PENTAX DSI-100 SERIES
FREQUENCY INVERTER

User's Manual

Introduction

First of all, thank you for choosing DSI-100 series inverter.

DSI-100 series inverter is a general purpose, stable and high performance current vector inverter. Whether VF control or open loop vector control operation, it has reached the industry's leading control level. At the same time, it has random PWM control technology beyond its peers. It can run normally in severe environments such as power grid fluctuation, high temperature, high humidity and concentrated dust, and has extremely high reliability.

Besides excellent performance and reliability, DSI-100 is also more powerful. Simple PLC, built-in PID, multi-stage speed, high-speed pulse, communication and other operation modes can also realize regular operation and switch operation between the two motors. In addition to the standard RS485 interface。

DSI-100 series frequency inverters t can be used to drive various kinds of automatic production equipment such as fans, water pumps, textile, paper drawing, machine tools, packaging, food, etc.

Precautions

- In order to explain the details of the product, the illustrations in this manual sometimes show the state with the cover or safety cover removed. When using this product, please be sure to install the case or cover according to the regulations, and operate according to the contents of the manual.
- The illustrations in this instruction manual are for illustration only and may differ from the product you ordered.
- Due to product upgrades or specification changes, and in order to improve the convenience and accuracy of the manual, the contents of this manual will be changed in time.
- If you need to order the instruction manual due to damage or loss, please contact the regional agents of our company, or contact our customer service center directly.
- If you still have some problems in use, please contact the customer service center of our company.

Content

Chapter 1: Inspection and Safety Precautions

The inverters have been strictly tested and quality inspected before leaving the factory. After purchasing, please check whether the packaging of the product is damaged due to careless transportation; whether the specifications and models of the product are consistent with the model ordered. If you have any questions, please contact local dealers, or contact our company directly.

1.1. Check after unpacking

※ The inspection includes one machine, one instruction manual, and one warranty card.

※ Check the nameplate on the side of the inverter to make sure that the product in your hand is the one you ordered.

1-1-1. Nameplate Description

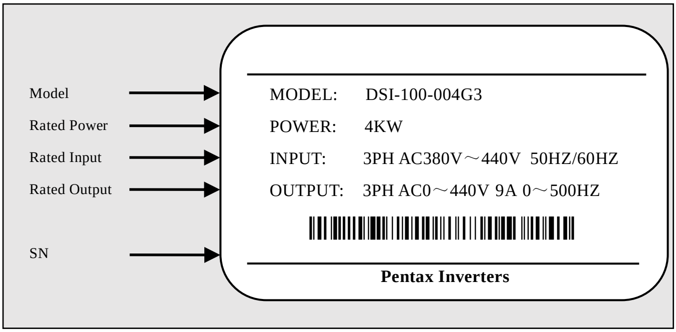
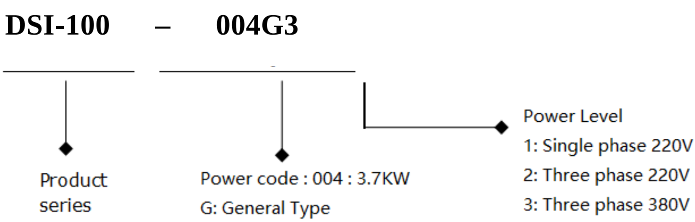


Figure 1-1 Nameplate Description

1-1-2. Model description



1-2. Safety Precautions

In this manual, safety precautions are divided into the following two categories:

Danger: A situation that may result in serious injury or even death due to the danger caused by not operating as required;

CAUTION: Moderate or minor injury, and equipment damage may result due to hazards caused by not operating as required;

Type of Security Matter	Contents of safety precautions
Danger	●Do not install it if you find that the control system has entered water, or parts are missing or damaged when unpacking! ●If the packing list does not match the actual name, please do not install it! ●It should be handled with care, otherwise there is a danger of damage to the equipment! ● Please do not use damaged drives or inverters with missing parts. There is a danger of injury! ●Do not touch the components of the control system with your hands, otherwise there is a danger of static electricity damage!
Danger	●Please install it on flame-retardant objects such as metal; keep away from combustibles. Otherwise it may cause a fire! ●Do not twist the fixing bolts of the equipment components at will, especially the bolts marked with red!
Caution	●Do not let the wire head or screw fall into the driver. Otherwise, the drive will be damaged! ●Please install the driver in a place with less vibration and avoid direct sunlight. ●When more than two inverters are placed in the same cabinet, please pay attention to the installation position to ensure the heat dissipation effect.
Danger	●The instruction of this manual must be followed, and the construction shall be carried out by professional electrical engineering personnel, otherwise there will be unexpected dangers! ●There must be a circuit breaker between the inverter and the power supply, otherwise a fire may occur! ●Before wiring, please confirm that the power supply is in a zero-energy state, otherwise there is a danger of electric shock! ●Please properly ground the inverter according to the standard, otherwise there is danger of electric shock! ● Never connect the input power to the output terminals (U, V, W) of the inverter. Pay attention to the markings of the terminals, and do not connect the wrong wires! Otherwise, the drive will be damaged! ●Ensure that the wiring conforms to the EMC requirements and the safety standards of the area where it is located. Please refer to the recommendations in the manual for the wire diameter used. Otherwise an accident may occur! ●Never connect the braking resistor directly between the DC bus +and - terminals. Otherwise it will cause a fire! ●Encoder must use shielded wire, and the shielding layer must ensure that the single end is reliably grounded!
Caution	●Please confirm whether the voltage level of the input power is consistent with the rated voltage level of the inverter; whether the wiring positions of the power input terminals (R, S, T) and output terminals (U, V, W) are correct; and pay attention to check the connection with the drive Whether there is a short circuit in the connected peripheral circuits, and whether the connected lines are fastened, otherwise the driver will be damaged! ●Any part of the inverter does not need to be subjected to the withstand voltage test, the product has been tested before leaving the factory. Otherwise it will cause an accident!

Type of Security Matter	Contents of safety precautions
Danger	●The inverter can only be powered on after the cover is covered. Otherwise it may cause electric shock! ●The wiring of all peripheral accessories must comply with the instructions of this manual, and make the correct wiring according to the circuit connection method provided in this manual. Otherwise it will cause an accident!
Danger	●Do not open the cover after power on. Otherwise there is a danger of electric shock! ●Do not touch the driver and peripheral circuits with wet hands. Otherwise there is a danger of electric shock! ●Do not touch any input and output terminals of the inverter. Otherwise there is a danger of electric shock! ●At the beginning of power-on, the inverter automatically performs safety detection on the external strong current circuit. At this time, do not touch the U, V, W terminals of the driver or the motor terminals, otherwise there is a danger of electric shock! ●If parameter identification is required, please pay attention to the danger of injury during motor rotation. Otherwise it may cause an accident! ●Do not arbitrarily change the parameters of the inverter manufacturer. Otherwise, it may cause damage to the equipment!
Dange r	●Do not touch the cooling fan and discharge resistor to test the temperature. Otherwise burns may occur! ●Non-professional technicians should not detect signals during operation. Otherwise it may cause personal injury or equipment damage!
Caution	●When the inverter is running, it should be avoided that something falls into the equipment. Otherwise, the equipment will be damaged! ●Do not use the method of contactor on and off to control the start and stop of the drive. Otherwise, the equipment will be damaged!
Danger	●Do not repair and maintain the equipment with electricity. Otherwise there is a danger of electric shock! ●Confirm that the maintenance and repair of the drive can only be carried out when the voltage of the inverter is lower than 36V, which shall be subject to two minutes after the power is cut off. Otherwise, the residual charge on the capacitor will cause harm to people! ●Persons without professional training are not allowed to repair and maintain the inverter. Otherwise, personal injury or equipment damage may be caused! ●After the inverter is replaced, the parameters must be set, and all pluggable plug-ins must be plugged and unplugged in the case of power failure!

1-3. Precautions

Item	note type	Content
1	Motor insulation inspection	Before using the motor for the first time, before using it for a long time, and during regular inspection, the motor insulation should be checked to prevent damage to the inverter due to the insulation failure of the motor winding. During insulation inspection, the motor connection must be separated from the inverter. It is recommended to use a 500V voltage megger, and the measured insulation resistance should be no less than 5MΩ.
2	Thermal protection of the motor	If the selected motor does not match the rated capacity of the inverter, especially when the rated power of the inverter is greater than the rated power of the motor, be sure to adjust the motor protection related parameter values in the inverter or install a thermal Relay in front of the motor to protect the motor.
3	Operation above power frequency	This inverter can provide an output frequency of 0Hz to 500.00Hz. If the customer needs to run above 50Hz, please consider the bearing capacity of the mechanical device.
4	Vibration of mechanical devices	At some output frequencies, the inverter may encounter the mechanical resonance point of the load device, which can be avoided by setting the jump frequency parameter in the inverter.
5	About motor heating and noise	Because the output voltage of the inverter is a PWM wave and contains certain harmonics, the temperature rise, noise and vibration of the motor will increase slightly compared with the power frequency operation.
6	When there is a varistor on the output side or a capacitor to improve power factor	The output of the inverter is PWM wave. If the output side is equipped with a capacitor for improving power factor or a varistor for lightning protection, it is easy to cause instantaneous overcurrent of the inverter or even damage the inverter. Please do not use.
7	Switch devices such as contactors used at the input and output ends of the inverter	If a contactor is installed between the power supply and the input end of the inverter, it is not allowed to use this contactor to control the start and stop of the inverter. When the contactor must be used to control the start and stop of the inverter, the interval should not be less than one hour. Frequent charging and discharging may reduce the service life of the capacitors in the inverter. If there is a switch device such as a contactor between the output end and the motor, make sure that the inverter is switched on and off when there is no output, otherwise the modules in the inverter may be damaged.
8	Use other than rated voltage	It is not suitable to use the DSI-100 series inverter outside the allowable working voltage range specified in the manual, which may cause damage to the components in the inverter. If necessary, use the corresponding boost or step-down device for voltage transformation.
9	Three-phase input is changed to two-phase input	The three-phase inverter in the DSI-100 series cannot be changed to two-phase. Failure to do so will result in malfunction or damage to the inverter.
10	Lightning strike protection	This series of inverters is equipped with lightning strike overcurrent protection device, which has a certain self-protection ability for induced lightning. For places where lightning occurs frequently, customers should also install protection on the front end of the inverter.
11	Altitude and Derating Usage	In areas with an altitude of more than 1000m, the cooling effect of the inverter is deteriorated due to the thin air, so it is necessary to derate the use. In this case, please contact our company for technical consultation.
12	Some special usage	If the customer needs to use methods other than the recommended wiring diagram provided in this manual, such as common DC bus, please consult our company.

Item	note type	Content
13	Pay attention to the scrapping of the inverter	The electrolytic capacitors of the main circuit and the electrolytic capacitors on the printed board may explode when they are burned. Toxic gas will be generated when the plastic parts are burned. Please dispose of them as industrial waste.
14	About the Adapter Motor	1) The standard matching motor is a four-pole squirrel-cage asynchronous induction motor. If it is not the above motor, please select the inverter according to the rated current of the motor. 2) The cooling fan of the non-variable frequency motor is coaxially connected to the rotor shaft, and the cooling effect of the fan decreases when the speed decreases. Therefore, if the motor is overheated, a strong exhaust fan should be installed or replaced with a frequency conversion motor; 3) The frequency converter has built-in standard parameters of the adapted motor. According to the actual situation, it is necessary to identify the motor parameters or modify the default values to match the actual values as much as possible, otherwise the operation effect and protection performance will be affected; 4) Due to the short circuit in the cable or the motor, the inverter will alarm, or even the machine will be fried. Therefore, please first perform an insulation short-circuit test on the initially installed motor and cable, and this test should also be performed frequently during routine maintenance. Note that the inverter must be completely disconnected from the tested part when doing this test.
15	other	1) Never connect the AC power supply to the U, V, W and other terminals of the inverter output. 2) The panel must be fixed and locked before power-on, so as to avoid personal safety damage due to defective internal capacitors and other components. 3) After the power is turned on, wiring, inspection, etc. cannot be performed. 4) After the device is powered on, do not touch the internal circuit board and its components to avoid the danger of electric shock. 5) Turn off the power, and within 5 minutes after the keyboard display goes out, do not touch the circuit board and any parts in the machine, and you must use the instrument to confirm that the capacitors in the machine have been discharged before performing the operation in the machine, otherwise there will be electric shock. Danger. 6) The static electricity of the human body will seriously damage the internal MOS field effect transistors, etc. If anti-static measures are not taken, do not touch the internal devices such as printed circuit boards and IGBTs with your hands, otherwise it may cause malfunctions. 7) When using, the grounding terminal (E or ⏚) of the inverter should be properly and reliably grounded according to the national electrical safety regulations and other relevant standards. Do not stop the machine by pulling the brake (power off), and cut off the power supply after the motor stops running. 8) The optional input filter accessories must be added to meet the CE standard.

1-4. Scope of use

※ This inverter is only suitable for general industrial three-phase AC asynchronous motors.

※ This inverter can only be used in the occasions approved by our company. Unapproved use environment may cause fire, electric shock, explosion and other events.

※ If it is used in equipment that may cause personal injury or death due to inverter failure (for example: lifting equipment for transporting personnel, aviation systems, safety equipment, etc.), it must be handled with care. In this case, please consult the manufacturer.

Use environment

(1) Ambient temperature -10℃～40℃.

(2) Prevent electromagnetic interference and stay away from interference sources.

(3) Prevent the intrusion of water droplets, steam, dust, dust, cotton wool and fine metal powder.

(4) Prevent the intrusion of oil, salt and corrosive gas.

(5) Avoid vibration.

(6) Avoid high temperature and humidity and no rain dripping, and the humidity is less than 90%RH (no condensation).

(7) It is forbidden to use it in the dangerous environment of flammable, combustible, explosive gas, liquid or solid.

Only trained personnel are allowed to operate this device, please read the safety, installation, operation and maintenance sections of this manual carefully before use.

The safe operation of this equipment depends on proper transport, installation, operation and maintenance!

Chapter 2: Standard Specifications

2-1. Technical Specifications

Model	Input voltage	Output power （KW）	Input current （A）	Output current （A）	Match motor KW
DSI-100-K75G1	Single-phase AC220V±15 50/60Hz	0.75	8.2	4.0	0.75
DSI-100-1K5G1		1.5	14.0	7.0	1.5
DSI-100-2K2G1		2.2	23.0	9.6	2.2
DSI-100-K75G3	Three-phase AC380V~440V -15%~+10% 50/60Hz	0.75	3.4	2.3	0.75
DSI-100-1K5G3		1.5	5.0	3.7	1.5
DSI-100-2K2G3		2.2	5.8	5.0	2.2
DSI-100-004G3		3.7	10.5	9.0	3.7
DSI-100-5K5G3		5.5	14.6	13	5.5

2-2 Standard specification

Item		Specification
Basic function	Highest frequency	Vector control: 0～500Hz; V/F control: 0～500Hz
	Carrier frequency	0.8kHz-12kHz the carrier frequency can be adjusted automatically according to the load characteristics.
	Input frequency resolution	Digital setting: 0.01HZ Analog setting: Maximum frequency × 0.025%
	Control mode	Open loop vector control (SVC) and V/F control
	Start torque	0.5Hz/150%（SVC）
	Speed range	1: 100 （SVC）
	Speed control accuracy	±0.5%（SVC）
	Overload capacity	150% rated current 60sec; 180% rated current 3sec
	Torque boost	Auto-torque boost; manual torque boost 0.1%~30.0%
	V/F curve	Three types: linear type; Multi-point type; the nth power of V/F curve
	ACC/DEC curve	Linear or S curve of ACC/DEC ways. Four types of ACC/DEC Time, ACC/DEC time range is 0.0~6500.0s
	DC brake	DC brake frequency: 0.00Hz~ max frequency, brake time: 0.0s~36.0s,brake action current: 0.0%~100.0%
	JOG Control	JOG frequency range: 0.00Hz~50.00Hz. JOG speed-up/down time: 0.0s~6500.0.s
	Simple PLC, multi-stage speed	Via built-in PLC or control terminal can realize max 16 stage speed running

Item		Specification
	running	
	Built-in PID	Can realize process control close-loop system conveniently
	Auto-adjust voltage (AVR)	When grid voltage changes, can keep output voltage steadily automatically
	Over current and over	During running, limit current and voltage automatically, protect from tripping off frequently for over voltage and over current.
	Quick current-limit function	Reduce over current error on max extent, protect inverter normal running
	Torque limitation and control	"digger" feature, inverter could limit torque automatically, prevent over current tripping off;
Personable function	Outstanding perform	Using high-perform current vector control
	Instance stop not stop	During instant power-off, by motor feedback energy, inverter compensates voltage-drop to keep running for short time.
	Quick current-limit function	Reduce over current error on max extent
	Timing control	timing control function: setting time range: 0.0min~6500.0min
	Command source	control panel, control terminal, communication; can be switched by several modes
	Frequency source	digital setting, analog voltage setting, analog current setting, pulse setting, communication setting, can be switched by several methods
Running	Input terminal	Standard: 5 digital input terminal, one of them support max 100KHz HS pulse input; 2 analog input terminal, AI1 support 0~10V voltage input, AI2 support 0~10V voltage or 0~20mA current

Item		Specification
	Output terminal	Standard: 1 high-speed pulse output terminal(optional open collector),support 0~100kHz pulse 1 Relay output terminal 1 analog output support 0~10V voltage or 0~20mA current
Display and keypad	LED display	Can display parameter
	Press-key locking and function selection	Realize press-key partial or full locking, define part press-key function range, to avoid wrong operation
	Protection function	Power-on motor short circuit test, output phase-loss protection, over-current protection, over-voltage protection, under-voltage protection, overheat protection, overload protection etc.
Environment	Application site	Indoor, without direct sunlight, no powder, corrosive gas, combustion air, oil dust, water steam, water drop or salt etc.
	Altitude level	Less than 1000m, Derating below 1000m, the rated output current is reduced by 1% for every 100m increase
	Environment temperature	-10℃~+40℃（During 40℃~50℃，please reduce capacity use）
	Humidity	<95% RH, no water drop condensed

2-3. Sharp and Dimension

2-3-1. Product appearance drawing

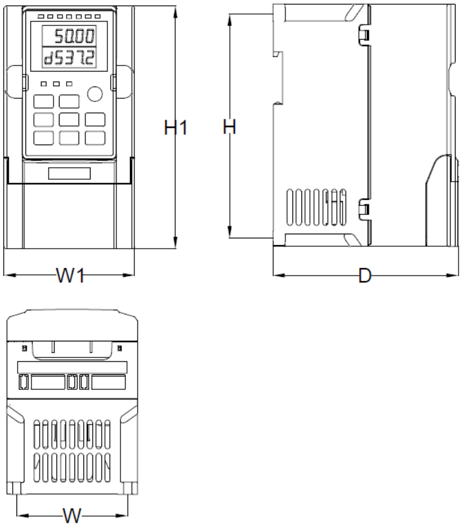


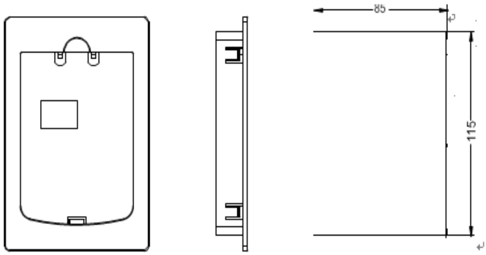
Figure 2-1 Product outline drawing and installation hole size

2-3-2. Installation hole size

<table>
<tr><th rowspan="2">Model</th><th colspan="7">Outline Dimension (mm)</th></tr>
<tr><th>W</th><th>H</th><th>D</th><th>W1</th><th>H1</th><th>Mounting hole(d)</th><th>weight</th></tr>
<tr><td>DSI-100-K75G1</td><td rowspan="6">75</td><td rowspan="6">151.5</td><td rowspan="6">125.5</td><td rowspan="6">88.5</td><td rowspan="6">164</td><td rowspan="6">5</td><td rowspan="6">0.9</td></tr>
<tr><td>DSI-100-1K5G1</td></tr>
<tr><td>DSI-100-2K2G1</td></tr>
<tr><td>DSI-100-K75G3</td></tr>
<tr><td>DSI-100-1K5G3</td></tr>
<tr><td>DSI-100-2K2G3</td></tr>
<tr><td>DSI-100-004G3</td><td rowspan="2">86</td><td rowspan="2">170.5</td><td rowspan="2">136.5</td><td rowspan="2">97</td><td rowspan="2">184</td><td rowspan="2">5</td><td rowspan="2">1.3</td></tr>
<tr><td>DSI-100-5K5G3</td></tr>
</table>

Figure 2-2 Product dimension and installation

2-3-3. Dimensions keyboard housing

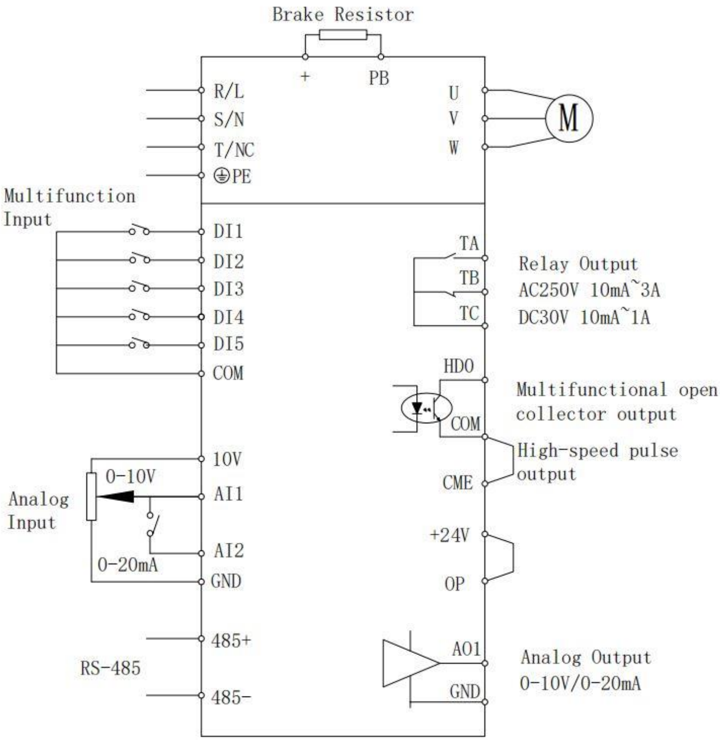


Chapter 3: Installation and Circuits Diagram

3-1. Use environment

(1) Ambient temperature -10℃～40℃.
(2) Prevent electromagnetic interference and stay away from interference sources.
(3) Prevent the intrusion of water droplets, steam, dust, dust, cotton wool and fine metal powder.
(4) Prevent the intrusion of oil, salt and corrosive gas.
(5) Avoid vibration.
(6) Avoid high temperature and humidity and no rain dripping, and the humidity is less than 90%RH (no condensation).
(7) It is forbidden to use it in the dangerous environment of flammable, combustible, explosive gas, liquid or solid.

3-2 Wire diagram



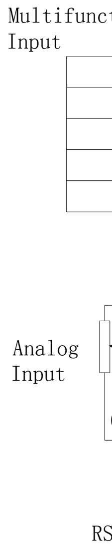
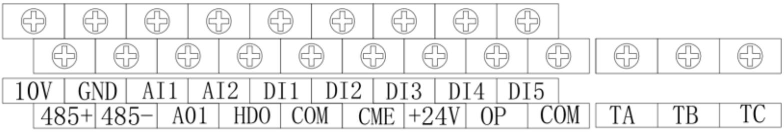


Figure 3-1 Wiring diagram

The inverter wiring is divided into two parts: the main circuit and the control circuit. The user must make the correct connection according to the wiring circuit shown in the figure above.

3-3. Control circuit terminal

3-3-1 Control circuit terminal layout



3-3-2. Control circuit terminal description

Terminal	Description	Function
HDO-CME	OC type DO	Optocoupler isolation, bipolar open collector output. Output voltage range: 0-24V. Output current range: 0-50mA.
HDO-COM	High-speed pulse output	When used as high-speed pulse output, the maximum frequency is 100KHz. Disconnect the COM and CME shorting jumper
TA/TB/TC	Relay output	Contact drive capability: AC250V, 3A, COSΦ=0.4DC30V, 1A TC→TA is NO, TC→TB is NC
10V-GND	+10V power supply	Provide 10V power supply to the outside, the maximum output current: 10mA Generally used as an external potentiometer power supply, the potentiometer resistance range is 1KΩ-5KΩ
+24V-COM	+24V power supply	Provide +24V power supply to the outside, generally used as the working power supply of digital input and output terminals and external sensors The maximum output current of the power supply: 200mA
OP	External power input	The factory default is connected with 24V, When using external signals to drive DI1~DI5, the OP needs to be connected to the external power supply and disconnected from the +24V power supply terminal
DI1-OP	DI1	1. Optocoupler isolation, compatible with bipolar input 2. Input impedance: 2.4kΩ 3. Voltage range for level input: 9V~30V
DI2-OP	DI2	
DI3-OP	DI3	
DI4-OP	DI4	
DI5-OP	High-speed pulse input terminal	In addition to the characteristics of DI1~DI4, It can also be used as a high-speed pulse input channel. Maximum input frequency: 100kHz
AI1	Multi-function analog input signal 1	1. Adjustable in the range of 0-10V. 2. The input impedance is 22kΩ, and the current input is 500Ω.
AI2	Multi-function analog input signal 2	1. JP2 1-2 short circuit: adjustable within the range of 0-10V. 2. JP2 2-3 short circuit: adjustable within the range of 0-20mA. 3. The input impedance is 22kΩ, and the current input is 500Ω.

