Users' Manual

SV600 Series

Ver.1.0

SHENZHEN SCOV ELECTRIC TECHNOLOGIES CO., LTD

Foreword

Thank you for purchasing and using SV600 Series frequency inverter.

SV600 series inverter is a general-purpose vector inverter, which is mainly used to control and adjust the speed of three-phase AC asynchronous motor. It adopts space SVPWM vector control technology to achieve high torque output at low speed. With good dynamic characteristics and overload capacity, it can meet the various needs of users.

This series of inverters is suitable for most motor-driven fields, including: textile, papermaking, packaging, food, fans, water pumps and various automatic production equipment. As a speed control device, it has strong load adaptability, stable operation and good reliability.

The manual provides users with relevant precautions such as installation and wiring, parameter setting, operation debugging and daily maintenance. In order to ensure the correct installation and operation of the inverter, please read this manual carefully before use.

If any difficulties or special requirements during the use, please contact the distributors or our company directly, we will serve you wholeheartedly.

Content

1 Safety information and precautions

1.1 Safety precautions

Users should familiar with the manual and other related technical materials and be sure to follow the safety precautions required in this chapter when installing, operating, and maintaining the product. At the same time, you should also know about the mechanical knowledge, safety information, precaution and so on.

In the manual, safety precautions are classified into <Danger> and <Warning> two categories:

DANGER**:** Failure to comply with the notice will result in fire, serious injury or even death.

WARNING**:** Failure to comply with the notice will result in personal injury or devices and property damage, even accidents.

Both marks which used in the manual indicate that there is an important content of safety. Failure to comply with those notices may lead to death, serious injury, damage to the products and related machines and systems. SCOV will assume no liability or responsibility for any injury, damage or loss caused by improper operation.

1.1.1 Safety precautions before installation

DANGER
● To avoid damage expanding and injury, please don't install the frequency inverter if you find water seepage, component missing or damaged. ● Do not install it if the packing list not conform to the product.

WARNING
● Do not touch the components with your hands. Electrostatic may cause damages. ● The withstand voltage test has been done before leaving the factory. The users do not need to perform the test on the inverter again. It may cause damage to the inverter insulation and internal components. ● Do not use the product when the rated value in the nameplate is inconsistent with the order requirements.

1.1.2 Safety precautions for transporting and installation

DANGER
● Install the equipment longitudinally on incombustible objects such as metal, and keep it away from combustible materials. Otherwise it may result in a fire. ● Install the equipment in the place that can bear the weight to avoid danger of injury due to falling. Do not install the equipment in an environment containing explosive gas. It may has danger of explosion.

WARNING

- Lift and handle the inverter gently when carrying, do not hold the front cover with one hand only. It may hurt your feet or damage the inverter if it falls off.
- Prevent conductive objects such as screws and metal shavings from falling into the inverter during installation. It may cause the inverter to malfunction or be damaged.
- Avoid places with harsh environments such as oil mist, dust suspension, vibration, etc. When installing in a cabinet, please ensure that the ambient temperature in the cabinet is within the allowed temperature range of the inverter. Otherwise it may cause the inverter to malfunction or be damaged.

1.1.3 Safety precautions for wiring

DANGER

- Do not perform wiring work expect for electrical construction professionals. Otherwise it has risk of electric shock and fire.
- Before wiring the inverter terminals, you must cut off all power connected to the inverter. The waiting time after the power is cut off is not shorter than the time marked on the inverter. Also ensure the DC voltage between **+1** ~- or **+ 2** ~- is less than 30V. What's more, the inverter must properly regulate the ground wire. Otherwise it has a danger of electric shock.
- Please connect the input power cable and the motor cable correctly. Never connect the input power to the output terminals (U, V, W) of the inverter. Pay attention to the marks on the terminals and do not connect the wrong wires. Otherwise it has risk of damage to the inverter.
- Never connect the braking resistor directly between the DC bus positive terminal +1 or +2 and the negative terminal -. Otherwise it has risk of fire and damage to the inverter.
- The main circuit terminal wiring screws must be tightened well. For the wire diameter, please refer to the recommendations in the manual. Otherwise it has risk of fire and damage to the inverter.
- It is forbidden to connect AC220V voltage level signals to terminals except for the control terminals TA, TB, TC, otherwise is has risk of damage to the inverter.

WARNING

- Ensure that the rated voltage of the inverter is consistent with the voltage of the AC power supply. Otherwise it may cause damage to the inverter.
- The encoder signal line should uses shielded wire, and the single end of the shield layer should reliably grounded. Otherwise it may cause the inverter to malfunction.

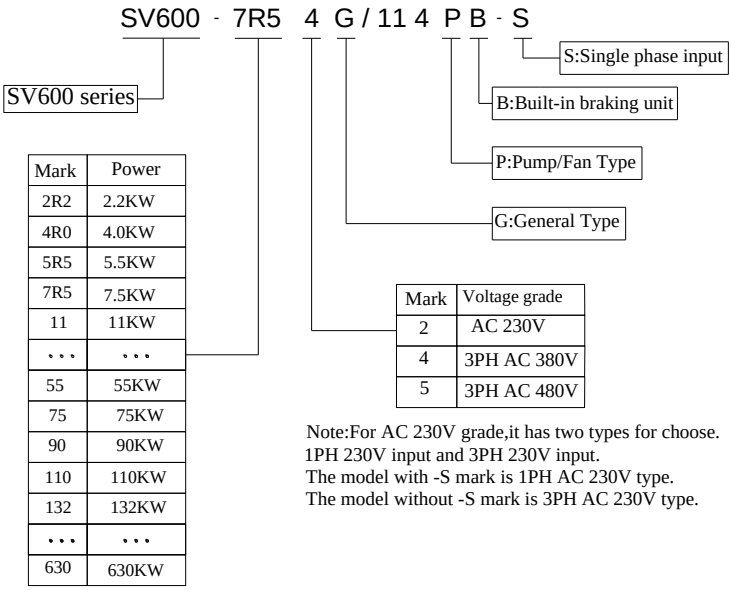
1.1.4 Safety precautions for debugging and operation

DANGER
● Ensure the front cover installed well before connect the input power supply. After power-on, do not open the cover and operate it as there is a high voltage inside. Otherwise it has a danger of electric shock. ● Please ensure the safety and reliability around the motor and mechanical load during motor electric parameters auto-tuning and the inverter operation. Otherwise it has risk of injury. ● Non-professional technicians are prohibited from testing signals during power-on. Otherwise it has risk of electric shock and damage to the inverter. ● Forbidden to repair the motor and mechanical equipment during power-on. Otherwise it has risk of electric shock and personal injury.

WARNING
● Do not touch the fan, radiator or braking resistor directly. May cause mechanical injury and burns. ● Do not use the input contactor on/off frequently to control the start and stop of the frequency inverter. May cause damage to the inverter. ● Check the allowable operating range of the motor and machine before operating as it is very easy for the inverter to drive the motor from low speed to high speed. Otherwise it may cause equipment damage.

2 Product Introduction

2.1 SV600 models introduction



Mark	Power
2R2	2.2KW
4R0	4.0KW
5R5	5.5KW
7R5	7.5KW
11	11KW
···	···
55	55KW
75	75KW
90	90KW
110	110KW
132	132KW
···	···
630	630KW

Mark	Voltage grade
2	AC 230V
4	3PH AC 380V
5	3PH AC 480V

Note:For AC 230V grade,it has two types for choose.
1PH 230V input and 3PH 230V input.
The model with -S mark is 1PH AC 230V type.
The model without -S mark is 3PH AC 230V type.

Fig. 2-1 Model description

2.2 Inverter nameplate

A nameplate indicating the type and rating of the inverter is affixed to the right side of the inverter case. The nameplate example of SV600 series is as follow:

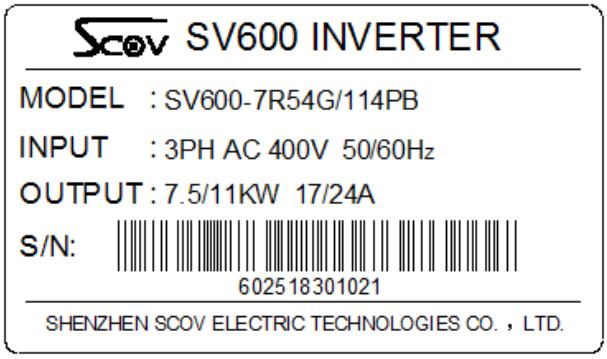


Fig. 2-2 SV600 inverter nameplate

2.3 Product models list

Table 2-1 Models and Specifications for 230V grade

Inverter model	Power supply capacity KVA	Input current A	Rated Output current A	Adapted Motor KW
Single-phase power supply: 230V(-15%~+20%) 50/60 Hz				
SV600-0R752GB-S	1.5	8.2	4.04	0.75
SV600-1R52GB-S	3	14	7.3	1.5
SV600-2R22GB-S	4	23	9.6	2.2
SV600-4R02GB-S	7	33	17	4.0
SV600-5R52GB-S	12	55	24	5.5
SV600-7R52GB-S	15	70	32.5	7.5
SV600-112GB-S	20	95	46	11
SV600-152GB-S	29	130	62.5	15
SV600-18R52G-S	35	160	75.5	18.5
SV600-222G-S	42	190	92.5	22
SV600-302G-S	50	230	111	30
Three phase power supply: 230V(-15%~+20%) 50/60 Hz				
SV600-0R42GB	1.5	3.4	2.5	0.4
SV600-0R752GB	3	5	4.04	0.75
SV600-1R52GB	5.9	10.5	7.3	1.5
SV600-2R22GB	5.9	10.5	10	2.2
SV600-4R02GB	11	20.5	17	4.0
SV600-5R52GB	17	26	24	5.5
SV600-7R52GB	21	35	32.5	7.5
SV600-112GB	30	46.5	46	11
SV600-152GB	40	62	62	15
SV600-18R52G	57	76	76	18.5
SV600-222G	69	92	92	22
SV600-302G	85	113	111	30
SV600-452G	134	180	169	45

Inverter model	Power supply capacity KVA	Input current A	Rated Output current A	Adapted Motor KW
SV600-552G	160	214	210	55
SV600-752G	192	256	246	75
SV600-902G	231	307	300	90
SV600-1102G	243	385	370	110
SV600-1322G	318	468	460	132
SV600-1602G	355	525	510	160
SV600-1852G	396	600	600	185

Table 2-2 Models and Specifications for 380V and 480V grade

Inverter model	Power supply capacity KVA	Output current A		Adapted motor KW	
		G type	P type	G type	P type
Three-phase power supply: 380V(-15%~+20%) 50/60 Hz					
SV600-0R754G/1R54PB	1.5	2.5	4.04	0.75	1.5
SV600-1R54G/2R24PB	3	4.04	5.5	1.5	2.2
SV600-2R24G/4R04PB	4	5.5	10	2.2	4.0
SV600-4R04G/5R54PB	5.9	10	13	4.0	5.5
SV600-5R54G/7R54PB	8.9	13	17	5.5	7.5
SV600-7R54G/114PB	11	17	24	7.5	11
SV600-114G/154PB	17	24	32.5	11	15
SV600-154G/18R54PB	21	32.5	38	15	18.5
SV600-18R54G/224PB	24	38	46	18.5	22
SV600-224G/304PB	30	46	62.5	22	30
SV600-304G/374PB	40	62	75.5	30	37
SV600-374G/454P	57	75.5	92.5	37	45
SV600-454G/554P	69	92.5	111	45	55
SV600-554G/754P	85	111	146	55	75
SV600-754G/904P	114	146	169	75	90
SV600-904G/1104P	134	169	210	90	110
SV600-1104G/1324P	160	210	246	110	132

Inverter model	Power supply capacity KVA	Output current A		Adapted motor KW	
		G type	P type	G type	P type
SV600-1324G/1604P	192	246	300	132	160
SV600-1604G/1854P	200	300	350	160	185
SV600-1854G/2004P	231	350	370	185	200
SV600-2004G/2204P	243	370	415	200	220
SV600-2204G/2504P	273	415	460	220	250
SV600-2504G/2804P	318	460	510	250	280
SV600-2804G/3154P	355	510	600	280	315
SV600-3154G/3554P	396	600	660	315	355
SV600-3554G/4004P	500	660	740	355	400
SV600-4004G/4504P	500	740	820	400	450
SV600-4504G/5004P	565	820	920	450	500
SV600-5004G/5604P	625	920	990	500	560
SV600-5604G/6304P	690	990	1160	560	630
SV600-6304G	770	1160	/	630	/
Three phase power supply: 480V(15%~+15%) 50/60 Hz					
SV600-0R755G/1R55PB	1.5	2.5	4.04	0.75	1.5
SV600-1R55G/2R25PB	3	4.04	5.5	1.5	2.2
SV600-2R25G/4R05PB	4	5.5	10	2.2	4.0
SV600-4R05G/5R55PB	5.9	10	13	4.0	5.5
SV600-5R55G/7R55PB	8.9	13	17	5.5	7.5
SV600-7R55G/115PB	11	17	24	7.5	11
SV600-115G/155PB	17	24	32.5	11	15
SV600-155G/18R55PB	21	32.5	38	15	18.5
SV600-18R55G/225PB	24	38	46	18.5	22
SV600-225G/305PB	30	46	62.5	22	30
SV600-305G/375PB	40	62	75.5	30	37
SV600-375G/455P	57	75.5	92.5	37	45
SV600-455G/555P	69	92.5	111	45	55

Inverter model	Power supply capacity KVA	Output current A		Adapted motor KW	
		G type	P type	G type	P type
SV600-555G/755P	85	111	146	55	75
SV600-755G/905P	114	146	169	75	90
SV600-905G/1105P	134	169	210	90	110
SV600-1105G/1325P	160	210	246	110	132
SV600-1325G/1605P	192	246	300	132	160
SV600-1605G/1855P	200	300	350	160	185
SV600-1855G/2005P	231	350	370	185	200
SV600-2005G/2205P	243	370	415	200	220
SV600-2205G/2505P	273	415	460	220	250
SV600-2505G/2805P	318	460	510	250	280
SV600-2805G/3155P	355	510	600	280	315
SV600-3155G/3555P	396	600	660	315	355
SV600-3555G/4005P	500	660	740	355	400
SV600-4005G/4505P	500	740	820	400	450
SV600-4505G/5005P	565	820	920	450	500
SV600-5005G/5605P	625	920	990	500	560
SV600-5605G/6305P	690	990	1160	560	630
SV600-6305G	770	1160	/	630	/

2.4 Product technical specifications

Item			Specifications
Input	Voltage and frequency		Single phase 230V,50Hz/60Hz Three phase 230V, 50Hz/60Hz Three phase 380V, 50Hz/60Hz Three phase 480V, 50Hz/60Hz
	Allowed volt. range		Single phase 230V:200V~260V; Three phase 230V, 200V~260V; Three phase 380V, 320V~460V; Three phase 480V, 380V~528V;
Output	Voltage		3PH 0～Input voltage
	Frequency		0～300Hz(SVC vector control) 0~3200Hz(V/F control)
	Overload capacity		G type：150% for 1mint, 180% for 3s. P type：120% for 1 mint, 150% for 3s.
Control performance	Control mode		Speed sensorless vector control(SVC) V/F control
	Speed regulation range		1:100(SVC control mode) 1:50(V/F control mode)
	Start-up torque		0.5Hz/150%(SVC control mode) 1.0Hz/150% (V/F control mode)
	Speed stability accuracy		≤±0.5% of rating synchronous speed (SVC)
	Frequency precision		Digital setting：max. frequency*±0.01%；Analog setting:Max. frequency*±0.5%
	Frequency resolution	Analog setting	0.1% of Max. frequency
		Digital setting	The precision less than 100HZ：0.01Hz
		High pulse setting	0.1% of Max. frequency
	Torque boost		Manual torque boost: 0.1～12.0%
	V/F curve		Straight-line V/F curve; Multi-point V/F curve N-power V/F curve (1.2-power, 1.4-power, 1.6-power, 1.8-power, square)
	V/F separation		Complete separation Half separation
	Acceleration/Deceleration curves		Linear and “S” curves acceleration and deceleration for selection Four groups of Acc./Dec. time available.
	Braking	Power consumption braking	The model with “B” mark has built-in braking unit. Install braking resistor between P+ and PB when needed. For model without braking unit, you can add external braking unit and braking resistor.

		DC braking	DC braking frequency: 0.00 Hz to maximum frequency Braking time: 0.0–36.0s Braking action current value: 0.0%–100.0%
	JOG RUN		JOG frequency range: 0.00–50.00 Hz JOG acceleration/deceleration time: 0.0–6500.0s
	Multi-speed		Total 16 speeds can be selected by simple PLC function or the combination of 4 DI terminals.
	PID control		Be convenient to make closed-loop system which used for constant pressure water supply or air compressor.
	Automatic voltage regulate (AVR)		Automatically keep constant output voltage when the power supply voltage changes.
	Automatic current limiting		Automatic current limiting avoids the malfunction of frequent overcurrent causing trip during operation
	Carrier modulation		Modulate carrier automatically based on the characteristic of load.
	Speed tracking		Smoothly restart the rotating motor without overcurrent
Running function	Control command		Keyboard control, terminal control, communication control supported and can be selected by many methods.
	Frequency setting source		Main and auxiliary frequency setting, analog, high pulse input, communication setting and so on. Those frequency setting sources also can be switched over by terminals DI or keys on the keyboard.
	Binding function		The control command and frequency setting source can be bond arbitrarily, changes synchronously.
Input and output char-acter	Digital input channel		6 digital input (DI) 6 virtal digital input (VDI). The function selection of each DI, please refer to Group P4.
	Analog input channel		AI1: 4～20mA or 0～10V AI2: 4～20mA or 0～10V
	Pulse output channel		HDOP:High pulse output,0~20kHz
	Analog output channel		AO1:4~20mA or 0~10V AO2:0~10V
Unique feature	Rapid current limiting		Limit the output current of the inverter during operation and avoids overcurrent fault occurs.
	Fixed length control		Can realize fixed length control
	Timing control		Timing control function：setting time range:0.1Min ～ 6500.0Min
	Virtual terminal		6 virtal digital input (VDI) and 4 virtal digital output (VDO) for choose, realizing simple logical control.
Keyboard	LED display		5 LED display for showing setting frequency, output frequency, output voltage, output current and so on.
	Lock the button		Lock all or part of the keys on the keyboard.

Protection function		Short circuit detection, short circuit to ground detection, input and output loss phase detection, overcurrent, overvoltage, undervoltage, overheat, overload, underload, contactor protection, terminals protection and so on.
Ambient	Use ambient	Indoor, not bare to sunlight, no dust, no corrosive gas, no flammable gas, no vapor, no water drop or salt etc.
	Altitude	Less than 1000 meters.（10% de-rating using for each 1000 meters when over 1000 meters.)
	Ambient temperature	-10℃ ～+40℃(under ambient temperature 40℃ ～50℃,please reduce the volume or strengthen heat sink)
	Ambient humidity	Less than 95%RH，without condenses
	Vibration	Smaller than5.9m/s ^{2}(0.6g)
	Storage temperature	-40℃～+70℃
Structure	Defending grade	IP20
	Cooling mode	Forced air cooling and fan controls with temperature
Mounting mode		Wall hangning or install in cabinet

3 Mechanical Installation

3.1 Installation

3.1.1 Installation Environment

The installation environment is very important for the long-term maintenance of the performance and function of the frequency inverter. Please install the inverter according to the below **Table 3-1**.

Table 3-1 Installation Environment

Item	Requirements
Installation site	Indoor
Ambient temperature	-10 to +40 ℃ ● In order to improve the reliability of the inverter, please use it in the place where the temperature does not change drastically. ● When using it in a closed space such as a control cabinet, please use cooling fan or cooling air conditioner to cool it and prevent the internal temperature from exceeding the condition temperature. ● Please avoid the inverter freezing.
Humidity	95% RH or below Please avoid condensation on the inverter.
Storage temperature	-20 ~ + 60 °C
Environment	Please install the inverter in the following locations. ● Locations free from oil mist, corrosive gases, flammable gases, dust, etc. ● Locations that metal powder, oil, water and other external objects can not enter the inverter (Do not install the inverter on flammable materials such as wood). ● Location without radioactive materials and flammable materials ● Place without harmful gases and liquids ● Place with less salt erosion ● Place without direct sunlight
Altitude	Less than 1000m, derating 1% for each 100 meters when higher than 1000m. <1>

Note 1: Please do not install transformers or other equipments around the inverter which generate electromagnetic waves or interference, otherwise it will cause the inverter to malfunction. If you need to install such equipment, you should install shield plate before the inverter.

Note 2: Please use cloth or paper to cover the upper portion of the frequency inverter to prevent metal debris, oil and water from entering into the frequency inverter during installation. After finish the job, be sure to remove the cloth or paper, and if it still covered, the ventilation will become poor and causes the frequency inverter to abnormally heat.

3.2 Installation direction and space

3.2.1 Installation Space

The surrounding installation space and clearance should be reserved varies with the power levels of the SV600 series inverter.

◆ **Single inverter installation**

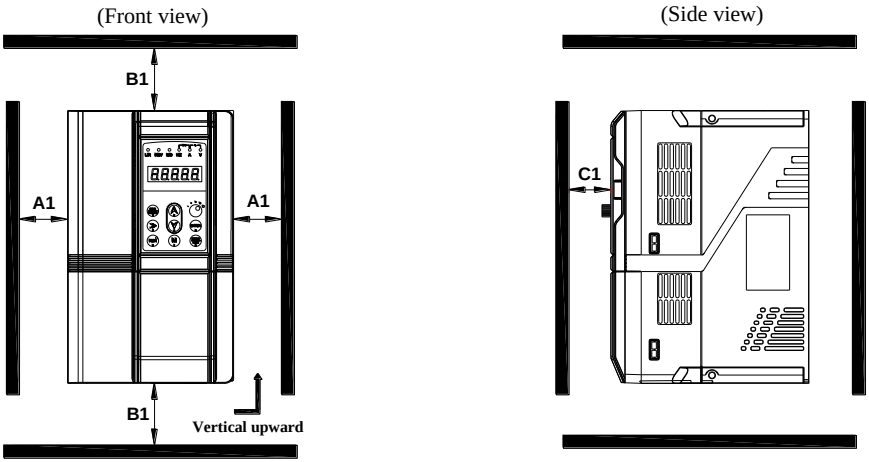


Fig. 3-1 Single inverter installation

Table 3-2 Installation clearance requirements

Power level	Dimension requirements (Unit:mm)		
2.2 KW ~ 22KW	A1 ≥ 10	B1 ≥ 200	C1 ≥ 40
30 ~ 37KW	A1 ≥ 50	B1 ≥ 200	C1 ≥ 40
≥ 45 KW	A1 ≥ 50	B1 ≥ 300	C1 ≥ 40

◆ **Multi-inverter installation**

The SV600 series inverter dissipates heat from the bottom to the top. When multiple inverters work together, please install them side by side and the upper of the inverter should be aligned. Clearance should be reserved between each inverter as shown in **Fig.3-2**:

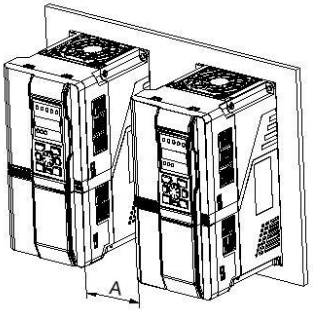


Table 3-3 Installation clearance requirements for each power class of the SV600

Power level	Space requirement (mm)
2.2KW~22KW	A≥10
30~37KW	A≥50
≥45KW	A≥50

Fig. 3-2 Installation clearance of multiple inverters

◆ **Different rows installation**

If one row of inverters need to be installed above another row, please install insulation guide plate to prevent the heat from the lower row inverters which will cause the temperature of the upper row inverters to raise, even over-heat and overload fault occurs. Measures as shown in **Fig.3-3**:

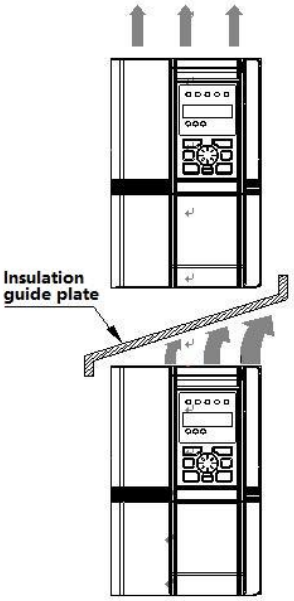


Fig.3-3 Up and down row installation

3.2.2 Installation direction

When installing the inverter, please install it in a vertical upward direction. Other directions such as lying down, lying on its side and upside down are forbidden.

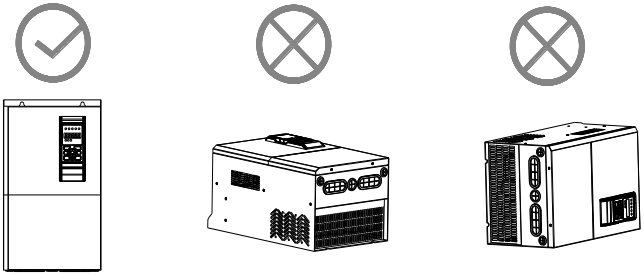


Fig.3-4 Installation Direction

3.3 Installation Guidance

The SV600 series inverter supports wall-mounted installation. You can follow below installation instructions and in conjunction with specific model and application requirements of the installation occasion to install the inverter.

- As shown in **Fig.3-1**, the installation space needs to ensure that the frequency inverter has sufficient heat sink space. Please consider the heat dissipation of other devices in the cabinet when reserve the space.
- Please mount the frequency inverter vertically to facilitate the upward emission of heat. If there are multiple frequency inverters in the cabinet, please install them side by side. Please refer to **Fig.3-3** and install a heat insulation flow guide plate in the case where the upper and lower mounting is required.
- When a mounting bracket is required, the material of the mounting bracket must be flame-retardant
- For applications with metal dust, it is recommended to use a mounting cabinet that can completely close the inverter to completely isolate the inverter from metal dust. At this time, the space in the fully sealed cabinet should be as large as possible. Installing the heatsink outside the cabinet is also recommended.

3.3.1 Wall-mounted Installation

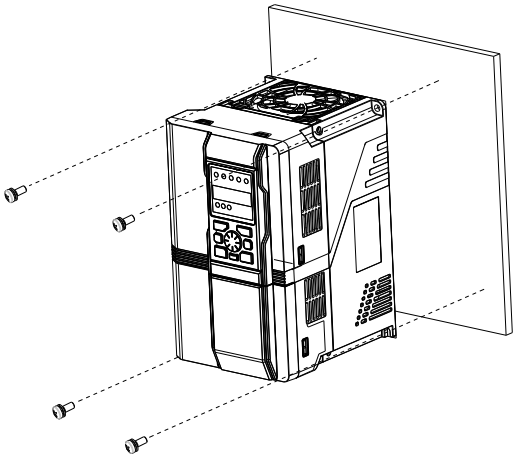


Fig. 3-5 Wall-mounted Installation

3.4 Disassembly and installation of keyboard

3.4.1 Disassembly of the keyboard

Please press the holders on both sides of the keyboard firmly according to the directions 1 and 2 in Fig.3-6 and lift the keyboard body in the direction 3.

3.4.2 Installation of the keyboard

Install and press the keyboard in the direction 1 as shown in Fig.3-7 until you hear a "click". Do not install the keyboard from any other direction, otherwise it will cause poor contact of the keyboard.

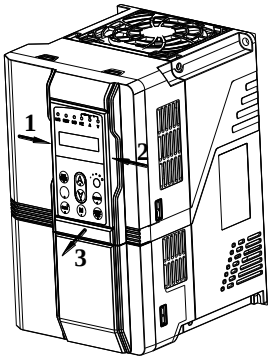


Fig. 3-6 Keyboard Disassembly

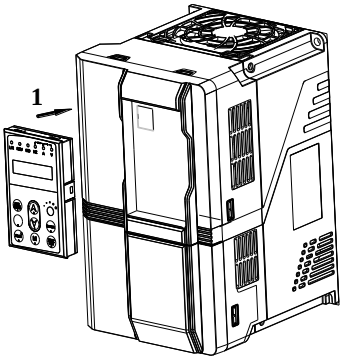


Fig.3-7 Keyboard Installation

3.5 SV600 appearance and installation dimensions

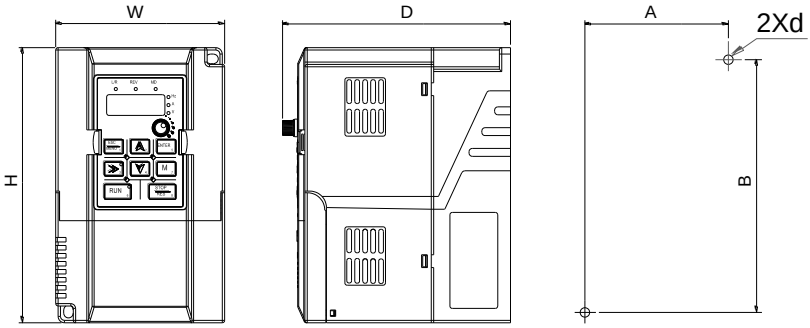


Fig.a

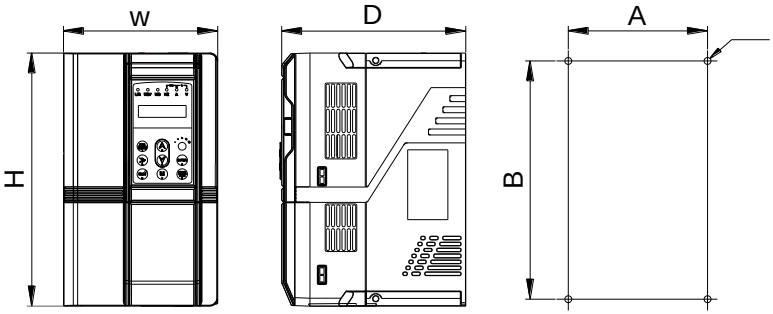


Fig.b

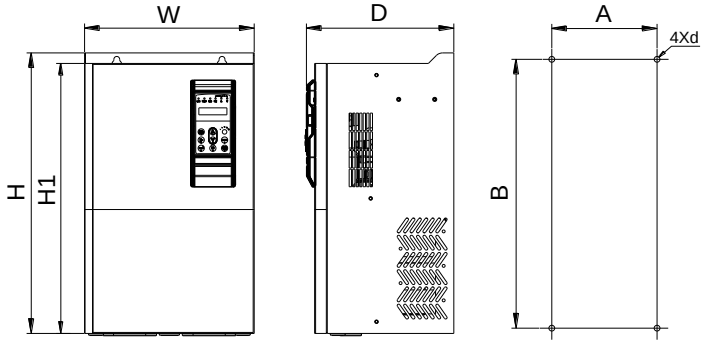


Fig.c

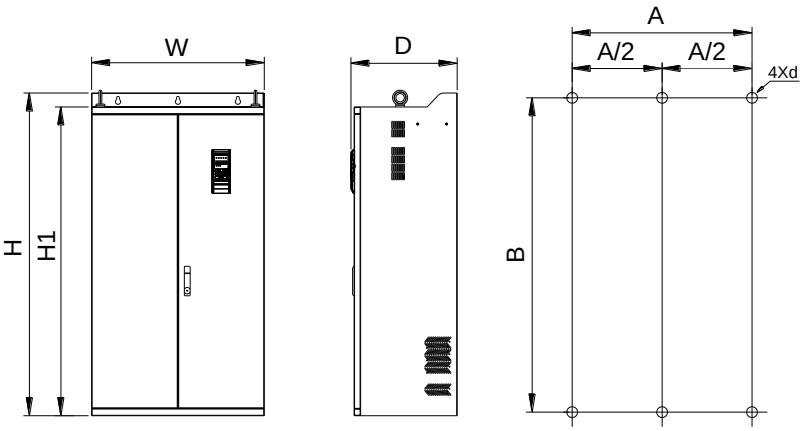


Fig.d

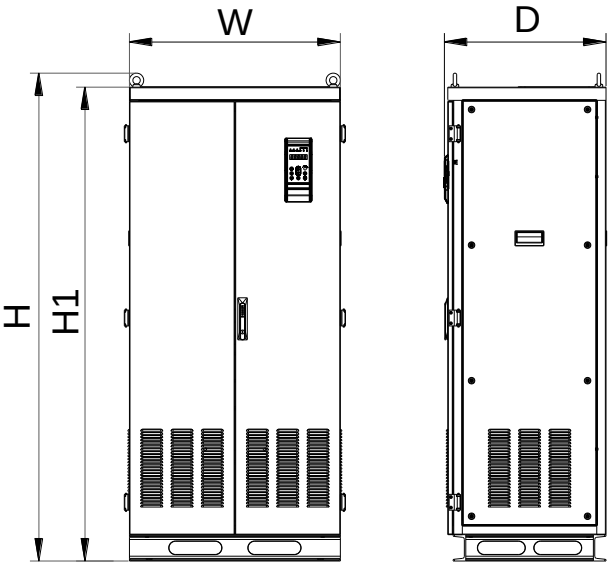


Fig.e

Table 3-3 230V Grade Inverter appearance and installation dimension (unit: mm)

Inverter Model	A	B	H1	H	W	D.	Installation hole	Fig. No.
SV600-0R752GB-S	90	158	/	172	106	143	5.2	Fig.a
SV600-1R52GB-S								
SV600-2R22GB-S								
SV600-0R42GB								
SV600-0R752GB								
SV600-4R02GB-S	115	205	/	215	125	187	5.2	Fig.b
SV600-1R52GB								
SV600-2R02GB								
SV600-4R02GB								
SV600-5R52GB-S	140	240	/	255	155	197	7	
SV600-5R52GB								
SV600-7R52GB-S	190	315	/	335	210	212	7	
SV600-112GB-S								
SV600-7R52GB								
SV600-112GB								
SV600-152GB-S	160	415	412	430	260	240	9	Fig.c
SV600-152GB								
SV600-18R52G-S	180	465	462	480	290	263	10	
SV600-222G-S								
SV600-18R52G								
SV600-222G								
SV600-302G-S	200	500	497	515	300	290	10	
SV600-302G								
SV600-372G								
SV600-452G	200	535	530	550	340	312	10	
SV600-552G	300	680	660	705	420	353	11	
SV600-752G								
SV600-902G	300	950	930	975	470	405	11	
SV600-1102G								
SV600-1322G	350	1040	1020	1070	580	435	12	
SV600-1602G	500	1315	1290	1350	720	455	12	Fig.d
SV600-1852G								

Table 3-4 380V and 480V Grade Inverter appearance and installation dimension (unit: mm)

Inverter Model	A	B	H1	H	W	D.	Installation hole	Fig. No.
SV600-0R754G/1R54PB	90	158	/	172	106	143	5.2	Fig.a
SV600-1R54G/2R24PB								
SV600-2R24G/4R04PB								
SV600-4R04G/5R5PB	115	205	/	215	125	187	5.2	Fig.b
SV600-5R54G/7R54PB								
SV600-7R54G/114PB								
SV600-114G/154PB	140	240	/	255	155	197	7	
SV600-115G/155PB								
SV600-7R52GB-S	190	315	/	335	210	212	7	
SV600-154G/18R54PB								
SV600-18R54G/224PB								
SV600-224G/304PB								
SV600-304G/374PB	160	415	412	430	260	240	9	Fig.c
SV600-305G/375PB								
SV600-374G/454P	180	465	462	480	290	263	10	
SV600-454G/554P								
SV600-554G/754P	200	500	497	515	300	290	10	
SV600-754G/904P								
SV600-904G/1104P	200	535	530	550	340	312	10	
SV600-905G/1105P								
SV600-1104G/1324P	300	680	660	705	420	353	11	
SV600-1324G/1604P								
SV600-1604G/1854P	300	950	930	975	470	405	11	
SV600-1854G/2004P								
SV600-2004G/2204P								
SV600-2204G/2504P	350	1040	1020	1070	580	435	12	
SV600-2504G/2804P								
SV600-2804G/3154P	500	1315	1290	1350	720	455	12	Fig.d
SV600-3154G/3554P								
SV600-3554G/4004P								
SV600-4004G/4504P								
SV600-4504G/5004P	/	/	1800	1855	840	615	/	Fig.e
SV600-5004G/5604P								

Inverter Model	A	B	H1	H	W	D.	Installation hole	Fig. No.
SV600-5604G/6304P	/	/	1800	1855	840	625	/	Fig.e
SV600-6304G								

480V voltage grade inverter has same appearance and installation dimension,please refer to the above information when install 480V voltage grade inverter.

3.6 Keyboard appearance and installation dimensions

The SV600 series inverter keyboard can be installed on the electric control cabinet directly. The mounting holing size is as shown in **Fig.3-7** and **Fig.3-8.**

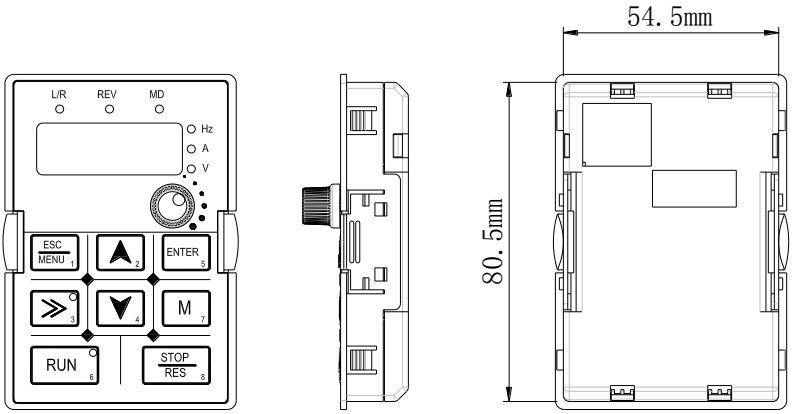


Fig.3-7 SV600 keyboard and holing dimension(For 2.2KW and below inverter)

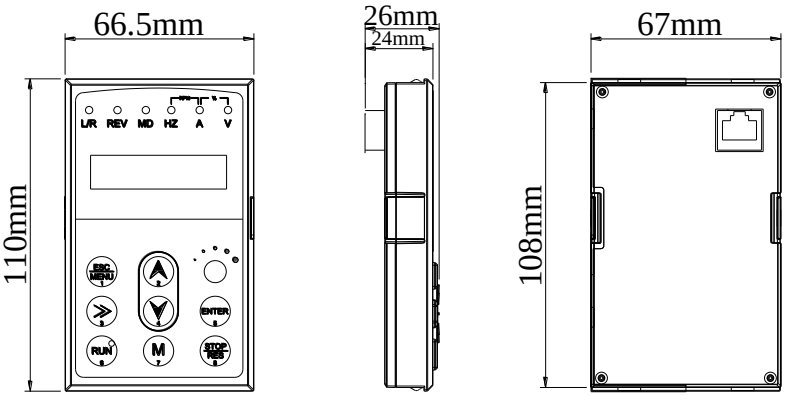


Fig.3-8 SV600 keyboard and holing dimension (For inverter above 2.2KW)

For the inverter with sheet metal, it has standard keyboard holder on the front cover. You can remove the standard keyboard holder from the inverter and install it on the electric control

cabinet. Please refer to the holing dimension of standard keyboard holder in **Fig.3-9**. We also have external keyboard holder for all models inverter. The dimension of the keyboard holder and the holing size as shown in **Fig.3-9.**

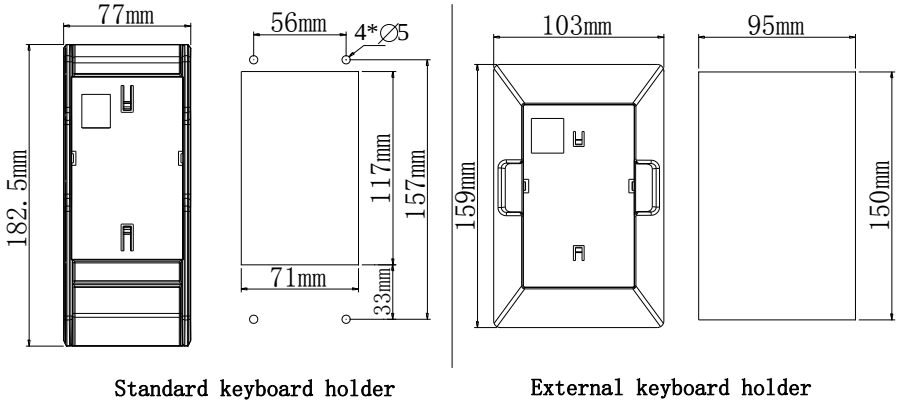


Fig. 3-9 SV600 keyboard holder and installation dimensions

4 Electrical wiring and precautions

4.1Main circuit electrical wiring

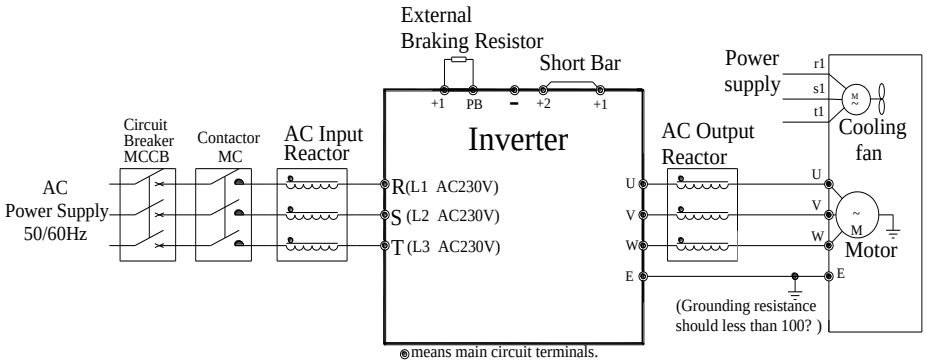


Fig. 4-1 Inverter main circuit wiring

Note: 1) Please be sure to remove the shorting link between the (+1) and (+2) terminals when install DC reactor.

