INOMAX

Medium and Low-Voltage drives Servo drives
Solar pump inverters Soft starters solution provider

MAX600 series special HVAC freqeuncy drive

0.75KW-630KW | 220V-480V

User manual

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SHENZHEN INOMAX TECHNOLOGY CO.LTD
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PREAMBLE

This manual provides you with detailed rules and precautions for installation, wiring, function parameter setting, daily maintenance, fault diagnosis and elimination of the inverter.

In order to give full play to the functions of the product and ensure the safety of users and equipment, please read this manual carefully before using the inverter. Improper use may cause abnormal operation of the inverter, failure, reduced service life, and even equipment damage, personal injury and death !

Safety statement

When installing, operating, and maintaining the product, please read and follow the safety precautions first.

To ensure personal and equipment safety, when installing, operating and maintaining the product, please follow all safety precautions indicated on the label on the product and in the manual.

The "Caution", "Warning" and "Danger" items in the manual do not represent all safety items that should be observed, but are only supplements to all safety precautions.

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

Our company will not bear any legal responsibility for personal safety accidents and property losses caused by illegal operation of products。

Security Level Definition

Danger "Danger" means that death or serious injury will result if not followed。

Warning WARNING means death or serious bodily injury could result if not followed。

NOTE "Caution" indicates that minor personal injury or equipment damage may result if not followed。

Safety Precautions

Unpacking and acceptance	
NOTE	✧ Before unpacking, please check whether the outer packaging of the product is intact, whether it is damaged, soaked, damp, deformed, etc. ✧ Please open the package according to the order of levels, and violent beating is strictly prohibited! ✧ When unpacking, please check whether the surface of the product and product accessories is damaged, rusted, bruised, etc. ✧ After unpacking, please carefully compare the packing list to check whether the quantity and information of the product and product accessories are complete
Warning	✧ Damage, rust, signs of use, etc. are found on the product and product accessories when unpacking, please do not install it! ✧ When opening the box, if you find water in the product, missing parts or damaged parts, please do not install it!

	✧ Please check the packing list carefully, if you find that the packing list does not match the product name, please do not install !
during storage and transport	
NOTE	✧ Please store and transport according to the storage and transport conditions of the product, and the storage temperature and humidity meet the requirements. ✧ Avoid storage and transportation in places such as water splashing rain, direct sunlight, strong electric field, strong magnetic field, strong vibration, etc. ✧ Avoid storing the product for more than 3 months. When the storage time is too long, please carry out stricter protection and necessary inspection. ✧ Please pack the product strictly before transporting by vehicle, and a closed box must be used for long-distance transport. ✧ It is strictly forbidden to mix and transport this product with equipment or items that may affect or damage this product。
Danger	✧ Please be sure to use professional loading and unloading equipment to move large or heavy equipment and products! ✧ When carrying the product with bare hands, please be sure to hold the product shell firmly to avoid falling parts of the product, otherwise there is a risk of injury! ✧ When handling the product, please be sure to lift it with care, and pay attention to the objects under your feet at all times to prevent tripping or falling, otherwise there is a risk of injury or product damage! ✧ When the equipment is lifted by lifting tools, it is forbidden for people to stand or stay under the equipment。
When wiring	
Danger	✧ Non-professionals are strictly prohibited from installing, wiring, maintaining, inspecting or replacing parts! ✧ Do not perform wiring work while the power is on, otherwise there will be a risk of electric shock. ✧ Before wiring, please cut off the power of all devices. After the power is cut off, there is residual voltage in the internal capacitor of the device, please wait at least 10 minutes before wiring and other operations. ✧ Please be sure to ensure that the equipment and products are well grounded, otherwise there will be a risk of electric shock. ✧ Please follow the steps specified in the electrostatic prevention measures (ESD), and wear an electrostatic wrist strap for wiring and other operations to avoid damage to the equipment or internal circuits of the product。 ✧
Warning	✧ It is strictly forbidden to connect the input power to the output terminal of the device or product, otherwise it will cause damage to the device or even cause a fire. ✧ When the drive equipment is connected to the motor, please ensure that the phase sequence of the drive and motor terminals is accurate and consistent to avoid reverse rotation of the motor. ✧ The cables used in wiring must meet the corresponding wire diameter and shielding requirements, and the shielding layer of the shielded cable needs to be reliably grounded at one end! ✧ After the wiring is complete, please ensure that there are no loose screws or exposed cables inside the device and product。

when power on	
Danger	✧ Before powering on, please confirm that the equipment and products are installed in good condition, the wiring is firm, and the motor unit is allowed to restart. ✧ Before powering on, please confirm that the power supply meets the equipment requirements to avoid equipment damage or fire! ✧ When the power is turned on, the mechanical device of the equipment or product may move suddenly, please keep away from the mechanical device. ✧ After power on, please do not open the equipment cabinet door or product protection cover, otherwise there is a danger of electric shock! ✧ It is strictly forbidden to touch any terminal of the device when it is powered on, otherwise there is a danger of electric shock! ✧ It is strictly forbidden to disassemble any device or parts of the equipment and products in the energized state, otherwise there is a risk of electric shock !
Runtime	
Danger	✧ It is strictly forbidden to touch any terminal of the equipment in the running state, otherwise there is a risk of electric shock! ✧ It is strictly forbidden to disassemble any device or parts of the equipment and products in the running state, otherwise there is a risk of electric shock! ✧ It is strictly forbidden to touch the device casing, fan or resistor to test the temperature, otherwise it may cause burns! ✧ It is strictly forbidden for non-professional technicians to detect signals during operation, otherwise it may cause personal injury or equipment damage !
Warning	✧ During operation, avoid other items or metal objects falling into the device, otherwise it will cause damage to the device! ✧ Do not use the contactor on-off method to control the start and stop of the equipment, otherwise it will cause equipment damage !
during maintenance	
Danger	✧ Non-professionals are strictly prohibited from installing, wiring, maintaining, inspecting or replacing parts! ✧ It is strictly forbidden to maintain the equipment in the power-on state, otherwise there is a risk of electric shock! ✧ After cutting off the power of all equipment, please wait at least 10 minutes before performing equipment maintenance and other operations。
Warning	✧ Please carry out daily and regular inspection and maintenance of equipment and products according to equipment maintenance and maintenance requirements, and make maintenance records。
during maintenance	
Danger	✧ Non-professionals are strictly prohibited from installing, wiring, maintaining, inspecting or replacing parts! ✧ It is strictly forbidden to repair the equipment in the power-on state, otherwise there is a risk of electric shock! ✧ After cutting off the power supply of all equipment, please wait at least 10 minutes before performing equipment inspection, maintenance and other operations。

Warning	✧ Please follow the product warranty agreement for equipment repair. ✧ When the equipment breaks down or is damaged, professionals will troubleshoot and repair the equipment and products according to the maintenance instructions, and make maintenance records. ✧ Please follow the product replacement guide for wearing parts. ✧ Do not continue to use the damaged machine, otherwise it will cause greater damage. ✧ After replacing the device, be sure to re-check the device wiring and parameter settings。
When scrapped	
Warning	✧ Please scrap equipment and products in accordance with relevant national regulations and standards to avoid property loss or casualties! ✧ Discarded equipment and products should be processed and recycled in accordance with the industrial waste treatment standards to avoid environmental pollution。

Safety signs

In order to ensure the safe operation and maintenance of the equipment, please be sure to follow the safety signs pasted on the equipment and products, and do not damage, damage or peel off the safety signs. Safety signs are described as follows：

Safety signs	Description of content
	✧ Be sure to read the instruction manual before installation and operation, otherwise there will be danger of electric shock! ✧ Do not remove the cover when the power is on and within 10 minutes after cutting off the power! ✧ When performing maintenance, inspection and wiring, please wait for 10 minutes after cutting off the power supply on the input side and output side, and start working after the power indicator light is completely off。

This manual is an accessory sent with the machine, please keep it in a safe place for future use in the inspection and maintenance of the inverter. Due to the continuous improvement of products, the information provided by the company is subject to change without prior notice。

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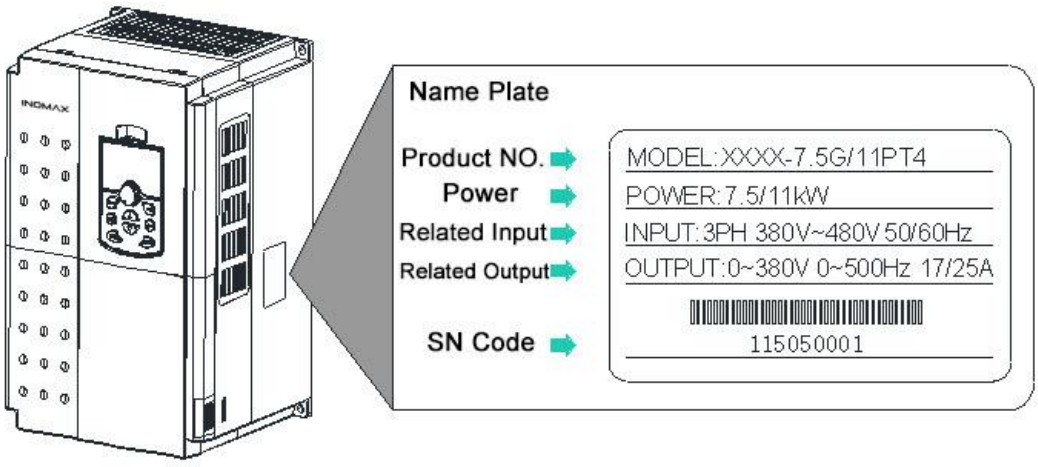
Chapter 1 Product Information

1. Arrival inspection

Before leaving the factory, each frequency converter has undergone strict quality control and has been treated with enhanced anti-collision packaging. After unpacking, please check the following items:

- **Check whether the inverter is damaged during transportation.**
- **Check whether there is an instruction manual in the packing box (with a certificate of conformity and a warranty card).**
- **Check the inverter nameplate and confirm that it is the product model you ordered.**
- **If you ordered the optional parts of the inverter, please check to confirm.**

2. Description of inverter nameplate



3.Specification model, technical specification

Model	Input Current (A)	Output Current (A)	Adaptable Motor		Product Size H*W*D (mm)
			KW	HP	
3phase input & output 380V-480V, 50/60Hz					
MAX600-R75GT4	3.4	2.1	0.75	1	152*89*123
MAX600-1R5GT4	5	3.8	1.5	2	152*89*123
MAX600-2R2GT4	5.8	5.1	2.2	3	152*89*123
MAX600-3R7G/5R5PT4	10.5	9	3.7	5	185*118*167
MAX600-5R5G/7R5PT4	14.6	13	5.5	7.5	185*118*187
MAX600-7R5G/011PT4	20.5	17	7.5	10	247*160*190
MAX600-011G/015PT4	26	25	11	15	247*160*190
MAX600-015G/018PT4	35	32	15	20	320*220*205
MAX600-018G/022PT4	38.5	37	18.5	25	320*220*205
MAX600-022/030PGT4	46.5	45	22	30	320*220*205
MAX600-030G/037PT4	62	60	30	40	432*255*235
MAX600-037G/045PT4	76	75	37	50	432*255*235
MAX600-045G/055PT4	92	91	45	60	432*255*235
MAX600-055G/075PT4	113	112	55	75	518*300*260
MAX600-075G/090PT4	157	150	75	100	518*300*260
MAX600-090G/110PT4	180	176	90	125	620*390*300
MAX600-110G/132PT4	214	210	110	150	620*390*300
MAX600-132G/160PT4	256	253	132	175	620*390*300
MAX600-160G/185PT4	307	304	160	210	780*480*360
MAX600-185G/200PT4	340	335	185	250	780*480*360
MAX600-200G/220PT4	385	377	200	260	1274*480*361
MAX600-220G/250PT4	430	426	220	300	1274*480*361
MAX600-250G/280PT4	468	465	250	350	1274*480*361
MAX600-280G/315PT4	525	520	280	370	1320*650*418
MAX600-315G/355PT4	590	585	315	420	1320*650*418
MAX600-355G/400PT4	665	650	355	470	1720*800*490
MAX600-400G/450PT4	785	725	400	530	1720*800*490

MAX600-450G/500PT4	883	820	450	600	1720*800*490
MAX600-500G/560PT4	1000	930	500	660	1720*800*490
MAX600-560G/630PT4	1100	1080	560	750	1850*1060*500
MAX600-630G/710PT4	1200	1120	630	850	1850*1060*500

Project		Specification
Basic features	highest frequency	0～400Hz
	carrier frequency	1.2kHz～15kHz can automatically adjust the carrier frequency according to the load characteristics.
	control method	Space voltage vector control mode, no PG vector control mode
	Motor Type	Asynchronous motor, permanent magnet synchronous motor
	Overload capacity	110% rated current for 1 minute, overload allowed once every 5 minutes
	Frequency setting method	Digital setting, analog setting, pulse frequency setting, multi-speed operation setting, simple PLC setting, PID setting, communication setting, etc. It can realize the switching of setting combination and setting channel
	Start-stop setting method	Operation panel setting, control terminal setting, communication setting and multiple switching modes
	Fault protection function	Provides multiple fault protection functions: overcurrent, overvoltage, undervoltage, overtemperature, phase loss, overload, etc.

Project		Specification
Peripheral Interface	Input Terminals	Standard: 5 digital input terminals, 1 of which supports high-speed pulse input up to 50kHz 2 analog input terminals, 1 only supports 0-10V voltage input, 1 supports 0-10V voltage input or 0-20mA current input
	Output Terminals	Standard: 1 digital output terminal 2 relay output terminals 2 analog output terminals, supporting 0~20mA current output or 0~10V voltage output

display and keyboard	LED display	Display parameters, status information, fault information,
	Key lock and function selection	Realize the locking of some or all of the keys, and define the range of some keys
	Protective function	Power-on motor short circuit detection, input and output phase loss protection, overcurrent protection, overvoltage protection, undervoltage protection, overheat protection, overload protection, etc.
environment	place of use	Indoor, free from direct sunlight, free from dust, corrosive gas, flammable gas, oil mist, water vapor, dripping water or salt, etc., the altitude is lower than
	ambient temperature	-10° C~+50° C (The ambient temperature is 40° C~50° C, please use with derating)
	humidity vibration	Humidity less than 95%RH, no condensation, vibration less than 5.9m/s2 (0.6g)
	storage temperature	－20℃～＋60℃

Chapter 2 Installation

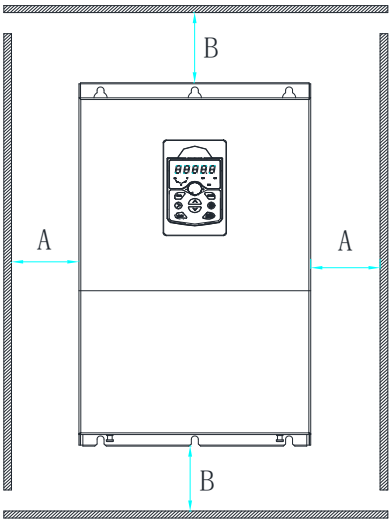
1. Installation environment

- A place free from water droplets, steam, dust and oily dust
- No corrosive, flammable gas or liquid.
- No floating dust and metal particles.
- Sturdy and vibration-free place.
- A place free from electromagnetic noise interference。
- The operating environment temperature is -10℃~ 40℃. If the ambient temperature exceeds 40° C, please place it in a well-ventilated place, and derate the inverter for use.

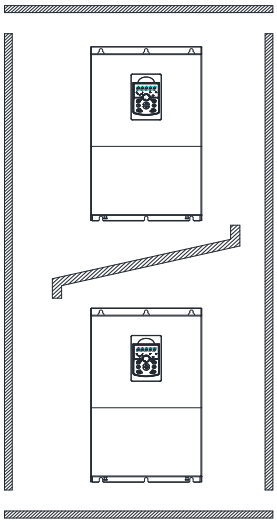
2. Installation method and space

- The inverter should be installed on a non-combustible structure such as metal, otherwise a fire accident may occur.
- The inverter should be installed vertically and securely with screws, do not install it upside down, obliquely or horizontally. The frequency converter will generate heat when it is running. In order to ensure the passage of cooling air, a certain space should be reserved during installation (as shown in the figure).
- When the inverter is installed in the control cabinet, ventilation and heat dissipation should be considered to ensure that the ambient temperature of the inverter does not exceed the specified value. Do not install the inverter in a closed box with poor ventilation and heat dissipation.
- When installing multiple inverters in the same control cabinet, in order to reduce the mutual thermal influence, it is recommended to install them side by side horizontally. If it must be installed up and down, a partition must be provided to reduce the influence of the heat generated by the lower part on the upper part (as shown in the figure).
- Do not allow foreign matter such as various fibers, paper pieces, wood chips (chips) or metal fragments to enter the inverter。

single installation drawing

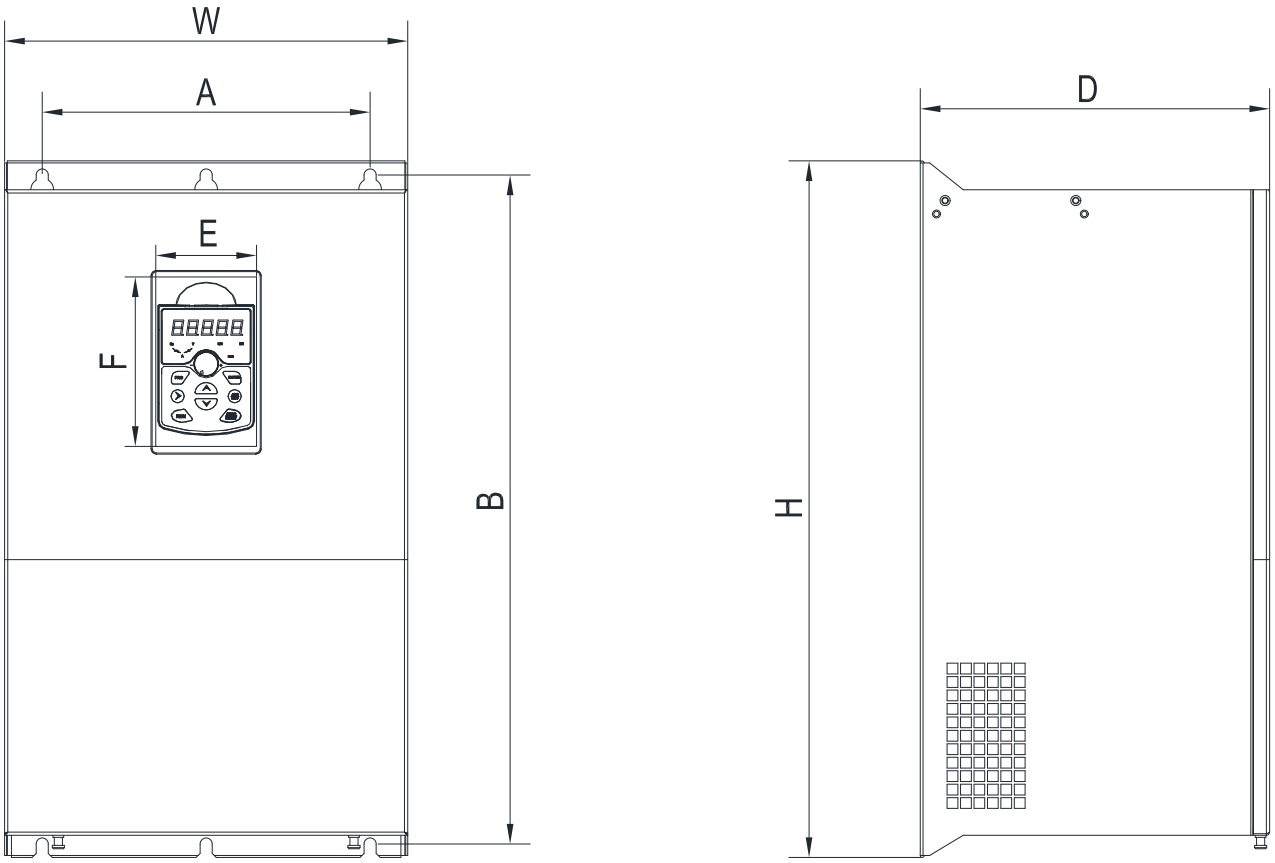


Up and down installation diagram

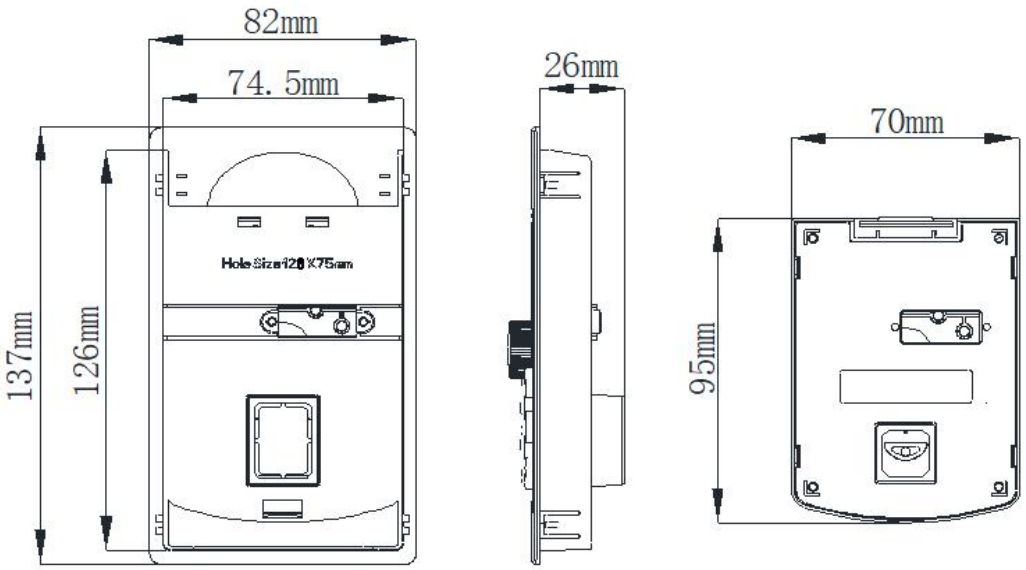


power level	installation size	
	A	B
≤15kw	≥20mm	≥100mm
18.5～30kw	≥50mm	≥200mm
≥37kw	≥50mm	≥300mm

3. Dimensions and installation dimensions



※:The opening size of the keyboard bottom bracket: Width E=74.5mm; Length F=126mm

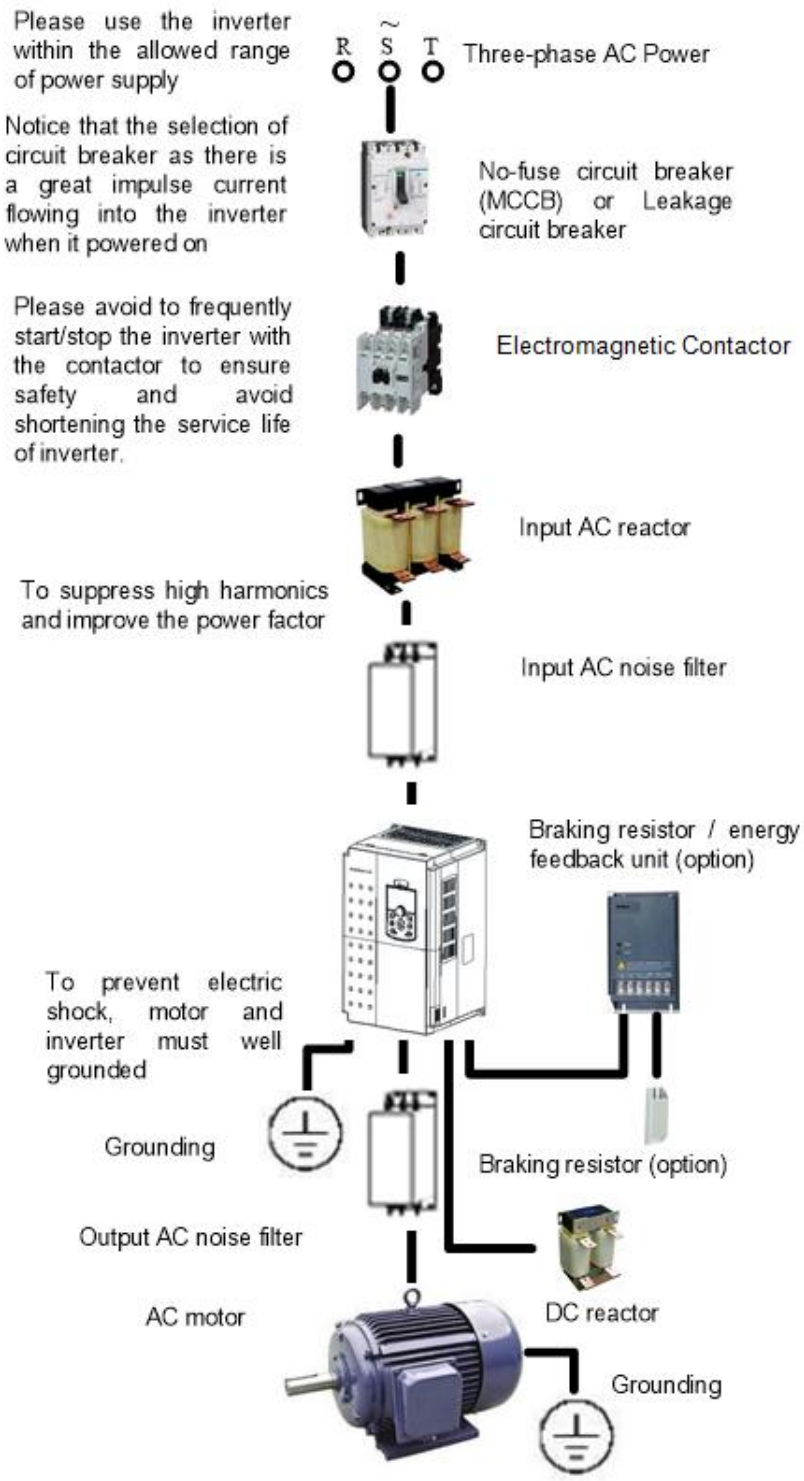


Model	installation size		Dimensions			Installation hole diameter (mm)
	A(mm)	B(mm)	H(mm)	W(mm)	D(mm)	
MAX600-R75GT4	107	175	185	118	167	Φ4.5
MAX600-1R5GT4						
MAX600-2R2GT4						
MAX600-3R7G/5R5PT4						
MAX600-5R5G/7R5PT4	107	175	185	118	187	Φ4.5
MAX600-7R5G/011PT4	148	235	247	160	190	Φ5.5
MAX600-011G/015PT4						
MAX600-015G/018PT4	205	305	320	220	205	Φ5.5
MAX600-018G/022PT4						
MAX600-022/030PGT4						
MAX600-030G/037PT4	180	416	432	255	234.5	Φ7
MAX600-037G/045PT4						
MAX600-045G/055PT4	244	497	518	300	260	Φ9
MAX600-055G/075PT4						
MAX600-075G/090PT4	300	598	620	390	300	Φ11
MAX600-090G/110PT4						
MAX600-110G/132PT4						
MAX600-132G/160PT4	350	745	780	480	360	Φ12
MAX600-160G/185PT4						
MAX600-185G/200PT4	/	/	1274	480	361	/
MAX600-200G/220PT4						
MAX600-220G/250PT4						
MAX600-250G/280PT4	/	/	1320	650	418	/
MAX600-280G/315PT4						
MAX600-315G/355PT4						
MAX600-355G/400PT4	/	/	1720.4	800	490	/
MAX600-400G/450PT4						
MAX600-450G/500PT4						
MAX600-500G/560PT4						
MAX600-560G/630PT4	/	/	1850	1060	500	/
MAX600-630G/710PT4						
0.75G ～ 630GThe opening size of the keyboard bottom bracket: Width E=74.5mm; Length F=126mm						

Due to the continuous improvement of the product, if there is any change in the information provided by the company, please refer to the actual product, and ask the customer service of the company for the latest installation size.

Chapter 3 Wiring

1. Connection of peripheral equipment

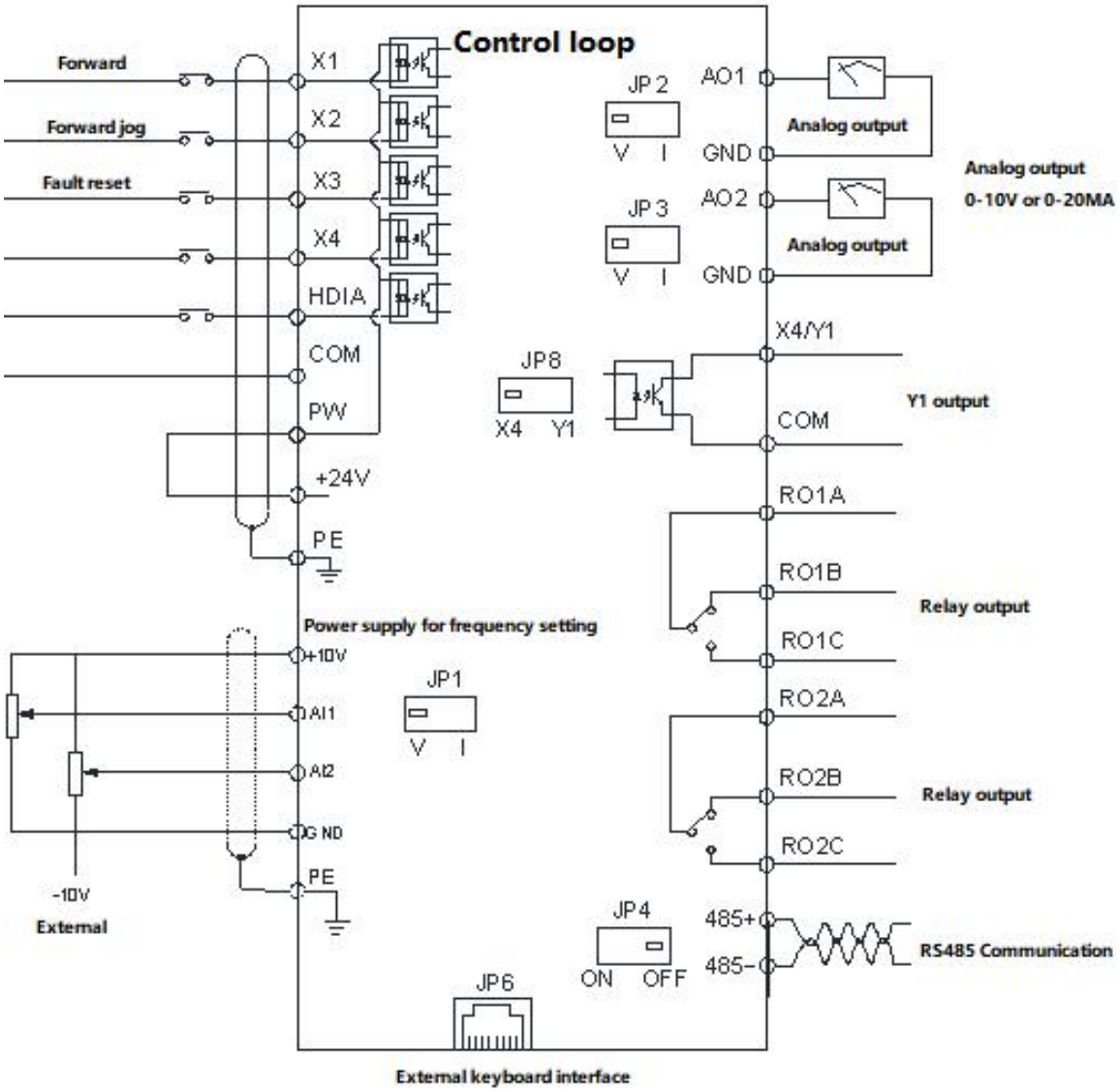


In order to ensure the safety of the operator and the frequency converter and other equipment, the work must be performed by certified and qualified professional electrical personnel. The following are special precautions when wiring:

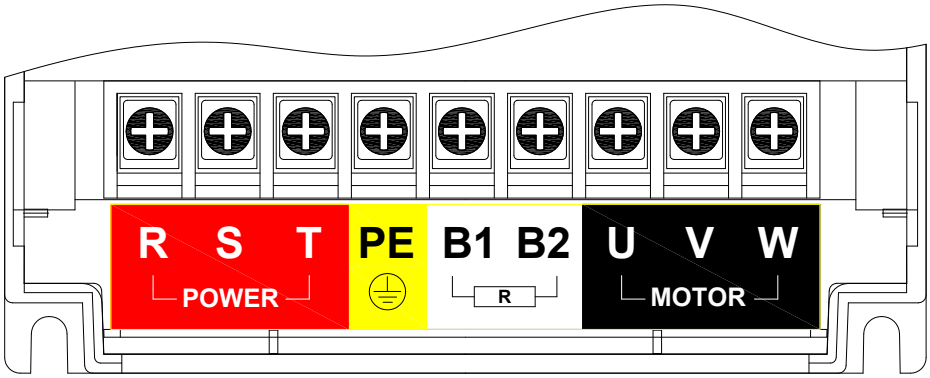
- Please confirm that the input power is cut off before wiring。

- The ground terminal of the inverter must be ⏚ Reliable grounding。
- Confirm that the rated voltage of the inverter is consistent with the AC power supply voltage。
- The power line must be connected to the R, S, T terminals of the inverter, and the motor line must be connected to the U, V, W terminals. Do not connect wrongly, otherwise it will cause internal damage to the inverter。
- Confirm that the terminals and wires are reliably connected, and the screws of the main circuit terminals must be locked tightly.
- It is strictly forbidden to touch the main circuit terminals, otherwise there is a risk of electric shock.

2. Standard wiring



3. Main circuit terminal description



Terminal	Terminal Name			Terminal function description
	22KW and below	30-37KW	45KW and above	
R S T	Main circuit power input terminal			AC 380V 3 phase input terminal
L N				AC 220V 1 phase input terminal
U V W	Inverter output terminal			Connect with 3 phase AC motor
P	no this terminal	no this terminal	DC reactor terminal 1	B1,B2 connect with braking resistor terminal,(+),(-) connect with braking unit terminal,P,(+) connect with DC reactor,need to remove the Short link between P and (+)when do connection
(+) or B1	Braking resistor terminal 1	/	DC reactor terminal 2	
		Braking Unit terminal 1		
(-)	no this terminal	Braking Unit terminal 2		
B2	Braking resistor terminal 2	no this terminal		
PE	Ground Terminal			make sure terminal do ground

When wiring, please implement wiring in accordance with the provisions of electrical regulations to ensure safety。

(1) .Connection of power input terminals R, S, T

✧ A circuit breaker should be connected between the three-phase AC input power supply and the main circuit terminals (R, S, T). It is better to connect another electromagnetic contactor (MC) in series so that the power supply can be cut off at the same time when the protection function of the frequency converter is activated (R-C surge absorbers need to be installed at both ends of the electromagnetic contactor)。

✧ If the inverter is equipped with a leakage circuit breaker for protection against leakage faults, in order to prevent the leakage circuit breaker from malfunctioning, please select a current with a

sensitivity of more than 200mA and an action time of more than 0.1 second.