AO1	Multi-function analog output	1. JP1 1-2 short circuit: adjustable within the range of 0-10V. 2. JP2 2-3 short circuit: adjustable within the range of 0-20mA.
485+\485-	RS-485	Standard RS485 communication interface, not isolated from GND, please use twisted pair or shielded wire

3-4. Wiring Precautions

※It is not allowed to install phase-advancing capacitors or resistance-capacitance absorption devices at the U, V, W output ends of the inverter. When replacing the motor, the input power of the inverter must be cut off.

※Do not drop metal scraps or wire ends into the inverter when wiring, otherwise the inverter may malfunction.

※The motor can be switched or the industrial frequency power supply can be switched only when the inverter stops outputting.

※In order to minimize the influence of electromagnetic interference, when the electromagnetic contactor and Relay used are close to the inverter, it is necessary to consider installing a surge absorbing device.

※The external control line of the inverter must be equipped with an isolation device or a shielded line.

※In addition to shielding, the input command signal wiring should also be routed separately, preferably away from the main circuit wiring.

※When the carrier frequency is less than 3KHz, the maximum distance between the inverter and the motor should be within 50 meters; when the carrier frequency is greater than 4KHz, the distance should be appropriately reduced, and the wiring should be laid in a metal pipe.

※When the inverter is equipped with peripheral equipment (filters, reactors, etc.), first measure its insulation resistance to ground with a 1000-volt megohmmeter to ensure that it is not less than 4 megohms.

※When the inverter needs to be started frequently, do not turn off the power supply, and must use the control terminal or keyboard or RS485 running command to start and stop to avoid damage to the rectifier.

※Do not connect the AC input power supply to the output terminals U, V and W of the inverter.

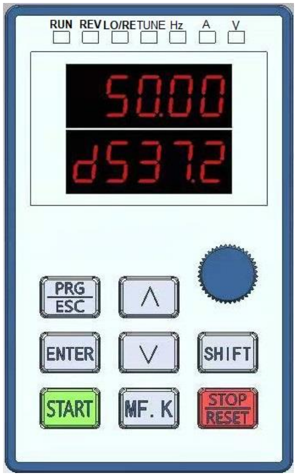
※In order to prevent accidents, the ground terminal () must be grounded reliably (the ground impedance should be below 100 ohms), otherwise there will be leakage.

※When the main circuit is wired, the selection of the wire diameter specification should be carried out in accordance with the relevant provisions of the national electrical regulations.

※The motor capacity should be equal to or smaller than the inverter capacity.

Chapter 4: Operating Keyboard

4-1. Operation keyboard appearance



4-2. Introduction to Keyboard Indicators

Indicator		Indicator function	Indicator status
Unit indicator	Hz	Frequency	Always on: The current displayed number is the frequency
	A	Current	Always on: The current displayed number is the current
	V	Voltage	Always on: The current displayed number is the voltage
	Hz+A	Speed	Both two lights are always on: the current display number is the speed
	A+V	Percentage	Steady on: The current displayed number is the percentage
Status indicator	RUN	Operating status	Always on: the inverter is running Always off: the inverter is in stop state
	LOCAL	Run command mode	Always on: Terminal control mode Blinking: Communication control mode Always off: Operation panel control mode
	FWD/REV	Forward/Reverse	Always on: the inverter is in the reverse state Always off: the inverter is in the forward rotation state
	TUNE	Tuning,Torque Control,Fault Indicator	Steady on: the inverter is in torque control mode Blinking slowly: the inverter is in tuning state Flashing quickly: the inverter is in fault state

A total of 5-digit LED display can display various monitoring data such as set frequency, output frequency, output current, output voltage, and alarm codes.

4-3. Operation panel key description

Key	Name	Function
PRG	Program	Level 1 menu entry or exit
ENTER	Confirm	Enter the menu interface level by level, set parameters to confirm
︽	Increment	Increment of data or function code
︾	Decrement	Decrement of data or function code
SHIFT	Shift	In the stop display interface and the running display interface, the display parameters can be selected cyclically; when modifying the parameters, the modification bits of the parameters can be selected
RUN	RUN	In keyboard operation mode, used to run operation
MF.K	Multi-function selection	According to 08-01 for function switch selection, it can be defined as command source, or direction quick switch
STOP/RESET	Stop/Reset	In the running state, pressing this key can be used to stop the running operation; in the fault alarm state, it can be used to reset the operation. The characteristics of this key are restricted by the function code 08-02.

Chapter 5: Summary of function parameters

The parameter menu in the user-defined parameter mode is not password protected. Group 0 is the basic function parameters, monitoring function parameters.

The symbols in the function table are explained as follows:

"◇": Indicates that the set value of this parameter can be changed when the inverter is in stop or running state;

"□": Indicates that the set value of this parameter cannot be changed when the inverter is running;

"■": Indicates that the value of this parameter is the actual detection record value and cannot be changed;

"*": Indicates that the parameter is a "manufacturer parameter", which is limited to the manufacturers Settings, and the user is prohibited from operating

Group 00 Monitoring Function Group

Para. No.	Para. Name	Display Range	Modify	COM Add.
00.00	Running frequency	0-500.00Hz	■	7000
00.01	Frequency reference	0-500.00Hz	■	7001
00.02	Bus voltage	0-3000V	■	7002
00.03	Output voltage	0-1140V	■	7003
00.04	Output current	0-655.35A	■	7004
00.05	Output power	0-32767KW	■	7005
00.06	Output torque	-200.0%-200.0%	■	7006
00.07	DI state	0-32767	■	7007
00.08	DO state	0-1023	■	7008
00.09	AI1 voltage	0-10.57V/0-20.000m	■	7009
00.10	AI2 voltage/current	0-10.57V/0-20.000m	■	700A
00.12	Count value	0-65535	■	700C
00.13	length value	0-65535	■	700D
00.14	Load speed display	0-65535	■	700E
00.15	PID reference	0-100.0Bar	■	700F
00.16	PID feedback	0-100.0Bar	■	7010
00.17	PLC stage	0-16	■	7011
00.18	Pulse reference	0-100.00KHz	■	7012
00.19	feedback speed	-500.00Hz-500.00Hz	■	7013
00.20	Remaining running time	0-65535Min	■	7014
00.21	AI1 voltage before correction	0-10.57V/0-20.000mA	■	7015
00.22	AI2 voltage (V)/ current (MA) before correction	0-10.57V/0-20.000mA	■	7016

Para. No.	Para. Name	Display Range	Modify	COM Add.
00.24	Motor speed	0-65535m/Min	■	7018
00.25	Accumulative power-on time	0-65535Min	■	7019
00.26	Accumulative running time	0-65535Min	■	701A
00.27	Pulse reference	0-65535Hz	■	701B
00.28	Communication reference	-100.0%-100.0%	■	701C
00.30	Main frequency A reference	0-500.00Hz	■	701E
00.31	Auxiliary frequency B reference	0-500.00Hz	■	701F
00.32	Viewing any register address value	-	■	7020
00.35	Motor temperature	-200.0%-200.0%	■	7023
00.37	Target torque	-	■	7025
00.39	Target voltage upon V/F separation	0-Motor rated voltage	■	7027
00.40	Output voltage upon V/F separation	0-Motor rated voltage	■	7028
00.41	S state display	-	■	7029
00.42	HDO state display	-	■	702A
00.43	S set for function state display 1	-	■	702B
00.44	S set for function state display 2	-	■	702C
00.45	fault information	-	■	702D
00.59	Frequency Reference	-100.00%-100.00%	■	703B
00.60	Running frequency	-100.00%-100.00%	■	703C
00.61	AC drive state	0-65535	■	703D
00.62	Current fault code	0-99	■	703E

Group 01 Basic Function Group

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
01.01	Motor 1 control mode	0: Sensor-less vector control (SVC) 1: Reserved 2: V/F control	2	□	F001
01.02	Command source selection	0: Operation panel 1: Terminal 2:Communication	0	◇	F002

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
01.03	Main frequency reference setting X channel selection	0:digital setting (preset frequency 01.08, UP / DOWN can be modified, power is not memory) 1:digital setting (preset frequency 01.08, UP / DOWN can be modified, power-down memory 2: AI1 3: AI2 4: AI3(Keyboard potentiometer) 5:High-speed pulse input setting (DI5) 6: Multi-segment instructions 7: Simple PLC 8: PID 9: communication given 10: Reserved	4	□	F003
01.04	Auxiliary frequency source Y command input selection	Same as 01.03 (main frequency source A instruction input selection)	0	□	F004
01.05	Auxiliary frequency source Y Reference object selection	0: relative to maximum frequency 1: Relative to frequency source X	0	◇	F005
01.06	Auxiliary frequency source Y command range	0%～150%	100%	◇	F006
01.07	Frequency source combination mode selection	Bit: frequency source selection 0: Main frequency source X 1: main and auxiliary operation results (operation relationship determined by ten) 2: Main frequency source X and auxiliary frequency source Y switch 3: Main frequency source X and master and slave operation result switching 4: auxiliary frequency source Y and master and slave operation result switching Ten: frequency source main and auxiliary operation relationship 0: main + auxiliary 1: main - auxiliary 2: the two maximum 3: the two minimum	00	◇	F007
01.08	Preset frequency	0.00Hz～max frequency（01.10）	50.00Hz	◇	F008

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
01.09	Running direction	0:Same direction 1:Opposite direction	0	◇	F009
01.10	Max. frequency	50.00Hz～500.00Hz	50.00Hz	□	F00A
01.11	Setting channel of frequency upper limit	0: 01.12 is set 1: AI1 2: AI2 3:AI3 (Keyboard potentiometer) 4:High-speed pulse setting (DI5) 5: Communication given	0	□	F00B
01.12	Frequency reference upper limit	Lower limit 01.14～max frequency 01.10	50.00Hz	◇	F00C
01.13	Frequency reference upper limit offset	0.00Hz～max frequency 01.10	0.00Hz	◇	F00D
01.14	Frequency reference lower limit	0.00Hz to frequency upper limit 01.12	0.00Hz	◇	F00E
01.15	Carrier frequency	0.8kHz～12.0kHz	Model determined	◇	F00F
01.16	Carrier frequency adjusted with temperature	0: No 1: Yes	1	◇	F010
01.17	Acceleration time 1	0.00s～65000s *01.19	Model determined	◇	F011
01.18	Deceleration time 1	0.00s～65000s *01.19	Model determined	◇	F012
01.19	Acceleration /Deceleration time unit	0: 1s 1: 0.1s 2: 0.01s	1	□	F013
01.20	Power-on automatic running delay time setting	0.0s～3600.0s	Model determined	◇	F014
01.21	Frequency offset of Auxiliary frequency setting channel for main and auxiliary calculation	0.00Hz～max frequency 01.10	0.00Hz	◇	F015
01.22	Frequency reference	1: 0.1Hz 2: 0.01Hz	2	□	F016

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
	resolution				
01.23	Retentive of digital setting frequency upon stop	0: No memory 1: Memory	1	◇	F017
01.24	Motor parameter group selection	0: 1st motor parameter 1: Reserved	0	□	F018
01.25	Acceleration /Deceleration time base frequency	0: Maximum frequency (01.10) 1: Set frequency 2: 100Hz	0	□	F019
01.26	Base frequency for UP/DOW modification during running	0: Run frequency 1: Set frequency	1	□	F01A
01.27	The run command is tied to the main frequency source X command selection:	Bit: Operation panel command Bind frequency source selection 0: no binding 1: Digital setting frequency 2: AI1 3: AI2 4: AI3 (Keyboard potentiometer) 5: High-speed pulse input setting (DI5) 6: multi-speed 7: Simple PLC 8: PID 9: communication given Ten: Terminal Command Binding Frequency Source Selection Hundreds: communication command binding frequency source selection	0000	◇	F01B

Group 02 1st Motor Parameters

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
02.00	Motor type selection	0: Ordinary asynchronous motor 1: Variable frequency asynchronous motor 2: Reserved	0	□	F100
02.01	Rated motor power	0.1KW～1000.0KW	Model determined	□	F101
02.02	Rated motor voltage	1V～2000V	Model determined	□	F102

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
02.03	Rated motor current	0.01A～655.35A（Inverter power<=55KW） 0.1A～6553.5A（Inverter power>55KW）	Model determined	□	F103
02.04	Rated motor frequency	0.01Hz～Max frequency	Model determined	□	F104
02.05	Rated motor speed	1rpm～65535rpm	Model determined	□	F105
02.06	Stator resistance	0.001Ω～65.535Ω（Inverter power<=55KW） 0.0001Ω～6.5535Ω（Inverter power>55KW）	Auto-tuning dependent	□	F106
02.07	Rotor resistance	0.001Ω～65.535Ω（Inverter power<=55KW） 0.0001Ω～6.5535Ω（Inverter power>55KW）	Auto-tuning dependent	□	F107
02.08	Leakage inductive reactance	0.01mH～655.35mH（Inverter power<=55KW） 0.001mH～65.535mH（Inverter power>55KW）	Auto-tuning dependent	□	F108
02.09	Mutual inductive	0.1mH～6553.5mH（Inverter power<=55KW） 0.01mH～655.35mH（Inverter power>55KW）	Auto-tuning dependent	□	F109
02.10	No-load current	0.01A～02.03（Inverter power<=55KW） 0.1A～02.03（Inverter power>55KW）	Auto-tuning dependent	□	F10A
02.37	Motor auto-tuning method selection	0: no operation 1:Asynchronous machine static part of the parameters of self-learning 2:asynchronous machine dynamic complete self-learning 3:asynchronous machine static complete self-learning	0	□	F125

Group 03 the motor vector control parameters

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
03.00	Speed loop proportional gain1	1～100	30	◇	F200
03.01	Speed loop integral time 1	0.01s～10.00s	0.50s	◇	F201
03.02	Switch over frequency 1	0.00～03.05	5.00Hz	◇	F202
03.03	Speed loop proportional gain 2	1～100	20	◇	F203
03.04	Speed loop integral time 2	0.01s～10.00s	1.00s	◇	F204
03.05	Switch over frequency 2	03.02～Max frequency(01.10)	10.00Hz	◇	F205
03.06	SVC slip compensation gain	50%～200%	100%	◇	F206
03.07	SVC Speed feedback filter time constant	0.000s～0.100s	0.015s	◇	F207
03.08	Torque limit source in speed control	0～200	64	◇	F208
03.09	Digital setting of torque limit in speed control	0: Function code 03.10 setting 1: AI1 2: AI2 3: AI3(keyboard potentiometer) 4: High-speed pulse input setting (DI5) 5: Communication given 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) 1-7 option full scale corresponds to 03.10	0	◇	F209
03.10	Speed loop proportional gain1	0.0%～200.0%	150.0%	◇	F20A
03.13	Excitation adjustment proportional gain	0～60000	2000	◇	F20D
03.14	Excitation adjustment integral gain	0～60000	1300	◇	F20E
03.15	Torque adjustment proportional gain	0～60000	2000	◇	F20F
03.16	Torque adjustment integral gain	0～60000	1300	◇	F210

Group 04 V/F Control Parameters

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
04.00	V/F curve setting	0: Straight line 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: VF complete separation mode 11: VF semi-separation mode	0	□	F300
04.01	Torque boost	0.0%: (Ineffective) 0.1%～30.0%	0.0%	◇	F301
04.02	Cut-off frequency of torque boost	0.00Hz～max frequency	50.00Hz	□	F302
04.03	Multi-point V/F frequency 1	0.00Hz～04.05	0.00Hz	□	F303
04.04	Multi-point V/F voltage 1	0.0%～100.0%	0.0%	□	F304
04.05	Multi-point V/F frequency 2	04.03～04.07	0.00Hz	□	F305
04.06	Multi-point V/F voltage 2	0.0%～100.0%	0.0%	□	F306
04.07	Multi-point V/F frequency 3	04.05～motor rated frequency（02.04）	0.00Hz	□	F307
04.08	Multi-point V/F voltage 3	0.0%～100.0%	0.0%	□	F308
04.09	V/F Slip compensation gain	-	100.0%	◇	F309
04.10	V/F over-excitation gain	0～200	64	◇	F30A
04.11	V/F oscillation suppression gain	0～100	Model determined	◇	F30B
04.13	Voltage source for V/F separation	0: digital setting (04.14) 1: AI1 (Note: J6 jumper) 2: AI2 3: AI3(keyboard potentiometer) 4: High-speed pulse input setting (DI5) 5: Multi-segment instructions 6: Simple PLC 7: PID 8: Communication given Note: 100.0% corresponds to the motor rated voltage	0	◇	F30D
04.14	Digital setting of	0V～motor rated voltage	0V	◇	F30E

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
	voltage for V/F separation				
04.15	Voltage rise time of V/F separation	0.0s～1000.0s Note: 0V to rated motor voltage	0.0s	◇	F30F
04.16	Voltage decline time of V/F separation	0.0s~1000.0s Note: time of 0v to rated motor voltage	0.0s	◇	F310
04.17	Stop mode selection for V/F separation	0: Frequency/voltage is reduced to 0 independently 1: The frequency starts to drop after the voltage is reduced to 0	0	◇	F311
04.19	Current limit selection	0: Useless 1: Useful	1	◇	F313
04.20	Current limit gain	0~100	20	◇	F314
04.21	Compensation factor of speed multiplying current limit level	50~200%	50%	◇	F315
04.22	Voltage limit	650V~800.0V	220V : 380V 380: 760V	◇	F316
04.23	Voltage limit selection	0: Useless 1: Useful	1	◇	F317
04.24	Frequency gain for voltage limit	0~100	30	◇	F318
04.25	Voltage gain for voltage limit	0~100	30	◇	F319
04.26	Frequency rise threshold during voltage limit	0~50Hz	5Hz	◇	F31A
04.27	Slip Compensation Time Constant	0.1-10.0s	0.5s	◇	F31B

Group 05 Input Terminals

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
05.00	DI1 function selection	0: No function 1: Forward RUN (FWD) 2: Reverse RUN (REV) 3: Three-line control 4: Forward JOG (FJOG) 5: Reverse JOG (RJOG) 6: Terminal UP 7: Terminal DOWN	1	□	F400
05.01	DI2 functions election		2	□	F401
05.02	DI3 functions election		8	□	F402
05.03	DI4 functions election		9	□	F403
05.04	DI5 functions election		12	□	F404

<table>
<tr><th>Para. No.</th><th>Para. Name</th><th>Setting Range</th><th>Default</th><th>Modify</th><th>COM Add.</th></tr>
<tr><td>05.05</td><td>Reserved</td><td rowspan="5">8: Coast to stop
9: Fault reset (RESET)
10: RUN pause
11: Normally open input of external fault
12: Multi-reference terminal 1
13: Multi-reference terminal 2
14: Multi-reference terminal 3
15: Multi-reference terminal 4
16: Terminal 1 for acceleration/ deceleration time selection
17: Terminal 2 for ACC/DEC time selection
18: Frequency source switchover
19: UP and DOWN setting clear (terminal, operation panel)
20: Command source switchover terminal 1
21: Acceleration/Deceleration prohibited
22: PID pause
23: PLC status reset
24: Swing pause
25: Counter input
26: Counter reset
27: Length count input
28: Length reset
29: Reserved
30: Pulse input (enabled only for DI5)
31:Reserved
32: Immediate DC braking
33: Normally closed input of external fault
34: Frequency modification forbidden
35: Reverse PID action direction
36: External STOP terminal 1
37: Command source switchover terminal 2
38: PID integral pause
39: Switchover between main frequency source X and preset frequency
40: Switchover between auxiliary frequency source Y and preset frequency
41: Reserved
42: Reserved
43: PID parameter switchover
44: User-defined fault 1
45: User-defined fault 2
46: Reserved
47: Emergency stop
48: External STOP terminal 2
49: Deceleration DC braking
50: Clear the current running time
51: Run terminal below the forced under voltage point
52: Deceleration stop function, JOG is valid
53-59: Reserved</td><td>13</td><td>□</td><td>F405</td></tr>
<tr><td>05.06</td><td>Reserved</td><td>0</td><td>□</td><td>F406</td></tr>
<tr><td>05.07</td><td>Reserved</td><td>0</td><td>□</td><td>F407</td></tr>
<tr><td>05.08</td><td>Reserved</td><td>0</td><td>□</td><td>F408</td></tr>
<tr><td>05.09</td><td>Reserved</td><td>—</td><td>□</td><td>F409</td></tr>
<tr><td>05.10</td><td>DI filter time</td><td>0.000– 1.000s</td><td>0.010s</td><td>◇</td><td>F40A</td></tr>
</table>

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
05.11	Terminal command mode	0: Two-line mode 1 1: Two-line mode 2 2: Three-line mode 1 3: Three-line mode 2	0	□	F40B
05.12	Terminal UP/DOWN rate	0.01–65.535 Hz/s	1.00Hz/s	◇	F40C
05.13	AI curve 1 minimum input	0.00V to 05.15	0.00V	◇	F40D
05.14	Corresponding setting of AI curve 1 minimum input	-100.0%～+100.0%	0.0%	◇	F40E
05.15	AI curve 1 maximum input	05.13～+10.00V	10.00V	◇	F40F
05.16	Corresponding setting of AI curve 1	-100.0%～+100.0%	100.0%	◇	F410
05.17	AI1 filter time	0.00s～10.00s	0.10s	◇	F411
05.18	AI curve 2 minimum input	0.00V～05.20	0.00V	◇	F412
05.19	Corresponding setting of AI curve 2 minimum input	-100.0%～+100.0%	0.0%	◇	F413
05.20	AI curve 2 maximum input	05.18～+10.00V	10.00V	◇	F414
05.21	Corresponding setting of AI curve 2 maximum input	-100.0%～+100.0%	100.0%	◇	F415
05.22	AI2 filter time	0.00s～10.00s	0.10s	◇	F416
05.28	Pulse minimum input	0.00kHz～05.30	0.00KHz	◇	F41C
05.29	Corresponding setting of pulse minimum input	-100.0%～100.0%	0.0%	◇	F41D
05.30	Pulse maximum input	05.28～100.00KHz	50.00KHz	◇	F41E
05.31	Corresponding setting of pulse maximum input	-100.0%～100.0%	100.0%	◇	F41F
05.32	Pulse filter time	0.00s～10.00s	0.10s	◇	F420

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
05.33	AI curve selection	Bit: AI1 curve selection 1: curve 1 (2 points, see 05.13 ~ 05.16) 2: Curve 2 (2 points, see 05.18 ~ 05.21) 3: curve 3 (2 points, see 05.23 ~ 05.26) 4: curve 4 (4 points, see 24.00 ~ 24.07) 5: curve 5 (4 points, see 24.08 ~ 24.15) Ten: AI2 curve selection, as above Hundreds: Reserved	321	◇	F421
05.34	Setting selection when AI less than min. input	Bit: AI1 is lower than the minimum input setting 0: corresponds to the minimum input setting 1: 0.0% Ten: AI2 is lower than the minimum input setting, as above Hundreds: Reserved	000	◇	F422
05.35	DI1 delay time	0.0s～3600.0s	0.0s	□	F423
05.36	DI2 delay time	0.0s～3600.0s	0.0s	□	F424
05.37	DI3 delay time	0.0s～3600.0s	0.0s	□	F425
05.38	DI terminal valid mode selection 1 (DI1~DI5)	0: High level valid 1: Low level valid Bit: DI1 Ten’s digit: DI2 Hundred’s digit: DI3 Thousands of bits: DI4 Ten thousands of bits: DI5	00000	□	F426
05.39	DI terminal valid mode selection 2	0: High level valid 1: Low level valid Bit: Reserved Ten’s digit: Reserved Hundred’s digit: Reserved Thousands of bits: Reserved Ten thousands of bits: Reserved	00000	□	F427

Group 06 Output Terminals

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
06.00	HDO terminal output mode	0: Pulse output 1: Digital output	0	◇	F500
06.01	HDO terminal function (open-collector output terminal)	0: No output 1: AC drive running 2: Fault output (stop) 3: Frequency-level detection FDT1 output 4: Frequency reached 5: Zero-speed running (no output at stop) 6: Motor overload pre-warning 7: AC drive overload pre-warning 8: Set count value reached 9: Designated count value reached	0	◇	F501
06.02	Relay output (TA-TB-TC)		2	◇	F502