4.1.1 Arrangement and definition of main circuit terminals

- SV600 single-phase frequency inverter 0.75 KW~2.2KW main circuit terminals:

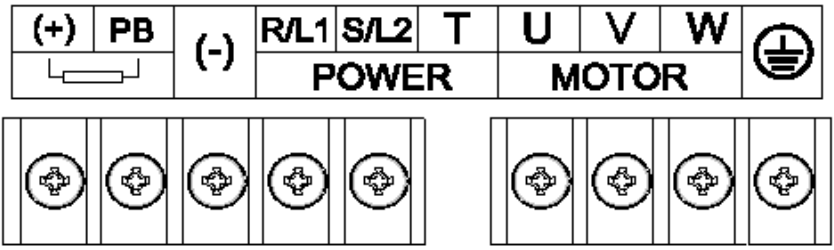


Fig.4-2 SV600 1PH (0.75KW-2.2KW) Inverter Main circuit terminals

- SV600 three-phase frequency inverter 0.75 kW~2.2kW main circuit terminals:

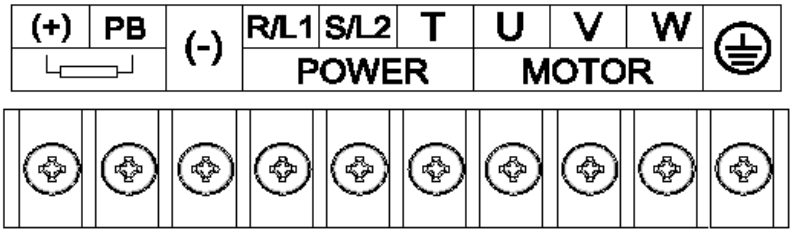


Fig.4-3 SV600 3PH (0.75KW-2.2KW) Inverter Main circuit terminals

SV600 three-phase inverter 4.0 KW~30KW main circuit terminals:

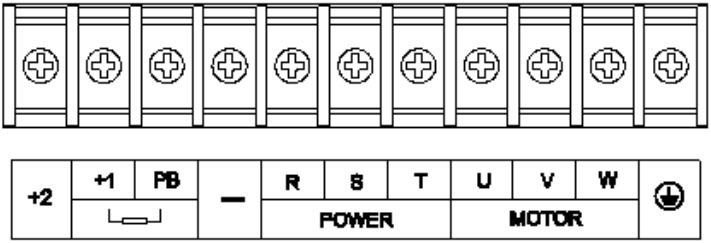


Fig. 4-4 SV600 (4.0KW-30KW) Inverter Main circuit terminals

- SV600 three-phase inverter 37kW-90kW main circuit terminals:

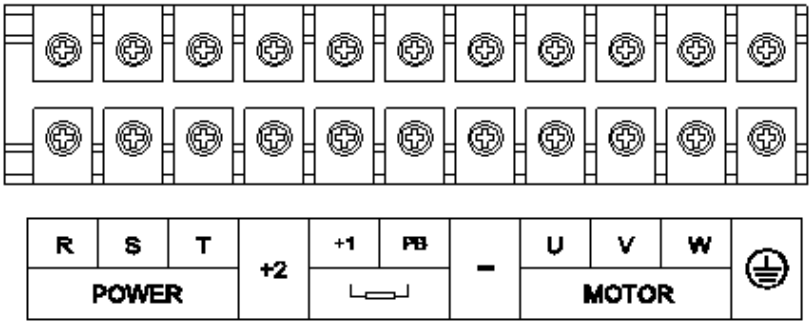


Fig.4-5 SV600 (30KW-90KW) Inverter Main circuit terminals

- SV600 three phase frequency inverter 110KW-200KW main circuit terminals:

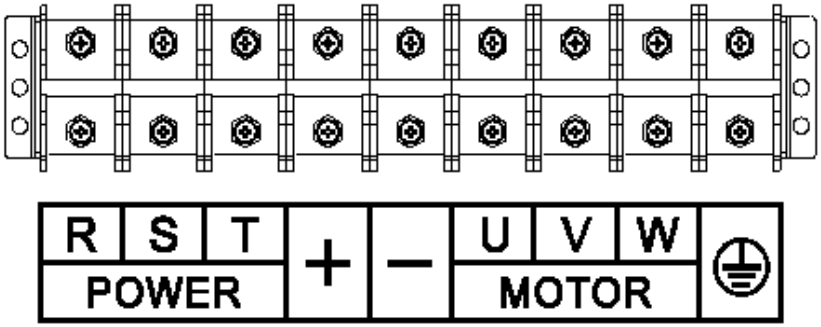


Fig.4-6 SV600 (110KW-200KW) Inverter Main circuit terminals

- SV600 three phase frequency inverter 220KW-400KW main circuit terminals:

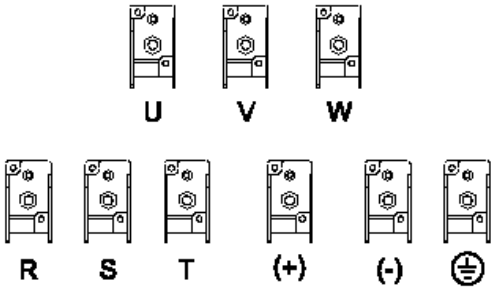


Fig. 4-7 SV600 (220KW-400KW) Inverter Main circuit terminals

- SV600 three phase frequency inverter450kW-630kW main circuit terminals:

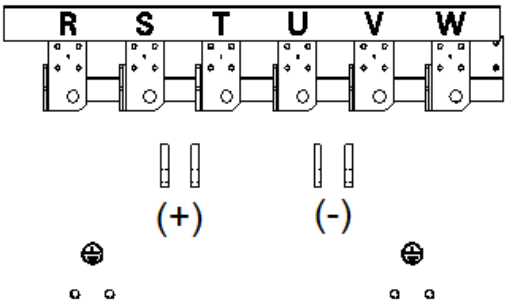


Fig.4-8 SV600 (450KW-630KW) Inverter Main circuit terminals

Table 4-1 Function Definition Table of Main Loop Terminal

Terminal symbol	Terminal name	Terminal function definition
-	DC supply terminal	DC power output, - is negative DC bus terminal, +1 or + is positive DC bus terminal, for external braking unit or common DC bus.
+1 or +		
+1	Braking resistor terminal	For installing external braking resistors and realize fast stopping.
PB		
R	Inverter POWER input terminals	Connect three phase AC power supply
S		
T		
U	Inverter output terminals for MOTOR	Connect three phase AC motor
V		
W		
⏚	Grounding	Ground terminal, ground resistance < 10 ohms.

4.1.2 Installation size and wire selection of power terminals

Table 4-2 Recommended cable diameter (230V Grade)

Inverter Model	Power (kW)	Rated Current (A)	Recommended cable mm^2	Torque N●m
Single-phase power supply: 230V(-15%~+20%) 50/60 Hz				
SV600-0R752GB-S	0.75	4.04	0.75	0.87
SV600-1R52GB-S	1.5	7.3	1.5	0.87
SV600-2R22GB-S	2.2	9.6	1.5	0.87
SV600-4R02GB-S	4	17	4	2.5
SV600-5R52GB-S	5.5	24	6	2.5
SV600-7R52GB-S	7.5	32.5	6	2.5
SV600-112GB-S	11	46	10	4.0
SV600-152GB-S	15	62.5	16	4.0
SV600-18R52G-S	18.5	75.5	25	10.5
SV600-222G-S	22	92.5	35	10.5
SV600-302G-S	30	111	50	10.5
Three phase power supply: 230V(-15%~+20%) 50/60 Hz				
SV600-0R42GB	0.4	2.5	0.75	0.87
SV600-0R752GB	0.75	4.04	0.75	0.87
SV600-1R52GB	1.5	7.3	2.5	1.2
SV600-2R22GB	2.2	10	2.5	1.2
SV600-4R02GB	4	17	4	2.5
SV600-5R52GB	5.5	24	6	2.5
SV600-7R52GB	7.5	32.5	6	2.5
SV600-112GB	11	46	10	4.0
SV600-152GB	15	62.5	16	4.0
SV600-18R52G	18.5	75.5	25	10.5
SV600-222G	22	92.5	35	10.5
SV600-302G	30	111	50	10.5
SV600-452G	45	169	95	20
SV600-552G	55	210	120	20
SV600-752G	75	246	120	20
SV600-902G	90	300	150	20

Inverter Model	Power (kW)	Rated Current (A)	Recommended cable mm^2	Torque N●m
SV600-1102G	110	370	185	85
SV600-1322G	132	460	120*2	85
SV600-1602G	160	510	120*2	85
SV600-1852G	185	600	150*2	85

Table 4-3 Recommended cable diameter (380V and 480V Grade)

Inverter Model	Power (kW)	Rated Current (A)	Recommended cable mm^2	Torque N●m
SV600-0R754G/1R54PB	0.75/1.5	2.5/4.04	0.75	0.87
SV600-1R54G/2R24PB	1.5/2.2	4.04/5.5	0.75	0.87
SV600-2R24G/4R04PB	2.2/4.0	5.5/10	1.5	0.87
SV600-4R04G/5R54PB	4.0/5.5	10/13	2.5	1.2
SV600-5R54G/7R54PB	5.5/7.5	13/17	4	1.2
SV600-7R54G/114PB	7.5/11	17/24	4	2.5
SV600-114G/154PB	11/15	24/32.5	6	2.5
SV600-154G/18R54PB	15/18.5	32.5/38	6	2.5
SV600-18R54G/224PB	18.5/22	38/46	10	4.0
SV600-224G/304PB	22/30	46/62.5	10	4.0
SV600-304G/374PB	30/37	62.5/75.5	16	4.0
SV600-374G/454P	37/45	75.5/92.5	25	10.5
SV600-454G/554P	45/55	92.5/111	35	10.5
SV600-554G/754P	55/75	111/146	50	10.5
SV600-754G/904P	75/90	146/169	70	10.5
SV600-904G/1104P	90/110	169/210	95	20
SV600-1104G/1324P	110/132	210/246	120	20
SV600-1324G/1604P	132/160	246/300	120	20
SV600-1604G/1854P	160/185	300/350	150	20
SV600-1854G/2004P	185/200	350/370	185	85
SV600-2004G/2204P	200/220	370/415	185	85
SV600-2204G/2504P	220/250	415/460	240	85
SV600-2504G/2804P	250/280	460/510	120×2	85

SV600-2804G/3154P	280/315	510/600	120×2	85
SV600-3154G/3554P	315/355	600/660	150×2	85
SV600-3554G/4004P	355/400	660/740	185×2	85
SV600-4004G/4504P	400/450	740/820	240×2	85
SV600-4504G/5004P	450/500	820/920	270*2	200
SV600-5004G/5604P	500/560	920/990	270*2	200
SV600-5604G/6304P	560/630	990/1160	300*2	200
SV600-6304G	630	1160	300*2	200

480V voltage grade inverter with same power has same rated output current and same recommended cable. When install 480V grade inverter, please refer to the above information.

4.2 Description of control terminals

Control circuit terminal layout is shown in Fig.4-8**:**

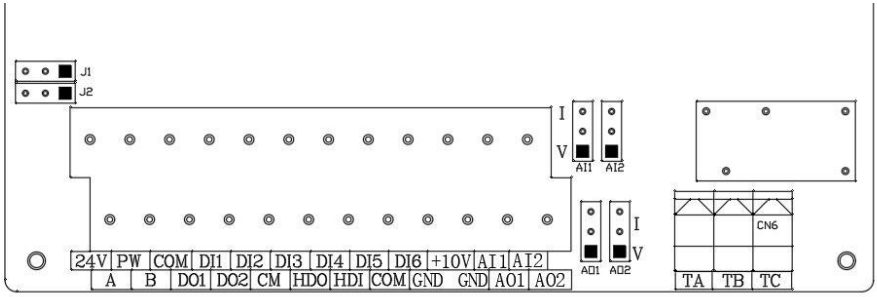


Fig. 4-8 Control board terminal layout

Table 4-3 Description of SV600 inverter control terminals

Type	Terminal symbol	Terminal name	Terminal function definition
Power Supply	+10V-GND	External +10V power supply	10V auxiliary power output, Maximum output is 50mA.
	+24V-COM	External +24 V supply	1. Provide +24V power supply to external device, the maximum output is 200mA 2. When driving DI1-DI6 with external signal, external +24V power supply can be connected.
	PW	External Power Terminal	Connect to +24V by factory default. When DI1-DI6 need to be driven by external signal, PW needs to be connected to external power supply. It also should be disconnected from the +24V.

Type	Terminal symbol	Terminal name	Terminal function definition
Analog Input	AI1-GND	Analog input 1	1. Input range: DC 0-10V/0-20mA, determined by the selection of AI1 short-circuit cap on the control board; Lower side:0~10V voltage input; Upper side: 0-20mA current input; 2. Input impedance: 20K at voltage input and 250K at current input
Analog Input	AI2-GND	Analog input 2	1. Input range: DC 0-10V/0-20mA, determined by the selection of AI2 short-circuit cap on the control board; Lower side:0~10V voltage input; Upper side: 0-20mA current input; 2. Input impedance: 20K at voltage input and 250K at current input
Digital Input	DI1	Digital input 1	Photoelectric converter is internal and functions of each DI can be programmed by parameters. Input conditions: Maximum DC30V/8mA. Please refer to note 1.
	DI2	Digital input 2	
	DI3	Digital input 3	
	DI4	Digital input 4	
	DI5	Digital input 5	
	DI6	Digital input 6	
	HDI	High speed pulse input	Besides functions of DI1 ~ DI6, it can also be used for high-speed pulse input. Maximum input frequency: 100KHz
Analog Output	AO1-GND	Analog Output 1	The output type is determined by the selection of the AO1 short-circuit cap on the control board. Lower side: 0 ~ 10V voltage output; Upper side : 0-20mA current output;
	AO2-GND	Analog Output 2	The output type is determined by the selection of the AO2 short-circuit cap on the control board. Lower side: 0 ~ 10V voltage output; Upper side : 0-20mA current output;
Digital Output	DO1-CM	Digital Output 1	Optical isolation, single polarity open-collector output Output voltage range: 0V-10V Output current range: 0-50mA Refer to note 2.
	DO2-CM	Digital Output2	
	HDO-COM	High speed pulse output	Range: 0 ~ 100KHz
Relay Output	TB-TC	NC terminal (Normal close)	Functions can be programmed by parameters.

Type	Terminal symbol	Terminal name	Terminal function definition
	TA-TC	NO terminal (Normal open)	Maximum contact capacity: 3A/240VAC 5A/30VDC
Communic-ation Terminal	A-B	Communication terminals A, B	RS485 communication port

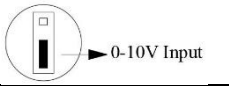
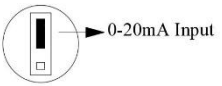
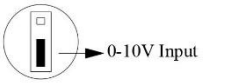
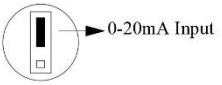
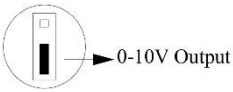
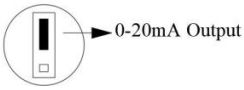
Note:

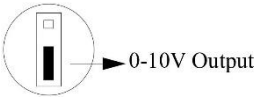
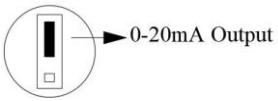
1. The default connection method of digital input port is NPN type. When PNP connection needed, please connect "PW" to "COM" with shorting link.

2. The ground of digital output CM is internal isolated from the ground of digital input COM. When driving with external power supply, CM and COM terminals cannot be shorted externally. But when driving with internal + 24V, CM and COM should be short-connected in external.

4.2.1 Connection Function Description of Conversion Terminal

Table 4-2 Inverter Conversion Terminal Connection Function Description

Symbol	Select position	Graphic symbol	Function descriptions
AI1	0-10V		0 ~ 10V Voltage Input
	0-20mA		0 ~ 20mA Current Input
AI2	0-10V		0 ~ 10V Voltage Input
	0-20mA		0 ~ 20mA Current Input
AO1	0-10V		0 ~ 10V Voltage Output
	0-20mA		0 ~ 20mA Current Output

Symbol	Select position	Graphic symbol	Function descriptions
AO2	0-10V		0 ~ 10V Voltage Output
	0-20mA		0 ~ 20mA Current Output
J1	GND		GND grounding well
	Dangling		GND dangling
J2	COM		COM grounding well
	Dangling		COM dangling

4.2.2 Wiring method of frequency inverter electric control circuit

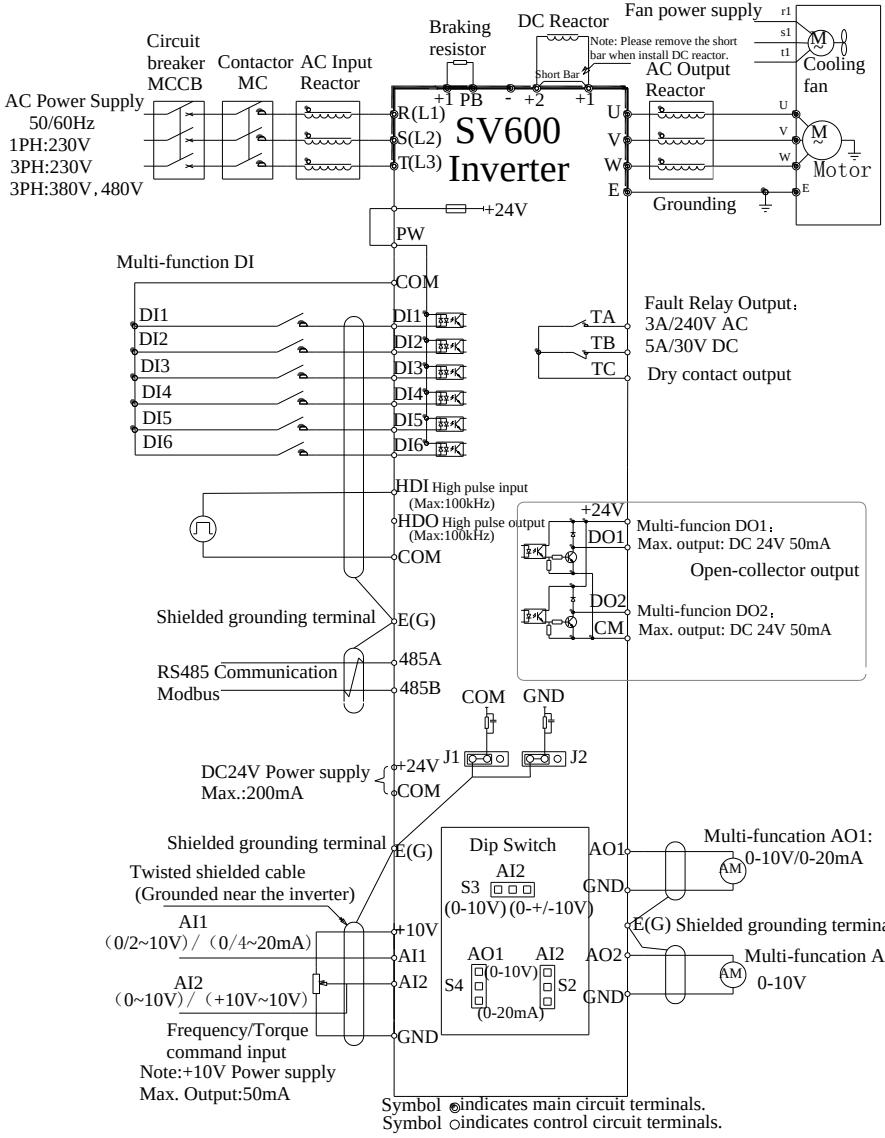


Fig.4-7 Wiring method of SV600 control circuit

4.2.3 Wiring description of control signal terminals

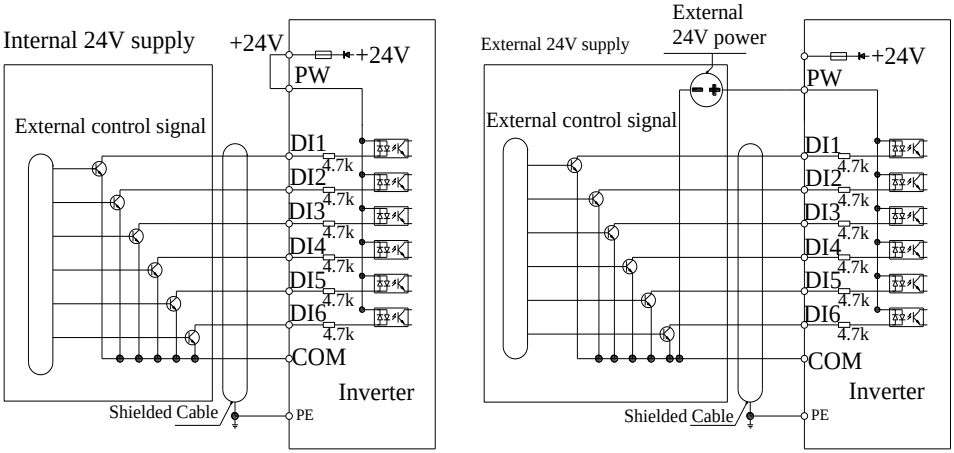


Fig.4-8 Digital input signal connection method of NPN characteristic transistor

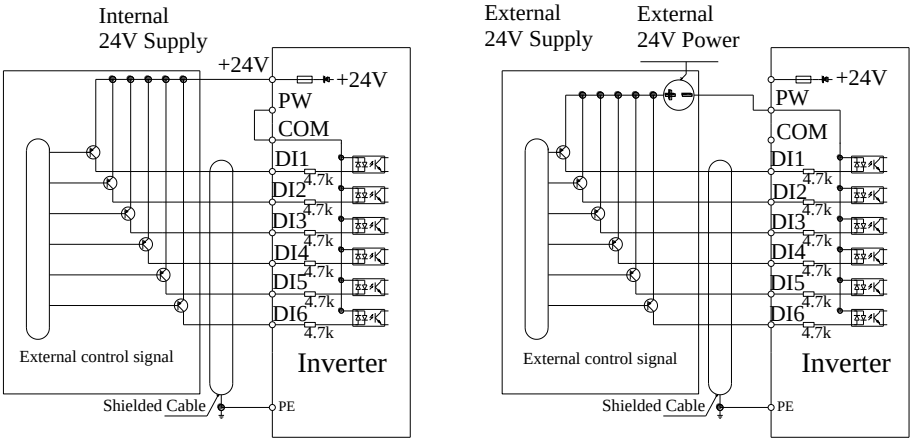


Fig.4-9 Digital input signal connection method of PNP characteristic transistor

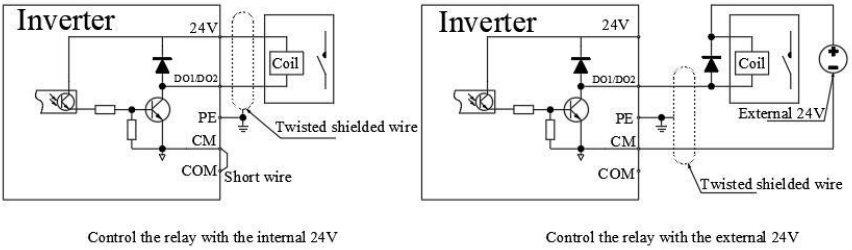


Fig.4-10 Connection method of the digital output signals

Note: The default setting is 24V open-collector input and no need external 24V. HDI supports open-collector signals which larger than 18V (default). For pulse signals need to larger than 9V input and the maximum pulse that HDI can receive is 100KHz.

4.3 EMC

4.3.1 Definitions of related terms

◆ EMC:

EMC (Electromagnetic Compatibility) is the ability of electrical and electronic equipments to work properly in an electromagnetic interference environment, also the ability not to release electromagnetic interference to other devices or systems and make influence on the stabilize working of other equipments.

Therefore, EMC includes two aspects:

Aspect 1: The electromagnetic interference caused by the device during normal operation cannot exceed certain limits;

Aspect 2: The device must have sufficient immunity to the electromagnetic interference in the environment, i.e. electromagnetic sensitivity.

- First class environment:

The first environment includes civilian facilities. It also includes low-voltage power grids facilities that are not directly connected through intermediate transformers and provide power to civil buildings.

- Second class environment:

The second environment includes all facilities other than those low-voltage supply networks that directly connected to civil buildings.

- C1 level Equipment:

The rated voltage of the electric drive system is less than 1000 V and used in the first environment.

- C2 level Equipment:

The rated voltage of the electric drive system is less than 1000 V and cannot be plug-in or movable equipment. It can only be installed and commissioned by a professional when used in the first environment.

- C3 level Equipment:

The rated voltage of the electric drive system is less than 1000 V and is suitable for the second environment and not for the first environment.

- C4 level Equipment:

The rated voltage of the electric drive system is equal to or above 1000 V or the rated current is equal to or above 400A, or use in a complex system of the second environment.

4.3.2 Introduction of EMC standards

◆ **EMC Standards**

The SV600 series frequency inverter meets the standard EN 61800-3:2004 C2 level requirements, and applicable to the first class environment and the second class environment.

◆ **EMC Requirements of Installation Environment**

The manufacturer of the system which installed with the inverter is responsible for the system's compliance with the requirements of the European EMC Directive. According to the system's application environment, please ensure that the system meets the requirements of standards EN61800-3: 2004 Class C2, C3 or C4.

The system (machinery or device) installed with the inverter must also be CE marked. The responsibility for the final assembly of the system is borne by the customer. Please confirm whether the system (machinery or device) complies with the European directives and meets the requirements of standard EN 61800-3: 2004 C2.

Note: In the first class environment, the frequency inverter may cause radio interference. Besides the CE compliance requirements mentioned in this chapter, users must take measures to prevent interference if necessary.

4.3.3 Installation of EMC input filter on Power supply input

EMC filter installed between the frequency inverter and the power supply can not only restrict the interference of electromagnetic noise in the surrounding environment on the inverter, but also prevents the interference from the inverter on the surrounding equipment.

The SV600 series inverter satisfies the requirements of category C2 only with an EMC filter installed on the power input side.

The installation precautions are as follows:

- When using the filter, please use it strictly according to the rated value. Since the filter is a Class I electrical appliance, the metal case ground of the filter should have a large area in good contact with the metal ground of the installation cabinet, and it must have good electrical continuity, otherwise there will be danger of electric shock and serious affects on the EMC effect.
- The filter ground must be connected to the common ground with the ground of the frequency inverter PE, otherwise the EMC effect will be seriously affected.
- The filter should be installed as close as possible to the power input of the frequency inverter.

4.3.4 Installation of AC input reactor on power supply input

AC input reactor is mainly used to reduce the harmonics in the input current. As optional device. When the application environment has high requirements about harmonic, an external reactor can be installed.

4.3.5 Installation of AC output reactor on frequency inverter output

Whether to install AC output reactor on the output side of the frequency inverter depends on the actual situation. The transmission line between the frequency inverter and the motor should not be too long. Distributed capacitance is large when the cable is too long and it will generate high-harmonic current easily.

When the cable length is equal to or greater than or the value in the table below, AC output reactor installed near the output of the frequency inverter is needed:

Table 4-5 Output cable length when AC output reactor needed

Frequency inverter power (kW)	Rated voltage (V)	Cable length (m)
4	200 ～ 500	50
5.5	200 ～ 500	70
7.5	200 ～ 500	100
11	200 ～ 500	110
15	200 ～ 500	125
18.5	200 ～ 500	135
22	200 ～ 500	150
≧ 30	200 ～ 500	150

4.3.6 Installation of external DC reactor

The SV600 series frequency inverter (Power ≤ 75KW) uses a separate wooden case package when the external DC reactor is shipped. When the user installing it, the short-circuit copper bar between the terminal + 2 and + 1 of the frequency inverter main circuit should be removed firstly. Please install the DC reactor between + 2 and + 1, and the terminals have no polarity. After the DC reactor installed well, the short-circuit copper bar between + 2 and + 1 no needed.

Note: special requirements can be customized non-standard.

4.3.7 Shielded cable

◆ **Requirements for shielded cables**

In order to meet the EMC requirements of CE marking, shielded cables must be used. There are three phase conductor shielded cables and four phase conductor shielded cables. If the conductive properties of the shield cannot satisfy the requirements, a separate PE wire is needed. One wire of the four phase conductors shielded cable can be used as PE wire as shown in **Fig.4-15**:

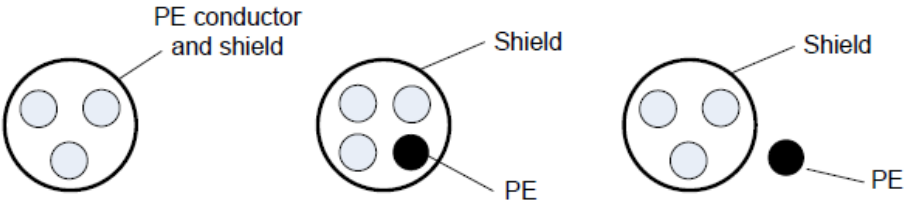


Fig. 4-15 Schematic diagram of the shielded cable

In order to effectively suppress the emission and conduction of radio frequency interference, the shielding layer of the shielded wire is composed of a coaxial copper braid. To enhance the shielding efficiency and electrical conductivity, the shielding layer should has a braided density greater than 90%. As shown in **Fig. 4-16**:

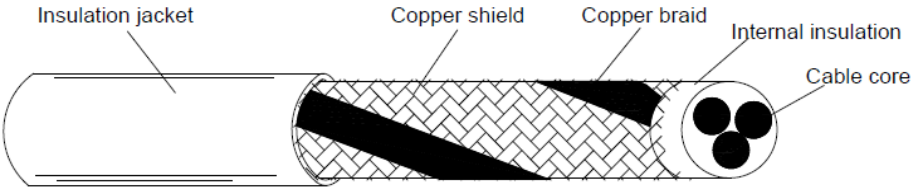


Fig. 4-16 Schematic diagram of shielded cable

1) Shielded symmetrical cables are recommended and four-core shielded cables can also be used as input cables.

2) The motor cable and PE shielded conductor (twisted shield) should be as short as possible to reduce electromagnetic radiation and external stray current and capacitive current of the cable. For motor cable lengths exceeding 100m, output filter or reactor is required.

3) All control cables are recommended to use shielded cables.

4) The output power line of frequency inverter is recommended to use shielded cable and the shielding layer should be grounded reliably. For the lead wire of the interfered device, it is recommended to use the twisted-pair shielded control line and ground the shield reliably.

◆ **Cable wiring requirements**

1) The motor cables must be laid far away from other cables. Several frequency inverter motor cables can be laid side by side.

2) The motor cables, the input power cables and the control cables are recommended be distributed in different ducts. To avoid electromagnetic interference caused by rapid variation of frequency inverter output voltage, the motor cables and other cables should be separated side by side for a long distance.

3) When the control cable must pass through the power cable, please ensure that the arranged angle between the two cables should be 90 degrees as much as possible. Don't pass other cables through the frequency inverter.

4) The power input and output lines of the inverter and weak current signal lines (e.g., control lines) should not be laid in parallel but as vertical as possible.

5) The cable ducts must be in good connection and well grounded. Aluminum ducts can be used to improve electric potential.

6) The filter, the frequency inverter, the motor should be well connected with the system (machinery or device) and the installed part is sprayed and protected, and the conductive metal is fully contacted.

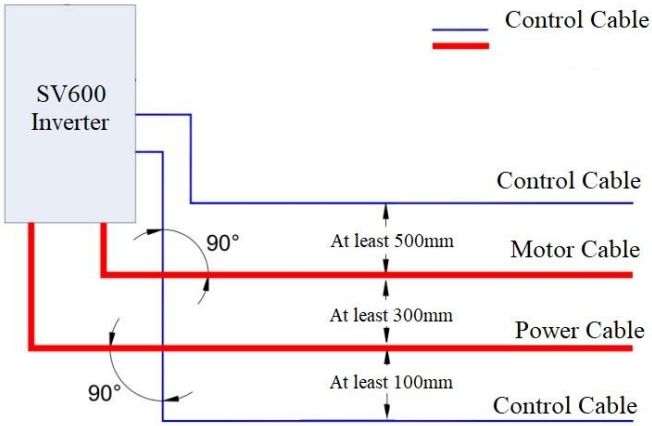


Fig. 4-17 Cable wiring

◆ **Requirements for leakage current**

1) Due to the output of the frequency inverter is high-speed pulse voltage, it will lead to high-frequency leakage current generates. In order to prevent electric shock and leakage fire, please install a leakage circuit breaker with the inverter.

2) The leakage current generated by each frequency inverter is about 100 mA, so the induced current of the selected leakage circuit breaker should be to larger than 100 mA.

3) High-frequency pulse interference may cause malfunction of the leakage circuit breaker after interference. Therefore, leakage circuit breaker with high frequency filtering should be selected. If several inverters need to be installed, each inverter should be provided with a leakage circuit breaker.

The factors that will affect the leakage current as follows:

- Frequency inverter capacity
- Carrier frequency
- The type and length of motor cable
- EMI filter

When the leakage current generated by the frequency inverter causes the leakage breaker to action, the following steps should to be done:

- Increasing the sensitivity current value of the leakage breaker
- Replace another leakage circuit breaker which has high-frequency inhibition effect.
- Decrease carrier frequency
- Shortening the length of the output cable
- Add leakage suppression devices

◆ Advices and solutions to Common EMC Interference Problem

The frequency inverter product belongs to strong interference device. Interference problem may still occurs due to improper wiring or grounding during using. When the inverter interferes with other devices, the following solutions can be adopted.

Table 4-6 Common EMC interference problems and solutions

Interference Type	Solutions
Leakage protection switch trip	● Connect the motor housing to the PE terminal of the inverter. ● Connect the PE terminal of the inverter to the PE of the power grid. ● Add safety capacitor box to the power input cable. ● Add magnetic rings to the inverter input cable.
Inverter causes interference during operation	● Connect the motor housing to the PE terminal of the inverter. ● Connect the PE terminal of the inverter to the PE of the power grid. ● Add safety capacitors box to the power input cables and wind the cables with magnetic rings. ● Add a safety capacitor to the interfered signal port or wind the signal cable with magnetic rings. ● Common ground connection between equipments;
Communication interference	● Connect the motor housing to the PE terminal of the inverter. ● Connect the PE terminal of the inverter to the PE of the power grid. ● Add safety capacitors box to the power input cables and wind the cables with magnetic rings. ● Add terminal resistor to the communication cable source and the load end. ● Add communication common grounding line in the out side of communication cable; ● Use shielded cable as communication line and connect the shield of the cable to the common grounding point.
I/O interference	● Enlarge capacitive filter at the low-speed DI and the recommended maximum value is 0.1uF. ● Enlarge capacitive filter at the AI and the recommended maximum value is 0.22uF.

5 Operation and keyboard display

5.1 Function and operation of keyboard

The keyboard can control the inverter START/STOP, display various data, check the value of monitoring parameters display, set and modify function code parameters, clear fault information and so on.

5.1.1 Function and name of each part

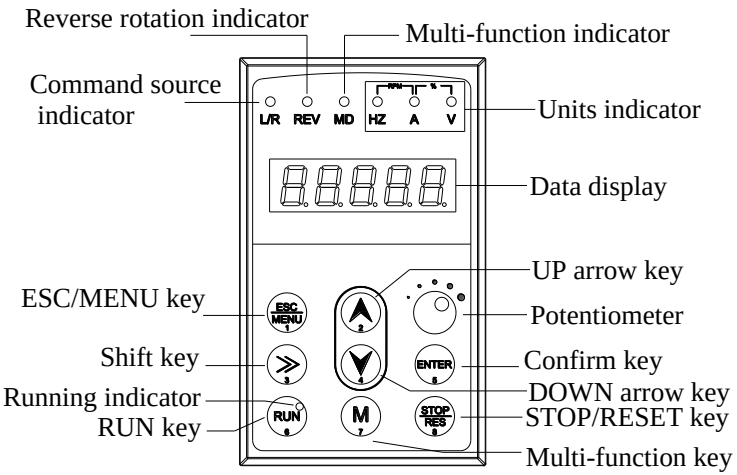


Fig. 5-1 SV600 keyboard display

Keys	Name	Function description
MENU	Menu	Enter or exit Level 1 menu
ENTER	Enter	Enter the menu level by level and confirm the parameter value
M	Multi-function key	Function switching selection according to P7-11, which can be defined as fast switching of command source or direction
	Shift key	Used to loop through the selection of display parameters; When modifying parameters, it is used to shift and select the bits to be modified
RUN	Run key	In keyboard operation mode, used to run operations
STOP/RST	Stop/Reset key	In keyboard operation mode, it is used for shutdown operation; Used to reset a fault when the fault is displayed
	UP arrow key	Increase in data or function code
	DOWN arrow key	Decrease in data or function code

5.1.2 Description of LED indicators

LED indicators include the unit indicator and status indicator.

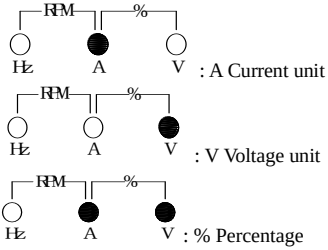
RUN: When it's on, the inverter is in running state, and when off, the inverter is in stopping state.

L/R: Keyboard operation, terminal operation and communication operation indicator:

○	L/R: Normal OFF	Keyboard operation START/STOP control
●	L/R: Normal ON	Terminal operation START/STOP control
◑	L/R: Flashing	Communication operation START/STOP control

REV: Forward and reverse indicator light, which indicates reverse rotation when it's on.

MD: Self-learning/torque control/fault indicator light. Light on indicates torque control mode, light slow flashing indicates self-learning state, and light fast flashing indicates fault state.



Data display area:

Total 5-bit LED display can display the set frequency, output frequency, various monitoring data and alarm code.

5.1.3 Description of function code viewing and modification method

The keyboard of SV600 inverter adopts three-level menu structure for parameter setting and other operations.

The three-level menus are: function parameter group (level 1 menu), function code (level 2 menu) and function code setting value (level 3 menu).

The operation flow chart is shown in **Fig.5-2**.

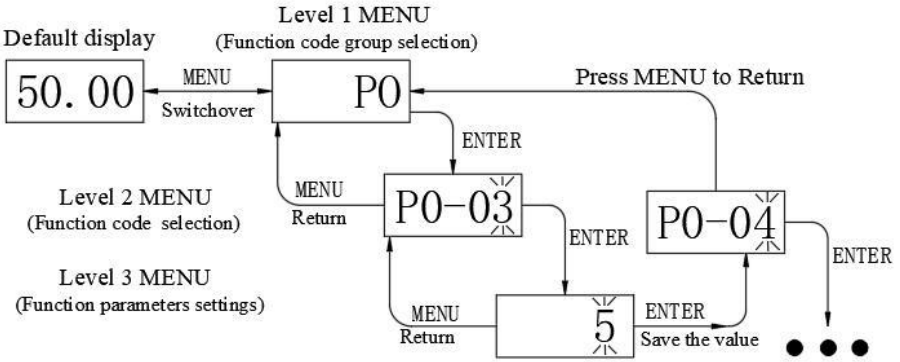
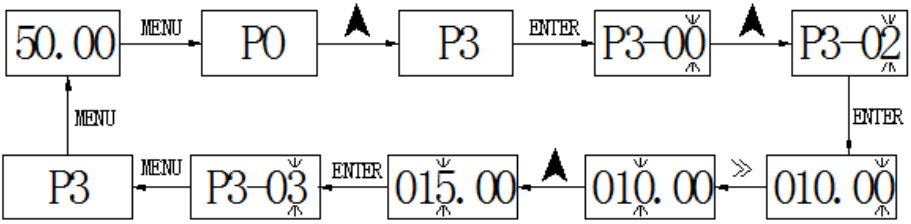


Fig.5-2 Menu structure and operation flow

Note: In the level 3 menu operation, you can press the MENU key or ENTER key to return to the level 2 menu. When press ENTER key, it will save the setting parameters and returns to the level 2 menu, and automatically transfers to the next function code. If press MENU key, the value of the parameter would not be saved and it returns directly to the level 2 menu.

For example, changing the value of the function code P3-02 from 10.00 Hz to 15.00 Hz as shown in follow.



In the level 3 menu state, if the parameter does not have flashing bits, it means that the function code cannot be modified. Possible reasons as blow:

1) The function code is a non-modifiable parameter, such as the inverter type, actual detection parameter, operation record parameter, etc.

2) The function code cannot be modified in the running state and can be modified only after stopping.

5.2 Setting and self-learning of motor characteristic parameters

5.2.1 Motor parameters need to be set

When the inverter operates in "vector control" (P0-01=0 or 1) mode, it strongly depend on the accurate motor parameters, which is one of the important differences from "V/F control" (P0-01=2) mode. In order to make the inverter have good driving performance and operation efficiency, the inverter must obtain the accurate parameters of the controlled motor. The required motor parameters are shown in blow table (default motor 1 function code):

Motor 1 Parameters	Parameter description	Description
P1-00	Motor type	Ordinary motor or special motor which suitable for frequency inverter
P1-01 to P1-05	Motor rated/voltage/current/frequency/speed	Model parameters, entered manually according to motor namplate
P1-06 to P1-20	Equivalent stator resistance, inductance, rotor inductance, etc. which inside the motor	Self-learning parameters

For multi-motor complex applications, the corresponding parameters of motor 2 as blow:

Motor 2 Parameters	Parameter description	Description
A2-00	Motor type	Ordinary motor or special motor which for frequency inverter

A2-01 to A2-05	Motor rated/voltage/current/frequency/speed	Model parameters, entered manually according to motor namplate
A2-06 to A2-20	Equivalent stator resistance, inductance, rotor	Self-learning parameters

5.2.2 Self-learning of motor parameters

The methods for the frequency inverter to obtain the internal electrical parameters of the controlled motor are: rotation complete self-learning, static complete self-learning, static self-learning and manual input of motor parameters, etc.

Self-learning method	Application	Self-learning effect
Rotation complete self-learning	The application that the motor and the load system can be easily separated	Best
Static complete self-learning	The motor is difficult to disengage from the load and rotation learning is not allowed	Good
Static self-learning	The motor is difficult to disengage from the load and rotation learning is not allowed	Poor
Manually enter parameters	If you have correct motor parameters provided by the motor manufacture or the inverter which has successfully performed self-learning, please enter them into P1-00 to P1-10	Good

Note: Under vector control, when needing to change the carrier frequency of the inverter or replace the frequency inverter, the control board of frequency inverter or the motor after performed motor parameters self-learning, if the model of those parts also changes, please perform motor parameters self-learning again.

6 Parameters List

If PP-00 is set to a non-zero number, parameter protection is enabled. You must enter the correct user password to enter the menu.

To cancel the password protection function, enter with password and set PP-00 to 0.

Group P and Group A are standard function parameters. Group U includes the monitoring function parameters.

The symbols in the parameter list table are described as follows:

"☆": The parameter can be modified when the frequency inveter in stop or running state.

"★": The parameter cannot be modified when the frequency inveter is in the running state.

"●": The parameter is the actually measured value and cannot be modified.

"*": The parameter is factory parameter and can be set only by the manufacturer.