- ✧ In order to prevent the high-voltage and high-current input power circuit of the power grid from damaging the rectifier parts, it is necessary to connect an AC reactor on the input side, which can also improve the power factor of the input side。
- ✧ Do not use the ON/OFF method of the main circuit power supply to control the operation and stop of the inverter. Use the RUN and STOP keys on the keyboard panel or the control circuit terminals to control the running and stopping of the inverter. If it is necessary to use the main power ON/OFF method to control the operation of the inverter, it can only be done about once per hour.
- ✧ In order to reduce the interference of the inverter to the surrounding equipment, a noise filter can be connected to the input side.
- ✧ Three-phase power models should not be connected to single-phase power。

(2) .Connection of inverter output terminals U, V, W

- ✧ The inverter output terminals are connected to the 3-phase motor according to the correct phase sequence. If the rotation direction of the motor is wrong, you can exchange the wiring of any two phases of U, V, and W.
- ✧ The output side of the inverter cannot be connected to capacitors and surge absorbers.
- ✧ When the wiring between the inverter and the motor exceeds 50 meters, the distributed capacitance between the lines will generate a large leakage current, which may cause the inverter to trip due to overcurrent. At the same time, in order to avoid motor insulation damage, an output reactor must be added to compensate .
- ✧ If the installation site of the inverter is very sensitive to interference, please install an output noise filter, and reducing the carrier frequency of the inverter will also reduce interference。

(3) . Connection of braking resistor and braking unit

- ✧ When the load inertia is large and needs to be stopped frequently or in a short period of time, when the braking capacity of the inverter is insufficient or in order to increase the braking torque, etc., select a braking resistor or a braking unit as required.
- ✧ The B1 and B2 terminals of the main circuit are connected to the braking resistor (if there are B1 and B2 terminals, it means that the inverter has a built-in braking unit)。
- ✧ When the inverter has no built-in braking unit, the (+) and (-) terminals of the main circuit are connected to the external braking unit。

✧ It is strictly forbidden to connect the (+) and (-) terminals of the main circuit to the braking resistor。

(4).Inverter ground terminal PE ⏚

✧ For safety and noise reduction, the ground terminal PE ⏚ of the inverter must be well grounded。

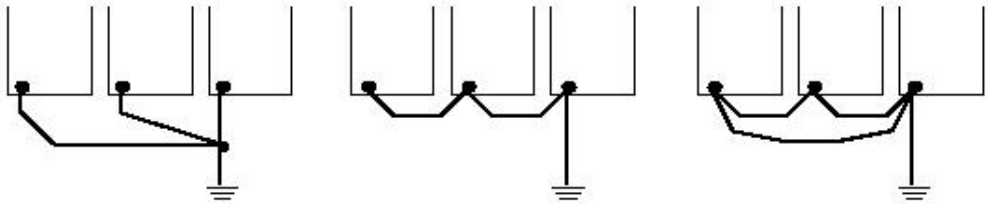
✧ Use a standard grounding wire, as short and thick as possible (grounding impedance below 10Ω).

✧ The grounding wire of the frequency converter cannot be grounded together with high-current loads such as electric welding machines and high-horsepower motors, but must be grounded separately.

✧ The power input wire generally adopts 5-core wires, 3 of which are live wires, 1 neutral wire, and 1 ground wire. It is strictly forbidden to use the neutral wire as a ground wire.

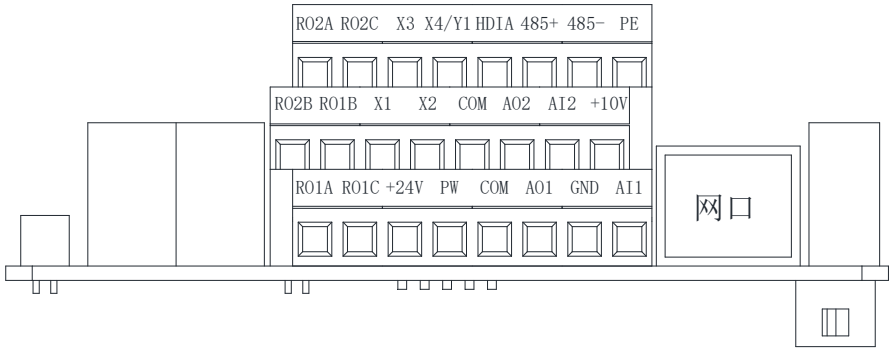
✧ When multiple inverters are installed together, all inverters must be directly connected to the common ground。

◆ Please refer to the following illustration：



(a) correct （b）Not recommended （c）Incorrect

4. Control circuit terminal description



Terminal name	Terminal description	
+10V	+10.5V power supply provided by this VFD	
AI1	Input range: AI1 voltage and current can be selected from 0(2)~10V, 0(4)~20mA AI2: -10V~+10V voltage Input impedance: 20kΩ for voltage input, 250Ω for current input	
AI2	AI1 voltage or current input is set by jumper JP1 Resolution: When 10V corresponds to 50Hz, the minimum resolution is 5mV 25℃, when input is 5V or above 10mA, the error is ±0.5%	
GND	+10.5V reference zero potential	
AO1	Output range: 0(2)~10V voltage or 0(4)~20mA current AO1 and AO2 voltage or current output is set by jumpers JP2 and JP3 25℃, output 5V, error ±0.5%	
AO2		
RO1A/RO2A	RO1 and RO2 two-way relay output; RO1A/RO2A common terminal, RO1B/RO2B normally closed, RO1C/RO2C normally open Contact capacity: 3A/AC250V, 1A/DC30V	
RO1B/RO2B		
RO1C/RO2C		
COM	+24V common terminal	
Y1	Switching capacity: 50mA/30V Output frequency range: 0~1kHz Y1 and X4 share output terminals, selected by jumper JP8	
485+	485 communication port, 485 differential signal port, standard 485 communication interface please use twisted pair shielded cable, 485 communication 120 ohm terminal matching resistor is selected through jumper JP4 access.	
485-		
PE	Ground terminal	
PW	The input switch quantity working power is provided from the outside to the inside. Voltage range: 12～30V	
+24V	The inverter provides user power supply, 24V (-10% ~ +15%), maximum output current 200mA	
X1	Switch input 1	1. Internal impedance: 3.3kΩ 2. Acceptable 12~30V voltage input 3. This terminal is a bidirectional input terminal, supporting NPN and PNP connection 4. Maximum input frequency: 1kHz 5. All are programmable digital input terminals, users can set terminal functions through function codes 6. X4 and Y1 share output terminals, selected by jumper JP8.
X2	Switch input 2	
X3	Switch input 3	
X4	Switch input 4	
HDIA	In addition to the switch input function, it can also be used as a high-frequency pulse input channel. Maximum input frequency: 50kHz. Duty cycle: 30% to 70%.	

Please use multi-core shielded cables or twisted wires to connect the control terminals. When using a shielded cable (end close to the drive) it should be connected to the ground terminal⏚PE

of the drive. When wiring, the control cables should be more than 20CM away from the main circuit and strong current lines (including power lines, motor lines, relays, contactor connections, etc.), and avoid parallel placement. It is recommended to use vertical wiring to prevent external interference from causing inverter errors. action。

5. Selection recommendation of peripheral electrical components

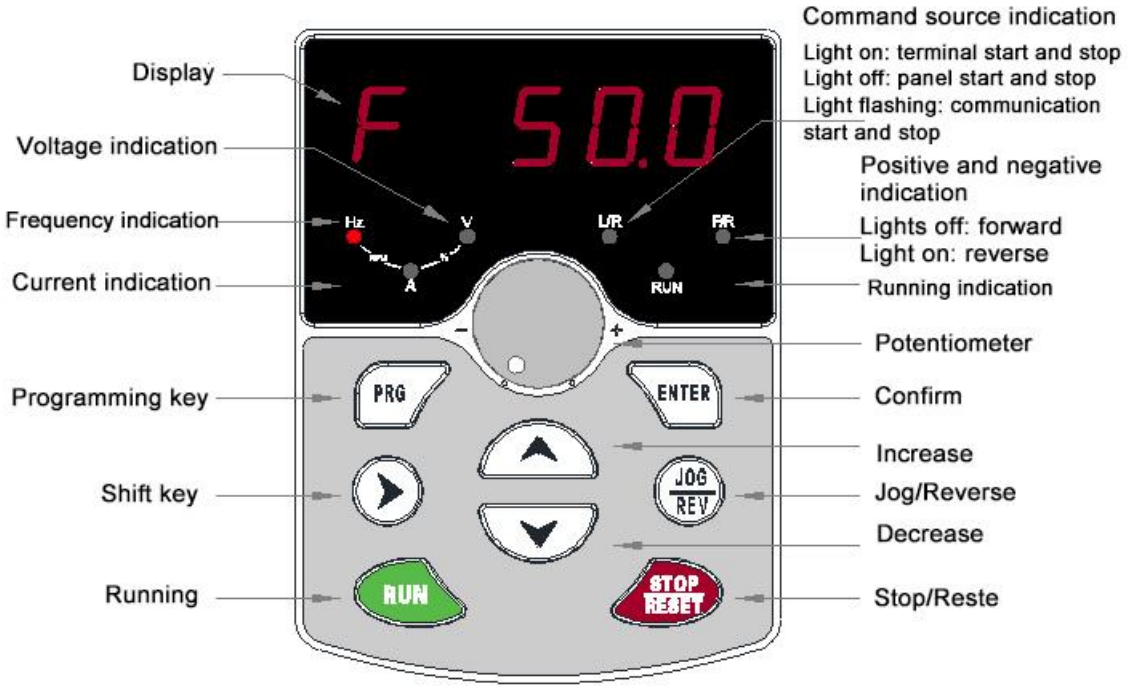
The following table lists the commonly used specifications in inverter wiring, such as circuit breaker, contactor rated current, main circuit path, reactor specifications, etc. The reactor takes the reactor model produced by Shell Electric Technology Co., Ltd. as an example。

Inverter power	breaker A	contactorA	main circuit wire mm2	Main circuit screw specification	Input reactor	Output reactor	DC reactor
Simplex 220V							
0.4kW-S2	10	9	0.75	M4	-	-	-
0.7kW-S2	16	12	0.75	M4	-	-	-
1.5kW-S2	25	18	1.5	M4	-	-	-
2.2kW-S2	32	25	2.5	M4	-	-	-
three phase 380V							
0.7kW-T4	6	9	0.75	M4	BK-JXL-10A	BK-CXL-10A	BK-DXL-10A
1.5kW-T4	10	9	0.75	M4	BK-JXL-10A	BK-CXL-10A	BK-DXL-10A
2.2kW-T4	10	9	1.5	M4	BK-JXL-10A	BK-CXL-10A	BK-DXL-10A
4.0kW-T4	16	12	2.5	M4	BK-JXL-15A	BK-CXL-15A	BK-DXL-15A
5.5kW-T4	20	18	2.5	M4	BK-JXL-15A	BK-CXL-15A	BK-DXL-15A
7.5kW-T4	32	25	4.0	M4	BK-JXL-20A	BK-CXL-20A	BK-DXL-20A
11kW-T4	40	32	4.0	M4	BK-JXL-30A	BK-CXL-30A	BK-DXL-30A
15kW-T4	50	38	6.0	M5	BK-JXL-40A	BK-CXL-40A	BK-DXL-40A
18.5kW-T4	50	40	10	M5	BK-JXL-50A	BK-CXL-50A	BK-DXL-50A
22 kW-T4	63	50	10	M5	BK-JXL-60A	BK-CXL-60A	BK-DXL-60A
30kW-T4	100	65	16	M6	BK-JXL-80A	BK-CXL-80A	BK-DXL-80A
37kW-T4	100	80	25	M6	BK-JXL-110A	BK-CXL-110A	BK-DXL-110A
45kW-T4	125	95	35	M8	BK-JXL-125A	BK-CXL-125A	BK-DXL-125A
55kW-T4	160	115	50	M8	BK-JXL-150A	BK-CXL-150A	BK-DXL-150A
75kW-T4	225	170	70	M10	BK-JXL-200A	BK-CXL-200A	BK-DXL-200A
90kW-T4	250	205	95	M10	BK-JXL-250A	BK-CXL-250A	BK-DXL-250A
110kW-T4	315	245	120	M10	BK-JXL-275A	BK-CXL-275A	BK-DXL-275A
132kW-T4	350	300	120	M12	BK-JXL-330A	BK-CXL-330A	BK-DXL-330A
160kW-T4	400	300	150	M12	BK-JXL-450A	BK-CXL-450A	BK-DXL-450A

185kW-T4	500	410	150	M12	BK-JXL-500A	BK-CXL-500A	BK-DXL-500A
200kW-T4	500	410	185	M12	BK-JXL-510A	BK-CXL-510A	BK-DXL-510A
220kW-T4	630	475	240	M12	BK-JXL-540A	BK-CXL-540A	BK-DXL-540A
250kW-T4	630	475	2×120	M12	BK-JXL-625A	BK-CXL-625A	BK-DXL-625A
280kW-T4	700	620	2×120	M12	BK-JXL-625A	BK-CXL-625A	BK-DXL-625A
315kW-T4	800	620	2×150	M12	BK-JXL-800A	BK-CXL-800A	BK-DXL-800A
350kW-T4	1000	800	2×185	M12	BK-JXL-1000A	BK-CXL-1000A	BK-DXL-1000A
400kW-T4	1250	800	2×240	M12	BK-JXL-1100A	BK-CXL-1100A	BK-DXL-1100A
450kW-T4	1250	1000	2×240	M12	---	---	---
500kW-T4	1500	1000	3×185	M12	---	---	---
560kW-T4	1500	1200	3×240	M16	---	---	---
630kW-T4	1500	1500	3×240	M16	---	---	---

Chapter 4 Basic Operation and Trial Run

1. Description of the keyboard panel



1. Description of panel indicators

Indicator status		Status Description
RUN Running lights	RUN	Light off: stop
	RUN	Light on: Running
L/R Run command indicator	L/R	Light off:Keypad control
	L/R	Light on:Terminal control
	L/R	Flashing:Communication control
F/R Positive and negative indicator	F/R	Light off:Forward running
	F/R	Light on:Reverse
Hz RPM % V A Unit indicator	Hz RPM % V A	Light on:shows frequency
	Hz RPM % V A	Light on:shows current
	Hz RPM % V A	Light on:shows voltage
	Hz RPM % V A	Hz/A light on:show motor running RPM
	Hz RPM % V A	A/V light on:shows percentage

2. digital display area：

A total of 5-digit LED display, which can display the set frequency, output frequency, various monitoring data and alarm codes, etc.。

2. Keyboard key description

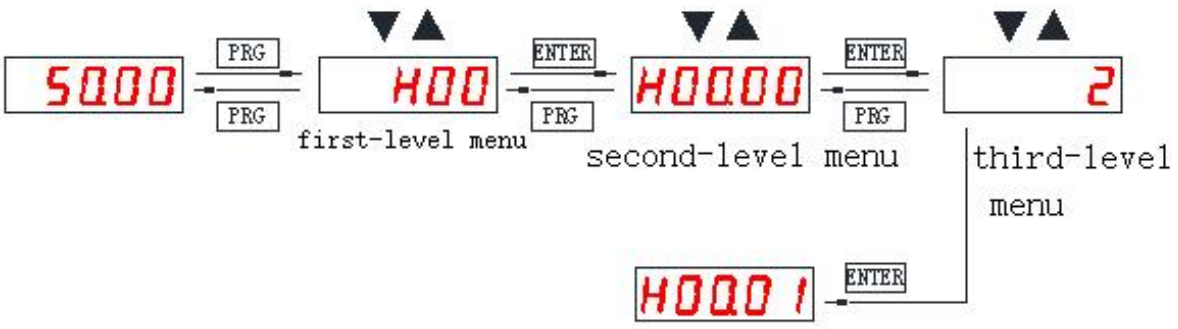
press key	Name	Function
	programming key	Enter or exit the first level menu.
	Enter	Enter the menu screen step by step, set parameters and confirm.
	increment key	Increment of data or function code.
	down key	Decrement of data or function code.
	shift key	In the shutdown display interface and the running display interface, the display parameters can be selected cyclically; when modifying the parameters, the modification bit of the parameter can be selected.
	run key	In the keyboard operation mode, it is used to run the operation.
	stop/reset	In the running state, press this key to stop the running operation; in the fault alarm state, it can be used to reset the operation; the characteristics of this key are restricted by the function code P7-02.
	multi-function selection key	According to the function switching selection of P7-01, it can quickly switch the command source and direction.
	panel knob	Through the parameters, the panel knob can be used for frequency setting or other settings

3. Function code modification and viewing instructions

1. Description of function code modification

The operation panel of the inverter adopts a three-level menu structure for parameter setting and other operations. The third-level menus are: function parameter group (first-level menu) → function code (second-level menu) → function code setting value (third-level menu).

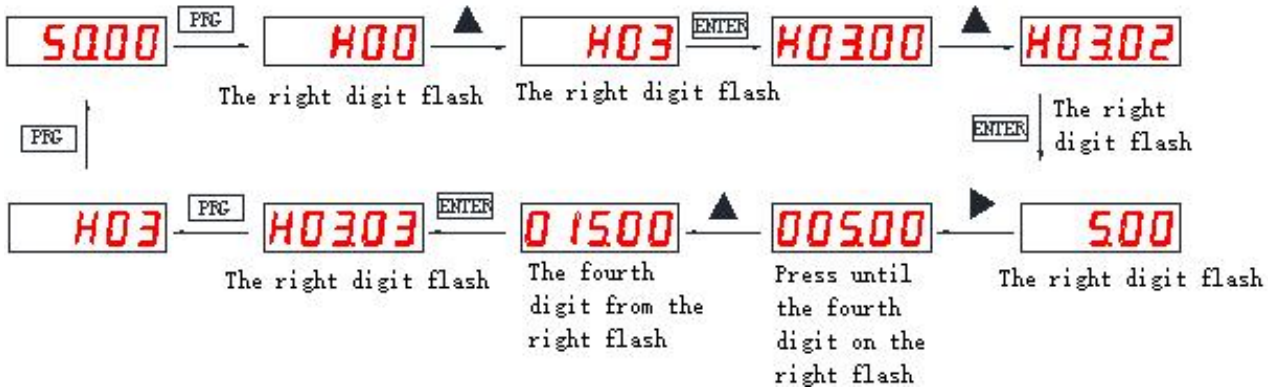
The operation process is shown in the figure below。



Note: When operating in the third-level menu, press the PRG key or ENTER key to return to the second-level menu. The difference between the two is: press the ENTER key to save the set parameters

and return to the second-level menu, and automatically transfer to the next function code; while press the PRG key to directly return to the second-level menu without saving the parameters and return to the current function code。

Example: Example of changing function code H03-02 from 5.00Hz to 15.00Hz。



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

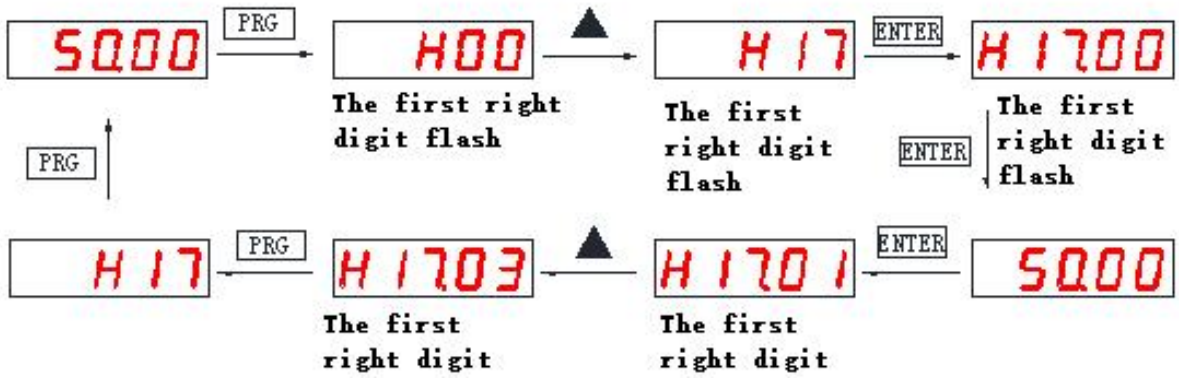
1) This function code is an unmodifiable parameter. Such as actual detection parameters, operation record parameters, etc.

2) This function code cannot be modified in the running state, and can only be modified after the machine is stopped.

3) Parameters are locked and cannot be modified. The lock function needs to be canceled.

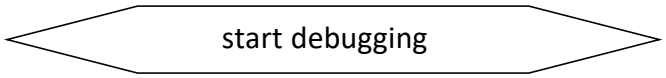
2.How to set and view status parameters

This series of inverters provide H17 group as a status viewing function group, and users can directly enter H17 group to view.



4. Quick debugging

(1) .Quick Commissioning Guide



Check that the peripheral wiring is correct and firm

📖 Please refer to Chapter 3 Standard Wiring

Power on, the inverter displays normal Set H00-18=1 (restore factory value)

📖 Please refer to the Detailed description of H00-18

Set motor related parameters

📖 Please refer to Section 5 Motor self-learning

According to whether the motor load can be disengaged, select the H00-15 tuning mode, and self-study the motor parameters

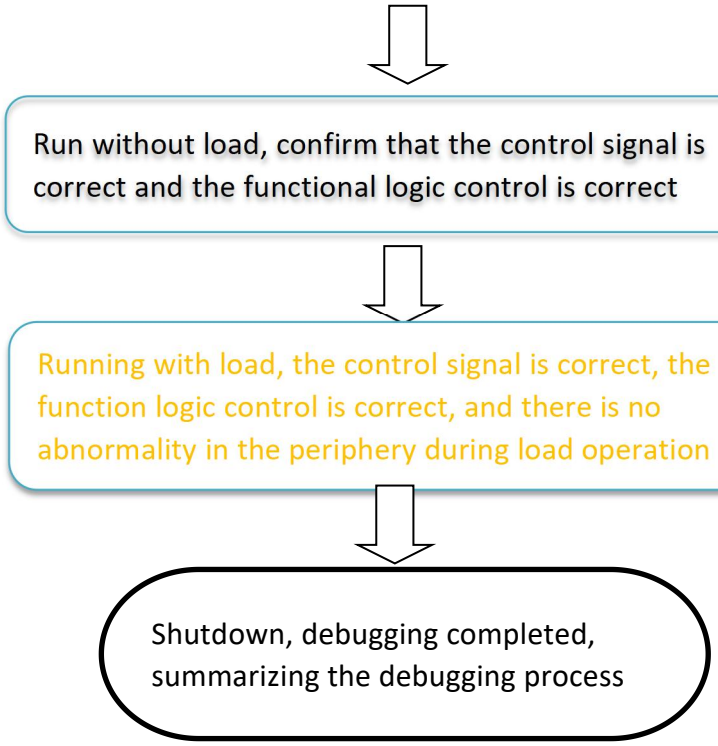
📖 Please refer to Section 5 Motor self-learning

Confirm that the motor can run, control the motor for trial operation, and press "RUN" on the panel to run;
Confirm that the running current, motor direction, and no-load operation are normal;
If it can be loaded, confirm that the load is operating normally.

📖Please refer to Section 5 Motor self-learning

Stop, according to control requirements, set logic control functions such as terminal input/output/communication/analog quantity/fault output

📖 Please refer to Section 5 Motor Control Mode



📖 Please refer to Section 5 Motor Control Mode

📖 Please refer to Section 5 Motor Control Mode

(2) .Things to check before turning on the power

Be sure to confirm the following items before turning on the power。

Project	Content
Confirmation of power supply voltage	Please confirm whether the power supply voltage is correct Three-phase (AC 380V~480V) or single-phase (AC 220V~240V 50/60Hz)
	Please wire the three-phase (R/S/T) or single-phase (L/N) of the power input terminal reliably
	Confirm that the frequency converter and motor are properly grounded
Confirmation of the connection between the inverter output terminal and the motor terminal	Please confirm whether the connection between the inverter output terminal (U/V/W) and the motor terminal is firm
Confirm the connection with the inverter control circuit terminal	Please confirm whether the control circuit terminals of the inverter and other control devices are connected securely
Confirmation of the status of the control terminals of the inverter	Please confirm whether the control circuit terminals of the inverter are all in the OFF state (the inverter is not running)
load confirmation	Please confirm whether the motor is in no-load state and not connected to the mechanical system

(3) Display status confirmation after power on

After the power is turned on, the manipulator display in normal state is as follows。

State	Show	Illustrate
normal time	50.00	The factory default display is digital setting 50.00Hz
failure	Err02	When the fault occurs, the inverter is in the stop state, and the fault type is displayed

(4) Parameter initialization

The setting of the frequency converter can be restored to the factory setting. After initialization, P00-18 will automatically return to zero.

H00-18	parameter initialization	Factory default	0
	Predetermined area	0	no action
		1	Restore factory parameters,
		2	Clear Fault information
		3	Keyboard parameter lock
		4-6	reserve

(5).Motor self-learning

The methods for the inverter to obtain the internal electrical parameters of the controlled motor include:

Dynamic self-learning; static self-learning 1; static self-learning 2; manual input of motor parameters, etc.

Self-learning	Applicable situation
Rotary autotuning 1. H00-15=1	Comprehensive motor parameter autotuning . It is recommended to use rotating autotuning when high control accuracy is required.
Static autotuning 1 (comprehensive autotuning); H00-15 = 2	static autotuning 1 is used in cases where the motor cannot be disconnected from load.
Static autotuning 2 (partial autotuning) H00-15 = 3	when the present motor is motor 1, onlyH02.06, H02.07, andH02.08 are autotuned; when the present motor is motor 2, only H12.06, H12.07, and H12.08 are autotuned.
Rotary autotuning 2 H00-15 = 4	which is similar to rotary autotuning 1 but only valid forAMs
Static autotuning 3 (partial autotuning) H00-15 = 5	which is valid only for AMs

The steps of automatic self-learning of motor parameters are as follows:

Step 1: If the motor can be completely disconnected from the load, in the case of power failure, mechanically separate the motor from the load, so that the motor can rotate freely without load.

Step 2: After power on, first select the inverter command command (H00-02) as the command channel of the operation panel.

Step 3: Enter the nameplate parameters of the motor accurately ;

※**1**、If it is an asynchronous motor, set H02-00 to 0, and H02-01 to H02-14 will be displayed. Enter the following parameters according to the motor nameplate:

Motor selection	Parameters
Motor parameters	H02-00:0(asynchronous motor) H02-01: Motor rated power H02-02:Motor rated frequency H02-03:Motor rated speed H02-04: Motor rated voltage H02-05: Motor rated current

※**2**、 If it is a synchronous motor, set H02-00 to 1, H02-15 to H02-23 will be displayed, and enter the following parameters according to the motor nameplate:

Motor selection	Parameters
Motor parameters	H02-00:1(synchronous motor) H02-15: Motor rated power H02-16:Motor rated frequency H02-17:Number of pole pairs of synchronous motor H02-18: Motor rated voltage H02-19: Motor rated current

Step 4: On the premise that the motor shaft can be disconnected from the load, select H00-15=1; and press ENTER to confirm. At this time, the keyboard displays TUNE, as shown in the figure below：



Then press the RUN key on the keyboard panel, the inverter will drive the motor to accelerate and decelerate, run forward and reverse, the running indicator light is on, and the self-learning operation lasts for about 2 minutes. When the above display information disappears, it will return to the normal parameter display state, indicating self-learning Finish.

If the motor cannot be completely disconnected from the load, Parameter static self-learning。

Chapter 5 Summary of Functional Parameters

1. Basic function parameter table

To better protect parameters, the VFD provides the password protection function. After a password is set (that is,H07.00is set to a non-zero value), "0.0.0.0.0" is displayed when you press the "PRG" key to enter the function code editing interface. You need to enter the correct user password to enter the interface. For the factory parameters, you need to enter the correct factory password to enter the interface. (You are not advised to modify the factory parameters. Incorrect parameter setting may cause operation exceptions or even damage to the VFD.) If password protection is not in locked state, you can change the password any time. You can set H07.00 to 0 to cancel the user password. When H07.00 is set to a non-zero value during power-on, parameters are prevented from being modified by using the user password function. When you modify function parameters through serial communication, the user password protection function is also applicable and compliant with the same rule.

"☆": Indicates that the parameter can be changed when the inverter is running or stopped.

"★": Indicates that the parameter cannot be changed when the inverter is running.

"●": Indicates that the parameter is only the actual detection record value, which can only be viewed and cannot be changed。

H00 Basic Function Group

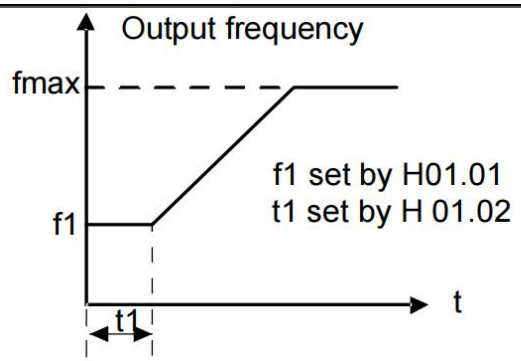
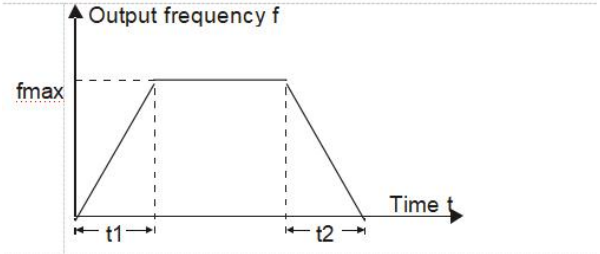
Function code	Name	Predetermined area	Factory default	Change
H00-00	Speed control mode	0: Sensorless vector control (SVC) mode 0 1: Sensorless vector control (SVC) mode 1 2: Space voltage vector control mode Note: Before using a vector control mode (0 or 1), enable the VFD to perform motor parameter autotuning first.	2	★
H00-01	Channel of running commands	0: Keypad 1: Terminal 2: Communication	0	☆
H00-02	Communication mode of running commands	0: Modbus 1: reserve 2: reserve	0	☆
H00-03	Maximum output frequency	10.00 ～ 400.00Hz，Max（H00.04）	50.00Hz	★
H00-04	upper limit frequency	H00.05 ～ H00.03	50.00Hz	★
H00-05	lower limit frequency	0.00Hz ～ H00.04	0HZ	★

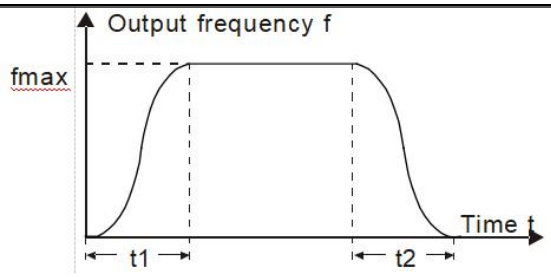
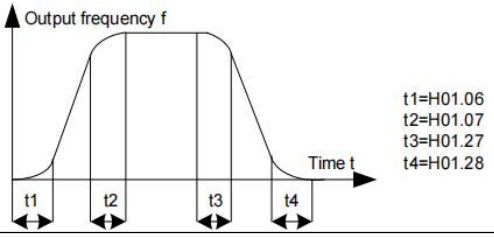
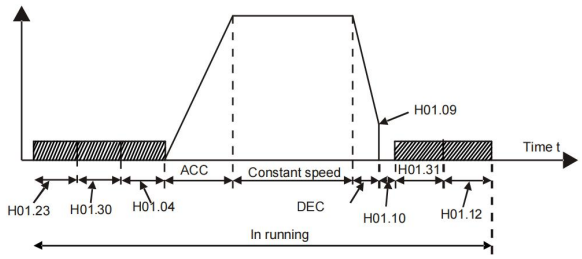
H00-06	Setting channel of A frequency command	0: Keypad 1:AI1 2:AI2 3:reserve 4：PULSE pulse 5：Simple PLC 6：Multi-stage speed 7：PIDs 8：Modbus Communication setting 9：reserve 10：reserve 15：reserve	0	☆
H00-07	Setting channel of B frequency command		15	☆
H00-08	Reference object of B frequency command	0: Max. output frequency 1: Afrequency command	0	☆
H00-09	Combination mode of setting source	0: A 1: B 2: (A+B) 3: (A-B) 4: Max(A, B) 5: Min(A, B)	0	☆
H00-10	Frequency set through keypad	When A and B frequency commands select the keypad for setting, the value of the function code is the original setting one of the frequency data of the VFD. Setting range: 0.00 Hz–H00.03(Max. output frequency)	50.00Hz	☆
H00-11	ACC time 1	ACC time means the time needed if the VFD speeds up from 0Hz to the max. output frequency (H00.03).	Depends on model	☆
H00-12	DEC time 1	DEC time means the time needed if the VFD speeds down from the max. output frequency (H00.03) to 0Hz. The VFD has four groups of ACC/DEC time, which can be selected by H05. The factory default ACC/DEC time of the VFD is the first group. H00.11and H00.12setting range: 0.0–3600.0s	Depends on model	☆
H00-13	Running direction	0: Run at the default direction. 1: Run at the opposite direction. 2: Disable reverse running	0	☆
H00-14	Carrier frequency	When the user uses a carrier frequency exceeding the default, it is necessary to reduce the rating. For every 1k carrier frequency increase, the rating is reduced by 10%. Setting range: 1.2 ～ 15.0kHz	Depends on model	☆
H00-15	Motor parameter autotuning	0: No operation 1: Rotary autotuning 1. Comprehensive motor parameter autotuning. It is recommended to use rotating autotuning when high control accuracy is required. 2: Static autotuning 1 (comprehensive autotuning); static autotuning 1 is used in cases where the motor cannot be disconnected from load.	0.00Hz	★

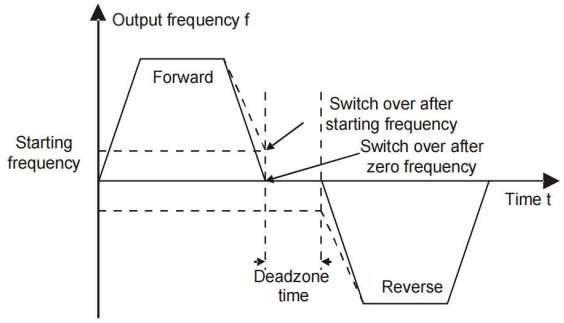
		3: Static autotuning 2 (partial autotuning); when the present motor is motor 1, onlyH02.06, H02.07, and H02.08 are autotuned; when the present motor is motor 2, only H12.06, H12.07, and H12.08 are autotuned. 4: Rotary autotuning 2, which is similar to rotary autotuning 1 but only valid for AMs 5: Static autotuning 3 (partial autotuning), which is valid only for AMs		
H00-16	AVR function selection	0: Invalid 1: Valid during the whole procedure The auto-adjusting function of the VFD can eliminate the impact on the output voltage of the VFD because of the bus voltage fluctuation.	1	☆
H00-17	Reserved	/	/	/
H00-18	Function parameter restore	0: No operation 1: Restore default values 2: Clear fault records 3 – 6: Reserved Note: After the selected operation is performed, the function code is automatically restored to 0. Restoring the default values may delete the user password. Exercise caution when using this function.	0	★

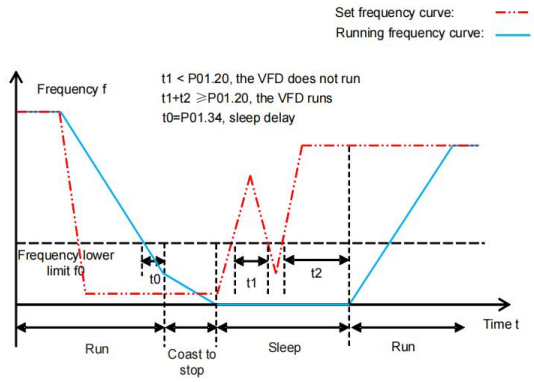
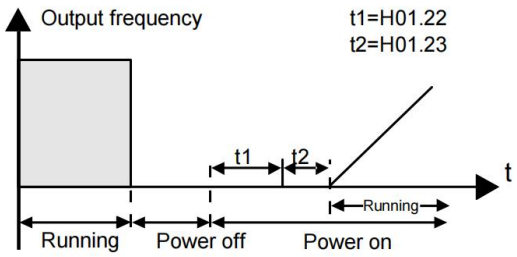
H01 group—Start and stop control

Function code	Name	Predetermined area	Factory default	Change
H01-00	Start mode	0: Direct start 1: Start after DC braking 2: Speed tracking restart 1 (not supported in SVC 0 for AMs) Note: For AMs, speed tracking is not supported in SVC 0, and software speed tracking is supported in other modes. For details, see parameters H01.35 – H01.41. For AMs, you do not need to modify parameters H01.35 – H01.41.	0	★
H01-01	Starting frequency of direct start	The function code indicates the initial frequency during VFD start. SeeH01.02(Starting frequency hold time) for detailed information. Setting range: 0.00 – 50.00Hz	0.50Hz	★

H01-02	Starting frequency hold time	 Setting a proper starting frequency can increase the torque during VFD start. During the hold time of the starting frequency, the output frequency of the VFD is the starting frequency. And then, the VFD runs from the starting frequency to the set frequency. If the set frequency is lower than the starting frequency, the VFD stops running and keeps in the standby state. The starting frequency is not limited in the lower limit frequency. Setting range: 0.0 – 50.0s	0.0s	★
H01-03	Braking current before start	The VFD performs DC braking with the braking current before start and it speeds up after the DC braking time. If the set DC braking time is 0, DC braking is invalid. Stronger braking current indicates larger braking power. The DC braking current before start is a percentage of the VFD rated current. H01.03setting range: 0.0 – 100.0% H01.04setting range: 0.00 – 50.00s	0.0%	★
H01-04	Braking time before start		0.00s	★
H01-05	ACC/DEC mode	Used to indicate the changing mode of the frequency during start and running. 0: Linear type. The output frequency increases or decreases linearly.  1: S curve. The output frequency increases or decreases according to the S curve. The S curve is generally applied to elevators, conveyors, and other application scenarios where smoother start or stop is required.	0	★