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
		10: Length reached 11: PLC cycle complete 12: Accumulative running time reached 13: Frequency limited 14: Torque limited 15: Ready for RUN 16: AI1 larger than AI2 17: Frequency upper limit reached 18: Frequency lower limit reached (no output at stop) 19: Under voltage state output 20: Communication setting 21: Reserved 22: Reserved 23: Zero-speed running 2 (having output at stop) 24: Accumulative power-on time reached 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 exceeded 32: Load becoming 0 33: Reverse running 34: Zero current state 35: Module temperature reached 36: Software current limit exceeded 37: Frequency lower limit reached (having output at stop) 38: Alarm output 39: Motor overheat warning 40: Current running time reached 41: Fault output 42: Forward running 43: One-to-two control 44: High pressure arrives 45: Low pressure arrives			
06.06	HDO terminal function (High speed pulse output terminal)	0: Running frequency 1: Set frequency 2: Output current 3: Output torque 4: Output power 5: Output voltage 6: Pulse input(100% corresponds to 100.0KHz) 7: AI1 8: AI2 9: AI3 10: Length 11: Count value 12: Communication setting	0	◇	F506

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
06.07	AO1 output function selection	13: Motor speed 14: Output current (100.0% corresponds to 1000.0A) 15: Output voltage (100.0% corresponds to 1000.0V) 16: Motor output torque (actual value, percentage relative to motor)	0	◇	F507
06.09	Maximum HDO output frequency	0.01KHz～100.00KHz	50.00KHz	◇	F509
06.10	AO1 offset coefficient	-100.0%～+100.0%	0.0%	◇	F50A
06.11	AO1 gain	-10.00～+10.00	1.00	◇	F50B
06.14	AO1 filter time	0.00s～10.00s	0.0s	◇	F50E
06.16	HDO filter time	0.00s～10.00s	0.0s	◇	F510
06.17	HDO delay time	0.0s～3600.0s	0.0s	◇	F511
06.18	Relay delay time	0.0s～3600.0s	0.0s	◇	F512
06.22	DO terminal valid state selection	0: High level valid 1: Low level valid Bit: HDO Ten's digit: TA1-TB1-TC1 Hundred's digit: Reserved Thousands of bits: Reserved Ten thousands of bits: Reserved	00000	◇	F516

Group 07 Start/Stop Control

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
07.00	Start mode	0: Direct start 1: Rotational speed tracking restart 2: Pre-excited start (asynchronous motor)	0	◇	F600
07.01	Rotational speed tracking mode	0: From frequency at stop 1: From zero speed 2: From maximum frequency	0	□	F601
07.02	Rotational speed tracking speed	1– 100	20	◇	F602
07.03	Startup frequency	0.00– 10.00 Hz	0.00Hz	◇	F603
07.04	Startup frequency holding time	0.0– 100.0s	0.0s	□	F604
07.05	Startup DC braking current/ Pre-excited current	0%– 100%	0%	□	F605
07.06	Startup DC braking time/ Pre-excited time	0.0– 100.0s	0.0s	□	F606

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
07.07	Acceleration/Deceleration mode	0: Linear acceleration/deceleration 1: S-curve acceleration/deceleration A 2: S-curve acceleration/deceleration B	0	□	F607
07.08	Time proportion of S-curve start segment	0.0%～（100.0%-07.09）	30.0%	□	F608
07.09	Time proportion of S-curve end segment	0.0%～（100.0%-07.08）	30.0%	□	F609
07.10	Stop mode	0: Decelerate to stop 1: Coast to stop	0	◇	F60A
07.11	Initial frequency of stop DC braking	0.00Hz～Max.frequency	0.00Hz	◇	F60B
07.12	Waiting time of stop DC braking	0.0s～100.0s	0.0s	◇	F60C
07.13	Stop DC braking current	0%～100%	0%	◇	F60D
07.14	Stop DC braking time	0.0s～100.0s	0.0s	◇	F60E
07.15	Brake use ratio	0%～100%	100%	◇	F60F

Group 08 Keyboard and Display

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
08.01	MF.K Key function selection	0: MF.K key disabled 1: Switchover between operation panel control and remote command control (terminal or communication) 2: Switchover between forward rotation and reverse rotation 3: Forward JOG 4: Reverse JOG 5: Reverse	3	□	F700
08.02	STOP/RESET key function	0: STOP/RESET key enabled only in operation panel control 1: STOP/RESET key enabled in any operation mode	1	◇	F701
08.03	LED display running parameters 1	0000～FFFF Bit00: Running frequency 1 (Hz) Bit01: Set frequency (Hz) Bit02: Bus voltage (V) Bit03: Output voltage (V) Bit04: Output current (A) Bit05: Output power (kW) Bit06: Output torque (%) Bit07: DI input status Bit08: DO output status Bit09: AI1 voltage (V) Bit10: AI2 voltage (V) Bit11: AI3 voltage (V) Bit12: Count value	0xC01F	◇	F702

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
		Bit13: Length value Bit14: Load speed display Bit15: PID setting			
08.04	LED display running parameters 2	0000～FFFF Bit00: PID feedback Bit01: PLC stage Bit02: Pulse setting frequency (kHz) Bit03: Running frequency 2 (Hz) Bit04: Remaining running time Bit05: AI1 voltage before correction (V) Bit06: AI2 voltage before correction (V) Bit07: Reserved Bit08: Linear speed Bit09: Current power-on time (Hour) Bit10: Current running time (Min) Bit11: Pulse setting frequency (Hz) Bit12: Communication setting value Bit13: Reserved Bit14: Main frequency A display (Hz) Bit15: Auxiliary frequency B display (Hz)	0x01	◇	F703
08.05	LED stop display parameters	0000～FFFF Bit00: Set frequency (Hz) Bit01: Bus voltage (V) Bit02: DI input status Bit03: DO output status Bit04: AI1 voltage (V) Bit05: AI2 voltage (V) Bit06: AI3 voltage (V) Bit07: Count value Bit08: Length value Bit09: PLC stage Bit10: Load speed Bit11: PID setting Bit12: Pulse setting frequency (kHz)	33	◇	F704
08.06	Load speed display coefficient	0.0001～6.5000	1.0000	◇	F705
08.07	Heatsink temperature of inverter module	0.0℃～100.0℃	-	■	F706
08.08	Temporary software version	0.0℃～100.0℃	-	■	F707
08.09	Accumulative running time	0h～65535h	-	■	F708
08.10	Product number	300	-	■	F709
08.11	Software version	-	-	■	F70A
08.12	Number of decimal places for	0: 0 decimal places 1: 1 decimal place	0	◇	F70B

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
	load speed display	2: 2 decimal places 3: 3 decimal places			
08.13	Accumulative power-on time	0h～65535h	-	■	F70C
08.14	Accumulative power consumption	0～65535Kw*h	-	■	F70D

Group 09 Auxiliary Functions

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
09.00	JOG running frequency	0.00Hz～Max. frequency	2.00Hz	◇	F800
09.01	JOG acceleration time	0.0s～6500.0s	20.0s	◇	F801
09.02	JOG deceleration time	0.0s～6500.0s	20.0s	◇	F802
09.03	Acceleration time 2	0.0s～6500.0s	Model determined	◇	F803
09.04	Deceleration time 2	0.0s～6500.0s	Model determined	◇	F804
09.05	Acceleration time 3	0.0s～6500.0s	Model determined	◇	F805
09.06	Deceleration time 3	0.0s～6500.0s	Model determined	◇	F806
09.07	Acceleration time 4	0.0s～6500.0s	Model determined	◇	F807
09.08	Deceleration time 4	0.0s～6500.0s	Model determined	◇	F808
09.09	Jump frequency 1	0.00 Hz to maximum frequency	0.00Hz	◇	F809
09.10	Jump frequency 2	0.00 Hz to maximum frequency	0.00Hz	◇	F80A
09.11	Frequency jump amplitude	0.00 Hz to maximum frequency	0.00Hz	◇	F80B
09.12	Forward/Reverse rotation dead-zone time	0.0–3000.0s	0.0s	◇	F80C
09.13	Reverse control	0: Enabled 1: Disabled	0	◇	F80D
09.14	Running mode when set frequency lower than frequency lower limit	0: Run at frequency lower limit 1: Stop 2: Run at zero speed	0	◇	F80E

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
09.15	Droop control	0.00– 10.00 Hz	0.00Hz	◇	F80F
09.16	Accumulative power-on time threshold	0–65000 h	0h	◇	F810
09.17	Accumulative running time threshold	0–65000 h	0h	◇	F811
09.18	Startup protection	0: No 1: Yes	1	◇	F812
09.19	Frequency detection value (FDT1)	0.00 Hz to maximum frequency	50.00Hz	◇	F813
09.20	Frequency detection hysteresis (FDT hysteresis 1)	0.0%– 100.0% (FDT1 level)	5.0%	◇	F814
09.21	Detection range of frequency reached	0.00– 100% (maximum frequency)	0.0%	◇	F815
09.22	Jump frequency during acceleration/deceleration	0: Disabled 1: Enabled	0	◇	F816
09.25	Frequency switchover point between acceleration time 1 and acceleration time 2	0.00 Hz to maximum frequency	0.00Hz	◇	F819
09.26	Frequency switchover point between deceleration time 1 and deceleration time 2	0.00 to maximum frequency	0.00Hz	◇	F81A
09.27	Terminal JOG preferred	0: Disabled 1: Enabled	1	◇	F81B
09.28	Frequency detection value (FDT2)	0.00 to maximum frequency	50.00Hz	◇	F81C
09.29	Frequency detection hysteresis (FDT hysteresis 2)	0.0%– 100.0% (FDT2 level)	5.0%	◇	F81D
09.30	Any frequency reaching detection value 1	0.00 Hz to maximum frequency	50.00Hz	◇	F81E
09.31	Any frequency reaching detection amplitude 1	0.0%– 100.0% (maximum frequency)	0.0%	◇	F81F
09.32	Any frequency reaching detection value 2	0.00 Hz to maximum frequency	50.00Hz	◇	F820

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
09.33	Any frequency reaching detection amplitude 2	0.0%– 100.0% (maximum frequency)	0.0%	◇	F821
09.34	Zero current detection level	0.0%–300.0% (rated motor current)	5.0%	◇	F822
09.35	Zero current detection delay time	0.00–600.00s	0.10s	◇	F823
09.36	Output overcurrent threshold	0.0% (no detection) 0.1%–300.0% (rated motor current)	200.0%	◇	F824
09.37	Output overcurrent detection delay time	0.00–600.00s	0.00s	◇	F825
09.38	Any current reaching 1	0.0%–300.0% (rated motor current)	100.0%	◇	F826
09.39	Any current reaching 1 amplitude	0.0%–300.0% (rated motor current)	0.0%	◇	F827
09.40	Any current reaching 2	0.0%–300.0% (rated motor current)	100.0%	◇	F828
09.41	Any current reaching 2 amplitude	0.0%–300.0% (rated motor current)	0.0%	◇	F829
09.42	Timing function	0: Disabled 1: Enabled	0	◇	F82A
09.43	Timing duration source	0: 09.44 1: AI1 2: AI2 3: Reserved (100% of analog input corresponds to the value of 09.44)	0	◇	F82B
09.44	Timing duration	0.0–6500.0 min	0.0Min	◇	F82C
09.45	AI1 input voltage lower limit	0.00 V to 09.46	3.10V	◇	F82D
09.46	AI1 input voltage upper limit	09.45 to 10.00 V	6.80V	◇	F82E
09.47	Module temperature threshold	0– 100°C	75℃	◇	F82F
09.48	Cooling fan control	0: Fan working during running 1: Fan working continuously	0	◇	F830
09.49	Current running time reached	0.0Min～6500.0Min	0.0Min	◇	F831

Group 10 Faults and Protections

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
10.00	Motor overload protection selection	0: Disabled 1: Enabled	1	◇	F900
10.01	Motor overload protection gain	0.20～10.00	1.00	◇	F901
10.02	Motor overload warning coefficient	50%～100%	80%	◇	F902

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
10.03	Overvoltage stall gain	0～100	30	◇	F903
10.04	Overvoltage stall protective voltage	650V～800V	760V	◇	F904
10.05	Overcurrent stall gain	0～100	20	◇	F905
10.06	Overcurrent stall protective current	100%～200%	150%	◇	F906
10.07	Short-circuit to ground upon power-on	0: Disabled 1: Enabled	1	◇	F907
10.08	Braking unit action starting	200.0~2000.0V	690.0V	◇	F908
10.09	Fault auto reset times	0～20	0	◇	F909
10.10	DO action during fault auto reset	0: no action 1: Action	0	◇	F90A
10.11	Time interval of fault auto	0.1s～100.0s	1.0s	◇	F90B
10.12	Input phase loss protection/ contactor energizing protection selection	10: Prohibit 11: Allow	11	◇	F90C
10.13	Output phase loss protection selection	0: Prohibit 1: Allow	1	◇	F90D
10.14	1st fault type	0: No fault 1: Reserved 2: Overcurrent during acceleration 3: Overcurrent during deceleration 4: Overcurrent at constant speed	E.XXX	■	F90E
10.15	2nd fault type		E.XXX	■	F90F

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
10.16	3rd (latest) fault type	5: Overvoltage during acceleration 6: Overvoltage during deceleration 7: Overvoltage at constant speed 8: Buffer resistance overload 9: Under voltage 10: AC drive overload 11: Motor overload 12:Power input phase loss 13: Power output phase loss 14: Module overheat 15: External equipment fault 16: Communication fault 17: Contactor fault 18: Current detection fault 19: Motor auto-tuning fault 20: Encoder/PG card fault 21: EEPROM read-write fault 22: AC drive hardware fault 23: Short circuit to ground 24: Reserved 25: Reserved 26: Accumulative running time reached 27: User-defined fault 1 28: User-defined fault 2 29: Accumulative power-on time reached 30: Load becoming 0 31: PID feedback lost during running 40: With-wave current limit fault 41: Motor switchover fault during running 42: Too large speed deviation 43: Motor over-speed 45: Motor overheat 51: Initial position fault	E.XXX	■	F910
10.17	Frequency upon 3rd fault	—	Hz	■	F911
10.18	Current upon 3rd fault	—	A	■	F912
10.19	Bus voltage upon 3rd fault	—	V	■	F913
10.20	DI status upon 3rd fault	—	—	■	F914
10.21	Output terminal status upon 3rd fault	—	—	■	F915
10.22	AC drive status upon 3rd fault	—	—	■	F916
10.23	Power-on time upon 3rd fault	—	s	■	F917
10.24	Running time upon 3rd fault	—	s	■	F918
10.27	Frequency upon 2nd fault	—	Hz	■	F91B

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
10.28	Current upon 2nd fault	—	A	■	F91C
10.29	Bus voltage upon 2nd fault	—	V	■	F91D
10.30	DI status upon 2nd fault	—	—	■	F91E
10.31	DO status upon 2nd fault	—	—	■	F91F
10.32	AC drive state upon 2nd fault	—	—	■	F920
10.33	Power-on time upon 2nd fault	—	s	■	F921
10.34	Running time upon 2nd fault	—	s	■	F922
10.37	Frequency upon 1st fault	—	Hz	■	F925
10.38	Current upon 1st fault	—	A	■	F926
10.39	Bus voltage upon 1st fault	—	V	■	F927
10.40	DI state upon 1st fault	—	—	■	F928
10.41	DO state upon 1st fault	—	—	■	F929
10.42	AC drive state upon 1st fault	—	—	■	F92A
10.43	Power-on time upon 1st fault	—	s	■	F92B
10.44	Running time upon 1st fault	—	s	■	F92C
10.47	Fault protection action selection 1	Bit: Motor overload (FU11) 0: Free parking 1: Stop by stop mode 2: continue to run Ten bit: input phase loss (FU12) (reserved) Hundreds bit: output phase loss (FU13) Thousands bit: External Fault (FU15) Ten thousands bit: communication error (FU16)	00000	◇	F92F
10.48	Fault protection action selection 2	Bit: keep(FU 20) 0: Free parking Ten bit: function code read and write exception (FU21) 0: Free parking 1: Stop by stop mode Hundreds bit: Inverter overload fault action selection (FU10) 0: Free stop 1: derating operation Thousands bit: Motor overheating (FU45) Ten thousands bit: Run time arrives (FU26)	00000	◇	F930

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
10.49	Fault protection action selection 3	Bit: User-defined fault 1 (FU27) 0: Free parking 1: stop according to the stop mode 2: keep running Tens bit: User-defined fault 2 (FU28) 0: Free parking 1: stop according to the stop mode 2: keep running Hundreds bit: the power-on time arrives (FU29) 0: Free parking 1: stop according to the stop mode 2: keep running Thousands bit: drop load (FU30) 0: Free parking 1: Decelerate to stop 2: Decelerate to 7% of the rated frequency of the motor and continue to run OK, it will automatically return to the set frequency operation when the load is not dropped. Ten thousand bit: PID feedback lost during runtime (FU31) 0: Free parking 1: stop according to the stop mode 2: keep running	00000	◇	F931
10.50	Fault protection action selection 4	Bit: Speed deviation is too large (FU42) 0: Free parking 1: Stop by stop mode 2: continue to run Ten bit: motor over speed (FU43) Hundreds bit: initial position error (FU51)	00000	◇	F932
10.54	Frequency selection for continuing to run upon fault	0: Run at the current operating frequency 1: run at the set frequency 2: Run at the upper limit frequency 3: Run at the following frequency limit 4: Run at abnormal backup frequency(10.55)	0	◇	F936
10.55	Backup frequency upon abnormality	0.0%– 100.0% (maximum frequency)	100.0%	◇	F937
10.56	Type of motor temperature sensor	0: No temperature sensor 1: PT100 2: PT1000	0	◇	F938
10.57	Motor overheat protection threshold	0–200°C	110℃	◇	F939

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
10.58	Motor overheat warning threshold	0–200°C	90℃	◇	F93A
10.59	Action selection at instantaneous power failure	0: Invalid 1: Decelerate 2: Decelerate to stop	0	◇	F93B
10.60	Action pause judging voltage at instantaneous power failure	80.0%– 100.0%	100.0%	◇	F93C
10.61	Voltage rally judging time at instantaneous power failure	0.00– 100.00s	0.50s	◇	F93D
10.62	Action judging voltage at instantaneous power failure	60.0%– 100.0% (standard bus voltage)	80.0%	◇	F93E
10.63	Protection upon load becoming 0	0: Disabled 1: Enabled	0	◇	F93F
10.64	Detection level of load becoming 0	0.0%– 100.0% (rated motor current)	10.0%	◇	F940
10.65	Detection time of load becoming 0	0.0–60.0s	1.0s	◇	F941
10.66	Inverter overheating pre-alarm threshold setting	0.0℃～150.0℃	95℃	◇	F942
10.67	Over-speed detection value	0.0%–50.0% (maximum frequency)	20.0%	◇	F943
10.68	Over-speed detection time	0.0–60.0s	5.0s	◇	F944
10.69	Detection value of too large speed deviation	0.0%–50.0% (maximum frequency)	20.0%	◇	F945
10.70	Detection time of too large speed deviation	0.0–60.0s	0.0s	◇	F946

Group 11 PID functions

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
11.00	PID setting source	0: 11.01 set 1: AI1 2: AI2 3: Reserved 4: Pulse setting (DI5) 5: Communication setting 6: Multi-reference 7: keyboard potentiometer	7	◇	FA00
11.01	PID digital setting	0.0～100.0Bar	3.0Bar	◇	FA01

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
11.02	PID feedback source	0: AI1 1: AI2 2: Reserved 3: AI1–AI2 4: Pulse setting (DI5) 5: Communication setting 6: AI1 + AI2 7: MAX (|AI1|, |AI2|) 8: MIN (|AI1|, |AI2|)	0	◇	FA02
11.03	PID action direction	0: Forward action 1: Reverse action	0	◇	FA03
11.04	PID setting feedback range	0–65535	10.0Bar	◇	FA04
11.05	Proportional gain Kp1	0.0– 100.0	20.0	◇	FA05
11.06	Integral time Ti1	0.01– 10.00s	1.00s	◇	FA06
11.07	Differential time Td1	0.00– 10.000	0.000s	◇	FA07
11.08	Cut-off frequency of PID reverse rotation	0.00 to maximum frequency	0.00Hz	◇	FA08
11.09	PID deviation limit	0.0%– 100.0%	0.0%	◇	FA09
11.10	PID differential limit	0.00%– 100.00%	0.10%	◇	FA0A
11.11	PID setting change time	0.00–650.00s	0.00s	◇	FA0B
11.12	PID feedback filter time	0.00–60.00s	0.00s	◇	FA0C
11.13	PID output filter time	0.00–60.00s	0.00s	◇	FA0D
11.14	Reserved	-	0.0%	◇	FA0E
11.15	Proportional gain Kp2	0.0– 100.0	20.0	◇	FA0F
11.16	Integral time Ti2	0.01– 10.00s	1.00s	◇	FA10
11.17	Differential time Td2	0.000– 10.000s	0.000s	◇	FA11
11.18	PID parameter switchover condition	0: No switchover 1: Switchover via DI 2: Automatic switchover based on deviation	0	◇	FA12
11.19	PID parameter switchover deviation 1	0.0% to 11.20	20.0%	◇	FA13
11.20	PID parameter switchover deviation 2	11.19 to 100.0%	80.0%	◇	FA14
11.21	PID initial value	0.0%– 100.0%	0.0%	◇	FA15
11.22	PID initial value holding time	0.00–650.00s	0.00s	◇	FA16
11.23	Maximum deviation between two PID outputs in forward direction	0.00%– 100.00%	1.00%	◇	FA17

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
11.24	Maximum deviation between two PID outputs in REVERSE direction	0.00%～100.00%	1.00%	◇	FA18
11.25	PID integral property	Bit: integral separation 0: invalid 1: valid Ten Bit: Whether to stop the integration after outputting to the limit 0: Continue to score 1: stop the points	00	◇	FA19
11.26	Detection level of PID feedback loss	0.0%: No detection 0.1% to 100.0%	0.0%	◇	FA1A
11.27	Detection time of PID feedback loss	0.0s to 20.0s	0.0s	◇	FA1B
11.28	Selection of PID operation at stop	0: Operation at stopped 1: Operation at stop	0	◇	FA1C

Group 12 Swing Frequency, Fixed Length and Count

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
12.00	Swing frequency setting mode	0: Relative to the central frequency 1: Relative to the maximum frequency	0	◇	FB00
12.01	Swing frequency amplitude	0.0%～100.0%	0.0%	◇	FB01
12.02	Jump frequency amplitude	0.0%～50.0%	0.0%	◇	FB02
12.03	Swing frequency cycle	0.1s～3000.0s	10.0s	◇	FB03
12.04	Triangular wave rising time coefficient	0.1%～100.0%	50.0%	◇	FB04
12.05	Set length	0m～65535m	1000m	◇	FB05
12.06	Actual length	0m～65535m	0m	◇	FB06
12.07	Number of pulses per meter	0.1～6553.5	100.0	◇	FB07
12.08	Set count value	1～65535	1000	◇	FB08
12.09	Designated count value	1～65535	1000	◇	FB09

Group 13 Multi-Reference and Simple PLC Function

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
13.00	Reference 0	-100.0%～100.0%	0.0%	◇	FC00
13.01	Reference 1	-100.0%～100.0%	0.0%	◇	FC01
13.02	Reference 2	-100.0%～100.0%	0.0%	◇	FC02
13.03	Reference 3	-100.0%～100.0%	0.0%	◇	FC03
13.04	Reference 4	-100.0%～100.0%	0.0%	◇	FC04
13.05	Reference 5	-100.0%～100.0%	0.0%	◇	FC05
13.06	Reference 6	-100.0%～100.0%	0.0%	◇	FC06