P0 Group Basic Function Parameters				
Function code	**Name**	**Setting range**	**Default**	**Property**
P0-00	G/P type display	1: G type (constant torque load) 2: P type (fan and pump load)	1	★
P0-01	Motor 1 control mode	0: Speed sensorless vector control (SVC) 1: Reserved 2: V/F control	2	★
P0-02	Command source selection	0: Keyboard control (LED Off) 1: Terminal Control (LED on) 2: Communication Control (LED Flashing)	0	☆
P0-03	Main frequency source X selection	0: Digital setting (preset by P0-08, not save when power failure) 1: Digital setting (preset by P0-08, save when power failure) 2: AI1 3: AI2 4: Potentiometer on the keyboard 5: PULSE pulse (HDI) 6: Multi-segment instruction 7: Simple PLC 8: PID 9: Communication setting	4	★
P0-04	Auxiliary frequency source Y selection	Same as P0-03 (Main Frequency Source X Selection)	0	★
P0-05	Auxiliary frequency source Y-range selection	0: Relative to maximum frequency 1: Relative to frequency source X	0	☆
P0-06	Auxiliary frequency source Y range	0% ~ 150%	100%	☆
P0-07	Frequency source method selection	Units digit: frequency source selection 0: Main Frequency Source X 1: The calculation of X and Y (the relation is determined by tens digit) 2: Switching between X(Main) and Y(Auxiliary)	00	☆

P0 Group Basic Function Parameters				
Function code	**Name**	**Setting range**	**Default**	**Property**
		3: Switching between X(Main) and the calculation result of X and Y 4: Switching between Y(Auxiliary) and the calculation of X and Y Tens digit: Calculation formula of X and Y 0: X(Main) + Y(Auxiliary) 1: X(Main)- Y(Auxiliary) 2:Maximum(X,Y) 3: Minimum(X,Y)		
P0-08	Preset frequency	0.00 Hz ~ maximum frequency (P0-10)	50.00 Hz	☆
P0-09	Rotation direction	0: Same direction 1: opposite direction	0	☆
P0-10	Maximum frequency	50.00 Hz ~ 320.00 Hz	50.00 Hz	★
P0-11	Upper frequency source	0: Set by P0-12 1: AI1 2: AI2 4: Pulse setting 5: Communication setting	0	★
P0-12	Upper limit frequency	Low limit frequency P0-14 ~ maximum frequency P0-10	50.00 Hz	☆
P0-13	Upper frequency offset	0.00 Hz ~ maximum frequency P0-10	0.00 Hz	☆
P0-14	Low limit frequency	0.00 Hz ~ upper frequency P0-12	0.00 Hz	☆
P0-15	Carrier frequency	0.5 KHz ~ 16.0 KHz	Depends on model	☆
P0-16	Carrier frequency changes with temperature	0: No 1: Yes	1	☆
P0-17	Acc.time1	0.00 s ~ 650.00 s (P0-19=2) 0.0 s ~ 6500.0 s (P0-19=1) 0s ~ 65000 s (P0-19=0)	Depends on model	☆
P0-18	Dec. time1	0.00 s ~ 650.00 s (P0-19=2) 0.0 s ~ 6500.0 s (P0-19=1) 0s ~ 65000 s (P0-19=0)	Depends on model	☆
P0-19	Acc./Dec. time unit	0: 1s 1: 0.1s 2: 0.01s	1	★
P0-21	Offset frequency of auxiliary frequency source Y	0.00 Hz ~ maximum frequency P0-10	0.00 Hz	☆
P0-22	Frequency command resolution	1: 0.1 Hz 2: 0.01 Hz	2	★
P0-23	Digital setting frequency save or not when stop	0: Not save 1: Save	1	☆
P0-24	Motor parameter group selection	0: Motor parameter group 1 1: Motor parameter group 2	0	★
P0-25	Acc./Dec. time reference frequency	0: Maximum frequency (P0-10) 1: Set frequency 2: 100Hz	0	★

P0 Group Basic Function Parameters				
Function code	**Name**	**Setting range**	**Default**	**Property**
P0-26	Reference frequency for UP/ DOWN during running	0: Running frequency 1: The set frequency	0	★
P0-27	Bundling command source with frequency source	Units digit:(Keyboard control binds to frequency source) 0: Not bind 1: Digital frequenc setting 2: AI1 3: AI2 4: Reserved 5: Pulse setting (HDI) 6: Multi-segment instruction 7: Simple PLC 8: PID 9: Communication setting Tens digit: (Terminal control binds to frequency source) Same as above. Hundreds digit: (Communication control binds to frequency source) Thousands digit: (Auto running binds to frequency source)	0000	☆
P0-28	Serial communication protocol selection	0: Modbus Protocol 1: Reserved	0	★

Group P1: Motor 1 basic parameters				
Function code	**Name**	**Setting range**	**Defaut**	**Property**
P1-00	Motor type selection	0: Standard asynchronous motor 1: Asynchronous motor special for frequency inverter	0	★
P1-01	Motor rated power	0.1 KW ~ 1000.0 KW	Depends on model	★
P1-02	Motor rated voltage	1V ~ 2000V	Depends on model	★
P1-03	Motor rated current	0.01 ~ 655.35 A (≤ 55 kW) 0.1 ~ 6553.5 A (≥ 75 kW)	Depends on model	★
P1-04	Motor rated frequency	0.01 Hz ~ maximum frequency	Depends on model	★
P1-05	Motor rated speed	1rpm ~ 65535rpm	Depends on model	★
P1-06	Motor stator resistance	0.001 Ω ~ 65.535 Ω (inverter power < = 55kW) 0.0001 Ω ~ 6.5535 Ω (inverter power > 55kW)	Obtain by self-learning	★
P1-07	Motor rotor resistance	0.001 Ω ~ 65.535 Ω (inverter power < = 55kW) 0.0001 Ω ~ 6.5535 Ω (inverter power > 55kW)	Obtain by self-learning	★
P1-08	Leakage inductance	0.01 mH ~ 655.35 mH (inverter power < =	Obtain by	★

Group P1: Motor 1 basic parameters				
Function code	**Name**	**Setting range**	**Defaut**	**Property**
	reactance	55kW) 0.001 mH ~ 65.535 mH (inverter power > 55kW)	self-learning	
P1-09	Mutual inductance reactance	0.1 mH ~ 6553.5 mH (inverter power < = 55kW) 0.01 mH ~ 655.35 mH (inverter power > 55kW)	Obtain by self-learning	★
P1-10	Motor no-load current	0.01 A ~ P1-03 (inverter power < = 55kW) 0.1 A ~ P1-03 (inverter power > 55kW)	Obtain by self-learning	★
P1-11 ~ 36	Reserved			
P1-37	Self-learning selection	0: No self-learning 1: Static self-learning 2: Rotation complete self-learning 3. Static complete self-learning	0	★

Group P2: Motor 1 vector control parameters				
Function code	**Name**	**Setting range**	**Default**	**Property**
P2-00	Speed loop proportional gain1	1-100	30	☆
P2-01	Speed loop integration time1	0.01 s ~ 10.00 s	0.50 s	☆
P2-02	Switching frequency 1	0.00~P2-05	5.00 Hz	☆
P2-03	Speed loop proportional gain2	1~100	20	☆
P2-04	Speed loop integration time2	0.01 s ~ 10.00 s	1.00 s	☆
P2-05	Switching frequency 2	P2-02 ~ maximum frequency	10.00 Hz	☆
P2-06	Vector control slip gain	50%~ 200%	100%	☆
P2-07	Time constant of speed loop filter	0.000 s ~ 0.100 s	0.000 s	☆
P2-08	Vector control over-excitation gain	0 ~ 200	64	☆
P2-09	Motoring torque upper limit source in speed control	0: Set by P2-10 1: AI1 2: AI2 3.Potentiometer on keyboard 4: Pulse setting 5: Communication setting 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) 100% in options 1-7 corresponds to P2-10	0	☆
P2-10	Digital setting of motoring torque upper limit in speed control	0.0% ~ 200.0% 100% corresponds to motor rated current	150.0%	☆

P2-11	Regenerating torque upper limit source in speed control	0: Set by P2-12 1: AI1 2: AI2 3.Potentiometer on keyboard 4: Pulse setting 5: Communication setting 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) 100% in options 1-7 corresponds to P2-12	0	☆
P2-12	Digital setting of regenerating torque upper limit in speed control	0.0% ~ 200.0% 100% corresponds to motor rated current	150.0%	☆
P2-13	Excitation adjustment proportional gain	0 ~ 60000	2000	☆
P2-14	Excitation adjustment integral gain	0 ~ 60000	1300	☆
P2-15	Torque adjustment proportional gain	0 ~ 60000	2000	☆
P2-16	Torque adjustment integral gain	0 ~ 60000	1300	☆
P2-17	Speed loop integral property	Units digit: Integral separation 0: Invalid 1: Valid	0	☆
P2-18 ~ 19	Reserved			
P2-20	Maximum output voltage coefficient	100%~110%	105%	★
P2-21	Maximum torque coefficient in weaken field	50%~200%	100.0%	☆

Group P3:V/F control parameters				
Function code	**Name**	**Setting range**	**Default**	**Property**
P3-00	V/F curve setting	0: Linear V/F 1: Multi-point V/F 2: Square V/F 3: 1.2-power V/F 4: 1.4-power V/F 6: 1.6-power V/F 8: 1.8-power V/F 9: Reserved 10: V/F complete separation 11: V/F half separation	0	★
P3-01	Torque boost	0.0%: (Automatic torque boost) 0.1 to 30.0 percent	Depends on model	☆
P3-02	Cut-off frequency of torque boost	0.00 Hz ~ Maximum frequency	50.00 Hz	★
P3-03	Multi-point V/F Frequency Point 1	0.00Hz ~ P3-05	5.00 Hz	★
P3-04	Multi-point VF Voltage Point 1	0.0% ~ 100.0%	10.0%	★
P3-05	Multi-point VF Frequency Point 2	P3-03~P3-07	10.00 Hz	★

Group P3:V/F control parameters				
Function code	**Name**	**Setting range**	**Default**	**Property**
P3-06	Multi-point VF Voltage Point 2	0.0% ~ 100.0%	20.0%	★
P3-07	Multi-point VF Frequency Point 3	P3-05 ~ Motor rated frequency (P1-04)	20.00 Hz	★
P3-08	Multi-point VF Voltage Point 3	0.0~100.0%	40.0%	★
P3-09	V/F slip compensation gain	0.0% ~ 200.0%	0.0%	☆
P3-10	V/F over-excitation gain	0 ~ 200	64	☆
P3-11	V/F oscillation suppression gain	0 ~ 100	Depends on model	☆
P3-13	V/F separation voltage source	0: Digital setting (P3-14) 1: AI1 2: AI2 5: Potentiometer on keyboard 4: Pulse Setting (HDI) 5: Multi-segment instruction 6: Simple PLC 7: PID 8: Communication setting Note: 100.0% corresponds to motor rated voltage	0	☆
P3-14	V/F separation voltage digital setting	0V ~ Motor rated voltage	0V	☆
P3-15	Acc. time for V/F separation voltage	0.0 s ~ 1000.0 s Note:The time for increasing from 0V to motor rated voltage	0.0 s	☆
P3-16	Dec. time for V/F separation voltage	0.0 s ~ 1000.0 s Note:The time for decreasing from motor rated voltage to 0V	0.0 s	☆
P3-17	Stop mode selection for V/F separation	0:Output frequency and output voltage decrease to 0 independently 1:Output frequency starts to decrease after output voltage is 0	0	☆
P3-18	Action current of V/F overcurrent stall	50%~200%	150%	★
P3-19	V/F overcurrent stall Eenable	0:Invalid 1:Valid	1	★
P3-20	V/F overcurrent stall suppression gain	0～100	20	☆
P3-21	Compensation coefficient of V/F overcurrent stall action current	50%～200%	50%	★
P3-22	Over-voltage stall action voltage	200.0V～2000.0V	Depends on model	★
P3-23	Over-voltage stall Enable	0:Invalid 1:Valid	1	★
P3-24	Over-voltage stall frequency suppression gain	0～100	30	☆
P3-25	Over-voltage stall voltage suppression gain	0～100	30	☆
P3-26	Over-voltage stall maximum increasing frequency limit	0～50Hz	5Hz	★

Group P4: Input Terminals				
Function code	**Name**	**Setting range**	**Default**	**Property**
P4-00	DI1 function selection	0: No function 1: Forward run (FWD) 2: Reverse run (REV) (Note: Function 1 and 2 need to be used according to the setting in P4-11, for more details,please refer to the description of parameters in Chapter 7) 3: 3-wire operation control 4: Forward JOG running 5: Reverse JOG running 6: Terminal UP 7: Terminal DOWN 8: Freely STOP 9: Fault Reset 10: Run pause 11: External Fault Input(NO Normal Open) 12: Multi-segment instruction terminal 1 13: Multi-segment instruction terminal 2 14: Multi-segment instruction terminal 3 15: Multi-segment instruction terminal 4 16: Acc./Dec. Time Selection Terminal 1 17: Acc./Dec. Time Selection Terminal 2 18: Frequency source switchover 19: UP/DOWN settings clear (Terminal, Keyboard) 20: Control command switchover terminal 1 21: Acceleration/Deceleration prohibit 22: PID pause 23: PLC status reset 24: Swing Pause 25: Count input 26: Count reset 27: Length count input 28: Length reset 29: Torque control prohibit 30: HDI (Pulse) frequency input 31: Reserved 32: Immediate DC braking 33: External Fault Input(NC Normal Close) 34: Frequency modification enable 35: Reverse direction of PID action 36: External Stop terminal 1 37: Control command switchover terminal 2 38: PID integral pause 39: Switchover between main frequency X and preset frequency 40: Switchover between auxiliary frequency Y and preset frequency 41: Motor selection terminal 1 42: Motor selection terminal 2	1	★
P4-01	DI2 function selection		2	★
P4-02	DI3 function selection		4	★
P4-03	DI4 function selection		9	★
P4-04	HDI function selection		30	★
P4-05	DI5 function selection		0	★
P4-06	DI6 function selection		0	★
P4-07 ~ 09	Reserved			

Group P4: Input Terminals				
Function code	**Name**	**Setting range**	**Default**	**Property**
		43: PID paramete switchover 44: User defined fault 1 45: User defined fault 2 46: Speed control/torque control switchover 47: Emergency stop 48: External Stop terminal 2 49: Deceleration DC brake 50: Clear the current running time 51: Switchover between two-wire and three-wire 52-59: Reserved		
P4-10	DI filter time	0.000 s ~ 1.000 s	0.010 s	☆
P4-11	Terminal command mode	0: 2-wire mode 1 1: 2-wire mode 2 2: 3-wire mode 1 3: 3-wire mode 2	0	★
P4-12	Terminal UP/DOWN rate	0.001 Hz/s ~ 65.535 Hz/s	1.00 Hz/s	☆
P4-13	AI Curve 1 minimum input	0.00V ~ P4-15	0.10 V	☆
P4-14	Correspondence setting of AI Curve 1 minimum input	-100.0% ~ +100.0%	1.0%	☆
P4-15	AI Curve 1 max input	P4-13 ~ +10.00 V	10.00 V	☆
P4-16	Correspondence setting of AI Curve 1 maximum input	-100.0% ~ +100.0%	100.0%	☆
P4-17	AI1 filter time	0.00 s ~ 10.00 s	0.10 s	☆
P4-18	AI Curve2 minimum input	0.00V ~ P4-20	0.10 V	☆
P4-19	Correspondence setting of AI Curve 2 minimum input	-100.0% ~ +100.0%	1.0%	☆
P4-20	AI Curve2 max input	P4-18 ~ +10.00 V	10.00 V	☆
P4-21	Correspondence setting of AI Curve 2 maximum input	-100.0% ~ +100.0%	100.0%	☆
P4-22	AI2 filter time	0.00 s ~ 10.00 s	0.10 s	☆
P4-23	Keyboard potentiometer minimum input	-10.00V～P4-25	-9.50V	☆
P4-24	Corresponding setting of keyboard potentiometer minimum input	-100.0%～+100.0%	0.0%	☆
P4-25	Keyboard potentiometer maximum input	P4-23～+10.00V	9.50V	☆
P4-26	Corresponding setting of keyboard potentiometer maximum input	-100.0%～+100.0%	100.0%	☆
P4-27	Keyboard potentiometer filter time	0.00s～10.00s	0.10s	☆
P4-28	PULSE minimum input	0.00KHz ~ P4-30	0.00 KHz	☆

Group P4: Input Terminals				
Function code	**Name**	**Setting range**	**Default**	**Property**
P4-29	PULSE minimum input corresponding setting	-100% ~ 100%	0.0%	☆
P4-30	PULSE Maximum input	P4-28 ~ 100.00 KHz	20.00 KHz	☆
P4-31	PULSE maximum input corresponding setting	-100% ~ 100%	100.0%	☆
P4-32	PULSE filter time	0.00 s ~ 10.00 s	0.00 s	☆
P4-33	AI curve selection	Units digit: AI1 curve selection 1: Curve 1 (2 points, refer to P4-13 ~ P4-16) 2: Curve 2 (2 points, refer to P4-18-P4-21) 3: Reserved 4: Curve 4 (4 points, refer to A6-00-A6-07) 5: Curve 5 (4 point, refer to A6-08-A6-15) Tens digit: AI2 curve selection Same as above.	21	☆
P4-34	Setting selection when AI less than the minimum	Units digit: AI1 0: Corresponding minimum input setting 1: 0.0% Tens digit: AI2 Same as above	11	☆
P4-35	DI1 delay time	0.0 s ~ 3600.0 s	0.0 s	★
P4-36	DI2 delay time	0.0 s ~ 3600.0 s	0.0 s	★
P4-37	DI3 delay time	0.0 s ~ 3600.0 s	0.0 s	★
P4-38	DI valid mode selection 1	0: High level valid 1: Low level valid Units digit: DI1 Tens digit: DI2 Hundreds digit: DI3 Thousands digit: DI4 Ten thousands digit: DI5	00000	★
P4-39	DI valid mode selection 2	0: High level valid 1: Low level valid Units digit: DI6 Tens digit: DI7 For digit above,Reserved	00000	★
P4-40	AI signal type selection	Units digit:AI1 input type selection 0:0~10V voltage signal or 0~20mA current signal 1: 4~20mA current signal Tens digit: AI2 input type selection 0:0~10V voltage signal or 0~20mA current signal 1: 4~20mA current signal	00	☆

Group P5: Output Terminals				
Function code	**Name**	**Setting range**	**Default**	**Property**
P5-00	HDO output mode selection	0: Pulse output (HDOP) 1: Switch signal output (HDOR)	0	☆
P5-01	HDOR output function selection	0: No output 1: Frequency inverter running 2: Fault output (freely stop fault) 3: Frequency level detection FDT1 output 4: Frequency reached 5: Zero speed running (no output at STOP) 6: Motor overload pre-warning 7: Frequency inverter overload pre-warning 8: Set count value reached 9: Count value reached 10: Length reached 11: PLC cycle complete 12: Accumulative running time arrived 13: Frequency limited 14: Torque limited 15: Run Ready 16: AI1 > AI2 17: Upper limit frequency reached 18: Low limit frequency reached (No output at stop) 19: Undervoltage status output 20: Communication setting 21: Reserved 22: Reserved 23: Zero Speed Running 2 (Output atstop) 24: Accumulative power-on time arrived 25: Frequency level detection FDT2 output 26: Frequency 1 reached 27: Frequency 2 reached 28: Current 1 reached 29: Current 2 reached 30: Timing reached 31: AI1 input limit reached 32: Underload 33: Reverse running 34: Zero current state 35:IGBT temperature reached 36: Output current limit exceeded 37: Low limit frequency reached (Output at stop) 38: Alarm output (all faults) 39: Motor overheat pre-wawrning 40: Current running time arrived. 41: Fault output (No output when it's fault with freely stop or under-voltage)	0	☆
P5-02	Control board relay function selection (T/A-T/B-T/C)		2	☆
P5-03	Reserved			
P5-04	DO1 output function selection		1	☆
P5-05	DO2 output selection		4	☆

Group P5: Output Terminals				
Function code	**Name**	**Setting range**	**Default**	**Property**
P5-06	HDOP output function selection	0: Output frequency 1: Set frequency 2: Output current 3: Output torque (absolute value) 4: Output power 5: Output voltage 6: PULSE input (100.0% for 100.0 KHz) 7: AI1 8: AI2 9: Reserved 10: Length 11: Count value 12: Communication setting 13: Motor speed 14: Output current (100.0% relates to. 1000.0 A) 15: Output voltage (100.0% relates to 1000.0 V) 16: Output torque (actual torque)	0	☆
P5-07	AO1 output function selection		0	☆
P5-08	AO2 output function selection		1	☆
P5-09	HDOP output maximum frequency	0.01 kHz ~ 100.00 kHz	20.00 kHz	☆
P5-10	AO1 offset coefficient	-100.0% ~ +100.0%	0.0%	☆
P5-11	AO1 gain	-10.00 ~ +10.00	1.00	☆
P5-12	AO2 offset coefficient	-100.0% ~ +100.0%	0.0%	☆
P5-13	AO2 gain	-10.00 ~ +10.00	1.00	☆
P5-17	HDOR output delay time	0.0 s ~ 3600.0 s	0.0 s	☆
P5-18	RELAY1 output delay time	0.0 s ~ 3600.0 s	0.0 s	☆
P5-19	Reserved			
P5-20	DO1 output delay time	0.0 s ~ 3600.0 s	0.0 s	☆
P5-21	DO2 output delay time	0.0 s ~ 3600.0 s	0.0 s	☆
P5-22	DO valid status selection	0: Positive logic 1: Negative logic Units digit: HDOR Tens digit: RELAY 1 Hundreds digit: Reserved Thousands digit: DO1 Ten thousands digit: DO2	00000	☆
P5-23	AO signal type selection	Units digit:AO1 0:0~10V voltage signal or 0~20mA current signal 1: 4~20mA current signal Tens digit:AO2 0:0~10V voltage signal or 0~20mA current signal 1: 4~20mA current signal	00	☆

Group P6: Start/Stop control				
Function code	**Name**	**Setting range**	**Default**	**Property**
P6-00	Start-up mode	0: Direct start 1: Speed tracking restart 2: Pre-excited start-up (asynchronous motor)	0	☆
P6-01	Rotational speed tracking mode	0: Start from the frequency at stop state 1: Start from zero speed 2: Star from maximum frequency	0	★
P6-02	Speed tracking speed	1~100	20	☆
P6-03	Start-up frequency	0.00 Hz ~ 10.00 Hz	0.00 Hz	☆
P6-04	Start-up frequency holding time	0.0 s ~ 100.0 s	0.0 s	★
P6-05	Start-up DC braking current/pre-excited current	0% ~ 100%	0%	★
P6-06	Start-up DC braking time/pre-excited time	0.0 s ~ 100.0 s	0.0 s	★
P6-07	Acceleration/deceleration mode	0: Linear acceleration/deceleration 1: S curve acceleration/deceleration A 2: S curve acceleration/deceleration B	0	★
P6-08	Time proportion of S-curve start segment	0.0% ~ (100.0%-P6-09)	30.0%	★
P6-09	Time proportion of S-curve end segment	0.0% ~ (100.0%-P6-08)	30.0%	★
P6-10	Stop mode	0: Decelerate to stop 1: Freely stop	0	★
P6-11	Start frequency of DC braking during Dec.	0.00 Hz ~ Maximum frequency	0.00 Hz	☆
P6-12	Waiting time of DC braking during Dec.	0.0 s ~ 100.0 s	0.0 s	☆
P6-13	DC braking current during Dec.	0% ~ 100%	0%	☆
P6-14	DC braking time during Dec.	0.0 s ~ 100.0 s	0.0 s	☆
P6-15	Brake using rate	0% ~ 100%	100%	☆
P6-18	Speed tracking current	30%~200%	Depends on model	★
P6-21	Time of removing magnetic	0.00~5.00s	1.00s	★

Group P7: Keyboard and Display				
Function code	**Name**	**Setting range**	**Default**	**Property**
P7-01	M key function selection	0: Invalid 1: Switchover between keyboard command channel and remote command channel (Terminal control or communication control) 2: Switchover between forward and reverse	3	★

Group P7: Keyboard and Display				
Function code	**Name**	**Setting range**	**Default**	**Property**
		3: Forward JOG 4: Reverse JOG		
P7-02	STOP/RESET key function	0: Only valid under keyboard control mode 1: Valid in all control mode	0	☆
P7-03	LED display parameter1 during running state	When it displays in binary: 0:Not display 1:Display 0000 ~ FFFF **Units digit:0~F(0000~1111 in binary)** Bit00: Running frequency 1 (Hz) Bit01: Set frequency (Hz) Bit02: Bus voltage (V) Bit03: Output voltage (V) **Tens digit: 0~F(0000~1111 in binary)** Bit04: Output current (A) Bit05: Output power (kW) Bit06: Output torque (%) Bit07: DI input status **Hundreds digit: 0~F(0000~1111 in binary)** Bit08: DO output status Bit09: AI1 voltage (V) Bit10: AI2 voltage (V) Bit11: Reserved **Thousands digit: 0~F(0000~1111 in binary)** Bit12: Count value Bit13: Length value Bit14: Load speed display Bit15: PID setting	001F	☆
P7-04	LED display parameter 2 during running state	When it displays in binary: 0:Not display 1:Display 0000 ~ FFFF **Units digit:0~F(0000~1111 in binary)** Bit00: PID feedback Bit01: PLC step Bit02: PULSE setting frequency (kHz) Bit03: Running Frequency 2 (Hz) **Tens digit: 0~F(0000~1111 in binary)** Bit04: Remaining running time Bit05: AI1 voltage before correction (V) Bit06: AI2 voltage before correction (V) Bit07: Reserved **Hundreds digit: 0~F(0000~1111 in binary)** Bit08: Linear speed Bit09: Current power-on time (Hour) Bit10: Current running time (Min) Bit11: PULSE setting frequency (Hz) **Thousands digit: 0~F(0000~1111 in binary)**	0	☆

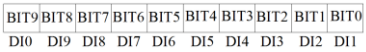
Group P7: Keyboard and Display				
Function code	**Name**	**Setting range**	**Default**	**Property**
		Bit12: Communication stting Bit13: Encoder feedback speed (Hz) Bit14: Main frequency X display (Hz) Bit15: Auxiliary frequency Y display (Hz)		
P7-05	LED display parameters at stop state	When it displays in binary: 0:Not display 1:Display 0000 ~ FFFF **Units digit:0~F(0000~1111 in binary)** Bit00: Set frequency (Hz) Bit01: Bus voltage (V) Bit02: DI input status Bit03: DO output status **Tens digit:0~F(0000~1111 in binary)** Bit04: AI1 voltage (V) Bit05: AI2 voltage (V) Bit06: Reserved Bit07: Count value **Hundreds digit:0~F(0000~1111 in binary)** Bit08: Length value Bit09: PLC step Bit10: Load speed Bit11: PID setting **Thousands digit:0~F(0000~1111 in binary)** Bit12: PULSE setting frequency (kHz) Bit13:PID feedback Note:Pressing ">>" key can monitor parameters by cycle	0003	☆
P7-06	Load speed display coefficient	0.0001-6.5000	1.0000	☆
P7-07	Inverter IGBT heatsink temperature	0.0 ℃ ~ 100.0 ℃	-	●
P7-08	User version No.	-	-	●
P7-09	Accumulative running time	0h ~ 65535h	-	●
P7-10	LED flashing selection at stop state	0:No flashing 1:Flashing	0	☆
P7-11	Software version No.	-	-	●
P7-12	Numer of decimal places of load speed display	0: 0 decimal place 1: 1 decimal place 2: 2 decimal places 3: 3 decimal places	1	
P7-13	Accumulative power-on time	0-65535 hours	-	●
P7-14	Accumulative power consumption	0 ~ 65535 KWh	-	●

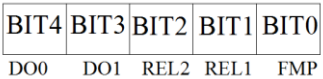
Group P8:Auxiliary Functions				
Function code	**Name**	**Setting range**	**Default**	**Property**
P8-00	JOG running frequency	0.00 Hz ~ Maximum frequency	2.00 Hz	☆
P8-01	JOG acceleration time	0.0 s ~ 6500.0 s	20.0 s	☆
P8-02	JOG deceleration time	0.0 s ~ 6500.0 s	20.0 s	☆
P8-03	Acc. time2	0.0 s ~ 6500.0 s	Depends on model	☆
P8-04	Dec. time2	0.0 s ~ 6500.0 s	Depends on model	☆
P8-05	Acc. time3	0.0 s ~ 6500.0 s	Depends on model	☆
P8-06	Dec. time3	0.0 s ~ 6500.0 s	Depends on model	☆
P8-07	Acc. time4	0.0 s ~ 6500.0 s	Depends on model	☆
P8-08	Dec. time4	0.0 s ~ 6500.0 s	Depends on model	☆
P8-09	Jump frequency 1	0.00 Hz ~ Maximum frequency	0.00 Hz	☆
P8-10	Jump frequency 2	0.00 Hz ~ Maximum frequency	0.00 Hz	☆
P8-11	Jump frequency amplitude	0.00 Hz ~ Maximum frequency	0.01 Hz	☆
P8-12	Forward/reverse rotation dead-zone time	0.0 s ~ 3000.0 s	0.0 s	☆
P8-13	Reverse control prohibition	0: Allow 1: Prohibit	0	☆
P8-14	Running mode selection when set frequency lower than low limit frequency	0: Run at low limit frequency 1: Stop 2: Run at zero speed	0	☆
P8-15	Droop control	0.00 Hz ~ 10.00 Hz	0.00 Hz	☆
P8-16	Accumulative power-on arrival time setting	0h ~ 65000h	0h	☆
P8-17	Accumulative running arrival time setting	0h ~ 65000h	0h	☆
P8-18	Terminal protection selection when power on	0: Invalid 1: Valid	0	☆
P8-19	Frequency detection value (FDT1)	0.00 Hz ~ maximum frequency	50.00 Hz	☆
P8-20	Frequency detection hysteresis (FDT1)	0.0% ~ 100.0% (FDT1 level)	5.0%	☆
P8-21	Frequency reached detection width	0.0% ~ 100.0% (maximum frequency)	1.0%	☆
P8-22	Jump frequency valid or not during Acc./Dec.	0:Invalid 1: Valid	0	☆
P8-25	Switchover frequency for Acc. time 1 and Acc. time 2	0.00 Hz ~ maximum frequency	0.00 Hz	☆
P8-26	Switchover frequency for Dec. time 1 and Dec. time 2	0.00 Hz ~ maximum frequency	0.00 Hz	☆
P8-27	Priority of terminal JOG	0: Invalid	1	☆

Group P8:Auxiliary Functions				
Function code	**Name**	**Setting range**	**Default**	**Property**
		1: Valid		
P8-28	Frequency detection value (FDT2)	0.00 Hz ~ maximum frequency	50.00 Hz	☆
P8-29	Frequency detection hysteresis (FDT2)	0.0% ~ 100.0% (FDT2 level)	5.0%	☆
P8-30	Any frequency reaching detection value 1	0.00 Hz ~ maximum frequency	50.00 Hz	☆
P8-31	Any frequency reaching detection width 1	0.0% ~ 100.0% (maximum frequency)	0.0%	☆
P8-32	Any frequency reaching detection value 2	0.00 Hz ~ maximum frequency	50.00 Hz	☆
P8-33	Any frequency reaching detection width 2	0.0% ~ 100.0% (maximum frequency)	0.0%	☆
P8-34	Zero current detection level	0.0% ~ 300.0% 100.0% corresponds to motor rated current	5.0%	☆
P8-35	Zero current detection delay time	0.01 s ~ 600.00 s	0.10 s	☆
P8-36	Output current exceeded limit	0.0% (not detection) 0.1% ~ 300.0% (motor rated current)	200.0%	☆
P8-37	Output current exceeded limit detection delay time	0.00 s ~ 600.00 s	0.00 s	☆
P8-38	Any reached current 1	0.0% ~ 300.0%(motor rated current)	100.0%	☆
P8-39	Any reached current 1 width	0.0% ~ 300.0% (motor rated current)	0.0%	☆
P8-40	Any reached current 2	0.0% ~ 300.0% (motor rated current)	100.0%	☆
P8-41	Any reached current 2 width	0.0% ~ 300.0% (motor rated current)	0.0%	☆
P8-42	Timing function selection	0: Invalid 1: Valid	0	★
P8-43	Timing duration source selection	0: Set by P8-44 1: AI1 2: AI2 3: Reserved (100% of AI corresponds to the value in P8-44	0	★
P8-44	Timing duration	0.0 Min ~ 6500.0 Min	0.0 Min	★
P8-45	AI1 input voltage protection low limit	0.00V ~ P8-46	3.10 V	☆
P8-46	AI1 input voltage protection upper limit	P8-45 ~ 10.00 V	6.80 V	☆
P8-47	IGBT temperature reached	0 ℃ ~ 100 ℃	75 ℃	☆
P8-48	Cooling fan control	0: Fan works during running 1: Fan always works.	0	☆
P8-49	Wakeup threshold	0.00 ~ 1.00.	0.75	☆
P8-50	Wakeup delay time	0.0 s ~ 6500.0 s	0.0 s	☆

Group P8:Auxiliary Functions				
Function code	**Name**	**Setting range**	**Default**	**Property**
P8-51	Sleep frequency	0.00 Hz ~ 50.00 Hz	0.00 Hz	☆
P8-52	Sleep delay time	0.0 s ~ 6500.0s	0.0 s	☆
P8-53	Current running time reached setting	0.0~6500.0min	0.0 Min	☆
P8-54	Output power correction coefficient	0.00% ~ 200.0%	100.0%	☆

Group P9: Fault and Protection				
Function code	**Name**	**Setting range**	**Default**	**Property**
P9-00	Motor overload protection selection	0: Invalid 1: Valid	1	☆
P9-01	Motor overload protection gain	0.20-10.00	1.00	☆
P9-02	Motor overload warning coefficient	50%-100%	80%	☆
P9-03	Overvoltage stall gain	0 ~ 100	100	☆
P9-04	Overvoltage stall protection voltage	120%~150%	120%	☆
P9-05	Overcurrent stall gain	0 ~ 100	20	☆
P9-06	Overcurrent stall protection current	100~200%	150%	☆
P9-07	Protection for short circuit to ground when power on	0: Invalid 1: Valid	1	☆
P9-08	Braking voltage of the built-in braking unit	200.0~2000.0V	Depends on model	★
P9-09	Fault automatic reset times	0 ~ 20	0	☆
P9-10	DO action selection during fault automatic reset	0: No action 1: Action	0	☆
P9-11	Fault auto reset interval time	0.1 s ~ 100.0 s	1.0 s	☆
P9-12	Input loss phase protection and contactor pull-in selection	Units digit: Input loss phase protection 0: Invalid 1: Valid Tens digit: Contactor pull-in protection 0: Invalid 1: Valid	1	☆
P9-13	Output loss phase protection	0: Invalid 1: Valid	1	☆
P9-14	Fault 1 type	0: No fault 1: Reserved 2: Overcurrent during acceleration 3: Overcurrent during decelerationt 4: Overcurrent at constant speed 5: Overvoltage during acceleration 6: Overvoltage during deceleration 7: Overvoltage at constant speed	-	●
P9-15	Fault 2 type		-	●
P9-16	Fault 3 type			●

<table>
<tr><th colspan="5">Group P9: Fault and Protection</th></tr>
<tr><th>Function code</th><th>Name</th><th>Setting range</th><th>Default</th><th>Property</th></tr>
<tr><td></td><td></td><td>8: Charging resistance overload
9: Undervoltage
10: Frequency inverter overload
11: Motor overload
12: Input loss phase
13: Output loss phase
14: IGBT overheat
15: External fault
16: Communication abnormal
17: Contactor abnormal
18: Current detection abnormal
19: Self-learning abnormal
20: Encoder/PG card abnormal
21: Parameter read/write abnormal
22: Inverter hardware abnormal
23: Motor short circuit to ground
24: Reserved
25: Reserved
26: Running time reached
27: User-defined Fault 1
28: User-defined Fault 2
29: Accumulative power-on time reached
30: Underload
31: PID feedback loss during running
40: Timeout of rapid current limiting
41: Switchover motor during running
42: Speed deviation too large
43: Motor overspeed
50: Motor overheat
51: Initial position error</td><td></td><td></td></tr>
<tr><td>P9-17</td><td>Fault 3(latest): Frequency</td><td>-</td><td>-</td><td>●</td></tr>
<tr><td>P-18</td><td>Fault 3(latest): Current</td><td>-</td><td>-</td><td>●</td></tr>
<tr><td>P9-19</td><td>Fault 3(latest): Bus voltage</td><td>-</td><td>-</td><td>●</td></tr>
<tr><td>P9-20</td><td>Fault 3(latest): Input terminal status</td><td rowspan="10">When the input terminal status is valid, the value of the corresponding bit in binary is 1. The order of each DI as shown in follow.
 

When the output terminal status is valid, the value of the corresponding bit in binary is 1. The order of each DO as shown in follow.
 
</td><td>-</td><td>●</td></tr>
<tr><td>P9-21</td><td>Fault 3(latest): Output terminal status</td><td>-</td><td>●</td></tr>
<tr><td>P9-22</td><td>Fault 3(latest): Inverter status</td><td>-</td><td>●</td></tr>
<tr><td>P9-23</td><td>Fault 3(latest): Accumulative power-on time</td><td>-</td><td>●</td></tr>
<tr><td>P9-24</td><td>Fault 3(latest): Accumulative running time</td><td>-</td><td>●</td></tr>
<tr><td>P9-27</td><td>Fault 2: Frequency</td><td>-</td><td>●</td></tr>
<tr><td>P9-28</td><td>Fault 2: Current</td><td>-</td><td>●</td></tr>
<tr><td>P9-29</td><td>Fault 2: Bus voltage</td><td>-</td><td>●</td></tr>
<tr><td>P9-30</td><td>Fault 2: Input terminal status</td><td>-</td><td>●</td></tr>
<tr><td>P9-31</td><td>Fault 2: Output terminal status</td><td>-</td><td>●</td></tr>
</table>

Group P9: Fault and Protection				
Function code	**Name**	**Setting range**	**Default**	**Property**
P9-32	Fault 2: Inverter status		-	●
P9-33	Fault 2: Accumulative power-on time		-	●
P9-34	Fault 2: Accumulative running time		-	●
P9-37	Fault 1: Frequency		-	●
P9-38	Fault 1: Current		-	●
P9-39	Fault 1: Bus voltage		-	●
P9-40	Fault 1: Input terminal status		-	●
P9-41	Fault 1: Output terminal status		-	●
P9-42	Fault 1: Inverter status		-	●
P9-43	Fault 1: Accumulative power-on time		-	●
P9-44	Fault 1: Accumulative running time		-	●
P9-47	Fault protection action selection 1	Units digit: Motor overload (Err11) 0: Freely stop 1: Stop according to the stop mode 2: Continue running Tens digit: Input loss phase (Err12) Selection as same as above Hundreds digit: Output loss phase (Err13) Selection as same as above Thousands digit: External Fault (Err15) Selection as same as above Ten thousands digits: Communication abnormal (Err16) Selection as same as above	00000	☆
P9-48	Fault protection action selection 2	Units digit:Reserved Tens digit: Parameter read/write abnormal (Err21) 0: Freely stop 1: Stop according to the stop mode Hundreds digit: Reserved Thousands digit: Motor overheat (Err25) 0: Freely stop 1: Stop according to the stop mode 2: Continue running Ten thousands digit: Accumulative running time reached (Err26) 0: Freely stop 1: Stop according to the stop mode 2: Continue running	00000	☆
P9-49	Fault protection action selection 3	Units digit: User-defined fault 1 (Err27) 0: Freely stop 1: Stop according to the stop mode 2: Continue running Tens digit: User-defined fault 2 (Err28) 0: Freely stop 1: Stop according to the stop mode 2: Continue running Hundreds digit: Accumulative power-on time reached	00000	☆

Group P9: Fault and Protection				
Function code	**Name**	**Setting range**	**Default**	**Property**
		(Err29) 0: Freely stop 1: Stop according to the stop mode 2: Continue running Thousands digit:Underload(Err30) 0: Freely stop 1: Stop according to the stop mode 2: Run at 7% of motor rated frequency and run at the set frequency when the load recovers Ten thousands: PID feedback loss during running (Err31) 0: Freely stop 1: Stop according to the stop mode 2: Continue running		
P9-50	Fault protection action selection 4	Units digit: Speed deviation too large (Err42) 0: Freely stop 1: Stop according to the stop mode 2: Continue running Tens digit: Motor overspeed (Err43) 0: Freely stop 1: Stop according to the stop mode 2: Continue running Hundreds digit: Initial position error (Err51) 0: Freely stop 1: Stop according to the stop mode 2: Continue running	00000	☆
P9-54	Frequency for continued running when fault occurs	0: Current running frequency 1: The set frequency 2: Upper limit frequency 3: Low limit frequency 4: Abnormal running frequency set in P9-55	0	☆
P9-55	Abnormal running frequency	0.0% ~ 100.0% (100.0% corresponds maximum frequency P0-10)	100.0%	☆
P9-56-58	Reserved			
P9-59	Instantaneous power failure action selection	0: Invalid 1: Constant DC bus voltage control 2: Decelerate to stop	0	★
P9-60	Action pause judgment voltage for instantaneous power failure	80. 0%-100. 0%	90.0%	★
P9-61	Judging time of voltage rising after instantaneous power failure	0.00 s ~ 100.00 s	0.50 s	★
P9-62	Instantaneous power failure judging voltage	60.0% ~ 100.0% (standard bus voltage)	80.0%	☆
P9-63	Underload protection selection	0: Invalid 1: Valid	0	☆
P9-64	Underload protection detection level	0.0-100.0%	10.0%	☆
P9-65	Underload protection detection time	0.0 ~ 60.0 s	1.0 s	☆
P9-67	Overspeed detection value	0.0% ~ 50.0% (maximum frequency)	20.0%	☆
P9-68	Overspeed detection time	0.0 s: Not detect 0.1 ~ 60.0 s	1.0 s	☆

Group P9: Fault and Protection				
Function code	**Name**	**Setting range**	**Default**	**Property**
P9-69	Speed deviation too large detection value	0.0% ~ 50.0% (maximum frequency)	20.0%	☆
P9-70	Speed deviation too large detection time	0.0 s: Not detect 0.1 ~ 60.0 s	5.0 s	☆
P9-71	Kp gain for continued running when instantaneous power failure occurs	0~100	40	☆
P9-72	Ki integral coefficient for continued running when instantaneous power failure occurs	0~100	30	☆
P9-73	Deceleration time for continued running when instantaneous power failure occurs	0~300.0s	20.0s	☆
P9-74	Load overcurrent falut selection	0:Invalid 1:Valid	0	☆
P9-75	Load overcurrent detection value	0.0~655.35A （0.0:Not detect）	0.0	☆
P9-76	Load overcurrent falut delay time	0.0~120.0S	0.0S	☆

Group PA: PID function				
Function code	**Name**	**Setting range**	**Default**	**Property**
PA-00	PID setting source	0: Set by PA-01 1: AI1 2: AI2 3:Potentiometer on keyboard 4: PULSEsetting (HDI) 5: Communication setting 6: Multi-segment instruction	0	☆
PA-01	PID digital setting	0.0% ~ 100.0%	50.0%	☆
PA-02	PID feedback source	0: AI1 1: AI2 2: Reserved 3: AI1-AI2 4: PULSE setting (HDI) 5: Communication setting 6: AI1+AI2 7: MAX (|AI1|, |AI2|) 8: MIN (|AI1|, |AI2|)	0	☆
PA-03	PID action direction	0:Positive 1:Negative	0	☆
PA-04	PID setting feedback range	0-65535	1000	☆
PA-05	Proportional gain Kp1	0.0-100.0	20.0	☆
PA-06	Integral time Ti1	0.01 s ~ 10.00 s	0.50 s	☆

Group PA: PID function				
Function code	**Name**	**Setting range**	**Default**	**Property**
PA-07	Differential time Td1	0.000 s ~ 10.000 s	0.000 s	☆
PA-08	Cut-off frequency of PID reverse rotation	0.00 ~ maximum frequency	0.00 Hz	☆
PA-09	PID deviation limit	0.0% ~ 100.0%	0.0%	☆
PA-10	PID differential limit	0.00% ~ 100.00%	0.10%	☆
PA-11	PID setting change time	0.00 ~ 650.00 s	0.00 s	☆
PA-12	PID feedback filtertime	0.00 ~ 60.00 s	0.00 s	☆
PA-13	PID output filter time	0.00 ~ 60.00 s	0.00 s	☆
PA-14	Reserved	-	-	
PA-15	Proportional gain Kp2	0.0-100.0	20.0	☆
PA-16	Integral time Ti2	0.01 s ~ 10.00 s	2.00 s	☆
PA-17	Differential time Td2	0.000 s ~ 10.000 s	0.000 s	☆
PA-18	PID parameter switchover condition	0: Not switchover 1: Switchover by DI 2: Switchover automatically according to deviation	0	☆
PA-19	PID parameter switchover deviation 1	0.0% ~ PA-20	20.0%	☆
PA-20	PID parameter switchover deviation 2	PA-19-100.0%	80.0%	☆
PA-21	PID initial value	0.0% ~ 100.0%	0.0%	☆
PA-22	PID initial value hold time	0.00 ~ 650.00 s	0.00 s	☆
PA-23	Twice output positive maximum deviation	0.00% ~ 100.00%	1.00%	☆
PA-24	Twice output negative maximum deviation	0.00% ~ 100.00%	1.00%	☆
PA-25	PID integral property	Units digit: Integral separated 0: Invalid 1: Valid Tens digit: Stop integration when output reaches the limit 0: Continue integration 1: Stop integration	00	☆
PA-26	PID feedback loss detection value	0.0%: Not detect 0.1% ~ 100.0%	0.0%	☆
PA-27	PID feedback loss detection time	0.0 s ~ 20.0 s	0.0 s	☆
PA-28	PID operation at stop state	0: No PID operation at stop 1: PID operation valid at stop	1	☆

Group Pb: Swing frequency, Fixed length and count functions				
Function code	**Name**	**Setting range**	**Default**	**Property**
Pb-00	Swing frequency setting method	0:Relative to center frequency 1: Relative to maximum frequency	0	☆
Pb-01	Swing frequuency amplitude	0.0% ~ 100.0%	0.0%	☆
Pb-02	Jump frequency amplitude	0.0% ~ 50.0%	0.0%	☆
Pb-03	Swing cycle period	0.1 s ~ 3000.0 s	10.0 s	☆
Pb-04	Triangular wave rising time coefficient	0.1% ~ 100.0%	50.0%	☆
Pb-05	Set length	0m ~ 65535m	1000m	☆
Pb-06	Actual length	0m ~ 65535m	0m	☆
Pb-07	Number of pulses per meter	0.1-6553.5	100.0	☆
Pb-08	Set count value	1-65535	1000	☆
Pb-09	Count value	1-65535	1000	☆