		 **Note:** If mode 1 is selected, set H01.06, H01.07, H01.27, and H01.28 accordingly.		
H01-06	Asynchronous motor stator resistance	The curvature of S curve is determined by the ACC range and ACC/DEC time(0-50S)	0.1s	★
H01-07	Asynchronous motor rotor resistance		0.1s	★
H01-08	Stop mode	0: Decelerate to stop. After a stop command takes effect, the VFD lowers output frequency based on the DEC mode and the defined DEC time; after the frequency drops to the stop speed (H01.15), the VFD stops. 1: Coast to stop. After a stop command takes effect, the VFD stops output immediately; and the load coasts to stop according to mechanical inertia.	0	☆
H01-09	Starting frequency of DC braking for stop	Starting frequency of DC braking for stop: During the deceleration to stop, the VFD starts DC braking for stop when running frequency reaches the starting frequency determined by H01.09. Wait time before DC braking: The VFD blocks the output before starting DC braking. After this wait time, DC braking is started so as to prevent overcurrent caused by DC braking at high speed. DC braking current for stop: It indicates the applied DC braking energy. Stronger current indicates greater DC braking effect. DC braking time for stop: It indicates the hold time of DC braking. If the time is 0, DC braking is invalid, and the VFD decelerates to stop within the specified time. 	0.00Hz	☆
H01-10	Demagnetization time		0.00s	☆
H01-11	DC braking current for stop		0.0%	☆
H01-12	DC braking time for stop		0.00s	☆

		H01.09setting range: 0.00Hz – H00.03 H01.10setting range: 0.00 – 30.00s H01.11setting range: 0.0 – 100.0% H01.12setting range: 0.0 – 50.0s		
H01-13	FWD/REV running deadzone time	This function code indicates the transition time specified in H01.14 during FWD/REV rotation switching. See the following figure:  Setting range: 0.0–3600.0s	0.0s	☆
H01-14	FWD/REV running switching mode	0: Switch at zero frequency 1: Switch at the starting frequency 2: Switch after the speed reaches the stop speed with a delay	1	★
H01-15	Stop speed	0.00–100.00Hz	0.50Hz	★
H01-16	Stop speed detection mode	0: Detect by the set speed (unique in space voltage vector control mode) 1: Detect by the feedback speed	0	★
H01-17	Stop speed detection time	0.00–100.00s	0.50s	★
H01-18	Terminal-based running command protection at power-on	When the channel of running commands is terminal control, the system detects the state of the running terminal during power-on. 0: The terminal running command is invalid at power-on. Even the running command is considered as valid during power-on, the VFD does not run and it keeps the protection state until the running command is canceled and enabled again. 1: The terminal running command is valid at power-on. If the running command is considered as valid during power-on, the VFD is started automatically after the initialization. Note: Exercise caution before using this function. Otherwise, serious result may follow.	0	☆
H01-19	Action selected when running frequency less than frequency lower	The function code determines the running state of the VFD when the set frequency is lower than the lower-limit one. 0: Run at the frequency lower limit 1: Stop 2: Sleep	0	★

	limit (valid when frequency lower limit greater than 0)	The VFD coasts to stop when the set frequency is lower than the lower-limit one. If the set frequency exceeds the lower limit one again and it lasts for the time set by H01-20, the VFD resumes the running state automatically.		
H01-20	Wake-up-from-sleep delay	Used to set the wake-up-from-sleep delay time. When the running frequency of the VFD is lower than the lower limit, the VFD becomes standby.When the set frequency exceeds the lower limit one again and it lasts for the time set byH01.20, the VFD runs automatically.  Setting range: 0.0–3600.0s (Valid only when H01.19=2)	0.0s	☆
H01-21	Power-off restart selection	The function code indicates whether the VFD automatically runs after re-power on. 0: Disable 1: Enable. If the restart condition is met, the VFD will run automatically after waiting the time defined byH01.22.	0	☆
H01-22	Wait time for restart after power-off	The function code indicates the wait time before the automatic running of the VFD that is re-powered on.  Setting range: 0.0–3600.0s (Valid only when H01.21=1)	1.0s	☆
H01-23	Start delay	After a VFD running command is given, the VFD is in standby state and restarts with the delay defined byH01.23to implement brake release. Setting range: 0.0–600.0s	0.0s	☆
H01-24	Stop speed delay	0.0–600.0s	0.0s	☆

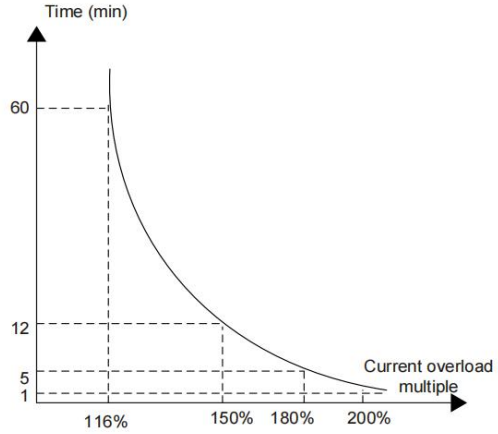
H01-25	Open-loop 0Hz output selection	0: Output without voltage 1: Output with voltage 2: Output with the DC braking current for stop	0	☆
H01-26	DEC time for emergency stop	0.0–60.0s	2.0s	☆
H01-27	Time of starting segment of DEC S curve	0.0–50.0s	0.1s	★
H01-28	Time of ending segment of DEC S curve	0.0–50.0s	0.1s	★
H01-29	Short-circuit braking current	When the VFD starts in direct start mode (H01.00=0), set H01.30 to a non-zero value to enter short-circuit braking. During stop, if the running frequency of VFD is lower than the starting frequency of brake for stop (H01.09), setH01.31to a non-zero value to enter short-circuit braking for stop, and then carryout DC braking in the time set byH01.12. (See descriptions for H01.09–H01.12.) H01.29setting range: 0.0–150.0% (VFD) H01.30setting range: 0.0–50.0s H01.31setting range: 0.0–50.0s	0.0%	☆
H01-30	Hold time of short-circuit braking for start		0.00s	☆
H01-31	Hold time of short-circuit braking for stop		0.00s	☆
H01-32	Pre-exciting time for jogging	0–10.000s	0.300s	☆
H01-33	Starting frequency of braking for stop in jogging	0–H00.03	0.00Hz	☆
H01-34	Sleep delay	0–3600.0s	0.0s	☆
H01-35	Speed tracking method	Speed tracking method 0: From stop frequency (Usually selected) 1: From low frequency (Applicable to restart after a long time of stop) 2: From max. frequency H00.03 (Applicable to common power generation load situation)	0	☆
H01-36	Quick/slow selection for speed tracking	1–100 A great value of this parameter indicates a fast rotation-speed tracking speed, but an excessively great value may result in poor tracking effect.	15	☆
H01-37	Speed tracking current	30%–200% (motor) Great great value of this parameter indicates	100%	☆
H01-38	Demagnetization time for speed tracking	0.0–10.0s	Depends on model	☆

H01-39	Advanced control for speed tracking	0x000–0x111 LED ones place: Current giving mode in vector control 0: 120% of current is given during startup, which is switched to the given value based on P01.35 1: The current is given based on P01.35 LED ones place: PWM mode selection 0: 2PH modulation mode 1: Based on P08.40 LED hundreds place: Search direction for speed tracking 0: Allow both forward and reverse search 1: Disallow reverse search	0x110	☆
H01-40	KP regulation coefficient for speed tracking	0–3000	1500	☆
H01-41	KI regulation coefficient for speed tracking	0–3000	1500	☆

H02 group--Parameters of motor 1

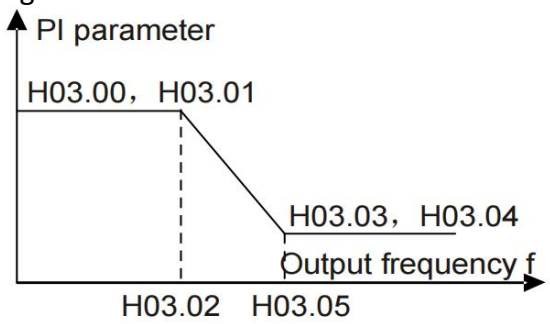
Function code	Name	Predetermined area	Factory default	Change
H02-00	Type of motor 1	0: Asynchronous motor (AM) 1: Synchronous motor (SM)	0	★
H02-01	Rated power of AM 1	0.1–3000.0kW	Depends on model	★
H02-02	Rated frequency of AM 1	0.01Hz–H00.03(Max. output frequency)	50.00Hz	★
H02-03	Rated speed of AM 1	1–60000rpm	Depends on model	★
H02-04	Rated voltage of AM 1	0–1200V	Depends on model	★
H02-05	Rated current of AM 1	0.8–6000.0A	Depends on model	★
H02-06	Stator resistance of AM 1	0.001–65.535Ω	Depends on model	☆
H02-07	Rotor resistance of AM 1	0.001–65.535Ω	Depends on model	☆
H02-08	Leakage inductance of AM 1	0.1–6553.5Mh	Depends on model	☆
H02-09	Mutual inductance of AM 1	0.1–6553.5Mh	Depends on model	☆
H02-10	No-load current of AM 1	0.1–6553.5A	Depends on model	☆
H02-11	Magnetic saturation coefficient 1 of iron	0.0–100.0%	80.0%	☆

	core of AM 1			
H02-12	Magnetic saturation coefficient 2 of iron core of AM 1	0.0–100.0%	68.0%	☆
H02-13	Magnetic saturation coefficient 3 of iron core of AM 1	0.0–100.0%	57.0%	☆
H02-14	Magnetic saturation coefficient 4 of iron core of AM 1	0.0–100.0%	40.0%	☆
H02-15	Rated power of SM 1	0.1–3000.0kW	Depends on model	★
H02-16	Rated frequency of SM 1	0.01Hz–P00.03(Max. output frequency)	50.00Hz	★
H02-17	Number of pole pairs of SM 1	1–128	2	★
H02-18	Rated voltage of SM 1	0–1200V	Depends on model	★
H02-19	Rated current of SM 1	0.8–6000.0A	Depends on model	★
H02-20	Stator resistance of SM 1	0.001–65.535Ω	Depends on model	☆
H02-21	Direct-axis inductance of SM 1	0.01–655.35Mh	Depends on model	☆
H02-22	Quadrature-axis inductance of SM 1	0.01–655.35Mh	Depends on model	☆
H02-23	Counter-emf of SM 1	0–10000	300	☆
H02-24	Reserved			☆
H02-25	Reserved			☆
H02-26	Overload protection of motor 1	0: No protection 1: Common motor protection (with low-speed compensation). As the cooling effect of a common motor is degraded at low speed running, the corresponding electronic thermal protection value needs to be adjusted properly, the low compensation indicates lowering the overload protection threshold of the motor whose running frequency is lower than 30Hz. 2: Variable-frequency motor protection (without low speed compensation). Because the heat dissipation function for a variable-frequency motor is not impacted by the rotation speed, it is not necessary to adjust the protection value at low speed running.	2	★
H02-27		Motor overload multiples M=Iout/(In*K) In is rated motor current, Iout is VFD output current, K is motor overload protection		☆

	Overload protection coefficient of motor 1	coefficient. A smaller value of "K" indicates a bigger value of "M". When M=116%, protection is performed after motor overload last for 1 hour; when M=150%, protection is performed after motor overload lasts for 12 minutes; when M=180%, protection is performed after motor overload lasts for 5 minutes; when M=200%, protection is performed after motor overload lasts for 60 seconds; and when M≥ 400%, protection is performed immediately.  Setting range: 20.0%–120.0%	100.0%	
H02-28	Power display calibration coefficient of motor 1	The function code can be used to adjust the power display value of motor 1. However, it does not affect the control performance of the VFD. Setting range: 0.00–3.00	1.00	☆
H02-29	Parameter display of motor 1	0: Display by motor type. In this mode, only parameters related to the present motor type are displayed. 1: Display all. In this mode, all the motor parameters are displayed.	0	☆
H02-30	System inertia of motor 1	0–30.000kgm2	0	☆

H03 group--Vector control of motor 1

Function code	Name	Predetermined area	Factory default	Change
H03-00	Speed-loop proportional gain 1	The parameters H03.00 – H03.05 are applicable only to vector control mode. Below the switching frequency 1 (H03.02), the speed-loop PI parameters are:H03.00and	20.0	☆
H03-01	Speed-loop integral time 1		0.200s	☆

H03-02	Low-point frequency for switching	H03.01. Above the switching frequency 2 (H03.05), the speed-loop PI parameters are:H03.03 and H03.04. PI parameters are obtained according to the linear change of two groups of parameters. See the following figure:The speed loop dynamic response characteristics of vector control can be adjusted by setting the proportional coefficient and integral time of speed regulator. Increasing proportional gain or reducing integral time can accelerate dynamic response of speed loop; however, if the proportional gain is too large or integral time is too small, system oscillation and overshoot may occur; if proportional gain is too small, stable oscillation or speed offset may occur. PI parameters have a close relationship with the inertia of the system. Adjust PI parameters depending on different loads to meet various demands. H03.00setting range: 0.0 – 200.0 H03.01setting range: 0.000 – 10.000s H03.02setting range: 0.00Hz – P03.05 H03.03setting range: 0.0 – 200.0 H03.04setting range: 0.000 – 10.000s H03.05setting range: H03.02 – H00.03(Max. output frequency)	5.00Hz	☆
H03-03	Speed-loop proportional gain 2		20.0	☆
H03-04	Speed-loop integral time 2		0.200s	☆
H03-05	High-point frequency for switching		10.00Hz	☆
H03-06	Speed-loop output filter	0 – 8 (corresponding to 0 – 28/10ms)	0	☆
H03-07	Electromotive slip compensation coefficient of vector control	Slip compensation coefficient is used to adjust the slip frequency of the vector control and improve the speed control accuracy of the system. Adjusting the parameter properly can control the speed steady-state error. Setting range: 50 – 200%	100%	☆
H03-08	Braking slip compensation coefficient of vector control		100%	☆
H03-09	Current-loop proportional coefficient P	Note: ①The two function codes impact the dynamic response speed and control	1000	☆

H03-10	Current-loop integral coefficient I	accuracy of the system. Generally, you do not need to modify the two function codes. ②、 Applicable to SVC mode 0 (H00.00=0). ③、The values of the two function codes are updated automatically after SM parameter autotuning is completed. Setting range: 0 – 65535	1000	☆
H03-11	Torque setting method	0~1: Keyboard setting torque (H03.12) 2: AI1 setting torque (100% relative to 3 times the rated current of the motor) 3: AI2 setting torque (same as above) 4: Reserved 5: Pulse frequency HDIA setting torque (same as above) 6: Multi-stage torque setting (same as above) 7: Modbus communication setting torque 8~18: Reserved	0	☆
H03-12	Torque set through keypad	-300.0% – 300.0% (of the motor rated current)	20.0%	☆
H03-13	Torque reference filter time	0.000 – 10.000s	0.010s	☆
H03-14	Setting source of forward rotation upper-limit frequency in torque control	0: Keypad (H03.16) 1: AI1 (100% corresponding to the max. frequency) 2: AI2 (same as the above) 3: Reserved 4: Pulse frequency HDIA (same as the above) 5: Multi-step setting (same as the above) 6: Modbus communication (same as the above) 7~18: Reserved	0	☆
H03-15	Setting source of reverse rotation upper-limit frequency in torque control	0: Keypad (H03.17) 1: AI1 (100% corresponding to the max. frequency) 2: AI2 (same as the above) 3: Reserved 4: Pulse frequency HDIA (same as the above) 5: Multi-step setting (same as the above) 6: Modbus communication (same as the above) 7~18: Reserved	0	☆
H03-16	Forward rotation upper-limit frequency set through keypad in torque control	Used to set the frequency upper limits. 100% corresponds to the max. frequency.H03.16sets the value whenH03.14=1;H03.17sets the value whenH03.15=1. Setting range: 0.00Hz – H00.03(Max. output frequency)	50.00Hz	☆
H03-17	Reverse rotation upper-limit			☆

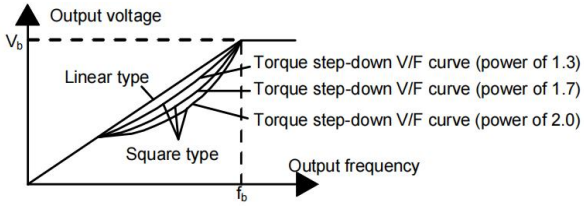
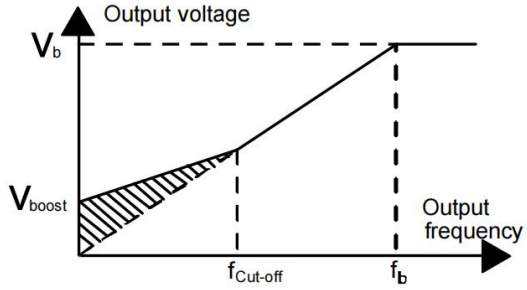
	frequency set through keypad in torque control		50.00Hz	
H03-18	Setting source of electromotive torque upper limit	0: Keyboard sets the torque upper limit (H03.20) 1: AI1 sets the torque upper limit (100% relative to 3 times the motor current) 2: AI2 sets the torque upper limit (same as above) 3: Reserved 4: Pulse frequency HDIA sets the torque upper limit (same as above) 5: Modbus communication sets the torque upper limit 6 to 18: Reserved	0	☆
H03-19	Setting source of braking torque upper limit	0: Keyboard sets the torque upper limit (H03.21) 1: AI1 sets the torque upper limit (100% relative to 3 times the rated current of the motor) 2: AI2 sets the torque upper limit (same as above) 3: Reserved 4: Pulse frequency HDIA sets the torque upper limit (same as above) 5: Modbus communication sets the torque upper limit 6 to 18: Reserved	0	☆
H03-20	Electromotive torque upper limit set through keypad	Used to set torque limits. Setting range: 0.0 – 300.0% (of the motor rated current)	180.0%	☆
H03-21	Braking torque upper limit set through keypad		180.0%	☆
H03-22	Weakening coefficient in constant power zone	Used when the asynchronous motor is in weak magnetic control H03.22 setting range: 0.1 ~ 2.0 H03.23 setting range: 10% ~ 100%	0.3	☆
H03-23	Lowest weakening point in constant power zone		20%	☆
H03-24	Max. voltage limit	H03.24sets the max. output voltage of the VFD, which is the percentage of motor rated voltage. Set the value according to onsite conditions. Setting range: 0.0 – 120%	100.0%	☆
H03-25	Pre-exciting time	Pre-exciting is performed for the motor when the VFD starts up. A magnetic field is built up inside the motor to improve the	0.300s	☆

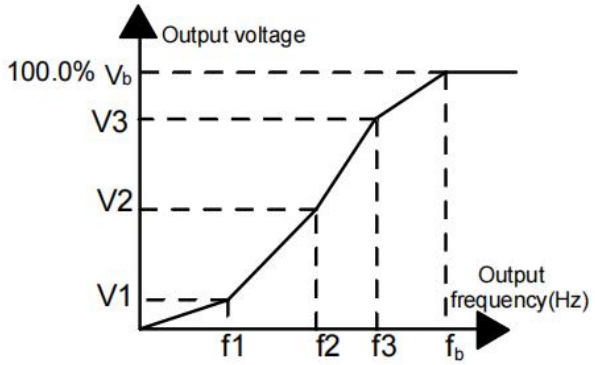
		torque performance during the start process. Setting range: 0.000 – 10.000s		
H03-26	Flux-weakening proportional gain	0 – 8000	1000	☆
H03-27	Speed display selection in vector control	0: Display the actual value 1: Display the set value	0	☆
H03-28	Static friction compensation coefficient	0.0 – 100.0%	0.0%	☆
H03-29	Corresponding frequency point of static friction	0.50 – H03.31	1.00Hz	☆
H03-30	High speed friction compensation coefficient	0.0 – 100.0%	0.0%	☆
H03-31	Corresponding frequency of high speed friction torque	H03.29 – 400.00kHz	50.00Hz	☆
H03-32	Enabling torque control	0: Disable 1: Enable	0	★
H03-33	Flux-weakening integral gain	0 – 8000	1200	☆
H03-34	Reserved			☆
H03-35	Control mode optimization selection	Range: 0x0000 – 0x1111 Ones place: Torque command selection 0: Torque reference 1: Torque current reference Tens place: Reserved 0: Reserved 1: Reserved Hundreds place: indicates whether to enable speed-loop integral separation 0: Disable 1: Enable Thousands place: Reserved 0: Reserved 1: Reserved	0x0000	☆
H03-36	Speed-loop differential gain	0.00 – 10.00s	0.00s	☆
H03-37	High-frequency current-loop proportional coefficient	H03.37setting range: 0 – 65535 H03.38setting range: 0 – 65535 H03.39setting range: 0.0 – 100.0% (of the max. frequency)	1000	☆
H03-38	High-frequency current-loop integral coefficient		1000	☆
H03-39	Current-loop			☆

	high-frequency switching threshold		100.0%	
H03-40	Enabling inertia compensation	0: Disable 1: Enable	0	☆
H03-41	Upper limit of inertia compensation torque	The max. inertia compensation torque is limited to prevent inertia compensation torque from being too large. Setting range: 0.0 – 150.0% (of the motor rated torque)	10.0%	☆
H03-42	Inertia compensation filter times	Filter times of inertia compensation torque, used to smooth inertia compensation torque. Setting range: 0 – 10	7	☆
H03-43	Inertia identification torque	Due to friction force, it is required to set certain identification torque for the inertia identification to be performed properly. 0.0 – 100.0% (of the motor rated torque)	10.0%	☆
H03-44	Enabling inertia identification	0: No operation 1: Enable	0	★
H03-45	Current loop proportional coefficient after autotuning	0 – 65535	0	●
H03-46	Current integral proportional coefficient after autotuning	0 – 65535	0	●

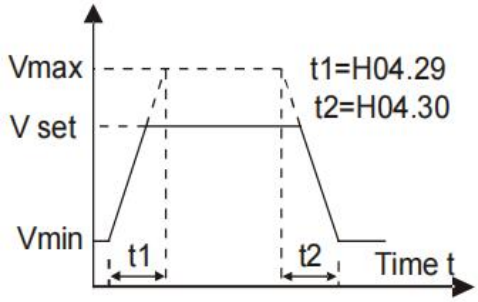
H04 group—V/F control

Function code	Name	Predetermined area	Factory default	Change
H04-00	V/F curve setting of motor 1	This group of function code defines the V/F curve of motor 1 to meet the needs of different loads. 0: Straight-line V/F curve, applicable to constant torque loads 1: Multi-point V/F curve 2: Torque-down V/F curve (power of 1.3) 3: Torque-down V/F curve (power of 1.7) 4: Torque-down V/F curve (power of 2.0)	0	★

		Curves 2 – 4 are applicable to the torque loads such as fans and water pumps. You can adjust according to the characteristics of the loads to achieve best performance. 5: Customized V/F (V/F separation); in this mode, V can be separated from F and F can be adjusted through the frequency setting channel set byH00.06or the voltage setting channel set byH04.27to change the characteristics of the curve. Note: In the following figure, Vb is the motor rated voltage and fb is the motor rated frequency. 		
H04-01	Torque boost of motor 1	In order to compensate for low-frequency torque characteristics, you can make some boost compensation for the output voltage. H04.01 is relative to the max. output voltage Vb. P04.02defines the percentage of cut-off frequency of manual torque boost to the rated motor frequency fb. Torque boost can improve the low-frequency torque characteristics of V/F. You need to select torque boost based on the load. For example, larger load requires larger torque boost, however, if the torque boost is too large, the motor will run at over-excitation, which may cause increased output current and motor overheating, thus decreasing the efficiency. When torque boost is set to 0.0%, the VFD uses automatic torque boost. Torque boost cut-off threshold: Below this frequency threshold, torque boost is valid; exceeding this threshold will invalidate torque boost.  H04.01setting range: 0.0%: Automatic; 0.1%	0.0%	☆
H04-02	Torque boost cut-off of motor 1		20.0%	☆

		– 10.0% H04.02setting range: 0.0% – 50.0%		
H04-03	V/F frequency point 1 of motor 1	WhenH04.00=1 (multi-dot V/F curve),you can set the V/F curve through H04.03 – H04.08. The V/F curve is generally set according to the load characteristics of the motor. Note: V1 < V2 < V3, f1 < f2 < f3. Too high voltage for low frequency will cause motor overheat or damage and cause VFD overcurrent stall or overcurrent protection.	0.00Hz	☆
H04-04	V/F voltage point 1 of motor 1		00.0%	☆
H04-05	V/F frequency point 2 of motor 1		0.00Hz	☆
H04-06	V/F voltage point 2 of motor 1		0.0%	☆
H04-07	V/F frequency point 3 of motor 1		0.00Hz	☆
H04-08	V/F voltage point 3 of motor 1	 H04.03setting range: 0.00Hz – H04.05 H04.04setting range: 0.0% – 110.0% (of the rated voltage of motor 1) H04.05setting range: H04.03 – H04.07 H04.06setting range: 0.0% – 110.0% (of the rated voltage of motor 1) H04.07setting range: H04.05 – H02.02(Rated frequency of AM 1) or H04.05 – H02.16(Rated frequency of SM 1) Setting range ofH04.08: 0.0% – 110.0% (of the rated voltage of motor 1)	00.0%	☆
H04-09	V/F slip compensation gain of motor 1	Used to compensate for the motor rotating speed change caused by load change in the space voltage vector mode, and thus improve the rigidity of the mechanical characteristics of the motor. You need to calculate the rated slip frequency of the motor as follows: △ f=fb-n*p/60 Of which, fb is the rated frequency of the motor, corresponding to function codeH02.02. n is the rated rotating speed of the motor, corresponding to function codeH02.03. p is the number of pole pairs of the motor. 100.0% corresponds to the rated slip frequency △ f of motor 1. Setting range: 0.0 – 200.0%	0.0%	☆
H04-10	Low-frequency oscillation control factor of motor 1	In space voltage vector control mode, the motor, especially the large-power motor, may experience current oscillation at certain	10	☆

H04-11	High-frequency oscillation control factor of motor 1	frequencies, which may cause unstable motor running, or even VFD overcurrent. You can adjust the two function codes properly to eliminate such phenomenon. H04.10 setting range: 0–100 H04.11 setting range: 0–100 H04.12 setting range: 0.00Hz–H00.03 (Max. output frequency)	10	☆
H04-12	Oscillation control threshold of motor 1		30.00Hz	☆
H04-13	V/F curve setting of motor 2	Used to define the V/F curve of motor 2 to meet the needs of different loads. 0: Straight-line V/F curve 1: Multi-point V/F curve 2: Torque-down V/F curve (power of 1.3) 3: Torque-down V/F curve (power of 1.7) 4: Torque-down V/F curve (power of 2.0) 5: Customized V/F curve (V/F separation) Note: Refer to the description forH04.00.	0	☆
H04-14	Torque boost of motor 2	Note: Refer to the descriptions for H04.01and H04.02. H04.14setting range: 0.0%: Automatic; 0.1%–10.0% H04.15setting range: 0.0%–50.0% (of the rated frequency of motor 2)	0.0%	☆
H04-15	Torque boost cut-off of motor 2		20.0%	☆
H04-16	V/F frequency point 1 of motor 2	Note: Refer to the descriptions for H04.03and H04.08. H04.16setting range: 0.00Hz–H04.18 H04.17setting range: 0.0%–110.0% (of the rated voltage of motor 2) H04.18setting range: H04.16–H04.20 H04.19setting range: 0.0%–110.0% (of the rated voltage of motor 2) H04.20setting range: H04.18–H12.02(Rated frequency of AM 2) orH04.18–H12.16(Rated frequency of SM 2) H04.21setting range: 0.0%–110.0% (of the rated voltage of motor 2)	0.00Hz	☆
H04-17	V/F voltage point 1 of motor 2		00.0%	☆
H04-18	V/F frequency point 2 of motor 2		0.00Hz	☆
H04-19	V/F voltage point 2 of motor 2		00.0%	☆
H04-20	V/F frequency point 3 of motor 2		0.00Hz	☆
H04-21	V/F voltage point 3 of motor 2		00.0%	☆
H04-22	V/F slip compensation gain of motor 2	Refer to the descriptions forH04.09 Setting range: 0.0–200.0%	0.0%	☆
H04-23	Low-frequency oscillation control factor of motor 2	Refer to the descriptions forH04.10-H04.12 H04.23 setting range: 0 ~ 100 H04.24 setting range: 0 ~ 100 H04.25 setting range: 0.00Hz ~ H00.03 (maximum frequency)	10	☆
H04-24	High-frequency oscillation control factor of motor 2		10	☆
H04-25	Oscillation control threshold of motor 2		30HZ	☆
H04-26		0: Disable		☆

	Energy-saving run	1: Automatic energy-saving run In light-load state, the motor can adjust the output voltage automatically to achieve energy saving.	0	
H04-27	Voltage setting channel	0: Keyboard setting voltage (set by H04.28) 1: AI1 setting voltage 2: AI2 setting voltage 3: Reserved 4: HDIA setting voltage 5: Multi-stage setting voltage (the setting value is determined by the multi-stage speed of the H10 group parameter) 6: PID setting voltage 7: Modbus communication setting voltage 8 to 18: Reserved	0	☆
H04-28	Voltage set through keypad	The function code is the voltage digital setting when "keypad" is selected as the voltage setting channel. Setting range: 0.0% – 100.0%	100.0%	☆
H04-29	Voltage increase time	Voltage increase time means the time needed for the VFD to accelerate from min. Output voltage to the max. Output frequency. Voltage decrease time means the time needed for the VFD to decelerate from the max. output frequency to min. output voltage. Setting range: 0.0–3600.0s	5.0s	☆
H04-30	Voltage decrease time		5.0s	☆
H04-31	Max. output voltage	The function codes are used to set the upper and lower limits of output voltage.  H04.31setting range:H04.32–100.0% (of the motor rated voltage) H04.32setting range: 0.00Hz–P04.31	100.0%	☆
H04-32	Output min. voltage		0.0%	☆
H04-33	Weakening coefficient in constant power zone	1.00–1.30	1.00	☆
H04-34	Pull-in current 1 in SM V/F control	Valid for synchronous motor VF control H04.34 Reactive current of the motor when the output frequency is less than the frequency set by H04.36. Setting range: -100.0% to 100.0% (rated current of the motor)	20.0%	☆
H04-35	Pull-in current 2 in SM V/F control		10.0%	☆
H04-36	Frequency threshold for pull-in		50.00Hz	☆

	current switching in SM V/F control	H04.35 Reactive current of the motor when the output frequency is greater than the frequency set by H04.36. Setting range: -100.0% to 100.0% (rated current of the motor) H04.36 is used to set the switching frequency of pull-in current 1 and pull-in current 2. Setting range: 0.00Hz to H00.03 (maximum frequency) H04.37 is used to set the proportional coefficient of reactive current closed-loop control. Setting range: 0 to 3000 H04.38 is used to set the integral coefficient of reactive current closed-loop control. Setting range: 0 ~ 3000 H04.39 is used to set the output limit value of reactive current closed-loop control. The larger the value, the higher the voltage value of reactive closed-loop compensation and the greater the motor output. Generally, no adjustment is required. Setting range: 0 ~ 16000		
H04-37	Reactive current closed-loop proportional coefficient in SM V/F control		50	☆
H04-38	Reactive current closed-loop integral time in SM V/F control		30	☆
H04-39	Reactive current closed-loop output limit in SM VF control		8000	☆
H04-40	Enabling IF mode for AM 1	0: Invalid 1: Enable	0	★
H04-41	Current setting in IF mode for AM 1	When IF control is adopted for AM 1, the function code is used to set the output current. The value is a percentage in relative to the rated current of the motor. Setting range: 0.0–200.0%	120.0%	☆
H04-42	Proportional coefficient in IF mode for AM 1	When IF control is adopted for AM 1, the function code is used to set the proportional coefficient of the output current closed-loop control. Setting range: 0–5000	350	☆
H04-43	Integral coefficient in IF mode for AM 1	When IF control is adopted for AM 1, the function code is used to set the integral coefficient of the output current closed-loop control. Setting range: 0–5000	150	☆
H04-44	Starting frequency point for switching off IF mode for AM 1	0.00–H04.50	10.00Hz	☆
H04-45	Enabling IF mode for AM 2	0: Invalid 1: Enable	0	★
H04-46	Current setting in IF mode for AM 2	When IF control is adopted for AM 2, the function code is used to set the output current. The value is a percentage in relative to the rated current of the motor.	120.0%	☆

		Setting range: 0.0–200.0%		
H04-47	Proportional coefficient in IF mode for AM 2	When IF control is adopted for AM 2, the function code is used to set the proportional coefficient of output current closed-loop control. Setting range: 0–5000	350	☆
H04-48	Integral coefficient in IF mode for AM 2	When IF control is adopted for AM 2, the function code is used to set the integral coefficient of output current closed-loop control. Setting range: 0–5000	150	☆
H04-49	Starting frequency point for switching off IF mode for AM 2	0.00–H04.51	10.00Hz	☆
H04-50	End frequency point for switching off IF mode for AM 1	H04.44–H00.03	25.00Hz	☆
H04-51	End frequency point for switching off IF mode for AM 2	H04.49–H00.03	25.00Hz	☆
H04-52	VF energy-saving mode selection	0: Max. efficiency 1: Optimal power factor 2: MTPA	0	☆
H04-53	Energy-saving gain coefficient	0.0%–400.0%	100.0	☆
H04-54	Angle compensation coefficient in energy saving control	40.0%–200.0% Note: A small value of this parameter increases energy saving control effect, but this also reduces the load carrying capability for sudden load.	80.0%	☆

H05 group--Input terminals

Function code	Name	Predetermined area	Factory default	Change
H05-00	HDI input type	0x00–0x11 Ones place: HDIA input type 0: HDIA is high-speed pulse input 1: HDIA is digital input	0	★
H05-01	Function of X1	0: No function 1: Run forward 2: Run reversely 3: Three-wire running control 4: Jog forward 5: Jog reversely 6: Coast to stop 7: Reset faults 8: Pause running 9: External fault input 10: Increase frequency setting (UP)	1	★
H05-02	Function of X2		4	★
H05-03	Function of X3		7	★
H05-04	Function of X4 Note: You can only choose one between X4 and Y1 output 《Switch the functions of X4 and Y1 by jumper JP8》		0	★
H05-05	Function of HDIA		0	★

H05-06	Reserved	11: Decrease frequency setting (DOWN) 12: Clear the frequency increase/decrease setting 13: Switch between A setting and B setting 14: Switch between combination setting and A setting 15: Switch between combination setting and B setting 16: Multi-step speed terminal 1 17: Multi-step speed terminal 2 18: Multi-step speed terminal 3 19: Multi-step speed terminal 4 20: Pause multi-step speed running 21: ACC/DEC time selection 1 22: ACC/DEC time selection 2 23: Simple PLC stop reset 24: Pause simple PLC 25: Pause PID control 26–27: Reserved 28: Counter reset 29: Switch between speed control and torque control 30: Disable ACC/DEC 31: Trigger the counter 32: Reserved 33: Clear the frequency increase/decrease setting temporarily 34: DC braking 35: Switch from motor 1 to motor 2 36: Switch the running command channel to keypad 37: Switch the running command channel to terminal 38: Switch the running command channel to communication 39: Pre-exciting command 40: Clear electricity consumption 41: Keep electricity consumption 42: Switch the setting source of braking torque upper limit to keypad 43–72: Reserved 73: PID2 start 74: PID2 stop 75: Pause PID2 integral 76: Pause PID2 control 77: Switch PID2 polarities 78: Disable HVAC (only in stopped state) 79: Trigger fire signal 80: Pause PID1 control 81: Pause PID1 integral 82: Switch PID1 polarities 83: Trigger sleep mode	/	☆
H05-07	Reserved		/	☆