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
13.07	Reference 7	-100.0%～100.0%	0.0%	◇	FC07
13.08	Reference 8	-100.0%～100.0%	0.0%	◇	FC08
13.09	Reference 9	-100.0%～100.0%	0.0%	◇	FC09
13.10	Reference 10	-100.0%～100.0%	0.0%	◇	FC0A
13.11	Reference 11	-100.0%～100.0%	0.0%	◇	FC0B
13.12	Reference 12	-100.0%～100.0%	0.0%	◇	FC0C
13.13	Reference 13	-100.0%～100.0%	0.0%	◇	FC0D
13.14	Reference 14	-100.0%～100.0%	0.0%	◇	FC0E
13.15	Reference 15	-100.0%～100.0%	0.0%	◇	FC0F
13.16	Simple PLC running mode	0: Stop after the AC drive runs one cycle 1: Keep final values after the AC drive runs one cycle 2: Repeat after the AC drive runs one cycle	0	◇	FC10
13.17	Simple PLC retentive selection	Bit: Memory selection when power off 0: No memory when power off 1: Memory when power off Tens bit: memory selection during stop 0: No memory when stopped 1: Memory when stopped	00	◇	FC11
13.18	Running time of simple PLC reference 0	0.0s（h）～6500.0（h）	0.0s(h)	◇	FC12
13.19	Acceleration/deceleration time of simple PLC reference 0	0～3	0	◇	FC13
13.20	Running time of simple PLC reference 1	0.0s（h）～6500.0（h）	0.0s(h)	◇	FC14
13.21	Acceleration/deceleration time of simple PLC reference 1	0～3	0	◇	FC15
13.22	Running time of simple PLC reference 2	0.0s（h）～6500.0（h）	0.0s(h)	◇	FC16
13.23	Acceleration/deceleration time of simple PLC reference 2	0～3	0	◇	FC17
13.24	Running time of simple PLC reference 3	0.0s（h）～6500.0（h）	0.0s(h)	◇	FC18
13.25	Acceleration/deceleration time of simple PLC reference 3	0～3	0	◇	FC19
13.26	Running time of simple PLC reference 4	0.0s（h）～6500.0（h）	0.0s(h)	◇	FC1A
13.27	Acceleration/deceleration time of simple PLC reference 4	0～3	0	◇	FC1B
13.28	Running time of simple PLC reference 5	0.0s（h）～6500.0（h）	0.0s(h)	◇	FC1C
13.29	Acceleration/deceleration time of simple PLC reference 5	0～3	0	◇	FC1D
13.30	Running time of simple PLC reference 6	0.0s（h）～6500.0（h）	0.0s(h)	◇	FC1E

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
13.31	Acceleration/deceleration time of simple PLC reference 6	0～3	0	◇	FC1F
13.32	Running time of simple PLC reference 7	0.0s（h）～6500.0（h）	0.0s(h)	◇	FC20
13.33	Acceleration/deceleration time of simple PLC reference 7	0～3	0	◇	FC21
13.34	Running time of simple PLC reference 8	0.0s（h）～6500.0（h）	0.0s(h)	◇	FC22
13.35	Acceleration/deceleration time of simple PLC reference 8	0～3	0	◇	FC23
13.36	Running time of simple PLC reference 9	0.0s（h）～6500.0（h）	0.0s(h)	◇	FC24
13.37	Acceleration/deceleration time of simple PLC reference 9	0～3	0	◇	FC25
13.38	Running time of simple PLC reference 10	0.0s（h）～6500.0（h）	0.0s(h)	◇	FC26
13.39	Acceleration/deceleration time of simple PLC reference 10	0～3	0	◇	FC27
13.40	Running time of simple PLC reference 11	0.0s（h）～6500.0（h）	0.0s(h)	◇	FC28
13.41	Acceleration/deceleration time of simple PLC reference 11	0～3	0	◇	FC29
13.42	Running time of simple PLC reference 12	0.0s（h）～6500.0（h）	0.0s(h)	◇	FC2A
13.43	Acceleration/deceleration time of simple PLC reference 12	0～3	0	◇	FC2B
13.44	Running time of simple PLC reference 13	0.0s（h）～6500.0（h）	0.0s(h)	◇	FC2C
13.45	Acceleration/deceleration time of simple PLC reference 13	0～3	0	◇	FC2D
13.46	Running time of simple PLC reference 14	0.0s（h）～6500.0（h）	0.0s(h)	◇	FC2E
13.47	Acceleration/deceleration time of simple PLC reference 14	0～3	0	◇	FC2F
13.48	Running time of simple PLC reference 15	0.0s（h）～6500.0（h）	0.0s(h)	◇	FC30
13.49	Acceleration/deceleration time of simple PLC reference 15	0～3	0	◇	FC31
13.50	Time unit of simple PLC running	0: s (second) 1:h (hour)	0	◇	FC32
13.51	Reference 0 source	0: Set by 13.00 1: AI1 2: AI2 3: AI3 keyboard potentiometer 4: Pulse setting 5: PID 6: Set by preset frequency (01. 08), modified via terminal UP/ DOWN	7	◇	FC33

Group 14 Communication Parameters

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
14.00	Baud rate	Bit: MODBUS 0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS Ten bit: Profibus-DP 0: 115200BPS 1: 208300BPS 2: 256000BPS 3: 512000BpS Hundred's bit:Reserved Thousand's bit (CANlink baud rate) 0: 20 1: 50 2: 100 3: 125 4: 250 5: 500 6: 1M	6005	◇	FD00
14.01	MODBUS data format	0: No parity (8-N-2) 1: Even check (8-E-1) 2: Odd parity (8-O-1) 3: No parity (8-N-1)	0	◇	FD01
14.02	Local address	0: Broadcast address; 1 to 247	1	◇	FD02
14.03	MODBUS response delay	0ms～20ms	2	◇	FD03
14.04	Communication timeout	0.0: invalid 0.1s to 60.0s	0.0	◇	FD04
14.05	Modbus protocol selection	Bit: MODBUS 0: non-standard MODBUS protocol 1: Standard MODBUS protocol Ten bit:Reserved	31	◇	FD05
14.06	Current resolution read by communication	0: 0.01 1: 0.1	0	◇	FD06
14.07	Communication master-slave mode	0: Slave 1: Mater	0	◇	FD07

Group 15~16 Reserved
Group 17 Function Code Management

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
17.00	User password	0～65535	0	◇	1F00

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
17.01	Parameter initialization	0: No operation 1: Restore factory parameters except motor parameters 2: Clear records 4: Back up current user parameters 501: Restore user backup parameters	0	◇	1F01
17.02	Parameter display property	Bit: 00 group display selection 0: Not displayed 1: Display Ten: Group(18~30) display the selection 0: Not displayed 1: Display	11	◇	1F02
17.03	Selection of individualized parameter display	Bit: User custom parameter group display selection 0: Not displayed 1: Display Ten bit: User Change Parameter Group Display Selection 0: Not displayed 1: Display	00	◇	1F03
17.04	Selection of parameter modification	0: Can be modified 1: Cannot be modified	0	◇	1F04

Group18~22 Reserved

Group 23 Control Optimization Parameters

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
23.00	DPWM switchover frequency upper limit	0.00– 15.00 Hz	8.00Hz	◇	A500
23.01	PWM modulation mode	0: Asynchronous modulation 1: Synchronous modulation	0	◇	A501
23.02	Dead zone compensation mode selection	0: No compensation 1: Compensation mode 1 2: Compensation mode 2	1	◇	A502
23.03	Random PWM depth	0: Random PWM invalid 1-10	0	◇	A503
23.04	Rapid current limit	0: Disabled1: Enabled	1	◇	A504
23.05	Current detection compensation	0- 100	5	◇	A505
23.06	Under voltage threshold	60.0%– 140.0%	100%	◇	A506
23.07	SVC optimization mode selection	0: No optimization 1: Optimization mode 1 2: Optimization mode 2	2	◇	A507
23.08	Dead-zone time adjustment	100%–200%	150%	◇	A508
23.09	Overvoltage threshold	200.0–2500.0 V	800.0V	◇	A509

Para. No.	Para. Name	Setting Range	Default	Modify	COM Add.
23.10	Low frequency variable carrier enable	0-1	1	◇	A509
23.11	Zero speed running output enable	0-1	1	◇	A510
23.12	Power phase loss protection sensitivity	0-30.0%	13%	◇	A511

Chapter 6: Parameter Description

Group 00 Monitoring parameter group

The 00 parameter group is used to monitor the operating status information of the inverter. The customer can view it through the panel to facilitate on-site debugging, and can also read the parameter group value through communication for monitoring by the host computer.

The communication address is 0x7000～0x7044.

Among them, 00.00～00.31 are the running and stop monitoring parameters defined in 08.03 and 08.04.

00.00	Running frequency(Hz)	Display range	0.00～500.00Hz(01.22=2) 0.00～500.00Hz(01.22=1)
00.01	Setting frequency(Hz)		

Displays the theoretical running frequency of the inverter and the absolute value of the set frequency. For the actual output frequency of the inverter, see 00.19

00.02	DC bus voltage(V)	Display range	0.0V～3000.0V

Display the inverter bus voltage value

00.03	The output voltage(V)	Display range	0V～1140V

Display the output voltage value of the inverter during operation

00.04	The output current(V)	Display range	0.00A～655.35A (≤ 55KW) 0.0A～6553.5A (>55KW)

Display the output current value of the inverter during operation

00.05	The output power(kW)	Display range	0～32767

The calculated value of actual output power of motor

00.06	Output torque(%)	Display range	-200.0%～ 200.0%

Display the output torque value of the inverter during operation

00.07	DI input status	Display range	0～ 32767

Displays the current X terminal input state value in hexadecimal. After conversion into binary data, each bit corresponds to the X input signal, 1 indicates that the input is a high-level signal, and 0 indicates that the input is a low-level signal. The corresponding relationship between each bit and the input terminal is as follows:

Bit0	Bit1	Bit2	Bit3
DI1	DI2	DI3	DI4
Bit4	Bit5	Bit6	Bit7
DI5	-	-	-

00.08	DO output status	Display range	0~1023

Displays the current DO terminal output status value in hexadecimal. After conversion into binary data, each bit corresponds to a DO signal, 1 means the output is high, and 0 means the output is low. The correspondence between each bit and DO is as follows:

Bit0	Bit1	Bit2	Bit3
-	Relay 1	-	HDO

00.10	AI1 voltage）/current (mA）	Display range	0.00V~10.57V 0.00mA~20.00mA

When 05.40 is set to 0, the AI1 sampling data display unit is voltage (V)

When 05.40 is set to 1, AI1 sampling data display unit is current (mA)

00.14	Load speed display	Display range	0~65535

See 08.12 for details.

00.15	PID set	Display range	0~65535
00.16	PID feedback	Display range	0~65535

Display PID set value and feedback value, the value format is as follows:
PID setting=PID setting (percent)*11.04
PID feedback=PID feedback (percent)*11.04

00.18	PULSE pulse input frequency(kHz)	Display range	0.00kHz~100.00KHz

Display DI5 high-speed pulse sampling frequency, the minimum unit is 0.01KHz

00.19	Feedback speed	Display range	-320.00Hz~320.00Hz -500.0Hz~500.0Hz

Display the actual output frequency of the inverter

The ten-digit setting value of function code 08.12 (load speed display decimal point) indicates the number of decimal points in 00.19/00.29,

When it is set to 2, the number of decimal points in 00.19 is 2, and the Display range is -320.00Hz～320.00Hz;
When it is set to 1, the number of decimal points in 00.19 is 1, and the Display range is -500.0Hz to 500.0Hz.

00.20	Surplus remaining time	Display range	0.0~6500.0min

Displays the remaining run time of the timing run
For the introduction of timing operation, see the introduction of parameters 09.42~09.44

00.21	AI1 voltage before correction	Display range	0.000V~10.570V
00.22	AI2 voltage/Current before correction	Display range	0.000V~10.570V 0.000mA~20.000mA

Displays the actual value of the analog input sampled voltage/current.

The actual voltage/current used is linearly corrected to make the deviation between the sampled voltage/current and the actual input voltage/current smaller.

See 00.09, 00.10, 00.11 for the actual correction voltage/current used.

00.24	Linear velocity	Display range	0~65535 m/min

Displays the linear velocity of the DI5 high-speed pulse sampling, in m/min

Calculate the linear velocity value according to the actual number of sampled pulses per minute and 12.07 (pulses per meter)

00.27	PULSE input frequency	Display range	0~65535Hz

Display the DI5 high-speed pulse sampling frequency, the unit is 1Hz. It is the same data as 00.18, only the displayed unit is different

00.28	Communication set value	Display range	-100.00%~100.00%

Display data written through communication address 0x1000

00.30	Main frequency X display	Display range	0.00Hz~320.00Hz 0.0Hz~3200.0Hz

Main frequency source set frequency

00.31	Auxiliary frequency Y display	Display range	0.00Hz~320.00Hz 0.0Hz~3200.0Hz

Auxiliary frequency source set frequency

00.35	Target torque(%)	Display range	-200.0% ～ 200.0%

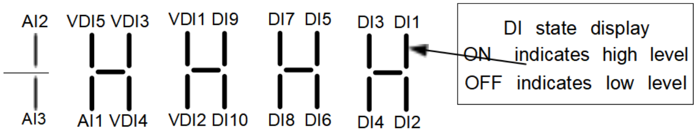
Display the current torque upper limit set value

00.39	VF separation target voltage	Display range	0V~Motor rated voltage
00.40	VF separation output voltage	Display range	0V~Motor rated voltage

Displays the target output voltage and the current actual output voltage when operating in the VF separation state
For the VF separation mode, please refer to the related introduction of the 04 group.

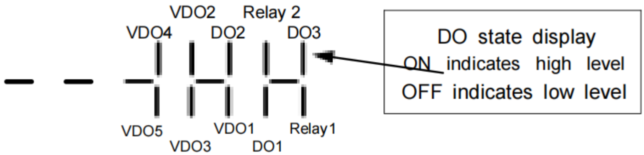
00.41	DI input status display	Display range	-

Visually display the DI terminal status, the display format is as follows:



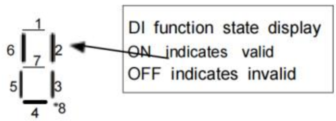
00.42	DO output status display	Display range	-

Visually display the DO terminal status, the display format is as follows:



00.43	DI function status display1	Display range	-

Visually display whether terminal functions 1 to 40 are valid
There are 5 digital tubes on the keyboard, and each digital tube display can represent 8 function options
The definition of digital tube is as follows:



The digital tubes represent functions from right to left:
1～8、9～16、17～24、25～32、33～40

00.44	DI function status display2	Display range	-

Visually display whether terminal functions 41 to 59 are valid
The display is similar to 00.43
The digital tubes represent functions 41-48, 49-56, 57-59 from right to left respectively

00.58	Z signal counter	Display range	0 ～65535

Display current ABZ or UVW encoder Z-phase pulse count
When the encoder rotates forward or reverse every time, the corresponding value is added or subtracted by 1. Check the value to check whether the encoder is installed normally.

00.59	Set frequency	Display range	-100.00% ～100.00%
00.60	running frequency	Display range	-100.00% ～100.00%

Display the current set frequency and running frequency, 100.00% corresponds to the maximum frequency of the inverter (01.10)

00.61	Inverter running status	Display range	0 ～65535

Display inverter running status information, the data definition format is as follows:

<table>
<tr><td rowspan="5">00.61</td><td>Bit0</td><td rowspan="2">0 :STOP ; 1 :FWD ; 2 :REV</td></tr>
<tr><td>Bit1</td></tr>
<tr><td>Bi2</td><td rowspan="2">0 :Constant ; 1 :Accelerate ; 2 :Decelerate</td></tr>
<tr><td>Bit3</td></tr>
<tr><td>Bit4</td><td>0 :DC Bus normal ; 1 :Under-voltage</td></tr>
</table>

00.62	Current fault code	Display range	0 ～99

Group 01 Basic Function Group

01.00	GP type display		Default	Model dependent
	Setting Range	1	G type (constant torque load)	
		2	P type (variable torque load e.g. fan and pump)	

This parameter is used to display the delivered model and cannot be modified
1: Applicable to constant torque load with rated parameters specified
2: Applicable to variable torque load (fan and pump) with rated parameters specified

01.01	Motor 1 control		Default	0
	Setting Range	0	Sensor less flux vector control (SVC)	
		1	Reserved	
		2	Voltage/Frequency (V/F) control	

0: Sensor less flux vector control (SVC)
It indicates open-loop vector control, and is applicable to high-performance control applications such as machine tool, centrifuge, wire drawing machine and injection molding machine. One AC drive can operate only one motor.
1: Reserved
2: Voltage/Frequency (V/F) control
It is applicable to applications with low load requirements or applications where one AC drive operates multiple motors, such as fan and pump.
Note: If vector control is used, motor auto-tuning must be performed because the advantages of vector control can only be utilized after correct motor parameters are obtained. Better performance can be achieved by adjusting speed regulator parameters in group 02 (or groups A2, A3, and A4 respectively for motor 2, 3, and 4).

01.02	Command source selection		Default	0
	Setting Range	0	Operation panel control (LED off)	
		1	Terminal control (LED on)	
		2	Communication control (LED blinking)	

It is used to determine the input channel of the AC drive control commands, such as run, stop, forward rotation, reverse rotation and jog operation.
0：Operation panel control channel (“LOCAL/REMOT” indicator off)
Commands are given by pressing keys “RUN” and “STOP/RES” on the operation panel
1：Terminal control (“LOCAL /REMOT” indicator on)
Commands are given by means of multifunctional input terminals with functions such as FWD, REV, JOGF, and JOGR.
2：Communication control channel (“LOCAL/REMOT” indicator blinking)
Commands are given from host computer.

01.03	Main frequency source X selection		Default	0
	Setting Range	0	Digital setting (Preset frequency 01.08, UP/DOWN adjustable, non-retentive at power failure)	
		1	Digital setting (Preset frequency 01.08, UP/DOWN adjustable, retentive at power failure)	
		2	AI1	
		3	AI2	
		4	AI3 (keyboard potentiometer)	

		5	Pulse setting (DI5)
		6	Multi-reference
		7	PLC
		8	PID
		9	Communication setting

It is used to select the setting channel of the main frequency. You can set the main frequency in the following 10 channels:

0: Digital setting (non-retentive at power failure)

The initial value of the set frequency is the value of 01.08 (Preset frequency). You can change the set frequency by pressing ▲ and ▼ on the operation panel (or using the UP/DOWN functions of input terminals).

When the AC drive is powered on again after power failure, the set frequency reverts to the value of 01.08.

1: Digital setting (retentive at power failure)

The initial value of the set frequency is the value of 01.08 (Preset frequency). You can change the set frequency by pressing keys ▲ and ▼ on the operation panel (or using the UP/DOWN functions of input terminals).

When the AC drive is powered on again after power failure, the set frequency is the value memorized at the moment of the last power failure.

Note that 01.23 (Retentive of digital setting frequency upon power failure) determines whether the set frequency is memorized or cleared when the AC drive stops. It is related to stop rather than power failure.

2: AI1

3: AI2

4: AI3 (keyboard potentiometer)

5: Pulse setting (DI5)

The frequency is set by DI5 (high-speed pulse). The signal specification of pulse setting is 9–30 V (voltage range) and 0–100 kHz (frequency range). Input pulse can only be given from multifunctional input terminals DI5. The relation between DI5 terminal input pulse frequency and the corresponding set, is designed through the 05.28～05.31, the corresponding relation of two points is straight line corresponding relation. The corresponding value 100% of pulse setting corresponds to the value of 01.10 (Maximum frequency).

6: Multi-reference

In multi-reference mode, combinations of different DI terminal states correspond to different set frequencies. The DSI-100 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 01.10 (Maximum frequency).

If a DI terminal is used for the multi-reference function, you need to perform related setting in group 04.

7. Simple PLC

When the frequency source is a simple PLC, the operating frequency source of the inverter can be switched between 1 to 16 arbitrary frequency commands. The holding time and the respective acceleration and deceleration time of the 1 to 16 frequency commands can also be set by the user. For details, please refer to Instructions for PC groups.

8. PID

Select the output of the process PID control as the operating frequency. Generally used for on-site process closed-loop control, such as constant pressure closed-loop control, constant tension closed-loop control and other occasions.

When using PID as the frequency source, it is necessary to set the relevant parameters of the "PID function" of the PA group.

9. Communication given

Refers to the frequency given by the communication method.

01.04	Auxiliary frequency source		Default	0
	Setting Range	0	Digital setting (Preset frequency 01.08, UP/DOWN adjustable, non-retentive at power failure)	
		1	Digital setting (Preset frequency 01.08, UP/DOWN adjustable, retentive at power failure)	
		2	AI1	
		3	AI2	
		4	AI3 (keyboard potentiometer)	
		5	Pulse setting (DI5)	
		6	Multi-reference	
		7	PLC	
		8	PID	
		9	Communication setting	

When the auxiliary frequency source is used as an independent frequency reference channel (that is, the frequency source is selected as X to Y switching), its usage is the same as that of the main frequency source X. For the usage method, please refer to the relevant instructions in 01.03.

When the auxiliary frequency source is used as the superposition reference (that is, the composite realization frequency reference of the main frequency source X and the auxiliary frequency source Y), it is necessary to pay attention to:

1. When the auxiliary frequency source is a digital reference, the preset frequency (01.08) does not work. The frequency adjustment by the user through the ▲ and ▼ keys of the keyboard (or the UP and DOWN of the multi-function input terminal) is directly in the main reference. adjusted on a frequency basis.

2. When the auxiliary frequency source is given by analog input (AI1, AI2) or pulse input, 100% of the input setting corresponds to the range of auxiliary frequency source, which can be set by 01.05 and 01.06.

3. When the frequency source is pulse input given, it is similar to analog given.

Tip: The auxiliary frequency source Y selection and the main frequency source X selection cannot be set to the same channel, that is, 01.03 and 01.04 should not be set to the same value, otherwise it will easily cause confusion.

01.05	Range of auxiliary frequency Y for X and Y		Default	0
	Setting Range	0	Relative to maximum frequency	
		1	Relative to main frequency X	
01.06	Range of auxiliary frequency Y for X and Y		Default	0
	Setting Range		0% ～150%	

When the frequency source is selected as "frequency superposition" (ie 08 is set to 1, 3 or 4), these two parameters are used to determine the adjustment range of the auxiliary frequency source.

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

01.07	Frequency source selection		Default	0
	Setting Range	Unit’s digit	Frequency source selection	
		0	Main frequency source X	
		1	X and Y operation (operation relationship determined by ten's digit)	
		2	Switchover between X and Y	
		3	Switchover between X and "X and Y operation"	
		4	Switchover between Y and "X and Y operation"	
		Ten’s digit	X and Y operation relationship	
		0	X + Y	
		1	X – Y	
		2	Maximum	
		3	Minimum	

It is used to select the frequency setting channel. If the frequency source involves X and Y operation, you can set the frequency offset in 01.21 for superposition to the X and Y operation result, flexibly satisfying various requirements.

Unit’s digit: Frequency source selection

0: Main frequency source X

Main frequency source X as target frequency

1: X and Y operation

Main and auxiliary operation result as the target frequency, main and auxiliary operation relationship see the description of ten digits.

2: Main frequency source X and auxiliary frequency Y switchover

When the multi-function input terminals function 18 (frequency switch) is invalid, the main frequency X as the target frequency.

When the multi-function input terminals function 18 (frequency switch) is valid, the auxiliary frequency Y as the target frequency.

3: The main frequency source X switchover with the main and auxiliary operation result.

When the multi-function input terminals function 18 (frequency switch) is invalid, the main frequency X as the target frequency.

When the multi-function input terminals function 18 (frequency switch) is valid, the main and auxiliary operation result as the target frequency.

4: The auxiliary frequency source Y switchover with the main and auxiliary operation result.

When the multi-function input terminals function 18 (frequency switch) is invalid, the auxiliary frequency Y as the target frequency.

When the multi-function input terminals function 18 (frequency switch) is valid, the main and auxiliary operation result as the target frequency.

Ten digits: Frequency source main and auxiliary operation relations.

0: X+Y

The target frequency is the sum of main frequency X and auxiliary frequency Y.

1: X-Y

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

2: MAX

The target frequency is the largest absolute value of main frequency X and auxiliary frequency Y.

3: MIN

The target frequency is the least absolute value of main frequency X and auxiliary frequency Y.

In addition, when the frequency source selection is X and Y, offset frequency can be set by 01.21, offset frequency, superimposed on the advocate complementary operation results in a flexible response to various needs.

01.08	Preset frequency	Default	50.00Hz
	Setting Range	0.00～maximum frequency (valid when frequency source is digital setting)	

If the frequency source is digital setting or terminal UP/DOWN, the value of this parameter is the initial frequency of the AC drive (digital setting)

01.09	Rotation direction		Default	0
	Setting Range	0	Same direction	
		1	Reverse direction	

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.

Note: The motor will resume running in the original direction after parameter initialization. Do not use this function in applications where changing the rotating direction of the motor is prohibited after system commissioning is complete.

01.10	Maximum frequency	Default	50.00 Hz
	Setting Range	50.00Hz ～320.00Hz	

When the frequency source is AI, pulse setting (DI5), or multi-reference, 100% of the input corresponds to the value of this parameter.

The output frequency of the DSI-100 can reach up to 3200 Hz. To take both frequency reference resolution and frequency input range into consideration, you can set the number of decimal places for frequency reference in 01.22.

If 01.22 is set to 1, the frequency reference resolution is 0.1 Hz. In this case, the setting range of 01.10 is 50.0 to 3200.0 Hz.

If 01.22 is set to 2, the frequency reference resolution is 0.01 Hz. In this case, the setting range of 01.10 is 50.00 to 320.00 Hz.