Group PC: Multi-segment instruction, simple PLC functions				
Function code	**Name**	**Setting range**	**Default**	**Property**
PC-00	Multi-segment instruction 0	-100.0% ~ 100.0% (100% corresponds to frequency set in P0-10)	10.0%	☆
PC-01	Multi-segment instruction 1	-100% ~ 100%	20.0%	☆
PC-02	Multi-segment instruction 2	-100% ~ 100%	30.0%	☆
PC-03	Multi-segment instruction 3	-100% ~ 100%	40.0%	☆
PC-04	Multi-segment instruction 4	-100% ~ 100%	50.0%	☆
PC-05	Multi-segment instruction 5	-100% ~ 100%	60.0%	☆
PC-06	Multi-segment instruction 6	-100% ~ 100%	70.0%	☆
PC-07	Multi-segment instruction 7	-100% ~ 100%	80.0%	☆
PC-08	Multi-segment instruction 8	-100% ~ 100%	90.0%	☆
PC-09	Multi-segment instruction 9	-100% ~ 100%	100.0%	☆
PC-10	Multi-segment instruction 10	-100% ~ 100%	100.0%	☆
PC-11	Multi-segment instruction 11	-100% ~ 100%	100.0%	☆
PC-12	Multi-segment instruction 12	-100% ~ 100%	100.0%	☆
PC-13	Multi-segment instruction 13	-100% ~ 100%	100.0%	☆
PC-14	Multi-segment instruction 14	-100% ~ 100%	100.0%	☆

Group PC: Multi-segment instruction, simple PLC functions				
Function code	**Name**	**Setting range**	**Default**	**Property**
PC-15	Multi-segment instruction 15	-100% ~ 100%	100.0%	☆
PC-16	Simple PLC operation mode	0:Stop after single cycle 1:Keep running at final frequency after single cycle 2: Continuous loop	0	☆
PC-17	Simple PLC memory selection	Units digit:Memory selection when power off 0:Not save 1:Save Tens digit: Memory selection when stop 0: Not save when stop 1: Save when stop	00	☆
PC-18	Simple PLC Step 0 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-19	Acc./Dec. Time of simple PLC Step 0	0 ~ 3	0	☆
PC-20	Simple PLC Step 1 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-21	Acc./Dec. Time of simple PLC Step 1	0 ~ 3	0	☆
PC-22	Simple PLC Step 2 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-23	Acc./Dec. Time of simple PLC Step 2	0 ~ 3	0	☆
PC-24	Simple PLC Step 3 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-25	Acc./Dec. Time of simple PLC Step 3	0 ~ 3	0	☆
PC-26	Simple PLC Step 4 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-27	Acc./Dec. Time of simple PLC Step 4	0 ~ 3	0	☆
PC-28	Simple PLC Step 5 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-29	Acc./Dec. Time of simple PLC Step 5	0 ~ 3	0	☆
PC-30	Simple PLC Step 6 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-31	Acc./Dec. Time of simple PLC Step 6	0 ~ 3	0	☆
PC-32	Simple PLC Step 7 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-33	Acc./Dec. Time of simple PLC Step 7	0 ~ 3	0	☆
PC-34	Simple PLC Step 8 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-35	Acc./Dec. Time of simple PLC Step 8	0 ~ 3	0	☆
PC-36	Simple PLC Step 9 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-37	Acc./Dec. Time of simple PLC Step 9	0 ~ 3	0	☆
PC-38	Simple PLC Step 10 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-39	Acc./Dec. Time of simple PLC Step 10	0 ~ 3	0	☆
PC-40	Simple PLC Step 11 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆

Group PC: Multi-segment instruction, simple PLC functions				
Function code	**Name**	**Setting range**	**Default**	**Property**
PC-41	Acc./Dec. Time of simple PLC Step 11	0 ~ 3	0	☆
PC-42	Simple PLC Step 12 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-43	Acc./Dec. Time of simple PLC Step 12	0 ~ 3	0	☆
PC-44	Simple PLC Step 13 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-45	Acc./Dec. Time of simple PLC Step 13	0 ~ 3	0	☆
PC-46	Simple PLC Step 14 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-47	Acc./Dec. Time of simple PLC Step 14	0 ~ 3	0	☆
PC-48	Simple PLC Step 15 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-49	Acc./Dec. Time of simple PLC Step 15	0 ~ 3	0	☆
PC-50	Simple PLC running time unit	0: s 1: h	0	☆
PC-51	Multi-segment instruction 0 source	0: Set by PC-00 1: AI1 2: AI2 3: Reserved 4: PULSE setting (HDI) 5: PID 6: Set by P0-08 (preset frequency) and adjusted by UP/DOWN terminals	0	☆

Group Pd: Communication parameters				
Function code	**Name**	**Setting range**	**Default**	**Property**
Pd-00	Communication baud rate	0:300 BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4:4800 BPS 5: 9600 BPS 6:19200 BPS 7:38400 BPS 8:57600 BPS 9:115200 BPS	6	☆
Pd-01	MODBUS data format	0: No parity (8-N-2) 1: Even parity (8-E-1) 2: Odd parity (8-O-1) 3: No parity (8-N-1)	3	☆
Pd-02	Local address	0: Broadcast address 1-247	1	☆
Pd-03	MODBUS response delay	0 ~ 20ms	2	☆
Pd-04	Serial communication timeout	0.0s: Invalid 0.1 ~ 60.0 s	0.0	☆
Pd-05	MODBUS	0: Non-standard MODBUS protocol 1: Standard MODBUS protocol	1	☆
Pd-06	Communication reading current resolution	0: 0.01 A 1: 0.1 A	0	☆

Group PP : Function Code Management				
Function code	**Name**	**Setting range**	**Default**	**Property**
PP-00	User password	0-65535	0	☆
PP-01	Parameter initialization	0: No action 01: Restore factory settings, excluding motor parameters 02: Clear record information 04: Back up user current parameters 501: Restore user backup parameters	0	★
PP-02	Function parameter group display selection	Units digit: U Group Display Selection 0: Not display 1: Display Tens digit: Group A Display Selection 0: Not display 1: Display	11	★
PP-03	Reserved			
PP-04	Function code modification property	0: Modifiable 1: Not modifiable	0	☆

Group A0: Torque Control Parameters				
Function code	**Name**	**Setting range**	**Default**	**Property**
A0-00	Speed/Torque control selection	0: Speed control 1: Torque control	0	★
A0-01	Torque setting source selection	0: Set by A0-03 1: AI1 2: AI2 3: Reserved 4: PULSE setting (HDI) 5: Communication setting 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) (100% of 1-7 options, corresponding to the value set in A0-03)	0	★
A0-03	Torque digital setting	-200.0% ~ 200.0%	150.0%	☆
A0-05	Forward maximum frequency of torque control	0.00 Hz ~ maximum frequency	50.00 Hz	☆
A0-06	Reverse maximum frequency of torque control	0.00 Hz ~ maximum frequency	50.00 Hz	☆
A0-07	Torque control acceleration time	0.00 s ~ 65000 s	0.00 s	☆
A0-08	Torque control deceleration time	0.00 s ~ 65000 s	0.00 s	☆

Group A1: Virtual IO				
Function code	**Name**	**Setting range**	**Default**	**Property**
A1-00	VDI1 function selection	0 ~ 59	0	★
A1-01	VDI2 function selection	0 ~ 59	0	★

Group A1: Virtual IO				
Function code	**Name**	**Setting range**	**Default**	**Property**
A1-02	VDI3 function selection	0 ~ 59	0	★
A1-03	VDI4 function selection	0 ~ 59	0	★
A1-04	VDI5 function selection	0 ~ 59	0	★
A1-05	VDI terminal status setting mode	0:Valid or not depends on the state of the virtual VDOx 1: Valid or not depends on the setting in A1-06 Units digit: Virtual terminal VDI1 Tens digit: Virtual terminal VDI2 Hundreds digit: Virtual terminal VDI3 Thousands digit: Virtual terminal VDI4 Ten thousands: Virtual terminal VDI5	00000	★
A1-06	Virtual VDI terminal status setting	0: Invalid 1: Valid Units digit: Virtual terminal VDI1 Tens digit: Virtual terminal VDI2 Hundreds digit: Virtual terminal VDI3 Thousands digit: Virtual terminal VDI4 Ten thousands: Virtual terminal VDI5	00000	★
A1-07	The function selection of AI1 when used as DI	0 ~ 59	0	★
A1-08	The function selection of AI2 when used as DI	0 ~ 59	0	★
A1-09	Reserved			
A1-10	Action mode selection of AI when used as DI	0: High level valid 1: Low level valid Units digit: AI1 Tens digit: AI2	000	★
A1-11	VDO1 function selection	0: Internal short with physical DIx 1 ~ 40: Refer to function selection of DO in Group P5	0	☆
A1-12	VDO2 function selection	0: Internal short with physical DIx 1 ~ 40: Refer to function selection of DO in Group P5	0	☆
A1-13	VDO3 function selection	0: Internal short with physical DIx 1 ~ 40: Refer to function selection of DO in Group P5	0	☆
A1-14	VDO4 function selection	0: Internal short with physical DIx 1 ~ 40: Refer to function selection of DO in Group P5	0	☆
A1-15	VDO5 function selection	0: Internal short with physical DIx 1 ~ 40: Refer to function selection of DO in Group P5	0	☆
A1-16	VDO1 Output Delay	0.0 s ~ 3600.0 s	0.0 s	☆
A1-17	VDO2 Output Delay	0.0 s ~ 3600.0 s	0.0 s	☆
A1-18	VDO3 Output Delay	0.0 s ~ 3600.0 s	0.0 s	☆
A1-19	VDO4 Output Delay	0.0 s ~ 3600.0 s	0.0 s	☆
A1-20	VDO5 Output Delay	0.0 s ~ 3600.0 s	0.0 s	☆
A1-21	VDO status selection	0: Positive logic 1: Negative logic Units digit: VDO1 Tens bits: VDO2 Hundreds digit: VDO3 Thousands digit: VDO4 Ten thousands digit: VDO5	00000	☆

Group A2: Motor 2 Parameters				
Function code	**Name**	**Setting range**	**Default**	**Property**
A2-00	Motor type selection	0: Ordinary asynchronous motor 1: Asynchronous motor special for frequency inverter	0	★
A2-01	Motor rated power	0.1 kW ~ 1000.0 kW	Depends on model	★
A2-02	Motor rated voltage	1V ~ 2000V	Depends on model	★
A2-03	Motor rated current	0.01 A ~ 655.35 A (variable-frequency drive power ≤ 55 kW) 0.1 A ~ 6553.5 A (converter power > 55kW)	Depends on model	★
A2-04	Motor rated frequency	0.01 Hz ~ maximum frequency	Depends on model	★
A2-05	Motor rated speed	1rpm ~ 65535rpm	Depends on model	★
A2-06	Motor stator resistance	0.001 Ω ~ 65.535 Ω (inverter power < = 55kW) 0.0001 Ω ~ 6.5535 Ω (inverter power > 55kW)	Obtain by self-learning	★
A2-07	Motor rotor resistance	0.001 Ω ~ 65.535 Ω (inverter power < = 55kW) 0.0001 Ω ~ 6.5535 Ω (inverter power > 55kW)	Obtain by self-learning	★
A2-08	Leakage inductance reactance	0.01 mH ~ 655.35 mH (inverter power < = 55kW) 0.001 mH ~ 65.535 mH (inverter power > 55kW)	Obtain by self-learning	★
A2-09	Mutual inductance reactance	0.1 mH ~ 6553.5 mH (inverter power < = 55kW) 0.01 mH ~ 655.35 mH (inverter power > 55kW)	Obtain by self-learning	★
A2-10	Motor no-load current	0.01 A ~ P1-03 (inverter power < = 55kW) 0.1 A ~ P1-03 (inverter power > 55kW)	Obtain by self-learning	★
A2-16 ~ 36	Reserved			
A2-37	Self-learning selection	0: No self-learning 1: Static self-learning 2: Rotation complete self-learning 3. Static complete self-learning	0	★
A2-38	Speed loop proportional gain1	1-100	30	☆
A2-39	Speed loop integration time1	0.01 s ~ 10.00 s	0.50 s	☆
A2-40	Switching frequency 1	0.00-A2-43	5.00 Hz	☆
A2-41	Speed loop proportional gain2	1-100	20	☆
A2-42	Speed loop integration time2	0.01 s ~ 10.00 s	1.00 s	☆
A2-43	Switching frequency 2	A2-40 ~ maximum frequency	10.00 Hz	☆

Group A2: Motor 2 Parameters				
Function code	**Name**	**Setting range**	**Default**	**Property**
A2-44	Vector control slip gain	50 to 200 percent	100%	☆
A2-45	Time constant of speed loop filter	0.000 s ~ 0.100 s	0.000 s	☆
A2-46	Vector control over-excitation gain	0 ~ 200	64	☆
A2-47	Motoring torque upper limit source in speed control	0: Set by A2-48 1: AI1 2: AI2 3.Potentiometer on keyboard 4: Pulse setting 5: Communication setting 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) 100% in options 1-7 corresponds to A2-48	0	☆
A2-48	Digital setting of motoring torque upper limit in speed control	0.0% ~ 200.0% 100% corresponds to motor rated current	150.0%	☆
A2-51	Excitation adjustment proportional gain	0 ~ 20000	2000	☆
A2-52	Excitation adjustment integral gain	0 ~ 20000	1300	☆
A2-53	Torque adjustment proportional gain	0 ~ 20000	2000	☆
A2-54	Torque adjustment integral gain	0 ~ 20000	1300	☆
A2-55	Speed loop integral property	Units digit: Integral separation 0: Invalid 1: Valid	0	☆
A2-59-60	Reserved			
A2-61	Motor 2 control mode	0: Speed sensorless vector control (SVC) 1: Reserved 2: V/F control	0	★
A2-62	Acc./Dec. Time selection of Motor 2	0: Same as Motor 1 1: Acc./Dec. Time 1 2: Acc./Dec. Time 2 3: Acc./Dec. Time 3 4: Acc./Dec. Time 4	0	☆
A2-63	Motor 2 torque boost	0.0%: Automatic torque boost 0.1%~ 30.0%	Depends on model	☆
A2-65	Motor 2 oscillation suppression gain	0 ~ 100	Depends on model	☆

Group A5: Control Optimization Parameters				
Function code	**Name**	**Setting range**	**Default**	**Property**
A5-00	DPWM switchover frequency upper limit	0.00 Hz ~ maximum frequency	8.00 Hz	☆
A5-01	PWM modulation	0:Asynchronous modulation 1: Synchronous modulation	0	☆
A5-02	Dead zone compensation mode selection	0: No compensation 1: Compensation mode1 2: Compensation mode2	1	☆
A5-03	Random PWM depth	0: Invalid 1 ~ 10: PWM Carrier frequency random depth	0	☆
A5-04	Rapid current limit Enable	0: Disabled 1: Enabled	1	☆
A5-05	Current detection compensation	0 ~ 100	5	☆
A5-06	Undervoltage level setting	60.0%-140.0%	100.0%	☆
A5-07	SVC optimization mode selection	0: No optimization 1: Optimization mode 1 2: Optimization mode 2	1	☆
A5-08	Dead zone time adjustment	100%~200%	150%	★
A5-09	Overvoltage level setting	200.0 V ~ 2500.0 V	Depends on model	★

Group A6: AI Curve Setting				
Function code	**Name**	**Setting range**	**Default**	**Property**
A6-00	AI Curve 4 minimum input	-10.00 V ~ A6-02	0.00 V	☆
A6-01	Correspondence setting of AI Curve 4 minimum input	-100.0% ~ +100.0%	0.0%	☆
A6-02	AI Curve 4 inflexion 1 input	A6-00 ~ A6-04	3.00 V	☆
A6-03	Correspondence setting of AI Curve 4 inflexion 1 input	-100.0% ~ +100.0%	30.0%	☆
A6-04	AI Curve 4 inflexion 2 input	A6-02 to A6-06	6.00 V	☆
A6-05	Correspondence setting of AI Curve 4 inflexion 2 input	-100.0% ~ +100.0%	60.0%	☆
A6-06	AI Curve 4 max input	A6-06 ~ +10.00 V	10.00 V	☆
A6-07	Correspondence setting of AI Curve 4 maximum input	-100.0% ~ +100.0%	100.0%	☆
A6-08	AI Curve 5 minimum input	-10.00 V ~ A6-10	-10.00 V	☆
A6-09	Correspondence setting of AI Curve 5 minimum input	-100.0% ~ +100.0%	-100.0%	☆
A6-10	AI Curve 5 inflexion 1 input	A6-08 ~ A6-12	-3.00 V	☆
A6-11	Correspondence setting of AI Curve 5 inflexion 1 input	-100.0% ~ +100.0%	-30.0%	☆
A6-12	AI Curve 5 inflexion 2 input	A6-10 to A6-14	3.00 V	☆
A6-13	Correspondence setting of AI Curve 5 inflexion 2 input	-100.0% ~ +100.0%	30.0%	☆
A6-14	AI Curve 5 max input	A6-12 ~ +10.00 V	10.00 V	☆

A6-15	Correspondence setting of AI Curve 5 maximum input	-100.0 ~ +100.0%	100.0%	☆
A6-24	AI1 jump point setting	-100% ~ 100%	0.0%	☆
A6-25	AI1 jump point amplitude	0.0% ~ 100.0%	0.5%	☆
A6-26	AI2 jump point setting	-100% ~ 100%	0.0%	☆
A6-27	AI2 jump point amplitude	0.0% ~ 100.0%	0.5%	☆

Group AC: Correction of AI and AO				
Function code	**Name**	**Setting range**	**Default**	**Property**
AC-00	AI1 Measured Voltage 1	0.500 V ~ 4.000 V	Factory calibrated	☆
AC-01	AI1 Display Voltage 1	0.500 V ~ 4.000 V	Factory calibrated	☆
AC-02	AI1 Measured Voltage 2	6.000 V ~ 9.999 V	Factory calibrated	☆
AC-03	AI1 Display Voltage 2	6.000 V ~ 9.999 V	Factory calibrated	☆
AC-04	AI2 Measured Voltage 1	0.500 V ~ 4.000 V	Factory calibrated	☆
AC-05	AI2 Display Voltage 1	0.500 V ~ 4.000 V	Factory calibrated	☆
AC-06	AI2 Measured Voltage 2	6.000 V ~ 9.999 V	Factory calibrated	☆
AC-07	AI2 Display Voltage2	6.000 V ~ 9.999 V	Factory calibrated	☆
AC-12	AO1 Target Voltage1	0.500 V ~ 4.000 V	Factory calibrated	☆
AC-13	AO1 Measured Voltage 1	0.500 V ~ 4.000 V	Factory calibrated	☆
AC-14	AO1 Target Voltage2	6.000 V ~ 9.999 V	Factory calibrated	☆
AC-15	AO1 Measured Voltage 2	6.000 V ~ 9.999 V	Factory calibrated	☆
AC-16	AO2 Target Voltage1	0.500 V ~ 4.000 V	Factory calibrated	☆
AC-17	AO2 Measured Voltage 1	0.500 V ~ 4.000 V	Factory calibrated	☆
AC-18	AO2 Target Voltage2	6.000 V ~ 9.999 V	Factory calibrated	☆
AC-19	AO2 Measured Voltage2	6.000 V ~ 9.999 V	Factory calibrated	☆
AC-20	AI2 Measured Current1	0.000 mA ~ 20.000 mA	Factory calibrated	☆
AC-21	AI2 Sampling Current1	0.000 mA ~ 20.000 mA	Factory calibrated	☆
AC-22	AI2 Measured Current2	0.000 mA ~ 20.000 mA	Factory calibrated	☆
AC-23	AI2 Sampling Current2	0.000 mA ~ 20.000 mA	Factory calibrated	☆
AC-24	AO1 Ideal Current1	0.000 mA ~ 20.000 mA	Factory calibrated	☆
AC-25	AO1 Measured Current1	0.000 mA ~ 20.000 mA	Factory calibrated	☆
AC-26	AO1 Ideal Current2	0.000 mA ~ 20.000 mA	Factory calibrated	☆

Group AC: Correction of AI and AO				
Function code	**Name**	**Setting range**	**Default**	**Property**
AC-27	AO1 Measured Current2	0.000 mA ~ 20.000 mA	Factory calibrated	☆

Monitor Parameters

Function code	Name	Min. unit	Communication address
U0-00	Running frequency (Hz)	0.01 Hz	7000H
U0-01	Set frequency (Hz)	0.01 Hz	7001H
U0-02	Bus voltage (V)	0.1 V	7002H
U0-03	Output voltage (V)	1V	7003H
U0-04	Output current (A)	0.01 A	7004H
U0-05	Output power (kW)	0.1 kW	7005H
U0-06	Output torque (%)	0.1%	7006H
U0-07	DI input Status	1	7007H
U0-08	DO output status	1	7008H
U0-09	AI1 voltage (V)	0.01 V	7009H
U0-10	AI2 voltage (V)/current (mA)	0.01 V/0. 01 mA	700AH
U0-11	Reserved		
U0-12	Count value	1	700CH
U0-13	Length value	1	700DH
U0-14	Load speed	1	700EH
U0-15	PID setting	1	700FH
U0-16	PID feedback	1	7010H
U0-17	PLC stage	1	7011H
U0-18	PULSE input frequency (Hz)	0.01 kHz	7012H
U0-19	Feedback speed (Hz)	0.01 Hz	7013H
U0-20	Remaining running time	0.1 Min	7014H
U0-21	AI1voltage before correction	0.001 V	7015H
U0-22	AI2 voltage (V)/current (mA) before correction	0.001 V/0. 01 mA	7016H
U0-23	Reserved		
U0-24	Linear speed	1m/Min	7018H
U0-25	Accumulative power-on time	1Min	7019H
U0-26	Accumulative running time	0.1 Min	701AH
U0-27	PULSE Input Frequency	1Hz	701BH
U0-28	Communication setting	0.01%	701CH

Function code	Name	Min. unit	Communication address
U0-29	Encoder feedback speed	0.01 Hz	701DH
U0-30	Main frequency X display	0.01 Hz	701EH
U0-31	Auxiliary frequency Y display	0.01 Hz	701FH
U0-33	Reserved		
U0-34	Reserved		
U0-35	Target torque (%)	0.1%	7023H
U0-36	Reserved		
U0-37	Angle of power factor	0.1 °	7025H
U0-38	Reserved		
U0-39	Target Voltage of V/F separation	1V	7027H
U0-40	Output Voltage of V/F separation	1V	7028H
U0-41	DI input state display	1	7029H
U0-42	DO output state display	1	702AH
U0-43	DI function state display 1 (01~40)	1	702BH
U0-44	DI function status display 2 (41~80)	1	702CH
U0-45	Fault information	1	702DH
U0-58	Reserved		
U0-59	Current set frequency (%)	0.01%	703BH
U0-60	Current running Frequency (%)	0.01%	703CH
U0-61	Frequency inverter state	1	703DH
U0-62	Current fault code	1	703EH
U0-63	Reserved		
U0-64	Reserved		
U0-65	Torque upper limit	0.1%	7041H

7 Parameters Description

Group P0：Basic Function Parameters

Function code	Name	Setting range	Default	Property
P0-00	G/P type display	1: G type (constant torque load) 2: P type (fan and pump load)	1	★

3PH 380V and 480V voltage grade inverter has G and P type for choose.

1: G type, suitable for constant torque load

2: P type, suitable for variable torque load (Centrifugal fans and pumps)

When the load is blower or roots blower, please also select G type.

Function code	Name	Setting range	Default	Property
P0-01	Motor 1 control mode	0: Speed sensorless vector control (SVC) 1: Reserved 2: V/F control	2	★

For simple applications with low load requirements like fan and pump, please select V/F control mode. Multiple motors can be operated together by one inverter when under V/F control.

Note: When vector control mode selected, please perform motor parameters self-learning to obtain motor internal characteristic parameters correctly. The advantages of vector control be utilized with correct motor parameters.

Function code	Name	Setting range	Default	Property
P0-02	Command source selection	0: Keyboard control (LED Off) 1: Terminal Control (LED on) 2: Communication Control (LED Flashing)	0	☆

Inverter control mode selection.

0: Keyboard control (LED Off).

Start or stop the inverter by press the key on the keyboard.

1: Terminal Control (LED on).

Start or stop the inverter by terminal. Multi-function DI with FWD or REV functions needs to be used.

2: Communication Control (LED Flashing)

Start or stop the inverter by communication. For more details, please refer to the descrption of MODBUS communication.

Function code	Name	Setting range	Default	Property
P0-03	Main frequency source X selection	0: Digital setting (preset by P0-08, not save when power failure) 1: Digital setting (preset by P0-08, save when power failure) 2: AI1 3: AI2 4: Potentiometer on the keyboard 5: PULSE setting (HDI) 6: Multi-speed instruction 7: Simple PLC 8: PID 9: Communication setting	4	★

Used to select the setting channel of the main frequency. Selections as below:

0: Digital setting (preset by P0-08, not save when power failure)

The initial value of the set frequency is the value of P0-08 (Preset frequency). You can change the set frequency by pressing the UP and DOWN arrow key on the keyboard (or using the multi-function DI input terminals with UP/DOWN function).

The frequency after changed would not be saved when power failure. Power on again, the set frequency still is the setting value in P0-08.

1: Digital setting (preset by P0-08, save when power failure)

The initial value of the set frequency is the value of P0-08 (Preset frequency). You can change the set frequency by pressing the UP and DOWN arrow key on the keyboard (or using the multi-function DI input terminals with UP/DOWN function). The changed frequency would be saved when power failure.When power on agian, the set frequency is the saved frequency.

2: AI1 (0–10 V voltage input)

3: AI2 (0–10 V voltage input or 4–20 mA current input)

When AI is used as the frequency setting source, the corresponding value 100% of the voltage/current input corresponds to the value of P0-10 (Maximum frequency).

4:Potentiometer on the keyboard

Rotates the potentiometer on the keyboard can increase or decrease the frequency.

5: PULSE setting (HDI)

The frequency is set by HDI. The signal specification of pulse setting is 9–30 V (voltage range) and 0–100 kHz (frequency range). The corresponding value 100% of pulse setting corresponds to the value of P0-10 (Maximum frequency).

6: Multi-speed instruction

In multi-speed mode, combinations of different DI terminal states correspond to different set frequency. SSV600 series inverter supports a maximum of 16 speeds implemented by 16 state combinations of four DI terminals (allocated with functions 12 to 15) in Group PC. The multiple references indicate percentages of the value of P0-10 (Maximum frequency). The related setting of DI terminals, please refer to description of Group P4.

7: Simple PLC

When the simple programmable logic controller (PLC) mode is used as the frequency source, the running frequency of the inverter can be switched over among the 16 steps. You can set the holding time and Acc./Dec. time of each step. For details, refer to the descriptions of Group PC.

8: PID

The output of PID control is used as the running frequency. When applying PID as the frequency source, you need to set parameters of PID function in group PA.

9: Communication setting

The frequency is set by MODBUS communication. For more details, please refer to description of MODBUS communication the manual.

Function code	Name	Setting range	Default	Property
P0-04	Auxiliary frequency source Y selection	Same as P0-03 (Main Frequency Source X Selection)	0	★

When used as an independent frequency input channel, the auxiliary frequency source Y is used in the same way as the main frequency source X (refer to P0-03).

When the auxiliary frequency source is used with main frequency X together, pay attention to the following aspects:

1) If the auxiliary frequency source Y is digital setting, the preset frequency (P0-08) does not take effect. You can directly adjust the set main frequency by pressing UP and DOWN arrow keys on the keyboard (or using the multi-function DI input terminals with UP/DOWN function).

2) If the auxiliary frequency source is analog input (AI1, AI2) or pulse setting, 100% of the input corresponds to the range of the auxiliary frequency Y (set in P0-05 and P0-06).

3) If the auxiliary frequency source is pulse setting, it is similar to analog input.

Note: The main frequency source X and auxiliary frequency source Y must not use the same channel. That is, P0-03 and P0-04 cannot be set to the same value.

Function code	Name	Setting range	Default	Property
P0-05	Auxiliary frequency source Y-range selection	0: Relative to maximum frequency 1: Relative to frequency source X	0	☆
P0-06	Auxiliary frequency source Y range	0% ~ 150%	100%	☆

If main frequency X and auxiliary frequency used together, P0-05 and P0-06 are used to set the adjustment range of the auxiliary frequency source.

You can set the auxiliary frequency to be relative to either maximum frequency or main frequency X. If relative to main frequency X, the setting range of the auxiliary frequency Y varies according to the main frequency X.

Function code	Name	Setting range	Default	Property
P0-07	Frequency source method selection	Units digit: frequency source selection 0: Main Frequency Source X 1: The calculation of X and Y (the relation is determined by tens digit) 2: Switching between X(Main) and Y(Auxiliary) 3: Switching between X(Main) and the calculation result of X and Y 4: Switching between Y(Auxiliary) and the calculation of X and Y Tens digit: Calculation formula of X and Y 0: X(Main) + Y(Auxiliary) 1: X(Main)- Y(Auxiliary) 2:Maximum(X,Y) 3: Minimum(X,Y)	00	☆

Used to select the frequency setting channel. Details as shown in **Fig. 7-1**.

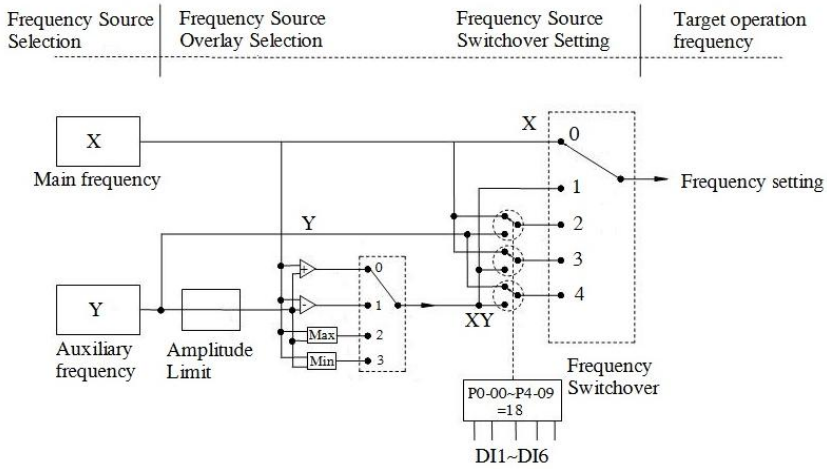


Fig. 7-1 Main frequency source X and auxiliary frequency source Y setting

Function code	Name	Setting range	Default	Property
P0-08	Preset frequency	0.00 Hz ~ maximum frequency (P0-10)	50.00 Hz	☆

If the frequency source is digital setting or terminal UP/DOWN, P0-08 is the initial frequency.

Function code	Name	Setting range	Default	Property
P0-09	Rotation direction	0: Same direction 1: opposite direction	0	☆

You can change the rotation direction of the motor just by modifying this parameter without changing the motor wiring. Modifying this parameter is equivalent to exchanging any two of the motor's U, V, W wires.

Function code	Name	Setting range	Default	Property
P0-11	Upper limit frequency source	0: Set by P0-12 1: AI1 2: AI2 4: Pulse setting (HDI) 5: Communication setting	0	★

The setting method as same as the setting of P0-03.

Function code	Name	Setting range	Default	Property
P0-12	Upper limit frequency	Low limit frequency P0-14 ~ maximum frequency P0-10	50.00 Hz	☆
P0-13	Upper frequency offset	0.00 Hz ~ maximum frequency P0-10	0.00 Hz	☆
P0-14	Low limit frequency	0.00 Hz ~ upper frequency P0-12	0.00 Hz	☆

When P0-11=0, the upper limit frequency set by P0-12.

When P0-11 is 1, 2 or 4, the upper limit frequency offset would be added.

The actual upper limit frequency = Frequency (AI1, AI2 or Pulse setting) + P0-13.

Function code	Name	Setting range	Default	Property
P0-15	Carrier frequency	0.5 KHz ~ 16.0 KHz	Depends on model	☆
P0-16	Carrier frequency changes with temperature	0: No 1: Yes	1	☆

Carrier frequency mainly affects motor noise and heat loss when running. Relationship among carrier frequency, motor noise and leak current is as follows:

When carrier frequency goes up (↑), the motor noise is reduced (↓), leakage current of the motor is increased (↑), and the interference is increased (↑);

When carrier frequency goes down (↓), the motor noise is increased (↑), leakage current of the motor is decreased (↓) and the interference is decreased (↓).

When the ambient temperature is high and the motor load is heavy, properly reduce the carrier frequency to reduce thermal loss to the inverter.

The factory setting of carrier frequency varies with the inverter power. If you need to modify the carrier frequency, note that if the set carrier frequency is higher than factory setting, it will lead to an increase in temperature rise of the inverter's heatsink. In this case, you need to de-rate the inverter. Otherwise, overheat and alarm may occurs.

When P0-16=1, the inverter automatically reduces the carrier frequency when detecting that the heatsink temperature is high. It will resume the carrier frequency to the set value when the heatsink temperature becomes normal.

Function code	Name	Setting range	Default	Property
P0-17	Acc.time1	0.00 s ~ 650.00 s (P0-19=2) 0.0 s ~ 6500.0 s (P0-19=1) 0s ~ 65000 s (P0-19=0)	Depends on model	☆
P0-18	Dec. time1	0.00 s ~ 650.00 s (P0-19=2) 0.0 s ~ 6500.0 s (P0-19=1) 0s ~ 65000 s (P0-19=0)	Depends on model	☆
P0-19	Acc./Dec. time unit	0: 1s 1: 0.1s 2: 0.01s	1	★

Acceleration time is the time required by the inverter to accelerate from 0 Hz to the frequency set in P0-25.

Deceleration timeis the time required by theinverter to decelerate from the frequency set in P0-25 to 0 Hz.

Please notice that the actual Dec. time will be much longer than the value set in P0-18 when overvoltage stall occurs.

Total four group Acc./Dec. time can be selected by multi-function DI terminal. For the setting of the DI, please refer to the description of DI.

Acc./Dec. Time 1: P0-17,P0-18

Acc./Dec. Time 2: P8-03,P8-04

Acc./Dec. Time 3: P8-05,P8-06

Acc./Dec. Time 4: P8-07,P8-08

Function code	Name	Setting range	Default	Property
P0-21	Offset frequency of auxiliary frequency source Y	0.00 Hz ~ maximum frequency P0-10	0.00 Hz	☆

When the main frequency X and auxiliary frequency Y are used together, the offset set in P0-21 would be added.

The final set frequency= the calculation frequency of X and Y +P0-21

Function code	Name	Setting range	Default	Property
P0-22	Frequency command resolution	1: 0.1 Hz 2: 0.01 Hz	2	★

Used to set the resolution of all frequency parameters.

Note: Modifying this parameter will make the decimal places of all frequency parameters change and the corresponding frequency values change.

Function code	Name	Setting range	Default	Property
P0-23	Digital setting frequency save or not when stop	0: Not save 1: Save	1	☆

0: Not save

The set frequency adjusted by UP and DOWN arrow on the keyboard (or multi-function terminal DI with UP/DOWN functions) during running would not be saved when inverter stops.

1: Save

The set frequency adjusted by UP and DOWN arrow on the keyboard (or multi-function terminal DI with UP/DOWN functions) during running would not be saved when inverter stops.

Function code	Name	Setting range	Default	Property
P0-24	Motor parameter group selection	0: Motor parameter group 1 1: Motor parameter group 2	0	★

Two groups motor parameters in SV600 series inverter. They can be selected by P0-24 or multi-function terminal DI with switchover function.

Function code	Name	Setting range	Default	Property
P0-25	Acc./Dec. time reference frequency	0: Maximum frequency (P0-10) 1: Set frequency 2: 100Hz	0	★

The acceleration and deceleration time are the time needed for increasing or decreasing from zero frequency to the reference frequency selected in P0-25. When P0-25=1, the Acc./Dec. time will change according to the set frequency.

Function code	Name	Setting range	Default	Property
P0-26	Reference frequency for UP/ DOWN during running	0: Running frequency 1: The set frequency	0	★

The parameter is valid only when the frequency source is digitall setting.

When adjusting the inverter frequency by pressing UP or DOWN arrow on the keyboard (or multi-function terminal DI with UP/DOWN functions), P0-26 decides the reference frequency for starting to increase or decrease.

Function code	Name	Setting range	Default	Property
P0-27	Bundling command source with frequency source	Units digit:(Keyboard control binds to frequency source) 0: Not bind 1: Digital frequenc setting 2: AI1 3: AI2 4: Reserved	0000	☆

		5: Pulse setting (HDI) 6: Multi-segment instruction 7: Simple PLC 8: PID 9: Communication setting Tens digit: (Terminal control binds to frequency source) Same as above. Hundreds digit: (Communication control binds to frequency source) Thousands digit: (Auto running binds to frequency source)		

Bind the running command with the frequency setting sources, facilitating to implement synchronous switchover.

The frequency source as same as the selection in P0-03. Different running command sources can be bound to the same frequency source. If a command source has a bound frequency source, the frequency source set in P0-03 to

P0-07 no longer takes effect when the command source is effective.

Group P1: Motor 1 Parameters

Function code	Name	Setting range	Default	Property
P1-00	Motor type selection	0: Standard asynchronous motor 1: Asynchronous motor special for frequency inverter	0	★
P1-01	Motor rated power	0.1 KW ~ 1000.0 KW	Depends on model	★
P1-02	Motor rated voltage	1V ~ 2000V	Depends on model	★
P1-03	Motor rated current	0.01 ~ 655.35 A (≤ 55 kW) 0.1 ~ 6553.5 A (≥ 75 kW)	Depends on model	★
P1-04	Motor rated frequency	0.01 Hz ~ maximum frequency	Depends on model	★
P1-05	Motor rated speed	1rpm ~ 65535rpm	Depends on model	★

Set the parameters according to the motor nameplate no matter whether V/F control or vector control is adopted. To achieve better V/F or vector control performance, motor parameters self-learning is required. The motor parameters self-learning accuracy depends on the correct setting of motor nameplate parameters.

Function code	Name	Setting range	Default	Property
P1-06	Motor stator resistance	0.001 Ω ~ 65.535 Ω (inverter power < = 55kW) 0.0001 Ω ~ 6.5535 Ω (inverter power > 55kW)	Obtain by self-learning	★
P1-07	Motor rotor resistance	0.001 Ω ~ 65.535 Ω (inverter power < = 55kW) 0.0001 Ω ~ 6.5535 Ω (inverter power > 55kW)	Obtain by self-learning	★
P1-08	Leakage inductance reactance	0.01 mH ~ 655.35 mH (inverter power < = 55kW) 0.001 mH ~ 65.535 mH (inverter power > 55kW)	Obtain by self-learning	★
P1-09	Mutual inductance reactance	0.1 mH ~ 6553.5 mH (inverter power < = 55kW) 0.01 mH ~ 655.35 mH (inverter power > 55kW)	Obtain by self-learning	★
P1-10	Motor no-load current	0.01 A ~ P1-03 (inverter power < = 55kW) 0.1 A ~ P1-03 (inverter power > 55kW)	Obtain by self-learning	★

The parameters in P1-06 to P-10 are asynchronous motor internal characteristic parameters. These parameters are unavailable on the motor nameplate and are obtained by means of motor parameters self-learning. Only P1-06 to P1-08 can be obtained through static motor parameters self-learning.

When motor rated power or motor rated voltage changed, please perform self-learning agian if under vector control.

If it is impossible to perform motor auto-tuning onsite, manually input the values of these parameters according to data provided by the motor manufacturer or other ways.

Function code	Name	Setting range	Default	Property
P1-37	Self-learning selection	0: No self-learning 1: Static self-learning 2: Rotation complete self-learning 3. Static complete self-learning	0	★

In order to ensure the best control performance of the inverter during vector control, please disconnect the load from the motor and use the rotation self-learning to perform motor parameter self-learning, otherwise the vector control effect will be affected. Use static self-learning when the motor has a large inertia load and is not easy to disconnect and vector control is required.

Please correctly set motor nameplate parameters P1-00 to P1-05 before perfrom motor characteristic parameters self-learning.

0: No self-learning

1: Static self-learning

Suitable for the motor has a large inertia load and is not easy to disconnect.

2: Rotation complete self-learning

To perform rotation complete self-learning, ensure that the motor is disconnected from the load. During the process of rotation complete self-learning, the inverter performs static auto-tuning first and then accelerates to 80% of the rated motor frequency within the Acc. time set in P0-17. The inverter keeps running for a certain period and then decelerates to stop within Dec. time set in P0-18.

3. Static complete self-learning

Suitable for the application without encoder and the motor load is large and cannot be disconnected.

Steps: Correctly set the motor nameplate parameters P1-00 to P1-05 and select the self-learning mode in P1-37, then press RUN key on the keyboard to start the self-learning. The whole processing will last several miniutes.

Group P2: Motor 1 vector control parameters

Function code	Name	Setting range	Default	Property
P2-00	Speed loop proportional gain1	1-100	30	☆
P2-01	Speed loop integration time1	0.01 s ~ 10.00 s	0.50 s	☆
P2-02	Switching frequency 1	0.00~P2-05	5.00 Hz	☆
P2-03	Speed loop proportional gain2	1~100	20	☆
P2-04	Speed loop integration time2	0.01 s ~ 10.00 s	1.00 s	☆
P2-05	Switching frequency 2	P2-02 ~ maximum frequency	10.00 Hz	☆

SV600 series inverter has two groups of speed loop PI parameters. Each group parameters can be swithover by the switchover frequency 1 and switchover frequency 2.

1. Speed loop PI parameters P2-00 and P2-01 valid when running frequency <=P2-02.
2. Speed loop PI parameters P2-03 and P2-04 valid when running frequency >=P2-05.
3. When P2-02 <running frequency <P2-05, speed loop PI parameters value obtained from the linear switchover as shown in **Fig.7-02.**

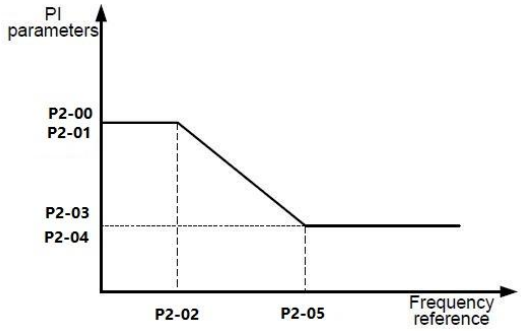


Fig.7-2 Speed loop PI parameters

Properly set the proportional gain and integral time of the speed regulator to get good speed dynamic response characteristics in vector control. If need a faster system response, increase the proportional gain and reduce the integral time. But this may lead to system oscillation.
The recommended adjustment method is as follows:
If the factory setting cannot meet the requirements, increase the proportional gain first to ensure that the system does not oscillate, and then reduce the integral time to ensure that the system has quick response and small overshoot.

Function code	Name	Setting range	Default	Property
P2-06	Vector control slip gain	50%~ 200%	100%	☆

Under SVC vector control, it is used to adjust speed stability accuracy of the motor. When the motor with load runs at a very low speed, increase the value of this parameter; when the motor with load runs at a very large speed, decrease the value of this parameter.

Function code	Name	Setting range	Default	Property
P2-07	Time constant of speed loop filter	0.000 s ~ 0.100 s	0.000 s	☆

The parameter just valid when P0-01=0. Increasing the value of P2-07 will improve the stability of the motor, but the dynamic response becomes weak, but too small will cause the motor to oscillate. In general, it no need to be adjusted. Increasing it in the case of large speed fluctuation.

Function code	Name	Setting range	Default	Property
P2-08	Vector control over-excitation gain	0 ~ 200	64	☆

During deceleration of the inverter, over-excitation control can restrain rise of the bus voltage to avoid the overvoltage fault. The larger the over-excitation gain is, the better the restraining effect is. Too large over-excitation gain may lead to an increase in output current. Therefore, set this parameter to a proper value in actual applications.

Function code	Name	Setting range	Default	Property
P2-09	Motoring torque upper limit source in speed control	0: Set by P2-10 1: AI1 2: AI2 3.Potentiometer on keyboard 4: Pulse setting 5: Communication setting 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) 100% in options 1-7 corresponds to P2-10	0	☆
P2-10	Digital setting of motoring torque upper limit in speed control	0.0% ~ 200.0% 100% corresponds to motor rated current	150.0%	☆

P2-11	Regenerating torque upper limit source in speed control	0: Set by P2-12 1: AI1 2: AI2 3.Potentiometer on keyboard 4: Pulse setting 5: Communication setting 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) 100% in options 1-7 corresponds to P2-12	0	☆
P2-12	Digital setting of regenerating torque upper limit in speed control	0.0% ~ 200.0% 100% corresponds to motor rated current	150.0%	☆

In the speed control mode, the maximum output torque of the inverter is restricted by F2-09 or F2-11. If the torque upper limit is analog, pulse or communication setting, 100% of the setting corresponds to the value of P2-10 or P2-12, and 100% of P2-10 or P2-12 corresponds to the inverter rated torque.