		84: Trigger wakeup mode 85: Manual polling 86: Pump cleaning signal 87: Water level upper limit of inlet pool 88: Water level lower limit of inlet pool 89: Water shortage level of inlet pool 90: Manual soft startup (Reserved) 91: Enable condensation protection 92–95: Reserved 96: Manual soft startup for motor A 97: Manual soft startup for motor B 98: Manual soft startup for motor C 99: Manual soft startup for motor D 100: Manual soft startup for motor E 101: Manual soft startup for motor F 102: Manual soft startup for motor G 103: Manual soft startup for motor H 104: Disable motor A 105: Disable motor B 106: Disable motor C 107: Disable motor D 108: Disable motor E 109: Disable motor F 110: Disable motor G 111: Disable motor H		
H05-08	Input terminal polarity	Used to set the polarity of input terminals. When a bit is 0, the input terminal is positive; when a bit is 1, the input terminal is negative. 0x000–0x3F	0x000	☆
H05-09	Digital input filter time	Used to specify the filter time of sampling of S1–S4 and HDIA terminals. In strong interference cases, increase the value to avoid maloperation. 0.000–1.000s	0.010s	☆
H05-10	Virtual terminal setting	0x000–0x3F (0: Disable. 1: Enable) BIT0: X1 virtual terminal BIT1: X2 virtual terminal BIT2: X3 virtual terminal BIT3: X4 virtual terminal BIT4: HDIA virtual terminal BIT5: Reserved	0x00	★
H05-11	Terminal control mode	Used to set the mode of terminal control. 0: Two-wire control 1, the enabling consistent with the direction. This mode is widely used. The defined FWD/REV terminal command determines the motor rotation direction. 1: Two-wire control 2, the enabling	0	★

		separated from the direction. In this mode, FWD is the enabling terminal. The direction depends on the defined REV state. 2: Three-wire control 1. This mode defines Sin as the enabling terminal, and the running command is generated by FWD, while the direction is controlled by REV. During running, the Sin terminal needs to be closed, and terminal FWD generates a rising edge signal, then the VFD starts to run in the direction set by the state of terminal REV; the VFD needs to be stopped by disconnecting terminal Sin. The direction control is as follows during running: Sin: Three-wire control; FWD: Forward running; REV: Reverse running 3: Three-wire control 2. This mode defines Sin as the enabling terminal, and the running command is generated by FWD or REV, but the direction is controlled by both FWD and REV. During running, the Sin terminal needs to be closed, and terminal FWD or REV generates a rising edge signal to control the running and direction of the VFD; the VFD needs to be stopped by disconnecting terminal Sin Sin: Three-wire control; FWD: Forward running; REV: Reverse running Note: For two-wire controlled running mode, when the FWD/REV terminal is valid, if the VFD stops due to a stop command given by another source, the VFD does not run again after the stop command disappears even if the control terminal FWD/REV is still valid. To make the VFD run, you need to trigger FWD/REV again, for example, PLC single-cycle stop, fixed-length stop, and valid STOP/RST stop during terminal control. (See H07.04.)		
H05-12	X1 switch-on delay	The function code defines the delay time corresponding to the level change of the programmable input terminal from opening to disconnecting.	0.000s	☆
H05-13	X1 switch-off delay		0.000s	☆
H05-14	X2 switch-on delay		0.000s	☆
H05-15	X2 switch-off delay		0.000s	☆

H05-16	X3 switch-on delay	Setting range: 0.000 ~ 50.000s Note: After the virtual terminal is enabled, the terminal status can only be changed through communication, the communication address is 0x200A	0.000s	☆
H05-17	X3 switch-off delay		0.000s	☆
H05-18	X4 switch-on delay		0.000s	☆
H05-19	X4 switch-off delay		0.000s	☆
H05-20	HDIA switch-on delay		0.000s	☆
H05-21	HDIA switch-off delay		0.000s	☆
H05-22	Reserved		/	/
H05-23	Reserved		/	/
H05-24	AI1 lower limit	When the analog input voltage exceeds the range of the set maximum input or minimum input, it will be calculated based on the maximum input or minimum input. Note: Analog AI1 can support 0 ~ 10V/0 ~ 20mA input. When AI1 selects 0 ~ 20mA input, the voltage corresponding to 20mA is 10V; AI2 supports -10 ~ +10V input. H05.24: 0.00V ~ H05.26 H05.25/H05.27/H05.30: -300.0%～300.0% H05.26: H05.24 ~ 10.00V H05.28/H05.37：0.000s～10.000s H05.29：-10.00V～H05.31 H05.32/H05.34/H05.36：-300.0%～300.0% H05.31：H05.29～H05.33 H05.33：H05.31～H05.35 H05.35：H05.33～10.00V	0.00V	☆
H05-25	Corresponding setting of AI1 lower limit		0.0%	☆
H05-26	AI1 upper limit		10.00V	☆
H05-27	Corresponding setting of AI1 upper limit		100.0%	☆
H05-28	AI1 input filter time		0.030s	☆
H05-29	AI2 lower limit		-10.00V	☆
H05-30	Corresponding setting of AI2 lower limit		-100.0%	☆
H05-31	AI2 middle value 1		0.00V	☆
H05-32	Corresponding setting of AI2 middle value 1		0.0%	☆
H05-33	AI2 middle value 2		0.00V	☆
H05-34	Corresponding setting of AI2 middle value 2		0.0%	☆
H05-35	AI2 upper limit		10.00V	☆
H05-36	Corresponding setting of AI2 upper limit		100.0%	☆
H05-37	AI2 input filter time		0.030s	☆
H05-38	HDIA high-speed pulse input function selection	0: Frequency setting 1: Reserved 2: Reserved	0	★
H05-39	HDIA lower limit frequency	0.000 kHz –P05.41	0.000 kHz	☆
H05-40	Corresponding setting of HDIA lower limit frequency	-300.0%–300.0%	0.0%	☆
H05-41	HDIA upper limit	H05.39–50.000kHz	50.000 kHz	☆

	frequency			
H05-42	Corresponding setting of HDIA upper limit frequency	-300.0%–300.0%	100.0%	☆
H05-43	HDIA frequency input filter time	0.000s–10.000s	0.030s	☆
H05-44 to 49	Reserved	/	/	
H05-50	AI1 input signal type	0: Voltage 1: Current Note: When you set AI1 to use current input by setting this parameter, you also need to change the AI1 jumper cap at the right corner of the control board from V to I.	0	★
H05-51 to 52	Reserved	/	/	
H05-53	Keypad analog lower limit	0.00V–P05.54	0.00V	☆
H05-54	Corresponding setting of keypad analog lower limit	-300.0%–300.0%	0.0%	☆
H05-55	Keypad analog upper limit	P05.56–10.00V	10.00V	☆
H05-56	Corresponding setting of keypad analog upper limit	-300.0%–300.0%	100.0%	☆
H05-57	Keypad analog input filter time	0.000s–10.000s	0.030s	☆

H06 group—Output terminals

Function code	Name	Predetermined area	Factory default	Change
H06-00	Reserved	Reserved		☆
H06-01	Y1 output Note: You can only choose one between X4 and Y1 output 《Switch the functions of X4 and Y1 by jumper JP8》	0: Invalid 1: Running 2: Running forward 3: Running reversely 4: Jogging 5: VFD in fault 6: Frequency level detection FDT1	0	☆
H06-02	Reserved	7: Frequency level detection FDT2	0	☆
H06-03	RO1 output	8: Frequency reached	1	☆
H06-04	RO2 output	9: Running in zero speed10: Upper limit frequency reached	5	☆

		11: Lower limit frequency reached 12: Ready for running 13: Pre-exciting 14: Overload pre-alarm 15: Underload pre-alarm 16: Simple PLC stage completed 17: Simple PLC cycle completed 18: Set counting value reached 19: Designated counting value reached 20: External fault is valid 21: Reserved 22: Running time reached 23: Modbus communication virtual terminal output 24-25：Reserved 26: DC bus voltage established 27–32: Reserved 33: Speed limit reached during torque control 34: PROFINET communication virtual terminal output 35–36: Reserved 37: Any frequency reached 38–47: Reserved 48: Fire mode activated 49: Pre-alarm of PID1 feedback too low 50: Pre-alarm of PID1 feedback too high 51: PID1 in sleep 52: PID2 in startup 53: PID2 stopped 54: Indication of run with backup pressure 55: Water shortage indication of inlet pool 56: Pre-alarm output 57: Control variable-frequency circulation motor A 58: Control variable-frequency circulation motor B 59: Control variable-frequency circulation motor C 60: Control variable-frequency circulation motor D 61: Control variable-frequency circulation motor E 62: Control variable-frequency circulation motor F 63: Control variable-frequency circulation motor G 64: Control variable-frequency circulation		

		motor H		
H06-05	Output terminal polarity selection	When the bit is set to 0, the input terminal is positive polarity; When the bit is set to 1, the input terminal is negative polarity Setting range: 0x0 ~ 0xF	00	☆
H06-06	Y1 switch-on delay	The function code defines the delay time corresponding to the level change of the programmable output terminal from opening to disconnecting. Setting range: 0.000 ~ 50.000s Note: H06.08 and H06.09 are only valid when H06.00=1.	0.000s	☆
H06-07	Y1 switch-off delay		0.000s	☆
H06-08	Reserved		/	
H06-09	Reserved		/	
H06-10	RO1 switch-on delay		0.000s	☆
H06-11	RO1 switch-off delay		0.000s	☆
H06-12	RO2 switch-on delay		0.000s	☆
H06-13	RO2 switch-off delay		0.000s	☆
H06-14	AO1 output	0: Running frequency (0–Max. output frequency) 1: Set frequency (0–Max. output frequency) 2: Ramp reference frequency (0–Max. output frequency) 3: Rotational speed (0–Speed corresponding to max. output frequency) 4: Output (0–Twice the inverter unit rated current) 5: Output current (0–Twice the motor rated current) 6: Output (0–1.5 times the inverter unit rated voltage) 7: Output power (0–Twice the motor rated power) 8: Set torque (0–Twice the motor rated torque) 9: Output torque (Absolute value, 0–±Twice the motor rated torque) 10: AI1 input (0–10V/0–20mA) 11: AI2 input (0–10V) 12: AI3 input (0–10V/0–20mA) 13: HDIA input (0.00–50.00kHz) 14: Value 1 set through Modbus communication (0–1000) 15: Value 2 set through Modbus communication (0–1000) 16-21： Reserved 22: Torque current (bipolar, 0–Triple the motor rated current) 23: Exciting current (bipolar, 0–Triple the motor rated current) 24: Set frequency (bipolar, 0–Max. output frequency) 25: Ramp reference frequency (bipolar, 0–Max. output frequency) 26: Rotational speed (bipolar, 0–Speed	0	☆
H06-15	AO2 output		0	☆
H06-16	Reserved		/	

		corresponding to max. output frequency) 27-29： Reserved 30: Rotational speed (0–Twice the motor rated synchronous speed) 31: Output torque 32: PID1 output 33: PID2 output 34: PID1 reference value 35: PID1 feedback value 36: PID2 reference value 37: PID2 feedback value 38–47: Reserved		
H06-17	AO1 output lower limit	H06.17 setting range: -300.0% to H06.19 H06.18 setting range: 0.00V to 10.00V H06.19 setting range: H06.17 to 300.0% H06.20 setting range: 0.00V to 10.00V H06.21 setting range: 0.000s to 10.000s	0.0%	☆
H06-18	AO1 output corresponding to lower limit		0.00V	☆
H06-19	AO1 output upper limit		100.0%	☆
H06-20	AO1 output corresponding to upper limit		10.00V	☆
H06-21	AO1 output filter time		0.000s	☆
H06-22	AO0 output lower limit	-300.0%–P06.23	0.0%	☆
H06-23	AO0 output corresponding to lower limit	0.00V–10.00V	0.00V	☆
H06-24	AO0 output upper limit	P06.35–300.0%	100.0%	☆
H06-25	AO0 output corresponding to upper limit	0.00V–10.00V	10.00V	☆
H06-26	AO0 output filter time	0.000s–10.000s	0.000s	☆
H06-27 to H06-32		Reserved	/	
H06-33	Detection value for frequency being reached	0–P00.03	1.00Hz	☆
H06-34	Frequency reaching detection time	0–3600.0s	0.5s	☆

H07 group--Human-machine interface

Function code	Name	Predetermined area	Factory default	Change
H07-00	User password	0–65535 When you set the function code to a	0	☆

		non-zero number, password protection is enabled. If you set the function code to 00000, the previous user password is cleared and password protection is disabled. After the user password is set and takes effect, you cannot enter the parameter menu if you enter an incorrect password. Please remember your password and save it in a secure place. After you exit the function code editing interface, the password protection function is enabled within 1 minute. If password protection is enabled, "0.0.0.0.0" is displayed when you press thePRG/ESC key again to enter the function code editing interface. You need to enter the correct user password to enter the interface. Note: Restoring the default values may delete the user password. Exercise caution when using this function.		
H07-01	Parameter copy	0: No operation 1: Upload the machine function parameters to the keyboard 2: Download the keyboard function parameters to the machine (including motor parameters) Note: After completing 1-2 operations, the parameters will automatically return to 0	0	★
H07-02	Key function selection	ange: 0x00 – 0x27 Ones place: Function of “JOG/REV” 0: No function 1: Jog 2: Reserved 3: Switch between forward and reverse rotating 4:Clear the UP/DOWN Setting 5: Coast to stop 6: Switch command channels in sequence 7: Reserved Tens place: Reserved	0x01	★
H07-03	"JOG/REV" key operation command channel switching sequence selection	When H07.02=6, set the running command channel switching sequence 0: keyboard control → terminal control → communication control 1: keyboard control ← → terminal control 2: keyboard control ← → communication control 3: terminal control ← → communication	0	☆

		control		
H07-04	"STOP/RST" key stop function selection	Selection of the shutdown function (valid in any condition of fault reset): 0: Valid only for panel control 1: Valid for both panel and terminal control 2: Valid for both panel and communication control 3: Valid for all control modes	0	☆
H07-05	Running status display parameter selection 1	0x0000 – 0xFFFF Bit 0: Running frequency (HZ on) Bit 1: Set frequency (HZ On) Bit 2: Bus voltage (V on) Bit 3: Output voltage (V on) Bit 4: Output current (A on) Bit 5: Running speed (RPM on) Bit 6: Output power (% on) Bit 7: Output torque (% on) Bit 8: PID reference value (% on) Bit 9: PID feedback value (% on) Bit 10: Input terminal state Bit 11: Output terminal state Bit 12: Set torque (% on) Bit 13: Pulse count value Bit 14: Motor overload percentage (% on) Bit 15: PLC and current step number of multi-step speed	0x03FF	☆
H07-06	Operation status display parameter selection 2	0x0000 – 0xFFFF Bit 0: AI1 (V on) Bit 1: AI2 (V on) Bit 2: AI3 (V on) BIT3: High-speed pulse HDIA frequency BIT4: Reserved Bit 5: VFD overload percentage (% on) Bit 6: Ramp frequency reference (HZ on) Bit 7: Linear speed Bit 8: AC incoming current (A on) Bit 9: Upper limit frequency (HZ on) Bit 10: AI0 (V on)	0x0000	☆
H07-07	Selection of parameters displayed in stopped state	0x0000 – 0xFFFF Bit 0: Set frequency (HZ On) Bit 1: Bus voltage (V on) Bit 2: Input terminal state Bit 3: Output terminal state Bit 4: PID reference value (% on) Bit 5: PID feedback value (% on) Bit 6: Set torque (% on) Bit 7: AI1 (V on) Bit 8: AI2 (V on) Bit 9: AI3 (V on) BIT10: High-speed pulse HDIA frequency BIT11: Reserved	0x00FF	☆

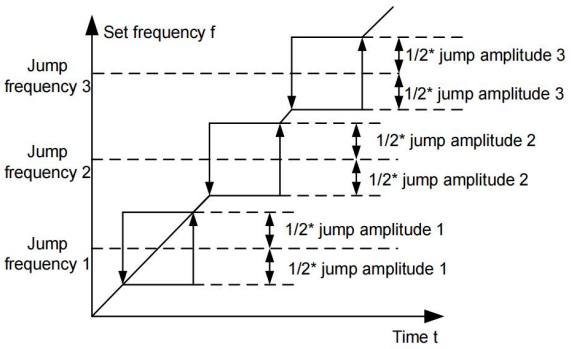
		Bit 12: Pulse count value Bit 13: PLC and current step number of multi-step speed Bit 14: Upper limit frequency (HZ on) Bit 15: AI0 (V on)		
H07-08	Frequency display coefficient	0.01 – 10.00 Display frequency = Running frequency * P07.08	1.00	☆
H07-09	Rotational speed display coefficient	0.1 – 999.9% Mechanical rotation speed = 120 * (Displayed running frequency) * H07.09/(Motor pole pairs)	100.0%	☆
H07-10	Linear speed display coefficient	0.1 – 999.9% Linear speed=(Mechanical rotation speed) * P07.10	1.0%	☆
H07-11	Rectifier bridge temperature	-20.0 – 120.0° C		●
H07-12	Inverter temperature	-20.0 – 120.0° C		●
H07-13	Control board software version	1.00 – 655.35		●
H07-14	Local accumulative running time	0 – 65535h		●
H07-15	VFD electricity consumption MSB	Used to display the electricity consumption of the VFD. VFD electricity consumption =H07.15*1000 + H07.16 H07.15setting range: 0 – 65535 kWh (*1000) Setting range of H07.16: 0.0 – 999.9 kWh		●
H07-16	VFD electricity consumption LSB			●
H07-17	Reserved			●
H07-18	VFD rated power	0.4 – 3000.0kW	Depends on model	●
H07-19	VFD rated voltage	50 – 1200V	Depends on model	●
H07-20	VFD rated current	0.1 – 6000.0A	Depends on model	●
H07-21	Factory bar code 1	0x0000 – 0xFFFF		●
H07-22	Factory bar code 2	0x0000 – 0xFFFF		●
H07-23	Factory bar code 3	0x0000 – 0xFFFF		●
H07-24	Factory bar code 4	0x0000 – 0xFFFF		●
H07-25	Factory bar code 3	0x0000 – 0xFFFF		●
H07-26	Factory bar code 4	0x0000 – 0xFFFF		●
H07-27	Present fault type	0: No fault 1: Inverter unit U-phase protection (OUt1) 2: Inverter unit V-phase protection (OUt2) 3: Inverter unit W-phase protection (OUt3) 4: Overcurrent during acceleration (OC1) 5: Overcurrent during deceleration (OC2) 6: Overcurrent during constant speed		●
H07-28	Last fault type			●
H07-29	2nd-last fault type			●
H07-30	3rd-last fault type			●
H07-31	4th-last fault type			●
H07-32	5th-last fault type			●

		running (OC3) 7: Overvoltage during acceleration (OV1) 8: Overvoltage during deceleration (OV2) 9: Overvoltage during constant speed running (OV3) 10: Bus undervoltage fault (UV) 11: Motor overload (OL1) 12: VFD overload (OL2) 13: Phase loss on input side (SPI) 14: Phase loss on output side (SPO) 15: Rectifier module overheat (OH1) 16: Inverter module overheat (OH2) 17: External fault (EF) 18: RS485 communication fault (CE) 19: Current detection fault (ItE) 20: Motor autotuning fault (tE) 21: EEPROM operation error (EEP) 22: PID feedback offline fault (PIDE) 23: Reserved 24: Running time reached (END) 25: Electronic overload (OL3) 26: Keypad communication error (PCE) 27: Parameter upload error (UPE) 28: Parameter download error (DNE) 29: PROFIBUS communication fault (E_dP) 30: Ethernet communication fault (E_NET) 31: CANopen communication fault (E-CAN) 32: To-ground short-circuit fault 1 (ETH1) 33: To-ground short-circuit fault 2 (ETH2) 34: Speed deviation fault (dEu) 35: Mal-adjustment fault (STo) 36: Underload fault (LL) 37 – 54: Reserved 55: Duplicate expansion card type (E-Err) 56: Reserved 57: PROFINET communication fault (E_PN) 58: CAN communication fault (ESCAN) 59: Motor overtemperature fault (OT) 60: Failure to identify the card at slot 1 (F1-Er) 61: Failure to identify the card at slot 2 (F2-Er) 62: Reserved 63: Communication timeout of the card at slot 1 (C1-Er) 64: Communication timeout of the card at slot 2 (C2-Er) 65: Reserved 66: EtherCat communication fault (E-CAT) 67: Bacnet communication fault (E-BAC) 68: DeviceNet communication fault (E-DEV) 69: CAN slave fault in master/slave synchronization (S-Err)		

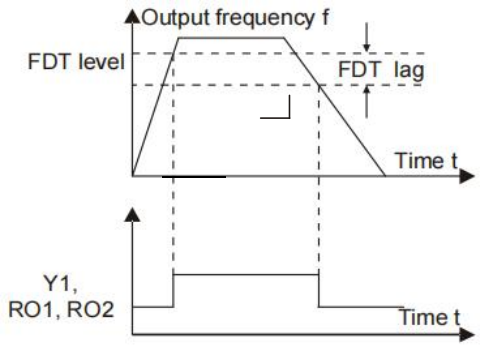
		70: EtherNet IP communication timeout fault (E-EIP) 71 – 72: Reserved 73: Freezing fault 74: Stalling fault 75: Dry pumping fault 76 – 79: Reserved		
H07-33	Running frequency at present fault	0.00Hz – H00.03	0.00Hz	●
H07-34	Ramp reference frequency at present fault	0.00Hz – H00.03	0.00Hz	●
H07-35	Output current at present fault	0 – 1200V	0V	●
H07-36	Output current at present fault	0.0 – 6300.0A	0.0A	●
H07-37	Bus voltage at present fault	0.0 – 2000.0V	0.0V	●
H07-38	Max. temperature at present fault	-20.0 – 120.0° C	0.0° C	●
H07-39	Input terminal status at present fault	0x0000 – 0xFFFF	0x0000	●
H07-40	Output terminal status at present fault	0x0000 – 0xFFFF	0x0000	●
H07-41	Running frequency at last fault	0.00Hz – H00.03	0.00Hz	●
H07-42	Ramp reference frequency at last fault	0.00Hz – H00.03	0.00Hz	●
H07-43	Output voltage at last fault	0 – 1200V	0V	●
H07-44	Output current at last fault	0.0 – 6300.0A	0.0A	●
H07-45	Bus voltage at last fault	0.0 – 2000.0V	0.0V	●
H07-46	Temperature at last fault	-20.0 – 120.0° C	0.0° C	●
H07-47	Input terminal status at last fault	0x0000 – 0xFFFF	0x0000	●
H07-48	Output terminal status at last fault	0x0000 – 0xFFFF	0x0000	●
H07-49	Running frequency at 2nd-last fault	0.00Hz – H00.03	0.00Hz	●
H07-50	Ramp reference frequency at 2nd-last fault	0.00Hz – H00.03	0.00Hz	●
H07-51	Output voltage at 2nd-last fault	0 – 1200V	0V	●
H07-52	Output current at 2nd-last fault	0.0 – 6300.0A	0.0A	●
H07-53	Bus voltage at	0.0 – 2000.0V	0.0V	●

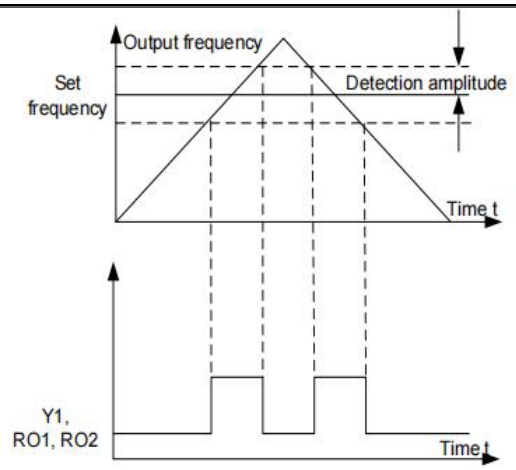
	2nd-last fault			
H07-54	Temperature at 2nd-last fault	-20.0 – 120.0° C	0.0° C	●
H07-55	Input terminal status at 2nd-last fault	0x0000 – 0xFFFF	0x0000	●
H07-56	Output terminal status at 2nd-last fault	0x0000 – 0xFFFF	0x0000	●

H08 group--Enhanced functions

Function code	Name	Predetermined area	Factory default	Change
H08-00	ACC time 2	For details, see H00.11 and H00.12. The VFD has four groups of ACC/DEC time, which can be selected by H05. The factory default ACC/DEC time of the VFD is the first group. Setting range: 0.0 – 3600.0s	Depends on model	☆
H08-01	DEC time 2		Depends on model	☆
H08-02	ACC time 3		Depends on model	☆
H08-03	DEC time 3		Depends on model	☆
H08-04	ACC time 4		Depends on model	☆
H08-05	DEC time 4		Depends on model	☆
H08-06	Running frequency of jog	The function code is used to define the reference frequency during jogging. Setting range: 0.00Hz – H00.03(Max. output frequency)	5.00Hz	☆
H08-07	ACC time for jogging	ACC time for jogging means the time needed for the VFD to accelerate from 0Hz to the max. output frequency (H00.03). DEC time for jogging means the time needed for the VFD to decelerate from the max. Output frequency (H00.03) to 0Hz. Setting range: 0.0 – 3600.0s	Depends on model	☆
H08-08	DEC time for jogging		Depends on model	☆
H08-09	Jump frequency 1	 When the set frequency is within the range	0.00Hz	☆
H08-10	Jump frequency amplitude 1		0.00Hz	☆
H08-11	Jump frequency 2		0.00Hz	☆
H08-12	Jump frequency amplitude 2		0.00Hz	☆
H08-13	Jump frequency 3		0.00Hz	☆
H08-14	Jump frequency amplitude 3			☆

		of jump frequency, the VFD runs at the boundary of jump frequency. The VFD can avoid mechanical resonance points by setting jump frequencies. The VFD supports the setting of three jump frequencies. If the jump frequency points are set to 0, this function is invalid. Setting range: 0.00Hz–H00.03(Max. output frequency)	0.00Hz	
H08-15 to H08-18		Reserved	/	☆
H08-19	Switching frequency of ACC/DEC time	0.00 – H00.03(Max. frequency) 0.00Hz: No switchover If the running frequency is greater thanH08.19, switch to ACC/DEC time 2.	0.00Hz	☆
H08-20	Frequency threshold of the start of droop control	0.00 – 50.00Hz	2.00Hz	☆
H08-21	Reference frequency of ACC/DEC time	0: Max. output frequency 1: Set frequency 2: 100Hz Note: Valid only for straight-line ACC/DEC	0	☆
H08-22	Output torque calculation method	0: Based on torque current 1: Based on output power	0	☆
H08-23	Number of decimal points of frequency	0: Two 1: One	0	☆
H08-24	Number of decimal points of linear speed	0: No decimal point 1: One 2: Two 3: Three	0	★
H08-25	Set counting value	H08.26 – 65535	0	☆
H08-26	Designated counting value	0 – H08.25	0	☆
H08-27	Set running time	0 – 65535min	0min	☆
H08-28	Auto fault reset count	Auto fault reset count: When the VFD uses automatic fault reset, it is used to set the number of automatic fault reset times. When the number of continuous reset times exceeds the value, the VFD reports a fault and stops. Auto fault reset interval: Time interval from when a fault occurred to when automatic fault reset takes effect. After VFD starts, If no fault occurred within 600s after the VFD starts, the number of automatic fault reset times is cleared. H08.28 setting range: 0 – 10 H08.29 setting range: 0.1 – 3600.0s	0	☆
H08-29	Auto fault reset interval		1.0s	☆
H08-30	Frequency	The output frequency of the VFD changes as the load changes. The function code is		☆

	decrease ratio in drop control	mainly used to balance the power when several motors drive a same load. Setting range: 0.00 – 50.00Hz	0.00Hz	
H08-31	Channel for switching between motor 1 and motor 2	0x00 – 0x14 Ones place: Switchover channel 0: Terminal 1: Modbus communication 2: PROFIBUS/CANopen communication 3: Ethernet communication 4: PROFINET communication Tens place: indicates whether to enable switchover during running 0: Disable 1: Enable	0x00	☆
H08-32	FDT1 electrical level detection value	When the output frequency exceeds the corresponding frequency of FDT electrical level, the multifunction digital output terminal continuously outputs the signal of "Frequency level detection FDT". The signal is invalid only when the output frequency decreases to a value lower than the frequency corresponding to (FDT electrical level—FDT lagging detection value).  H08.33setting range: 0.0-100.0% (FDT1 electrical level) H08.34setting range: 0.00Hz-H00.03(Max. output frequency) H08.35setting range: 0.0-100.0% (FDT2 electrical level)	50.00Hz	★
H08-33	FDT1 lagging detection value		5.0%	☆
H08-34	FDT2 electrical level detection value		50.00Hz	☆
H08-35	FDT2 lagging detection value		5.0%	☆
H08-36	Detection value for frequency being reached	When the output frequency is within the detection range, the multifunction digital output terminal outputs the signal of "Frequency reached".	0.00Hz	☆

		 Setting range: 0.00Hz-H00.03(Max. output frequency)		
H08-37	Reserved		/	
H08-38	Reserved		/	
H08-39	Cooling-fan running mode	0x0000-0x0041 Ones place: Run mode 0: Normal mode 1: Permanent running after power-on Tens place: Reserved Hundreds place: 0: Max. airspeed 1: Automatic speed regulation Thousands place: Reserved	0x0100	☆
H08-40	PWM selection	0x0000-0x1121 Ones place: PWM mode selection 0: PWM mode 1, 3PH modulation and 2PH modulation 1: PWM mode 2, 3PH modulation Tens place: PWM carrier frequency limit 0: Low-speed carrier frequency limit mode 1 1: Low-speed carrier frequency limit mode 2 2: No limit on carrier frequency Hundreds place: Deadzone compensation method 0: Compensation method 1 1: Compensation method 2 Thousands place: PWM loading mode selection 0: Interruptive loading 1: Normal loading	0x1101	☆
H08-41	Overmodulation selection	0x00-0x1111 Ones place: 0: Disable 1: Enable Tens place: 0: Mild overmodulation 1: Deepened overmodulation Hundreds: Carrier frequency limit 0:Yes 1:No Thousands: Output voltage compensation 0: No 1: Yes	1000	★
H08-42		0x0000-0x1223 LED ones place: 0: Both the ▲/▼ key and digital potentiometer can be used for the control.		★

	Keypad digital control setting	1: Only the ▲/▼ key can be used for the control. 2: Only the digital potentiometer can be used for the control. 3: Neither the ▲/▼ key nor the digital potentiometer can be used for the control. Tens place: Frequency control selection 0: Valid only when H00.06=0 or H00.07=0 1: Valid for all frequency setting methods 2: Invalid for multi-step speed running when multi-step speed running has the priority LED hundreds place: Action selection for stop 0: Setting is valid. 1: Valid during running, cleared after stop 2: Valid during running, cleared after a stop command is received LED thousands place: Indicates whether to enable the integral function through the ▲/▼ key and digital potentiometer. 0: Disable the integral function 1: Enable the integral function	0x0000	
H08-43	Keypad digital potentiometer integral rate	0.01-10.00s	0.10s	☆
H08-44	UP/DOWN terminal control setting	0x000 ~ 0x221 Ones: Frequency control selection 0: UP/DOWN terminal setting is valid 1: UP/DOWN terminal setting is invalid Tens: Frequency control selection 0: Only valid for H00.06=0 or H00.07=0 1: All frequency modes are valid 2: When multi-terminal speed is prioritized, it is invalid for multi-speed Hundreds: Action selection when stopping 0: Setting is valid 1: Valid during operation, cleared after stopping 2: Valid during operation, cleared after receiving the stop command	0x000	☆
H08-45	Frequency increment integral rate of the UP terminal	0.01-50.00Hz/s	0.50Hz/s	☆
H08-46	Frequency integral rate of the DOWN terminal	0.01-50.00Hz/s	0.50Hz/s	☆
H08-47		0x000-0x111 Ones place: Action selection at power-off during frequency adjusting through digitals. 0: Save the setting at power-off. 1: Clear the setting at power-off.		☆

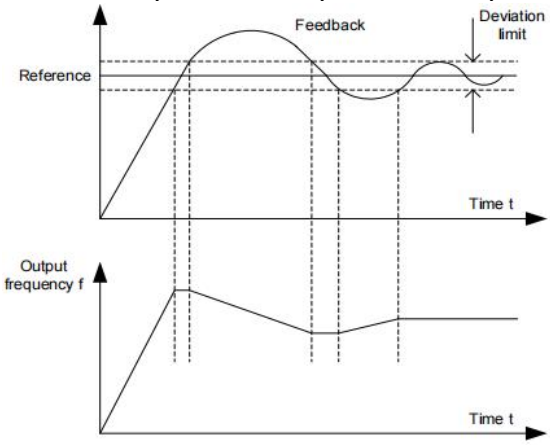
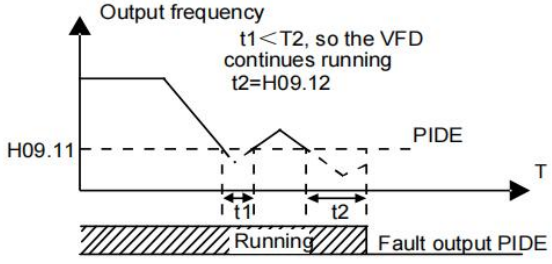
	Action selection at power-off during frequency setting	Action selection at power-off during frequency adjusting through Modbus communication 0: Save the setting at power-off. 1: Clear the setting at power-off. Hundreds place: Action selection at power-off during frequency adjusting through DP communication methods 0: Save the setting at power-off. 1: Clear the setting at power-off.	0x000	
H08-48	Initial electricity consumption MSB	Used to set the initial electricity consumption. Initial electricity consumption =H08.48*1000 + H08.49 H08.48setting range: 0-59999 kWh (k) H08.49setting range: 0.0-999.9 kWh	0kWh	☆
H08-49	Initial electricity consumption LSB		0.0kWh	☆
H08-50	Magnetic flux braking	Used to enable magnetic flux braking. 0: Invalid 100-150: A larger coefficient indicates stronge braking. The VFD can quickly slowdown the motor by increasing the magnetic flux. The energy generated by the motor during braking can be transformed into heat energy by increasing the magnetic flux. The VFD monitors the state of the motor continuously even during the magnetic flux period. Magnetic flux braking can be used for motorstop, as well as for motor rotation speed change. The other advantages include: Braking is performed immediately after the stop command is given. The braking can be started without waiting for magnetic flux weakening. The cooling is better. The current of the stator other than the rotor increases during magnetic flux braking, while the cooling of the stator is more effective than the rotor.	0	☆
H08-51	VFD input power factor	This function code is used to adjust the current display value on the AC input side. 0.00-1.00	0.56	☆
H08-52	Reserved			☆
H08-53	Upper limit frequency bias value in torque control	0.00 Hz-P00.03(Max. frequency) Note: Valid only for torque control.	0.00Hz	☆
H08-54	Upper limit frequency ACC/DEC selection	0: No limit on acceleration or deceleration 1: ACC/DEC time 1 2: ACC/DEC time 2	0	☆

	in torque control	3: ACC/DEC time 3 4: ACC/DEC time 4		
H08-55	Carrier frequency change with temperature	Note: When the VFD detects that the heatsink temperature exceeds the rated temperature, it automatically decreases the carrier frequency to lower the temperature rise. When the temperature decreases to a specified value, the carrier frequency restores to the setting. This function can reduce the VFD overheat alarm	1	☆
H08-56	Temperature point of carrier frequency reduction	40.0-80.0° C	65.0° C	
H08-57	Wait time of carrier frequency reduction	0-30min	10	
H08-58	Output phase loss detection delay during running	0-360.0s Note: When the run time exceeds the delay, the VFD detects for output phase loss.	5.0s	
H08-59 to H08-69		Reserved		

H09 group--PID control

Function code	Name	Predetermined area	Factory default	Change
H09-00	PID reference source	When frequency command selection (H00.06, H00. 07) is 7, or channel of voltage setup (H04.27) is 6, the running mode of VFD is process PID control. The function code determines the target given channel during the PID process. 0: Set by H09.01 1: AI1 2: AI2 3:Reserved 4: High-speed pulse HDIA 5: Multi-step running 6: Modbus communication 7-10: Reserved	0	☆
H09-01	PID digital setting	The function code is mandatory whenH09.00=0. The base value of The function code is the feedback of the system. Setting range: -100.0%-100.0%	0.0%	☆
H09-02	PID feedback source	Used to select the PID feedback channel. 0: AI1 1: AI2 2: Reserved 3: High-speed pulse HDIA 4: Modbus communication 5-8: Reserved	0	☆

