibration is stable, and the outlet air temperature is normal 2. No abnormal noise and odor 3. The fastening screws are not loose
Motor	1. Vibration and temperature rise 2. Noise	1. Stable running and normal temperature 2. No abnormal or uneven noise
Input and output parameters	1. Input voltage 2. Output current	1. The input voltage is within the specified range 2. The output current is below the rated value

9.3 Scheduled maintenance

In order to prevent the inverter from malfunctioning and ensure its long-term high-performance stable operation, users must regularly (within six months) inspect the inverter. The contents of the inspection are as follows:

Inspection items	Inspection contents	Elimination methods
Screws for external terminals	Check whether the screws are loose	Tighten
Power components	Dust and dirt	Completely remove debris with dry compressed air
Radiator	Dust and dirt	Completely remove debris with dry compressed air
Electrolytic capacitor	Whether there is discoloration or peculiar smell	Replace the electrolytic capacitor
Fan	Abnormal noise and vibration Whether the cumulative time exceeds 20,000 hours	1. Remove the sundries 2. Replace the fan
PCB board	Dust and dirt	Completely remove debris with dry compressed air

9.4 Replacement of vulnerable parts

The fan and electrolytic capacitor in the inverter are easily damaged components, and their service life is closely related to the use environment and maintenance conditions. The general life time of vulnerable components is as follows:

Fan: It must be replaced after more than 5 years of use. If the inverter is used in critical positions, replace the fan in time as soon as the fan starts to make abnormal noise. Wuhan GUIDE Technology Co., Ltd. provides fan spare parts.

Electrolytic capacitor: It must be replaced after more than 5 years of use. For specific operation methods, please contact Wuhan GUIDE Technology Co., Ltd. or call our national unified service hotline (400-0077-570).

Note: The life time is the time when it is used under the following conditions.

(1) Ambient temperature: 40°C;

(2) Load rate: 80%;

(3) Running rate: 24 hours/day.

9.5 Storage and warranty

Pay attention to the following matters when the inverter is not used temporarily or stored for a long time after purchase:

(1) Avoid storing the inverter in a place with high temperature, humidity, vibration or metal dust, and ensure good ventilation.

(2) If the inverter is not used for a long time, it shall be energized once every six months to restore the characteristics of the filter capacitor and check the function of the inverter. The voltage shall be incrementally increased using an auto-transformer during energization for a duration of no less than 5 hours.

During the warranty period, a certain repair fee shall be charged for faults caused by the following reasons:

①Faults caused by use not in accordance with the operation manual or beyond the standard specifications.

②Faults caused by repair and modification without permission.

③Faults caused by improper storage.

④Faults caused when the inverter is used for abnormal functions.

⑤The machine is damaged due to fire, salt corrosion, gas corrosion, earthquake, storm, flood, lightning, abnormal voltage or other force majeure.

Even if the warranty period is exceeded, the Company also provides lifetime paid maintenance services.

GUIDE Inverter GF630N01 Series

Instruction Manual Version: 1.01

Precautions

1. Be sure to read this manual before using the inverter product.
2. For safety, ask professionals to carry out commissioning and wiring.
3. The contents of this manual are subject to change without prior notice.

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