01.11	Source of frequency upper limit		Default	0
	Setting Range	0	Set by 01.12	
		1	VS	
		2	AS	
		3	keyboard potentiometer	
		4	PULSE setting (DI5)	

It is used to set the source of the frequency upper limit, including digital setting (01.12), AI, pulse setting or communication setting. If the frequency upper limit is set by means of analog input, the analog input setting is 100% corresponding to 01.12.

For example, to avoid runaway in torque control mode in winding application, you can set the frequency upper limit by means of analog input. When the AC drive reaches the upper limit, it will continue to run at this speed.

01.12	Frequency upper limit	Default	50.00Hz
	Setting Range	Frequency lower limit 01.14 ~maximum frequency 01.10	
01.13	Frequency upper limit offset	Default	0.00Hz
	Setting Range	0.00Hz ~maximum frequency 01.10	

If the source of the frequency upper limit is analog input or pulse setting, the final frequency upper limit is obtained by adding the offset in this parameter to the frequency upper limit set in 01.11

01.14	Frequency lower limit	Default	0.00Hz
	Setting Range	0.00Hz ~frequency upper limit 01.12	

If the frequency reference is lower than the value of this parameter, the AC drive can stop, run at the frequency lower limit, or run at zero speed, determined by 08-14.

01.15	Carrier frequency	Default	Model dependent
	Setting Range	0.5kHz ～16.0kHz	

It is used to adjust the carrier frequency of the AC drive, helping to reduce the motor noise, avoiding the resonance of the mechanical system, and reducing the leakage current to the earth and interference generated by the AC drive.

If the carrier frequency is low, output current has high harmonics, and the power loss and temperature rise of the motor increase.

If the carrier frequency is high, power loss and temperature rise of the motor declines.

However, the AC drive has an increase in power loss, temperature rise and interference.

Adjusting the carrier frequency will exert influences on the aspects listed in the following table:

Carrier frequency	Low － High
Motor noise	Large － Small
Output current waveform	Bad － Good
Motor temperature rise	High － Low
AC drive temperature rise	Low － High
Leakage current	Small － Large
External radiation interference	Small － Large

The factory setting of carrier frequency varies with the AC drive 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 AC drive's heatsink. In this case, you need to de-rate the AC drive. Otherwise, the AC drive may overheat and alarm.

01.16	Carrier frequency adjustment with temperature	Default	1
	Setting Range	0: No 1: Yes	

It is used to set whether the carrier frequency is adjusted based on the temperature. The AC drive automatically reduces the carrier frequency when detecting that the heatsink temperature is high. The AC drive resumes the carrier frequency to the set value when the heatsink temperature becomes normal. This function reduces the overheat alarms.

01.17	Acceleration time 1	Default	Model dependent
	Setting Range	0.00s ～650.00s (01.19=2) 0.0s ～6500.0s (01.19=1) 0s ～65000s(01.19=0)	
01.18	Deceleration time 1	Default	Model dependent
	Setting Range	0.00s ～650.00s (01.19=2) 0.0s ～6500.0s (01.19=1) 0s ～65000s(01.19=0)	

Acceleration time indicates the time required by the AC drive to accelerate from 0 Hz to "Acceleration/Deceleration base frequency" (01.25), that is, t1 in below figure

Deceleration time indicates the time required by the AC drive to decelerate from "Acceleration/Deceleration base frequency" (01.25) to 0 Hz, that is, t2 in below figure.

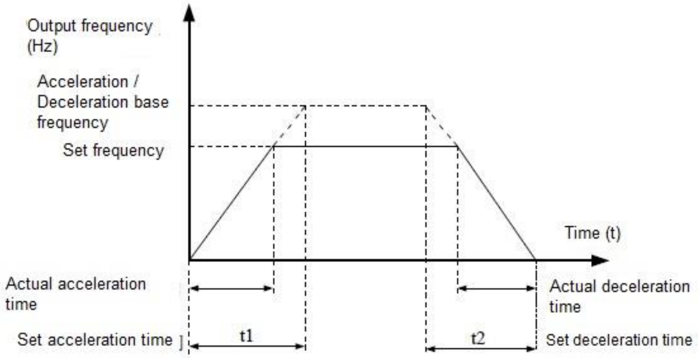


Figure Acceleration / Deceleration time

The DSI-100 provides totally four groups of acceleration/deceleration time for selection. You can perform switchover by using a DI terminal.

Group 1: 01.17, 01.18

Group 2: 09.03, 09.04

Group 3: 09.05, 09.06

Group 4: 09.07, 09.08

01.19	Acceleration/Deceleration time unit		Default	1
	Setting Range	0	1s	
		1	0.1s	
		2	0.01s	

To satisfy requirements of different applications, the DSI-100 provides three acceleration/deceleration time units, 1s, 0.1s and 0.01s.

Note:

Modifying this parameter will make the displayed decimal places change and corresponding acceleration/deceleration time also change.

01.21	Frequency offset of auxiliary frequency source for X and Y operation	Default	0.00Hz
	Setting Range	0.00Hz ～maximum frequency 01.10	

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

When the frequency source is the main and auxiliary operation, 01.21 is used as the offset frequency, which is superimposed with the main and auxiliary operation results as the final frequency setting value, so that the frequency setting can be more flexible.

01.22	Frequency reference resolution		Default	2
	Setting Range	1	0.1Hz	
		2	0.01Hz	

This parameter is used to determine the resolution of all frequency-related function codes.

When the frequency resolution is 0.1Hz, the maximum output frequency of DSI-100 can reach 3200Hz, and when the frequency resolution is 0.01Hz, the maximum output frequency of DSI-100 is 600.00Hz

Note: When modifying this function parameter, the decimal places of all frequency-related parameters will change, and the corresponding frequency value will also change. Special attention should be paid during use;

01.23	Retentive of digital setting frequency upon power failure		Default	0
	Setting Range	0	Not retentive	
		1	Retentive	

This parameter is valid only when the frequency source is digital setting.

If 01.23 is set to 0, the digital setting frequency value resumes to the value of 01.08 (Preset frequency) after the AC drive stops. The modification by using keys ▲ and ▼ or the terminal UP/DOWN function is cleared.

If 01.23 is set to 1, the digital setting frequency value is the set frequency at the moment when the AC drives stops. The modification by using keys ▲ and ▼ or the terminal UP/DOWN function remains effective.

01.24	Motor parameter group selection		Default	0
	Setting Range	0	Motor parameter group 1	
		1	Reserved	
		2	Reserved	
		3	Reserved	
01.25	Acceleration/Deceleration time base frequency		Default	0
	Setting Range	0	Maximum (01.10)	
		1	Set frequency	
		2	100Hz	

The acceleration and deceleration time refers to the acceleration and deceleration time from zero frequency to the frequency set by 01.25. When 01.25 is selected as 1, the acceleration and deceleration time is related to the set frequency. If the set frequency changes frequently, the acceleration of the motor changes, so attention should be paid to the application.

01.26	Base frequency for UP/DOWN modification during running		Default	0
	Setting Range	0	Running frequency	
		1	Set frequency	

This parameter is valid only when the frequency source is digital setting.

It is used to set the base frequency to be modified by using keys ▲ and ▼ or the terminal UP/DOWN function. If the running frequency and set frequency are different, there will be a large difference between the AC drive's performance during the acceleration/deceleration process.

01.27	Binding command source to frequency source		Default	000
	Setting Range	Unit's digit	Binding operation panel command to frequency source	
		0	No binding	
		1	Frequency source by digital setting	
		2	AI1	
		3	AI2	
		4	Reserved	
		5	PULSE setting (X5)	
		6	Multi-reference	
		7	Simple PLC	
		8	PID	
		9	Communication setting	
		Ten's digit	Binding terminal command to frequency source (0–9, same as unit's digit)	
		Hundred's digit	Binding communication command to frequency source (0–9, same as unit's digit)	

Define the binding combination between three running command channels and nine frequency given channels to facilitate synchronous switching.

The meaning of the above frequency given channel is the same as the main frequency source X selection 01.03, please refer to the description of 01.03 function code.

Different running command channels can be bundled with the same frequency given channel.

When the command source has a bundled frequency source, the frequency source set by 01.03~01.07 will no longer work during the valid period of the command source.

01.28	Serial communication protocol		Default	0
	Setting Range	0	MODBUS protocol	
		1	Reserved	
		2	Reserved	

Group 02: Motor 1 Parameters

02.00	Motor type selection		Default	0
	Setting Range	0	Common asynchronous motor	
		1	Variable frequency asynchronous motor	
		2	Reserved	
02.01	Rated motor power		Default	Model dependent
	Setting Range		0.1kW ～1000.0kW	
02.02	Rated motor voltage		Default	Model dependent
	Setting Range		1V ～2000V	

02.03	Rated motor current	Default	Model dependent
	Setting Range	0.01A ～655.35A(AC drive power <=55kW) 0.1A ～6553.5A(AC drive power >55kW)	
02.04	Rated motor frequency	Default	Model dependent
	Setting Range	0.01Hz ～maximum frequency	
02.05	Rated motor rotational speed	Default	Model dependent
	Setting Range	1rpm ～65535rpm	

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 auto-tuning is required. The motor auto-tuning accuracy depends on the correct setting of motor nameplate parameters.

02.06	Stator resistance (asynchronous motor)	Default	Model dependent
	Setting Range	0.001Ω□～65.535Ω(AC drive power ≤ 55kW) 0.0001Ω□～6.5535Ω(AC drive power >55kW)	
02.07	Rotor resistance (asynchronous motor)	Default	Model dependent
	Setting Range	0.001Ω□～65.535Ω(AC drive power ≤ 55kW) 0.0001Ω□～6.5535Ω(AC drive power >55kW)	
02.08	Leakage inductive reactance (asynchronous motor)	Default	Model dependent
	Setting Range	0.01mH ～655.35mH(AC drive power ≤ 55kW) 0.001mH ～65.535mH(AC drive power >55kW)	
02.09	Mutual inductive reactance	Default	Model dependent
	Setting Range	0.1mH ～6553.5mH(AC drive power ≤ 55kW) 0.01mH ～655.35mH(AC drive power >55kW)	
02.10	No-load current (asynchronous motor)	Default	Model dependent
	Setting Range	0.01A ～02-03(AC drive power ≤ 55kW) 0.1A ～02-03(AC drive power >55kW)	

02.06~02.10 are the parameters of the asynchronous motor, these parameters are generally not on the motor nameplate, and need to be obtained through the automatic tuning of the inverter.

Among them, "asynchronous motor static tuning" can only obtain three parameters of 02.06~02.08, and "asynchronous motor complete tuning" can obtain all the five parameters here, as well as current loop PI parameters and so on.

When changing the rated power of the motor (02.01) or the rated voltage of the motor (02.02), the inverter will automatically modify the parameter values of 02.06 to 02.10, and restore these 5 parameters to the commonly used standard Y series motor parameters.

If it is not possible to tune the asynchronous motor on site, you can enter the above corresponding function code according to the parameters provided by the motor manufacturer.

02.37	Auto-tuning selection		Default	0
	Setting	0	No auto-tuning	
		1	Asynchronous motor static auto-tuning	
		2	Asynchronous motor complete auto-tuning	
		3	Static complete parameter identification	

In order to ensure the best control performance of the inverter during vector control, please disconnect the load from the motor and use rotary tuning to perform motor parameter self-learning, otherwise the vector control effect will be affected. When the motor with a large inertia load is not easy to disengage and vector control is required, please use the static complete parameter identification.

Before parameter self-learning, it is necessary to correctly set the motor type and nameplate parameters 02.00~02.05.

Tuning action description: Set the motor nameplate parameters and self-learning type, and then press the RUN key, the inverter will perform static tuning.

0: No operation, that is, tuning is prohibited.

1: Asynchronous motor static tuning 1, which is suitable for the occasions where the asynchronous motor and the large inertia load are not easy to be disengaged, and the rotation tuning cannot be performed.

2: Asynchronous motor dynamic tuning

During the dynamic tuning process, the inverter first performs static tuning, and then accelerates to 80% of the rated frequency of the motor according to the acceleration time 01.17. After maintaining for a period of time, it decelerates to stop according to the deceleration time 01.18 and ends the tuning.

3: Static complete parameter identification

It is suitable for the case of no encoder, self-learning of motor parameters when the motor is stationary (the motor may still vibrate slightly at this time, please pay attention to safety)

Action description: Set the function code to 3, then press the RUN key, the inverter will perform no-load tuning

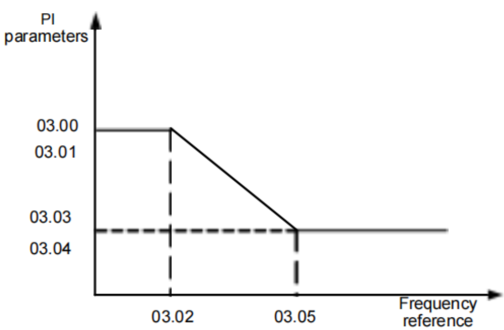
Note: Tuning supports motor tuning in keyboard operation mode, terminal mode, and communication mode.

Group 03 Vector Control Parameters

This group of function codes is only valid for vector control and invalid for VF control.

03.00	Speed loop proportional gain 1	Default	30
	Setting Range	1 ～100	
03.01	Speed loop integral time 1	Default	0.50s
	Setting Range	0.01s ～10.00s	
03.02	Switchover frequency 1	Default	5.00Hz
	Setting Range	0.00 ～03.05	
03.03	Speed loop proportional gain 2	Default	20
	Setting Range	0 ～100	
03.04	Speed loop integral time 2	Default	1.00s
	Setting Range	0.01s ～10.00s	
03.05	Switchover frequency 2	Default	10.00Hz
	Setting Range	03.02 ～maximum output frequency	

When the inverter runs at different frequencies, different speed loop PI parameters can be selected. When the running frequency is less than the switching frequency 1 (03.02), the speed loop PI adjustment parameters are 03.00 and 03.01. When the running frequency is greater than the switching frequency 2, the speed loop PI adjustment parameters are 03.03 and 04.04. The speed loop PI parameters between switching frequency 1 and switching frequency 2 are linearly switched between two sets of PI parameters, as shown in Figure below



Schematic diagram of PI parameters

The speed dynamic response characteristics in vector control can be adjusted by setting the proportional gain and integral time of the speed regulator.

To achieve a faster system response, increase the proportional gain and reduce the integral time. Be aware that this may lead to system oscillation.

The recommended adjustment method is as follows:

If the factory setting cannot meet the requirements, make proper adjustment. 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.

Note: Improper PI parameter setting may cause too large speed overshoot, and over voltage fault may even occur when the overshoot drops.

03.06	Vector control slip	Default	100%
	Setting Range	50% ～200%	

For SVC, 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.
For FVC, it is used to adjust the output current of the AC drive with same load.

03.07	Time constant of speed loop filter	Default	0.000s
	Setting Range	0.000s ～0.100s	

In the vector control mode, the output of the speed loop regulator is torque current reference. This parameter is used to filter the torque references. It need not be adjusted generally and can be increased in the case of large speed fluctuation. In the case of motor oscillation, decrease the value of this parameter properly.
If the value of this parameter is small, the output torque of the AC drive may fluctuate greatly, but the response is quick.

03.08	Vector control over-excitation gain	Default	64
	Setting Range	0 ～200	

During the deceleration process of the inverter, the over-excitation control can suppress the rise of the bus voltage and avoid over-voltage faults. The larger the over-excitation gain, the stronger the suppression effect.

For occasions where the inverter is prone to over-voltage alarm during deceleration, it is necessary to increase the over-excitation gain. However, if the over-excitation gain is too large, it will easily lead to an increase in the output current, which needs to be weighed in the application.
In the case of small inertia, the voltage will not rise during motor deceleration, it is recommended to set the over-excitation gain to 0; in the case of a braking resistor, it is also recommended to set the over-excitation gain to 0.

03.09	Torque upper limit source in speed control mode		Default	0
	Setting Range	0	03.10	
		1	AI1	
		2	AI2	
		3	AI3 (keyboard potentiometer)	
		4	PULSE setting (DI5)	
		5	Communication setting	

03.10	Digital setting of torque upper limit in speed control mode	Default	150.0%
	Setting Range	0.0% ～200.0%	

In the speed control mode, the maximum output torque of the AC drive is restricted by 03.09.

If the torque upper limit is analog, pulse or communication setting, 100% of the setting corresponds to the value of 03.10, and 100% of the value of 03.10 corresponds to the AC drive rated torque.

03.13	Excitation adjustment proportional gain	Default	2000
	Setting Range	0 ～20000	
03.14	Excitation adjustment integral gain	Default	1300
	Setting Range	0 ～20000	
03.15	Torque adjustment proportional	Default	2000
	Setting Range	0 ～20000	
03.16	Torque adjustment integral gain	Default	1300
	Setting Range	0 ～20000	

These are current loop PI parameters for vector control. These parameters are automatically obtained through "Asynchronous motor complete auto-tuning" or "Synchronous motor no-load auto-tuning", and do not need to be modified.

The dimension of the current loop integral regulator is integral gain rather than integral time.

Note that too large current loop PI gain may lead to oscillation of the entire control loop.

Therefore, when current oscillation or torque fluctuation is great, manually decrease the proportional gain or integral gain here.

Group 04 V/F Control Parameters

This group of function codes is only valid for V/F control and invalid for vector control.

V/F control is suitable for general-purpose loads such as fans and pumps, or one inverter with multiple motors, or applications where the power of the inverter and the motor are quite different.

04.00	V/F curve setting		Default	0
	Setting Range	0	Linear VF	
		1	Multi-point VF	
		2	Square VF	
		3	1.2-power VF	
		4	1.4-power VF	
		6	1.6-power VF	
		8	1.8-power VF	
		9	Reserved	
		10	VF complete separation	
		11	VF half separation	

0: Linear V/F. It is applicable to common constant torque load.

1: Multi-point VF. It is applicable to special load such as dehydrator and centrifuge. Any such VF curve can be obtained by setting parameters of 04.03~04.08.

2: Square VF. It is applicable to centrifugal loads such as fan and pump.

3~8: VF curve between linear VF and square VF

10: VF complete separation. In this mode, the output frequency and output voltage of the AC drive are independent. The output frequency is determined by the frequency source, and the output voltage is determined by "Voltage source for VF separation" (04.13).

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

11: VF half separation

In this mode, V and F are proportional and the proportional relationship can be set in 04.13. The relationship between V and F are also related to the rated motor voltage and rated motor frequency in Group 02.

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)

04.01	Torque boost	Default	Model dependent
	Setting Range	0.0% ～30%	
04.02	Cut-off frequency of torque boost	Default	50.00Hz
	Setting Range	0.00Hz ～maximum output frequency	

To compensate the low frequency torque characteristics of V/F control, you can boost the output voltage of the AC drive at low frequency by modifying 04.01. If the torque boost is set to too large, the motor may overheat, and the AC drive may suffer over current.

If the load is large and the motor startup torque is insufficient, increase the value of 04.01.

If the load is small, decrease the value of 04.01. If it is set to 0.0, the AC drive performs automatic torque boost. In this case, the AC drive automatically calculates the torque boost value based on motor parameters including the stator resistance.

04.02 specifies the frequency under which torque boost is valid. Torque boost becomes invalid when this frequency is exceeded, as shown in the following figure.

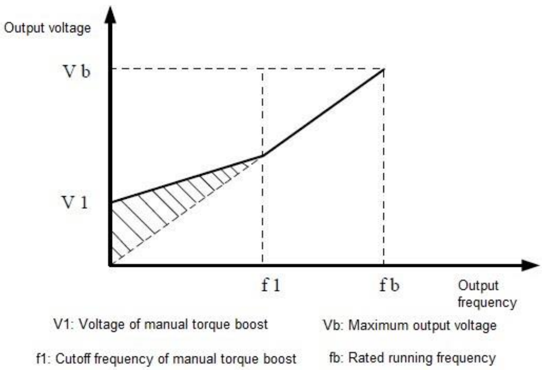


Figure Manual torque boost

04.03	Multi-point VF frequency P1	Default	0.00Hz
	Setting Range	0.00Hz ～04.05	
04.04	Multi-point VF voltage V1	Default	0.0%
	Setting Range	0.0% ～100.0%	
04.05	Multi-point VF frequency P2	Default	0.00Hz
	Setting Range	04.03 ～04.07	
04.06	Multi-point VF voltage V2	Default	0.0%
	Setting Range	0.0% ～100.0%	

04.07	Multi-point VF frequency P3	Default	0.00Hz
	Setting Range	04.05～rated motor frequency (02-04)	
04.08	Multi-point VF voltage V3	Default	0.0%
	Setting Range	0.0% ～100.0%	

These six parameters 04.03~04.08 are used to define the multi-point VF curve.

The multi-point VF curve is set based on the motor's load characteristic. The relationship between voltages and frequencies is:

V1 < V2 < V3, P1 < P2 < P3

At low frequency, higher voltage may cause overheat or even burnt out of the motor and over current stall or over current protection of the AC drive.

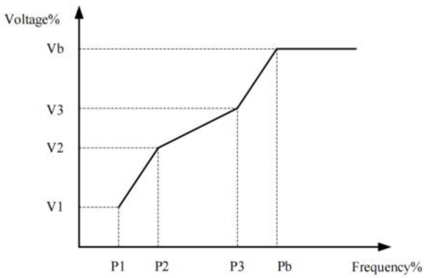


Figure Setting of multi-point VF curve

04.09	VF slip compensation	Default	0.0%
	Setting Range	0% ～200.0%	

This parameter is valid only for the asynchronous motor.

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.

If this parameter is set to 100%, it indicates that the compensation when the motor bears rated load is the rated motor slip. The rated motor slip is automatically obtained by the AC drive through calculation based on the rated motor frequency and rated motor rotational speed in group 02.

Generally, if the motor rotational speed is different from the target speed, slightly adjust this parameter.

04.10	VF over-excitation gain	Default	64
	Setting	0 ～200	

During deceleration of the AC drive, over-excitation can restrain rise of the bus voltage, preventing the over voltage fault. The larger the over-excitation is, the better the restraining result is.

Increase the over-excitation gain if the AC drive is liable to over voltage error during deceleration.

However, too large over-excitation gain may lead to an increase in the output current.

Set 04.09 to a proper value in actual applications.

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.

04.11	VF oscillation suppression gain	Default	Model dependent
	Setting Range	0 ～100	

Set this parameter to a value as small as possible in the prerequisite of efficient oscillation suppression to avoid influence on VF control.

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 rated motor current and no-load current must be correct. Otherwise, the VF oscillation suppression effect will not be satisfactory.

04.13	VF Voltage source for VF		Def	0
	Setting Range	0	Digital setting (P3-14)	
		1	AI1	
		2	AI2	
		3	AI3 (keyboard potentiometer)	
		4	PULSE setting (DI5)	
		5	Multi-reference	
		6	Simple PLC	
		7	PID	
		8	Communication setting	
		100.0% corresponds to the rated motor voltage 02.02		

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

If VF separated control is enabled, the output voltage can be set in 04.14 or by means of analog, multi-reference, simple PLC, PID or communication. If you set the output voltage by means of non-digital setting, 100% of the setting corresponds to the rated motor voltage. If a negative percentage is set, its absolute value is used as the effective value.

0: Digital setting (04.14)

The output voltage is set directly in 04.14.

1: AI1 2: AI2 3: AI3 (keyboard potentiometer)

The output voltage is set by AI terminals.

4: PULSE setting (DI5)

The output voltage is set by pulses of the terminal DI5.

Pulse setting specification: voltage range 9–30 V, frequency range 0–100 kHz

5: Multi-reference

If the voltage source is multi-reference, parameters in group 04 and 13 must be set to determine the corresponding relationship between setting signal and setting voltage.

6: Simple PLC

If the voltage source is simple PLC mode, parameters in group 13 must be set to determine the setting output voltage.

7: PID

The output voltage is generated based on PID closed loop. For details, see the description of PID in group 11.

8: Communication setting

The output voltage is set by the host computer by means of communication.

When the voltage source to choose 1 ~ 8, 0 ~ 100% are corresponding to the output voltage of 0 V~ motor rated voltage.

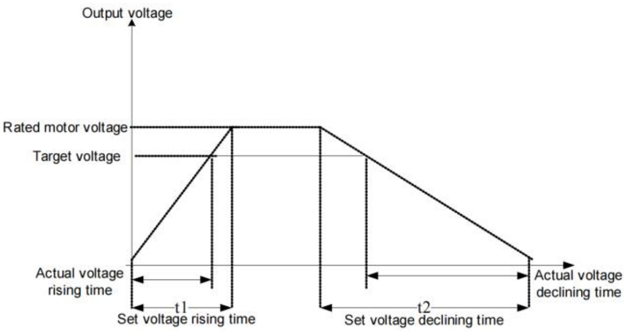
04.14	VF Separation of digital voltage setting	Default	0V

	Setting Range	0V ~Motor Rated Voltage	
04.15	Voltage rise time of VF separation	Default	0.0s
	Setting Range	0.0s ～1000.0s	
04.16	Voltage decline time of VF separation	Default	0.0s
	Setting Range	0.0s ～1000.0s	

The voltage source for VF separation is set in the same way as the frequency source. For details, see 01.03. 100.0% of the setting in each mode corresponds to the rated motor voltage. If the corresponding value is negative, its absolute value is used

04.15 indicates the time required for the output voltage to rise from 0 V to the rated motor voltage shown as t1 in the following figure.