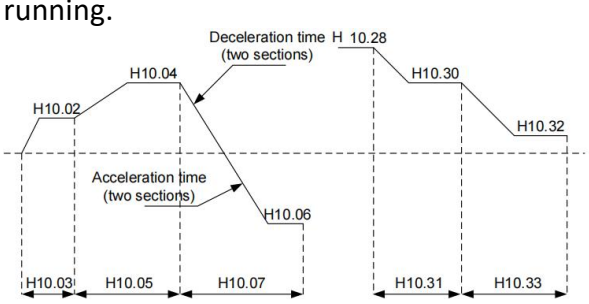
		Note: The reference channel and feedback channel cannot be duplicate. Otherwise, effective PID control cannot be achieved.		
H09-03	PID output characteristics selection	0: PID output is positive. When the feedback signal is greater than the PID reference value, the output frequency of the VFD will decrease to balance the PID. Example: PID control on strain during unwinding. 1: PID output is negative. When the feedback signal is greater than the PID reference value, the output frequency of the VFD will increase to balance the PID. Example: PID control on strain during unwinding.	0	☆
H09-04	Proportional gain (Kp)	The function is applied to the proportional gain P of PID input. P determines the strength of the whole PID adjuster. The value 100 indicates that when the difference between the PID feedback value and given value is 100%, the range within which the PID regulator can regulate the output frequency command is the max. frequency (ignoring integral function and differential function). Setting range: 0.00-100.00	1.80	☆
H09-05	Integral time (Ti)	Used to determine the speed of the integral adjustment on the deviation of PID feedback and reference from the PID regulator. When the deviation of PID feedback and reference is 100%, the integral adjuster works continuously during the time (ignoring proportional and differential function) to achieve the max. output frequency (H00.03) or the max. voltage (H04.31). Shorter integral time indicates stronger adjustment. Setting range: 0.00-10.00s	0.90s	☆
H09-06	Differential time (Td)	Used to determine the strength of the change ratio adjustment on the deviation of PID feedback and reference from the PID regulator. If the PID feedback changes 100% during the time, the adjustment of the differential regulator (ignoring proportional and integral function) is the max. output frequency (H00.03) or the max. voltage (H04.31). Longer differential time indicates stronger adjustment. Setting range: 0.00-10.00s	0.00s	☆
H09-07	Sampling cycle (T)	Used to indicate the sampling cycle of feedback. The regulator calculates in each sampling cycle. A longer sampling cycle indicates slower response.	0.001s	☆

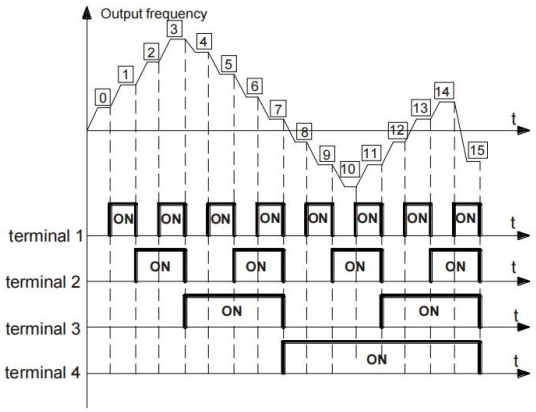
		Setting range: 0.001-10.000s		
H09-08	PID control deviation limit	The output of the PID system is relative to the max. deviation of the closed loop reference. As shown in the following figure, the PID regulator stops regulating in the range of deviation limit. Set the function parameter properly to adjust the accuracy and stability of the PID system.  Setting range: 0.0-100.0%	0.0%	☆
H09-09	PID output upper limit	The function codes are used to set the upper and lower limits of PID regulator output values. 100.0% corresponds to the max. output frequency (H00.03) or max. voltage (H04.31). H09.09setting range:H09.10--100.0% H09.10setting range: -100.0%-H09.09	100.0%	☆
H09-10	PID output lower limit		0.0%	☆
H09-11	Feedback offline detection value	Used to set the PID feedback offline detection value. When the feedback value is smaller than or equal to the feedback offline detection value, and the duration exceeds the value specified by P09.12, the VFD reports "PID feedback offline fault" and the keypad displays PIDE.  P09.11setting range: 0.0-100.0% P09.12setting range: 0.0-3600.0s		☆
H09-12	Feedback offline detection time		1.0S	☆
H09-13	PID control selection	0x0000-0x1111 **Ones place:** 0: Continue integral control after the frequency reaches upper/lower limit 1: Stop integral control after the frequency reaches upper/lower limit	0x0001	☆

		Tens place: 0: Same as the main reference direction 1: Contrary to the main reference direction **Hundreds place:** 0: Limit as per the max. frequency 1: Limit as per A frequency **Thousands place:** 0: A+B frequency. ACC/DEC of main reference A frequency source buffering is invalid. 1: A+B frequency. ACC/DEC of main reference A frequency source buffering is valid. The ACC/DEC is determined byH08.04(ACC time 4).		
H09-14	Low frequency proportional gain (Kp)	0.00-100.00 Low-frequency switching point: 5.00Hz, high-frequency switching point: 10.00Hz (P09.04corresponds to high-frequency parameter), and the middle is the linear interpolation between these two points.	1.00	●
H09-15	ACC/DEC time of PID command	0.0-1000.0s	0.0s	●
H09-16	PID output filter time	0.000-10.000s	0.000s	●
H09-17	Reserved			●
H09-18	Low frequency integral time (Ti)	0.00-10.00s	0.90s	●
H09-19	Low frequency differential time (Td)	0.00-10.00s	0.00s	●
H09-20	Low frequency point for PID parameter switching	0.00-H09.21	5.00Hz	●
H09-21	High frequency point for PID parameter switching	H09.20-H00.04	10.00Hz	●
H09-22				●

H10 group--Simple PLC and multi-step speed control

Function code	Name	Predetermined area	Factory default	Change
H10-00	Simple PLC mode	0: Stop after running once. The VFD stops automatically after running for one cycle, and it can be started only after receiving the running command. 1: Keep running in the final value after running for one cycle. The VFD keeps the running frequency and direction of the last section	0	☆

		after a single cycle. 2: Cyclic running. The VFD enters the next cycle after completing one cycle until receiving the stop command.		
H10-01	Simple PLC memory selection	0: Without memory at power failure 1: Memory at power-off. The PLC memories its running stage and running frequency before power-off.	0	☆
H10-02	Multi-step speed 0	Frequency setting range for steps from step 0 to step 15: -100.0 – 100.0%. 100.0% corresponds to the max. output frequency H00.03. Running time setting range for steps from step 0 to step 15: 0.0 – 6553.5s(min). The time unit is specified by H10.37. When simple PLC operation is selected, it is required to set H10.02 – H10.33 to determine the running frequency and running time of each step. Note: The symbol of multi-step speed determines the running direction of simple PLC, and the negative value means reverse running.  When selecting multi-step speed running, the multi-step speed is within the range of -fmax – fmax, and it can be set continuously. The start/stop of multi-step stop running is also determined by H00.01. The VFD supports the setting of 16-step speed,which are set by combined codes of multi-step terminals 1-4 set by S terminals, corresponding to function code H05.01-H05.06) and correspond to multi-step speed 0 to multi-step speed 15.	0.0%	☆
H10-03	Running time of step 0		0.0s(min)	☆
H10-04	Multi-step speed 1		0.0%	☆
H10-05	Running time of step 1		0.0s(min)	☆
H10-06	Multi-step speed 2		0.0%	☆
H10-07	Running time of step 2		0.0s(min)	☆
H10-08	Multi-step speed 3		0.0%	☆
H10-09	Running time of step 3		0.0s(min)	☆
H10-10	Multi-step speed 4		0.0%	☆
H10-11	Running time of step 4		0.0s(min)	☆
H10-12	Multi-step speed 5		0.0%	☆
H10-13	Running time of step 5		0.0s(min)	☆
H10-14	Multi-step speed 6		0.0%	☆
H10-15	Running time of step 6		0.0s(min)	☆
H10-16	Multi-step speed 7		0.0%	☆
H10-17	Running time of step 7		0.0s(min)	☆
H10-18	Multi-step speed 8		0.0%	☆
H10-19	Running time of step 8		0.0s(min)	☆
H10-20	Multi-step speed 9		0.0%	☆
H10-21	Running time of step 9		0.0s(min)	☆
H10-22	Multi-step speed 10		0.0%	☆
H10-23	Running time of step 10 Multi-step speed 11		0.0s(min)	☆
H10-24	Running time of step 11 Multi-step speed 12		0.0%	☆
H10-25	Running time of step		0.0s(min)	☆

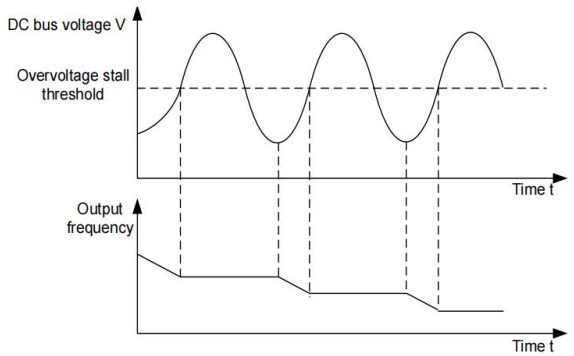
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<tr><td></td><td>12</td><td rowspan="11">

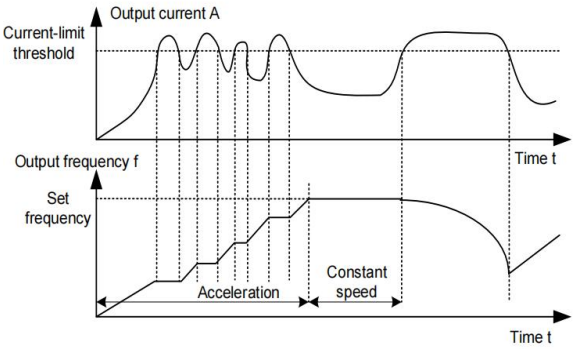
When terminal 1, terminal 2, terminal 3 and terminal 4 are OFF, the frequency input mode is set by H00.06 or H00.07. When terminal 1,
terminal 2, terminal 3 and terminal 4 are not all OFF, the frequency set by multi-step speed will prevail, and the priority of multi-step setting is
higher than that of the keypad, analog, high-speed pulse, PID, and communication settings.
The relation between terminal 1, terminal 2, terminal 3 and terminal 4 are shown in the following (T indicates terminal).
<table>
<tr><td>T1</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr>
<tr><td>T2</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr>
<tr><td>T3</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>T4</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>Step</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr>
<tr><td>T1</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr>
<tr><td>T2</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr>
<tr><td>T3</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>T4</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>Step</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr>
</table></td><td></td><td></td></tr>
<tr><td>H10-26</td><td>Multi-step speed 13</td><td>0.0%</td><td>☆</td></tr>
<tr><td>H10-27</td><td>Running time of step 13</td><td>0.0s(min)</td><td>☆</td></tr>
<tr><td>H10-28</td><td>Multi-step speed 14</td><td>0.0%</td><td>☆</td></tr>
<tr><td>H10-29</td><td>Running time of step 14</td><td>0.0s(min)</td><td>☆</td></tr>
<tr><td>H10-30</td><td>Multi-step speed 15</td><td>0.0%</td><td>☆</td></tr>
<tr><td>H10-31</td><td>Running time of step 15</td><td>0.0s(min)</td><td>☆</td></tr>
<tr><td>H10-32</td><td>Running time of step 8</td><td>0.0%</td><td>☆</td></tr>
<tr><td>H10-33</td><td>Multi-step speed 9</td><td>0.0s(min)</td><td>☆</td></tr>
<tr><td>H10-34</td><td>ACC/DEC time of steps 0-7 of simple PLC</td><td rowspan="2">The description is as follows:</td><td>0x0000</td><td>☆</td></tr>
<tr><td>H10-35</td><td>ACC/DEC time of steps 8-15 of simple PLC</td><td>0x0000</td><td>☆</td></tr>
</table>

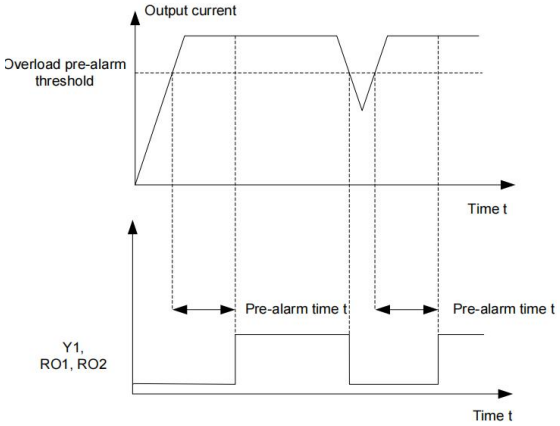
<table>
<tr>
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<td>
<table>
<tr><th>Code</th><th colspan="2">Binary</th><th>Step</th><th>ACC/DEC time 1</th><th>ACC/DEC time 2</th><th>ACC/DEC time 3</th><th>ACC/DEC time 4</th></tr>
<tr><td rowspan="8">H10.34</td><td>BIT1</td><td>BIT0</td><td>0</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>BIT3</td><td>BIT2</td><td>1</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>BIT5</td><td>BIT4</td><td>2</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>BIT7</td><td>BIT6</td><td>3</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>BIT9</td><td>BIT8</td><td>4</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>BIT11</td><td>BIT10</td><td>5</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>BIT13</td><td>BIT12</td><td>6</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>BIT15</td><td>BIT14</td><td>7</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td rowspan="8">H10.35</td><td>BIT1</td><td>BIT0</td><td>8</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>BIT3</td><td>BIT2</td><td>9</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>BIT5</td><td>BIT4</td><td>10</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>BIT7</td><td>BIT6</td><td>11</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>BIT9</td><td>BIT8</td><td>12</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>BIT11</td><td>BIT10</td><td>13</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>BIT13</td><td>BIT12</td><td>14</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
<tr><td>BIT15</td><td>BIT14</td><td>15</td><td>00</td><td>01</td><td>10</td><td>11</td></tr>
</table>
Select corresponding acceleration/deceleration time, and then convert 16-bit binary number into hexadecimal number, finally, and then set corresponding function codes.
ACC/DEC time 1 is set by H00.11 and H00.12;
ACC/DEC time 2 is set by H08.00 and H08.01;
ACC/DEC time 3 is set by H08.02 and H08.03;
ACC/DEC time 4 is set by H08.04 and H08.05.
Setting range: 0x0000 –0xFFFF
</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H10-36</td>
<td>PLC restart mode</td>
<td>0: Restart from the first step, namely if the VFD stops during running (caused by stop command, fault or power down), it will run from the first step after restart.
1: Continue running from the step frequency when interruption occurred, namely if the VFD stops during running (caused by stop command or fault), it will record the running time of current step, and enters this step automatically after restart, then continue running at the frequency defined by this step in the remaining time.</td>
<td>0</td>
<td>★</td>
</tr>
<tr>
<td>H10-37</td>
<td>Multi-step time unit</td>
<td>0: second; the running time of each step is counted in seconds</td>
<td>0</td>
<td>★</td>
</tr>
</table>

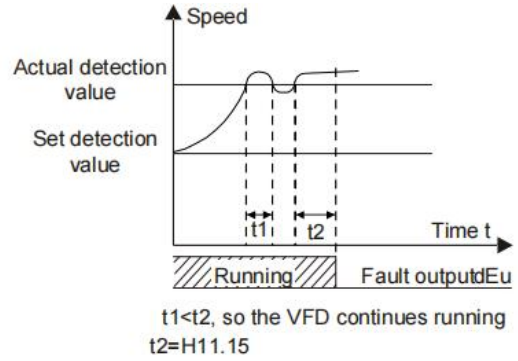
		1: minute; the running time of each step is counted in minutes		

H11 group—Protection parameters

Function code	Name	Predetermined area	Factory default	Change
H11-00	Protection against phase loss	0x000-0x111 **Ones place:** 0: Disable software input phase loss protection. 1: Enable software input phase loss protection. **Tens place:** 0: Disable output phase loss protection. 1: Enable output phase loss protection.	0x011	☆
H11-01	Frequency drop at transient power-off	<table><tr><td>Voltage class</td><td>220V</td><td>380V</td></tr><tr><td>Frequency decrease at sudden power failure</td><td>260V</td><td>460V</td></tr></table> 0: Disable 1: Enable Note: ※. Enabling this function can avoid inverter shutdown due to protection when the power grid is switched. ※. The input phase loss protection function must be disabled before enabling this function	0	☆
H11-02	Reserved		/	☆
H11-03	Overvoltage stalling protection	0: Disable 1: Enable  If the bus voltage exceeds the overvoltage stalling point, the motor is in power generation state, and the overvoltage stalling protection function takes effect to regulate output frequency (that is, consume	1	

		unnecessary regenerative electricity).		
H11-04	Overvoltage stalling protection voltage	120-150% (standard bus voltage) (380V)	136%	☆
		120-150% (standard bus voltage) (220V)	120%	
H11-05	Current limit mode	During accelerated running, as the load is too large, the actual acceleration rate of motor is lower than that of output frequency, if no measures are taken, the VFD may trip due to overcurrent during acceleration. 0x00-0x11 **Ones place**: Current limit action selection 0: Invalid 1: Always valid **Tens**: Hardware current limit overload alarm selection 0: Valid 1: Invalid	01	☆
H11-06	Automatic current limit threshold	Current-limit protection function detects output current during running, and compares it with the current-limit level defined by P11.06, if it exceeds the current-limit level, the VFD will run at stable frequency during accelerated running,or run in decreased frequency during constant-speed running; if it exceeds the current-limit level continuously, the VFD output frequency will drop continuously until reaching lower limit frequency. When the output current is detected to be lower than the current-limit level again, it will continue accelerated running.  H11.06setting range: 50.0-180.0% H11.07setting range: 0.00-50.00Hz/s	120.0%	
H11-07	Frequency drop rate during current limit		10.00 Hz/s	☆
H11-08		0x000-0x1132 Ones place: 0: Motor OL/UL pre-alarm, relative to motor rated current. 1: VFD OL/UL pre-alarm, relative to the VFD rated current 2: Motor output torque OL/UL pre-alarm, relative to motor rated torque. Tens place: 0: The VFD continues to work for an OL/UL		☆

	VFD/motor OL/UL pre-alarm selection	alarm. 1: The VFD continues to work for a UL alarm but stops running for an OL fault. 2: The VFD continues to work for an OL alarm but stops running for a UL fault. 3. The VFD stops running for an OL/UL alarm. Hundreds place: 0: Detect all the time. 1: Detect during constant speed running. Thousands place: VFD overload current reference selection 0: Related to current calibration coefficient 1: Irrelated to current calibration coefficient	0x000	
H11-09	Overload pre-alarm detection level	If the VFD or motor output current is larger than the overload pre-alarm detection level (H11.09), and the duration exceeds the overload pre-alarm detection time (H11.10), overload pre-alarm signal will be outputted.  H11.09setting range:H11.11-200.0% H11.10setting range: 0.1-3600.0s	Type G: 150% Type F: 120%	☆
H11-10	Overload pre-alarm detection time		1.0s	☆
H11-11	Underload pre-alarm detection threshold	Underload pre-alarm signal will be outputted if the output current of the VFD or motor is lower than underload pre-alarm detection level (H11.11), and the duration exceeds underload pre-alarm detection time (H11.12). H11.11setting range: 0-P11.09 Setting range ofH11.12: 0.1-3600.0s	50%	☆
H11-12	Underload pre-alarm detection time		1.0s	☆
H11-13	Fault output terminal action upon fault occurring	Used to set the action of fault output terminals at undervoltage and fault reset. 0x00-0x11 **Ones place:** 0: Act upon an undervoltage fault 1: Do not act upon an undervoltage fault **Tens place:** 0: Act during automatic reset 1: Do not act during the automatic reset period	0x00	☆
H11-14	Speed deviation detection value	0.0-50.0% Used to set the speed deviation detection value.	10.0%	☆

H11-15	Speed deviation detection time	0.0-10.0s (No speed deviation protection for the value=0.0) Used to set the speed deviation detection time. Note: Speed deviation protection is invalid when H11.15=0.0.  Setting range: 0.0-10.0s	2.0s	☆
H11-16	Automatic frequency-reduction during voltage drop	0-1 0: Invalid 1: Valid	0	☆
H11-17	Proportional coefficient of voltage regulator during undervoltage stall	This parameter is used to set the proportional coefficient of the bus voltage regulator during undervoltage stall. Setting range: 0-1000	100	☆
H11-18	Proportional coefficient of voltage regulator during undervoltage stall	This parameter is used to set the integral coefficient of the bus voltage regulator during undervoltage stall. Setting range: 0-1000	40	☆
H11-19	Proportional coefficient of current regulator during undervoltage stall	This parameter is used to set the proportional coefficient of the active current regulator during undervoltage stall. Setting range: 0-1000	25	☆
H11-20	Integral coefficient of current regulator during undervoltage stall	This parameter is used to set the integral coefficient of the active current regulator during undervoltage stall. Setting range: 0-2000	150	☆
H11-21	Proportional coefficient of voltage regulator during overvoltage stall	This parameter is used to set the proportional coefficient of the bus voltage regulator during overvoltage stall. Setting range: 0-1000	60	☆
H11-22	Integral coefficient of voltage regulator during overvoltage stall	This parameter is used to set the integral coefficient of the bus voltage regulator during overvoltage stall. Setting range: 0-1000	10	☆
H11-23	Proportional coefficient of current regulator during	This parameter is used to set the proportional coefficient of the active current regulator during overvoltage stall. Setting range: 0-1000	60	☆

	overvoltage stall			
H11-24	Integral coefficient of current regulator during overvoltage stall	This parameter is used to set the integral coefficient of the active current regulator during overvoltage stall. Setting range: 0-2000	250	☆
H11-25	Enable VFD overload integral	0: Disable 1: Enable When this parameter is set to 0,the overload timing value is reset to zero after the VFD is stopped. In this case, the determination of VFD overload takes more time, and therefore the effective protection over the VFD is weakened. When this parameter is set to 1,the overload timing value is not reset, and the overload timing value is accumulative. In this case, the determination of VFD overload takes less time, and therefore the protection over the VFD can be performed more quickly.	1	★
H11-26	Reserved			
H11-27	VF oscillation control method	0x00-0x11 Ones place: 0: Method 1 1: Method 2 Tens place: 0: Reserved 1: Reserved	0x11	★
H11-28	Software input phase loss detection method	0-1	1	☆
H11-29	Software input phase loss detection limit value	0-200.0	40.0	☆
H11-30	Software input phase loss detection time	0-20.0	2.0	☆
H11-31	Fault protection selection 1	0x0000-0x3313 LED ones place: Motor overload 0: Coast to stop 1: Stop according to the stop mode 2: Pre-alarm and run 3: Keep running LED tens place: VFD overload 0: Coast to stop 1: Stop according to the stop mode LED hundreds place: Input phase loss (same as that for ones place) LED thousands place: Output phase loss on output side (same as that for ones place)	0	☆
H11-32		0x0000-0x3300 LED ones place: Rectifier module overheating 0: Coast to stop		☆

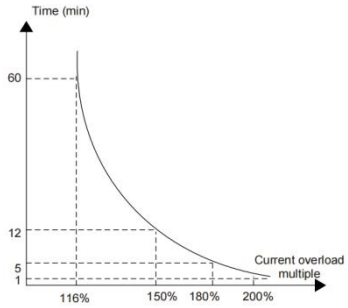
	Fault protection selection 2	LED tens place: Inverter module overheat (same as that for ones place) LED hundreds place: External fault 0: Coast to stop 1: Stop according to the stop mode 2: Pre-alarm and run 3: Keep running LED thousands place: RS485 communication fault (same as that for hundreds place)	0x0000	
H11-33	Fault protection selection 3	0x0000-0x3100 LED ones place: Current detection fault 0: Coast to stop LED tens place: Motor autotuning fault (same as that for ones place) LED hundreds place: EEPROM operation fault 0: Coast to stop 1: Stop according to the stop mode LED thousands place: PID feedback offline 0: Coast to stop 1: Stop according to the stop mode 2: Pre-alarm and run 3: Keep running	0x0000	☆
H11-34	Fault protection selection 4	0x0000-0x1311 Ones place: Reserved 0: Reserved 1: Reserved Tens place: Running time reached (same as that for ones place) 0: Coast to stop 1: Stop according to the stop mode Hundreds place: Electronic overload 0: Coast to stop 1: Stop according to the stop mode 2: Pre-alarm and run 3: Keep running Thousands place: Keypad communication fault (same as that for ones place)	0x0000	☆
H11-35	Fault protection selection 5	0x0000-0x0300 Ones place: Keypad upload fault 0: Coast to stop Tens place: Keypad download fault (same as that for ones place) Hundreds place: DP communication fault 0: Coast to stop 1: Stop according to the stop mode 2: Pre-alarm and run 3: Keep running Thousands place: Reserved	0x0000	☆
H11-36	Fault protection selection 6	0x0000-0x3003 Ones place: CANopen communication fault 0: Coast to stop 1: Stop according to the stop mode 2:	0x0000	☆

		Pre-alarm and run 3: Keep running Tens place: To-ground short-circuit fault 1 0: Coast to stop Hundreds place: To-ground short-circuit fault 2 (same as that for tens place) Thousands place: Speed deviation fault (same as that for ones place)		
H11-37	Fault protection selection 7	0x0000-0x0011 Ones place: Mal-adjustment fault 0: Coast to stop 1: Stop according to the stop mode Tens place: Electronic underload fault (same as that for ones place) Hundreds place: Reserved Thousands place: Reserved	0x0000	☆
H11-38	Fault protection selection 8	Reserved		
H11-39	Fault protection selection 9	Reserved		
H11-40	Fault protection selection 10	Reserved		
H11-41	Fault protection selection 11	Reserved		
H11-42	Fault protection selection 12	0x0000-0x3303 Ones place: Duplicate expansion card type 0: Coast to stop 1: Stop according to the stop mode 2: Pre-alarm and run 3: Keep running Tens place: Reserved Hundreds place: PROFINET communication timeout fault (same as that for ones place) Thousands place: CAN communication fault (same as that for ones place)	0x0000	☆
H11-43	Fault protection selection 13	0x0000-0x0333 Ones place: Motor overheating 0: Coast to stop 1: Stop according to the stop mode Tens place: Failed to identify the expansion card in card slot 1 0: Coast to stop 1: Stop according to the stop mode 2: Pre-alarm and run 3: Keep running Hundreds place: Failed to identify the expansion card in card slot 2 (same as that for tens place) Thousands place: Reserved	0x0000	☆
H11-44		0x0000-0x0033 Ones place: Communication timeout of		☆

	Fault protection selection 14	expansion card at card slot 1 0: Coast to stop 1: Stop according to the stop mode 2: Pre-alarm and run 3: Keep running Tens place: Communication timeout of expansion card at card slot 2 (same as that for ones place) Hundreds place: Reserved Thousands place: Reserved	0x0000	
H11-45	Fault protection selection 15	0x0000-0x0300 Ones place: Reserved Tens place: Reserved Hundreds place: CAN slave fault in master/slave synchrization 0: Coast to stop 1: Stop according to the stop mode 2: Pre-alarm and run 3: Keep running Thousands place: Reserved	0x0000	☆
H11-46	Fault protection selection 16	0x0000-0x3300 Ones place: Reserved Tens place: Reserved Hundreds place: Freezing fault 0: Coast to stop 1: Stop according to the stop mode 2: Pre-alarm and run 3: Keep running Thousands place: Stalling fault (same as that for hundreds place)	0x0000	☆
H11-47	Fault protection selection 17	0x0000-0x0003 Ones place: Dry pumping 0: Coast to stop 1: Stop according to the stop mode 2: Pre-alarm and run 3: Keep running Tens place: Reserved Hundreds place: Reserved Thousands place: Reserved	0x0000	☆
H11-48	Fault protection selection 18	Reserved		
H11-49	Fault protection selection 19	Reserved		
H11-50	Fault protection selection 20	Reserved		
H11-51	Output frequency selection for running with pre-alarm	0x0000-0x0004 Ones place: 0: Run at the present running frequency 1: Run at the frequency set through keypad 2: Run at the upper limit frequency 3: Run at the lower limit frequency 4: Run at the backup frequency upon exceptions	0x0000	☆
H11-52	Backup frequency upon exceptions	0.00 Hz-P00.03(Max. output frequency)	0	☆

H12 group--Parameters of motor 2

Function code	Name	Predetermined area	Factory default	Change
H12-00	Type of motor 2	0: Asynchronous motor (AM) 1: Synchronous motor (SM)	0	☆
H12-01	Rated power of AM 2	0.1-3000.0kW	Depends on model	☆
H12-02	Rated frequency of AM 2	0.01Hz-P00.03(Max. output frequency)	50.00Hz	☆
H12-03	Rated speed of AM 2	1-60000rpm	Depends on model	☆
H12-04	Rated voltage of AM 2	0–1200V	Depends on model	☆
H12-05	Rated current of AM 2	0.8–6000.0A	Depends on model	☆
H12-06	Stator resistance of AM 2	0.001–65.535Ω	Depends on model	☆
H12-07	Rotor resistance of AM 2	0.001–65.535Ω	Depends on model	☆
H12-08	Leakage inductance of AM 2	0.1–6553.5mH	Depends on model	☆
H12-09	Mutual inductance of AM 2	0.1–6553.5mH	Depends on model	☆
H12-10	No-load current of AM 2	0.1–6553.5A	Depends on model	☆
H12-11	Magnetic saturation coefficient 1 of iron core of AM 2	0.0–100.0%	80%	☆
H12-12	Magnetic saturation coefficient 2 of iron core of AM 2	0.0–100.0%	68%	☆
H12-13	Magnetic saturation coefficient 3 of iron core of AM 2	0.0–100.0%	57%	☆
H12-14	Magnetic saturation coefficient 4 of iron core of AM 2	0.0–100.0%	40%	☆
H12-15	Rated power of SM 2	0.1–3000.0kW	Depends on model	☆
H12-16	Rated frequency of SM 2	0.01Hz–P00.03(Max. output frequency)	50.00Hz	☆
H12-17	Number of pole pairs of SM 2	1–128	2	☆
H12-18	Rated voltage of SM 2	0–1200V	Depends on model	☆
H12-19	Rated current of SM 2	0.8–6000.0A	Depends on model	☆
H12-20	Stator resistance of SM 2	0.001–65.535Ω	Depends on model	☆
H12-21	Direct-axis	0.01–655.35mH	Depends on	☆

	inductance of SM 2		model	
H12-22	Quadrature-axis inductance of SM 2	0.01–655.35mH	Depends on model	☆
H12-23	Counter-emf constant of SM 2	0–10000V	300	☆
H12-24	Reserved			☆
H12-25	Reserved			☆
H12-26	Stator resistance of SM 2	0.001–65.535Ω	Depends on model	☆
H12-27	Overload protection coefficient of motor 2	Motor overload multiples M=Iout/(In*K) In is rated motor current, Iout is VFD output current, K is motor overload protection coefficient. A smaller value of "K" indicates a bigger value of "M". When M=116%, protection is performed after motor overload lasts for 1 hour; when M=200%, protection is performed after motor overload lasts for 60 seconds; and when M≥400%, protection is performed immediately.  Setting range: 20.0%–120.0%	100.0%	☆
H12-28	Power display calibration coefficient of motor 2	0.00–3.00	1.00	☆
H12-29	Parameter display of motor 2	0: Display by motor type. In this mode, only parameters related to the present motor type are displayed. 1: Display all. In this mode, all the motor parameters are displayed.	0	☆
H12-30	System inertia of motor 2	0–30.000kgm2	0.000	☆

H13 group--SM control

function code	Name	Predetermined area	Factory default	Change
H13-00		Used to set the reduction rate of the input		☆

	SM injected-current decrease ratio	reactive current. When the active current of the synchronous motor increases to some extent, the input reactive current can be reduced to improve the power factor of the motor. Setting range: 0.0%–100.0% (of the motor rated current)	80.0%	
H13-01	Detection mode of initial pole	0: No detection 1: High-frequency superposition 2: Pulse superposition	0	★
H13-02	Pull-in current 1	Pull-in current is the pole position orientation current; pull-in current 1 is valid within the lower limit of pull-in current switch-over frequency threshold. If you need to increase the start torque, increase the value of this function parameter properly. Setting range: 0.0%–100.0% (of the motor rated current)	20.0%	☆
H13-03	Pull-in current 2	Pull-in current is the pole position orientation current; pull-in current 2 is valid within the lower limit of pull-in current switch-over frequency threshold. You do not need to change the value in most cases. Setting range: 0.0%–100.0% (of the motor rated current)	10.0%	☆
H13-04	Pull-in current switchover frequency	0.00Hz–H00.03(Max. frequency)	10.00Hz	☆
H13-05	Reserved			
H13-06	High-frequency superposition voltage	Used to set the pulse current threshold when the initial magnetic pole position is detected in the pulse mode, The value is a percentage in relative to the rated current of the motor. Setting range: 0.0–300.0% (of the motor rated voltage)	100.0%	★
H13-07	Reserved			
H13-08	Control parameter 1	0–0xFFFF	0	☆
H13-09		Used to set the frequency threshold for enabling the counter-electromotive force		☆

	Control parameter 2	phase-locked loop in SVC 0. When the running frequency is lower than the value of the function code, the phase-locked loop is disabled; and when the running frequency is higher than that, the phase-locked loop is enabled. Setting range: 0–655.35	2.00	
H13-10	Reserved			
H13-11	Maladjustment detection time	Used to adjust the responsiveness of anti-maladjustment function. If the load inertia is large, increase the value of this parameter properly, however, the responsiveness may slowdown accordingly. Setting range: 0.0–10.0s	0.5s	☆
H13-12	High-frequency compensation coefficient of SM	Valid when the motor speed exceeds the rated speed. If oscillation occurred to the motor, adjust this parameter properly. Setting range: 0.0–100.0%	0.0%	☆
H13-13	High-frequency current-loop	0–300.0%	20.0%	★

H14 group--Serial communication

Function code	Name	Predetermined area	Factory default	Change
H14-00	Local communication address	Setting range: 1–247 When the master writes the slave communication address to 0 indicating a broadcast address in a frame, all the salves on the Modbus bus receive the frame but do not respond to it. The communication addresses on the communication network are unique, which is the basis of the point-to-point communication. Note: The communication address of a slave cannot be set to 0.	1	☆
H14-01	Communication baud rate	The function code is used to set the rate of data transmission between the upper computer and the VFD. 0: 1200BPS 1: 2400BPS 2: 4800BPS 3: 9600BPS 4: 19200BPS 5: 38400BPS 6: 57600BPS	4	☆

		7: 115200BPS Note: The baud rate set on the VFD must be consistent with that on the upper computer. Otherwise, the communication fails. A greater baud rate indicates faster communication.		
H14-02	Data bit check	The data format set on the VFD must be consistent with that on the upper computer. Otherwise, the communication fails. 0: No check (N, 8, 1) for RTU 1: Even check (E, 8, 1) for RTU 2: Odd check (O, 8, 1) for RTU 3: No check (N, 8, 2) for RTU 4: Even check (E, 8, 2) for RTU 5: Odd check (O, 8, 2) for RTU	1	☆
H14-03	Communication response delay	0–200ms The function code indicates the communication response delay, that is, the interval from when the VFD completes receiving data to when it sends response data to the upper computer. If the response delay is shorter than the rectifier processing time, the rectifiersends response data to the upper computer after processing data. If the delay is longer than the rectifier processing time, the rectifier does not send response data to the upper computer until the delay is reached although data has been processed.	5	☆
H14-04	Communication timeout time	0.0 (invalid)–60.0s When the function code is set to 0.0, the communication timeout time is invalid. When the function code is set to a non-zero value, the system reports the "485 communication fault" (CE) if the communication interval exceeds the value. In general, the function code is set to 0.0. When continuous communication is required, you can set the function code to monitor communication status.	0.0s	☆
H14-05	Transmission error processing	0: Report an alarm and coast to stop 1: Keep running without reporting an alarm 2: Stop according to the stop mode without generating alarms (only in the communication-based control mode) 3: Stop according to the stop mode without generating alarms (in all control modes)	0	☆

H14-06	Communication processing action	0x00–0x11 Ones place: 0: Respond to write operations 1: Not respond to write operations Tens place: 0: Communication password protection is invalid. 1: Communication password protection is valid.	0x00	☆
H14-07 ～ H14-11		Reserved		