Function code	Name	Setting range	Default	Property
P2-13	Excitation adjustment proportional gain	0 ~ 60000	2000	☆
P2-14	Excitation adjustment integral gain	0 ~ 60000	1300	☆
P2-15	Torque adjustment proportional gain	0 ~ 60000	2000	☆
P2-16	Torque adjustment integral gain	0 ~ 60000	1300	☆

P2-13 to P2-16 are vector control current loop parameters. They are obtaind by rotation motor parameters complete self-learning and generally no need to be changed.

Too large current loop PI gain may lead to oscillation of the entire control loop. Therefore, when current oscillation or torque fluctuation is large, manually decrease the proportional gain or integral gain here.

Function code	Name	Setting range	Default	Property
P2-17	Speed loop integral property	Integral separation 0: Invalid 1: Valid	0	☆

0: Invalid

1: Valid

When P2-17=1, the integration of speed loop was separated. Just the proportion was left.

Function code	Name	Setting range	Default	Property
P2-20	Maximum output voltage coefficient	100%~110%	105%	★

It means that the inverter's maximum output voltage can be increased. Increasing P2-20 can increase the maximum load capacity in the field weakening area of the motor, but it will increase the motor current ripple and increase the motor heat. Normally no need to be adjusted.

Function code	Name	Setting range	Default	Property
P2-21	Maximum torque coefficient in weaken field	50%~200%	100.0%	☆

The parameter just valid when the motor operates above the motor rated frequency. When the motor runs at 2 times of motor rated frequency, if the motor speed drops a lot, please increase P2-21 properly. Normally no need to be adjusted.

Group P3: V/F Control Parameters

Group P3 is valid only for V/F control mode.

Function code	Name	Setting range	Default	Property
P3-00	V/F curve setting	0: Linear V/F 1: Multi-point V/F 2: Square V/F 3: 1.2-power V/F 4: 1.4-power V/F 6: 1.6-power V/F 8: 1.8-power V/F 9: Reserved 10: V/F complete separation 11: V/F half separation	0	★

0: Linear V/F

Suitable for constant torque load.

1: Multi-point V/F

Customized curve can be used for special applications like dehydrator and centrifuge.

2: Square V/F

Suitable for centrifugal loads like fan and pump.

3 ~8: V/F curve between linear V/F and square V/F.

10: V/F complete separation

The output frequency and output voltage of the inverter are independent.

The output frequency is determined by the frequency source, and the output voltage is determined by P3-13.

It is applicable to induction heating, inverse power supply and torque motor control.

11: V/F half separation

V and F are proportional and the proportional relationship can be set in P3-13. The relationship between V and F are also related to the rated motor voltage and rated motor frequency in Group P1.

Assume that the voltage source input is X (0 to 100%), the relationship between V and F is:

V/F = 2 *X *(Rated motor voltage)/(Rated motor frequency)

Function code	Name	Setting range	Default	Property
P3-01	Torque boost	0.0%: (Automatic torque boost) 0.1 to 30.0 percent	Depends on model	☆
P3-02	Cut-off frequency of torque boost	0.00 Hz ~ Maximum frequency	50.00 Hz	★

To compensate the low frequency torque characteristics of V/F control, you can boost the output voltage of the inverter at low frequency by modifying P3-01. If the torque boost is set to too large, the motor may overheat, and the inverter may suffer overcurrent. If the load is large and the motor startup torque is insufficient, increase the value of P3-01. When P3-01=0.0, the inverter performs automatic torque boost. It automatically calculates the torque boost value based on motor parameters including the stator resistance. Torque boost becomes invalid when P3-02 is exceeded, as shown in **Fig.7-3**.

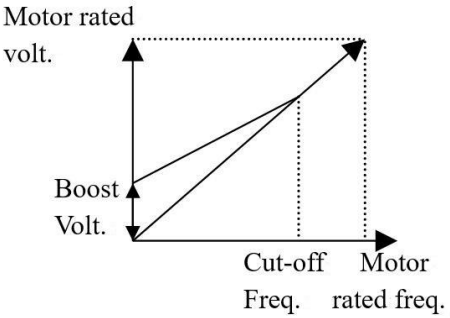
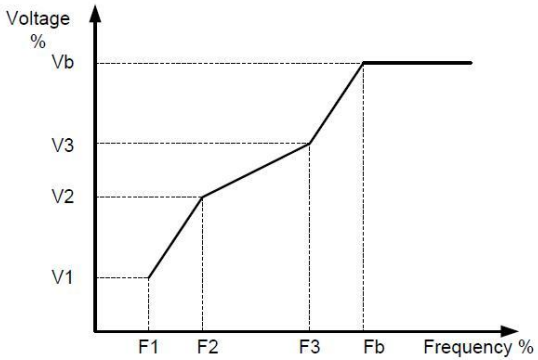


Fig.7-3 Torque boost and cut-off frequency

Function code	Name	Setting range	Default	Property
P3-03	Multi-point V/F Frequency Point 1	0.00Hz ~ P3-05	5.00 Hz	★
P3-04	Multi-point VF Voltage Point 1	0.0% ~ 100.0%	10.0%	★
P3-05	Multi-point VF Frequency Point 2	P3-03~P3-07	10.00 Hz	★
P3-06	Multi-point VF Voltage Point 2	0.0% ~ 100.0%	20.0%	★
P3-07	Multi-point VF Frequency Point 3	P3-05 ~ Motor rated frequency (P1-04)	20.00 Hz	★
P3-08	Multi-point VF Voltage Point 3	0.0~100.0%	40.0%	★

Those parameters are used to define the multi-point V/F curve.
The relationship as shown in **Fig.7-4**.



V1~V3: Voltage of point 1, point 2 and point 3
F1~F3: Frequeny of point 1, point 2 and point 3
Vb: Motor rated voltage
Fb: Motor rated frequency
Fig.7-4 Multi-point V/F curve setting

Function code	Name	Setting range	Default	Property
P3-09	V/F slip compensation gain	0.0% ~ 200.0%	0.0%	☆

It can compensate the rotational speed slip of the asynchronous motor when the load of the motor increases, stabilizing the motor speed in case of load change. 100% means that the compensation is the rated motor slip when the motor bears rated load.

Function code	Name	Setting range	Default	Property
P3-10	V/F over-excitation gain	0 ~ 200	64	☆

During deceleration of the inverter, over-excitation can restrain rise of the bus voltage, preventing the overvoltage fault. The larger the over-excitation is, the better the restraining result is. Increase the over-excitation gain if the inverter is liable to overvoltage error during deceleration. However, too large over-excitation gain may lead to an increase in the output current.

Set the over-excitation gain to 0 in the applications where the inertia is small and the bus voltage will not rise during motor deceleration or where there is a braking resistor.

Function code	Name	Setting range	Default	Property
P3-11	V/F oscillation suppression gain	0 ~ 100	Depends on model	☆

Set this parameter to 0 if the motor has no oscillation. Increase the value properly only when the motor has obvious oscillation. The larger the value is, the better the oscillation suppression result will be.

When the oscillation suppression function is enabled, the motor rated current and noload current must be correct. Otherwise, the V/F oscillation suppression effect will not be satisfactory.

Function code	Name	Setting range	Default	Property
P3-13	V/F separation voltage source	0: Digital setting (P3-14) 1: AI1 2: AI2 5: Potentiometer on keyboard 4: Pulse Setting (HDI) 5: Multi-segment instruction 6: Simple PLC 7: PID 8: Communication setting Note: 100.0% corresponds to motor rated voltage	0	☆
P3-14	V/F separation voltage digital setting	0V ~ Motor rated voltage	0V	☆
P3-15	Acc. time for V/F separation voltage	0.0 s ~ 1000.0 s Note:The time for increasing from 0V to motor rated voltage	0.0 s	☆
P3-16	Dec. time for V/F separation voltage	0.0 s ~ 1000.0 s Note:The time for decreasing from motor rated voltage to 0V	0.0 s	☆

V/F separation is generally applicable to scenarios such as induction heating, inverse power supply and motor torque control.

The voltage source for V/F separation is set in the same way as the frequency source. For details, see P0-03. 100.0% of the setting in each mode corresponds to the motor rated voltage. If the corresponding value is negative, its absolute value is used.

P3-15 is the Acc. time for voltage increasing from 0V to motor rated voltage. P3-16 is the Dec. time for decreasing from motor rated voltage to 0V.

Function code	Name	Setting range	Default	Property
P3-17	Stop mode selection for V/F separation	0:Output frequency and output voltage decrease to 0 independently 1:Output frequency starts to decrease after output voltage is 0	0	☆

0: Output frequency and output voltage decrease to 0 independently

V/F separation output voltage decreses to 0V according to the Dec. time set in P3-15 and the V/F separation output frequency decreases to 0Hz accordinig to the Dec. time set in P0-18.

1: Output frequency starts to decrease after output voltage is 0

Firstly, the V/F separation output voltage decreses to 0V according to the Dec. time set in P3-15, then the V/F separation output frequency decreases to 0Hz accordinig to the Dec. time set in P0-18.

Function code	Name	Setting range	Default	Property
P3-18	Action current of V/F overcurrent stall	50%~200%	150%	★
P3-19	V/F overcurrent stall Eenable	0:Invalid 1:Valid	1	★
P3-20	V/F overcurrent stall suppression gain	0～100	20	☆
P3-21	Compensation coefficient of V/F overcurrent stall action current	50%～200%	50%	★

In the region that the frequency is lower than motor rated frequency, the overcurrent stall action current is P3-18. When the output current larger than the action current, the overcurrent stall suppression function takes effect and the actual deceleration time will increase.

In the high-frequency region, the motor drive current is small. With same stall current, the motor speed drops greatly when the frequency is lower than motor rated frequency. In order to improve the operating characteristics of the motor, the stall operating current below the rated frequency can be reduced. When the operating frequency exceeds the rated frequency, **the overcurrent stall action current** = **fs / fn * P3-21 *P3-18**, fs is the running frequency and fn is the motor rated frequency.

Function code	Name	Setting range	Default	Property
P3-22	Over-voltage stall action voltage	200.0V～2000.0V	Depends on model	★
P3-23	Over-voltage stall Enable	0:Invalid 1:Valid	1	★
P3-24	Over-voltage stall frequency suppression gain	0～100	30	☆
P3-25	Over-voltage stall voltage suppression gain	0～100	30	☆
P3-26	Over-voltage stall maximum increasing frequency limit	0～50Hz	5Hz	★

Increasing P3-24 will improve the control effect of the bus voltage, but the output frequency will fluctuate. If the output frequency fluctuates greatly, you can appropriately reduce P3-24. Increasing P3-25 can reduce the overshoot of the bus voltage.

Note: When braking unit and braking resistor used, please make follow settings:

Set P3-11(V/F oscillation suppression gain) as 0, otherwise it may occurs large current during running.

Set P3-23(Over-voltage stall Enable) as 0, otherwise it may lead to the actual deceleration increases.

Group P4: Input Terminals

SV600 series inverter has 6 multi-function input terminals DI.

Function code	Name	Setting range	Default	Property
P4-00	DI1 function selection	0: No function 1: Forward run (FWD) 2: Reverse run (REV) (Note: Function 1 and 2 need to be used according to the setting in P4-11, for more details,please refer to the description of parameters in Chapter 7) 3: 3-wire operation control 4: Forward JOG running 5: Reverse JOG running 6: Terminal UP 7: Terminal DOWN 8: Freely STOP 9: Fault Reset 10: Run pause 11: External Fault Input(NO Normal Open) 12: Multi-segment instruction terminal 1 13: Multi-segment instruction terminal 2 14: Multi-segment instruction terminal 3 15: Multi-segment instruction terminal 4 16: Acc./Dec. Time Selection Terminal 1 17: Acc./Dec. Time Selection Terminal 2 18: Frequency source switchover 19: UP/DOWN settings clear (Terminal, Keyboard) 20: Control command switchover terminal 1 21: Acceleration/Deceleration prohibit 22: PID pause 23: PLC status reset 24: Swing Pause 25: Count input 26: Count reset 27: Length count input 28: Length reset 29: Torque control prohibit 30: HDI (Pulse) frequency input 31: Reserved 32: Immediate DC braking	1	★
P4-01	DI2 function selection		2	★
P4-02	DI3 function selection		4	★
P4-03	DI4 function selection		9	★
P4-04	HDI function selection		30	★
P4-05	DI5 function selection		0	★
P4-06	DI6 function selection		0	★

		33: External Fault Input(NC Normal Close) 34: Frequency modification enable 35: Reverse direction of PID action 36: External Stop terminal 1 37: Control command switchover terminal 2 38: PID integral pause 39: Switchover between main frequency X and preset frequency 40: Switchover between auxiliary frequency Y and preset frequency 41: Motor selection terminal 1 42: Reserved 43: PID paramete switchover 44: User defined fault 1 45: User defined fault 2 46: Speed control/torque control switchover 47: Emergency stop 48: External Stop terminal 2 49: Deceleration DC brake 50: Clear the current running time 51: Switchover between two-wire and three-wire 52-59: Reserved		

Those parameters are used to select the function of each DI.

0: No function

1: Forward run (FWD)

2: Reverse run (REV)

3: 3-wire operation control

3-wire operation control takes effect when the DI is valid. For more details, please refer to the description of P4-11.

4: Forward JOG running

5: Reverse JOG running

For function 4 and 5, the related parameters like JOG frequency, Acc./Dec. time are P8-00, P8-01 and P8-02.

6: Terminal UP

7: Terminal DOWN

When function 6 and 7 selected,the DI with UP and DOWN functions are used to increase and decrease the setting frequency.

8: Freely STOP

When the DI is valid, the inverter will block is output and the motor stops freely.

9: Fault Reset

10: Run pause

The inverter will decelerates to stop when the DI with the function is valid. When the DI becomes invalid, the inverter resumes its status before stop.

11: External Fault Input (NO Normal Open)

When the DI with the function is valid, the inverter reports Err15 and performs the fault protection action. For more details, see the description of P9-47.

12: Multi-segment instruction terminal 1

13: Multi-segment instruction terminal 2

14: Multi-segment instruction terminal 3

15: Multi-segment instruction terminal 4

Four multi-segment instruction terminals can be combined into 16 states, which correspond to 16 instruction setting values, as detailed in **Table 7-1**.

Table 7-1 Functional Description of Multi-Segment Instructions

K4	K3	K2	K1	Command setting	Corresponding parameters
OFF	OFF	OFF	OFF	Multi-segment instruction 0	PC-00
OFF	OFF	OFF	ON	Multi-segment instruction 1	PC-01
OFF	OFF	ON	OFF	Multi-segment instruction 2	PC-02
OFF	OFF	ON	ON	Multi-segment instruction 3	PC-03
OFF	ON	OFF	OFF	Multi-segment instruction4	PC-04
OFF	ON	OFF	ON	Multi-segment instruction 5	PC-05
OFF	ON	ON	OFF	Multi-segment instruction 6	PC-06
OFF	ON	ON	ON	Multi-segment instruction 7	PC-07
ON	OFF	OFF	OFF	Multi-segment instruction 8	PC-08
ON	OFF	OFF	ON	Multi-segment instruction 9	PC-09
ON	OFF	ON	OFF	Multi-segment instruction 10	PC-10
ON	OFF	ON	ON	Multi-segment instruction 11	PC-11
ON	ON	OFF	OFF	Multi-segment instruction 12	PC-12
ON	ON	OFF	ON	Multi-segment instruction 13	PC-13
ON	ON	ON	OFF	Multi-segment instruction 14	PC-14
ON	ON	ON	ON	Multi-segment instruction 15	PC-15

If the frequency source is multi-speed, the value 100% of PC-00 to PC-15 corresponds to the value of P0-10 (Maximum frequency).

Besides the multi-speed function, the multi-segment instruction can be also used as the PID setting source or the voltage source for V/F separation, satisfying the requirement on switchover of different setting values.

16: Acc./Dec. Time Selection Terminal 1

17: Acc./Dec. Time Selection Terminal 2

Two DI with above functions can be combined into 4 states, which corresponding to 4 groups of Acc./Dec. time. Details as below.

Table 7-2 Acc./Dec. Time Selection

Terminal 2	Terminal 1	Acc./ Dec. Time Selection	Corresponding parameters
OFF	OFF	Acc./Dec. Time 1	P0-17, P0-18
OFF	ON	Acc./Dec. Time 2	P8-03, P8-04
ON	OFF	Acc./Dec. Time 3	P8-05, P8-06
ON	ON	Acc./Dec. Time 4	P8-07, P8-08

18: Frequency source switchover

The terminal is used to perform switchover between two frequency sources according to the setting in P0-07.

19: UP/DOWN settings clear (Terminal, Keyboard)

The terminal is used to clear the modification by the DI with UP/DOWN function or the UP and DOWN arrow on the keyboard, returning the set frequency to the value of P0-08.

20: Control command switchover terminal 1

The terminal is used to perform switchover between terminal control and keyboard control or switchover between communication control and keyboard control.

When it's valid, the control mode becomes keyboard control.

21: Acceleration/Deceleration prohibit

The inverter will maintain the current frequency running except for STOP command valid.

22: PID pause

When the DI is valid, the inverter will stop the PID function and maintain the current frequency running.

23: PLC status reset

24: Swing Pause

The inverter outputs the central frequency, and the swing frequency function pauses.

25: Count input

26: Count reset

27: Length count input

28: Length reset

29: Torque control prohibit

The inverter is prohibited from torque control and enters the speed control mode.

30: HDI (Pulse) frequency input

31: Reserved

32: Immediate DC braking

33: External Fault Input (NC Normal Close)

When the DI is valid, the inverter reports Err15 and stops.

34: Frequency modification enable

After the DI is valid, the inverter does not respond to any frequency modification.

35: Reverse direction of PID action

After the DI is valid, the PID action direction is reversed to the direction set in PA-03.

36: External Stop terminal 1

37: Control command switchover terminal 2

It is used to perform switchover between terminal control and communication control. If the DI

is valid, it will switch over to communication control.

38: PID integral pause

When the DI is valid, the integral adjustment function of PID pauses. But the proportional and differentiation adjustment functions are still valid.

39: Switchover between main frequency X and preset frequency

40: Switchover between auxiliary frequency Y and preset frequency

For function 39 and 40, when the DI is valid, the preset frequency set in P0-08 becomes valid.

41: Motor selection terminal 1

Table 7-3 Motor parameters group Selection

Terminal 1	Motor parameters group Selection	Acc./Dec. Time Selection
OFF	Motor parameters group 1,P1 and P2	Acc./Dec. Time 1
ON	Motor parameters group 2, A2	Acc./Dec. Time 2

42: Reserved

43: PID paramete switchover

If the PID parameters switchover performed by means of DI terminal (PA-18 = 1), the PID parameters are PA-05 to PA-07 when the terminal becomes OFF; the PID parameters are PA-15 to PA-17 when this terminal becomes ON.

44: User defined fault 1

45: User defined fault 2

If these two DIs become ON, the inverter reports Err27 and Err28 respectively, and performs fault protection actions based on the setting in P9-49.

46: Speed control/torque control switchover

The DI used to switch over between speed control and torque control. When it's OFF, the inverter runs in the mode set in A0-00. When it's ON, it switches over to the other control mode.

47: Emergency stop

48: External Stop terminal 2

In any control mode (keyboard, terminal or communication), it can be used to make the inverter decelerate to stop. The Dec. time is Dec. time 4.

49: Deceleration DC brake

When the DI is valid, the inverter decelerates to the initial frequency of DC braking and then switches over to DC braking state.

50: Clear the current running time

When the DI is valid, the inverter's current running time is cleared. The function must be supported by P8-42 and P8-53.

51: Switchover between two-wire and three-wire

It will switch over to 3-wire mode 1when the DI is valid and the setting in P4-11 is 2-wire mode 1.

Function code	Name	Setting range	Default	Property
P4-10	DI filter time	0.000 s ~ 1.000 s	0.010 s	☆

If DI terminals are liable to interference and may cause malfunction, increase the value of this parameter to enhance the anti-interference capability. However, increase of DI filter time will reduce the response of DI terminals.

Function code	Name	Setting range	Default	Property
P4-11	Terminal command mode	0: 2-wire mode 1 1: 2-wire mode 2 2: 3-wire mode 1 3: 3-wire mode 2	0	★

0: 2-wire mode 1

K1	K2	RUN command
ON	OFF	Forward RUN
OFF	ON	Reverse RUN
ON	ON	Stop
OFF	OFF	Stop

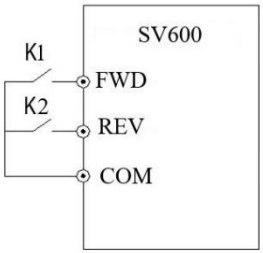


Fig.7-5 2-wire mode 1

1: 2-wire mode 2

K1	K2	RUN command
ON	OFF	Forward RUN
ON	ON	Reverse RUN
OFF	OFF	Stop
OFF	ON	Stop

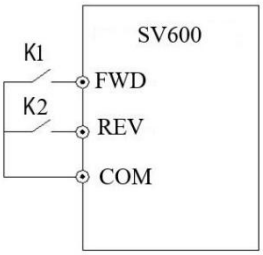


Fig.7-6 2-wire mode 2

2: 3-wire mode 1

SB1: NC (Normal close) button, for stop control
SB2: NO (Normal open) button, for forward run
SB3: NO (Normal open) button, for reverse run

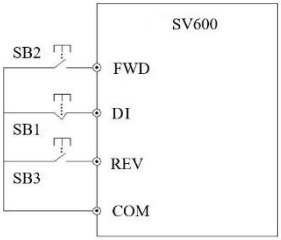


Fig.7-7 3-wire mode 1

3: 3-wire mode 2

K	Running direction
OFF	Forward
ON	Reverse

K: Switch, for running direction selection
SB1: NC (Normal close) button, for stop control
SB2: NO (Normal open) button, for running control

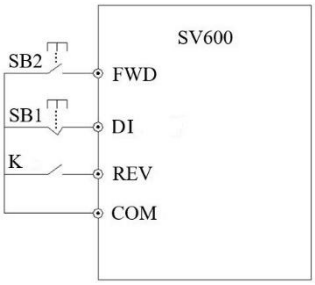


Fig.7-8 3-wire mode 2

Function code	Name	Setting range	Default	Property
P4-12	Terminal UP/DOWN rate	0.001 Hz/s ~ 65.535 Hz/s	1.00 Hz/s	☆

It is used to adjust the frequency change rate when the frequency is adjusted by multi-function terminal DI with UP/DOWN function.
If P0-22 (Frequency reference resolution) is 2, the setting range is 0.001–65.535 Hz/s.
If F0-22 (Frequency reference resolution) is 1, the setting range is 0.01–655.35 Hz/s.

Function code	Name	Setting range	Default	Property
P4-13	AI Curve 1 minimum input	0.00V ~ P4-15	0.10 V	☆
P4-14	Correspondence setting of AI Curve 1 minimum input	-100.0% ~ +100.0%	1.0%	☆
P4-15	AI Curve 1 max input	P4-13 ~ +10.00 V	10.00 V	☆
P4-16	Correspondence setting of AI Curve 1 maximum input	-100.0% ~ +100.0%	100.0%	☆
P4-17	AI1 filter time	0.00 s ~ 10.00 s	0.10 s	☆
P4-18	AI Curve2 minimum input	0.00V ~ P4-20	0.10 V	☆
P4-19	Correspondence setting of AI Curve 2 minimum input	-100.0% ~ +100.0%	1.0%	☆
P4-20	AI Curve2 max input	P4-18 ~ +10.00 V	10.00 V	☆
P4-21	Correspondence setting of AI Curve 2 maximum input	-100.0% ~ +100.0%	100.0%	☆
P4-22	AI2 filter time	0.00 s ~ 10.00 s	0.10 s	☆

These parameters are used to define the relationship between the analog input voltage and the corresponding setting. When the analog input is current input, 1 mA current corresponds to 0.5 V voltage.
P4-17 and P4-22 is used to set the software filter time of AI1 and AI2. If the analog input is liable to interference, increase the value of this parameter to stabilize the detected analog input. However, increase of the AI filter time will slow the response of analog detection. Set this

parameter properly based on actual conditions.
Two typical setting examples are shown in the following figure.

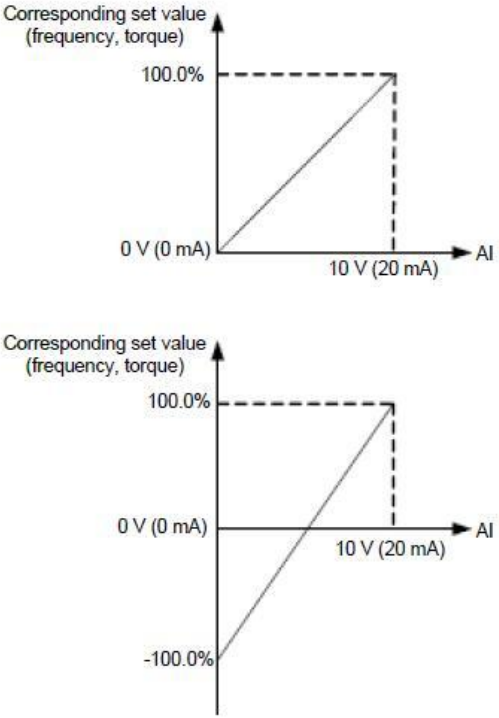


Fig.7-9 Typical relationship between AI and set value

Function code	Name	Setting range	Default	Property
P4-23	Keyboard potentiometer minimum input	-10.00V～P4-25	-9.50V	☆
P4-24	Corresponding setting of keyboard potentiometer minimum input	-100.0%～+100.0%	0.0%	☆
P4-25	Keyboard potentiometer maximum input	P4-23～+10.00V	9.50V	☆
P4-26	Corresponding setting of keyboard potentiometer maximum input	-100.0%～+100.0%	100.0%	☆
P4-27	Keyboard potentiometer filter time	0.00s～10.00s	0.10s	☆
P4-22	AI2 filter time	0.00 s ~ 10.00 s	0.10 s	☆

These parameters are used to define the relationship between the potentiometer (on the keyboard) and the corresponding setting. The method of setting this function is similar to that of setting AI1 function.

Function code	Name	Setting range	Default	Property
P4-28	PULSE minimum input	0.00KHz ~ P4-30	0.00 KHz	☆
P4-29	PULSE minimum input corresponding setting	-100% ~ 100%	0.0%	☆
P4-30	PULSE Maximum input	P4-28 ~ 100.00 KHz	20.00 KHz	☆
P4-31	PULSE maximum input corresponding setting	-100% ~ 100%	100.0%	☆
P4-32	PULSE filter time	0.00 s ~ 10.00 s	0.00 s	☆

These parameters are used to define the relationship between high pulse frequency and the corresponding setting. The method of setting this function is similar to that of setting AI1 function.

Function code	Name	Setting range	Default	Property
P4-33	AI curve selection	Units digit: AI1 curve selection 1: Curve 1 (2 points, refer to P4-13 ~ P4-16) 2: Curve 2 (2 points, refer to P4-18-P4-21) 3: Reserved 4: Curve 4 (4 points, refer to A6-00-A6-07) 5: Curve 5 (4 point, refer to A6-08-A6-15) Tens digit: AI2 curve selection Same as above.	21	☆

Curve 1 and curve 2 are 2-point curves which set in group P4. Curve 4 and curve 5 are both 4-point curves which set in group A6.

Function code	Name	Setting range	Default	Property
P4-34	Setting selection when AI less than the minimum	Units digit: AI1 0: Corresponding minimum input setting 1: 0.0% Tens digit: AI2 Same as above	11	☆

This parameter is used to determine the corresponding setting when the analog input voltage is less than the minimum value. The units digit and tens digit of this parameter respectively correspond to the setting for AI1, AI2.

Function code	Name	Setting range	Default	Property
P4-35	DI1 delay time	0.0 s ~ 3600.0 s	0.0 s	★
P4-36	DI2 delay time	0.0 s ~ 3600.0 s	0.0 s	★
P4-37	DI3 delay time	0.0 s ~ 3600.0 s	0.0 s	★

These parameters are used to set the delay time of the inverter when the status of DI terminals changes. Currently, only DI1, DI2 and DI3 support the delay time function.

Function code	Name	Setting range	Default	Property
P4-38	DI valid mode selection 1	0: High level valid 1: Low level valid Units digit: DI1 Tens digit: DI2 Hundreds digit: DI3 Thousands digit: DI4 Ten thousands digit: DI5	00000	★
P4-39	DI valid mode selection 2	0: High level valid 1: Low level valid Units digit: DI6 Tens digit: DI7 For digit above,Reserved	00000	★

These parameters are used to set the valid mode of DI terminals.

0: High level valid

1: Low level valid

Function code	Name	Setting range	Default	Property
P4-40	AI signal type selection	Units digit:AI1 input type selection 0:0~10V voltage signal or 0~20mA current signal 1: 4~20mA current signal Tens digit: AI2 input type selection 0:0~10V voltage signal or 0~20mA current signal 1: 4~20mA current signal	00	☆

P4-40 used to select the signal type of AI1 and AI2. Please also turn the switch on the right side which also used for select the signal type of AI1 and AI2.

Group P5: Output Terminals

SV600 series inverer provide analog output (AO) terminal, digital output (DO) terminal, relay terminal and HDO terminal (used for high-speed pulse output or open-collector switch signal output) for choose.

Function code	Name	Setting range	Default	Property
P5-00	HDO output mode selection	0: Pulse output (HDOP) 1: Switch signal output (HDOR)	0	☆

The HDO terminal is programmable multiplexing terminal. It can be used for high-speed pulse output (HDOP), with maximum frequency of 50 kHz. Refer to P5-06 for relevant functions of HDOP. It can also be used as open collector switch signal output (HDOR).

Function code	Name	Setting range	Default	Property
P5-01	HDOR output function selection	0: No output 1: Frequency inverter running 2: Fault output (freely stop fault) 3: Frequency level detection FDT1 output 4: Frequency reached 5: Zero speed running (no output at STOP) 6: Motor overload pre-warning 7: Frequency inverter overload pre-warning 8: Set count value reached 9: Count value reached 10: Length reached 11: PLC cycle complete 12: Accumulative running time arrived 13: Frequency limited 14: Torque limited 15: Run Ready 16: AI1 > AI2 17: Upper limit frequency reached 18: Low limit frequency reached (No output at stop) 19: Undervoltage status output 20: Communication setting	0	☆
P5-02	Control board relay function selection (T/A-T/B-T/C)		2	☆
P5-03	Reserved			
P5-04	DO1 output function selection		1	☆

P5-05	DO2 output selection	21: Reserved 22: Reserved 23: Zero Speed Running 2 (Output atstop) 24: Accumulative power-on time arrived 25: Frequency level detection FDT2 output 26: Frequency 1 reached 27: Frequency 2 reached 28: Current 1 reached 29: Current 2 reached 30: Timing reached 31: AI1 input limit reached 32: Underload 33: Reverse running 34: Zero current state 35:IGBT temperature reached 36: Output current limit exceeded 37: Low limit frequency reached (Output at stop) 38: Alarm output (all faults) 39: Motor overheat pre-wawrning 40: Current running time arrived. 41: Fault output (No output when it's fault with freely stop or under-voltage)	4	☆

0: No output

1: Frequency inverter running

2: Fault output (freely stop fault)

When the inverter reports a fault and stop, the DO is ON.

3: Frequency level detection FDT1 output

Please refer to the descriptions of P8-19 and P8-20.

4: Frequency reached

Please refer to the descriptions of P8-21.

5: Zero speed running (no output at STOP)

When the inverter runs at 0 speed, the DO is ON. When the inverter stops, the DO is OFF.

6: Motor overload pre-warning

If the pre-warning threshold is exceeded, the DO becomes ON. For motor overload parameters, see the descriptions of P9-00 to P9-02.

7: Frequency inverter overload pre-warning

The DO becomes ON 10s before the inverter overload protection action is performed.

8: Set count value reached

The DO becomes ON when the count value reaches the value set in PB-08.

9: Count value reached

The DO becomes ON when the count value reaches the value set in PB-09.

10: Length reached

The DO becomes ON when the detected actual length exceeds the value set in PB-05.

11: PLC cycle complete

When simple PLC completes one cycle, the DO outputs a pulse signal with width of 250 ms.

12: Accumulative running time arrived

If the accumulative running time of the inverter exceeds the time set in P8-17, the DO becomes ON.

13: Frequency limited

When the output frequency of the inverter reaches the upper limit or low limit, the DO becomes ON.

14: Torque limited

In speed control mode, if the output torque reaches the torque limit, the inverter enters the stall protection state and meanwhile the DO becomes ON.

15: Run Ready

The inverter detects no fault and is ready for RUN, the DO becomes ON.

16: AI1 > AI2

When the input of AI1 is larger than the input of AI2, the DO becomes ON.

17: Upper limit frequency reached

If the running frequency reaches the upper limit, the DO becomes ON.

18: Low limit frequency reached (No output at stop)

If the running frequency reaches the low limit, the DO becomes ON. In the stop state, the DO becomes OFF.

19: Undervoltage status output

If the inverter is in undervoltage state, the DO becomes ON.

20: Communication setting

Please refer to the MODBUS communication protocol.

21: Reserved

22: Reserved

23: Zero Speed Running 2 (Output at stop)

If the output frequency of the inverter is 0, the DO becomes ON. In the state of stop, the signal is still ON.

24: Accumulative power-on time arrived

If the inverter accumulative power-on time (P7-13) exceeds the value set in P8-16, the DO becomes ON.

25: Frequency level detection FDT2 output

Refer to the descriptions of P8-28 and P8-29.

26: Frequency 1 reached

Refer to the descriptions of P8-30 and P8-31.

27: Frequency 2 reached

Refer to the descriptions of P8-32 and P8-33.

28: Current 1 reached

Refer to the descriptions of P8-38 and P8-39.

29: Current 2 reached

Refer to the descriptions of P8-40 and P8-41.

30: Timing reached

If the timing function (P8-42) is valid, the DO becomes ON after the current running time of the inverter reaches the set time.

31: AI1 input limit reached

If AI1 input is larger than the value of P8-46 or lower than the value of P8-45, the DO becomes ON.

32: Underload

If the load decreases deeply, the DO becomes ON.

33: Reverse running

34: Zero current state

Refer to the descriptions of P8-28 and P8-29.

35: IGBT temperature reached

If the heatsink temperature of the inverter IGBT (P7-07) reaches the set IGBT temperature threshold (P8-47), the DO becomes ON.

36: Output current limit exceeded

Refer to the descriptions of P8-36 and P8-37.

37: Low limit frequency reached (Output at stop)

If the running frequency reaches the low limit, the DO becomes ON. In the stop state, the signal is still ON.

38: Alarm output (all faults)

If fault occurs on the inverter and the inverter continues to run, the DO outputs the alarm signal.

39: Motor overheat pre-wawrning

If the motor temperature reaches the temperature set in P9-58, the DO becomes ON. You can view the motor temperature by using U0-34.

40: Current running time arrived.

If the current running time of inverter exceeds the value of P8-53, the DO becomes ON.

41: Fault output (No output when it's fault with freely stop or under-voltage)

When fault occurs on the inverter, the DO becomes ON. But for fault with freely stop or under-voltage, it becomes OFF.

Function code	Name	Setting range	Default	Property
P5-06	HDOP output function selection	0: Output frequency 1: Set frequency 2: Output current 3: Output torque (absolute value) 4: Output power	0	☆

P5-07	AO1 output function selection	5: Output voltage 6: PULSE input (100.0% for 100.0 KHz) 7: AI1 8: AI2 9: Reserved 10: Length 11: Count value 12: Communication setting 13: Motor speed 14: Output current (100.0% relates to. 1000.0 A) 15: Output voltage (100.0% relates to 1000.0 V) 16: Output torque (actual torque)	0	☆
P5-08	AO2 output function selection		1	☆

Function selection for HDOP, AO1 and AO2.

0: Output frequency

1: Set frequency

For function 0 and 1, 0~maximum frequency corresponds to 0.0%~100.0%.

2: Output current

0 to 2 times of motor rated current corresponds to 0.0%~100.0%.

3: Output torque (absolute value)

0 to 2 times of motor rated torque corresponds to 0.0%~100.0%.

4: Output power

0 to 2 times of rated power corresponds to 0.0%~100.0%.

5: Output voltage

0 to 1.2 times of inverter rated voltage corresponds to 0.0%~100.0%.

6: PULSE input (100.0% for 100.0 KHz)

0.01~ 100.00 KHz corresponds to 0.0%~100.0%.

7: AI1

8: AI2

9: Reserved

10: Length

0 to maximum set length corresponds to 0.0%~100.0%.

11: Count value

0 to maximum count value corresponds to 0.0%~100.0%.

12: Communication setting

0.0%~100.0%.

13: Motor speed

0~maximum frequency corresponds to 0.0%~100.0%

14: Output current (100.0% relates to. 1000.0 A)

15: Output voltage (100.0% relates to 1000.0 V)

16: Output torque (actual torque)

-2 times of rated motor torque to 2 times of rated motor torque corresponds to 0.0%~100.0%.

Function code	Name	Setting range	Default	Property
P5-09	HDOP output maximum frequency	0.01 kHz ~ 100.00 kHz	20.00 kHz	☆

If the HDOterminal is used for pulse output, this parameter is used to set the maximum frequency of pulse output.

Function code	Name	Setting range	Default	Property
P5-10	AO1 offset coefficient	-100.0% ~ +100.0%	0.0%	☆
P5-11	AO1 gain	-10.00 ~ +10.00	1.00	☆
P5-12	AO2 offset coefficient	-100.0% ~ +100.0%	0.0%	☆
P5-13	AO2 gain	-10.00 ~ +10.00	1.00	☆

These parameters are used to correct the zero drift of analog output and the output amplitude deviation. They can also be used to define the desired AO curve.

If "b" represents zero offset, "k" represents gain, "Y" represents actual output, and "X" represents standard output, the actual output is: Y = k*X + b.

Function code	Name	Setting range	Default	Property
P5-17	HDOR output delay time	0.0 s ~ 3600.0 s	0.0 s	☆
P5-18	RELAY1 output delay time	0.0 s ~ 3600.0 s	0.0 s	☆
P5-19	Reserved			
P5-20	DO1 output delay time	0.0 s ~ 3600.0 s	0.0 s	☆
P5-21	DO2 output delay time	0.0 s ~ 3600.0 s	0.0 s	☆

The delay time setting for each DO.

Function code	Name	Setting range	Default	Property
P5-22	DO valid status selection	0: Positive logic 1: Negative logic Units digit: HDOR Tens digit: RELAY 1 Hundreds digit: Reserved Thousands digit: DO1 Ten thousands digit: DO2	00000	☆

0: Positive logic

When the DO is ON, it connects to COM internal.

1: Negative logic

When the DO is OFF, it connects to COM.

Function code	Name	Setting range	Default	Property
P5-23	AO signal type selection	Units digit:AO1 0:0~10V voltage signal or 0~20mA current signal 1: 4~20mA current signal Tens digit:AO2 0:0~10V voltage signal or 0~20mA current signal 1: 4~20mA current signal	00	☆

Voltage or current signal can be selected for AO1 and AO2. Please also turn the swith on the right side which also for the selection of signal type.

Group P6: Start/Stop Control

Function code	Name	Setting range	Default	Property
P6-00	Start-up mode	0: Direct start 1: Speed tracking restart 2: Pre-excited start-up (asynchronous motor)	0	☆

0: Direct start

If the DC braking time is set to 0, the inverter starts to run at the startup frequency.

If the DC braking time is not 0, the inverter performs DC braking first and then starts to run at the startup frequency.

1: Speed tracking restart

It is applicable to the restart upon instantaneous power failure of large-inertia load. To ensure the performance of rotational speed tracking restart, set the motor parameters in group P1 correctly.

2: Pre-excited start-up (asynchronous motor)

It is valid only for asynchronous motor and used for building the magnetic field before the motor runs. For pre-excited current and pre-excited time, see parameters of P6-05 and P6-06.

If the pre-excited time is 0, the inverter cancels pre-excitation and starts to run at startup frequency.

If the pre-excited time is not 0, the inverter pre-excites first before startup, improving the dynamic response of the motor.

Function code	Name	Setting range	Default	Property
P6-01	Rotational speed tracking mode	0: Start from the frequency at stop state 1: Start from zero speed 2: Star from maximum frequency	0	★
P6-02	Speed tracking speed	1~100	20	☆

The larger of P6-02 value is, the faster the tracking is. However, too large value may cause

unreliable tracking.

Function code	Name	Setting range	Default	Property
P6-03	Start-up frequency	0.00 Hz ~ 10.00 Hz	0.00 Hz	☆
P6-04	Start-up frequency holding time	0.0 s ~ 100.0 s	0.0 s	★

To ensure the motor torque at inverter startup, set a proper startup frequency. In addition, to build excitation when the motor starts up, the startup frequency must be held for a certain period.

Function code	Name	Setting range	Default	Property
P6-05	Start-up DC braking current/pre-excited current	0% ~ 100%	0%	★
P6-06	Start-up DC braking time/pre-excited time	0.0 s ~ 100.0 s	0.0 s	★

Startup DC braking is generally used during restart of the inverter after the rotating motor stops. Pre-excitation is used to make the inverter build magnetic field for the asynchronous motor before startup to improve the responsiveness.

Startup DC braking is valid only for direct start (P6-00 = 0). In this case, the inverter performs DC braking at the set startup DC braking current. After the startup DC braking time, the inverter starts to run. If the startup DC braking time is 0, the inverter starts directly without DC braking. The larger the startup DC braking current is, the larger the braking force is.

If the startup mode is pre-excited start (P6-00 = 2), the inverter builds magnetic field based on the set pre-excited current. After the pre-excited time, the inverter starts to run. If the pre-excited time is 0, the inverter starts directly without pre-excitation.

Function code	Name	Setting range	Default	Property
P6-07	Acceleration/deceleration mode	0: Linear acceleration/deceleration 1: S curve acceleration/deceleration A 2: S curve acceleration/deceleration B	0	★

Used to set the frequency change mode during the AC drive start and stop process.

0: Linear acceleration/deceleration

The output frequency increases or decreases in linear mode.SV600 series inverter has four group of Acc./Dec. time, which can be selected by multi-function terminal DI. For the settings, please refer to group P4 parameters.

1: S curve acceleration/deceleration A

The output frequency increases or decreases along the S curve. This mode is generally used in the applications where start and stop processes are relatively smooth, such as elevator and conveyor belt. P6-08 and P6-09 respectively define the time proportions of the start segment and the end segment.

2: S curve acceleration/deceleration B

In this curve, the rated motor frequency fb is always the inflexion point. This mode is usually used in applications where acceleration/deceleration is required at the speed higher than the rated frequency.

When the set frequency is higher than the rated frequency, the Acc./Dec. time is:

t=(4/9*(f/fb)^2+5/9)*T

In the formula, f is the set frequency, fb is the motor rated frequency and T is the Acc. time from 0 Hz to fb.

Function code	Name	Setting range	Default	Property
P6-08	Time proportion of S-curve start segment	0.0% ~ (100.0%-P6-09)	30.0%	★
P6-09	Time proportion of S-curve end segment	0.0% ~ (100.0%-P6-08)	30.0%	★

These two parameters respectively define the time proportions of the start segment and the end segment of S-curve acceleration/deceleration. They must satisfy the requirement: P6-08 + P6-09 ≤ 100.0%.