04.16 indicates the time required for the output voltage to decline from the rated motor voltage to 0 V, shown as t2 in the following figure.

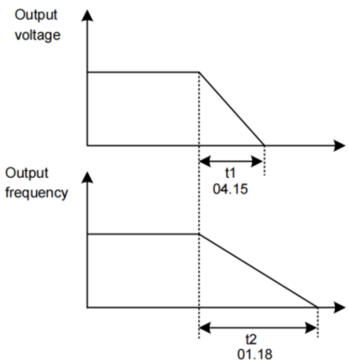


Voltage of V/F separation

04.17	VF separation stop mode selection	Default	0s
	Setting Range	0: Frequency/voltage is reduced to 0 independently 1: After the voltage is reduced to 0, the frequency is reduced again	

0: Frequency/voltage is reduced to 0 independently

The output voltage of V/F separation is decreased to 0V according to the voltage drop time (04.15); the frequency is decreased to 0Hz according to the deceleration time (01.18) at the same time.



1: After the voltage is reduced to 0, the frequency is reduced

The output voltage of V/F separation is first decreased to 0V according to the voltage drop time (04.15), and then the frequency is decreased to 0Hz according to the deceleration time (01.18).

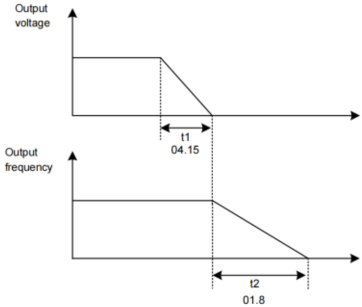
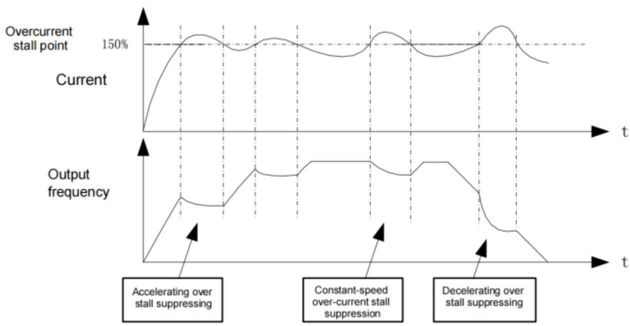


Figure Schematic diagram of successive drops of V/F separation frequency/voltage

● Inverter output current (torque) limit

During acceleration, constant speed and deceleration, if the current exceeds the overcurrent stall current point (150%), the overcurrent stall will take effect. When the current exceeds the overcurrent stall point, the output frequency will begin to decrease until the current returns to the overcurrent stall. After the point is below, the frequency will start to accelerate up to the target frequency, and the actual acceleration time will be automatically extended. If the actual acceleration time cannot meet the requirements, "02.21 Overcurrent stall action current" can be appropriately increased.



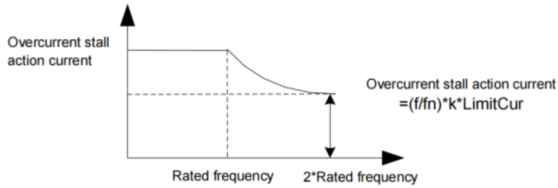
Schematic diagram of overcurrent stall action

Function Code	Function	Setting Range	Function description
04.18	Overcurrent stall action current	150%	Over-current stall suppression
04.19	Over-current stall suppression	1	0 invalid, 1 valid
04.20	Overcurrent Stall Suppression Gain	20	If the current exceeds the overcurrent stall current point,
04.21	Double-speed overcurrent stall action current compensation	50%	Reduce the high-speed overcurrent stall action

In the high frequency region, the motor drive current is small. Compared with the same stall current below the rated frequency, the speed of the motor drops greatly. In order to improve the operating characteristics of the motor, the stall action current above the rated frequency can be reduced. In some centrifuges when the operating frequency is high, several times of field weakening is required and the load inertia is large, this method has a good effect on the acceleration performance.

Transient stall action current over rated frequency = (fs/fn) * k * LimitCur;

fs is the running frequency, fn is the rated frequency of the motor, k is the 04.21 "double-speed overcurrent stall action current compensation coefficient", and LimitCur is 04.18 "overcurrent stall action current";



Schematic diagram of double-speed over-speed stall action

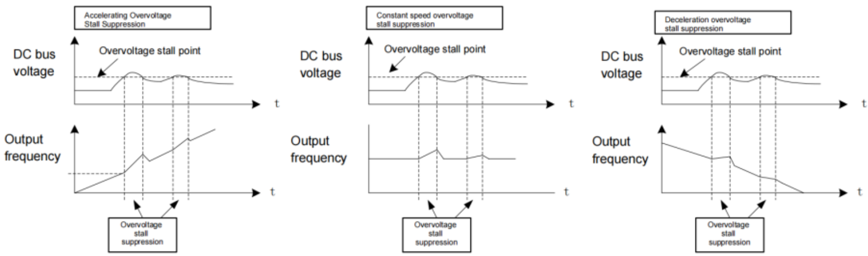
Remark:

Over-current stall action current of 150% means 1.5 times the rated current of the inverter;

For high-power motors, the carrier frequency is below 2kHz. Due to the increase of the pulsating current, the wave-by-wave current limiting response starts before the overcurrent stall prevention action, resulting in insufficient torque. In this case, please reduce the overcurrent stall prevention action current.

● Inverter bus voltage limit (and braking resistor turn-on voltage setting)

If the bus voltage exceeds the overvoltage stall point of 760V, it means that the electromechanical system is in the power generation state (motor speed > output frequency), the overvoltage stall will take effect, adjust the output frequency (consume more electricity than the feedback), and the actual deceleration time will be automatically Lengthen to avoid tripping protection. If the actual deceleration time cannot meet the requirements, the over-excitation gain can be appropriately increased.



Schematic diagram of overvoltage stall action

Function Code	Function	Setting Range	Function description
04.22	Overvoltage stall action voltage	760V	
04.23	Over-voltage stall suppression enable	1	0 invalid, 1 valid
04.24	Overvoltage stall suppression frequency gain	30	Increasing 04.24 will improve the control effect of bus voltage, However, the output frequency will fluctuate. If the output frequency fluctuates greatly, 04.24 can be appropriately reduced. Increasing 04.2 can reduce the overshoot of bus voltage 04.25.
04.25	Overvoltage Stall Suppression Voltage Gain	30	
04.26	Overvoltage stall maximum rising frequency limit	5Hz	Overvoltage stall maximum rising frequency limit

Remark:

When using a braking resistor or adding a braking unit or using an energy regenerative unit, please pay attention:

Please set the value of 04.11 "over excitation gain" to "0", if it is not "0", it may cause the problem of excessive current during operation.

Please set the value of 04.23 "overvoltage stall enable" to "0", if it is not "0", it may cause the problem of prolonged deceleration time.

Group 05 Input Terminals

DSI-100 series inverters are equipped with 5 multi-function digital input terminals as standard (DI5 can be used as high-speed pulse input terminal) and 2 analog input terminals.

Function Code	Parameter Name	Default	Remark
05.00	DI1 function selection	1 (FWD)	Standard
05.01	DI2 function selection	2 (REV)	Standard
05.02	DI3 function selection	9 (Alarm reset)	Standard
05.03	DI4 function selection	12: Multi-reference terminal 1	Standard
05.04	DI5 function selection	13: Multi-reference terminal 2	Standard

The following table lists the functions available for the DI terminals.

Value	Function	Description
0	No function	Set 0 for reserved terminals to avoid malfunction.
1	Forward RUN (FWD)	The terminal is used to control forward or reverse RUN of the AC drive.
2	Reverse RUN (REV)	
3	Three-line control	The terminal determines three-line control of the AC drive. For details, see the description of 05.11.
4	Forward JOG (FJOG)	FJOG indicates forward JOG running, while RJOG indicates reverse JOG running. The JOG frequency, acceleration time and deceleration time are described respectively in 10.00, 10.01 and 10.02.
5	Reverse JOG (RJOG)	
6	Terminal UP	If the frequency is determined by external terminals, the terminals with the two functions are used as increment and decrement commands for frequency modification. When the frequency source is digital setting, they are used to adjust the frequency.
7	Terminal DOWN	
8	Coast to stop	The AC drive blocks its output, the motor coasts to rest and is not controlled by the AC drive. It is the same as coast to stop described in 07.10.
9	Fault reset (RESET)	The terminal is used for fault reset function, the same as the function of RESET key on the operation panel. Remote fault reset is implemented by this function.
10	RUN pause	The AC drive decelerates to stop, but the running parameters are all memorized, such as PLC, swing frequency and PID parameters. After this function is disabled, the AC drive resumes its status before stop.
11	Normally open (NO) input of external fault	If this terminal becomes ON, the AC drive reports Err15 and performs the fault protection action. For more details, see the description of 10.47.

12	Multi-reference terminal K1	The setting of 16 speeds or 16 other references can be implemented through combinations of 16 states of these four terminals. For more details, see appendix 1.
13	Multi-reference terminal K2	
14	Multi-reference terminal K3	
15	Multi-reference terminal K4	
16	Terminal 1 for ACC/DEC time selection	Totally four groups of acceleration/deceleration time can be selected through combinations of two states of these two terminals. For more details, see appendix 2.
17	Terminal 2 for ACC/DEC time selection	
18	Frequency source switchover	The terminal is used to perform switchover between two frequency sources according to the setting in 01.07.
19	UP/DOWN setting clear (terminal, operation panel)	If the frequency source is digital setting, the terminal is used to clear the modification by using the UP/DOWN function or the increment/decrement key on the operation panel, returning the set frequency to the value of 01.08.
20	Command source switchover terminal	If the command source is set to terminal control (01.02 = 1), this terminal is used to perform switchover between terminal control and operation panel control. If the command source is set to communication control (01.02 = 2), this terminal is used to perform switchover between communication control and operation panel control.
21	ACC/DEC prohibited	It enables the AC drive to maintain the current frequency output without being affected by external signals (except the STOP command).
22	PID pause	PID is invalid temporarily. The AC drive maintains the current frequency output without supporting PID adjustment of frequency source.
23	PLC status reset	The terminal is used to restore the original status of PLC control for the AC drive when PLC control is started again after a pause.
24	Swing pause	The AC drive outputs the central frequency, and the swing frequency function pauses.
25	Counter input	This terminal is used to count pulses.
26	Counter reset	This terminal is used to clear the counter status.
27	Length count input	This terminal is used to count the length.
28	Length reset	This terminal is used to clear the length.
29	Torque control prohibited	The AC drive is prohibited from torque control and enters the speed control mode.
30	Pulse input (enabled only for DI5)	DI5 is used for pulse input.
31	Reserved	Reserved
32	Immediate DC braking	After this terminal becomes ON, the AC drive directly switches over to the DC braking state.
33	Normally closed (NC) input of external fault	After this terminal becomes ON, the AC drive reports Err15 and stops.
34	Frequency modification forbidden	After this terminal becomes ON, the AC drive does not respond to any frequency modification.

35	Reverse PID action direction	After this terminal becomes ON, the PID action direction is reversed to the direction set in 11-03.
36	External STOP terminal 1	In operation panel mode, this terminal can be used to stop the AC drive, equivalent to the function of the STOP key on the operation panel.
37	Command source switchover terminal 2	It is used to perform switchover between terminal control and communication control. If the command source is terminal control, the system will switch over to communication control after this terminal becomes ON.
38	PID integral pause	After this terminal becomes ON, the integral adjustment function pauses. However, the proportional and differentiation adjustment functions are still valid.
39	Switchover between main frequency source X and preset frequency	After this terminal becomes ON, the frequency source X is replaced by the preset frequency set in 11-08.
40	Switchover between auxiliary frequency source Y and preset frequency	After this terminal is enabled, the frequency source Y is replaced by the preset frequency set in 01.08.
41	Reserved	Reserved
42	Reserved	
43	PID parameter switchover	If the PID parameters switchover performed by means of DI terminal (11.18 = 1), the PID parameters are 11.05 to 11.07 when the terminal becomes OFF; the PID parameters are 11.15 to 11.17 when this terminal becomes ON.
44	User-defined fault 1	If these two terminals become ON, the AC drive reports Err27 and Err28 respectively, and performs fault protection actions based on the setting in 10.49.
45	User-defined fault 2	
46	Reserved	Reserved
47	Emergency stop	When this terminal becomes ON, the AC drive stops within the shortest time. During the stop process, the current remains at the set current upper limit. This function is used to satisfy the requirement of stopping the AC drive in emergency state.
48	External STOP terminal 2	In any control mode (operation panel, terminal or communication), it can be used to make the AC drive
49	Deceleration DC braking	When this terminal becomes ON, the AC drive decelerates to the initial frequency of stop DC braking and then switches over to DC braking state.
50	Clear the current running time	When this terminal becomes ON, the AC drive's current running time is cleared. This function must be supported by 09.42 and 09.53.

Appendix 1: State combinations of the four multi-reference terminals

The four multi-reference terminals have 16 state combinations, corresponding to 16 reference values, as listed in the following table:

K4	K3	K2	K1	Reference Setting	Corresponding Parameter
OFF	OFF	OFF	OFF	Reference 0	13.00
OFF	OFF	OFF	ON	Reference 1	13.01
OFF	OFF	ON	OFF	Reference 2	13.02
OFF	OFF	ON	ON	Reference 3	13.03
OFF	ON	OFF	OFF	Reference 4	13.04
OFF	ON	OFF	ON	Reference 5	13.05
OFF	ON	ON	OFF	Reference 6	13.06
OFF	ON	ON	ON	Reference 7	13.07
ON	OFF	OFF	OFF	Reference 8	13.08
ON	OFF	OFF	ON	Reference 9	13.09
ON	OFF	ON	OFF	Reference 10	13.10
ON	OFF	ON	ON	Reference 11	13.11
ON	ON	OFF	OFF	Reference 12	13.12
ON	ON	OFF	ON	Reference 13	13.13
ON	ON	ON	OFF	Reference 14	13.14
ON	ON	ON	ON	Reference 15	13.15

If the frequency source is multi-reference, the value 100% of 13.00~13.15 corresponds to the value of 01.10 (Maximum frequency).

Besides the multi-speed function, the multi-reference can be also used as the PID setting source or the voltage source for VF separation, satisfying the requirement on switchover of different setting values.

Appendix 2: State combinations of two terminals for acceleration/deceleration time selection

K2	K1	Acceleration/Deceleration Time Selection	Corresponding Parameters
OFF	OFF	Acceleration/Deceleration time 1	01.17、01.18
OFF	ON	Acceleration/Deceleration time 2	09.03、09.04
ON	OFF	Acceleration/Deceleration time 3	09.05、09.06
ON	ON	Acceleration/Deceleration time 4	09.07、09.08

05.10	DI filter time	Default	0.010s
	Setting Range	0.000s ～1.000s	

It is used to set the software filter time of DI terminal status. 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.

05.11	Terminal command mode		Default	0
	Setting Range	0	Two-line mode 1	
		1	Two-line mode 2	
		2	Three-line mode 1	
		3	Three-line mode 2	

This parameter is used to set the mode in which the AC drive is controlled by external terminals.

0: Two-line mode 1:

It is the most commonly used two-line mode, in which the forward/reverse rotation of the motor is decided by

X1 and X2. The parameters are set as below:

Function Code	Parameter Name	Value	Function Description
05.11	Terminal command mode	0	Two-line 1
05.00	X1 function selection	1	Forward RUN (FWD)
05.01	X2 function selection	2	Reverse RUN (REV)

K1	K2	RUN command
1	0	Forward RUN
0	1	Reverse RUN
1	1	Stop
0	0	Stop

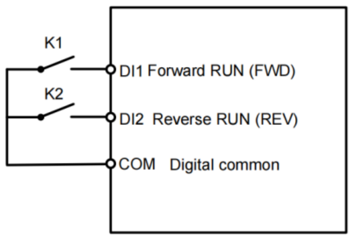


Figure Setting of two-line mode 1

1: Two-line mode 2

In this mode, X1 is RUN enabled terminal, and X2 determines the running direction.
The parameters are set as below:

Function Code	Parameter Name	Valu	Function Description
05.11	Terminal command mode	1	Two-line 2
05.00	X1 function selection	1	RUN enabled
05.01	X2 function selection	2	Forward or reverse direction

K1	K2	RUN command
1	0	Forward RUN
1	1	Reverse RUN
0	0	Stop
0	1	Stop

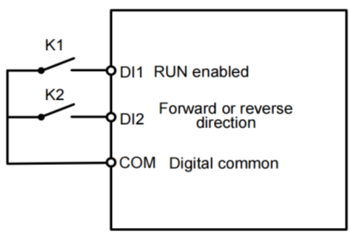


Figure Setting of two-line mode 2

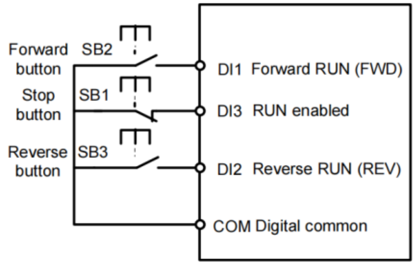
As shown in the preceding figure, if K1 is ON, the AC drive instructs forward rotation when K2 is OFF, and instructs reverse rotation when K2 is ON. If K1 is OFF, the AC drive stops.

2: Three-line mode 1

In this mode, X3 is RUN enabled terminal, and the direction is decided by X1 and X2.
The parameters are set as below:

Function Code	Parameter Name	Value	Function Description
05.11	Terminal command mode	2	Three-line 1

05.00	X1 function selection	1	Forward RUN (FWD)
05.01	X2 function selection	2	Reverse RUN (REV)
05.02	X3 function selection	3	Three-line control



Setting of three-line mode 1

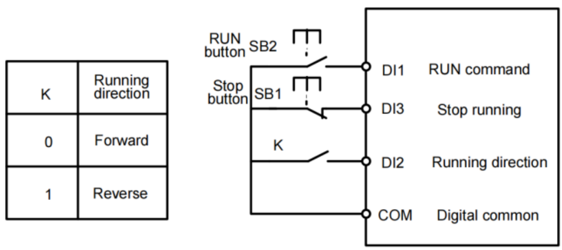
As shown in the preceding figure, if SB1 is ON, the AC drive instructs forward rotation when SB2 is pressed to be ON and instructs reverse rotation when SB3 is pressed to be ON. The AC drive stops immediately after SB1 becomes OFF. During normal startup and running, SB1 must remain ON. The AC drive's running state is determined by the final actions on SB1, SB2 and SB3.

3: Three-line mode 2

In this mode, X3 is RUN enabled terminal. The RUN command is given by X1 and the direction is decided by X2. The parameters are set as below:

Function Codes are set as below:

Function Code	Parameter Name	Value	Function Description
05.11	Terminal command mode	3	Three-line 2
05.00	X1 function selection	1	RUN enabled
05.01	X2 function selection	2	Forward or reverse direction
05.02	X3 function selection	3	Three-line control



Setting of three-line mode 2

As shown in the preceding figure, if SB1 is ON, the AC drive starts running when SB2 is pressed to be ON; the AC drive instructs forward rotation when K is OFF and instructs reverse rotation when K is ON. The AC drive stops immediately after SB1 becomes OFF. During normal startup and running, SB1 must remain ON. The AC drive's running state is determined by the final actions of SB1, SB2 and K.

05.12	Terminal UP/DOWN rate	Default	1.00Hz/s
	Setting Range	0.01Hz/s ～65.535Hz/s	

It is used to adjust the rate of change of frequency when the frequency is adjusted by means of terminal UP/DOWN.
If 01.22 (Frequency reference resolution) is 2, the setting range is 0.001–65.535 Hz/s.
If 01.22 (Frequency reference resolution) is 1, the setting range is 0.01–655.35 Hz/s.

05.13	AI1 curve 1 minimum input	Default	0.00V
	Setting Range	0.00V ～05.15	
05.14	Corresponding setting of AI1 curve 1 minimum input	Default	0.0%
	Setting Range	-100.00% ～100.0%	
05.15	AI1 curve 1 maximum input	Default	10.00V
	Setting Range	05.13 ～10.00V	
05.16	Corresponding setting of AI1 curve 1 maximum input	Default	100.0%
	Setting Range	-100.00% ～100.0%	
05.17	AI1 filter time	Default	0.10s
	Setting Range	0.00s ～10.00s	

These parameters are used to define the relationship between the analog input voltage and the corresponding setting.
When the analog input voltage exceeds the maximum value (05.15), the maximum value is used. When the analog input voltage is less than the minimum value (05.13), the value set in 05.34 (Setting for AI1 less than minimum input) is used.
When the analog input is current input, 1mA current corresponds to 0.5 V voltages.
05.17 (AI1 filter time) is used to set the software filter time of AI1. 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.
In different applications, 100% of analog input corresponds to different nominal values. For details, refer to the description of different applications.
Two typical setting examples are shown in the following figure.

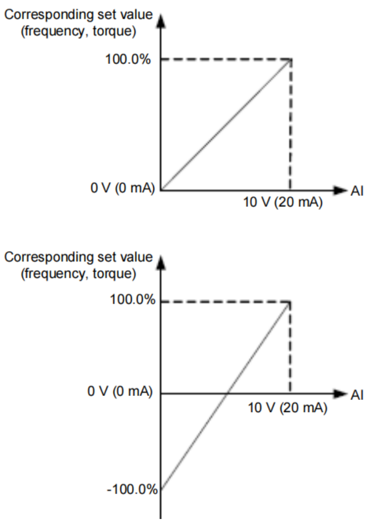


Figure Corresponding relationship between analog input and set values

05.18	AI2 curve minimum input	Default	0.00V

	Setting Range	0.00V ～05.20	
05.19	Corresponding setting of AI2 curve minimum input	Default	0.0%
	Setting Range	-100.00% ～100.0%	
05.20	AI2 curve maximum input	Default	10.00V
	Setting Range	05.18 ～10.00V	
05.21	Corresponding setting of AI2 curve maximum input	Default	100.0%
	Setting Range	-100.00% ～100.0%	
05.22	AI2 filter time	Default	0.10s
	Setting Range	0.00s ～10.00s	

The method of setting AI2 functions is similar to that of setting AI1 function.

05.28	PULSE minimum input	Default	0.00kHz
	Setting Range	0.00kHz ～05.30	
05.29	Corresponding setting of pulse minimum input	Default	0.0%
	Setting Range	-100.00% ～100.0%	
05.30	Pulse maximum input	Default	50.00kHz
	Setting Range	05.28 ～50.00kHz	
05.31	Corresponding setting of pulse maximum input	Default	100.0%
	Setting Range	-100.00% ～100.0%	
05.32	PULSE filter time	Default	0.10s
	Setting Range	0.00s ～10.00s	

These parameters are used to set the relationship between DI5 pulse input and corresponding settings. The pulses can only be input by DI5. The method of setting this function is similar to that of setting AI1 function.

05.33	AI curve selection		Default	321
	Setting Range	Unit's digit	AI1 curve selection	
		1	Curve 1 （2 points, see 05.13 ～05.16）	
		2	Curve 2 （2 points, see 05.18 ～05.21）	
		3	Curve 3 （2 points, see 05.23 ～05.26）	
		4	Curve 4 （4 points, see 24.00 ～24.07）	
		5	Curve 5 （4 points, see 24.08 ～24.15）	
		Ten's digit	AI2 curve selection （1 ～5, same to AI1）	
		Hundred's digit	Reserved	

The unit's digit, ten's digit of this parameter are respectively used to select the corresponding curve of AI1 and AI2. Any of the five curves can be selected for AI1, AI2

Curve 1&2 are all 2-point curves, set in group 05. Curve 4&5 are both 4-point curves, set in group 24.

The DSI-100 provides two AI terminals as standard.

05.34	Setting for AI less than minimum input		Default	000
	Setting	Unit's digit	Setting for AI1 less than minimum input	

	Range	0	Minimum value
		1	0.0%
		Ten's digit	Setting for AI2 less than minimum input (0 ～1，same to AI1）
		Hundred's digit	Reserved

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

If the value of a certain digit is 0, when analog input voltage is less than the minimum input, the corresponding setting of the minimum input (05.14、05.19、05.24) is used.

If the value of a certain digit is 1, when analog input voltage is less than the minimum input, the corresponding value of this analog input is 0.0%.