H17 group--Status viewing

Function code	Name	Predetermined area	Factory default	Change
H17-00	Set frequency	Displays the present set frequency of the VFD. Range: 0.00Hz–H00.03	50.00Hz	●
H17-01	Output frequency	Displays the present output frequency of the VFD. Range: 0.00Hz–H00.03	0.00Hz	●
H17-02	Ramp reference frequency	Displays the present ramp reference frequency of the VFD. Range: 0.00Hz–H00.03	0.00Hz	●
H17-03	Output voltage	Displays the present output voltage of the VFD. Range: 0–1200V	0V	●
H17-04	Output current	Displays the valid value of current output current of the VFD. Range: 0.0–5000.0A	0.0A	●
H17-05	Motor rotation speed	Displays the current motor speed. Range: 0–65535RPM	0 RPM	●
H17-06	Torque current	Displays the present torque current of the VFD. Range: -3000.0–3000.0A	0.0A	●
H17-07	Exciting current	Displays the present exciting current of the VFD. Range: -3000.0–3000.0A	0.0A	●
H17-08	Motor power	Displays the present motor power; 100% relative to the rated motor power. The positive value is the motoring state while the negative value is the generating state. Range: -300.0–300.0% (relative to the rated motor power)	0.0%	●
H17-09	Output torque percentage	Displays the present output torque of the VFD; 100% relative to the rated motor torque. During forward running, the positive value is the motoring state while the negative value is generating state. During reverse running, the positive value is the generating state while the negative value is the motoring state.	0.0%	●

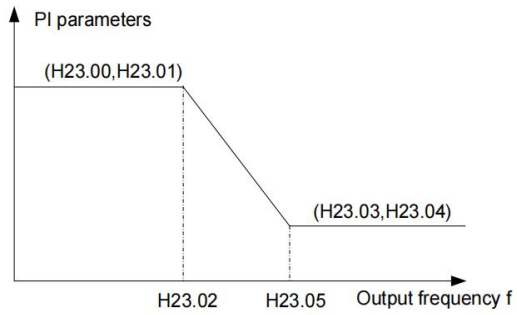
		Range: -250.0–250.0%		
H17-10	Estimated motor frequency	Displays the estimated motor rotor frequency under the open-loop vector condition. Range: 0.00–P00.03	0.00Hz	●
H17-11	DC bus voltage	Displays the present DC bus voltage of the VFD. Range: 0.0–2000.0 V	0V	●
H17-12	Digital input terminal status	Displays the present digital input terminal state of the VFD. 0x0000–0x003F Corresponds to HDIA, X4, X3, X2 and X1 respectively.	0x0000	●
H17-13	Digital output terminal status	Displays the present digital output terminal state of the VFD. 0x0000–0x000F Corresponding to Reserved, RO1, HDO and Y1 respectively	0x0000	●
H17-14	Digital adjustment value	Displays the adjustment amount of terminal “UP/DOWN”. Range: 0.00Hz ~ H00.03	0.00Hz	●
H17-15	Torque reference value	Relative to the percentage of the rated torque of the present motor, displaying the torque reference. Range: -300.0%–300.0% (of the motor rated current)	20.0%	●
H17-16	Linear speed	0–65535	0	●
H17-17	Reserved			●
H17-18	Count value	0–65535	0	●
H17-19	AI1 input voltage	Displays the AI1 input signal. Range: 0.00–10.00V	0.00V	●
H17-20	AI2 input voltage	Displays the AI2 input signal. Range: -10.00V–10.00V	0.00V	●
H17-21	HDIA input frequency	Display HDIA input frequency. Range: 0.000–50.000kHz	0.000 kHz	●
H17-22	Reserved		/	●
H17-23	PID reference value	Displays the PID reference value. Range: -100.0–100.0%	0.0%	●
H17-24	PID feedback value	Displays the PID feedback value. Range: -100.0–100.0%	0.0%	●
H17-25	Motor power factor	Displays the power factor of the current motor. Range: -1.00–1.00	1.00	●
H17-26	Duration of this run	Displays the duration of this run of the VFD. Range: 0–65535min	0m	●
H17-27	Present step of simple PLC	Used to display the present step of the simple PLC function.	0	●

H17-28	Motor ASR controller output	Displays the ASR controller output value under the vector control mode, relative to the percentage of rated motor torque. Range: -300.0%–300.0% (of the motor rated current)	0.0%	●
H17-29	Pole angle of open-loop SM	Displays the initial identification angle of SM. Range: 0.0–360.0	0.0	●
H17-30	Phase compensation of SM	Displays the phase compensation of SM. Range: -180.0–180.0	0.0	●
H17-31	High-frequency superposition current of SM	0.0%–200.0% (of the motor rated current)	0.0	●
H17-32	Motor flux linkage	0.0%–200.0%	0.0%	●
H17-33	Exciting current reference	Displays the exciting current reference value under the vector control mode. Range: -3000.0–3000.0A	0.0A	●
H17-34	Torque current reference	Displays the torque current reference value under the vector control mode. Range: -3000.0–3000.0A	0.0A	●
H17-35	AC incoming current	Displays the valid value of incoming current on AC side. Range: 0.0–5000.0A	0.0A	●
H17-36	Actual output torque	Displays the actual output torque value of the VFD. During forward running, the positive value is the motoring state while the negative value is generating state. During reverse running, the positive value is the generating state while the negative value is the motoring state. Range: -3000.0N·m – 3000.0 N·m	0.0 N • m	●
H17-37	Motor overload count value	0–65535	0	●
H17-38	Process PID output	-100.0%–100.0%	0.00%	●
H17-39	Function codes in parameter download error	0.00–99.00	0.00	●
H17-40	Motor control mode	Ones place: Control mode 0: Vector 0 1: Vector 1 2: VF control 3: Closed-loop vector control Tens place: Control status 0: Speed control 1: Torque control 2: Position control Hundreds place: Motor number 0: Motor 1 1: Motor 2	0x002	●

H17-41	Electromotive torque upper limit	0.0%–300.0% (of the motor rated current)	180.0%	●
H17-42	Braking torque upper limit	0.0%–300.0% (of the motor rated current)	180.0%	●
H17-43	Forward rotation upper-limit frequency in torque control	0.00–P00.03	50.00Hz	●
H17-44	Reverse rotation upper-limit frequency in torque control	0.00–P00.03	50.00Hz	●
H17-45	Inertia compensation torque	-100.0%–100.0%	0.0%	●
H17-46	Friction compensation torque	-100.0%–100.0%	0.0%	●
H17-47	Motor pole pairs	0–65535	Depends on model	●
H17-48	VFD overload count value	0–65535	0	●
H17-49	Frequency set by A source	0.00–P00.03	0.00Hz	●
H17-50	Frequency set by B source	0.00–P00.03	0.00Hz	●
H17-51	PID proportional output	-100.0%–100.0%	0.00%	●
H17-52	PID integral output	-100.0%–100.0%	0.00%	●
H17-53	PID differential output	-100.0%–100.0%	0.00%	●
H17-54	PID present proportional gain	0.00–100.00	0.00%	●
H17-55	PID present integral gain	0.00–10.00s	0.00%	●
H17-56	PID present differential time	0.00–10.00s	0.00%	●
H17-57 to H17-59		Reserved		

H23 group--Vector control of motor 2

Function code	Name	Predetermined area	Factory default	Change
H23-00	Speed-loop proportional gain 1	The parameters H23.00–H23.05 are applicable only to vector control mode. Below the switching frequency 1 (H23.02), the speed-loop PI parameters	20.0	☆
H23-01	Speed-loop integral time 1		0.200s	☆

H23-02	Low-point frequency for switching	are:H23.00andH23.01. Above the switching frequency 2 (H23.05), the speed-loop PI parameters are:H23.03andH23.04. PI parameters are obtained according to the linear change of two groups of parameters. See the following figure:  The speed loop dynamic response characteristics of vector control can be adjusted by setting the proportional coefficient and integral time of speed regulator. Increasing proportional gain or reducing integral time can accelerate dynamic response of speed loop; however, if the proportional gain is too large or integral time is too small, system oscillation and overshoot may occur; if proportional gain is too small, stable oscillation or speed offset may occur. PI parameters have a close relationship with the inertia of the system. Adjust PI parameters depending on different loads to meet various demands. H23.00setting range: 0.0–200.0 H23.01setting range: 0.000–10.000s H23.02setting range: 0.00Hz–P23.05 H23.03setting range: 0.0–200.0 H23.04setting range: 0.000–10.000s H23.05setting range: H23.02–H00.03(Max output frequency)	5.00Hz	☆
H23-03	Speed-loop proportional gain 2		20.0	☆
H23-04	Speed-loop integral time 2		0.200s	☆
H23-05	High-point frequency for switching		10.00Hz	☆
H23-06	Speed-loop output filter	0–8 (corresponding to 0–28/10ms)	0	☆
H23-07	Electromotive slip compensation coefficient of vector control	Slip compensation coefficient is used to adjust the slip frequency of the vector control and improve the speed control accuracy of the system. Adjusting the parameter properly can control the speed steady-state error.	100%	☆
H23-08	Braking slip compensation coefficient of vector		100%	☆

	control	Setting range: 50–200%		
H23-09	Current-loop proportional coefficient P	Note: ※The two function codes impact the dynamic response speed and control accuracy of the system. Generally, you do not need to modify the two function codes. ※Applicable to SVC mode 0 (P00.00=0) ※The values of the two function codes are updated automatically after SM parameter autotuning is completed. Setting range: 0–65535	1000	☆
H23-10	Current-loop integral coefficient I		1000	☆
H23-11	Speed-loop differential gain	0.00 – 10.00s	0.00s	☆
H23-12	High-frequency current-loop proportional coefficient	In the vector control mode (H00.00=3),when the frequency is lower than the current-loop high-frequency switching threshold (H23.14), the current-loop PI parameters areH23.09and H23.10; and when the frequency is higher than the current-loop high-frequency switching threshold, the current-loop PI parameters are H23.12and H23.13. P23.12 setting range: 0 – 65535 P23.13setting range: 0 – 65535 P23.14setting range: 0.0 – 100.0% (of the max. frequency)	1000	☆
H23-13	High-frequency current-loop integral coefficient		1000	☆
H23-14	Current-loop high-frequency switching threshold		100.0%	☆

H25 Extended I/O Card Input Function Group

Function code	Name	Predetermined area	Factory default	Change
H25-00	Reserved			
H25-01	X5 Terminal Function Selection	Reference H05 group	0	★
H25-02	X6 Terminal Function Selection		0	★
H25-03	X7 Terminal Function Selection		0	★
H25-04	X8 Terminal Function Selection		0	★
H25-05 to H25-07		Reserved		
H25-08	Expansion card input terminal polarity selection	0x00 ～ 0x7F	0x00	☆
H25-09	Expansion Card Virtual Terminal Settings	0x000–0x7F (0: Disable. 1: Enable) BIT0: S5 virtual terminal BIT1: S6 virtual terminal BIT2: S7 virtual terminal	0x00	★

		BIT3: S8 virtual terminal BIT4: S9 virtual terminal BIT5: S10 virtual terminal BIT6: HDI3 virtual terminal		
H25-10	Reserved			
H25-11	Reserved			
H25-12	X5 switch-on delay	The function code defines the delay time corresponding to the level change of the programmable input terminal when it is turned on or off. Setting range: 0.000 ~ 50.000s	0.000s	☆
H25-13	X5 switch-off delay		0.000s	☆
H25-14	X6 switch-on delay		0.000s	☆
H25-15	X6 switch-off delay		0.000s	☆
H25-16	X7 switch-on delay		0.000s	☆
H25-17	X7 switch-off delay		0.000s	☆
H25-18	X8 switch-on delay		0.000s	☆
H25-19	X8 switch-off delay		0.000s	☆
H25-20 TO H25-23				
H25-24	AI3 lower limit	H25.24 Setting range: 0.00V ～ H25.26 H25.25 Setting range: -300.0% ～ 300.0% H25.26 Setting range: H25.24 ～ 10.00V H25.27 Setting range: -300.0% ～ 300.0% H25.28 Setting range: 0.000s ～ 10.000s	0.00V	☆
H25-25	Corresponding setting of AI3 lower limit		0.0%	☆
H25-26	AI3 upper limit		10.00V	☆
H25-27	Corresponding setting of AI3 upper limit		100.0%	☆
H25-28	AI3 input filter time		0.030s	☆
H25-29 to H25-39		Reserved		
H25-40	AI3 input signal type selection	0: Voltage 1: Current	0	☆

H26 Extended I/O Card Output Function Group

Function code	Name	Predetermined area	Factory default	Change
H26-00 to H26-01		Reserved		
H26-02	Y2 output	Same as the description for H06	0	☆
H26-03	Reserved			
H26-04	RO3 output	Same as the description for H06	0	☆
H26-05 to H26-10		Reserved		
H26-11	RO4 output	Same as the description for H06	0	☆
H26-12	Expansion card output terminal polarity	0x0000–0x7FF RO10, RO9…RO3, HDO2,Y3, Y2 in sequence	0x000	☆
H26-13	Reserved	The function code defines the delay time corresponding to the level change of the programmable output terminal when it is turned on and off. Setting range: 0.000 ~ 50.000s		☆
H26-14	Reserved			☆
H26-15	Y2 switch-on delay		0.000s	☆
H26-16	Y2 switch-off delay		0.000s	☆
H26-17	Reserved			☆
H26-18	Reserved			☆

H26-19	RO3 switch-on delay	Note: H26.13 and H26.14 are only valid when H26.00=1.	0.000s	☆
H26-20	RO3 switch-off delay		0.000s	☆
H26-21 to H26-32	Reserved		0.000s	☆
H26-33	RO4 switch-on delay		0.000s	☆
H26-34	RO4 switch-off delay		0.000s	☆
H26-35	AO3 output	Same as H06.14	0	☆
H26-36	Reserved			
H26-37	Reserved			
H26-38	AO3 output lower limit	H26.38 Setting range: 100.0% -300.0% H26.39 Setting range: 0.00V ~ 10.00V H26.40 Setting range: H26.38 ~ 100.0% H26.41 Setting range: 0.00V ~ 10.00V H26.42 Setting range: 0.000s ~ 10.000s	0.0%	☆
H26-39	AO3 output corresponding to lower limit		0.00V	☆
H26-40	AO3 output upper limit		100.0%	☆
H26-41	AO3 output corresponding to upper limit		10.00V	☆
H26-42	AO3 output filter time		0.000s	☆

H89 group--HVAC status viewing

Function code	Name	Predetermined area	Factory default	Change
H89-00	HVAC function status	0: Invalid 1: Valid	0	●
H89-01	Variable-frequency motor run sequence	1 – 8 The sequences 1 – 8 correspond to motors A – F. For fixed variable-frequency motors, the value is 255.	1	●
H89-02	Multi-motor validity status	0x00 – 0xFF Bit 0 – Bit 7 correspond to motors A – H. 0: The corresponding motor is invalid and cannot be put into service. 1: The corresponding motor is valid and can be put into service.	0x00	●
H89-03	Power-frequency motor run status	0x00 – 0xFF Bit 0 – Bit 7 correspond to motors A – H. 0: The corresponding motor stops. 1: The corresponding motor is running.	0x00	●
H89-04	SN of power-frequency motor to be polled	1 – 4	2	●
H89-05	Left time of power-frequency motor to be polled	0.00 – 600.00h	0.00h	●
H89-06	SN of variable-frequency motor to be polled	1 – 4	2	●

H89-07	Left time of variable-frequency motor to be polled	0.00 – 600.00h	0.00h	●
H89-08	PID1 status	Bit 0: Stopped Bit 1: Paused Bit 2: Integral paused Bit 3: Deadzone	0	●
H89-09	Present reference value of PID1	-100.0 – 100.0%	0.0%	●
H89-10	PID1 feedback value	-100.0 – 100.0%	0.0%	●
H89-11	PID1 deviation input	-100.0 – 100.0%	0.0%	●
H89-12	Proportional output value of PID1	-1000.0 – 1000.0%	0.0%	●
H89-13	Integral output value of PID1	-100.00 – 100.00%	0.00%	●
H89-14	PID1 differential output	-1000.0 – 1000.0%	0.0%	●
H89-15	Comprehensive output of PID1	-100.00 – 100.00%	0.00%	●
H89-16	PID2 status	0: Stop 1: Normal running 2: Deadzone	1	●
H89-17	Present reference value of PID2	-100.0 – 100.0%	0.0%	●
H89-18	PID2 feedback value	-100.0 – 100.0%	0.0%	●
H89-19	PID2 deviation input	-100.0 – 100.0%	0.0%	●
H89-20	Proportional output value of PID2	-1000.0 – 1000.0%	0.0%	●
H89-21	Integral output value of PID2	-100.00 – 100.00%	0.00%	●
H89-22	PID2 differential output	-1000.0 – 1000.0%	0.0%	●
H89-23	Comprehensive output of PID2	-100.0 – 100.0%	0.0%	●
H89-24	Accumulative run time of motor A	0 – 65535H	0	●
H89-25	Accumulative run time of motor B	0 – 65535H	0	●
H89-26	Accumulative run time of motor C	0 – 65535H	0	●
H89-27	Accumulative run time of motor D	0 – 65535H	0	●
H89-28 to H28-31		Reserved		

H89-32	AI/AO measured temperature	-20.0 – 200.0	0	●
H89-33 to H89-35		Reserved		

H90 group--PID1 control

Function code	Name	Predetermined area	Factory default	Change
H90-00	Unit selection	0: MPa 1: kPa 2: Pa 3: A 4: V 5: % 6: m/s 7: m/min 8: m/h 9: m3/s 10: m3/min 11: m3/h 12: kg/s 13: kg/min 14: kg/h 15 – 21: Reserved	0	★
H90-01	Number of decimal places	0 – 3	3	★
H90-02	PID1 given max. value	0.000 – 30.000 It is displayed with three decimal places by default. If H90.01 is changed, the number of decimal places changes.	1.000	☆
H90-03	PID1 reference upper limit	H90.04 – H90.02	1.000	☆
H90-04	PID1 reference lower limit	0.000 – P90.03	0	☆
H90-05	ACC/DEC time of PID1 reference value	0.0 – 1000.0s	0.0s	
H90-06	PID1 reference source 1	0: Keypad (H90.07) 1: AI1 2: AI2 3: Reserved 4: HDIA 5: Reserved 6: Communication card	0	☆
H90-07	PID1 reference value 1 through keypad	H90.04 – H90.03	0.100	
H90-08	PID1 feedback source 1	0: Keypad (H90.09) 1: AI1 2: AI2 3: Reserved 4: HDIA 5: Reserved 6: Communication card	0	
H90-09	PID1 feedback value 1 through keypad	H90.04 – H90.03	0.100	
H90-10	Gain of PID1	0.00 – 60.000	1.000	☆

	feedback source 1			
H90-11	PID1 reference source 2	0: Keypad (H90.12) 1: AI1 2: AI2 3: Reserved 4: HDIA 5: Reserved 6: Communication card	0	☆
H90-12	PID1 reference value 2 through keypad	H90.04 – H90.03	0.100	☆
H90-13	PID1 feedback source 2	0: Keypad (P90.14) 1: AI1 2: AI2 3: Reserved 4: HDIA 5: Reserved 6: Communication card	0	☆
H90-14	PID1 feedback value 2 through keypad	H90.04 – H90.03	0.100	☆
H90-15	Gain of PID1 feedback source 2	0.00 – 60.000	1.000	☆
H90-16	Feedback function combination	0: No combination, feedback source 1 1: Sum of feedback sources 1 and 2 1: Difference between feedback sources 1 and 2 3: Average of feedback sources 1 and 2 4: Minimum of feedback sources 1 and 2 5: Maximum of feedback sources 1 and 2 6: Min. negative difference or max. Negative difference among multiple reference values When calculating the difference between reference source 1 and feedback source 1 and the difference between reference source 2 and feedback source 2, give priority to the condition in which the feedback is greater than the reference. If there are some feedback values that are greater than the reference values, select the group with the max. negative difference as the PID reference and feedback. If all feedback values are less than the reference values, select the group with the min. positive difference as the PID reference and feedback.	0	☆

		7: Max. positive difference or min. Negative difference among multiple reference values When calculating the difference between reference source 1 and feedback source 1 and the difference between reference source 2 and feedback source 2, give priority to the condition in which the feedback is less than the reference. If there are some feedback values that are less than the reference values, select the group with the max. positive difference as the PID reference and feedback. If all feedback values are greater than the reference values, select the group with the min. negative difference as the PID reference and feedback.		
H90-17	Feedback upper limit detection value	0 – 100.0%	100.0%	☆
H90-18	Feedback lower limit detection value	0 – 100.0%	0.0%	☆
H90-19	Feedback out-of-range detection time	0.0 – 3600.0s	1.0s	☆
H90-20	PID1 feedback filter time	0.000 – 60.000s	0.000s	☆
H90-21	PID1 deviation input limit value	0.0 – 100.0%	100.0%	☆
H90-22	Output characteristics selection	0: PID output is positive. 1: PID output is negative.	0	☆
H90-23	PID1 output gain	0 – 60.000	1.000	☆
H90-24	PID1 output filter time	0.000 – 60.000s	0.100s	☆
H90-25	PID1 output upper limit	H90.26 – 100.0%	100.0%	☆
H90-26	PID1 output lower limit	-100.0% – H90.25	0.0%	☆
H90-27	Proportional gain	0.000 – 60.000	1.000	☆
H90-28	Integral time	0.000 – 60.000s	5.000s	☆
H90-29	Differential time	0.000 – 60.000s	0.000s	☆
H90-30	Sampling period	0.001 – 60.000s	0.100s	☆
H90-31	PID1 control deadzone	0.0 – 100.0%	0.0%	★
H90-32	Deadzone delay	0.0 – 300.0s The PID suspends the regulation when the PID input deviation is kept for the deadzone retaining delay time.	1.0s	●
H90-33	Integral separation	0.0 – 100.0%	100.0%	☆

	threshold			
H90-34	Differential filter times	0 – 40	10	☆
H90-35	Prior differential processing	0: Perform differential processing on feedback with priority 1: Perform differential processing on deviation with priority	0	☆
H90-36 to H90-39				

H91 group--PID2 control

Function code	Name	Predetermined area	Factory default	Change
H91-00	Unit selection	0: MPa 1: kPa 2: Pa 3: A 4: V 5: % 6: m/s 7: m/min 8: m/h 9: m3/s 10: m3/min 11: m3/h 12: kg/s 13: kg/min 14: kg/h 15 – 21: Reserved	0	★
H91-01	Number of decimal places	0 – 3	3	★
H91-02	PID2 given max. value	0.000 – 30.000 It is displayed with three decimal places by default. If H91.01 is changed, the number of decimal places changes.	1.000	☆
H91-03	PID2 reference upper limit	H91.04 – H91.02	1.000	☆
H91-04	PID2 reference lower limit	0.000 – H91.03	0	☆
H91-05	ACC/DEC time of PID2 reference value	0.0 – 1000.0s	0.0s	☆
H91-06	PID2 reference source 1	0: Keypad (H91.07) 1: AI1 2: AI2 3: Reserved 4: HDIA 5: Reserved 6: Communication card	0	☆
H91-07	PID2 reference value 1 through keypad	H91.04 – H91.03	0.100	☆
H91-08	PID1 feedback source 1	0: Keypad (H90.09) 1: AI1 2: AI2 3: Reserved 4: HDIA	0	☆

		5: Reserved 6: Communication card		
H91-09	PID2 feedback value 1 through keypad	H91.04 – H91.03	0.100	☆
H91-10	Gain of PID2 feedback source 1	0.00 – 60.000	1.000	☆
H91-11	PID2 startup feedback value	0.0 – H91.02 It is displayed with three decimal places by default. If H91.01 is changed, the number of decimal places changes. When H91.15 is set to 1 or the enabling terminal is valid, if the output is positive, the feedback is less than the value of this function code; if the output is negative, the feedback is greater than the value of this function code. After the situation lasts for the time specified by H91.12, PID2 automatically starts.	0	☆
H91-12	PID2 startup delay	0.0 – 300.0s	1.0s	☆
H91-13	PID2 stop feedback value	0.0 – H91.02 It is displayed with three decimal places by default. If H91.01 is changed, the number of decimal places changes. If the output is positive, the feedback is greater than the value of this function code; if the output is negative, the feedback is less than the value of this function code. After the situation lasts for the time specified by H91.14, PID2 automatically stopts.	1.000	☆
H91-14	PID2 stop delay	0.0 – 300.0s	1.0s	☆
H91-15	Enabling PID2	0: Invalid 1: Valid	0	☆
H91-16	Reserved			
H91-17	Feedback upper limit detection value	0 – 100.0%	100.0%	☆
H91-18	Feedback lower limit detection value	0 – 100.0%	0.0%	☆
H91-19	Feedback out-of-range detection time	0.0 – 3600.0s	1.0s	☆
H91-20	PID2 feedback filter time	0.000 – 60.000s	0.000s	☆
H91-21	PID2 deviation input limit value	0.0 – 100.0%	100.0%	☆

H91-22	Output characteristics selection	0: PID output is positive. 1: PID output is negative.	0	☆
H91-23	PID2 output gain	0 – 60.000	1.000	☆
H91-24	PID2 output filter time	0.000 – 60.000s	0.000s	☆
H91-25	PID2 output upper limit	H91.26 – 100.0%	100.0%	☆
H91-26	PID2 output lower limit	-100.0 – H91.25	0.0%	☆
H91-27	Proportional gain	0.000 – 60.000	1.000	☆
H91-28	Integral time	0.000 – 60.000s	5.000s	☆
H91-29	Differential time	0.000 – 60.000s	0.000s	☆
H91-30	Sampling period	0.001 – 60.000s	0.100s	☆
H91-31	PID2 control deadzone	0.0 – 100.0%	0.0%	★
H91-32	Deadzone delay	0.0 – 300.0% The PID suspends the regulation when the PID input deviation is kept for the deadzone retaining delay time.	1.0s	☆
H91-33	Integral separation threshold	0.0 – 200.0%	200.0%	☆
H91-34	Differential filter times	0 – 40	10	☆
H91-35	Prior differential processing	0: Perform differential processing on feedback with priority 1: Perform differential processing on deviation with priority	0	☆
H91-36 to H91-39				

H92 group-- Reserved

H93 group--Fire control

Function code	Name	Predetermined area	Factory default	Change
H93-00	Fire mode	0: Invalid 1: Fire mode 1 2: Fire mode 2 When H93.00=0, the fire mode is invalid, the VFD runs in normal mode and it stops if suffering a fault. When H93.00 is a non-zero value and the fire signal is activated, the fire	0	★

		mode is valid, and the VFD runs at the speed specified by H93.01. If fire mode 1 is selected, the VFD always runs except it is damaged. If fire mode 2 is selected, the VFD always runs except it stops upon the following faults: OUT1, OUT2, OUT3, OC1, OC2, OC3, OV1, OV2, OV3, and SPO.		
H93-01	Running frequency in fire mode	0.00Hz – H00.03 (Max. output frequency)	50.00Hz	☆
H93-02	Motor running direction in fire mode	0: Run at the default direction. 1: Run at the opposite direction.	0	☆
H93-03	Fire mode flag	0 – 1 If the fire mode duration reaches 5 minutes, this flag is set to 1, and no warranty repair is granted.	0	●
H93-04	Actual month and date when fire activated	01.01 – 12.31	00.00	●
H93-05	Actual time when fire activated	00.00 – 23.59	00.00	●
H93-06 to H93-09		Reserved		

H94 group--HVAC

Function code	Name	Predetermined area	Factory default	Change
H94-00	HVAC function selection	0: Invalid 1: Valid	0	★
H94-01	Sleep method selection	0: Sleep only through terminals 1: Automatic sleep based on running frequency 2: Automatic sleep based on deviation	0	☆
H94-02	Sleep starting frequency	H00.05 – H00.04 (Upper limit frequency) When the running frequency is less than or equal to the value and this situation lasts the time longer than H94.04, sleep is allowed.	5.00Hz	☆
H94-03		0.0 – 30.0% (relative to PID1 max. value) When output is positive, if the feedback is		☆

	Sleep starting deviation	greater than the reference, sleep is allowed only when the absolute difference is greater than the value of this function code and the situation lasts the time longer than H94.04. When output is negative, if the feedback is less than the reference, sleep is allowed only when the absolute difference is greater than the value of this function code and this situation lasts the time longer than H94.04.	5.0%	
H94-04	Sleep delay	0.0 – 3600.0s	60.0s	☆
H94-05	PID1 reference boost value	-100.0 – 100.0% (relative to PID1 reference value)	10.0%	☆
H94-06	Longest boost time	0.000 – 6000.0s This function is used for continuous VFD running when the running frequency reaches the upper limit frequency but the feedback value cannot reach the setting after boost. In this situation, the VFD enters the sleep mode at once after the boost time.	10.0s	☆
H94-07	Wake-up-from-slee p frequency	H00.05 – H00.04 (Upper limit frequency) In closed-loop PID, the PID output is superimposed directly from the corresponding value of this frequency when the VFD is woken up.	5.00Hz	☆
H94-08	Wake-up-from-slee p deviation	0.0 – 30.0% (relative to PID1 max. value) In closed-loop PID, when output is positive, if the feedback is less than the reference, wakeup is allowed only when the actual difference is greater than the value of this function code and this situation lasts the time longer than H94.09. When output is negative, if the feedback is greater than the reference, wakeup is allowed only when the actual difference is greater than the value of this function code and this situation lasts the time longer than H94.09.	5.0%	☆
H94-09	Wake-up-from-slee p delay	0.0 – 3600.0s Min. sleep time.	5.0s	☆
H94-10	Selection of Variable Frequency Motor	0: Fixed variable frequency motor Motor A is a variable frequency motor, while the other motors are power frequency motors. Set as a fixed variable frequency motor. If A~D motors are set as	1	★

	Operation	variable frequency motors, they are invalid. If multiple motors are used, the corresponding motors can only be set as power frequency motors. At this time, GD270 can form a system of up to 1 fixed variable frequency motor and 4 power frequency motors. 1: Cyclic variable frequency motor According to the wiring method in the appendix, use the same number of relays and motors to switch the frequency conversion frequency cycle. If set as a cyclic variable frequency motor, at least two A~D motors need to be set as variable frequency motors. At this time, GD270 can form a system of up to 4 variable frequency motors.		
H94-11	Total number of motors	0 – 8, corresponding to motors A – H. The sequence numbers must be successive.	1	★
H94-12 to H94-18		Reserved		
H94-19	Pressure tolerance for motor adding	0.0 – 30.0% (relative to PID1 max. value)	5.0%	☆
H94-20	Running frequency for motor adding	H94.25 (Running frequency for motor reducing) – H00.03	50.00Hz	☆
H94-21	Motor adding delay	0.0 – 3600.0s	10.0s	☆
H94-22	Switching frequency for variable-frequency motor adding	H00.05 (Lower limit frequency) – H00.03	50.00Hz	☆
H94-23	Variable-frequency motor DEC time for power-frequency motor adding	0.0 – 300.0s	10.0s	☆
H94-24	Pressure tolerance for motor reducing	0.0 – 30.0% (relative to PID1 max. value)	4.0%	☆
H94-25	Running frequency for motor reducing	H00.05 – H94.20 (Running frequency for motor adding)	5.00Hz	☆
H94-26	Motor reducing delay	0.0 – 3600.0s	10.0s	☆
H94-27	Variable-frequency motor action for motor reducing	0: Keep the frequency unchanged 1: Accelerate to the motor running frequency	1	☆
H94-28	Variable-frequency motor ACC time for	0.0 – 300.0s	10.0s	☆

	motor reducing			
H94-29	Multi-motor pressure loss compensation	0: No 1: Yes	0	☆
H94-30	Pressure reference boost value for one auxiliary motor	0.0 – 100.0% (relative to PID1 reference value)	5.0%	☆
H94-31	Pressure reference boost value for two auxiliary motors	0.0 – 100.0% (relative to PID1 reference value)	10.0%	☆
H94-32	Pressure reference boost value for three auxiliary motors	0.0 – 100.0% (relative to PID1 reference value)	15.0%	☆
H94-33	Reserved			
H94-34	Motor polling cycle	0.0 – 6000.0h Automatic polling is targeted at idle variable-frequency motors. The value 0 indicates no polling.	0.0h	☆
H94-35	Running frequency threshold for polling	H00.05 – H00.03 When the running frequency is greater than the value of this function code, variable-frequency motor polling is not performed. Otherwise, great water pressure change impacts water supply.	45.00Hz	☆
H94-36	Contactor closing delay	0.2 – 100.0s The delay starts after the contactor closing command is given. The VFD startup command is given after the delay since actual contactor closing also takes sometime.	0.5s	☆
H94-37	Contactor opening delay	0.2 – 100.0s Some time is taken from giving the contactor opening command to actual contactor opening. After the delay, the VFD controls the motor to switch to power frequency.	0.5s	☆
H94-38	Manual soft startup switching frequency	0.00 – H00.03 Used to check whether a motor can run properly.	50.00Hz	☆
H94-39	Water level signal input selection of inlet pool	0: None 1: Digital 2: AI1 3: AI2 4: reserve	0	☆

		5: HDIA 7: Communication card		
H94-40	Water level upper limit of inlet pool	0.0 – 100.0%	60.0%	☆
H94-41	Water level lower limit of inlet pool	0.0 – 100.0%	40.0%	☆
H94-42	Water shortage level of inlet pool	0.0 – 100.0%	20.0%	☆
H94-43	Backup pressure upon exceptions	0.0 – 100.0% (relative to PID1 max. value)	0.0%	☆
H94-44	Protection value for PID1 feedback too low	0.0 – 100.0% (relative to PID1 max. value)	10.0%	☆
H94-45	Delay of PID1 feedback too low	0.0 – 3600.0s Corresponding terminal output that is set when PID1 feedback value is less than P94.44 and this situation lasts the time longer than P94.45.	500.0s	☆
H94-46	Protection value for PID1 feedback too high	0.0 – 100.0% (relative to PID1 max. value)	80.0%	☆
H94-47	Delay of PID1 feedback too high	0.0 – 3600.0s Corresponding terminal output that is set when PID1 feedback value is greater than P94.46 and this situation lasts the time longer than P94.47.	500.0s	☆
H94-48	DEC time of emergency stop	0.0 – 600.0s	2.0s	☆
H94-49	ACC time with water pump frequency	0 – 3600.0s	Depends on model	☆
H94-50	DEC time with water pump frequency	0 – 3600.0s	Depends on model	☆
H94-51 TO H94-59		Reserved		

H95 group--Reserved

H96 group--HVAC protection

Function code	Name	Predetermined area	Factory default	Change
H96-00	Action upon water pipe break	0: Normal running 1: Stop	0	☆
H96-01	Detection level of water pipe break	After water pipe break, the VFD running frequency boosts up to the upper limit or the PID output upper limit frequency. When it is set to 0, the water pipe break function is invalid. Range: 0.0 – 100.0%	10.0%	☆
H96-02	Detection time of water pipe break	Used to check the detection time of water pipe break. Range: 0.0 – 6000.0s	120.0s	☆
H96-03	Water pipe soft padding function	0: Disable 1: Enable	0	☆
H96-04	Reference frequency for soft padding	0.00 – P00.03	30.00Hz	☆
H96-05	Duration of reference frequency for soft padding	0.0 – 6000.0s	10.0s	☆
H96-06	Soft padding cutoff detection level	The PID function is valid when the feedback value is greater than the value of this function code. Range: 0.0 – 100.0%	30.0%	☆
H96-07 to H96-09		Reserved		
H96-10	Enabling freezing protection	Protection against freezing: The freezing protection signal is activated when the detected temperature is lower than the protection threshold; this signal is ignored if the VFD is running. If the run command is received after the protection has been activated, the protection is terminated and the run command is executed. If a stop command is received after the protection has been activated, the motor is stopped and automatic protection is disabled. Automatic protection can be enabled only when the temperature is higher than the protection threshold. 0: Disable 1: Enable	0	☆