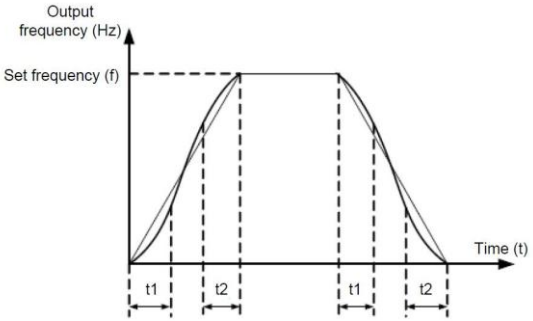


Fig.7-10 S-curve Acc./Dec.A

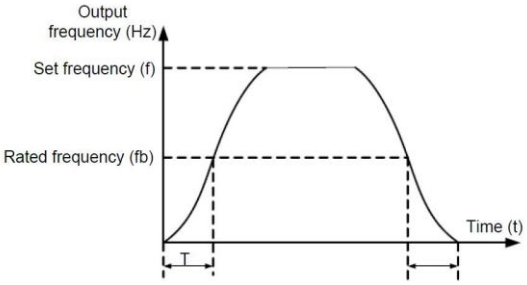


Fig.7-11 S-curve Acc./Dec. B

Function code	Name	Setting range	Default	Property
P6-10	Stop mode	0: Decelerate to stop 1: Freely stop	0	★

0: Decelerate to stop

When stop command valid, the inverter decreases the output frequency according to the deceleration time and stops.

1: Freely stop

When stop command valid, the inverter blocks the output immediately and the motor stops freely.

Function code	Name	Setting range	Default	Property
P6-11	Start frequency of DC braking during Dec.	0.00 Hz ~ Maximum frequency	0.00 Hz	☆
P6-12	Waiting time of DC braking during Dec.	0.0 s ~ 100.0 s	0.0 s	☆
P6-13	DC braking current during deceleration.	0% ~ 100%	0%	☆
P6-14	DC braking time during Dec.	0.0 s ~ 100.0 s	0.0 s	☆

During the process of decelerating to stop, the inverter starts DC braking when the running frequency is lower than the value set in P6-11.

The inverter stops output for a period that set in P6-12 and then starts DC braking. This prevents faults such as overcurrent caused due to DC braking at high speed.

P6-14 specifies the holding time of DC braking. If it is set to 0, DC braking is cancelled.

Details as shown in **Fig.7-13**.

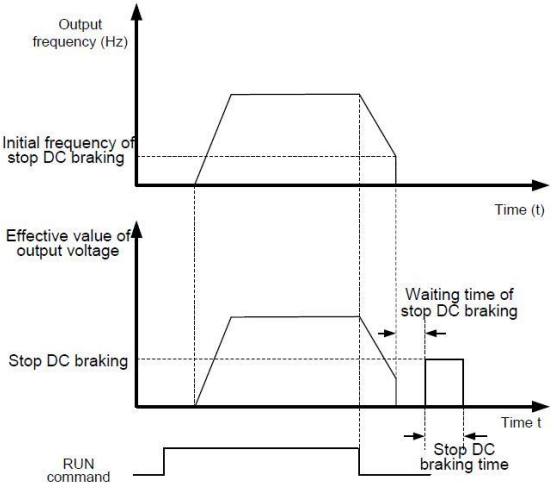


Fig.7-12 DC braking

Function code	Name	Setting range	Default	Property
P6-15	Brake using rate	0% ~ 100%	100%	☆

It is valid only for the inverter with internal braking unit and used to adjust the duty ratio of the braking unit. The larger the value of this parameter is, the better the braking result will be. However, too larger value causes great fluctuation of the inverter bus voltage during the braking process.

Function code	Name	Setting range	Default	Property
P6-18	Speed tracking current	30%~200%	Depends on model	★
P6-21	Time of removing magnetic	0.00~5.00s	1.00s	★

P6-18 used to set the speed tracking current limit during speed tracking.

Group P7: Keyboard and Display

Function code	Name	Setting range	Default	Property
P7-01	M key function selection	0: Invalid 1: Switchover between keyboard command channel and remote command channel (Terminal control or communication control) 2: Switchover between forward and reverse 3: Forward JOG 4: Reverse JOG	3	★

M key is a multi-function key. The function of M key can be selected in P7-01.

0: Invalid

1: Switchover between keyboard command channel and remote command channel (Terminal control or communication control)

When P7-01=1, pressing M key, the command channel would be sitched over to keyboard control.

2: Switchover between forward and reverse

M key can switch over the rotaion direction. Only valid under keyboard control mode.

3: Forward JOG

M key used as Forward JOG run key.

4: Reverse JOG

M key used as Reverse JOG run key.

Function code	Name	Setting range	Default	Property
P7-02	STOP/RESET key function	0: Only valid under keyboard control mode 1: Valid in all control mode	0	☆
P7-03	LED display parameter1 during running state	When it displays in binary: 0:Not display 1:Display 0000 ~ FFFF Units digit:0~F(0000~1111 in binary) Bit00: Running frequency 1 (Hz) Bit01: Set frequency (Hz) Bit02: Bus voltage (V) Bit03: Output voltage (V) Tens digit: 0~F(0000~1111 in binary) Bit04: Output current (A) Bit05: Output power (kW) Bit06: Output torque (%) Bit07: DI input status Hundreds digit: 0~F(0000~1111 in binary) Bit08: DO output status Bit09: AI1 voltage (V) Bit10: AI2 voltage (V) Bit11: Reserved Thousands digit: 0~F(0000~1111 in binary) Bit12: Count value Bit13: Length value Bit14: Load speed display Bit15: PID setting	001F	☆
P7-04	LED display parameter 2 during running state	When it displays in binary: 0:Not display 1:Display 0000 ~ FFFF Units digit:0~F(0000~1111 in binary) Bit00: PID feedback Bit01: PLC step Bit02: PULSE setting frequency (kHz) Bit03: Running Frequency 2 (Hz) Tens digit: 0~F(0000~1111 in binary) Bit04: Remaining running time Bit05: AI1 voltage before correction (V) Bit06: AI2 voltage before correction (V) Bit07: Reserved Hundreds digit: 0~F(0000~1111 in binary)	0	☆

		Bit08: Linear speed Bit09: Current power-on time (Hour) Bit10: Current running time (Min) Bit11: PULSE setting frequency (Hz) Thousands digit: 0~F(0000~1111 in binary) Bit12: Communication stting Bit13: Encoder feedback speed (Hz) Bit14: Main frequency X display (Hz) Bit15: Auxiliary frequency Y display (Hz)		

These two parameters are used to set the parameters that can be viewed when the inverter is in the running state. Each digit of P7-03 or P7-04 can be used to set the display state of 4 parameters. Total 32 parameters can be set by P7-03 and P7-04.

Function code	Name	Setting range	Default	Property
P7-05	LED display parameters at stop state	When it displays in binary: 0:Not display 1:Display 0000 ~ FFFF Units digit:0~F(0000~1111 in binary) Bit00: Set frequency (Hz) Bit01: Bus voltage (V) Bit02: DI input status Bit03: DO output status Tens digit:0~F(0000~1111 in binary) Bit04: AI1 voltage (V) Bit05: AI2 voltage (V) Bit06: Reserved Bit07: Count value Hundreds digit:0~F(0000~1111 in binary) Bit08: Length value Bit09: PLC step Bit10: Load speed Bit11: PID setting Thousands digit:0~F(0000~1111 in binary) Bit12: PULSE setting frequency (kHz) Bit13:PID feedback Note:Pressing “>>” key can monitor parameters by cycle	0003	☆

P7-05 used to set the display state of each parameters when the inverter is in stop state.

Function code	Name	Setting range	Default	Property
P7-06	Load speed display coefficient	0.0001-6.5000	1.0000	☆

Used to adjust the relationship between the output frequency of the inverter and the load speed. For details, see the description of P7-12.

Function code	Name	Setting range	Default	Property
P7-07	Inverter IGBT heatsink temperature	0.0 ℃ ~ 100.0 ℃	-	●
P7-08	Product No.	-	-	●
P7-09	Accumulative running time	0h ~ 65535h	-	●

P7-07 used to display the heatsink temperature of inverter IGBT.

P7-09 used to display the accumulative running time of the inverter. After the accumulative running time reaches the value set in P8-17, the DO with function 12 becomes ON.

Function code	Name	Setting range	Default	Property
P7-10	LED flashing selection at stop state	0:No flashing 1:Flashing	0	☆
P7-11	Software version No.	-	-	●
P7-12	Numer of decimal places of load speed display	0: 0 decimal place 1: 1 decimal place 2: 2 decimal places 3: 3 decimal places	1	

P7-12 is used to set the number of decimal places for load speed display.

If P7-06 (Load speed display coefficient) is 1.500 and P7-12 is 2 (2 decimal places). When the running frequency of the inverter is 20.00 Hz, the load speed is 20.00*1.500 =30.00 (display of 2 decimal places).

Function code	Name	Setting range	Default	Property
P7-13	Accumulative power-on time	0-65535 hours	-	●
P7-14	Accumulative power consumption	0 ~ 65535 KWh	-	●

P7-13 is used to display the accumulative power-on time of the inverter since the delivery. If the time reaches the set power-on time (P8-17), the DO with function 24 becomes ON.

P7-14 is used to display the accumulative power consumption of the inverter until now.

Group P8: Auxiliary Functions

Function code	Name	Setting range	Default	Property
P8-00	JOG running frequency	0.00 Hz ~ Maximum frequency	2.00 Hz	☆
P8-01	JOG acceleration time	0.0 s ~ 6500.0 s	20.0 s	☆
P8-02	JOG deceleration time	0.0 s ~ 6500.0 s	20.0 s	☆

These parameters are used to define the set frequency and Acc./Dec. time of the inverter JOG running. The startup mode is "Direct start" (P6-00 = 0) and the stop mode is "Decelerate to stop" (P6-10 = 0) during JOG running.

Function code	Name	Setting range	Default	Property
P8-03	Acc. time2	0.0 s ~ 6500.0 s	Depends on model	☆
P8-04	Dec. time2	0.0 s ~ 6500.0 s	Depends on model	☆
P8-05	Acc. time3	0.0 s ~ 6500.0 s	Depends on model	☆
P8-06	Dec. time3	0.0 s ~ 6500.0 s	Depends on model	☆
P8-07	Acc. time4	0.0 s ~ 6500.0 s	Depends on model	☆
P8-08	Dec. time4	0.0 s ~ 6500.0 s	Depends on model	☆

SV600 series inverter has total 4 groups of Acc./Dec. time. Acc./Dec. time 1 set in P0-17 and P0-18. Each group Acc./Dec. time can be selected by multi-function terminal DI. For more details, please see the descriptions of P4-01 to P4-05.

Function code	Name	Setting range	Default	Property
P8-09	Jump frequency 1	0.00 Hz ~ Maximum frequency	0.00 Hz	☆
P8-10	Jump frequency 2	0.00 Hz ~ Maximum frequency	0.00 Hz	☆
P8-11	Jump frequency amplitude	0.00 Hz ~ Maximum frequency	0.01 Hz	☆

Setting the jump frequency helps to avoid the mechanical resonance point of the load.
The principle of the jump frequencies and jump amplitude is shown in the following figure.

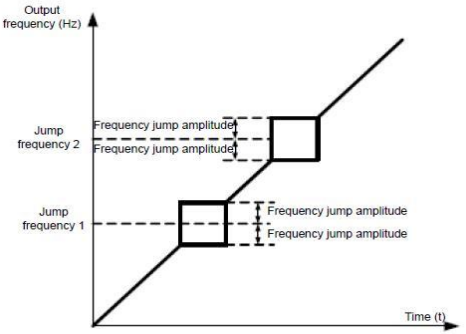


Fig. 7-13 Jump frequency and amplitude settings

Function code	Name	Setting range	Default	Property
P8-12	Forward/reverse rotation dead-zone time	0.0 s ~ 3000.0 s	0.0 s	☆
P8-13	Reverse control prohibition	0: Allow 1: Prohibit	0	☆

P8-12 is used to set the time when the output is 0 Hz at transition of the inverter forward rotation and reverse rotation, as shown in the following figure.

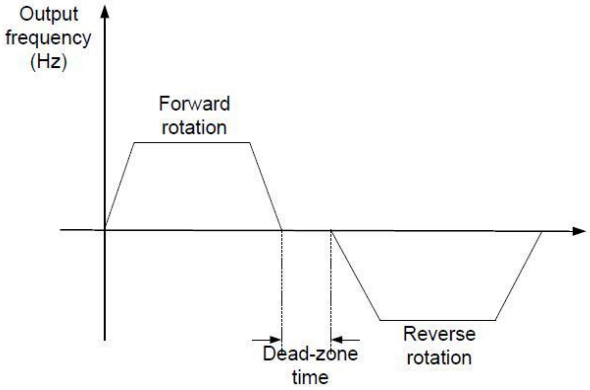


Fig.7-14 Dead-zone time

In the applications where reverse rotation is prohibited, please set P8-13 to 1.

Function code	Name	Setting range	Default	Property
P8-14	Running mode selection when set frequency lower than low limit frequency	0: Run at low limit frequency 1: Stop 2: Run at zero speed	0	☆
P8-15	Droop control	0.00 Hz ~ 10.00 Hz	0.00 Hz	☆

The droop control function is used for balancing the workload allocation when multiple motors are used to drive the same load. The output frequency of theinverter decreases as the load increases.

Function code	Name	Setting range	Default	Property
P8-16	Accumulative power-on arrival time setting	0h ~ 65000h	0h	☆
P8-17	Accumulative running arrival time setting	0h ~ 65000h	0h	☆

If the accumulative power-on time (P7-13) reaches the value set in P8-16, the corresponding DO becomes ON.

If the accumulative running time (P7-09) reaches the value set in P8-17, the corresponding DO becomes ON.

Function code	Name	Setting range	Default	Property
P8-18	Terminal protection selection when power on	0: Invalid 1: Valid	0	☆

When P8-18=1, the inverter will not run when power on if the run command is valid before power on. In this way, the motor can be protected from responding to run commands upon power-on or fault reset in unexpected conditions.

Function code	Name	Setting range	Default	Property
P8-19	Frequency detection value (FDT1)	0.00 Hz ~ maximum frequency	50.00 Hz	☆
P8-20	Frequency detection hysteresis (FDT1)	0.0% ~ 100.0% (FDT1 level)	5.0%	☆

If the running frequency is higher than the value of P8-19, the corresponding DO becomes ON.
If the running frequency is lower than value of P8-19*(1-P8-20), the DO becomes OFF.

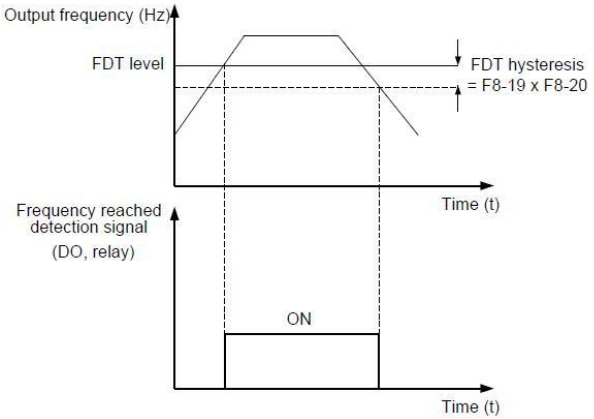


Fig.7-15 FDT frequency detection

Function code	Name	Setting range	Default	Property
P8-21	Frequency reached detection width	0.0% ~ 100.0% (maximum frequency)	1.0%	☆

If the inverter running frequency is within the certain range of the set frequency, the corresponding DO becomes ON.

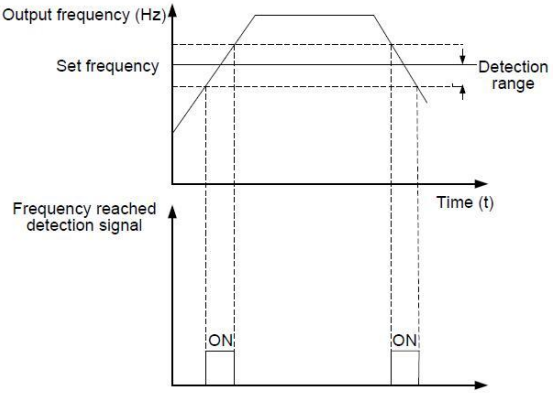


Fig.7-16 Frequency reached detection

Function code	Name	Setting range	Default	Property
P8-22	Jump frequency valid or not during Acc./Dec.	0:Invalid 1: Valid	0	☆

It is used to set whether the jump frequencies are valid during acceleration/deceleration.

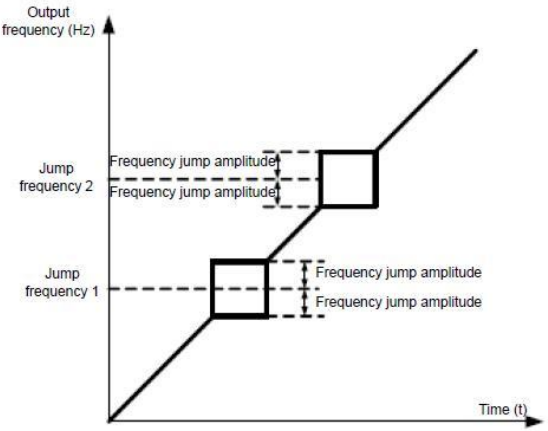


Fig.7-17 Jump frequency

Function code	Name	Setting range	Default	Property
P8-25	Switchover frequency for Acc. time 1 and Acc. time 2	0.00 Hz ~ maximum frequency	0.00 Hz	☆
P8-26	Switchover frequency for Dec. time 1 and Dec. time 2	0.00 Hz ~ maximum frequency	0.00 Hz	☆

It is used to select different groups of Acc./Dec. time based on the running frequency range rather than DI terminal during the running process of the inverter.

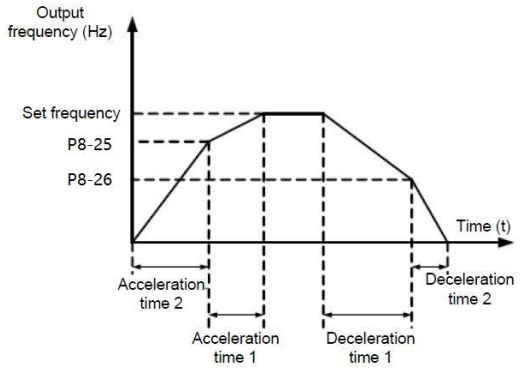


Fig.7-18 Acc./Dec. Time Switchover

Function code	Name	Setting range	Default	Property
P8-27	Priority of terminal JOG	0: Invalid 1: Valid	1	☆

P8-27 is used to set the priority of terminal JOG command. When P8-27=1 and the multi-function terminal DI with JOG function is valid, the inverter will change to JOG running even it's under others running state.

Function code	Name	Setting range	Default	Property
P8-28	Frequency detection value (FDT2)	0.00 Hz ~ maximum frequency	50.00 Hz	☆
P8-29	Frequency detection hysteresis (FDT2)	0.0% ~ 100.0% (FDT2 level)	5.0%	☆

The frequency detection function is the same as FDT1 function. For details, refer to the descriptions of P8-19 and P8-20.

Function code	Name	Setting range	Default	Property
P8-30	Any frequency reaching detection value 1	0.00 Hz ~ maximum frequency	50.00 Hz	☆
P8-31	Any frequency reaching detection width 1	0.0% ~ 100.0% (maximum frequency)	0.0%	☆
P8-32	Any frequency reaching detection value 2	0.00 Hz ~ maximum frequency	50.00 Hz	☆
P8-33	Any frequency reaching detection width 2	0.0% ~ 100.0% (maximum frequency)	0.0%	☆

If the output frequency of the inverter is within the positive and negative amplitudes of the any frequency reaching detection value, the corresponding DO becomes ON.

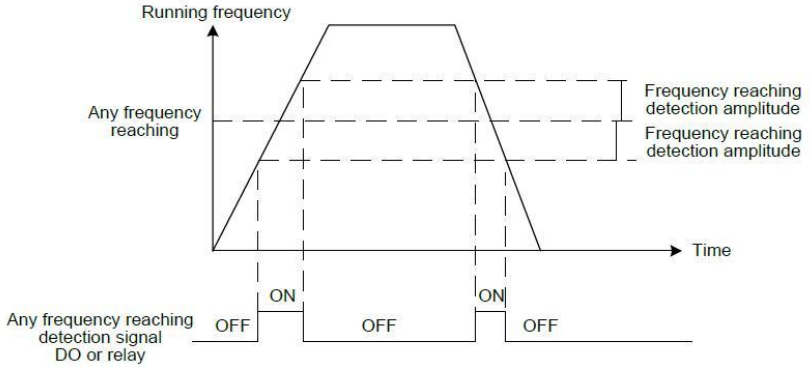


Fig.7-19 Frequency reaching detection

Function code	Name	Setting range	Default	Property
P8-34	Zero current detection level	0.0% ~ 300.0% 100.0% corresponds to motor rated current	5.0%	☆
P8-35	Zero current detection delay time	0.01 s ~ 600.00 s	0.10 s	☆

If the output current of the inverter is equal to or less than the zero current detection level and the duration exceeds the zero current detection delay time, the corresponding DO becomes ON.

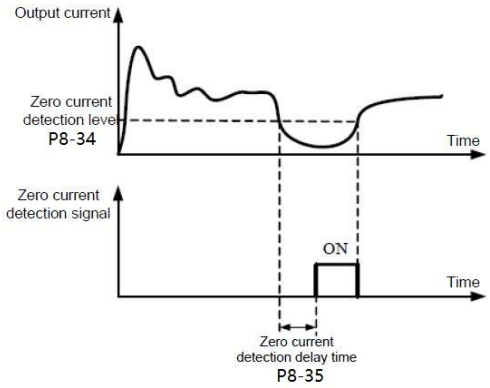


Fig.7-20 Zero current detection

Function code	Name	Setting range	Default	Property
P8-36	Output current exceeded limit	0.0% (not detection) 0.1% ~ 300.0% (motor rated current)	200.0%	☆
P8-37	Output current exceeded limit detection delay time	0.00 s ~ 600.00 s	0.00 s	☆

If the output current of the inverter is equal to or higher than the overcurrent threshold and the duration exceeds the detection delay time, the corresponding DO becomes ON.

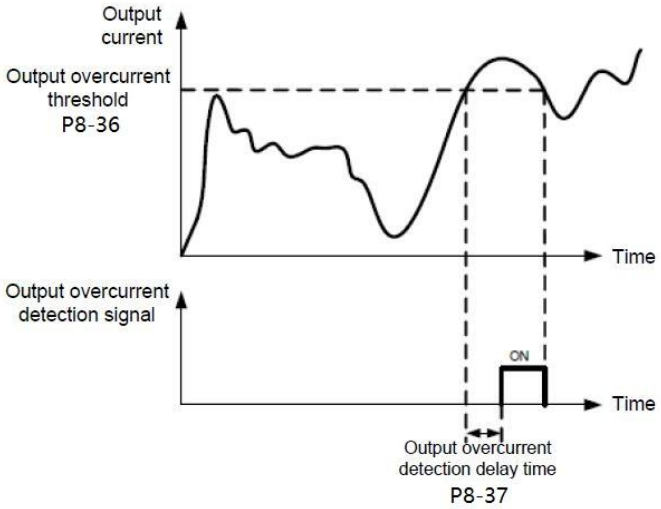


Fig.7-21 Output overcurrent detection

Function code	Name	Setting range	Default	Property
P8-38	Any reached current 1	0.0% ~ 300.0%(motor rated current)	100.0%	☆
P8-39	Any reached current 1 width	0.0% ~ 300.0% (motor rated current)	0.0%	☆
P8-40	Any reached current 2	0.0% ~ 300.0% (motor rated current)	100.0%	☆
P8-41	Any reached current 2 width	0.0% ~ 300.0% (motor rated current)	0.0%	☆

If the output current of the inverter is within the positive and negative amplitudes of any current reaching detection value, the corresponding DO becomes ON.

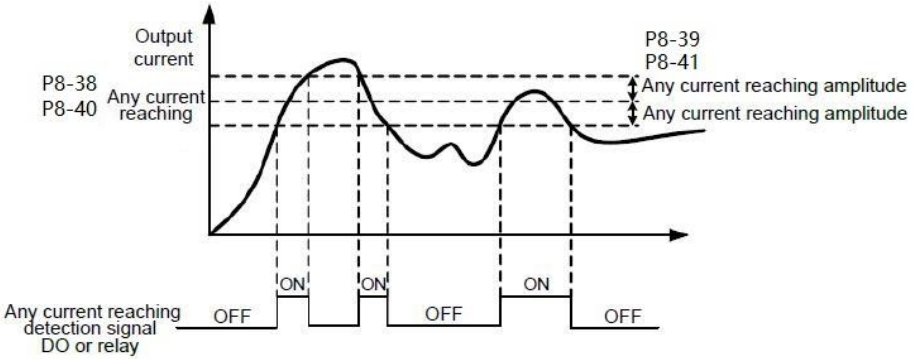


Fig.7-22 Current reachinig detection

Function code	Name	Setting range	Default	Property
P8-42	Timing function selection	0: Invalid 1: Valid	0	★
P8-43	Timing duration source selection	0: Set by P8-44 1: AI1 2: AI2 3: Reserved (100% of AI corresponds to the value in P8-44	0	★
P8-44	Timing duration	0.0 Min ~ 6500.0 Min	0.0 Min	★

These parameters are used to implement the AC drive timing function.

If P8-42 is set to 1, the inverter starts to timing at startup. When the set timing duration is reached, the inverter stops automatically and meanwhile the corresponding DO becomes ON.

The inverter starts timing from 0 each time it starts up and the remaining timing duration can be queried by U0-20.

The timing duration is set in P8-43 and P8-44, in unit of minute.

Function code	Name	Setting range	Default	Property
P8-45	AI1 input voltage protection low limit	0.00V ~ P8-46	3.10 V	☆
P8-46	AI1 input voltage protection upper limit	P8-45 ~ 10.00 V	6.80 V	☆

These two parameters are used to set the limits of the input voltage to provide protection on the inverter. When the AI1 input is larger than the value of P8-46 or smaller than the value of P8-45, the corresponding DO becomes ON, indicating that AI1 input exceeds the limit.

Function code	Name	Setting range	Default	Property
P8-47	IGBT temperature reached	0 ℃ ~ 100 ℃	75 ℃	☆

When the heatsink temperature of the IGBT reaches the value of this parameter, the corresponding DO becomes ON.

Function code	Name	Setting range	Default	Property
P8-48	Cooling fan control	0: Fan works during running 1: Fan always works.	0	☆

If this parameter is set to 0, the fan works when the inverter is in running state. When the inverter stops, the cooling fan works if the heatsink temperature is higher than 40 ℃ and stops working if the heatsink temperature is lower than 40 ℃. If this parameter is set to 1, the cooling fan keeps working after power-on.

Function code	Name	Setting range	Default	Property
P8-49	Wakeup threshold	0.00 ~ 1.00.	0.75	☆

P8-50	Wakeup delay time	0.0 s ~ 6500.0 s	0.0 s	☆
P8-51	Sleep frequency	0.00 Hz ~ 50.00 Hz	0.00 Hz	☆
P8-52	Sleep delay time	0.0 s ~ 6500.0s	0.0 s	☆

These parameters are used to implement the sleep and wakeup functions in the constant pressure water or air supply application.

When the inverter is in running state, the inverter will enter the sleep state and stops automatically if the set frequency is lower than or equal to the dormant frequency (P8-51) and lasts the sleep delay time (P8-52).

When the inverter is in sleep state and the current running command is effective, the inverter starts up if the set frequency is higher than or equal to the wakeup frequency (P8-49) which lasting the wakeup delay time (P8-50).

If the wakeup frequency and dormant frequency are set to 0, the dormant and wakeup functions are disabled.

When the sleep function is enabled, if the frequency source is PID, whether PID operation is performed in the sleep state is determined by PA-28. In this case, select PID operation enabled in the stop state (PA-28 = 1).

Function code	Name	Setting range	Default	Property
P8-53	Current running time reached setting	0.0~6500.0min	0.0 Min	☆

If the current running time reaches the value set in this parameter, the corresponding DO becomes ON.

Function code	Name	Setting range	Default	Property
P8-54	Output power correction coefficient	0.00% ~ 200.0%	100.0%	☆

When the output power (U0-05) is not equal to the required value, you can perform linear correction on output power by using this parameter.

Group F9: Fault and Protection

Function code	Name	Setting range	Default	Property
P9-00	Motor overload protection selection	0: Invalid 1: Valid	1	☆
P9-01	Motor overload protection gain	0.20-10.00	1.00	☆
P9-02	Motor overload warning coefficient	50%-100%	80%	☆

When P9-00 = 1, the inverter judges whether the motor is overloaded according to the inverse time-lag curve of the motor overload protection.

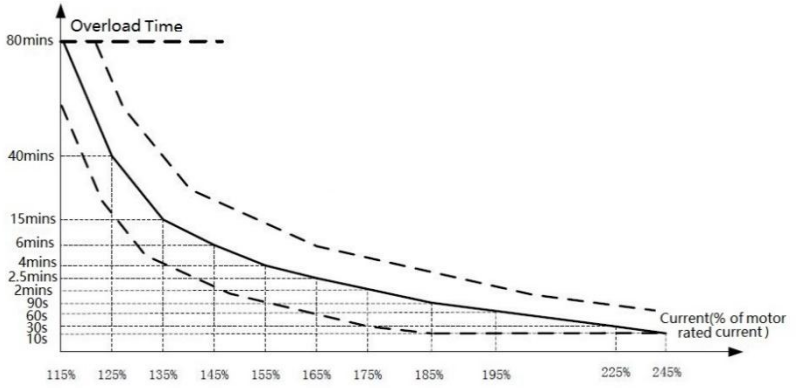


Fig.7-23 Motor overload protection curve

According the above curve, if P9-01=1, when the motor current reaches 175% of motor rated current and lasts 2mins, the inverter will report Err11 fault.

And when thhe motor currents reaches 115% of the motor rated current and lasts 80mins, the inverter will report Err11 fault.

P9-02 is used to set the motor overload pre-warning coefficient. When the accumulative output current of the inverter is greater than the value of the overload inverse time-lag curve multiplied by P9-02, the DO terminal with function 6 (Motor overload pre-warning) becomes ON.

Function code	Name	Setting range	Default	Property
P9-03	Overvoltage stall gain	0 ~ 100	100	☆
P9-04	Overvoltage stall protection voltage	120%~150%	120%	☆

When the DC bus voltage exceeds the value of P9-04 (Overvoltage stall protective voltage) during deceleration of the AC drive, the inverter stops deceleration and keeps the present running frequency. After the bus voltage declines, the inverter continues to decelerate.

The largerP9-03 is, the greater suppression effect.

Function code	Name	Setting range	Default	Property
P9-05	Overcurrent stall gain	0 ~ 100	20	☆
P9-06	Overcurrent stall protection current	100~200%	150%	☆

When the output current exceeds the overcurrent stall protection current during acceleration/deceleration of the inverter, the inverter stops acceleration/deceleration and keeps the present running frequency. After the output current declines, the inverter continues to accelerate/decelerate.

The largerP9-05 is, the greater suppression effect.

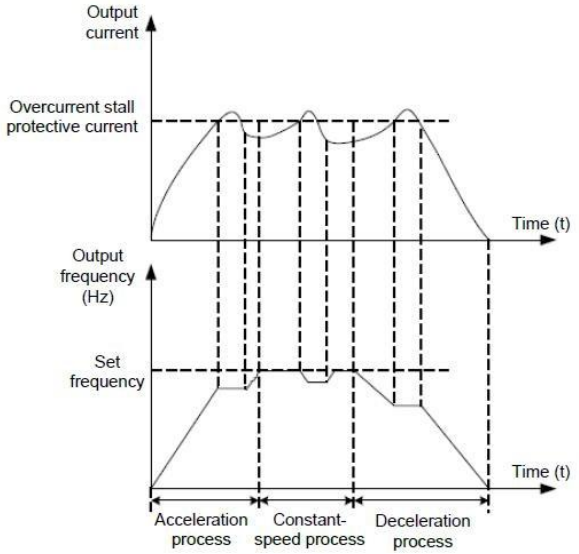


Fig.7-24 Overcurrent stall protection

Function code	Name	Setting range	Default	Property
P9-07	Protection for short circuit to ground when power on	0: Invalid 1: Valid	1	☆
P9-08	Braking voltage of the built-in braking unit	200.0~2000.0V	Depends on model	★
P9-09	Fault automatic reset times	0 ~ 20	0	☆
P9-10	DO action selection during fault automatic reset	0: No action 1: Action	0	☆
P9-11	Fault auto reset interval time	0.1 s ~ 100.0 s	1.0 s	☆

P9-09 is used to set the times of fault auto resets if this function is used. After the value is exceeded, the inverter will remain in the fault state.

P9-10 is used to decide whether the DO acts during the fault auto reset if the fault auto reset

function is selected.

Function code	Name	Setting range	Default	Property
P9-12	Input loss phase protection and contactor pull-in selection	Units digit: Input loss phase protection 0: Invalid 1: Valid Tens digit: Contactor pull-in protection 0: Invalid 1: Valid	1	☆
P9-13	Output loss phase protection	0: Invalid 1: Valid	1	☆

Single phase input inverter does not have input loss phase protection function.

Function code	Name	Setting range	Default	Property
P9-14	Fault 1 type	0: No fault	-	●
P9-15	Fault 2 type	1: Reserved	-	●
P9-16	Fault 3 type	2: Overcurrent during acceleration 3: Overcurrent during decelerationt 4: Overcurrent at constant speed 5: Overvoltage during acceleration 6: Overvoltage during deceleration 7: Overvoltage at constant speed 8: Charging resistance overload 9: Undervoltage 10: Frequency inverter overload 11: Motor overload 12: Input loss phase 13: Output loss phase 14: IGBT overheat 15: External fault 16: Communication abnormal 17: Contactor abnormal 18: Current detection abnormal 19: Self-learning abnormal 20: Encoder/PG card abnormal 21: Parameter read/write abnormal 22: Inverter hardware abnormal 23: Motor short circuit to ground 24: Reserved 25: Reserved		●

		26: Running time reached 27: User-defined Fault 1 28: User-defined Fault 2 29: Accumulative power-on time reached 30: Underload 31: PID feedback loss during running 40: Timeout of rapid current limiting 41: Switchover motor during running 42: Speed deviation too large 43: Motor overspeed 50: Motor overheat 51: Initial position error		

It is used to record the types of the latest three faults of the inverter. 0 indicates no fault. For possible causes and solution of each fault, refer to Chapter 8.

Function code	Name	Setting range	Default	Property
P9-17	Fault 3(latest): Frequency	-	-	●
P-18	Fault 3(latest): Current	-	-	●
P9-19	Fault 3(latest): Bus voltage	-	-	●
P9-20	Fault 3(latest): Input terminal status	When the input terminal status is valid, the value of the corresponding bit in binary is 1. The order of each DI as shown in follow. BIT9 BIT8 BIT7 BIT6 BIT5 BIT4 BIT3 BIT2 BIT1 BIT0 DI0 DI9 DI8 DI7 DI6 DI5 DI4 DI3 DI2 DI1 When the output terminal status is valid, the value of the corresponding bit in binary is 1. The order of each DO as shown in follow. BIT4 BIT3 BIT2 BIT1 BIT0 DO0 DO1 REL2 REL1 FMP	-	●
P9-21	Fault 3(latest): Output terminal status		-	●
P9-22	Fault 3(latest): Inverter status		-	●
P9-23	Fault 3(latest): Accumulative power-on time		-	●
P9-24	Fault 3(latest): Accumulative running time		-	●
P9-27	Fault 2: Frequency		-	●
P9-28	Fault 2: Current		-	●
P9-29	Fault 2: Bus voltage		-	●
P9-30	Fault 2: Input terminal status		-	●
P9-31	Fault 2: Output terminal status		-	●
P9-32	Fault 2: Inverter status		-	●
P9-33	Fault 2: Accumulative power-on time		-	●

P9-34	Fault 2: Accumulative running time		-	●
P9-37	Fault 1: Frequency		-	●
P9-38	Fault 1: Current		-	●
P9-39	Fault 1: Bus voltage		-	●
P9-40	Fault 1: Input terminal status		-	●
P9-41	Fault 1: Output terminal status		-	●
P9-42	Fault 1: Inverter status		-	●
P9-43	Fault 1: Accumulative power-on time		-	●
P9-44	Fault 1: Accumulative running time		-	●

The fault records can be checked in above parameters, which include frequeny, current, DC bus voltage and so on when the fault occurs.

Function code	Name	Setting range	Default	Property
P9-47	Fault protection action selection 1	Units digit: Motor overload (Err11) 0: Freely stop 1: Stop according to the stop mode 2: Continue running Tens digit: Input loss phase (Err12) Selection as same as above Hundreds digit: Output loss phase (Err13) Selection as same as above Thousands digit: External Fault (Err15) Selection as same as above Ten thousands digits: Communication abnormal (Err16) Selection as same as above	00000	☆
P9-48	Fault protection action selection 2	Units digit:Reserved Tens digit: Parameter read/write abnormal (Err21) 0: Freely stop 1: Stop according to the stop mode Hundreds digit: Reserved Thousands digit: Motor overheat (Err25) 0: Freely stop 1: Stop according to the stop mode 2: Continue running Ten thousands digit: Accumulative running	00000	☆

		time reached (Err26) 0: Freely stop 1: Stop according to the stop mode 2: Continue running		
P9-49	Fault protection action selection 3	Units digit: User-defined fault 1 (Err27) 0: Freely stop 1: Stop according to the stop mode 2: Continue running Tens digit: User-defined fault 2 (Err28) 0: Freely stop 1: Stop according to the stop mode 2: Continue running Hundreds digit: Accumulative power-on time reached (Err29) 0: Freely stop 1: Stop according to the stop mode 2: Continue running Thousands digit:Underload(Err30) 0: Freely stop 1: Stop according to the stop mode 2: Run at 7% of motor rated frequency and run at the set frequency when the load recovers Ten thousands: PID feedback loss during running (Err31) 0: Freely stop 1: Stop according to the stop mode 2: Continue running	00000	☆
P9-50	Fault protection action selection 4	Units digit: Speed deviation too large (Err42) 0: Freely stop 1: Stop according to the stop mode 2: Continue running Tens digit: Motor overspeed (Err43) 0: Freely stop 1: Stop according to the stop mode 2: Continue running Hundreds digit: Initial position error (Err51) 0: Freely stop 1: Stop according to the stop mode 2: Continue running	00000	☆

0: Freely stop

When fault occurs, the inverter displays Err** and directly stops.

1: Stop according to the stop mode

When fault occurs, the inverter displays A** and stops.

2: Continue running

When fault occurs, the inverter continues to run and displays A**. The running frequency is set in P9-54.

Function code	Name	Setting range	Default	Property
P9-54	Frequency for continued running when fault occurs	0: Current running frequency 1: The set frequency 2: Upper limit frequency 3: Low limit frequency 4: Abnormal running frequency set in P9-55	0	☆
P9-55	Abnormal running frequency	0.0% ~ 100.0% (100.0% corresponds maximum frequency P0-10)	100.0%	☆
P9-59	Instantaneous power failure action selection	0: Invalid 1: Constant DC bus voltage control 2: Decelerate to stop	0	★
P9-60	Action pause judgment voltage for instantaneous power failure	80. 0%-100. 0%	90.0%	★
P9-61	Judging time of voltage rising after instantaneous power failure	0.00 s ~ 100.00 s	0.50 s	★
P9-62	Instantaneous power failure judging voltage	60.0% ~ 100.0% (standard bus voltage)	80.0%	☆

Upon instantaneous power failure, the DC bus voltage of the inverter will reduce. The function compensates the DC bus voltage reduction with the load feedback energy by reducing the output frequency so as to keep the inverterrunning continuously.

If P9-59 = 1, upon instantaneous power failure, the inverter decelerates. Once the bus voltage resumes to normal, the inverter accelerates to the set frequency. If the bus voltage remains normal for the time exceeding the value set in P9-61, it is considered that the bus voltage resumes to normal.

If P9-59 = 2, upon instantaneous power failure, the inverter decelerates to stop.

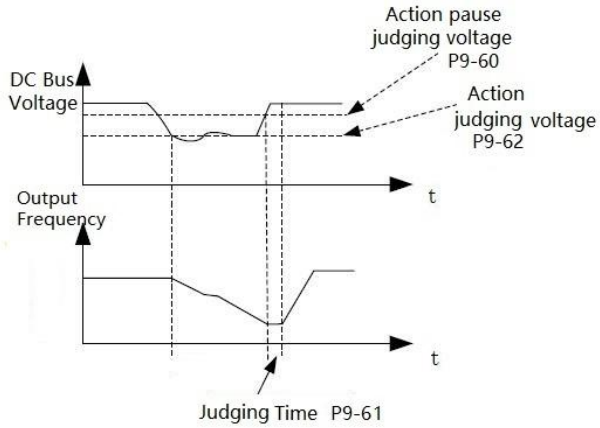


Fig.7-25 Instantaneous power failure protection

Function code	Name	Setting range	Default	Property
P9-63	Underload protection selection	0: Invalid 1: Valid	0	☆
P9-64	Underload protection detection level	0.0-100.0%	10.0%	☆
P9-65	Underload protection detection time	0.0 ~ 60.0 s	1.0 s	☆

If underload protection is enabled, when the output current of the inverter is lower than the detection level (P9-64) and the lasting time exceeds the detection time (P9-65), the output frequency of the inverter automatically declines to 7% of the rated frequency. During the protection, the inverter automatically accelerates to the set frequency if the load resumes to normal.

Function code	Name	Setting range	Default	Property
P9-67	Overspeed detection value	0.0% ~ 50.0% (maximum frequency)	20.0%	☆
P9-68	Overspeed detection time	0.0 s: Not detect 0.1 ~ 60.0 s	1.0 s	☆

The function only valid under close-loop vector control mode.

If the actual motor rotational speed detected by the inverter exceeds the maximum frequency and the excessive value is greater than the value of P9-67 and the lasting time exceeds the value of P9-68, the inverter reports Err43 and acts according to the selected fault protection action.

If the over-speed detection time is 0.0s, the over-speed detection function is disabled.

Function code	Name	Setting range	Default	Property
P9-69	Speed deviation too large detection value	0.0% ~ 50.0% (maximum frequency)	20.0%	☆
P9-70	Speed deviation too large detection time	0.0 s: Not detect 0.1 ~ 60.0 s	5.0 s	☆

The function only valid under close-loop vector control mode.

If the inverter detects the deviation between the actual motor rotational speed detected by the inverter and the set frequency is greater than the value of P9-69 and the lasting time exceeds the value of P9-70, the inverter reports Err42 and according to the selected fault protection action.

If P9-70 (Detection time of too large speed deviation) is 0.0s, this function is disabled.

Function code	Name	Setting range	Default	Property
P9-71	Kp gain for continued running when instantaneous power failure occurs	0~100	40	☆
P9-72	Ki integral coefficient for continued running when instantaneous power failure occurs	0~100	30	☆
P9-73	Deceleration time for continued running when instantaneous power failure occurs	0~300.0s	20.0s	☆
P9-74	Load overcurrent falut selection	0:Invalid 1:Valid	0	☆
P9-75	Load overcurrent detection value	0.0~655.35A （0.0:Not detect）	0.0	☆
P9-76	Load overcurrent falut delay time	0.0~120.0S	0.0S	☆

If load overcurrent protection is enabled, when the output current of the inverter is higher than the detection level (P9-75) and the lasting time exceeds the detection time (P9-76), the DO with the protection function will become ON.

Group PA: PID function

PID control is a general process control method. By performing proportional, integral and differential operations on the difference between the feedback signal and the target signal, it adjusts the output frequency and constitutes a feedback system to stabilize the controlled counter around the target value.

It is applied to process control such as flow control, pressure control and temperature control. The following figure shows the principle block diagram of PID control.

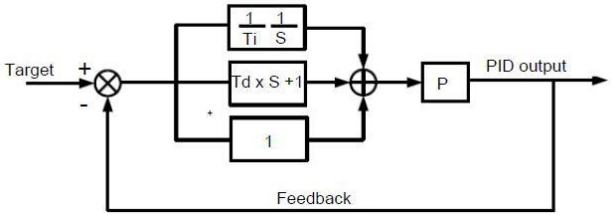


Fig.7-26 PID process control

Function code	Name	Setting range	Default	Property
PA-00	PID setting source	0: Set by PA-01 1: AI1 2: AI2 3:Potentiometer on keyboard 4: PULSEsetting (HDI) 5: Communication setting 6: Multi-segment instruction	0	☆
PA-01	PID digital setting	0.0% ~ 100.0%	50.0%	☆

PA-00 is used to select the channel of target process PID setting. The PID setting is a relative value and ranges from 0.0% to 100.0%.