05.35	DI1 delay time	Default	0.0s
	Setting Range	0.0s ～3600.0s	
05.36	DI2 delay time	Default	0.0s
	Setting Range	0.0s ～3600.0s	
05.37	DI3 delay time	Default	0.0s
	Setting Range	0.0s ～3600.0s	

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

05.38	DI valid mode selection 1		Default	00000
	Setting Range	Unit's digit	DI1 valid mode	
		0	High level valid	
		1	Low level valid	
		Ten's digit	DI2 valid mode (0 ～1, same as X1)	
		Hundred's digit	DI3 valid mode (0 ～1, same as X1)	
		Thousand's digit	DI4 valid mode (0 ～1, same as X1)	
		Ten thousand's digit	DI5 valid mode (0 ～1, same as X1)	

It is used to set the valid state mode of the digital input terminal.

When it is selected to be active at high level, it is valid when the corresponding DI terminal is connected to COM, and invalid when disconnected.

Group 06 Output Terminals

DSI-100 series inverters come standard with 1 multi-function AO terminal, 1 multi-function HDO terminal, and 1 multi-function Relay output terminal.

06.01	DO function (open-collector output terminal)	Default	0
06.02	Relay function (T/A-T/B-T/C)	Default	2

The above two function codes are used to select the function of two digital outputs, among which T/A-T/B-T/C are the Relays on the control board.

The function description of the multi-function output terminal is as follows:

Value	Function	Description
0	No output	The terminal has no function.
1	AC drive running	When the AC drive is running and has output frequency (can be zero), the terminal becomes ON.
2	Fault output (stop)	When the AC drive stops due to a fault, the terminal becomes ON.
3	Frequency-level detection FDT1 output	Refer to the descriptions of 09.19 and 09.20.
4	Frequency reached	Refer to the descriptions of 09.21.
5	Zero-speed running (no output at stop)	If the AC drive runs with the output frequency of 0, the terminal becomes ON. If the AC drive is in the stop state, the terminal becomes OFF.
6	Motor overload pre-warning	The AC drive judges whether the motor load exceeds the overload pre-warning threshold before performing the protection action. If the pre-warning threshold is exceeded, the terminal becomes ON. For motor overload parameters, see the descriptions of 10.00 to 10.02.
7	AC drive overload pre-warning	The terminal becomes ON 10s before the AC drive overload protection action is performed.
8	Set count value reached	The terminal becomes ON when the count value reaches the value set in 12.08.
9	Designated count value reached	The terminal becomes ON when the count value reaches the value set in 12.09.
10	Length reached	The terminal becomes ON when the detected actual length exceeds the value set in 12.05
11	PLC cycle complete	When simple PLC completes one cycle, the terminal outputs a pulse signal with width of 250 ms.
12	Accumulative running time reached	If the accumulative running time of the AC drive exceeds the time set in 09.17, the terminal becomes ON.
13	Frequency limited	If the set frequency exceeds the frequency upper limit or lower limit and the output frequency of the AC drive reaches the upper limit or lower limit, the terminal becomes ON.
14	Torque limited	In speed control mode, if the output torque reaches the torque limit, the AC drive enters the stall protection state and meanwhile the terminal becomes ON.
15	Ready for RUN	If the AC drive main circuit and control circuit become stable, and the AC drive detects no fault and is ready for RUN, the terminal becomes ON.
16	AI1>AI2	When the input of AI1 is larger than the input of AI2, the terminal becomes ON.

17	Frequency upper limit Reached	If the running frequency reaches the upper limit, the terminal becomes ON.
18	Frequency lower limit reached (no output at stop)	If the running frequency reaches the lower limit, the terminal becomes ON. In the stop state, the terminal becomes OFF.
19	Undervoltage state output	If the AC drive is in under voltage state, the terminal becomes ON.
20	Communication setting	Refer to the communication protocol.
21	Reserved	Reserved.
22	Reserved	Reserved.
23	Zero-speed running 2 (having output at stop)	If the output frequency of the AC drive is 0, the terminal becomes ON. In the state of stop, the signal is still ON.
24	Accumulative power-on time reached	If the AC drive accumulative power-on time (08.13) exceeds the value set in 09.16, the terminal becomes ON.
25	Frequency level detection FDT2	Refer to the descriptions of 09.28 and 09.29.
26	Frequency 1 reached	Refer to the descriptions of 09.30 and 09.31.
27	Frequency 2 reached	Refer to the descriptions of 09.32 and 09.33.
28	Current 1 reached	Refer to the descriptions of 09.38 and 09.39.
29	Current 2 reached	Refer to the descriptions of 09.40 and 09.41.
30	Timing reached	If the timing function (09.42) is valid, the terminal becomes ON after the current running time of the AC drive reaches the set time.
31	AI1 input limit exceeded	If AI1 input is larger than the value of 09.46 (AI1 input voltage upper limit) or lower than the value of 09.45 (AI1 input voltage lower limit), the terminal becomes ON.
32	Load becoming 0	If the load becomes 0, the terminal becomes ON.
33	Reverse running	If the AC drive is in the reverse running state, the terminal Becomes ON.
34	Zero current state	Refer to the descriptions of 09.28 and 09.29.
35	Module temperature reached	If the heatsink temperature of the inverter module (08.07) reaches the set module temperature threshold (09.47), the terminal becomes ON.
36	Software current limit exceeded	Refer to the descriptions of 09.36 and 09.37.
37	Frequency lower limit reached (having output at stop)	If the running frequency reaches the lower limit, the terminal becomes ON. In the stop state, the signal is still ON.
38	Alarm output	If a fault occurs on the AC drive and the AC drive continues to run, the terminal outputs the alarm signal.
39	Reserved	Reserved
40	Current running time reached	If the current running time of AC drive exceeds the value of 09.53, the terminal becomes ON

06.06	DO function selection (Pulse output terminal)	Default	0

06.07	AO1 function selection	Default	0

The output pulse frequency of the DO terminal ranges from 0.01 kHz to 06.09. The value of 06.09 is between 0.01 kHz and 100.00 kHz.

The output range of AO1 is 0–10 V or 0–20 mA.

The relationship between pulse and analog output ranges and corresponding functions is listed in the following table.

Value	Function	Range (Corresponding to Pulse or Analog Output Range 0.0%–100.0%)
0	Running frequency	0 to maximum output frequency
1	Set frequency	0 to maximum output frequency
2	Output current	0 to 2 times of rated motor current
3	Output torque (absolute value)	0 to 2 times of rated motor torque
4	Output power	0 to 2 times of rated power
5	Output voltage	0 to 1.2 times of rated AC drive voltage
6	Pulse input	0.01kHz ～100.00kHz
7	AI1	0V ～10V
8	AI2	0V ～10V (Or 0 ～20mA)
9	Reserved	Reserved
10	Length	0 ～maximum set length
11	Count value	0 ～maximum count value
12	Communication setting	0.0% ～100.0%
13	Motor rotational speed	0 ～rotational speed corresponding to Max. output frequency
14	Output current	0.0A ～1000.0A
15	Output voltage	0.0V ～1000.0V

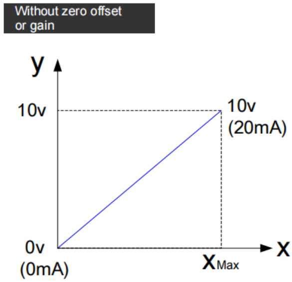
06.10	AO1 offset coefficient	Default	0.0%
	Setting Range	-100.0% ～+100.0%	
06.11	AO1 gain	Default	1.00
	Setting Range	-10.00 ～+10.00	

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.

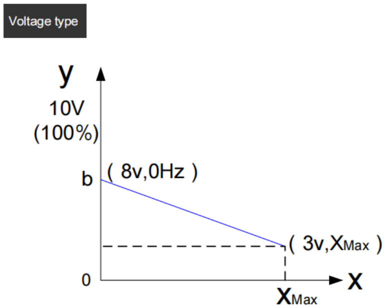
If "b" represents zero offset, "k" represents gain, "Y" represents actual output, and "X" represents standard output, the actual output is: $Y = kX + b$.

The zero offset coefficient 100% of AO1 and AO2 corresponds to 10 V (or 20 mA). The standard output refers to the value corresponding to the analog output of 0 to 10 V (or 0 to 20 mA) with no zero offset or gain adjustment.

For example, if the analog output is used as the running frequency, and it is expected that the output is 8 V (or 16mA)when the frequency is 0 and 3 V (or 6mA)at the maximum frequency, the gain shall be set to -0.50, and the zero offset shall be set to 80%.



Output schematic with no offset or gain



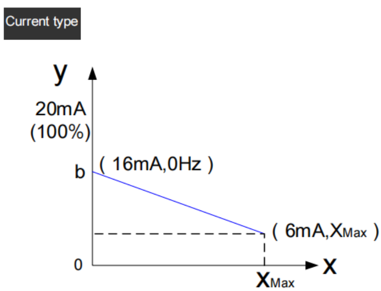
Zero offset b= y-kx =y (x=0) = 8v

Zero offset coefficient is 100% corresponds to 10V,so b=8V

Zero offset ratio $= \frac{8v}{10v} \times 100\% = 80\%$

$$k = \frac{y-b}{x} = \frac{\text{actual output-b}}{\text{Standard output}} = \frac{3v-8v}{10v} = -0.5$$

Schematic diagram of output with zero offset or gain (voltage type)



Zero offsetb=y-kx =y (x=0= 16mA

Zero offset coefficient is 100% corresponds to 20mAV,

so b=16mA, Zero offset ratio $= \frac{16mA}{20mA} \times 100\% = 80\%$

$$k = \frac{y-b}{x} = \frac{\text{actual output-b}}{\text{Standard output}} = \frac{6mA-16mA}{20mA} = -0.5$$

Schematic diagram of output with zero offset or gain (Current type)

06.17	HDO output delay time	Default	0.0s
	Setting Range	0.0s ～3600.0s	
06.18	Relay1 output delay time	Default	0.0s
	Setting Range	0.0s ～3600.0s	

These parameters are used to set the delay time of output terminals DO, Relay 1 from status change to actual output.

06.22	DO valid mode selection		Default	00000
	Setting Range	Unit's digit	HDO valid mode	
		0	Positive logic	
		1	Negative logic	
		Ten's digit	Relay1 valid mode(0 ～1, same as HDO)	
		Hundred's digit	Reserved	
		Thousand's digit	Reserved	
		Ten thousand's digit	Reserved	

It is used to set the logic of output terminals HDO, Relay1.

0: Positive logic

The output terminal is valid when being connected with COM, and invalid when being disconnected from COM.

1: Negative logic

The output terminal is invalid when being connected with COM, and valid when being disconnected from COM.

Group 07 Start/Stop Control

07.00	Start mode		Default	0
	Setting Range	0	Direct start	
		1	Rotational speed tracking restart	
		2	Pre-excited start (asynchronous motor)	

0: Direct start

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

– If the DC braking time is not 0, the AC drive performs DC braking first and then starts to run at the startup frequency. It is applicable to small-inertia load application where the motor is likely to rotate at startup.

1: Rotational speed tracking restart

The AC drive judges the rotational speed and direction of the motor first and then starts at the tracked frequency. Such smooth start has no impact on the rotating motor. 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 (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 07.05 and 07.06.

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

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

07.01	Rotational speed tracking mode		Default	0
	Setting Range	0	From frequency at stop	
		1	From zero speed	
		2	From maximum frequency	

To complete the rotational speed tracking process within the shortest time, select the proper mode in which the AC drive tracks the motor rotational speed.

0: From frequency at stop

It is the commonly selected mode.

1: From zero frequency

It is applicable to restart after a long time of power failure.

2: From the maximum frequency, it is applicable to the power-generating load.

07.02	Rotational speed tracking speed	Default	20
	Setting Range	1 ～100	

In the rotational speed tracking restart mode, select the rotational speed tracking speed. The larger the value is, the faster the tracking is. However, too large value may cause unreliable tracking.

07.03	Startup frequency	Default	0.00Hz
	Setting Range	0.00Hz ～10.00Hz	
07.04	Startup frequency holding time	Default	0.0s
	Setting Range	0.0s ～100.0s	

To ensure the motor torque at AC drive 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.

The startup frequency (07.03) is not restricted by the frequency lower limit. If the set target frequency is lower than the startup frequency, the AC drive will not start and stays in the standby state.

During switchover between forward rotation and reverse rotation, the startup frequency holding time is disabled. The holding time is not included in the acceleration time but in the running time of simple PLC.

Example 1:

01.03 ＝ 0 The frequency source is digital setting.

01.08 ＝ 2.00Hz The digital setting frequency is 2.00 Hz.

07.03 ＝ 5.00Hz The startup frequency is 5.00 Hz.

07.04 ＝ 2.0s The startup frequency holding time is 2.0s.

In this example, the AC drive stays in the standby state and the output frequency is 0.00 Hz.

Example 2：

01.03 ＝ 0 The frequency source is digital setting.

01.08 ＝ 10.00Hz The digital setting frequency is 10.00 Hz.

07.03 ＝ 5.00Hz The startup frequency is 5.00 Hz.

07.04 ＝ 2.0s The startup frequency holding time is 2.0s.

In this example, the AC drive accelerates to 5.00 Hz, and then accelerates to the set frequency 10.00 Hz after 2s.

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

Startup DC braking is valid only for direct start (07.00 = 0). In this case, the AC drive performs DC braking at the set startup DC braking current. After the startup DC braking time, the AC drive starts to run. If the startup DC braking time is 0, the AC drive 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 (07.00 = 3), the AC drive builds magnetic field based on the set pre-excited current. After the pre-excited time, the AC drive starts to run. If the pre-excited time is 0, the AC drive starts directly without pre-excitation.

The startup DC braking current or pre-excited current is a percentage relative to the base value.

07.05	Start DC braking current / pre-excitation current	Default	0%
	Setting Range	0%～100%	
07.06	Start DC braking time / pre-excitation time	Default	0.0s
	Setting Range	0.0s～100.0s	

Start DC braking, generally used to stop the running motor and then start it. Pre-excitation is used to make the asynchronous motor establish a magnetic field before starting, and improve the response speed.

Start DC braking is only valid when the start mode is direct start. At this time, the inverter first performs DC braking according to the set starting DC braking current, and then starts to run after the starting DC braking time. If the DC braking time is set to 0, it will start directly without DC braking. The greater the DC braking current, the greater the braking force.

If the starting mode is asynchronous machine pre-excitation start, the inverter will first establish a magnetic field according to the set pre-excitation current, and then start running after the set pre-excitation time. If the pre-excitation time is set to 0, it will start directly without going through the pre-excitation process.

The starting DC braking current/pre-excitation current is a percentage relative to the rated current of the inverter.

07.07	Acceleration/Deceleration mode		Default	0
	Setting Range	0	Linear acceleration/deceleration	
		1	S-curve acceleration/deceleration A	
		2	S-curve acceleration/deceleration B	

It is 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. The DSI-100 provides four group of acceleration/deceleration time, which can be selected by using 05.00 to 05.08.

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. 07.08 and 07.09 respectively define the time proportions of the start segment and the end segment.

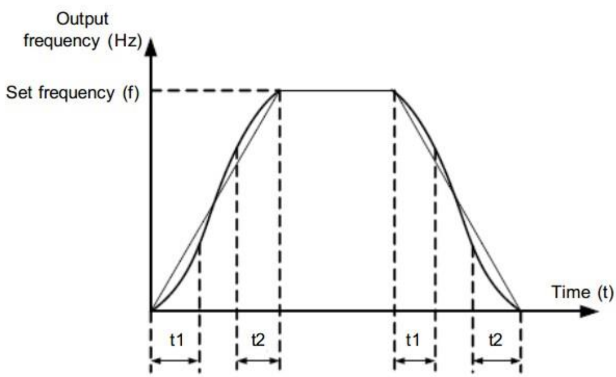
2: S-curve acceleration/deceleration B

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.

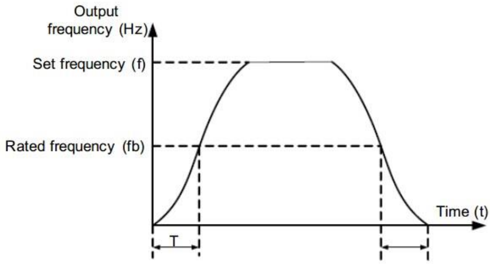
When the set frequency is higher than the rated frequency, the acceleration/deceleration time is:

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

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



S-curve acceleration/deceleration A



S-curve acceleration/deceleration B

07.08	Time proportion of S-curve start segment	Default	30.0%
	Setting Range	0.0% ～(100.0%-07.09)	
07.09	Time proportion of S-curve end segment	Default	30.0%
	Setting Range	0.0% ～(100.0%-07.08)	

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: 07.08 + 07.09 ≤ 100.0%.

In Figure, t1 is the time defined in 07.08, within which the slope of the output frequency change increases gradually. t2 is the time defined in 07.09, within which the slope of the output frequency change gradually decreases to 0. Within the time between t1 and t2, the slope of the output frequency change remains unchanged, that is, linear acceleration/deceleration.

07.10	Stop mode	Default	0
	Setting Range	0	Decelerate to stop
		1	Coast to stop

0: Decelerate to stop
After the stop command is enabled, the AC drive decreases the output frequency according to the deceleration time and stops when the frequency decreases to zero.
1: Coast to stop
After the stop command is enabled, the AC drive immediately stops the output. The motor will coast to stop based on the mechanical inertia.

07.11	Initial frequency of stop DC braking	Default	0.00Hz
	Setting Range	0.00Hz ～maximum frequency	
07.12	Waiting time of stop DC braking	Default	0.0s
	Setting Range	0.0s ～36.0s	
07.13	Stop DC braking current	Default	0%
	Setting Range	0% ～100%	
07.14	Stop DC braking time	Default	0.0s
	Setting Range	0.0s ～36.0s	

07.11 (Initial frequency of stop DC braking)
During the process of decelerating to stop, the AC drive starts DC braking when the running frequency is lower than the value set in 07.11.
07.12 (Waiting time of stop DC braking)
When the running frequency decreases to the initial frequency of stop DC braking, the AC drive stops output for a certain period and then starts DC braking. This prevents faults such as overcurrent caused due to DC braking at high speed.

07.13 (Stop DC braking current)

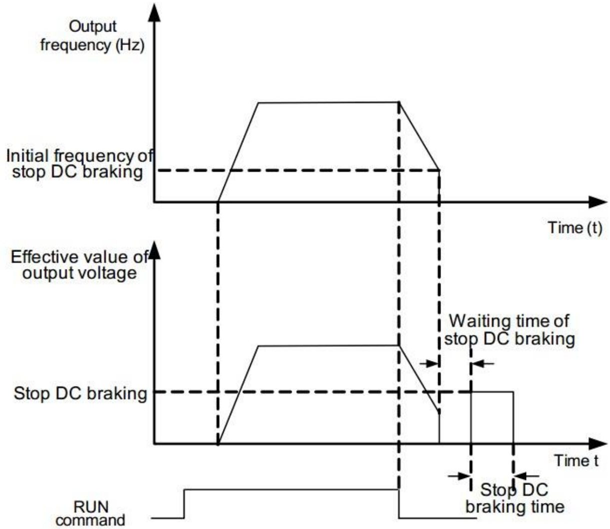
This parameter specifies the output current at DC braking and is a percentage relative to the base value.

– If the rated motor current is less than or equal to 80% of the rated AC drive current, the base value is the rated motor current.

– If the rated motor current is greater than 80% of the rated AC drive current, the base value is 80% of the rated AC drive current.

07.14 (Stop DC braking time)

This parameter specifies the holding time of DC braking. If it is set to 0, DC braking is cancelled.



Stop DC braking process

07.15	Brake use ratio	Default	100%
	Setting Range	0% ～100%	

It is valid only for the AC drive 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 AC drive bus voltage during the braking process.

Group 08 Keyboard and Display

08.01	MF.K function selection		Default	0
	Setting Range	0	MF key disabled	
		1	Switchover between operation panel control and remote command control (terminal or communication)	
		2	Switchover between forward rotation and reverse rotation	
		3	Forward JOG	
		4	Reverse JOG	

MF.K key refers to multifunctional key. You can set the function of the MF.K key by using this parameter. You can perform switchover by using this key both in stop or running state.

0: MF.K key disabled

1: Switchover between operation panel control and remote command control (terminal or communication).

You can perform switchover from the current command source to the operation panel control (local operation). If the current command source is operation panel control, this key is invalid.

2: Switchover between forward rotation and reverse rotation

You can change the direction of the frequency reference by using the MF.K key. It is valid only when the current command source is operation panel control.

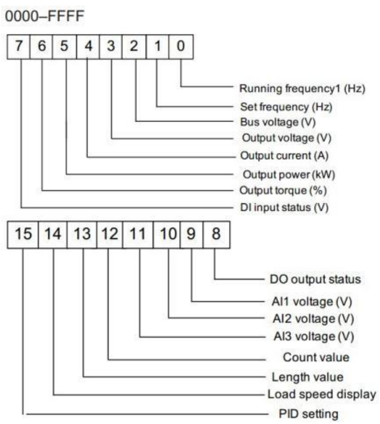
3: Forward JOG

You can perform forward JOG (FJOG) by using the MF.K key.

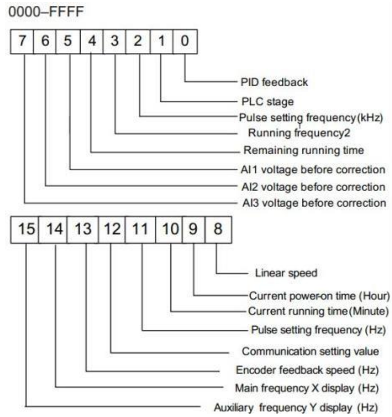
4: Reverse JOG

You can perform reverse JOG (RJOG) by using the MF.K key.

08.02	STOP/RESET key function		Default	1
	Setting Range	0	STOP/RESET key enabled only in keypad control	
		1	STOP/RESET key enabled in any operation mode	

<table>
<tr><td rowspan="2">08.03</td><td colspan="2">LED display running parameters 1</td><td>Default</td><td>1F</td></tr>
<tr><td>Setting Range</td><td>0000～FFFF</td><td colspan="2">

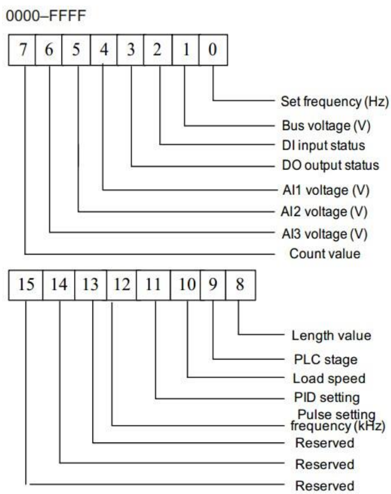
If a parameter needs to be displayed during the running, set the corresponding bit to 1, and set 08.03 to the hexadecimal equivalent of this binary number.</td></tr>
</table>

<table>
<tr><td rowspan="2">08.04</td><td colspan="2">LED display running parameters 2</td><td>Default</td><td>0</td></tr>
<tr><td>Setting Range</td><td>0000～FFFF</td><td colspan="2">

If a parameter needs to be displayed during the running, set the corresponding bit to 1, and set 08.03 to the hexadecimal equivalent of this binary number.</td></tr>
</table>

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

The maximum number of status parameters available for viewing is 32. The status parameters to be displayed are selected according to the binary digits of the parameter values of 08.03 and 08.04. The display sequence starts from the lowest digit of 08.03.

<table>
<tr><td rowspan="2">08.05</td><td colspan="2">LED display stop parameters</td><td>Default</td><td>0</td></tr>
<tr><td>Setting Range</td><td>0000～FFFF</td><td colspan="2">

If a parameter needs to be displayed during the running, set the corresponding bit to 1, and set 08.05 to the hexadecimal equivalent of this binary number.</td></tr>
</table>

08.06	Load speed display coefficient	Default	1.0000
	Setting Range	0.0001 ～6.5000	

This parameter is used to adjust the relationship between the output frequency of the AC drive and the load speed. For details, see the description of 08.12.

08.07	Heatsink temperature of inverter Module	Defaul	—
	Setting Range	0.0℃～100.0℃	

It is used to display the insulated gate bipolar transistor (IGBT) temperature of the inverter module, and the IGBT overheat protection value of the inverter module depends on the model.

08.08	Temporary software version	Default	—
	Setting Range	–	

It is used to display the temporary software version of the control board.

08.09	Accumulative running time	Default	0 hour
	Setting Range	0h ～65535h	

It is used to display the accumulative running time of the AC drive. After the accumulative running time reaches the value set in 09.17, the terminal with the digital output function 12 becomes ON.