H96-11	Temperature sensor type	Select current output for AO, connect one end of the temperature resistor to AI1 and AO2 and the other end to GND. 0: Invalid 1: PT100 2: PT1000 3: KTY84	0	☆
H96-12	Freezing protection threshold	-20.0° C – 20.0° C	-5.0° C	☆
H96-13	Low-temperature pre-alarm threshold	-20.0° C – 20.0° C When the temperature is lower than the value of this function code, the pre-alarm terminal outputs a signal.	0.0° C	☆
H96-14	Freezing protection frequency	0 – H00.04	0.0Hz	☆
H96-15	Current of triggering condensation protection	0.0 – 100.0% When an external terminal triggers the condensation protection signal, the VFD transfers DC current and stops the transfer if the duration reaches 40s. The condensation protection signal needs to be triggered again.	30.0%	☆
H96-16 to H96-19		Reserved		
H96-20	Forward run frequency for pump cleaning	0.00Hz – P00.04	50.00Hz	☆
H96-21	Reverse run frequency for pump cleaning	0.00Hz – P00.04	50.00Hz	☆
H96-22	Forward run ACC time for pump cleaning	0.0 – 3600.0s	5.0s	☆
H96-23	Reverse run ACC time for pump cleaning	0.0 – 3600.0s	5.0s	☆
H96-24	Forward run duration for pump cleaning	0.0 – 3600.0s	5.0s	☆
H96-25	Reverse run duration for pump cleaning	0.0 – 3600.0s	5.0s	☆
H96-26	Forward/reverse run interval for pump cleaning	0.0 – 3600.0s	1.0s	☆
H96-27	Number of pump cleaning cycles	1 – 1000	1	☆

H96-28	Motor stalling function selection	Prerequisite for selecting the function: The VFD exceeds the stalling current limit, the output frequency is lower than the stalling frequency upper limit, and the duration of this situation exceeds the stalling time. 0: Disable 1: Alarm 2: Faulty	0	☆
H96-29	Stalling current limit	0.0 – 1600.0% Note: 100.0% corresponds to the motor rated current.	200.0%	☆
H96-30	Stalling frequency upper limit	0.00 – H00.06 It cannot be lower than 10Hz.	15Hz	☆
H96-31	Stalling detection time	0.0 – 3600.0s	2.0s	☆
H96-32	Motor dry pumping function selection	0: Disable 1: Alarm 2: Faulty	0	☆
H96-33	Current limit for motor dry pumping	0.0% – 100.0% Note: 100.0% corresponds to the motor rated current.	0.0%	☆
H96-34	Detection time for motor dry pumping	0.0 – 3600.0s	2.0s	☆
H96-35	Motor overtemperature point	When the detected motor temperature is higher than the value of this function code, a fault is reported.	110.0°	☆

Chapter 6 Care and Maintenance

The maintenance and maintenance of the inverter should be carried out by professional and qualified personnel, and pay attention to the following items：

- Maintenance personnel must follow the specified method for maintenance and maintenance.
- Must cut off the power supply of the inverter for 5 minutes before maintenance.
- Do not directly touch the components on the PCB, otherwise it will be easily damaged by static electricity.
- After maintenance, it must be confirmed that all screws are tightened。

1.Care and maintenance

Due to the influence of the environment in which the inverter is used (such as temperature, humidity, smog, etc.) and the aging of internal components of the inverter, various faults may occur in the inverter. Therefore, daily inspections and regular maintenance must be carried out on the inverter during storage and use. Refer to the table below for daily inspection and maintenance：

Inspection object	Inspection cycle		Check content	Judgment Standards and Maintenance
	At any time	Regular		
operating environment	√		1. Temperature and humidity 2. Dust, moisture 3. Gas	1. Temperature <40° C, humidity < 90%, 2. No frost, no peculiar smell, no flammable and explosive gas
cooling system		√	1. Installation environment 2. The fan of the inverter body	1. The installation environment is well ventilated and the air duct is not blocked 2. The main body fan is running normally without abnormal noise
Inverter	√		1. Vibration, temperature rise 2. Noise 3. Internal dust, stolen goods 4. Wires, terminals	1. The vibration is stable and the air temperature at the air outlet is normal 2. No abnormal noise, no peculiar smell 3. Thorough removal with dry compressed air 4. The fastening screws are not loose
motor	√		1. Vibration, temperature rise 2. Noise	1. Stable operation and normal temperature 2. No abnormal, 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

2.Inspection and replacement of vulnerable parts

Some components in the inverter will be worn or their performance will decrease during use. In order to ensure the stable and reliable operation of the inverter, preventive maintenance should be carried out on the inverter, and parts should be replaced when necessary:
Fan: It must be replaced after more than 20,000 hours of use (about 2 to 3 years)
Electrolytic capacitor: It must be replaced after 30,000 to 40,000 hours of use (about 4 to 5 years）

3.store

Before installing this product, it is best to put it in the company's packing box according to the original package. If the machine is not used temporarily, in order to make the product comply with the company's warranty and future maintenance, the following items must be paid attention to when storing：

- **It must be placed in a dust-free and dry place**
- **The ambient temperature of the storage location must be within the range of -20° C to +60° C.**
- **The relative humidity of the storage location must be within the range of 0% to 95% without condensation.**
- **Avoid storing in an environment containing corrosive gas and liquid.**
- **Preferably packaged and stored on a shelf or countertop.**
- **Long-term storage will lead to deterioration of electrolytic capacitors. It is best to ensure that the power is turned on once within 2 years, and the power-on time is not less than 5 hours.。**

4.Inverter Warranty

The company will provide warranty service if the product occurs in the following situations:

- In the event of malfunction or damage under normal use：

1) During the warranty period (within 18 months from leaving the factory or within 1 year after delivery to the end user), the company provides free maintenance.
2) If more than 18 months, a reasonable maintenance fee will be charged。

- Even within the warranty period, a certain maintenance fee should be charged for failures caused by the following reasons：

1) Faults caused by not following the operation manual or using beyond the standard specifications.
2) Faults caused by self-repair and modification without permission.
3) Faults caused by poor storage and handling.
4) Faults caused when the inverter is used for abnormal functions。

5) Machine damage caused by 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。

Chapter 7 Appendix

1. Selection of braking resistor and braking unit

Selection of Braking Resistor Resistance

During braking, almost all the regenerative energy of the motor is consumed on the braking resistor. according to the formula：

$$U \times U / R = Pb$$

U - braking voltage for stable braking of the system (different systems have different U values, 380VAC systems generally take 700V);

Pb - braking power

Selection of Brake Resistor Power

Theoretically, the power of the braking resistor is the same as the braking power, but the derating is 70%. according to the formula：

$$0.7 \times Pr = Pb \times D$$

Pr —Power of the resistor；

D —Braking frequency, that is, the proportion of the regeneration process to the entire working process。

Common applications	elevator	uncoiling and uncoiling	centrifuge	occasional braking load	general occasion
Braking frequency value	20% ～30%	20 ～30%	50%～60%	5%	10%

Table 9-1 is the guide data. Users can choose different resistance values and power according to the actual situation. The power generated by the motor is determined, which is related to the inertia of the system, the deceleration time, the energy of the potential energy load, etc., and the customer needs to choose according to the actual situation. The greater the inertia of the system, the shorter the required deceleration time, and the more frequent the braking, the greater the power and the smaller the resistance value of the braking resistor。

During the operation of the inverter, if the speed of the controlled motor drops too fast, or the motor load shakes too fast, its electromotive potential energy will reversely charge the internal capacitor of the inverter through the inverter, so that the voltage at both ends of the power module will be pumped up, which is easy cause damage to the inverter. The internal control of the inverter will suppress this situation according to the load conditions. When the braking performance cannot meet the customer's requirements, an external braking resistor is required to release the energy in time.

The external braking resistor belongs to the energy consumption braking method, and its energy will be completely dissipated in the power braking resistor. Therefore, the power and resistance selection of the braking resistor must be reasonable and effective. The power and resistance value of the braking resistor recommended by the inverter are as follows. According to the load condition, the user can change the value appropriately, but it cannot be less than the minimum value required by the inverter。

Table 9-1 Selection table of inverter braking components

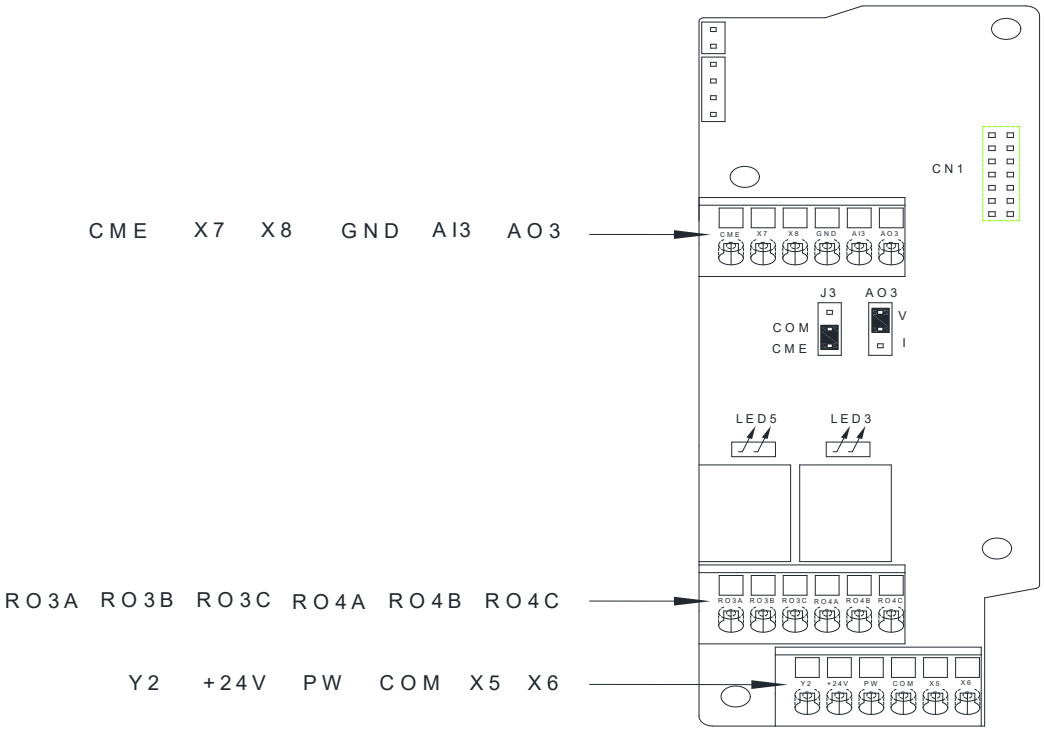
Inverter power	braking unit	Recommended resistor power	Minimum resistance value	quanti ty
0.75kW-220V	Standard built-in	80W	≥ 80Ω	1
1.5kW-220V		200W	≥ 55Ω	1
2.2kW-220V		200W	≥ 35Ω	1
3.7kW-220V		300W	≥ 25Ω	1
0.75kW-380V		150W	≥ 300Ω	1
1.5kW-380V		150W	≥ 220Ω	1
2.2kW-380V		250W	≥ 200Ω	1
3.7kW-380V		400W	≥ 130Ω	1
5.5kW-380V		500W	≥ 90Ω	1
7.5kW-380V		800W	≥ 65Ω	1
11kW-380V		1kW	≥ 43Ω	1
15kW-380V		1.3kW	≥ 32Ω	1

18.5kW-380V		1.5kW	≥ 25Ω	1
22kW-380V		1.5kW	≥ 22Ω	1
30kW-380V	need external	2.5kW	≥ 16Ω	1
37kW-380V		3.7kW	≥ 12.6Ω	1
45kW-380V		4.5kW	≥ 9.4Ω	1
55kW-380V		5.5kW	≥ 9.4Ω	1
75kW-380V		7.5kW	≥ 6.3Ω	1
90kW-380V		4.5kW	≥ 9.4Ω	2
110kW-380V		5.5kW	≥ 9.4Ω	2
132kW-380V		6.5kW	≥ 6.3Ω	2
160kW-380V		16kW	≥ 6.3Ω	2
185kW-380V		20kW	≥ 2.5Ω	1
200kW-380V		20kW	≥ 2.5Ω	1
220kW-380V		22kW	≥ 2.5Ω	1
250kW-380V		12.5kW	≥ 2.5Ω	2
280kW-380V		14kW	≥ 2.5Ω	2
315kW-380V		16kW	≥ 2.5Ω	2
350kW-380V		17kW	≥ 2.5Ω	2
400kW-380V		14kW	≥ 2.5Ω	3
450kW-380V		15kW	≥ 2.5Ω	3
500kW-380V		17kW	≥ 2.5Ω	3

Note: When the brake resistor is working, there is high voltage and high temperature on the surface. Please consider the safety and flammability of the surrounding environment when installing.

Multiple braking resistors are connected in parallel. The selection of external brake unit and resistor is for reference only, please consult the brake manufacturer for specific information。

2. IO Expansion card functionality



As shown in the diagram above, CME and COM are shorted by J3 at the factory. AO3 is set to output voltage type by default. If current type is required, it can be selected via jumper.

category	Terminals	Name	Terminal function description
Power	PW	External power input	The input switching power is supplied from the outside to the inside. At the factory, PW is shorted to 24V. If an external power supply is required, the shorting tab must be removed. Voltage range: 12～24V
Analog Input	AI3—GND	Analog Input 1	1. Input range: AI3 voltage and current selectable 0(2)～10V, 0(4)～20mA 2. Input impedance: 20kΩ for voltage input, 250Ω for current input 3. Voltage or current input is set by function code H25.40 4. Resolution: Minimum resolution 5mV at 10V corresponding to 50Hz 5. Error ±0.5%, 25℃, input 5V or above
Analog output	AO3—GND	Analog output 1	1. Output range: 0(2)～10V voltage or 0(4)～20mA current 2. Voltage or current output is set by jumper J5 3. Error ±0.5%, 25℃, output 5V or above 10mA
Digital Input/Output	X5—COM	digital input 1	1. Internal impedance: 3.3kΩ 2. Accepts 12-30V input voltage 3. This terminal is a bidirectional input terminal 4. Maximum input frequency: 1kHz
	X6—COM	digital input 2	
	X7—COM	digital input 3	
	X8—COM	digital input 4	
	Y2—CME	Switch output	1. Switching capacity: 200mA/30V 2. Output frequency range: 0-1kHz 3. CME and COM are shorted at the factory via J3.
Relay output	RO3A-RO3B	Relay 3 Normally Closed Point	1. Contact capacity: 3A/AC250V, 1A/DC30V 2. Cannot be used as a high-frequency switch output
	RO3A-RO3C	Relay 3 Normally Opened Point	
	RO4A-RO4B	Relay 4 Normally Closed Point	
	RO4A-RO4C	Relay 4 Normally Opened Point	

3. Water pump control function

This inverter's multi-pump control function is suitable for applications requiring the simultaneous operation of up to four water pumps, balancing water pressure fluctuations and flow rates. This function simplifies the control system and balances the start and stop of each pump motor, ensuring optimal performance of the water supply system. To enable this function, the following sub-functions need to be configured according to specific requirements:

※ Pump addition/reduction
※ Multi-pump polling
※ Pump maintenance mode
※ Smooth switching

3.1、One VFD connects three motors

The frequency converter requires three relay function terminals RO2-RO4 (optional accessories required), and a contactor KM is also needed to switch the water pump between two operating states: frequency converter controlled operation and mains frequency operation. All motors start and stop at ramp speeds to achieve soft switching, ensuring stable water supply pressure and reducing impact on water pipes. Users need to connect the multi-pump frequency converter control main circuit and the external relay control circuit according to Figures 5-1 and 5-2. Simultaneously configure the following functions:

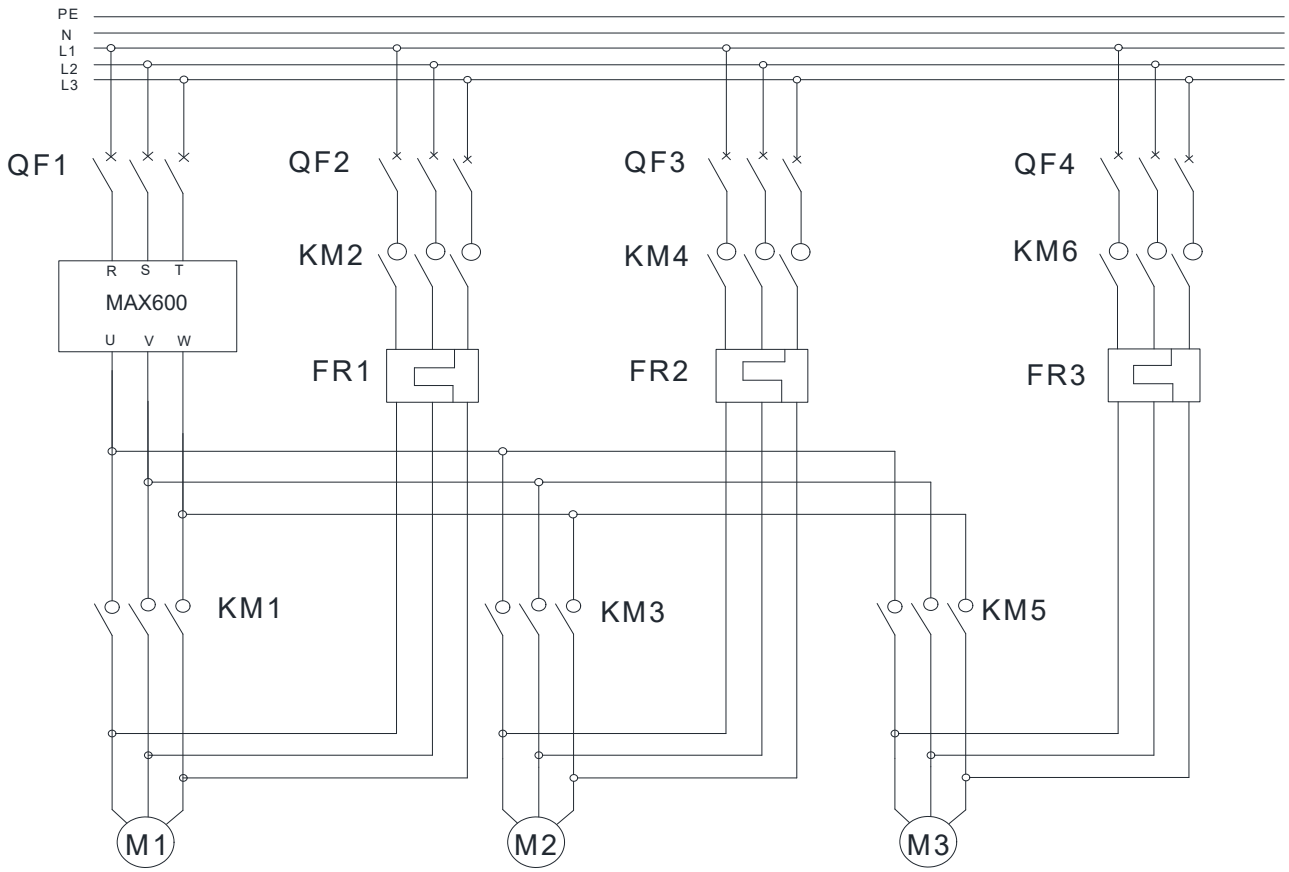
1. Enable multi-pump control function (H94.00=1)
2. Set the variable frequency motor as a circulating variable frequency motor (H94.10=1)
3. Set the total number of motors to 3 (H94.11=3)
4. Set RO2～RO4 to control variable frequency circulating pumps A, B, and C respectively (H06.04, H26.04, H26.11, set to 57～59 respectively)
5. Set the contactor closing delay, i.e., the interval between variable frequency and mains frequency operation.

Note:

After enabling the multi-pump control function, the variable frequency drive setting frequency can only be given by the water supply dedicated PID1.

It is not recommended to use the multi-pump control function on variable frequency drives with a rated power of 30kW and above.

The connected water pump motors need to have the same rated power.



KM1～KM6：contactor FR1～FR3 ： Thermal overload relay

QF1～QF4 ： circuit breaker M1～M3：Asynchronous motor

Figure - Wiring diagram of main circuit for 1-to-3 multi-pump frequency converter control

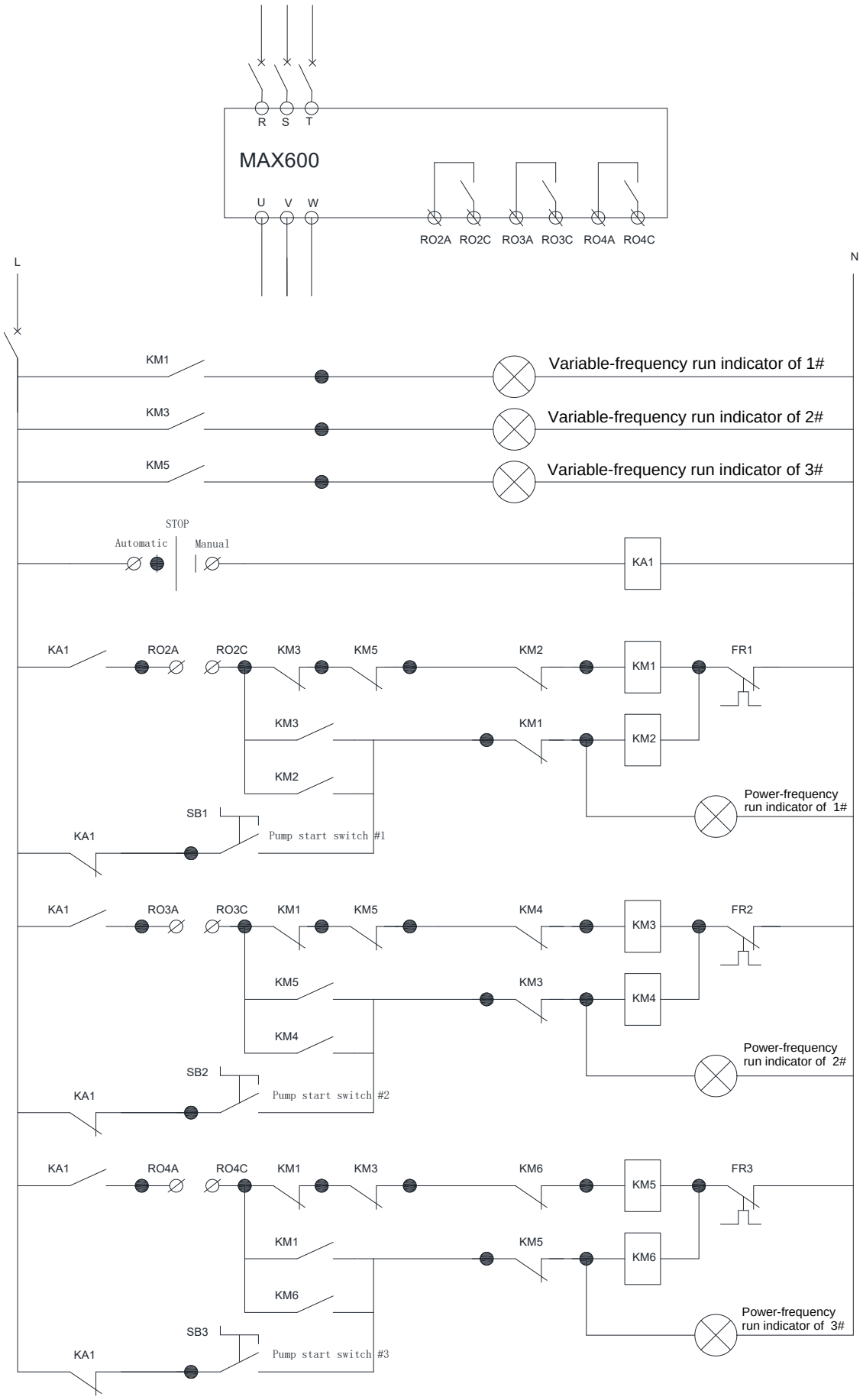


Figure - External relay control wiring diagram

Related functional parameter settings：

Function code	Name	Description	Setting
H94-00	HVAC function selection	0: Invalid 1: Valid	1
H94-10	Selection of Variable Frequency Motor Operation	0: Fixed variable frequency motor 1: Cyclic variable frequency motor	1
H94-11	Total number of motors	0－4, corresponding to motors A－H. The sequence numbers must be successive.	3
H06-04	RO2 Output selection	0-47: Same as standard unit 48: Fire mode activated 49: PID1 feedback too low warning 50: PID1 feedback too high warning 51: Inverter in sleep mode 52: PID2 running 53: PID2 stopped 54: Standby pressure operation indication 55: Inlet tank water shortage indication 56: Warning 57: Control variable frequency circulating pump A 58: Control variable frequency circulating pump B 59: Control variable frequency circulating pump C 60: Control variable frequency circulating pump D 61-64: Reserved 65: Low temperature warning 66: Stalled rotor warning 67: Dry pumping warning	57
H26-07	RO3 Output selection		58
H26-08	RO4 Output selection		59
H94.36	Contactor closing delay	0.2～100.0s	0.5s
H94.37	Contactor opening delay	0.2～100.0s	0.5s

3.2、Adding or subtracting motor pumps

※、Add motor

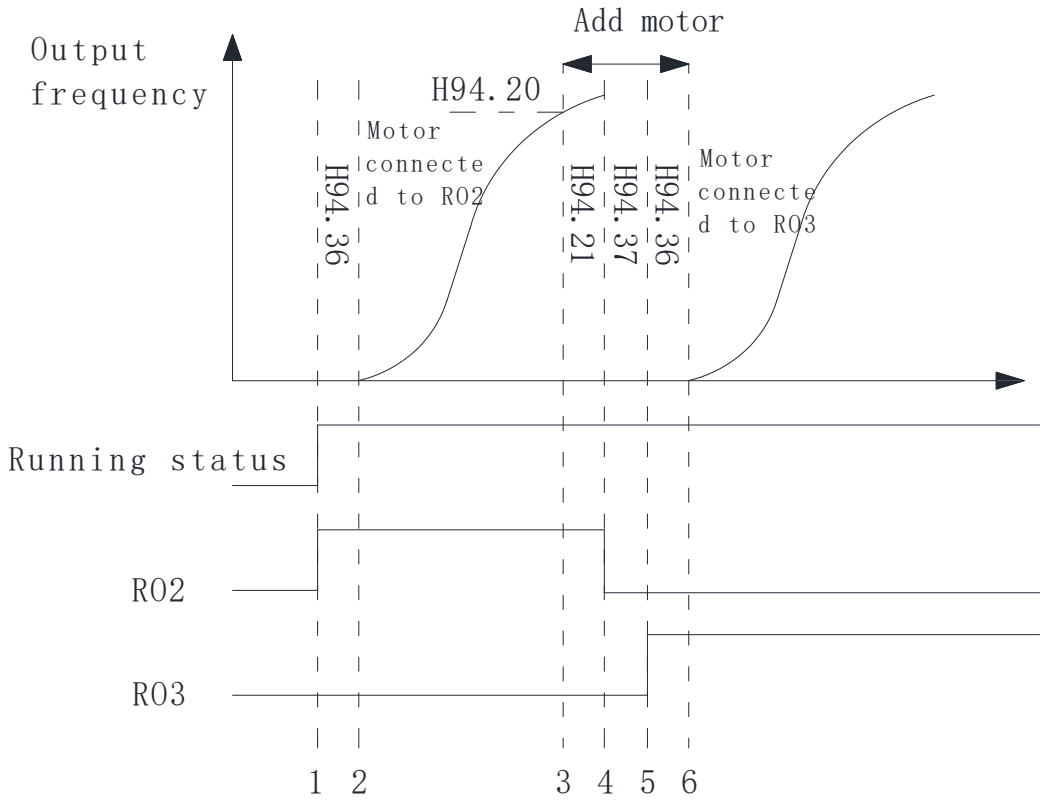


Figure 3.2-1 - Timing diagram for adding a motor

The above diagram assumes an initial state where the inverter output controls motor M1, while other motors are stopped. If the output frequency is greater than or equal to the motor operating frequency (H94.20), and the PID1 feedback is less than (PID1 setpoint - motor pressure tolerance (H94.19)), and the duration exceeds the motor delay (H94.21), the motor activation function is triggered. After the duration exceeds the motor delay (H94.21), the motor is activated, the inverter stops, and after an opening delay (H94.37), the corresponding contactor KM1 is disconnected. After a closing delay (H94.36), contactor KM3 is closed, ensuring complete contactor closure. The relay operation logic for the entire motor activation process is shown in the table below:

Table 3.2-1 - Circulating Variable Frequency Drive and Motor Action Logic

R02	R03	R04	Motor-M1	Motor- M2	Motor- M3
0	0	0	Stop	Stop	Stop
1	0	0	frequency conversion	Stop	Stop
0	0	0	Stop	Stop	Stop
0	1	0	Stop	frequency conversion	Stop
1	1	0	power frequency	frequency conversion	Stop
1	0	0	power frequency	Stop	Stop
1	0	1	power frequency	Stop	frequency conversion
1	1	1	power frequency	power frequency	frequency conversion

※、Reduce motor

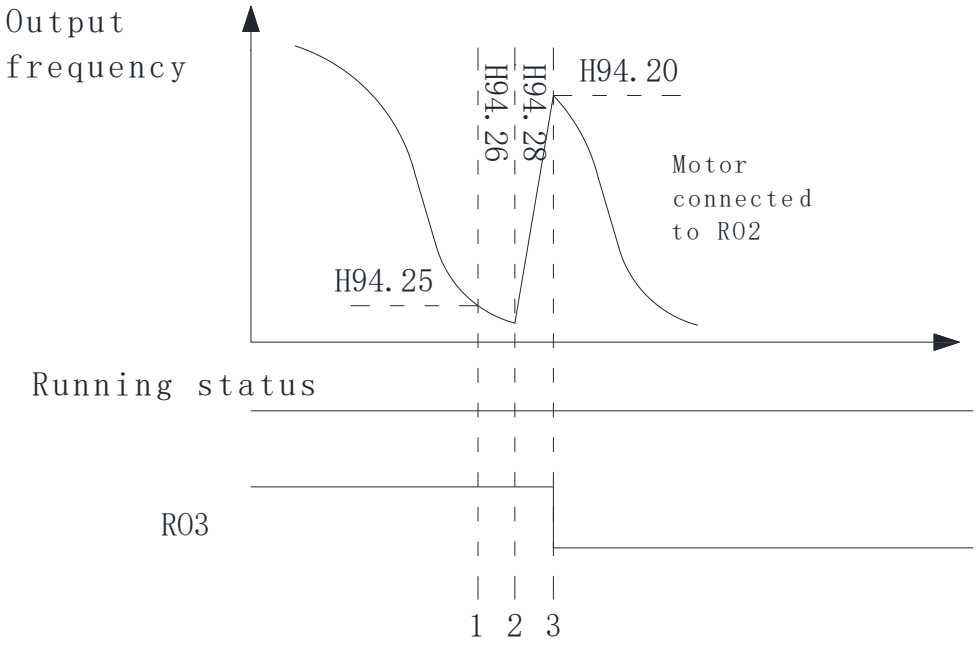


Figure 3.2-2 Timing diagram of the motor reduction

The above diagram assumes an initial state where the inverter output controls motor M2, motor M1 is running at mains frequency, and motor M3 is stopped. If the inverter output frequency is less than or equal to the motor operating frequency [H94.25], and the PID1 feedback value > (PID1 setpoint - motor pressure tolerance [H94.24]), and this duration exceeds the motor reduction delay [H94.26], the motor reduction function is triggered. Two options for the motor reduction action are provided, set via the inverter motor action selection function [H94.27].

【H94.27】=1

The inverter will reduce the motor acceleration time by 【H94.28】 and increase the output frequency to 【H94.20】 plus the motor operating frequency. After the motor acceleration is complete, the relay corresponding to the mains frequency running motor will be disconnected.

【H94.27】=0

The mains frequency running M1 motor will be directly disconnected, and the frequency of the inverter motor will be adjusted by PID control to achieve the given water pressure.

The relay operation logic during the motor reduction process is shown in the table below:

Table 3.2-1 -- Circulating Variable Frequency Motor Action Logic

R02	R03	R04	Motor-**M1**	Motor- **M2**	Motor- **M3**
1	1	1	power frequency	power frequency	frequency conversion
0	1	1	Stop	power frequency	frequency conversion
0	0	1	Stop	Stop	frequency conversion
0	0	0	Stop	Stop	frequency conversion

The relevant function codes for adding or subtracting motors are as follows：

Function code	Name	Description	Setting
H94.19	Add motor pressure tolerance	0.0 ～ 30.0%（relative to the maximum value of PID1）	5.0%
H94.20	Increase motor operating frequency	H94.25（Reduce motor operating frequency）～ H00.03	50.00Hz
H94.21	Add motor delay time	0.0～3600.0s	10.0s
H94.22	Add frequency conversion motor switching frequency	H00.05（Lower limit frequency）～ H00.03	50.00Hz
H94.23	When machining a variable frequency motor, the deceleration time of the variable frequency motor.	0.0 ～ 300.0s	10.0s
H94.24	Reduce motor pressure tolerance	0.0 ～ 30.0%（relative to the maximum value of PID1）	4.0%
H94.25	Reduce motor operating frequency	H00.05 ～ H94.20（Increase motor operating frequency）	5.00Hz
H94.26	Reduce motor delay time	0.0 ～ 3600.0s	10.0s
H94.27	Selecting the operation of the variable frequency motor when reducing the motor speed	0：Frequency unchanged 1：Accelerate to increase motor operating frequency	1
H94.28	Acceleration time of variable frequency motor when reducing motor speed	0.0 ～ 300.0s	10.0s

3.3、Polling function

※、Automatic rotation

This frequency converter supports automatic pump rotation. The automatic switching function has two main purposes: first, to keep the running time of each pump the same over time, thereby balancing the mechanical losses of different motors; and second, to prevent any pump from stopping for too long, which could lead to blockage.

When the initial motor running time exceeds the [H94.34] variable frequency motor cycle period, and the current frequency is greater than the [H94.35] cycle running frequency threshold, the frequency converter will start automatic cycle, changing the motor object controlled by the frequency converter through two actions: adding and subtracting motors, and then recalculating the cycle time.

Note: During normal PID control, the addition or subtraction of the motor will also cause the system to recalculate the cycle time.

The function codes are as follows:

Function code	Name	Description	Default	Revise
H94.34	Motor cycle	0.0～6000.0h Automatic rotation between idle variable frequency motors. If set to 0, this is disabled.	0.0h	☆
H94.35	Cyclic operation frequency threshold	H00.05～H00.03 When the operating frequency is greater than this value, the variable frequency motor will not be rotated to avoid large water pressure fluctuations affecting the water supply.	45.00Hz	☆

※、Manual cycle

The manual rotation function is used for testing to verify the correctness of the main circuit and control wiring, and whether the motor can operate normally. After rotation is completed or interrupted, a stop command needs to be given before it can be restarted and enter rotation mode again.

The function is implemented as follows: When the inverter is stopped, the X digital terminal input function selection is set to 85: Manual Cycling, and this terminal function is enabled, while a start command is issued. The inverter starts each connected motor in a cyclical manner, starting from motor M1. During the cyclical process, all motors will start sequentially in an add-motor manner. After all motors are started, the inverter will automatically reduce the number of motors sequentially in a decremental manner until the process ends.

Note: During the polling process, if the enable signal for the corresponding X terminal is canceled, the polling will continue until the end. If it is necessary to stop midway, a stop signal needs to be triggered.

3.4、Water pump maintenance mode

Users can configure the X digital input terminal function, setting it to 104-106 to lock the corresponding motors M1-M3. In this case, the corresponding motor will no longer participate in multi-pump control. Users do not need to adjust the existing wiring method; they only need to disconnect the contactors connecting the motor and the power grid to perform water pump maintenance.

3.5、Smooth switching function

Switching from a variable frequency pump to a fixed frequency pump can cause significant fluctuations in water pressure. A switching frequency of [H94.22] can be set so that the variable frequency drive operates at a higher switching frequency before switching to fixed frequency, preventing a rapid drop in water pressure and ensuring faster stabilization.