Function code	Name	Setting range	Default	Property
PA-02	PID feedback source	0: AI1 1: AI2 2: Reserved 3: AI1-AI2 4: PULSE setting (HDI) 5: Communication setting 6: AI1+AI2 7: MAX (|AI1|, |AI2|) 8: MIN (|AI1|, |AI2|)	0	☆

PA-02 is used to select the feedback signal channel of process PID. The PID feedback is a relative value and ranges from 0.0% to 100.0%.

Function code	Name	Setting range	Default	Property
PA-03	PID action direction	0:Positive 1:Negative	0	☆

0: Positive

When the feedback value is smaller than the PID setting, the inverter's output frequency increases.

1: Negative

When the feedback value is smaller than the PID setting, the inverter's output frequency decreases.

Note: The function is influenced by the DI function 35 "Reverse PID action direction".

Function code	Name	Setting range	Default	Property
PA-04	PID setting feedback range	0-65535	1000	☆

This parameter is a non-dimensional unit. It is used for PID setting display (U0-15) and PID feedback display (U0-16). Relative value 100% of PID setting feedback corresponds to the value of FA-04. If PA-04 is set to 2000 and PID setting is 100.0%, the PID setting display (U0-15) is 2000.

Function code	Name	Setting range	Default	Property
PA-05	Proportional gain Kp1	0.0-100.0	20.0	☆
PA-06	Integral time Ti1	0.01 s ~ 10.00 s	0.50 s	☆
PA-07	Differential time Td1	0.000 s ~ 10.000 s	0.000 s	☆

PA-05 (Proportional gain Kp1)

It decides the regulating intensity of the PID regulator. The higher the Kp1 is, the larger the regulating intensity is. The value 100.0 indicates when the deviation between PID feedback and PID setting is 100.0%, the adjustment amplitude of the PID regulator on the output frequency reference is the maximum frequency.

PA-06 (Integral time Ti1)

It decides the integral regulating intensity. The shorter the integral time is, the larger the regulating intensity is. When the deviation between PID feedback and PID setting is 100.0%, the integral regulator performs continuous adjustment for the time set in PA-06. Then the adjustment amplitude reaches the maximum frequency.

PA-07 (Differential time Td1)

It decides the regulating intensity of the PID regulator on the deviation change. The longer the differential time is, the larger the regulating intensity is. Differential time is the time within which the feedback value change reaches 100.0%, and then the adjustment amplitude reaches the maximum frequency.

Function code	Name	Setting range	Default	Property
PA-08	Cut-off frequency of PID reverse rotation	0.00 ~ maximum frequency	0.00 Hz	☆

In some situations, only when the PID output frequency is a negative value (inverter reverse rotation), PID setting and PID feedback can be equal. However, too high reverse rotation frequency is prohibited in some applications, and PA-08 is used to determine the reverse rotation frequency upper limit.

Function code	Name	Setting range	Default	Property
PA-09	PID deviation limit	0.0% ~ 100.0%	0.0%	☆

If the deviation between PID feedback and PID setting is smaller than the value of PA-09, PID control stops.

Function code	Name	Setting range	Default	Property
PA-10	PID differential limit	0.00% ~ 100.00%	0.10%	☆

In PID control, the differential operation may easily cause system oscillation. Thus, the PID differential regulation is restricted to a small range.

Function code	Name	Setting range	Default	Property
PA-11	PID setting change time	0.00 ~ 650.00 s	0.00 s	☆

The PID setting change time indicates the time required for PID setting changing from 0.0% to 100.0%. The PID setting changes linearly according to the change time, reducing the impact caused by sudden setting change on the system.

Function code	Name	Setting range	Default	Property
PA-12	PID feedback filtertime	0.00 ~ 60.00 s	0.00 s	☆
PA-13	PID output filter time	0.00 ~ 60.00 s	0.00 s	☆

PA-12 is used to filter the PID feedback, helping to reduce interference on the feedback but slowing the response of the process closed-loop system.
PA-13 is used to filter the PID output frequency, helping to weaken sudden change of the inverter output frequency but slowing the response of the process closed-loop system.

Function code	Name	Setting range	Default	Property
PA-15	Proportional gain Kp2	0.0-100.0	20.0	☆
PA-16	Integral time Ti2	0.01 s ~ 10.00 s	2.00 s	☆
PA-17	Differential time Td2	0.000 s ~ 10.000 s	0.000 s	☆
PA-18	PID parameter switchover condition	0: Not switchover 1: Switchover by DI	0	☆

		2: Switchover automatically according to deviation		
PA-19	PID parameter switchover deviation 1	0.0% ~ PA-20	20.0%	☆
PA-20	PID parameter switchover deviation 2	PA-19-100.0%	80.0%	☆

In some applications, PID parameters switchover is required when one group of PID parameters cannot satisfy the requirement of the whole running process. These parameters are used for switchover between two groups of PID parameters. Regulator parameters PA-15 to PA-17 are set in the same way as PA-05 to PA-07.

The switchover can be implemented either via a DI terminal or automatically implemented based on the deviation.

If you select switchover via a DI terminal, the DI must be allocated with function 43 "PID parameter switchover". If the DI is OFF, group 1 (PA-05 to PA-07) is selected. If the DI is ON, group 2 (PA-15 to PA-17) is selected.

If you select automatic switchover, when the absolute value of the deviation between PID feedback and PID setting is smaller than the value of PA-19, group 1 is selected. When the absolute value of the deviation between PID feedback and PID setting is higher than the value of PA-20, group 2 is selected. When the deviation is between PA-19 and PA-20, the PID parameters are the linear interpolated value of the two groups of parameter values.

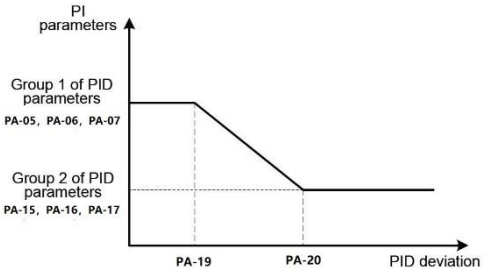


Fig.7-27 PID parameters switchover

Function code	Name	Setting range	Default	Property
PA-21	PID initial value	0.0% ~ 100.0%	0.0%	☆
PA-22	PID initial value hold time	0.00 ~ 650.00 s	0.00 s	☆

Before perform closed-loop PID algorithem, the inverter runs at PID initial value and lasts the time set in PA-22 when start-up.

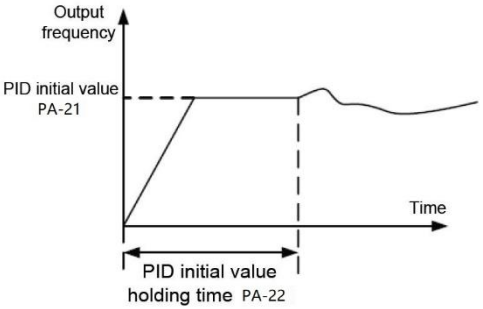


Fig.7-28 PID initial value setting

Function code	Name	Setting range	Default	Property
PA-23	Twice output positive maximum deviation	0.00% ~ 100.00%	1.00%	☆
PA-24	Twice output negative maximum deviation	0.00% ~ 100.00%	1.00%	☆

This function is used to limit the deviation between two PID outputs (2 ms per PID output) to suppress the rapid change of PID output and stabilize the running of the inverter.

Function code	Name	Setting range	Default	Property
PA-25	PID integral property	Units digit: Integral separated 0: Invalid 1: Valid Tens digit: Stop integration when output reaches the limit 0: Continue integration 1: Stop integration	00	☆

Integral separated

If it is valid, the PID integral operation stops when the DI allocated with function 38 "PID integral pause" is ON.

If it is invalid, integral separated remains invalid no matter whether the DI allocated with function 38 "PID integral pause" is ON or not.

Stop integration when output reaches the limit

If "Stop integrtion" is selected, the PID integral operation stops, which may help to reduce the PID overshoot.

Function code	Name	Setting range	Default	Property
PA-26	PID feedback loss detection value	0.0%: Not detect 0.1% ~ 100.0%	0.0%	☆
PA-27	PID feedback loss detection time	0.0 s ~ 20.0 s	0.0 s	☆

If the PID feedback is smaller than the value of PA-26 and the lasting time exceeds the value of PA-27, the inverter reports Err31 and acts according to the selected fault protection action.

Function code	Name	Setting range	Default	Property
PA-28	PID operation at stop state	0: No PID operation at stop 1: PID operation valid at stop	1	☆

It is used to select whether to continue PID operation in the state of stop. Generally, the PID operation stops when the inverter stops.

Group Pb: Swing frequency, fixed length and count functions

The swing frequency function is applied to the textile and chemical fiber fields and the applications where traversing and winding functions are required.

The swing frequency function indicates that the output frequency of the inverter swings up and down with the set frequency as the center. The trace of running frequency at the time axis is shown in the following figure.

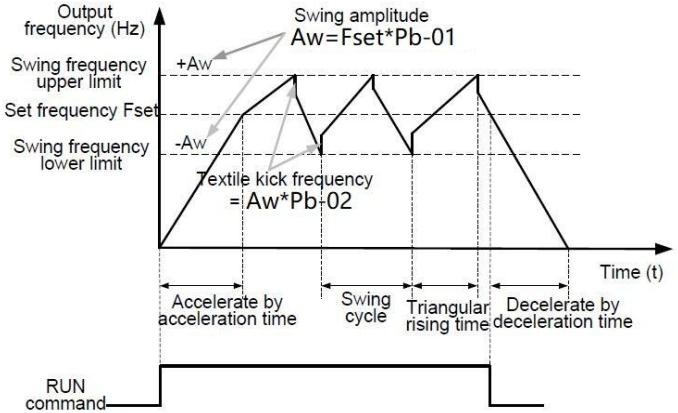


Fig.7-29 Swing function setting

Function code	Name	Setting range	Default	Property
Pb-00	Swing frequency setting method	0:Relative to center frequency 1: Relative to maximum frequency	0	☆

This parameter is used to select the base value of the swing amplitude.

0: Relative to the central frequency (P0-07 frequency source selection)

It is variable swing amplitude system. The swing amplitude varies with the central frequency (set frequency).

1: Relative to the maximum frequency (P0-10 maximum output frequency)

It is fixed swing amplitude system. The swing amplitude is fixed.

Function code	Name	Setting range	Default	Property

Pb-01	Swing frequuency amplitude	0.0% ~ 100.0%	0.0%	☆
Pb-02	Jump frequency amplitude	0.0% ~ 50.0%	0.0%	☆

This parameter is used to determine the swing amplitude and jump frequency amplitude.
The swing frequency is limited by the frequency upper limit and frequency lower limit.
When Pb-00 = 0, the actual swing amplitude AW =Set frequency (Fset)*Pb-01.
When Pb-00 = 0, the actual swing amplitude AW =P0-10*Pb-01.
Jump frequency = Swing amplitude AW * Pb-02

Function code	Name	Setting range	Default	Property
Pb-03	Swing cycle period	0.1 s ~ 3000.0 s	10.0 s	☆
Pb-04	Triangular wave rising time coefficient	0.1% ~ 100.0%	50.0%	☆

Pb-03 specifies the time of a complete swing frequency cycle.
Pb-04 specifies the triangular wave rising time (percentage of Pb-03).
Triangular wave rising time = Pb-03*Pb-04 (unit: s)
Triangular wave falling time = Pb-03- Pb-03*Pb-04(unit: s)

Function code	Name	Setting range	Default	Property
Pb-05	Set length	0m ~ 65535m	1000m	☆
Pb-06	Actual length	0m ~ 65535m	0m	☆
Pb-07	Number of pulses per meter	0.1-6553.5	100.0	☆

The preceding parameters are used for fixed length control.
The length information is collected by DI terminals. Pb-06 (Actual length) is calculated by dividing the number of pulses collected by the DI terminal by Pb-07 (Number of pulses per meter).
When the actual length Pb-06 exceeds the set length in Pb-05, the DO terminal allocated with function 10 (Length reached) becomes ON.
During the fixed length control, the length reset operation can be performed via the DI terminal allocated with function 28. For details, see the descriptions of P4-00 to P4-09.
Allocate corresponding DI terminal with function 27 (Length count input) in applications. If the pulse frequency is high, HDI must be used.

Function code	Name	Setting range	Default	Property
Pb-08	Set count value	1-65535	1000	☆
Pb-09	Count value	1-65535	1000	☆

The count value needs to be collected by DI terminal. Allocate the corresponding DI terminal with function 25 (Counter input) in applications. If the pulse frequency is high, HDI must be used.
When the count value reaches the set count value (Pb-08), the DO terminal allocated with function 8 (Set count value reached) becomes ON. Then the counter stops counting.

When the counting value reaches the count value (Pb-09), the DO terminal allocated with function 9 (count value reached) becomes ON. Then the counter continues to count until the set count value is reached.

Pb-09 should be equal to or smaller than Pb-08.

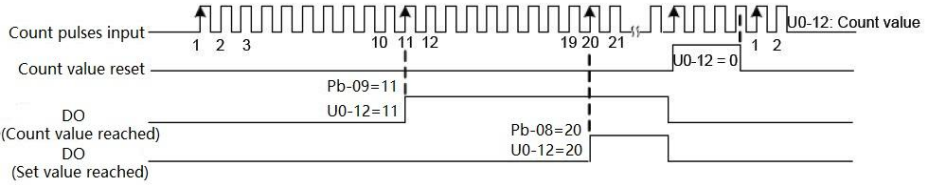


Fig.7-30 Counting function setting

Group PC: Multi-segment instruction, simple PLC functions

Multi-segment instruction has many functions. Besides multi-speed, it can be used as the setting source of the V/F separated voltage source and setting source of process PID. And iIt's relative value.

Simple PLC function can complete total maximum 16 steps with combination of multi-speed,

Function code	Name	Setting range	Default	Property
PC-00	Multi-segment instruction 0	-100.0% ~ 100.0% (100% corresponds to frequency set in P0-10)	10.0%	☆
PC-01	Multi-segment instruction 1	-100% ~ 100%	20.0%	☆
PC-02	Multi-segment instruction 2	-100% ~ 100%	30.0%	☆
PC-03	Multi-segment instruction 3	-100% ~ 100%	40.0%	☆
PC-04	Multi-segment instruction 4	-100% ~ 100%	50.0%	☆
PC-05	Multi-segment instruction 5	-100% ~ 100%	60.0%	☆
PC-06	Multi-segment instruction 6	-100% ~ 100%	70.0%	☆
PC-07	Multi-segment instruction 7	-100% ~ 100%	80.0%	☆
PC-08	Multi-segment instruction 8	-100% ~ 100%	90.0%	☆
PC-09	Multi-segment instruction 9	-100% ~ 100%	100.0%	☆
PC-10	Multi-segment instruction 10	-100% ~ 100%	100.0%	☆
PC-11	Multi-segment instruction 11	-100% ~ 100%	100.0%	☆
PC-12	Multi-segment instruction 12	-100% ~ 100%	100.0%	☆
PC-13	Multi-segment instruction 13	-100% ~ 100%	100.0%	☆
PC-14	Multi-segment instruction 14	-100% ~ 100%	100.0%	☆

PC-15	Multi-segment instruction 15	-100% ~ 100%	100.0%	☆

Multi-segment instruction can be the setting source of frequency, V/F separated voltage and process PID. The multi-reference is relative value and ranges from -100.0% to 100.0%.

As frequency source, it is a percentage relative to the maximum frequency. As V/F separated voltage source, it is a percentage relative to the rated motor voltage.

Multi- segment instruction can be switched over based on different states of DI terminals. For details, please refer to the descriptions of group P4.

Function code	Name	Setting range	Default	Property
PC-16	Simple PLC operation mode	0:Stop after single cycle 1:Keep running at final frequency after single cycle 2: Continuous loop	0	☆

0: Stop after single cycle

The inverter stops after running one cycleand will not start up until receiving another command.

1: Keep running at final frequency after single cycle

The inverter keeps running at the final running frequency and direction after running one cycle.

2: Continuous loop

The inverter repeats the simple PLC cycle again and again until eceiving the stop command.

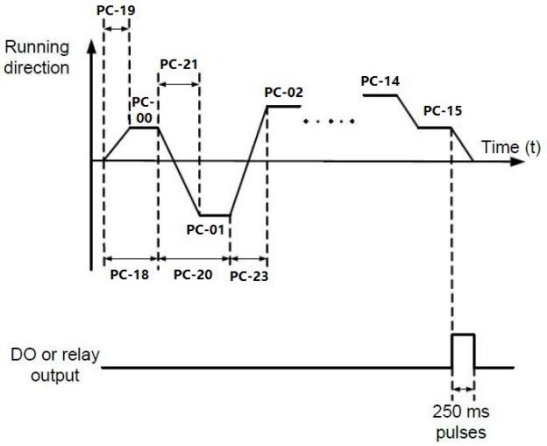


Fig.7-31 Simple PLC function

Function code	Name	Setting range	Default	Property
PC-17	Simple PLC memory selection	Units digit:Memory selection when power off 0:Not save 1:Save Tens digit: Memory selection when	00	☆

		stop 0: Not save when stop 1: Save when stop		

Units digit: Memory selection when power off

0: Not save

1: Save

The simple PLC running state would be saved when power failure occurs. The inverter will restart from the saved state (saved steps and saved frequency) when power on again and running command provided.

Tens digit: Memory selection when stop

0: Not save when stop

1: Save when stop

The simple PLC running state would be saved when stop. The inverter will restart from the saved state (saved steps and saved frequency) when running command is valid.

If not save selected, the inverter will restart from the initial state when the running command is valid.

Function code	Name	Setting range	Default	Property
PC-18	Simple PLC Step 0 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-19	Acc./Dec. Time of simple PLC Step 0	0 ~ 3	0	☆
PC-20	Simple PLC Step 1 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-21	Acc./Dec. Time of simple PLC Step 1	0 ~ 3	0	☆
PC-22	Simple PLC Step 2 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-23	Acc./Dec. Time of simple PLC Step 2	0 ~ 3	0	☆
PC-24	Simple PLC Step 3 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-25	Acc./Dec. Time of simple PLC Step 3	0 ~ 3	0	☆
PC-26	Simple PLC Step 4 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-27	Acc./Dec. Time of simple PLC Step 4	0 ~ 3	0	☆
PC-28	Simple PLC Step 5 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-29	Acc./Dec. Time of simple PLC Step 5	0 ~ 3	0	☆
PC-30	Simple PLC Step 6 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-31	Acc./Dec. Time of simple PLC Step 6	0 ~ 3	0	☆
PC-32	Simple PLC Step 7 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-33	Acc./Dec. Time of simple PLC Step 7	0 ~ 3	0	☆
PC-34	Simple PLC Step 8 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-35	Acc./Dec. Time of simple PLC Step 8	0 ~ 3	0	☆

PC-36	Simple PLC Step 9 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-37	Acc./Dec. Time of simple PLC Step 9	0 ~ 3	0	☆
PC-38	Simple PLC Step 10 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-39	Acc./Dec. Time of simple PLC Step 10	0 ~ 3	0	☆
PC-40	Simple PLC Step 11 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-41	Acc./Dec. Time of simple PLC Step 11	0 ~ 3	0	☆
PC-42	Simple PLC Step 12 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-43	Acc./Dec. Time of simple PLC Step 12	0 ~ 3	0	☆
PC-44	Simple PLC Step 13 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-45	Acc./Dec. Time of simple PLC Step 13	0 ~ 3	0	☆
PC-46	Simple PLC Step 14 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-47	Acc./Dec. Time of simple PLC Step 14	0 ~ 3	0	☆
PC-48	Simple PLC Step 15 running time	0.0 s (h) ~ 6553.5 s (h)	0.0 s (h)	☆
PC-49	Acc./Dec. Time of simple PLC Step 15	0 ~ 3	0	☆
PC-50	Simple PLC running time unit	0: s 1: h	0	☆

The above parameters are used to set the running time and Acc./Dec. time of each steps. Maximum total 16 steps can be set. When the running time of the steps is 0, it means that the step would be skiped.

Function code	Name	Setting range	Default	Property
PC-51	Multi-segment instruction 0 source	0: Set by PC-00 1: AI1 2: AI2 3: Reserved 4: PULSE setting (HDI) 5: PID 6: Set by P0-08 (preset frequency) and adjusted by UP/DOWN terminals	0	☆

The multi-segment instruction 0 source can be selected in PC-51.

Group Pd: Communication parameters

Function code	Name	Setting range	Default	Property
Pd-00	Communication baud rate	0:300 BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4:4800 BPS 5: 9600 BPS 6:19200 BPS 7:38400 BPS 8:57600 BPS 9:115200 BPS	6	☆

This parameter is used to set the data transmission rate between the upper device and the inverter. Note that the baud rate set in the upper device and the inverter must be consistent. Otherwise communication cannot be performed. The higher the baud rate, the faster the communication speed.

Function code	Name	Setting range	Default	Property
Pd-01	MODBUS data format	0: No parity (8-N-2) 1: Even parity (8-E-1) 2: Odd parity (8-O-1) 3: No parity (8-N-1)	3	☆

0: No parity (8-N-2)

Total 8 bits data, 2 stop bits and no parity for communication.

1: Even parity (8-E-1)

Total 8 bits data with 1 stop bits and even parity for communication.

2: Odd parity (8-O-1)

Total 8 bits data with 1 stop bits and odd parity for communication.

3: No parity (8-N-1)

Total 8 bits data with 1 stop bits and no parity for communication.

The data format set in the upper device and the inverter must be consistent, otherwise communication cannot be performed.

Function code	Name	Setting range	Default	Property
Pd-02	Local address	0: Broadcast address 1-247	1	☆

When thee local address is 0, the inverter works as upper device and used upper device broadcast function.

When the inverter need to work as slave device, the address of the inverter is set in Pd-02.

Function	Name	Setting range	Default	Property

code				
Pd-03	MODBUS response delay	0 ~ 20ms	2	☆

The response delay is the interval between the end of the inverter data reception and the sending of data to the upper device.

Function code	Name	Setting range	Default	Property
Pd-04	Serial communication timeout	0.0s: Invalid 0.1 ~ 60.0 s	0.0	☆

When serial communication fails and exceeds the time set in Pd-04, the inverter will report communication error. When Pd-04=0.0, the protection function is invalid.

Function code	Name	Setting range	Default	Property
Pd-05	MODBUS	0: Non-standard MODBUS protocol 1: Standard MODBUS protocol	1	☆

When Pd-05=1, standard MODBUS protocol is selected.

When Pd-05=0, the slave device will reply one more byte than standard MODBUS protocol when replying the reading command from the upper device.

Function code	Name	Setting range	Default	Property
Pd-06	Communication reading current resolution	0: 0.01 A 1: 0.1 A	0	☆

Group PP: Function Code Management

Function code	Name	Setting range	Default	Property
PP-00	User password	0-65535	0	☆

If it is set to any non-zero number, the password protection function is enabled. After a password has been set and taken effect, you must enter the correct password in order to enter the menu. If the entered password is incorrect you cannot view or modify parameters.

If PP-00 is set to 00000, the previously set user password is cleared, and the password protection function is disabled.

Function code	Name	Setting range	Default	Property
PP-01	Parameter initialization	0: No action 01: Restore factory settings, excluding motor parameters 02: Clear record information 04: Back up user current parameters 501: Restore user backup parameters	0	★

01: Restore factory settings, excluding motor parameters

If PP-01 is set to 1, most function codes are restored to the default settings except motor parameters, frequency reference resolution (P0-22), fault records, accumulative running time (P7-09), accumulative power-on time (P7-13) and accumulative power consumption (P7-14).

02: Clear record information

If PP-01 is set to 02, the fault records, accumulative running time (P7-09), accumulative power-on time (P7-13) and accumulative power consumption (P7-14) are cleared.

04: Back up user current parameters

If PP-01 is set to 04, the current parameter settings are backed up, helping you to restore the setting if incorrect parameter setting is performed.

501: Restore user backup parameters

If FP-01 is set t501, the previous backup user parameters are restored.

Function code	Name	Setting range	Default	Property
PP-02	Function parameter group display selection	Units digit: U Group Display Selection 0: Not display 1: Display Tens digit: Group A Display Selection 0: Not display 1: Display	11	★

The parameter is used to set whether display group U and group A parameters or not.

Function code	Name	Setting range	Default	Property

PP-04	Function code modification property	0: Modifiable 1: Not modifiable	0	☆

If it is set to 0, all parameters are modifiable. If it is set to 1, all parameters can only be viewed.

Group A0: Torque Control Parameters

Function code	Name	Setting range	Default	Property
A0-00	Speed/Torque control selection	0: Speed control 1: Torque control	0	★

It is used to select the inverter's control mode: speed control or torque control.

If the multi-function terminal DI with function 46 (Speed control/Torque control switchover) is OFF, the control mode is determined by A0-00. If multi-function terminal DI with function 46 is ON, the control mode is reverse to the value of A0-00.

However, if multi-function terminal DI with function 29 (Torque control prohibited) is ON, the inverter is fixed to run in the speed control mode.

Function code	Name	Setting range	Default	Property
A0-01	Torque setting source selection	0: Set by A0-03 1: AI1 2: AI2 3: Reserved 4: PULSE setting (HDI) 5: Communication setting 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) (100% of 1-7 options, corresponding to the value set in A0-03)	0	★
A0-03	Torque digital setting	-200.0% ~ 200.0%	150.0%	☆

A0-01 is used to set the torque setting source.

The torque setting is a relative value. 100.0% corresponds to the inverter's rated torque.

The setting range of A0-03 is -200.0% to 200.0%, indicating the inverter's maximum torque is twice of the inverter's rated torque.

If the torque setting is positive, the inverter rotates in forward direction. If the torque setting is negative, the inverter rotates in reverse direction.

100% of 1~7 selection in A0-01, corresponding to the value set in A0-03.

Function code	Name	Setting range	Default	Property
A0-05	Forward maximum frequency of torque control	0.00 Hz ~ maximum frequency	50.00 Hz	☆
A0-06	Reverse maximum frequency of torque control	0.00 Hz ~ maximum frequency	50.00 Hz	☆
A0-07	Torque control acceleration time	0.00 s ~ 65000 s	0.00 s	☆
A0-08	Torque control deceleration time	0.00 s ~ 65000 s	0.00 s	☆

A0-05 and A0-06 are used to set the maximum frequency in forward or reverse rotation in torque

control mode.

In torque control, if the load torque is smaller than the motor output torque, the motor's rotational speed will rise continuously. To avoid runaway of the mechanical system, the motor maximum rotating speed must be limited in torque control.

A-07 and A-08 are used to set the Acc./Dec. tie of torque control.

When A-07 and A-08 are set to 0, the motor rotational speed may change quickly and this will result in noise or too large mechanical stress.

Group A1: Virtual IO

Function code	Name	Setting range	Default	Property
A1-00	VDI1 function selection	0 ~ 59	0	★
A1-01	VDI2 function selection	0 ~ 59	0	★
A1-02	VDI3 function selection	0 ~ 59	0	★
A1-03	VDI4 function selection	0 ~ 59	0	★
A1-04	VDI5 function selection	0 ~ 59	0	★

VDI1 to VDI5 have the same functions as DI terminals on the control board and can be used for digital input. For more details, see description of P4-00 to P4-09.

Function code	Name	Setting range	Default	Property
A1-05	VDI terminal status setting mode	0:Valid or not depends on the state of the virtual VDOx 1: Valid or not depends on the setting in A1-06 Units digit: Virtual terminal VDI1 Tens digit: Virtual terminal VDI2 Hundreds digit: Virtual terminal VDI3 Thousands digit: Virtual terminal VDI4 Ten thousands: Virtual terminal VDI5	00000	★

0: Valid or not depends on the state of the virtual VDOx

Select the function of each VDO in A1-11~A1-15. When the VDO with the function become valid, the matched VDI also become valid.

1: Valid or not depends on the setting in A1-06

Set the status of each VDI in A1-06. For example, when A1-06 is 00001, it means VDI1 is valid and the inverter will perform the function of VDI1.

Function code	Name	Setting range	Default	Property
A1-06	Virtual VDI terminal status setting	0: Invalid 1: Valid Units digit: Virtual terminal VDI1 Tens digit: Virtual terminal VDI2 Hundreds digit: Virtual terminal VDI3 Thousands digit: Virtual terminal VDI4 Ten thousands: Virtual terminal VDI5	00000	★
A1-07	The function selection of AI1 when used as DI	0 ~ 59	0	★
A1-08	The function selection of AI2 when used as DI	0 ~ 59	0	★

A1-10	Action mode selection of AI when used as DI	0: High level valid 1: Low level valid Units digit: AI1 Tens digit: AI2	000	★

AI can also be used to as DI. The function of AI1 and AI2 are set in A1-07 and A1-08. The function is the same as that of DIs. For details, see the descriptions of group P4.

The following figure takes AI input voltage as an example to describe the relationship between AI input voltage and corresponding DI state.

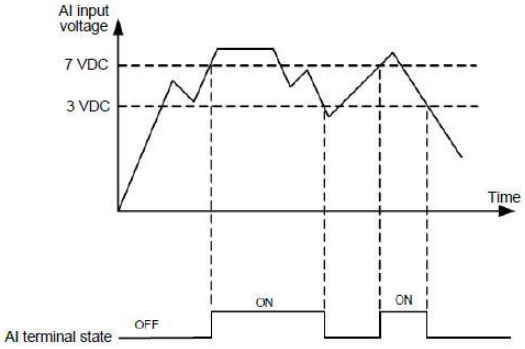


Fig.7-32 AI to DI function

Function code	Name	Setting range	Default	Property
A1-11	VDO1 function selection	0: Internal short with physical DIx 1 ~ 40: Refer to function selection of DO in Group P5	0	☆
A1-12	VDO2 function selection	0: Internal short with physical DIx 1 ~ 40: Refer to function selection of DO in Group P5	0	☆
A1-13	VDO3 function selection	0: Internal short with physical DIx 1 ~ 40: Refer to function selection of DO in Group P5	0	☆
A1-14	VDO4 function selection	0: Internal short with physical DIx 1 ~ 40: Refer to function selection of DO in Group P5	0	☆
A1-15	VDO5 function selection	0: Internal short with physical DIx 1 ~ 40: Refer to function selection of DO in Group P5	0	☆

VDO function selection in above parameters as same as the function selection of DO.

If VDO function is set to 0, the state of VDO1 to VDO5 is determined by the state of DI1 to DI5 on the control board. In this case, VDOx and DIx are one-to-one mapping relationship.

If VDO function is set to non-0, the function setting and use of VDOx are the same as DO in

group P5.

Function code	Name	Setting range	Default	Property
A1-16	VDO1 Output Delay	0.0 s ~ 3600.0 s	0.0 s	☆
A1-17	VDO2 Output Delay	0.0 s ~ 3600.0 s	0.0 s	☆
A1-18	VDO3 Output Delay	0.0 s ~ 3600.0 s	0.0 s	☆
A1-19	VDO4 Output Delay	0.0 s ~ 3600.0 s	0.0 s	☆
A1-20	VDO5 Output Delay	0.0 s ~ 3600.0 s	0.0 s	☆
A1-21	VDO status selection	0: Positive logic 1: Negative logic Units digit: VDO1 Tens bits: VDO2 Hundreds digit: VDO3 Thousands digit: VDO4 Ten thousands digit: VDO5	00000	☆

Group A2: Motor 2 Parameters

Function code	Name	Setting range	Default	Property
A2-00	Motor type selection	0: Ordinary asynchronous motor 1: Asynchronous motor special for frequency inverter	0	★
A2-01	Motor rated power	0.1 kW ~ 1000.0 kW	Depends on model	★
A2-02	Motor rated voltage	1V ~ 2000V	Depends on model	★
A2-03	Motor rated current	0.01 A ~ 655.35 A (variable-frequency drive power ≤ 55 kW) 0.1 A ~ 6553.5 A (converter power > 55kW)	Depends on model	★
A2-04	Motor rated frequency	0.01 Hz ~ maximum frequency	Depends on model	★
A2-05	Motor rated speed	1rpm ~ 65535rpm	Depends on model	★
A2-06	Motor stator resistance	0.001 Ω ~ 65.535 Ω (inverter power < = 55kW) 0.0001 Ω ~ 6.5535 Ω (inverter power > 55kW)	Obtain by self-learning	★
A2-07	Motor rotor resistance	0.001 Ω ~ 65.535 Ω (inverter power < = 55kW) 0.0001 Ω ~ 6.5535 Ω (inverter power > 55kW)	Obtain by self-learning	★
A2-08	Leakage inductance reactance	0.01 mH ~ 655.35 mH (inverter power < = 55kW) 0.001 mH ~ 65.535 mH (inverter power > 55kW)	Obtain by self-learning	★
A2-09	Mutual inductance reactance	0.1 mH ~ 6553.5 mH (inverter power < = 55kW) 0.01 mH ~ 655.35 mH (inverter power > 55kW)	Obtain by self-learning	★
A2-10	Motor no-load current	0.01 A ~ P1-03 (inverter power < = 55kW) 0.1 A ~ P1-03 (inverter power > 55kW)	Obtain by self-learning	★
A2-37	Self-learning selection	0: No self-learning 1: Static self-learning 2: Rotation complete self-learning 3. Static complete self-learning	0	★
A2-38	Speed loop proportional gain1	1-100	30	☆
A2-39	Speed loop integration time1	0.01 s ~ 10.00 s	0.50 s	☆

Function code	Name	Setting range	Default	Property
A2-40	Switching frequency 1	0.00-A2-43	5.00 Hz	☆
A2-41	Speed loop proportional gain2	1-100	20	☆
A2-42	Speed loop integration time2	0.01 s ~ 10.00 s	1.00 s	☆
A2-43	Switching frequency 2	A2-40 ~ maximum frequency	10.00 Hz	☆
A2-44	Vector control slip gain	50 to 200 percent	100%	☆
A2-45	Time constant of speed loop filter	0.000 s ~ 0.100 s	0.000 s	☆
A2-46	Vector control over-excitation gain	0 ~ 200	64	☆
A2-47	Motoring torque upper limit source in speed control	0: Set by A2-48 1: AI1 2: AI2 3.Potentiometer on keyboard 4: Pulse setting 5: Communication setting 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) 100% in options 1-7 corresponds to A2-48	0	☆
A2-48	Digital setting of motoring torque upper limit in speed control	0.0% ~ 200.0% 100% corresponds to motor rated current	150.0%	☆
A2-51	Excitation adjustment proportional gain	0 ~ 20000	2000	☆
A2-52	Excitation adjustment integral gain	0 ~ 20000	1300	☆
A2-53	Torque adjustment proportional gain	0 ~ 20000	2000	☆
A2-54	Torque adjustment integral gain	0 ~ 20000	1300	☆
A2-55	Speed loop integral property	Units digit: Integral separation 0: Invalid 1: Valid	0	☆
A2-59-60	Reserved			
A2-61	Motor 2 control mode	0: Speed sensorless vector control (SVC) 1: Reserved 2: V/F control	0	★
A2-62	Acc./Dec. Time	0: Same as Motor 1	0	☆

Function code	Name	Setting range	Default	Property
	selection of Motor 2	1: Acc./Dec. Time 1 2: Acc./Dec. Time 2 3: Acc./Dec. Time 3 4: Acc./Dec. Time 4		
A2-63	Motor 2 torque boost	0.0%: Automatic torque boost 0.1%~ 30.0%	Depends on model	☆
A2-65	Motor 2 oscillation suppression gain	0 ~ 100	Depends on model	☆

All parameters in group A2 have the same definition and usage as parameters of motor 1. For more details, refer to the descriptions of motor 1 parameters.

Group A5: Control Optimization Parameters

Function code	Name	Setting range	Default	Property
A5-00	DPWM switchover frequency upper limit	0.00 Hz ~ maximum frequency	8.00 Hz	☆

This parameter is valid only for V/F control.

It is used to determine the wave modulation mode in V/F control of asynchronous motor. If the frequency is lower than the value of P5-00, the waveform is 7-segment continuous modulation. If the frequency is higher than the value, the waveform is 5-segment intermittent modulation. The 7-segment continuous modulation causes more loss to switches of the inverter but smaller current ripple. The 5-segment intermittent modulation causes less loss to switches of the inverter but larger current ripple. This may lead to motor running instability at high frequency. Do not modify this parameter generally.

For instability of V/F control, refer to parameter P3-11. For loss to inverter and temperature rise, refer to parameter P0-15.

Function code	Name	Setting range	Default	Property
A5-01	PWM modulation	0:Asynchronous modulation 1: Synchronous modulation	0	☆

This parameter is valid only for V/F control.

Synchronous modulation indicates that the carrier frequency varies linearly with the change of the output frequency, ensuring that the ratio of carrier frequency to output frequency remains unchanged. Synchronous modulation is generally used at high output frequency, which helps improve the output voltage quality.

Synchronous modulation takes effect only when the running frequency is higher than 85 Hz. If the frequency is lower than 85 Hz, asynchronous modulation is always used.

Function code	Name	Setting range	Default	Property
A5-02	Dead zone compensation mode selection	0: No compensation 1: Compensation mode1 2: Compensation mode2	1	☆

Generally, no need to modify A5-02. Try to use a different compensation mode only when there is special requirement on the output voltage waveform quality or oscillation occurs on the motor.

For high power inverter, compensation mode 2 is recommended.

Function code	Name	Setting range	Default	Property
A5-03	Random PWM depth	0: Invalid 1 ~ 10: PWM Carrier frequency random depth	0	☆

The setting of random PWM depth can make the shrill motor noise softer and reduce the electromagnetic interference. If this parameter is set to 0, random PWM is invalid.

Function code	Name	Setting range	Default	Property
A5-04	Rapid current limit Enable	0: Disabled 1: Enabled	1	☆

The rapid current limit function can greatly reduce the inverter's overcurrent faults and guarantee uninterrupted running of the inverter.

However, long-time rapid current limit may cause the inverter to overheat, which is not allowed.

Function code	Name	Setting range	Default	Property
A5-05	Current detection compensation	0 ~ 100	5	☆

Too large value may lead to deterioration of control performance. Generally no need to modify it.

Function code	Name	Setting range	Default	Property
A5-06	Undervoltage level setting	60.0%-140.0%	100.0%	☆

It is used to set the undervoltage level of Err09. The undervoltage level 100% of the inverter of different voltage levels corresponds to different rated values, as listed in the following table.

Table 7-01 Undervoltage level for different voltage classes

Voltage level	Rated voltage of undervoltage level
AC 1PH 220V/230V	200V DC
AC 3PH 220V/230V	200V DC
AC 3PH 380V	350V DC
AC 3PH 480V	450V DC

Function code	Name	Setting range	Default	Property
A5-07	SVC optimization mode selection	0: No optimization 1: Optimization mode 1 2: Optimization mode 2	1	☆

1: Optimization mode 1

It is used when the requirement on torque control linearity is high.

2: Optimization mode 2

It is used for the requirement on speed stability is high.

Function code	Name	Setting range	Default	Property
A5-08	Dead zone time adjustment	100%~200%	150%	★

You can modify the value of this parameter to improve the voltage utilization rate. Too small value may system instability. Do not modify it generally.

Function code	Name	Setting range	Default	Property
A5-09	Overvoltage level setting	200.0 V ~ 2500.0 V	Depends on model	★

It is used to set the overvoltage threshold of the AC drive. The default values of different voltage classes are listed in the following table.

Table 7-02 Overvoltage level for different voltage classes

Voltage level	Default overvoltage level
AC 1PH 220V/230V	400V DC
AC 3PH 220V/230V	400V DC
AC 3PH 380V	800V DC
AC 3PH 480V	890V DC

Group A6: AI Curve Setting

Function code	Name	Setting range	Default	Property
A6-00	AI Curve 4 minimum input	-10.00 V ~ A6-02	0.00 V	☆
A6-01	Correspondence setting of AI Curve 4 minimum input	-100.0% ~ +100.0%	0.0%	☆
A6-02	AI Curve 4 inflexion 1 input	A6-00 ~ A6-04	3.00 V	☆
A6-03	Correspondence setting of AI Curve 4 inflexion 1 input	-100.0% ~ +100.0%	30.0%	☆
A6-04	AI Curve 4 inflexion 2 input	A6-02 to A6-06	6.00 V	☆
A6-05	Correspondence setting of AI Curve 4 inflexion 2 input	-100.0% ~ +100.0%	60.0%	☆
A6-06	AI Curve 4 max input	A6-06 ~ +10.00 V	10.00 V	☆
A6-07	Correspondence setting of AI Curve 4 maximum input	-100.0% ~ +100.0%	100.0%	☆
A6-08	AI Curve 5 minimum input	-10.00 V ~ A6-10	-10.00 V	☆
A6-09	Correspondence setting of AI Curve 5 minimum input	-100.0% ~ +100.0%	-100.0%	☆
A6-10	AI Curve 5 inflexion 1 input	A6-08 ~ A6-12	-3.00 V	☆
A6-11	Correspondence setting of AI Curve 5 inflexion 1 input	-100.0% ~ +100.0%	-30.0%	☆
A6-12	AI Curve 5 inflexion 2 input	A6-10 to A6-14	3.00 V	☆
A6-13	Correspondence setting of AI Curve 5 inflexion 2 input	-100.0% ~ +100.0%	30.0%	☆
A6-14	AI Curve 5 max input	A6-12 ~ +10.00 V	10.00 V	☆
A6-15	Correspondence setting of AI Curve 5 maximum input	-100.0 ~ +100.0%	100.0%	☆

The function of curve 4 and curve 5 is similar to that curve 1 to curve 3, but curve 1 to curve 3 are lines, and curve 4 and curve 5 are 4-point curves, implementing more flexible corresponding relationship. The schematic diagram of curve 4 and curve 5 is shown in the following figure.

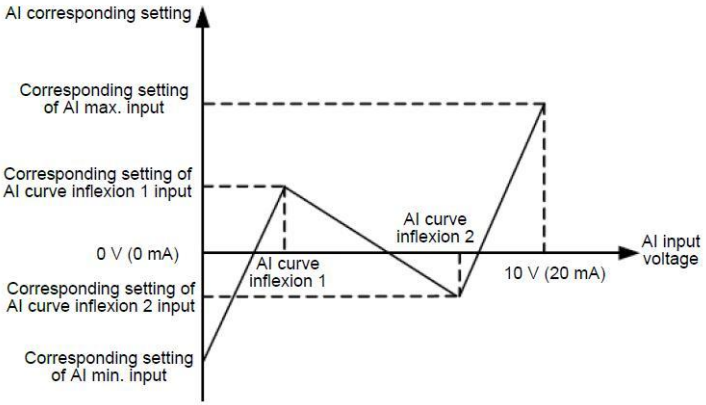


Fig.7-33 Curve 4 and 5 settings

P4-34 (AI curve selection) is used to select curve for AI1 to AI2.

Function code	Name	Setting range	Default	Property
A6-24	AI1 jump point setting	-100% ~ 100%	0.0%	☆
A6-25	AI1 jump point amplitude	0.0% ~ 100.0%	0.5%	☆
A6-26	AI2 jump point setting	-100% ~ 100%	0.0%	☆
A6-27	AI2 jump point amplitude	0.0% ~ 100.0%	0.5%	☆

Within the width between (jump point – jump point amplitude) and (jump point + jump point amplitude), the corresponding value of AI keeps not change, which is the corresponding value of AI jump point.

Group AC: Correction of AI and AO

Function code	Name	Setting range	Default	Property
AC-00	AI1 Measured Voltage 1	0.500 V ~ 4.000 V	Factory calibrated	☆
AC-01	AI1 Display Voltage 1	0.500 V ~ 4.000 V	Factory calibrated	☆
AC-02	AI1 Measured Voltage 2	6.000 V ~ 9.999 V	Factory calibrated	☆
AC-03	AI1 Display Voltage 2	6.000 V ~ 9.999 V	Factory calibrated	☆
AC-04	AI2 Measured Voltage 1	0.500 V ~ 4.000 V	Factory calibrated	☆
AC-05	AI2 Display Voltage 1	0.500 V ~ 4.000 V	Factory calibrated	☆
AC-06	AI2 Measured Voltage 2	6.000 V ~ 9.999 V	Factory calibrated	☆
AC-07	AI2 Display Voltage2	6.000 V ~ 9.999 V	Factory calibrated	☆

These parameters are used to correct the AI to eliminate the impact of AI zero offset and gain. They have been corrected upon delivery.

Measured voltage indicates the actual output voltage value measured by instruments such as the multimeter. Displayed voltage indicates the voltage display value sampled by the inverter.

During correction, provide two voltage values to each AI terminal, and save the measured values and displayed values to the function codes AC-00 to AC-07. Then the inverter will automatically perform AI zero offset and gain correction.

Function code	Name	Setting range	Default	Property
AC-12	AO1 Target Voltage1	0.500 V ~ 4.000 V	Factory calibrated	☆
AC-13	AO1 Measured Voltage 1	0.500 V ~ 4.000 V	Factory calibrated	☆
AC-14	AO1 Target Voltage2	6.000 V ~ 9.999 V	Factory calibrated	☆
AC-15	AO1 Measured Voltage 2	6.000 V ~ 9.999 V	Factory calibrated	☆
AC-16	AO2 Target Voltage1	0.500 V ~ 4.000 V	Factory calibrated	☆
AC-17	AO2 Measured Voltage 1	0.500 V ~ 4.000 V	Factory calibrated	☆
AC-18	AO2 Target Voltage2	6.000 V ~ 9.999 V	Factory calibrated	☆
AC-19	AO2 Measured Voltage2	6.000 V ~ 9.999 V	Factory calibrated	☆
AC-20	AI2 Measured Current1	0.000 mA ~ 20.000 mA	Factory calibrated	☆
AC-21	AI2 Sampling Current1	0.000 mA ~ 20.000 mA	Factory	☆

			calibrated	
AC-22	AI2 Measured Current2	0.000 mA ~ 20.000 mA	Factory calibrated	☆
AC-23	AI2 Sampling Current2	0.000 mA ~ 20.000 mA	Factory calibrated	☆
AC-24	AO1 Ideal Current1	0.000 mA ~ 20.000 mA	Factory calibrated	☆
AC-25	AO1 Measured Current1	0.000 mA ~ 20.000 mA	Factory calibrated	☆
AC-26	AO1 Ideal Current2	0.000 mA ~ 20.000 mA	Factory calibrated	☆
AC-27	AO1 Measured Current2	0.000 mA ~ 20.000 mA	Factory calibrated	☆

These parameters are used to correct the AO.

They have been corrected upon delivery. When you resume the factory values, these parameters will be restored to the factory-corrected values. You need not perform correction in the applications.

Target voltage indicates the theoretical output voltage of the inverter. Measured voltage indicates the actual output voltage value measured by instruments such as the multimeter.

Group U0: Monitor Parameters

Group U0 is used to monitor the inverter's state. You can view the parameter values by using keyboard, convenient for on-site commissioning, or from the upper device by means of communication (address: 0x7000-0x7044).

U0-00 to U0-31 are the monitoring parameters in the running and stop state defined by P7-03 and P7-04.

U0-00	Running frequency (Hz)	Display Range	0.00 ~ 320.00 Hz (P0-22=2) 0.0 ~ 3200.0 Hz (P0-22=1)
U0-01	Set frequency (Hz)	Display Range	

U0-00 and U0-01 display the absolute value of theoretical running frequency and set frequency. For the actual output frequency of the AC drive, see U0-19.

U0-02	Bus voltage (V)	Display Range	0.0 V ~ 3000.0 V
U0-03	Output voltage (V)	Display Range	0V ~ 1140V
U0-04	Output current (A)	Display Range	0.00A ~ 655.35 A (inverter power < = 55KW) 0.0A ~ 6553.5 A (inverter power > 55KW)
U0-05	Output power (KW)	Display Range	0 ~ 32767
U0-06	Output torque	Display Range	-200.0% ~ 200.0%
U0-07	DI input status	Display Range	0 ~ 32767

After the value is converted into a binary number, each bit corresponds to a DI. "1" indicates high level signal, and "0" indicates low level signal. The corresponding relationship between bits and DIs is described in the following table.

Bit0	Bit1	Bit2	Bit3
DI1	DI2	DI3	DI4
Bit4	Bit5	Bit6	Bit7
HDI	DI5	DI6	--
Bit8	Bit9	Bit10	Bit11
--	--	VDI1	VDI2
Bit12	Bit13	Bit14	Bit15
VDI3	VDI4	VDI5	--

U0-08	DO output status	Display Range	0 ~ 1023

After the value is converted into a binary number, each bit corresponds to a DO. "1" indicates high level signal, and "0" indicates low level signal. The corresponding relationship between bits and DOs is described in the following table.

Bit0	Bit1	Bit2	Bit3

DO3	Relay 1	None	DO1
Bit4	Bit5	Bit6	Bit7
DO2	VDO1	VDO2	VDO3
Bit8	Bit9	Bit10	Bit11
VDO4	VDO5		

U0-09	AI1 Voltage (V)	Display Range	0.00V ~ 10.57V
U0-10	AI2 Voltage (V)/Current (mA)	Display Range	0.00V ~ 10.57V 00mA ~ 20.00 mA

When P4-40 is set to 0, AI2 sampled data is displayed in voltages (V)
When P4-40 is set to 1, AI2 sampled data is displayed in current (mA)

U0-14	Load Speed	Display Range	0 ~ 65535

For more details, see the description of P7-12.

U0-15	PID Settings	Display Range	0 ~ 65535
U0-16	PID feedback	Display Range	0 ~ 65535

The PID setting value and feedback value are displayed in the following format:
PID Setting=PID Setting (%)*PA-04
PID Feedback = PID Feedback (%) * PA-04

U0-18	PULSE input frequency (Hz)	Display Range	0.00 kHz ~ 100.00 KHz

It displays the HDI high speed pulse sampling frequency, in minimum 0.01 KHz.

U0-19	Feedback speed (Hz)	Display Range	-3200.0 Hz ~ 3200.0 Hz

It displays the actual output frequency of the AC drive.

When P0-22 (Frequency reference resolution) is set to 1, the display range is -3200.00Hz~3200.00 Hz.

When P0-22 (Frequency reference resolution) is set to 2, the display range is -320.00Hz~320.00 Hz.

U0-20	Remaining running time	Display Range	0.0 ~ 6500.0 minutes

It displays the remaining running time when the timing operation is enabled. For details on timing operation, refer to 8-42 to P8-44.

U0-21	AI1 voltage before correction	Display Range	0.000 V ~ 10.570 V
U0-22	AI2 voltage/current before correction	Display Range	0.000 V ~ 10.570 V 0.000 mA ~ 20.000 mA

They display the AI sampleding voltage/current value of AI. The actually used voltage/current is obtained after linear correction to reduce the deviation between the sampled voltage/current and the actual input voltage/current.

For actual corrected voltage, see U0-09 and U0-10. Refer to group AC for the correction mode.

U0-24	Linear speed	Display Range	0 ~ 65535 m/min

It displays the linear speed of the HDI sampling. The unit is meter/minute.

The linear speed is obtained according to the actual number of pulses sampled per minute and Pb-07 (Number of pulses per meter).

U0-27	PULSE input frequency	Display Range	0 ~ 65535 Hz

It displays the HDI sampling frequency, in minimum unit of 1 Hz. It is the same as U0-18, except for the difference in units.

U0-28	Communication setting	Display Range	-100.00% ~ 100.00%

It displays the data written by means of the communication address 0x1000.

U0-30	Main frequency X display	Display Range	0.00 Hz ~ 500.00 Hz

It displays the setting of main frequency X.

If P0-22 (Frequency reference resolution) is 1, the display range is -3200.0–3200.0 Hz.

If P0-22 (Frequency reference resolution) is 2, the display range is -320.00–320.00 Hz.

U0-31	Auxiliary frequency Y display	Display Range	0.00 Hz ~ 500.00 Hz

Display the setting of auxiliary frequency source Y.

U0-35	Target torque (%)	Display Range	-200.0% ~ 200.0%

Displays the current torque upper limit.

U0-37	Angle of power factor	Display Range	-

Displays the current power factor angle.

U0-39	Target voltage of V/F separation	Display Range	0V ~ Motor rated voltage
U0-40	Output voltage of V/F separation	Display Range	0V ~ Motor rated voltage

They display the set voltage and actual output voltage in the V/F separation state. For V/F separation, see the descriptions of group P3.

U0-41	DI input state display	Display Range	-

Display the DI terminal state in the following format:

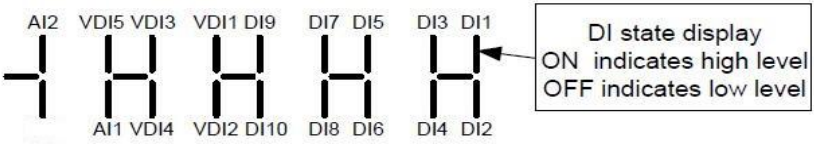


Fig.7-34 DI state display

U0-42	DO output state display	Display Range	-

The output state of the DO terminal is displayed visually in the following format:

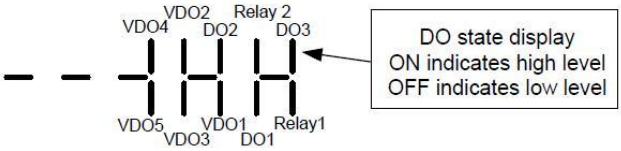


Fig.7-35 DO state display

U0-43	DI Function state display 1 (01~40)	Display Range	-

It displays whether the DI functions 1~40 are valid or not. The keyboard has five 7-segment LEDs and each 7-segment LED displays the selection of eight functions. The 7-segment LED is defined in the following figure.

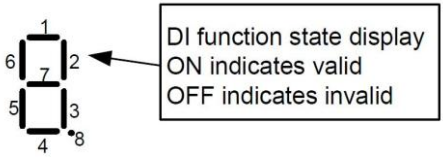


Fig.7-36 DI function state display

The 7-segment LED display functions 1-8, 9-16, 17-24, 25-32 and 33-40 respectively from right to left.

U0-44	DI Function Status Visual Display 2 (41~59)	Display Range	--

It displays whether the DI functions 41~59 are valid or not. Display similar to U0-43.

It represents functions 41 to 48, 49 to 56, 57 to 59 from right to left.

U0-59	Current set frequency (%)	Display Range	-100.00%~100.00%
U0-60	Current running frequency (%)	Display Range	-100.00%~100.00%

It displays the current set frequency and running frequency. 100.00% corresponds to the inverter's maximum frequency (P0-10).

U0-61	Frequency inverter state	Display Range	0~65535

It displays the running state of the inverter. The data format is listed in the following table:

U0-61	Bit0	0:Stop 1:Forward 2.Reverse
	Bit1	
	Bit2	0:Constant speed 1:Acceleration 2:Deceleration
	Bit3	
	Bit4	0:Bus voltage normal 1:Undervoltage

U0-62	Current fault code	Display Range	0~99
U0-65	Torque upper limit	Display Range	-200.00%~~200.00%

U0-65 displays the current setting torque upper limit.

8 Maintenance and Fault Diagnosis

8.1 Daily and periodic inspection

The influence of the ambient temperature, humidity, dust and vibration will cause the aging of the devices in the inverter, which may cause potential faults or reduce the service life of the inverter. Therefore, it is necessary to carry out routine and periodic maintenance.

Table 8-1 Daily and Periodic Inspection Items of the Inverter

Frequency	Check contents
Daily inspection	● Check whether the inverter cooling fan abnormal or not and the air duct blocked or not. ● Confirm the installation environment of the inverter and the input voltage is within the allowable range. ● Check whether the motor temperature rising is normal.
Periodic inspection	● Make sure that there are garbage, dirt and dust deposits on the surface of the inverter ● Confirm whether the insulation layer of power cable and signal cable is aging or cracking. ● Confirm that the mechanical installation of the inverter and motor is firm. ● Confirm that the connection between the inverter and motor terminals is firm. ● Confirm that the insulation resistance of inverter and motor is up to standard.

8.1.1 Wearing parts replacement

The wearing parts of the inverter mainly include cooling fans and electrolytic capacitors for filtering. Its life is closely related to the environment and maintenance conditions. The general life time as follows:

Table 8-2 fans, electrolytic capacitor life tables

Device Name	Life time	Remarks
Fan	About 5 years	The fans vibrate and abnormal noise should be changed into account
Electrolytic capacitor	About 5 years	Leakage of electrolytic capacitor, protrusion of safety valve and change of capacitance value

8.1.2 Inverter storage

After the user purchases the inverter, the following points must be noted for temporary storage and long-term storage:

1) Store as much as possible in the original packaging with good ventilation.

2) The whole machine is not allowed to be placed in humid, high temperature or outdoor exposure places for a long time.

3) Long-term storage will cause the deterioration of electrolytic capacitors. It must be ensured

that it is energized once within one year and the energized time is not less than 1 hour. The input voltage must be slowly increased to the rated value with a voltage regulator.

8.2 Warranty Agreement

1) Free warranty only applies to the frequency inverter itself.
2) Shenzhen SCOV will provide 18-month warranty (starting from the leave-factory date as indicated on the barcode) for the failure or damage under normal use conditions. If the equipment has been used for over 18 months, reasonable repair expenses will be charged.
3) Reasonable repair expenses will be charged for the damages due to the following causes:
Improper operation without following the instructions.
Fire, flood or abnormal voltage.
Using the inverter for non-recommended function
4) The maintenance fee is charged according to SCOV's uniform standard. If there is an agreement, the agreement prevails.

8.3 Faults and Solutions

SV600 inverter has many protective functions. When fault or failure occurs during operation, the inverter will perform protective function and the keyboard will display the fault code. Please refer to the table below for details of the fault types and common solutions. Please do not repair or modify without authorization. If you cannot make troubleshoot, please contact our agent or our company for supports.

Table 8-2 Fault List

Fault Name	Display	Possible causes	Countermeasures
Inverter unit protection	Err01	1. Short circuit of inverter output. 2. Motor cable too long. 3. IGBT overheat. 4. Internal wiring of inverter loose. 5. Main control board abnormal. 6. Drive board abnormal. 7. IGBT abnormal.	1. Check the output and eliminate external faults. 2. Install reactor or output filter. 3. Check the air duct the cooling fan. 4. Wiring internal cables well. 5. Seek technical supports from the agent or the manufacturer.
Overcurrent during acceleration	Err02	1. Inverter output short circuit or grounded. 2. Not perform motor self-learning under vector control mode. 3. Acceleration time is too short. 4. Manual torque boost or V/F curve improper. 5. Low voltage 6. Start the rotating motor. 7. Sudden loading during acceleration 8. Improper inverter power selection,	1. Check the output and eliminate external faults. 2. Perform motor parameters self-learning. 3. Increase the Acc. time. 4. Adjust manual torque boost or V/F curve. 5. Check and regulate the voltage to normal range. 6. Select speed tracking start or stop the motor after it stops. 7. Cancel Sudden Load

Fault Name	Display	Possible causes	Countermeasures
		too small.	8. Choose another inverter with larger power.
Overcurrent during deceleration	Err03	1. Inverter output short circuit or grounded. 2. Not perform motor self-learning under vector control mode. 3. The deceleration time too short. 4. Low voltage. 5. Sudden loading during deceleration. 6. DC Bus voltage increasing during deceleration.	1. Check the output and eliminate external faults. 2. Perform motor parameters self-learning. 3. Increase Dec. time 4. Check the input voltage and regulate it to normal range. 5. Remove the added load. 6. Add braking unit and braking resistor.
Overcurrent at constant speed	Err04	1. Inverter output short circuit or grounded. 2. Not perform motor self-learning under vector control mode. 3. Low voltage 4. Sudden loading during operation. 5. Improper inverter power selection, too small.	1. Check the output and eliminate external faults. 2. Perform motor parameters self-learning. 3. Check the input voltage and regulate it to normal range. 4. Remove the added load. 5. Choose another inverter with larger power.
Overvoltage during acceleration	Err05	1. Input voltage too high. 2. External force drives the motor running during acceleration. 3. Acceleration time too short. 4. Without braking unit and braking resistor.	1. Regulate the voltage to normal range 2. Cancel the external force or add braking resistor. 3. Increase the Acc. time 4. Add braking unit and braking resistor.
Overvoltage during deceleration	Err06	1. Input voltage too high. 2. External force drives the motor running during deceleration 3. Deceleration time too short. 4. Without braking unit and braking resistor.	1. Regulate the voltage to the normal range 2. Cancel the external force or add braking resistor. 3. Increase the Dec. time. 4. Add braking unit and braking resistor.
Overvoltage at constant speed	Err07	1. Input voltage too high. 2. External force on the motor during operation.	1. Regulate the voltage to normal range 2. Cancel the external force or add braking resistor.
Control power failure	Err08	Input voltage abnormal.	Adjust the input voltage to the allowable range.
Undervoltage	Err09	1. Instantaneous power failure. 2. Input voltage abnormal. 3. DC bus voltage detection abnormal.	1. Reset the fault 2. Adjust the voltage to normal range. 3. Seek technical supports from the agent

Fault Name	Display	Possible causes	Countermeasures
		4. Rectifier bridge and buffer resistor abnormal. 5. The drive board abnormal. 6. The control board abnormal.	or the manufacturer.
Inverter overload	Err10	1. Load too heavvy or the motor blocked. 2. Improper inverter power selection, too small.	1. Reduce the load and check the mechanical state of the system. 2. Choose another inverter with larger power.
Motor overload	Err11	1. P9-01 set improperly. 2. Load too large or the motor blocked. 3. Improper inverter power selection, too small.	1. Set the parameter correctly. 2. Reduce the load and check the mechanical state of the system. 3. Choose another inverter with larger power.
Input loss phase	Err12	1. 3PH input power supply abnormal. 2. The drive board abnormal. 3. The llightening board abnormal. 4. The main control board abnormal.	1. Check the input circuit and eliminate external faults. 2. Seek technical supports from the agent or the manufacturer.
Output loss phase	Err13	1. Motor cable abnormal. 2. 3PH output of inverter is unbalanced during running. 3. The drive board abnormal. 4. IGBT abnormal.	1. Check the motor cable and eliminate external faults. 2. Check whether the 3PH winding of motor is normal. 3. Seek technical supports from the agent or the manufacturer.
IGBT overheat	Err14	1. Ambient temperature too high. 2. Air ducts blocked. 3. The cooling fan broken. 4. IGBT thermistor broken. 5. IGBT broken.	1. Reduce ambient temperature. 2. Clean the air duct. 3. Replace the cooling fan. 4. Replace the broken thermistor. 5. Replace the IGBT.
External equipment fault	Err15	1. DI with external fault input function is valid. 2. VDI with external fault input function is valid	Reset operation
Communication failure	Err16	1. The upper device abnormal. 2. Communication cable abnormal. 3. P0-28 set improperly. 3. The communication parameters in PD group is set improperly.	1. Check the connection of the upper device. 2. Check the wiring of communication. 3. Set the parameter correctly. 4. Set communication parameters correctly.
Contactor fault	Err17	1. The drive board and power supply abnormal. 2. Contactor abnormal.	1. Replace the drive board or the power board. 2. Replace the contactor.
Current detection	Err18	1. Current sensor abnormal.	1. Replace the current sensor.

Fault Name	Display	Possible causes	Countermeasures
fault		2. The drive board abnormal.	2. Replace the drive board.
Motor self-learning fault	Err19	1. The motor parameters are not set according to the nameplate. 2. Motor self-learning timeout.	1. Correctly set motor parameters according to the nameplate. 2. Check the cable between the inverter and the motor.
Encode fault	Err20	1. Encoder type incorrect. 2. Encoder wiring incorrect. 3. The encoder broken. 4. PG card abnormal.	1. Correctly set the encoder type according to the actual situation 2. Check the wiring of encoder. 3. Replace the encoder. 4. Replace the PG card.
EEPROM read/write fault	Err21	EEPROM chip broken.	Replace the main control board.
Inverter hardware fault	Err22	1. Overvoltage fault exists. 2. Overcurrent fault exists.	1. Deal with the overvoltage fault. 2. Deal with the overcurrent fault.
Short circuit to ground	Err23	Motor short circuit to ground	Replace the motor cable or motor.
Cumulative running time reached	Err26	The cumulative running time reaches the set value.	Use the parameter initialization function to clear the record information.
User-defined fault 1	Err27	1. The DI with user-defined fault 1 input is valid. 2. The VDI with user-defined fault 1 input is valid.	Reset the operation.
User-defined fault 2	Err28	1. The DI with user-defined fault 2 input is valid. 2. The VDI with user-defined fault 2 input is valid.	Reset the operation.
Accumulative power-on time reached	Err29	The accumulative power-on time reaches the set value.	Use the parameter initialization function to clear the record information.
Underload fault	Err30	Inverter output current less than the value set in P9-64.	Check the load or the setting of P9-64 and P9-65.
PID feedback loss	Err31	PID feedback is less than the value set in PA-26.	Check the PID feedback signal or set PA-26 properly.
Wave-by-wave current limiting fault	Err40	1. Load too heavy or the motor blocked. 2. Improper inverter power selection, too small.	1. Reduce the load and check the mechanical state of the system. 2. Choose another inverter with larger power.
Motor switchover during operation	Err41	Switchover motor by DI during operation.	Switchover the motor after inverter stops.

Fault Name	Display	Possible causes	Countermeasures
Speed deviation too large	Err42	1. Encoder parameter set incorrectly. 2. Not perform motor self-learning. 3. P9-69 and P9-70 set incorrectly.	1. Correctly set encoder parameters. 2. Perform motor self-learning. 3. Correctly set P9-69 and P9-70.
Motor overspeed	Err43	1. Encoder parameter set incorrectly. 2. Not perform motor self-learning. 3. P9-67 and P9-68 set incorrectly.	1. Correctly set encoder parameters. 2. Perform motor self-learning. 3. Correctly set P9-67 and P9-68.
Motor overheat	Err45	1. The wiring of temperature sensor bad. 2. Motor temperature too high.	1. Check the wiring of temperature sensor and eliminate the fault. 2. Reduce the carrier frequency or take other measures to decrase the motor temperature.
Initial Position Error	Err51	The difference between the motor parameters and the actual conditions too large.	Check the motor parameters set correctly or not, expecially confirm the rate current set too small or not.

8.4 Common faults and solutions

The following fault you may come accross during the operation of the inverter. Please refer to the following table for simple fault analysis.

Table 8-2 Common Faults and Treatment Methods

No.	Fault phenomenon	Possible causes	Solutions
1	No display when power-on	1. No power supply or the supply voltage is too low. 2. The switch power on the drive board abnormal. 3. The rectifier bridge broken. 4. The buffer resistor of inverter broken. 5. The control board or keyboard abnormal. 6. The cable between the control board, power board and keyboard abnormal.	1. Check the input power supply. 2. Detect DC bus voltage. 3. Wiring the cable between the main control board, power board and keyboard well. 4. Seek technical supports from the agent or the manufacturer.
2	Display "Err23" when power-on	1. Motor or motor cable short circuit to ground. 2. Inverter broken.	1. Measuring the insulation of the motor and the motor cable with a megger. 2. Seek technical supports from the agent or the manufacturer.
3	Err14 (IGBT Overheat) occurs frequently	1. The carrier frequency too high. 2. Cooling fan broken or air duct blocked. 3. Inverter internal internal components broken (thermocouple or others)	1 .Reduce the carrier frequency (P0-15). 2. Replace the fan and clean the air ducts. 3. Seek technical supports from the agent or the manufacturer.
4	The motor does not rotate after the inverter runs.	1. Motor and motor cables abnormal. 2. Inverter parameters set improperly, expecially motor	1 .Ensure the motor and motor cable normal. 2. Correctly set the motor parameters

No.	Fault phenomenon	Possible causes	Solutions
		parameters. 3. Cable between the control board and the power board in poor connection. 4. The drive board abnormal.	and inverter parameters. 3. Wiring the cables well. 4. Replace the drive board or seed supports from the agent or the manufacturer.
5	DI terminals failed.	1. The parameters set incorrectly. 2. External signal incorrect. 3. The jumper between PW and +24V loose. 4. The control board abnormal.	1. Check and reset the parameters in P4 group. 2. Reconnect the external signal cables. 3. Re-confirm the jumper between PW and +24V. 4. Seek technical supports from the agent or the manufacturer.
6	The motor speed cannot be increased under close-loop vector control.	1. Encoder is broken or the encoder cable in poor or incorrect state. 2. The PG card is broken. 3. The drive board is broken.	1. Replace the encoder and wiring the encoder cable well. 2. Replace the PG card. 3. Seek technical supports from the agent or the manufacturer.
7	Overcurrent and overvoltage occurs frequently	1. Motor parameters set improperly. 2. The Acc./Dec. time set improperly. 3. The load fluctuates.	1. Correctly set motor parameters or perform motor self-learning again. 2. Set Acc./Dec. time properly. 3. Seek technical supports from the agent or the manufacturer.
8	Err17 occurs when power-on or running	The startup contactor is not engaged;	1. Check whether the contact cable is loose. 2. Confirm the contactor normal or not. 3. Check whether the 24V supply of the contactor abnormal or not. 4. Seek technical supports from the agent or the manufacturer.

Appendix A: Braking

A.1 Selection of braking unit and braking resistor

A.1.1 Selection of braking resistor resistance

When braking, almost all of the motor regenerative energy is consumed by the braking resistor. According to the formula:

Pb=U*U/R

U: System braking voltage (U normally is 700V AC 380V grade inverter)

Pb: Braking power

A.1.2 Selection of braking resistor power

In theory, the braking resistor has the same power as the braking power, but considering the de-rating is 70%. According to the formula:

0.7*Pr=Pb*D

Pr: The power of the braking resistor;

D: Braking rate, which is the proportion of the regeneration process to the entire working process.

Common application occasions	Elevator	Unwinding and Rewinding	Centrifuge	Accidental brake load	General occasions
Braking rate	20% ~30%	20 ~30%	50%~60%	5%	10%

Table A-1 is the guidance data. Users can choose different resistance values and power according to the actual situation. (However, the resistance value must not be less than the recommended value in the table, and the power can be large.) The selection of the braking resistor needs to be based on the actual application system. The power generated by the motor is determined by the inertia of the system, the Dec. time and the energy of the potential energy load. The larger the system's inertia, the shorter the deceleration time and the more frequent braking, the greater the power and the smaller the resistance of the braking resistor needed.

Table A-1 SV600 Inverter Braking Resistor selection (Braking rate=10%)

Inverter model	Recommended power	Recommended resistance	Braking unit
Single-phase 230V			
SV600-0R752GB-S	100W	≥ 150Ω	Built-in
SV600-1R52GB-S	150W	≥ 100Ω	Built-in
SV600-2R22GB-S	200W	≥ 70Ω	Built-in
SV600-4R02GB-S	500W	≥45Ω	Built-in
SV600-5R52GB-S	1000W	≥ 22Ω	Built-in

Inverter model	Recommended power (10% braking rate)	Recommended resistance	Braking unit
Single-phase 230V			
SV600-7R52GB-S	1500W	≥ 16Ω	Built-in
SV600-112GB	2000W	≥ 11Ω	Optional
SV600-152GB	2500W	≥ 10Ω	Optional
SV600-18R52G	3000W	≥8Ω	Optional
SV600-222G	3500W	≥ 6.7Ω	Optional
SV600-302G	4500W	≥ 5Ω	External
Three phase 230V			
SV600-0R42GB	150W	≥200Ω	Built-in
SV600-0R752GB	200W	≥ 110Ω	Built-in
SV600-1R52GB	350W	≥ 65Ω	Built-in
SV600-2R22GB	350W	≥ 65Ω	Built-in
SV600-4R02GB	500W	≥ 45Ω	Built-in
SV600-5R52GB	1000W	≥22Ω	Built-in
SV600-7R52GB	1500W	≥ 16Ω	Built-in
SV600-112GB	2000W	≥ 11Ω	Built-in
SV600-152GB	2500W	≥ 10Ω	Built-in
SV600-18R52G	3000W	≥8Ω	Optional
SV600-222G	3500W	≥ 6.7Ω	Optional
SV600-302G	4500W	≥ 5Ω	External
SV600-372G	6KW	≥ 4Ω	External
SV600-452G	7KW	≥ 3.3Ω	External
SV600-552G	9KW	≥ 2.5Ω	External
Three-phase 380V			
SV600-0R754G/1R54PB	250W	≥ 320Ω	Built-in
SV600-1R54G/2R24PB	250W	≥ 220Ω	Built-in
SV600-2R24G/4R04PB	250W	≥ 200Ω	Built-in
SV600-4R04G/5R54PB	400W	≥ 130Ω	Built-in
SV600-5R54G/7R54PB	500W	≥ 90Ω	Built-in
SV600-7R54G/114PB	750W	≥ 65Ω	Built-in
SV600-114G/154PB	1100W	≥ 43Ω	Built-in
SV600-154G/18R5PB	1500W	≥ 32Ω	Built-in
SV600-18R54G/224PB	2000W	≥ 25Ω	Built-in

Inverter model	Recommended power (10% braking rate)	Recommended resistance	Braking unit
Three-phase 380V			
SV600-224G/304PB	2200W	≥ 22Ω	Built-in
SV600-304G/374PB	3000W	≥ 16Ω	Built-in
SV600-374G/454P	4000W	≥ 12.6Ω	Optional
SV600-454G/554P	5000W	≥ 9.6Ω	Optional
SV600-554G/754P	5000W	≥ 9.6Ω	External
Three phase 480V			
SV600-0R754G/1R54PB	200W	≥ 400Ω	Built-in
SV600-1R54G/2R24PB	250W	≥ 300Ω	Built-in
SV600-2R24G/4R04PB	400W	≥ 200Ω	Built-in
SV600-4R04G/5R54PB	600W	≥ 130Ω	Built-in
SV600-5R54G/7R54PB	800W	≥ 100Ω	Built-in
SV600-7R54G/114PB	1000W	≥ 78Ω	Built-in
SV600-114G/154PB	1500W	≥ 55Ω	Built-in
SV600-154G/18R5PB	2000W	≥ 40Ω	Built-in
SV600-18R54G/224PB	2600W	≥30Ω	Built-in
SV600-224G/304PB	2800W	≥ 28Ω	Built-in
SV600-304G/374PB	4000W	≥ 21Ω	Built-in
SV600-374G/454P	4500W	≥ 17Ω	Optional
SV600-454G/554P	4500W	≥ 14Ω	Optional
SV600-554G/754P	5500W	≥ 11Ω	External

For the inverter model not included in the above table, please seek technical supports fromt the agent or the manufacturer.

A.1.3 Brake Resistance Wiring

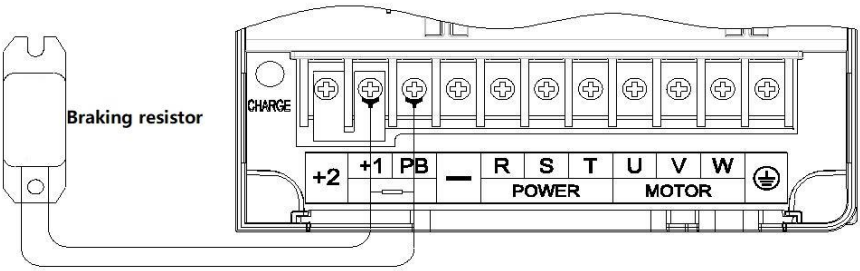


Fig.A-1 Applicable to the inverter with built-in braking unit

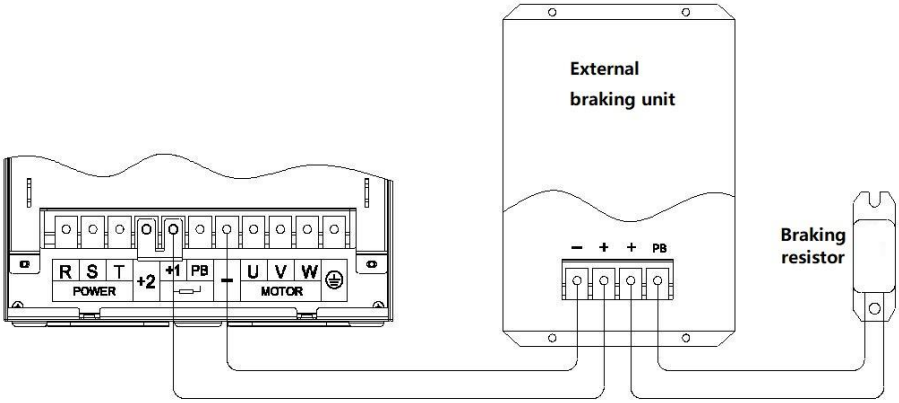


Fig.A-2 Applicable to inverter with external braking units

Appendix B: Modbus Communication

B.1 Modbus communication

B.1.1 Support protocol

Support Modbus protocol, RTU format. Broadcast address 0, the slave address: 1~247.

B.1.2 Interface mode

RS485 interface: asynchronous, semiduplex, the high byte is first, and the low byte is after.
The default data format: 8-N-1, 19200bps. For parameter settings, see the Pd group parameters.

B.1.3 Format of protocol

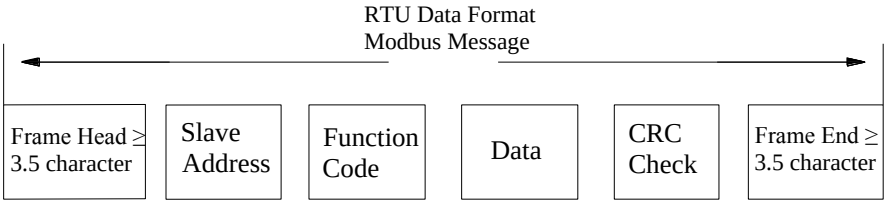


Fig.B-1 Modbus data format

B.1.4 Modbus Functions

The main function of Modbus is to read and write parameters. Different function codes determine different operation requests. The function code operation supported by the Modbus protocol of the frequency inverter is shown in table B-1:

Table B-1 Modbus function codes

Function code	Function code meaning
0x03	Read inverter function code parameters or status parameters
0x06	Write single parameter of the inverter, not save after power off

The application layer protocol data units of each function code are as follows:
Function code 0x03: Read register contents
The request format is as follows:

Application layer data unit	Data length (bytes)	Range
Local address	1	1~247
Function code	1	0x03
Register address	2	0x0000~0xFFFF

Number of registers	2	0x0001~0x000C
Check	CRC	0x0000~0xFFFF

The answer format is as follows:

Application layer data unit	Data length (bytes)	Range
Local address	1	1~247
Function code	1	0x03
Number of read bytes	1	2 * number of registers
Registers content	2 * number of registers	0x0000~0xFFFF
Check	CRC	0x0000~0xFFFF

Function code 0x06: Write single function code parameter or control parameter.

The request format is as follows:

Application layer data unit	Data length (bytes)	Range
Local address	1	1~247
Function code	1	0x06
Register address	2	0x0000~0xFFFF
Registers content	2	0x0000~0xFFFF
Check	CRC	0x0000~0xFFFF

The answer format is as follows:

Application layer data unit	Data length (bytes)	Range
Local address	1	1~247
Function code	1	0x06
Register address	2	0x0000~0xFFFF
Number of registers	2	0x0000~0xFFFF
Check	CRC	0x0000~0xFFFF

B.1.5 CRC16 function

CRC16 checkout value calculating function written by C language:

```
Uint16 CRC16(const Uint16 *data, Uint16 len)
{
Uint16 crcValue = 0xffff;
Uint16 i;
while (len--)
{
    crcValue ^= *data++;
    for (i = 0; i < 8; i++)
    {
        if (crcValue & 0x0001)
        {
            crcValue = (crcValue >> 1) ^ 0xa001;
        }
        else
        {
            crcValue = crcValue >> 1;
        }
    }
}
return (crcValue);
}
```

B.2 Function code parameter addressing rules

Register address of inverter function code parameter, control parameter and state parameter are shown in below table:

Table B-2 Function code address

Function code group	Communication EEPROM Address	Communication RAM Address
P0 ~ PE Group	0xF000 ~ 0xFEFF	0x0000 ~ 0x0EFF
A0 ~ AC Group	0xA000 ~ 0xACFF	0x4000 ~ 0x4CFF
U0 Group	0x7000 ~ 0x70FF	

Note: EEPROM lifetime will reduce when frequently stored parameters. So some function codes no need to be stored in communication EEPROM and just change the value in RAM.

For example, the address for writing the value of P3-12 into communication EEPROM area is 0xF30C and 0x030C is for RAM area.

PF Group: Cannot read and write.

U Group: Read only.

Some parameters cannot be changed when the inverter is running.

Register addresses of some parameters under running or stop state:

Parameter address	Parameter description	Parameter address	Parameter description
1000H	* Communication setting (Decimal) -10000 ~ 10000	**1010H**	PID settings
1001H	Running frequency	**1011H**	PID feedback
1002H	Bus voltage	**1012H**	PLC steps
1003H	Output voltage	**1013H**	PULSE input frequency (0.01 kHz)
1004H	Output current	**1014H**	Feedback speed (0.1 Hz)
1005H	Output power	**1015H**	Remaining running time
1006H	Output torque	**1016H**	AI1 voltage before correction
1007H	Running speed	**1017H**	AI2 voltage before correction
1009H	DO output flag	**1019H**	Linear speed
100AH	AI1 voltage	**101AH**	Current power-on time
100BH	AI2 voltage	**101BH**	Current running time
100DH	Count value input	**101DH**	Communication settings
100EH	Length value input	**101EH**	Actual feedback speed
100FH	Load speed	**101FH**	Main frequency X display
-	-	**1020H**	Auxiliary frequency Y display

Note: The communication setting is a percentage of the relative value, -10000~10000 corresponds to -100.00% ~100.00%.

When the communication setting is frequency, it's percentage of P0-10 and A2-48 is for torque communication setting.

Control command to the inverter: (Write Only)

Command word address	Command function
2000H	0001: Forward RUN
	0002: Reverse RUN
	0003: Forward JOG RUN
	0004: Reverse JOG RUN
	0005: Freely stop
	0006: Decelerate to stop
	0007: Fault reset

Read inverter status: (Read Only).

Status word address	Status word function
3000H	0001: Forward running
	0002: Reverse running
	0003: Stop

Password verification of parameter lock: (If returns 8888H, the password verification passes).

Password Address	Enter the contents of the password
1F00H	*****

DO control: (Write Only)

Command Address	Command Content
2001H	BIT0: DO1 output control BIT1: DO2 output control BIT2: RELAY1 output control BIT3: Reserved BIT4: HDOR output control BIT5: VDO1 BIT6: VDO2 BIT7: VDO3 BIT8: VDO4 BIT9: VDO5

AO1 control: (Write Only).

Command Address	Command Content
2002H	0-7FFF represents 0%-100%

AO2 control: (Write Only).

Command Address	Command Content
2003H	0-7FFF represents 0%-100%

PULSE output control: (Write Only).

Command Address	Command Content
2004H	0-7FFF represents 0%-100%

Inverter faults description:

Inverter fault address	Inverter fault information	
8000H	0000: No Fault 0001: Reserved 0002: Overcurrent during acceleration 0003: Overcurrent during deceleration 0004: Overcurrent at constant speed 0005: Overvoltage during acceleration 0006: Overvoltage during deceleration 0007: Overvoltage at constant speed 0008: Buffer resistor overload 0009: Undervoltage 000A: Inverter overload 000B: Motor overload 000C: Input loss phase 000D: Output loss phase 000E: IGBT overheat 000F: External fault 0010: Communication timeout 0011: Contactor abnormal 0012: Current detection fault 0013: Motor self-learning abnormal 0014: Encoder/PG card fault	0015: Parameter read/write abnormal 0016: Inverter hardware failure 0017: Motor short to ground 0018: Reserved 0019: Reserved 001A: Running time reached 001B: User-defined fault 1 001C: User-defined fault 2 001D: Power-on time reached 001E: Underload 001F: PID feedback loss 0028: Rapid current limit timeout 0029: Switchover motor during operation 002A: Speed deviation too large 002B: Motor overspeed 002D: Motor overheat 005A: Wrong encoder line number setting 005B: Missing encoder 005C: Initial position error 005E: Speed feedback error

B.3 Description of communication parameters for Pd Group

Function code	Name	Setting range	Default	Property
Pd-00	Communication baud rate	0:300 BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4:4800 BPS 5: 9600 BPS 6:19200 BPS 7:38400 BPS 8:57600 BPS 9:115200 BPS	6	☆

This parameter is used to set the data transmission rate between the upper device and the inverter. Note that the baud rate set in the upper device and the inverter must be consistent. Otherwise communication cannot be performed. The higher the baud rate, the faster the communication speed.

Function code	Name	Setting range	Default	Property
Pd-01	MODBUS data format	0: No parity (8-N-2) 1: Even parity (8-E-1) 2: Odd parity (8-O-1) 3: No parity (8-N-1)	3	☆

0: No parity (8-N-2)

Total 8 bits data, 2 stop bits and no parity for communication.

1: Even parity (8-E-1)

Total 8 bits data with 1 stop bits and even parity for communication.

2: Odd parity (8-O-1)

Total 8 bits data with 1 stop bits and odd parity for communication.

3: No parity (8-N-1)

Total 8 bits data with 1 stop bits and no parity for communication.

The data format set in the upper device and the inverter must be consistent, otherwise communication cannot be performed.

Function code	Name	Setting range	Default	Property
Pd-02	Local address	0: Broadcast address 1-247	1	☆

When thee local address is 0, the inverter works as upper device and used upper device broadcast function.

When the inverter need to work as slave device, the address of the inverter is set in Pd-02.

Function code	Name	Setting range	Default	Property
Pd-03	MODBUS response delay	0 ~ 20ms	2	☆

The response delay is the interval between the end of the inverter data reception and the sending of data to the upper device.

Function code	Name	Setting range	Default	Property
Pd-04	Serial communication timeout	0.0s: Invalid 0.1 ~ 60.0 s	0.0	☆

When serial communication fails and exceeds the time set in Pd-04, the inverter will report communication error. When Pd-04=0.0, the protection function is invalid.

Function code	Name	Setting range	Default	Property
Pd-05	MODBUS	0: Non-standard MODBUS protocol 1: Standard MODBUS protocol	1	☆

When Pd-05=1, standard MODBUS protocol is selected.

When Pd-05=0, the slave device will reply one more byte than standard MODBUS protocol when replying the reading command from the upper device..

Function code	Name	Setting range	Default	Property
Pd-06	Communication reading current resolution	0: 0.01 A 1: 0.1 A	0	☆

Shenzhen SCOV Electric Technologies Co., Ltd.

Warranty Card

Customer Information	Customer Name:	
	Detailed address:	
	Contact:	Tel.\Mobile:
Product information	Product model:	Serial No.:
	Date of purchase:	Application devices:
	Description of the fault:	
Fault details	(Maintenance time and content): Repair person: Y M D	

Note: Please send this card to our company together with the faulty product, thank !

Shenzhen SCOV Electric Technology Co., Ltd.

Certificate of conformity

Checker:_____

This product has been inspected by our quality control and quality assurance department. Its performance parameters conform to the "User Manual" standard attached and allowed to leave the factory.

Warranty agreement

SCOV promises that since the date of purchase from our company, users enjoy the following product warranty services.

1. Except for non-standard products, we provides 18 months warranty period from the purchase date for the failure or damage under normal use conditions.

2. Reasonable repair expenses will be charged for the damages due to the following causes:

2.1Improper operation without following the instructions in the User Manual.

2.2The user has repaired or altered the product without communication with our company and caused product failure.

2.3Broken due to force majeure such as earthquake, lightning, abnormal voltage, fire, flood or other natural disasters.

2.4Application in harsh environmental conditions beyond the manual, such as gas corrosion, salt erosion and metal dust pollution.

2.5 Damage caused by bad keeping, falling down from high place or other extrinsic factor after purchasing the inverter.

3. The right to interpret this agreement belongs to Shenzhen SCOV Electric Technology Co., Ltd.

Shenzhen SCOV Electric Technologies Co., Ltd.

Address: Room 301, Factory Building 3, No. 4 Fuye Road, Zhangkengjing Community, Guanhu Street, Longhua District, Shenzhen, China