The corresponding function codes are as follows:

Function code	Name	Description	Default	Revise
H94.22	Add frequency conversion motor switching frequency	H00.05（Lower limit frequency）～H00.03	50.00Hz	☆

3.6、Fixed frequency conversion function

The control logic of a fixed frequency converter is relatively simple and will not be discussed in detail here. Taking a 1-to-3 fixed frequency converter as an example, the parameters that need to be set are:

1、Enable multi-pump control function (H94.00=1)

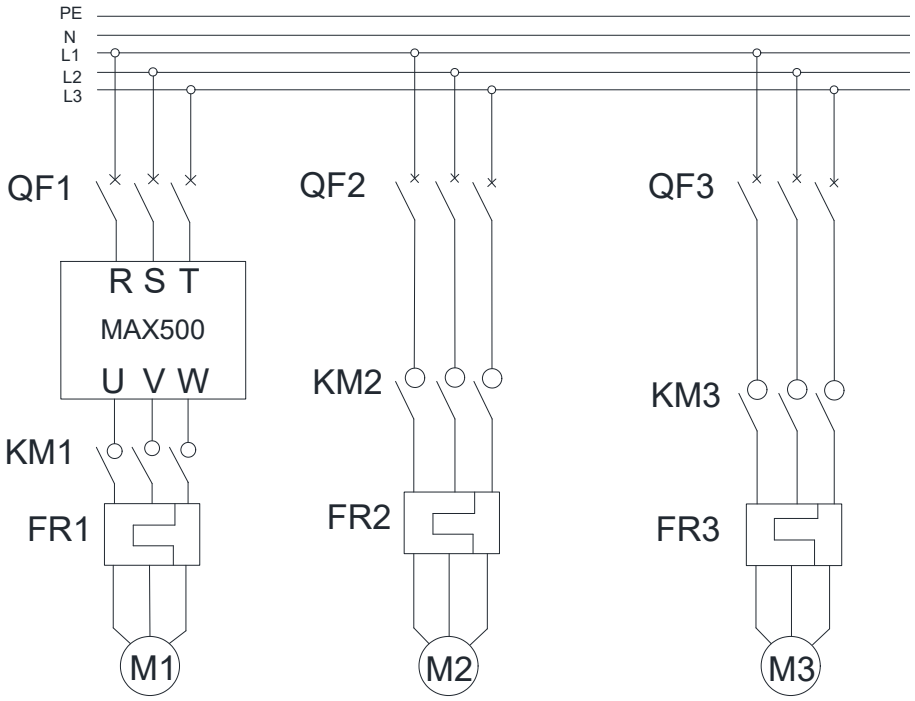
2、Set the variable frequency motor to a fixed variable frequency motor (H94.10=0).

3、Set the total number of motors to 3 (H94.11=3)

4、Set RO2 to RO4 to control variable frequency circulating pumps A, B, C, (H06.04, H26.04, H26.11) to 57 to 59 respectively.

5、Set the contactor closing delay, i.e., the interval between switching between frequency converter and mains frequency operation.

The control logic is shown in the following diagram and table：



KM1～KM3：contactor　　QF1～QF3:breaker

FR1～FR3：Thermal overload relay　　M1～M3：asynchronous motor

Figure 3.6-1 Fixed frequency converter main circuit wiring diagram

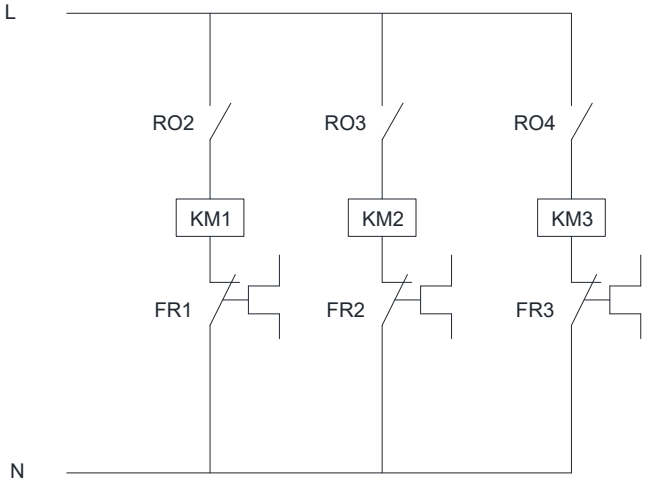


Figure3.6-2 Wiring diagram of fixed frequency converter control circuit

Table 3.6-1 Fixed Variable Frequency Drive with Motor Operation Logic

RO5	RO6	RO7	Motor-M1	Motor- M2	Motor- M3
0	0	0	Stop	Stop	Stop
1	0	0	frequency conversion	Stop	Stop
1	1	0	frequency conversion	power frequency	Stop
1	1	1	frequency conversion	power frequency	power frequency

Table 3.6-2 Fixed Variable Frequency Motor Operation Logic

RO5	RO6	RO7	Motor-M1	Motor- M2	Motor- M3
1	1	1	frequency conversion	power frequency	power frequency
1	1	0	frequency conversion	power frequency	Stop
1	0	0	frequency conversion	Stop	Stop
0	0	0	Stop	Stop	Stop

3.7、PID function specifically for water supply

This frequency converter provides two sets of dedicated PID controllers for water supply use. HVAC-related function PID settings must be configured using these two sets of PID controllers.

PID1 will be used as an example below.

The units for PID1 setpoint and PID1 feedback in water supply PID1 can be set via function code [H90.00]. PID1 can be set to PID source 1 [H90.06] and [H90.08], and PID source 2 [H90.11] and [H90.13], each with its own setpoint and feedback. [H90.16] represents the combination of PID source 1 and source 2.

The PID1 setpoint and PID1 feedback can be set to actual water pressure values instead of percentages. Function code [H90.01] sets the decimal places for parameters such as the PID1 setpoint and PID1 feedback. Function code [H90.02] sets the actual water pressure value corresponding to 100% of the PID1 setpoint. Function codes [H90.03] and [H90.04] set the upper and lower limits of the actual PID1 setpoint value. Generally, function codes [H90.02] and [H90.03] are set to the same value. Function codes [H89.09] and [H89.10] can be used to view the percentages of the PID1 setpoint and PID1 feedback.

Note: The difference between PID2 and PID1 is that PID2 cannot participate in adjusting the operating frequency. It can only convert the output of PID2 into an analog signal for external use by setting the AO function (set value: 32).

Please refer to the H90 PID1 control group and H91 PID2 control group for relevant function codes.

3.8、Automatic sleep function

Select the sleep mode according to [H94.01]. When the conditions of [H94.02] or [H94.03] are met and the condition is maintained for the time specified in [H94.04], the PID controller increases the sleep PID boost value by [H94.05] and continues for the PID boost time specified in [H94.06], at which point the inverter enters sleep mode. After the sleep wake-up conditions of [H94.08] are met for the sleep wake-up time specified in [H94.09], the inverter automatically wakes up and runs directly at the sleep wake-up frequency specified in [H94.07], and is then

subject to PID control.

The relevant function codes are as follows:

Function code	Name	Description	Default	Revise
H94.00	HVAC function selection	0: Invalid 1: Valid	0	★
H94.01	Sleep mode selection	0: Terminal sleep mode only 1: Automatic sleep mode based on operating frequency 2: Automatic sleep mode based on deviation	0	☆
H94.02	Sleep start frequency	H00.05～H00.04（Upper limit frequency) Sleep is allowed only when the operating frequency is less than or equal to this value and the duration is greater than H94.04.	5.00Hz	☆
H94.03	Sleep start deviation	0.0～30.0% (relative to the maximum value of PID1) When the output characteristic is positive, sleep mode is allowed only when the feedback is greater than the given value, the absolute value of the actual deviation is greater than this value, and the duration is greater than H94.04. When the output characteristic is negative, sleep mode is allowed only when the feedback is less than the given value, the absolute value of the actual deviation is greater than this value, and the duration is greater than H94.04.	5.0%	☆
H94.04	Sleep entry delay time	0.0～3600.0s	60.0s	☆
H94.05	PID1 Given a boost value	-100.0～100.0%（Relative to the given value of PID1）	10.0%	☆
H94.06	Maximum improvement time	0.000～6000.0s Used to avoid the situation where the frequency converter continues to operate when the operating frequency reaches the upper limit frequency and the feedback value cannot reach the set value after the increase. At this time, the frequency converter will immediately enter sleep mode after the increase time.	10.0s	☆
H94.07	Sleep wake-up frequency	H00.05～H00.04（Upper limit frequency） In a closed-loop PID controller, the PID output value upon wake-up is directly superimposed from the value corresponding to that frequency.	5.00Hz	☆
H94.08	Sleep wake-up deviation	0.0～30.0%（Relative to PID1 maximum value） Under closed-loop PID, when the output characteristic is positive and the feedback is less than the given value, Wake up is only allowed when the actual deviation absolute value is greater than this value and the duration is greater than H94.09. When the output characteristic is negative, wake-up is only allowed when the feedback is greater than the given value, the actual deviation absolute value is greater than this value, and the duration is greater than H94.09.	5.0%	☆

H94.09	Sleep wake-up delay time	0.0～3600.0s	Minimum sleep time	5.0s	☆

3.9、Pump cleaning function

The water pump cleaning process is shown in the figure below: the motor first runs forward for a period of time, then stops for a period of time, then reverses for a period of time, and finally stops for a period of time before running forward again, and so on.

Similar to the manual cycle function, the pump cleaning function can only be triggered when the inverter is stopped. Setting the X terminal function selection to 86, enabling the terminal, and then sending a start signal will activate the pump cleaning function.

After the pump cleaning process starts, all water pumps will be cleaned sequentially. Once all pumps have been cleaned, the frequency converter will automatically stop. The pump cleaning process can be interrupted at any time using a stop command. If pump cleaning needs to be performed again after completion or interruption, a stop command must be given.

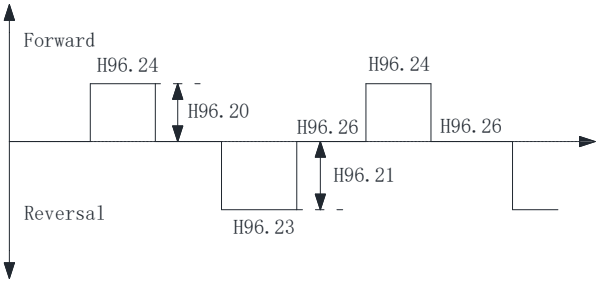


Figure 3.9-1 Pump cleaning logic diagram

The relevant function codes are as follows:

Function code	Name	Description	Default	Revise
H96.20	Pump cleaning forward rotation frequency	H00.05 ～ H00.03	50Hz	★
H96.21	Pump cleaning reverse frequency	H00.05 ～ H00.03	30Hz	★
H96.22	Pump cleaning acceleration time	0～3600.0s	10.0s	☆
H96.23	Pump cleaning deceleration time	0～3600.0s	10.0s	☆
H96.24	Pump cleaning forward rotation time	1.0s～1000.0s	5.0s	☆
H96.25	Pump cleaning reverse time	1.0s～1000.0s	5.0s	☆
H96.26	Pump cleaning forward and reverse rotation interval	1.0s～1000.0s	1.0s	☆
H96.27	Pump cleaning forward and reverse rotation cycles number	1～100	1	★

3.10、Water pipe burst detection function

This function can detect water pipe ruptures and promptly shut down the system to minimize losses. The function works as follows: Set [H96.00] to 1 to activate this function. If a water pipe ruptures and the water pressure consistently fails to reach the set value, the inverter's operating frequency will rise to the upper limit frequency or the PID output upper limit frequency.

The percentage exceeding the upper limit value, set via [H96.01], serves as the detection limit. Simultaneously, if the duration reaches the set value for the water pipe rupture detection time ([H96.02]), the system will shut down.。

The relevant function codes are as follows:

Function code	Name	Description	Default	Revise
H96.00	Water pipe burst action selection	0: Normal operation 1: Shutdown	0	☆
H96.01	Water pipe rupture detection level	When a water pipe bursts, the inverter's operating frequency will rise to its upper limit frequency or the PID output upper limit frequency. Setting it to 0 disables the water pipe burst function. Range: 0.0～100.0%	10.0%	☆
H96.02	Water pipe rupture detection time	Determining the continuous detection time range for water pipe rupture： 0.0～6000.0s	120.0s	☆

3.11、Water pipe soft filling function

In water supply systems, rapid water flow into empty pipes can cause water hammer, damaging pipes or valves. Enabling the soft-fill function ensures the inverter slowly and steadily fills the pipes upon startup, preventing water hammer. If the filling process stops due to a malfunction, the inverter will resume operation according to this function setting upon restarting.

The function is implemented as follows: Setting [H96.03] to 1 enables the soft-fill function. After starting the inverter, the motor exits the soft-fill process and frequency control is taken over by the PID controller after either of the following two conditions is met:

Condition 1: Running at the soft-fill given frequency [H96.04] for a duration equal to the soft-fill given frequency duration [H96.05].

Condition 2: The PID feedback value reaches the soft-fill cutoff level [H96.06].

The function codes are as follows:

Function code	Name	Description	Default	Revise
H96.03	Water pipe soft filling function selection	0: Disable 1: Enable	0	☆
H96.04	Soft fill given frequency	0.00～H00.03	30.00Hz	☆
H96.05	Soft fill for a given frequency duration	0.0～6000.0s	10.0s	☆
H96.06	Soft filler cutoff detection level	The PID function is effective when the detected feedback value is greater than this value. Range: 0.0～100.0%.	30.0%	☆

3.12、Frost protection function

At low temperatures, water freezing in the pipes can damage the water pump. With the frost protection function activated, if the ambient temperature falls below a certain set threshold, the motor will automatically rotate to prevent water freezing. This inverter has built-in AI/AO temperature measurement functionality and supports PT100, PT1000, and KTY84. During use, select current-type output for AO2 (jump to current I position), connect one end of the

temperature resistor to AI1/AO2, and the other end to GND. [H89.32] displays the temperature; when the range is exceeded, the temperature display shows 0 degrees Celsius.

When frost protection [H96.10] is enabled, if the measured temperature [H89.32] is lower than the frost protection threshold [H96.12], the frost protection signal is activated, and the inverter will operate at the frost protection frequency [H96.14]. If the inverter is already running, this signal is ignored. When protection is activated, if a run command is received, the frost protection will be discontinued, and the run command will be executed. When protection is activated, if a stop command is received, the motor will stop, and automatic re-enabling will no longer be possible; automatic re-enabling will only occur when the temperature exceeds the protection threshold.

Function code	Name	Description	Default	Revise
H89.32	AIAO Temperature measurement	-20.0～200.0	0	★
H96.10	Frost protection enabled	Frost protection： 0: Disable 1: Enable	0	☆
H96.11	Temperature sensor type	0：invalid 1：PT100 2：PT1000 3：KTY84	0	☆
H96.12	Frost protection threshold	-20.0℃～ 20.0℃	-5.0℃	☆
H96.13	Low temperature warning threshold	-20.0℃～ 20.0℃ When the temperature is below this value, the warning terminal outputs a signal.	0.0℃	☆
H96.14	Frost protection frequency	0～H00.04	0.0Hz	☆

Corresponding fault codes:

Fault Codes	Fault type	Possible reasons	Corrective measures
FrOST	Frost failure	Temperature below frost protection level	Check temperature

3.13、Condensation protection function

For motors in humid or cold environments, condensation can cause malfunctions. This risk can be eliminated by simply increasing the motor's surface temperature during downtime. When an external condensation sensor detects increased condensation, the inverter injects DC current into the motor to raise its surface temperature and prevent condensation.

Function Implementation: Configure the X digital input terminal to 91 to activate the condensation protection function. When an external signal enables this terminal, the inverter sends DC current, which automatically stops after 40 seconds. To re-trigger this function, the terminal must be re-enabled. The DC current ratio can be adjusted by setting [H96.15].

The corresponding function codes are as follows:

Function code	Name	Description	Default	Revise
H96.15	Condensation protection current	0.0～100.0%	30.0%	☆

Chapter 8 Communication protocol

The inverter provides RS485 communication interface and supports Modbus communication protocol. The user can realize centralized control through a computer or PLC, set the operation command of the inverter through this communication protocol, modify or read the function code parameters, and read the working status and fault information of the inverter, etc。

1. Agreement

The serial communication protocol defines the content and format of information transmitted in serial communication. It includes: host polling (or broadcast) format; host encoding method, including: function codes for required actions, transmission data and error checking, etc. The response of the slave machine also adopts the same structure, including: action confirmation, return data and error checking, etc. If the slave machine makes an error when receiving information, or cannot complete the action required by the host machine, it will organize a fault message as a response and feed it back to the host machine.

1. Application method

The inverter is connected to the "single master and multiple slaves" PC/PLC control network with RS485 bus as a communication slave.

2. Bus structure

A. Hardware interface

An RS485 expansion card needs to be inserted into the inverter.

B. Topology Single-master multi-slave system. Each communication device in the network has a unique slave address, and one of the devices acts as a communication host (usually a flat PC upper computer, PLC, HMI, etc.), actively initiates communication, and performs parameter read or write operations on the slave. Other devices are communication slaves, responding to inquiries or communication operations from the host to the machine. Only one device can send data at a time, while other devices are receiving.

The setting range of the slave address is 1~247. The slave address must be unique in the network.

C.Communication transmission method

Asynchronous serial, half-duplex transmission mode. In the process of serial asynchronous communication, the data is sent one frame at a time in the form of a message. According to the MODBUS-RTU protocol, when the idle time of no data on the communication data line is greater than the transmission time of 3.5Byte, it means a new one. Start of communication frame.

The built-in communication protocol of the inverter is the Modbus-RTU slave communication protocol, which can respond to the "query/command" of the host, or make corresponding actions according to the "query/command" of the host, and respond with communication data.

The host can refer to a personal computer (PC), industrial control equipment or a programmable logic controller (PLC), etc. The host can not only communicate with a slave independently, but also issue broadcast information to all lower slaves. For the individual access "query/command" of the host, the accessed slave must return a response frame; for the broadcast information sent by the host, the slave does not need to feedback the response to the host。

2. Communication Data Structure

The Modbus-RTU protocol communication of the inverter only supports the reading or writing of Word type parameters, and the corresponding communication reading operation command is 0x03; the writing operation command is 0x06, which does not support byte or bit reading and writing operations:

Theoretically, the upper computer can read several consecutive function codes at a time (that is, n can be up to 12), but be careful not to cross the last function code of this function code group, otherwise an error will be answered.

If the slave detects a communication frame error, or the read and write fails due to other reasons, it will reply with an error frame.

Slave read response error frame

Data frame field description：

Frame header START	Idle for more than 3.5 character transfer times
Slave address ADR	Communication address range: 1 ~ 247；
Command code CMD	03： Read slave parameters; 06: Write slave parameters
Function code address H	The parameter address inside the inverter, expressed in hexadecimal; divided into functional code type and non-functional code type (such as running status parameters, running commands, etc.) parameters, etc., see the address definition for details; byte after.
Function code address L	
Number of function codes H	The number of function codes read in this frame, if it is 1, it means read 1 function code. When transmitting, the high byte comes first and the low byte follows. This protocol can only rewrite one function code at a time, without this field
Number of function codes L	
Data H	Response data, or data to be written, when transmitting, the high byte comes first and the low byte follows。
Data L	
CRC CHK low bit	Detection value: CRC16 check value. When transmitting, the low byte comes first and the high byte follows. For the calculation method, please refer to the description of CRC check in this section。
CRC CHK high bit	
END	3.5 characters

CRC check method:

CRC (Cyclical Redundancy Check) uses the RTU frame format, and the message includes an error detection field based on the CRC method. The CRC field checks the content of the entire message. The CRC field is two bytes and contains a 16-bit binary value. It is calculated by the transmitting device and added to the message. The receiving device recalculates the CRC of the received message and compares it with the value in the

received CRC field. If the two CRC values are not equal, it means that there is an error in the transmission.

The CRC is to store 0xFFFF first, and then call a process to process the continuous 8-bit bytes in the message with the value in the current register. Only the 8Bit data in each character is valid for CRC, and the start and stop bits and parity bits are invalid.

During CRC generation, each 8-bit character is exclusive-ored (XOR) with the contents of the register, and the result moves toward the least significant bit, and the most significant bit is filled with 0. The LSB is extracted and detected. If the LSB is 1, the exclusive OR of the register and the preset value is performed separately. If the LSB is 0, no processing is performed. The whole process is repeated 8 times. After the last bit (bit 8) is complete, the next octet is individually XORed with the current value of the register. The value in the final register is the CRC value after all bytes in the message have been executed.

When the CRC is added to the message, the low byte is added first, followed by the high byte. The simple function of CRC is as follows：

```
unsigned int crc_chk_value（unsigned char *data_value,unsigned char length）{
                unsigned int crc_value=0xFFFF;
                int i;
                while（length--）                    {
                        crc_value^=*data_value++;
                        for（i=0;i<8;i++）                    {
                                if（crc_value&0x0001）
        {
                                        crc_value=（crc_value>>1）
^0xa001
                                }
                                else
                                {
                                 crc_value=（crc_value>>1）
                                 }
                        }
                }
                return（crc_value）;
}
```

Address definitions for communication parameters

Read and write function code parameters (some function codes cannot be changed and are only used by the manufacturer or monitored）：

3. Function code parameter address read and write rules

The function code address occupies two bytes, with the high byte in front and the low byte in the back. The range of high and low bytes are: high byte - 00 ~ FFH; low byte - 00 ~ FFH. The high byte is the group number before the function code point number, and the low byte is the number after the function code point number, but both must be converted into hexadecimal.

For example, H05.06, the group number before the function code point number is 05, then the high bit of the parameter address is 05, and the number after the function code point number is 06, then the low bit of the parameter address is 06, and the hexadecimal representation of the function code address is 0506H. For example, the parameter address of the function code H10.01 is 0A01H.

Note:

※1. Some parameters cannot be changed when the inverter is in operation; some parameters cannot be changed regardless of the inverter state; when changing the function parameters, pay attention to the parameter setting range, unit and related instructions.

※2. Since EEPROM is frequently stored, the service life of EEPROM will be reduced. For users, some function codes do not need to be stored in the communication mode, and only the value in the on-chip RAM needs to be changed to meet the use requirements. To achieve this function, just change the highest bit of the corresponding function code address from 0 to 1.

For example: function code H00.07 is not stored in EEPROM, only the value in RAM is modified, and the address can be set to 8007H. This address can only be used when writing to the on-chip RAM, and cannot be used for reading. If it is read, it will be an invalid address.

4. Address description for other functions：

In addition to modifying the parameters of the VFD, the master can also control the VFD, such as starting and stopping it, and monitoring the operation status of the VFD.

Function	Address	Data description	R/W
Communication-based control command	2000H	0001H: Run forward	R/W
		0002H: Run reversely	
		0003H: Jog forward	
		0004H: Jog reversely	
		0005H: Stop	
		0006H: Coast to stop	
		0007H: Fault reset	
		0008H: Stop jogging	
Communication-based setting address	2001H	Communication-based frequency setting (0–Fmax; unit: 0.01 Hz)	R/W
	2002H	PID reference (0–1000, in which 1000 corresponds to 100.0%)	
	2003H	PID feedback (0–1000, in which 1000 corresponds to 100.0%)	R/W
	2004H	Torque setting (-3000–3000, in which 1000 corresponds to 100.0% of the motor rated current)	R/W
	2005H	Upper limit setting of forward running frequency (0–Fmax; unit: 0.01 Hz)	R/W
	2006H	Upper limit setting of reverse running frequency (0–Fmax; unit: 0.01 Hz)	R/W
	2007H	Electromotive torque upper limit (0–3000, in which 1000 corresponds to 100.0% of the motor rated current)	R/W
	2008H	Braking torque upper limit. (0–3000, in which 1000 corresponds to 100.0% of the VFD rated current)	R/W
	2009H	Special CW Bit0–1=00: Motor 1 =01: Motor 2 Bit2=1 Enable speed/torque control switchover	R/W

Function	Address	Data description	R/W
		=0: Disable speed/torque control switchover Bit3=1 Clear electricity consumption data =0: Keep electricity consumption data Bit4=1 Enable pre-excitation =0: Disable pre-excitation Bit5=1 Enable DC braking =0: Disable DC braking	
	200AH	Virtual input terminal command (0x000–0x3FF) (Corresponding to S8/S7/S6/S5/Reserved/HDIA/S4/ S3/ S2/S1)	R/W
	200BH	Virtual output terminal command (0x00–0x0F) Corresponding to local RO2/RO1/HDO/Y1	R/W
	200CH	Voltage setting (used when V/F separation is implemented) (0–1000, 1000 corresponding to 100.0% of the motor rated voltage)	R/W
	200DH	AO setting 1 (-1000–+1000, in which 1000 corresponding to 100.0%)	R/W
	200EH	AO setting 2 (-1000–+1000, in which 1000 corresponding to 100.0%)	R/W

VFD status word 1	2100H	0001H: Forward running	R
		0002H: Reverse running	
		0003H: Stopped	
		0004H: VFD in fault	
		0005H: POFF	
		0006H: Pre-exciting	
VFD status word 2	2101H	Bit0=0: Not ready to run =1: Ready to run Bit1–2=00: Motor 1 =01: Motor 2 Bit3=0: Asynchronous motor =1: Synchronous motor Bit4=0: No overload pre-alarm =1: Overload pre-alarm Bit5–Bit6=00: Keypad-based control =01: Terminal-based control =10: Communication-based control Bit7: Reserved Bit8=0: Speed control =1: Torque control Bit9=0: Non position control =1: Position control	R

Function	Address	Data description		R/W
		Bit10–Bit11: =0: Vector 0 =1: Vector 1 =2: Closed-loop vector = 3: Space voltage vector		
VFD fault code	2102H	See the description of fault types.		R
VFD identification code	2103H	GD270-----0x01c0		R
Running frequency	3000H	0–Fmax (Unit: 0.01Hz)	Compatible with CHF100A and CHV100 communication addresses	R
Set frequency	3001H	0–Fmax (Unit: 0.01Hz)		R
Bus voltage	3002H	0.0–2000.0V (Unit: 0.1V)		R
Output voltage	3003H	0–1200V (Unit: 1V)		R
Output current	3004H	0.0–3000.0A (Unit: 0.1A)		R
Rotational speed	3005H	0–65535 (Unit: 1RPM)		R
Output power	3006H	-300.0–300.0% (Unit: 0.1%)		R
Output torque	3007H	-250.0–250.0% (Unit: 0.1%)		R
Closed-loop setting	3008H	-100.0–100.0% (Unit: 0.1%)		R
Closed-loop feedback	3009H	-100.0–100.0% (Unit: 0.1%)		R
Input status	300AH	000–3F Corresponding to the local Reserved/HDIA/S4/S3/S2/S1		R
Output status	300BH	000–0F Corresponding to local RO2/RO1/HDO/Y1		R
Analog input 1	300CH	0.00–10.00V (Unit: 0.01V)		R
Analog input 2	300DH	0.00–10.00V (Unit: 0.01V)		R
Analog input 3	300EH	-10.00–10.00V (Unit: 0.01V)		R
Analog input 4	300FH			R
Read input of HDIA high-speed pulse	3010H	0.00–50.00kHz (Unit: 0.01Hz)		R
Reserved	3011H			R
Read the actual step of multi-step speed	3012H	0–15		R
External length value	3013H	0–65535		R
External counting value	3014H	0–65535		R
Torque setting	3015H	-300.0–300.0% (Unit: 0.1%)		R
VFD identification code	3016H			R
Fault code	5000H			R

Chapter 9 Faults and Countermeasures

1. Fault alarm and countermeasures

If a fault occurs during the operation of the inverter, the inverter will immediately protect the motor and stop output. At the same time, the inverter fault relay contacts will be activated and the fault code will be displayed on the inverter display panel. Before seeking service, users can first perform self-checks according to the prompts in this section and analyze the cause of the fault. If the fault cannot be eliminated, please seek technical support from our company or product agents.

2. Note: The numbers marked in the fault type column, such as [1], [2], [3], etc., are the inverter fault type codes read through communication (the fault address is 2102H).

Fault code	Fault type	Possible cause	Solution
OUt1	[1] Inverter unit U-phase protection	ACC too fast. IGBT module is damaged. Misoperation caused by interference. Drive wires connected poorly. To-ground short circuit occurred.	Increase ACC time. Replace the power unit. Check drive wires. Check whether there is strong interference surrounding the peripheral device.
OUt2	[2] Inverter unit V-phase protection		
OUt3	[3] Inverter unit W-phase protection		
OV1	[7] Overvoltage during ACC	DEC time too short. Input voltage exception. Large energy feedback. No braking components. Energy-consumption braking is not enabled.	Check the input power. Check whether load DEC time is too short or the motor starts during rotating. Install dynamic braking components. Check the settings of related function codes.
OV2	[8] Overvoltage during DEC		
OV3	[9] Overvoltage during constant speed running		
UV	[10] Bus undervoltage	Grid voltage too low. The overvoltage stall protection is not enabled.	Check the grid input power. Check the settings of related function codes.

Fault code	Fault type	Possible cause	Solution
OL1	[11] Motor overload	Grid voltage too low. Motor rated current set incorrectly. The motorstall occurs or the load transient is too large.	Check the grid voltage. Reset the rated current of the motor. Check the load and adjust the torque boost quantity.
OL2	[12] VFD overload	ACC too fast. The motor in rotating is restarted. Grid voltage too low. Load is too large. Power is too small.	Increase ACC time. Avoid restart after stop. Check the grid voltage. Select a VFD with larger power. Select a proper motor.
SPI	[13] Phase loss on input side	Phase loss or violent fluctuation occurred on input R, S, T.	Check the input power. Check the installation wiring.
SPO	[14] Phase loss on output side	Phase loss occurred to U, V, W output (or the three phases of motor is asymmetrical).	Check the output wiring. Check the motor and cables.
OH1	[15] Rectifier module overheating	Air duct blocked or fan damaged. Ambient temperature too high. Long-time overload running.	Ventilate the air duct or replace the fan. Lower the ambient temperature.
OH2	[16] Inverter module overheating Fault		
EF	[17] External fault	X external faulty input terminal action.	Check external device input.
CE	[18] RS485 communication fault	Baud rate set improperly. Communication line fault. Incorrect communication address. Communication suffers from strong interference.	Set a proper baud rate. Check the wiring of communication interfaces. Set the communication address correctly. Change or replace the wire or improve the anti-interference capability.
ItE	[19] Current detection fault	Poor contact of the connector of control board. Hall component damaged. Amplification circuit exception.	Check the connector and re-plug. Replace the hall component. Replace the main control board.

Fault code	Fault type	Possible cause	Solution
tE	[20] Motor autotuning fault	Motor capacity does not match with the VFD capacity. This fault may occur if the capacity difference exceeds five power classes. Incorrect motor parameter settings. The parameters gained from autotuning deviate sharply from the standard parameters. Autotuning timeout.	Change the VFD model, or adopt V/F mode for control. Set the proper motor type and nameplate parameters. Empty the motor load and carry out autotuning again. Check the motor wiring and parameter settings. Check whether the upper limit frequency is larger than 2/3 of the rated frequency.
EEP	[21] EEPROM operation fault	Control parameter reading/writing error. EEPROM damaged.	Press “STOP/RESET”to reset Replace the main control board.
PIDE	[22] PID feedback offline fault	PID feedback offline. PID feedback source disappears.	Check PID feedback signal wires. Check PID feedback source.
END	[24] Running time reached	The actual running time of the VFD is longer than the internal set running time.	Ask for the supplier and adjust the set running time.
OL3	[25] Electronic overload fault	The VFD reports overload pre-alarm according to the setting.	Check the load and the overload pre-alarm points.
UPE	[27] Parameter upload error	Keypad cable connected improperly or disconnected. Keypad cable too long, causing strong interference. Keypad or mainboard communication circuit error.	Check for and remove the external interference source. Replace the hardware and seek maintenance services. Replace the hardware and seek maintenance services.
DNE	[28] Parameter download error	Keypad cable connected improperly or disconnected. Keypad cable too long, causing strong interference. Data storage error occurred to the keypad.	Check for and remove the external interference source. Replace the hardware and seek maintenance services. Re-back up the data on the keypad.

Fault code	Fault type	Possible cause	Solution
ETH1	[32] To-ground short-circuit fault 1	VFD output is short connected to the ground. There is a fault in the current detection circuit. Actual motor power setup deviates sharply from the VFD power..	Check whether the motor wiring is normal. Replace the hall component. Replace the main control board. Reset the motor parameters properly.
ETH2	[33] To-ground short-circuit fault 2	VFD output is short connected to the ground. There is a fault in the current detection circuit. Actual motor power setup deviates sharply from the VFD power..	Check whether the motor wiring is normal. Replace the hall component. Replace the main control board. Reset the motor parameters properly.
dEu	[34] Speed deviation fault	The load is too heavy or stalled.	Check and ensure the load is proper, and increase the detection time. Check whether the control parameters are set properly.
STo	[35] Mal-adjustment fault	Incorrect SM control parameter settings. Autotuned parameters are not accurate. The VFD is not connected to the motor.	Check the load and ensure the load is normal. Check whether control parameters are set correctly. Increase the mal-adjustment detection time.
LL	[36] Electronic underload fault	The VFD reports underload pre-alarm according to the setting.	Check the load and the underload pre-alarm points.
OT	[59] Motor overtemperature fault	Motor overtemperature input terminal is valid. The temperature detection resistance is abnormal. Long-time overload running or exception occurred.	Check the wiring of the motor overtemperature input terminal (terminal function 57). Check whether the temperature sensor is proper. Check the motor, and perform maintenance on the motor.
E-Err	[55] Duplicate expansion card type	The two inserted expansion cards are of the same type.	You should not insert two cards with the same type. Check the type of expansion card, and Remove one card after power-off.

Fault code	Fault type	Possible cause	Solution
F1-Er	[60] Failed to identify the expansion card at card slot 1	There is data transmission in interfaces of card slot 1, however, it cannot read the card type.	Check whether the expansion card at this slot is supported. Stabilize the expansion card interfaces after power-off, and check whether the fault persists at next power-on. Check whether the insertion port is damaged, if yes, replace the insertion port after power-off.
F2-Er	[61] Failed to identify the expansion card at card slot 2	There is data transmission in interfaces of card slot 2, however, it cannot read the card type.	Check whether the expansion card at this slot is supported. Stabilize the expansion card interfaces after power-off, and check whether the fault persists at next power-on. Check whether the insertion port is damaged, if yes, replace the insertion port after power-off.
C1-Er	[63] Communication timeout of expansion card at card slot 1	There is no data transmission in interfaces of card slot 1.	Check whether the expansion card at this slot is supported. Stabilize the expansion card interfaces after power-off, and check whether the fault persists at next power-on. Check whether the insertion port is damaged, if yes, replace the insertion port after power-off.
C2-Er	[64] Communication timeout of expansion card at card slot 2	There is no data transmission in interfaces of card slot 2.	Check whether the expansion card at this slot is supported. Stabilize the expansion card interfaces after power-off, and check whether the fault persists at next power-on. Check whether the insertion port is damaged, if yes, replace the insertion port after power-off.

Fault code	Fault type	Possible cause	Solution
E-DP	[29] PROFIBUS card communication timeout fault	There is no data transmission between the communication card and the host computer (or PLC).	Check whether the communication card wiring is loose or dropped.
E-NET	[30] Ethernet card communication timeout fault	There is no data transmission between the communication card and the host computer.	Check whether the communication card wiring is loose or dropped.
E-CAN	[31] CANopen card communication timeout fault	There is no data transmission between the communication card and the host computer (or PLC).	Check whether the communication card wiring is loose or dropped.
E-PN	[57] PROFINET card communication timeout fault	There is no data transmission between the communication card and the host computer (or PLC).	Check whether the communication card wiring is loose or dropped.
E-CAT	[66] EtherCAT card communication timeout fault	There is no data transmission between the communication card and the host computer (or PLC).	Check whether the communication card wiring is loose or dropped.
E-BAC	[67] BACNet card communication timeout fault	There is no data transmission between the communication card and the host computer (or PLC).	Check whether the communication card wiring is loose or dropped.
E-DEV	[68] DeviceNet card communication timeout fault	There is no data transmission between the communication card and the host computer (or PLC).	Check whether the communication card wiring is loose or dropped.

Fault code	Fault type	Possible cause	Solution
ESCAN	[58] CAN master/slave card communication timeout fault	There is no data transmission between the CAN master and slave communication cards.	Check whether the communication card wiring is loose or dropped.
S-Err	[69] CAN slave fault in master/slave synchronization	Fault occurred to one of the CAN slave VFDs.	Detect the CAN slave VFD and analyze the corresponding fault cause of the VFD.
FrOST	[73] Freezing fault	The temperature is lower than the freezing protection threshold.	Check the temperature.
BLOCK	[74] Stalling fault	The current is greater than the stalling current.	Check for stalling.
Dr	[75] Dry pumping fault	The current is lower than the current limit for motor dry pumping.	Check for dry pumping.
PoFF	System power failure	The system is powered off or the bus voltage is too low.	Check the grid conditions.

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