08.10	Product number	Default	
	Setting Range	AC drive product number	
08.11	Software version	Default	
	Setting Range	Software version of control board	

08.12	Number of decimal places for load speed display		Default	1
	Setting Range	0	0 decimal place	
		1	1 decimal place	
		2	2 decimal place	
		3	3 decimal places	

08.12 is used to set the number of decimal places for load speed display. The following gives an example to explain how to calculate the load speed:

Assume that 08.06 (Load speed display coefficient) is 2.000 and 08.12 is 2 (2 decimal places).

When the running frequency of the AC drive is 40.00 Hz, the load speed is 40.00 x 2.000 = 80.00 (display of 2 decimal places).

If the AC drive is in the stop state, the load speed is the speed corresponding to the set frequency, namely, "set load speed". If the set frequency is 50.00 Hz, the load speed in the stop state is 50.00 x 2.000 = 100.00 (display of 2 decimal places).

08.13	Accumulative power-on time	Default	—
	Setting Range	0 ～65535 hour	

It is used to display the accumulative power-on time of the AC drive since the delivery. If the time reaches the set power-on time (09.17), the terminal with the digital output function 24 becomes ON.

08.14	Accumulative power consumption	Default	-
	Setting Range	0 ～65535 kWh	

It is used to display the accumulative power consumption of the AC drive until now.

Group 09 Auxiliary Functions

09.00	JOG running frequency	Default	2.00Hz
	Setting Range	0.00Hz ~maximum frequency	
09.01	JOG acceleration time	Default	20.0s
	Setting Range	0.0s ～6500.0s	
09.02	JOG deceleration time	Default	20.0s
	Setting Range	0.0s ～6500.0s	

These parameters are used to define the set frequency and acceleration/deceleration time of the AC drive when jogging. The startup mode is "Direct start" (07.00 = 0) and the stop mode is "Decelerate to stop" (07.10 = 0) during jogging.

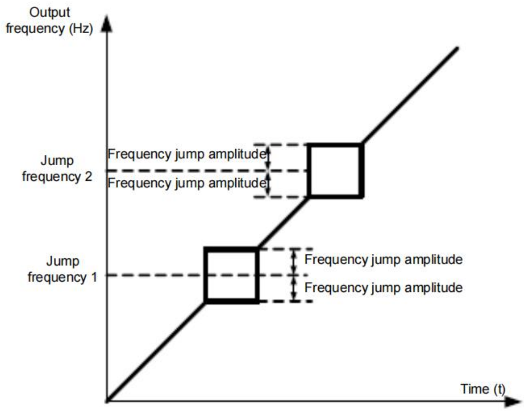
09.03	Acceleration time 2	Default	Model dependent
	Setting Range	0. 0s ～6500.0s	
09.04	Deceleration time 2	Default	Model dependent
	Setting Range	0. 0s ～6500.0s	
09.05	Acceleration time 3	Default	Model dependent
	Setting Range	0. 0s ～6500.0s	
09.06	Deceleration time 3	Default	Model dependent
	Setting Range	0. 0s ～6500.0s	
09.07	Acceleration time 4	Default	Model dependent
	Setting Range	0. 0s ～6500.0s	
09.08	Deceleration time 4	Default	Model dependent
	Setting Range	0. 0s ～500.0s	

The DSI-100 provides a total of four groups of acceleration/deceleration time, that is, the preceding three groups and the group defined by 01.17 and 01.18. Definitions of four groups are completely the same. You can switch over between the four groups of acceleration/deceleration time through different state combinations of X terminals. For more details, see the descriptions of 05.01 to 05.05.

09.09	Jump frequency 1	Default	0.00Hz
	Setting Range	0.00Hz ~maximum frequency	
09.10	Jump frequency 2	Default	0.00Hz
	Setting Range	0.00 Hz ~maximum frequency	
09.11	Frequency jump amplitude	Default	0.00Hz
	Setting Range	0.00 ~maximum frequency	

If the set frequency is within the frequency jump range, the actual running frequency is the jump frequency close to the set frequency. Setting the jump frequency helps to avoid the mechanical resonance point of the load.

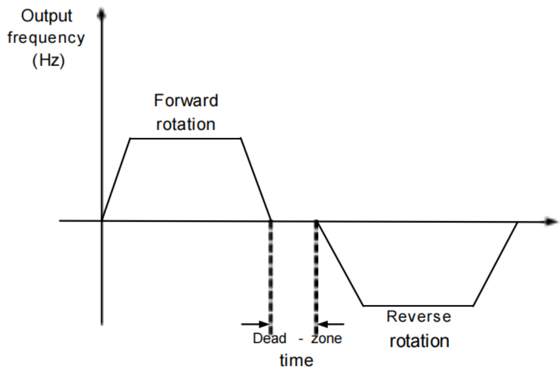
The DSI-100 supports two jump frequencies. If both are set to 0, the frequency jump function is disabled. The principle of the jump frequencies and jump amplitude is shown in the following figure.



Principle of the jump frequencies and jump amplitude

09.12	Forward/Reverse rotation dead-zone time	Default	0.0s
	Setting Range	0.0s ～3000.0s	

It is used to set the time when the output is 0Hz at transition of the AC drive forward rotation and reverse rotation, as shown in the following figure.



Forward/Reverse rotation dead-zone time

09.13	Reverse control		Default	0
	Setting Range	0	Enabled	
		1	Disabled	

It is used to set whether the AC drive allows reverse rotation. In the applications where reverse rotation is prohibited, set this parameter to 1.

09.14	Running mode when set frequency lower than frequency lower limit		Default	0
	Setting Range	0	Run at frequency lower limit	
		1	Stop	
		2	Run at zero speed	

It is used to set the AC drive running mode when the set frequency is lower than the frequency lower limit. The DSI-100 provides three running modes to satisfy requirements of various applications.

09.15	Droop control	Default	0.00Hz
	Setting Range	0.00Hz ～10.00Hz	

This function is used for balancing the workload allocation when multiple motors are used to drive the same load. The output frequency of the AC drives decreases as the load increases. You can reduce the workload of the motor under load by decreasing the output frequency for this motor, implementing workload balancing between multiple motors.

09.16	Accumulative power-on time threshold	Default	0h
	Setting Range	0h ～65000h	

If the accumulative power-on time (08.13) reaches the value set in this parameter, the corresponding DO terminal becomes ON.

09.17	Accumulative running time threshold	Default	0h
	Setting Range	0h ～65000h	

It is used to set the accumulative running time threshold of the AC drive. If the accumulative running time (08.09) reaches the value set in this parameter, the corresponding DO terminal becomes ON.

09.18	Startup protection		D	0
	Setting Range	0	No	
		1	Yes	

This parameter is used to set whether to enable the safety protection. If it is set to 1, the AC drive does not respond to the run command valid upon AC drive power-on (for example, an input terminal is ON before power-on). The AC drive responds only after the run command is canceled and becomes valid again.

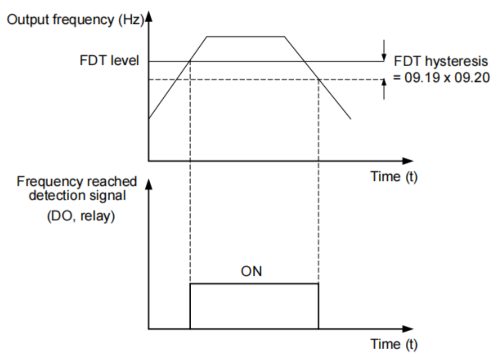
In addition, the AC drive does not respond to the run command valid upon fault reset of the AC drive. The run protection can be disabled only after the run command is canceled.

In this way, the motor can be protected from responding to run commands upon power-on or fault reset in unexpected conditions.

09.19	Frequency detection value(FDT1)	Default	50.00Hz
	Setting Range	0.00Hz ～maximum frequency	
09.20	Frequency detection hysteresis (FDT hysteresis 1)	Default	5.0%
	Setting Range	0.0% ～100.0% (FDT1 level)	

If the running frequency is higher than the value of 09.19, the corresponding DO terminal becomes ON. If the running frequency is lower than value of 09.19, the DO terminal goes OFF

These two parameters are respectively used to set the detection value of output frequency and hysteresis value upon cancellation of the output. The value of 09.20 is a percentage of the hysteresis frequency to the frequency detection value (09.19).

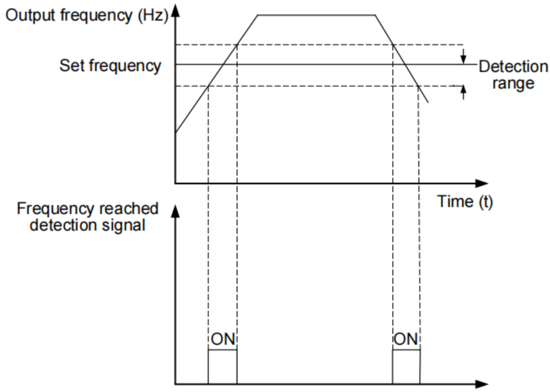


FDT level

09.21	Detection range of frequency reached	Default	0.0%
	Setting Range	0.00 ～100%(maximum frequency)	

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

This parameter is used to set the range within which the output frequency is detected to reach the set frequency. The value of this parameter is a percentage relative to the maximum frequency. The detection range of frequency reached is shown in the following figure.



Detection range of frequency reached

9.22	Jump frequency during acceleration/deceleration	Default	0
	Setting Range	0: Disabled; 1: Enabled	

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

When the jump frequencies are valid during acceleration/deceleration, and the running frequency is within the frequency jump range, the actual running frequency will jump over the set frequency jump amplitude (rise directly from the lowest jump frequency to the highest jump frequency). The following figure shows the diagram when the jump frequencies are valid during acceleration/deceleration.

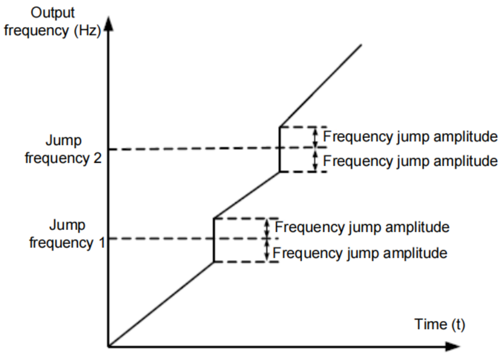
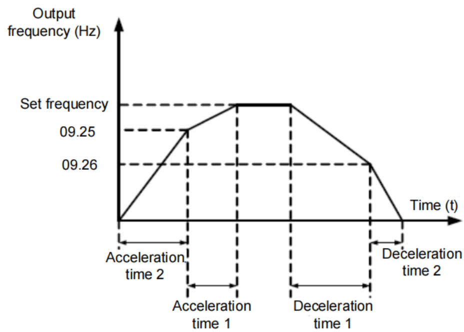


Diagram when the jump frequencies are valid during acceleration/deceleration

09.25	Frequency switchover point between acceleration time 1 and acceleration time 2	Default	0.00Hz
	Setting Range	0.00Hz ~maximum frequency	

09.26	Frequency switchover point between deceleration time 1 and deceleration time 2	Default	0.00Hz
	Setting Range	0.00Hz ～maximum frequency	

This function is valid when motor 1 is selected and acceleration/deceleration time switchover is not performed by means of DI terminal. It is used to select different groups of acceleration/deceleration time based on the running frequency range rather than DI terminal during the running process of the AC drive.



Acceleration/deceleration time switchover

During acceleration, if the running frequency is smaller than the value of 09.25, acceleration time 2 is selected. If the running frequency is larger than the value of 09.25, acceleration time 1 is selected.

During deceleration, if the running frequency is larger than the value of 09.26, deceleration time 1 is selected. If the running frequency is smaller than the value of 09.26, deceleration time 2 is selected.

09.27	Terminal JOG preferred	Default	0
	Setting Range	0: Disabled; 1: Enabled	

It is used to set whether terminal JOG is preferred.

If terminal JOG is preferred, the AC drive switches to terminal JOG running state when there is a terminal JOG command during the running process of the AC drive.

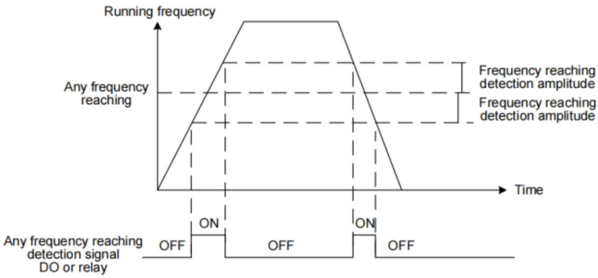
09.28	Frequency detection value (FDT2)	Default	50.00Hz
	Setting Range	0.00Hz ～maximum frequency	
09.29	Frequency detection hysteresis (FDT hysteresis 2)	Default	5.0%
	Setting Range	0.0% ～100.0 % (FDT2 level)	

The frequency detection function is the same as FDT1 function. For details, refer to the descriptions of 09.19 and 09.20.

09.30	Any frequency reaching detection value 1	Default	50.00Hz
	Setting Range	0.00Hz ～maximum frequency	
09.31	Any frequency reaching detection amplitude 1	Default	0.0%
	Setting Range	0.0%～100.0%(maximum frequency)	
09.32	Any frequency reaching detection value 2	Default	50.00Hz
	Setting Range	0.00Hz ～maximum frequency	
09.33	Any frequency reaching detection amplitude 2	Default	0.0%
	Setting Range	0.0%～100.0%(maximum frequency)	

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

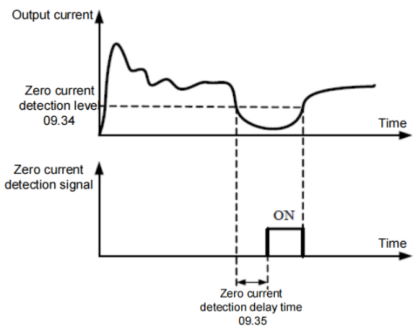
The DSI-100 provides two groups of any frequency reaching detection parameters, including frequency detection value and detection amplitude, as shown in the following figure.



Any frequency reaching detection

09.34	Zero current detection level	Default	5.0%
	Setting Range	0.0% ～300.0%(rated motor current)	
09.35	Zero current detection delay time	Default	0.10s
	Setting Range	0.00s ～600.00s	

If the output current of the AC drive 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. The zero current detection is shown in the following figure.

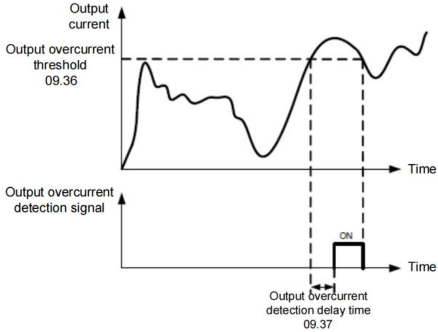


Zero current detection

09.36	Output overcurrent threshold	Default	200.0%
	Setting Range	0.0%(no detection); 0.1%~300.0% (rated motor current)	
09.37	Output overcurrent detection delay	Default	0.00s
	Setting Range	0.00s ～600.00s	

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

The output overcurrent detection function is shown in the following figure.

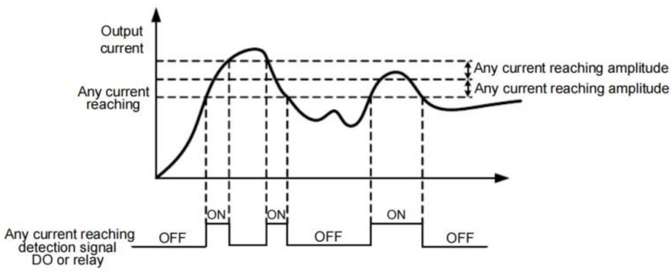


Output overcurrent detection

09.38	Any current reaching 1	Default	100.0%
	Setting Range	0.0% ～300.0%(rated motor current)	
09.39	Any current reaching 1 amplitude	Default	0.0%
	Setting Range	0.0% ～300.0%(rated motor current)	
09.40	Any current reaching 2	Default	100.0%
	Setting Range	0.0% ～300.0%(rated motor current)	
09.41	Any current reaching 2 amplitude	Default	0.0%
	Setting Range	0.0% ～300.0%(rated motor current)	

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

The DSI-100 provides two groups of any current reaching detection parameters, including current detection value and detection amplitudes, as shown in the following figure.



Any current reaching detection

09.42	Timing function		Default	0
	Setting Range	0	Disabled	
		1	Enabled	
09.43	Timing duration		Default	0
	Setting Range	0	09.44	
		1	AI1	
		2	AI2	
		3	AI3 (Keyboard Potentiometer)	
		(100% of analog input corresponds to the value of 09.44)		

09.44	Timing duration	Default	0.0Min
	Setting Range	0.0Min ～6500.0Min	

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

If 09.42 is set to 1, the AC drive starts to time at startup. When the set timing duration is reached, the AC drive stops automatically and meanwhile the corresponding DO becomes ON.

The AC drive starts timing from 0 each time it starts up and the remaining timing duration can be queried by 00.20.

The timing duration is set in 09.43 and 09.44, in unit of minute.

09.45	AI1 input voltage lower limit	Default	3.10V
	Setting Range	0.00V ～09.46	
09.46	AI1 input voltage upper limit	Default	6.80V
	Setting Range	09.45 ～10.00V	

These two parameters are used to set the limits of the input voltage to provide protection on the AC drive. When the AI1 input is larger than the value of 09.46 or smaller than the value of 09.45, the corresponding DO becomes ON, indicating that VS input exceeds the limit.

09.47	Module temperature threshold	Default	75℃
	Setting Range	0℃～ 100℃	

When the heatsink temperature of the AC drive reaches the value of this parameter, the corresponding DO becomes ON, indicating that the module temperature reaches the threshold.

09.48	Cooling fan control	Default	0
	Setting Range	0 : Fan working during running; 1: Fan working continuously	

It is used to set the working mode of the cooling fan. If this parameter is set to 0, the fan works when the AC drive is in running state. When the AC drive stops, the cooling fan works if the heatsink temperature is higher than 40°C, and stops working if the heatsink temperature is lower than 40°C.

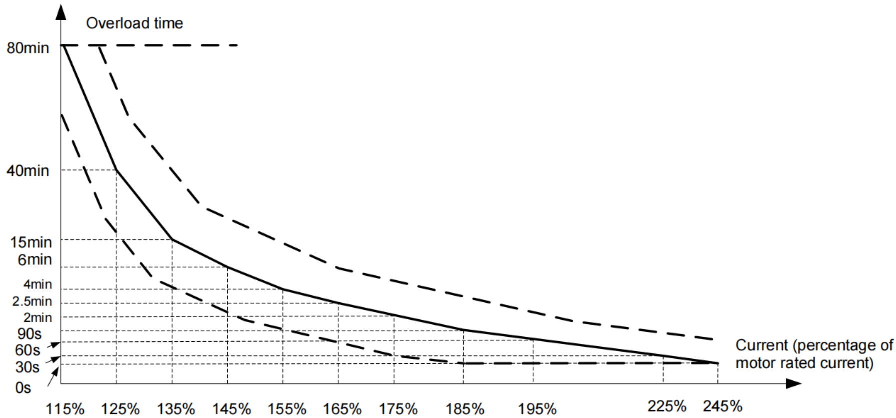
If this parameter is set to 1, the cooling fan keeps working after power-on.

09.49	Current running time reached	Default	0.0Min
	Setting Range	0.0Min ～6500.0Min	

Group 10 Faults and Protections

<table>
<tr><td rowspan="3">10.00</td><td colspan="2">Motor overload protection selection</td><td>Default</td><td>1</td></tr>
<tr><td rowspan="2">Setting Range</td><td>0</td><td colspan="2">Disabled</td></tr>
<tr><td>1</td><td colspan="2">Enabled</td></tr>
<tr><td rowspan="2">10.01</td><td colspan="2">Motor overload protection gain</td><td>Default</td><td>1</td></tr>
<tr><td colspan="2">Setting Range</td><td colspan="2">0.20 ～10.00</td></tr>
</table>

In order to effectively protect different load motors, this parameter needs to be set according to the overload capacity of the motor. The motor overload protection is an inverse time curve, and the motor overload protection curve is shown in below:



1) Under the condition that the running current of the motor reaches 175% of the rated current of the motor, the motor overload (Err11) will be reported after continuous operation for 2 minutes;

Under the condition that the running current of the motor reaches 115% times the rated current of the motor, it will report the motor overload (Err11) after continuous running for 80 minutes.

For example: motor rated current 100A

If 12.01 is set to 1.00, then when the motor running current reaches 125% (125A) of 100A, after 40 minutes, the inverter will report the motor overload fault;

If 12.01 is set to 1.20, then when the motor running current reaches 125% (125A) of 100A, after 40*1.2=48 minutes, the inverter will report the motor overload fault;

The longest overload is 80 minutes, and the shortest time is 10 seconds.

2) Example of motor overload protection adjustment: the motor needs to run for 2 minutes under the condition of 150% motor current to report overload. It can be known from the motor overload curve that the current of 150% (I) is between 145% (I1) and 155% (I2).) within the current range of 145% of the current for 6 minutes (T1) and 155% of the current for 4 minutes (T2), then the 5-minute overload of 150% of the motor's rated current under the default setting can be calculated as follows:

T = T1 + (T2 - T1)*(I - I1)/(I2 -I1) = 4 + (6 - 4)*(150% - 145%)/(155% -145%) = 5 (minutes)

Therefore, it can be concluded that the motor needs to report overload for 2 minutes under the condition of 150% motor current, and the motor overload protection gain is:

10.01 = 2 ÷ 5 = 0.4

Note: The user needs to correctly set the value of 10.01 according to the actual overload capacity of the motor. If this parameter is set too large, the motor may be overheated and damaged, and the inverter will not alarm and protect in time!

3) Motor overload warning coefficient means: when the motor overload detection level reaches the set value of this parameter, the multi-function output terminal DO or the fault relay (RELAY) outputs the motor overload pre-alarm signal. This parameter is based on the motor running continuously under a certain overload point. The time percentage calculation of overload failure is not reported.

For example: when the motor overload protection gain is set to 1.00 and the motor overload warning coefficient is set to 80%, if the motor current reaches 145% of the rated motor current and continues to run for 4.8 minutes (80% × 6 minutes), the multi-function output terminal DO Or the fault relay RELAY outputs the motor overload warning signal.

10.02	Motor overload pre-warning coefficient	Default	80%
	Setting Range	50% ～100%	

This function is used to give a warning signal to the control system via DO before motor overload rotection. This parameter is used to determine the percentage, at which pre-warning is performed before motor overload. The larger the value is, the less advanced the pre-warning will be.

When the accumulative output current of the AC drive is greater than the value of the overload inverse time-lag curve multiplied by 10.02, the DO terminal on the AC drive allocated with function 6 (Motor overload pre-warning) becomes ON.

10.03	Overvoltage stall gain	Default	0
	Setting Range	0 (no stall overvoltage)～100	
10.04	Overvoltage stall protective voltage	Default	130%
	Setting Range	120% ～150%	

When the DC bus voltage exceeds the value of 10.04 (Overvoltage stall protective voltage) during deceleration of the AC drive, the AC drive stops deceleration and keeps the present running frequency. After the bus voltage declines, the AC drive continues to decelerate.

10.03 (Overvoltage stall gain) is used to adjust the overvoltage suppression capacity of the AC drive.

The larger the value is, the greater the overvoltage suppression capacity will be.

In the prerequisite of no overvoltage occurrence, set 10.03 to a small value. For small-inertia load, the value should be small. Otherwise, the system dynamic response will be slow. For large-inertia load, the value should be large. Otherwise, the suppression result will be poor and an overvoltage fault may occur.

If the overvoltage stall gain is set to 0, the overvoltage stall function is disabled.

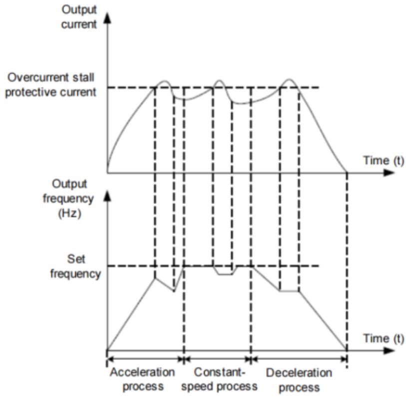
10.05	Overcurrent stall gain	Default	20
	Setting Range	0 ～100	
10.06	Overcurrent stall protective current	Default	150%
	Setting Range	100% ～200%	

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

10.05 (Overcurrent stall gain) is used to adjust the overcurrent suppression capacity of the AC drive. The larger the value is, the greater the overcurrent suppression capacity will be. In the prerequisite of no overcurrent occurrence, set 10.05 to a small value.

For small-inertia load, the value should be small. Otherwise, the system dynamic response will be slow. For large-inertia load, the value should be large. Otherwise, the suppression result will be poor and overcurrent fault may occur.

If the overcurrent stall gain is set to 0, the overcurrent stall function is disabled.



Overcurrent stall protection function

10.07	Short-circuit to ground upon power-on	Default	1
	Setting Range	0: Disabled; 1: Enabled	

It is used to determine whether to check the motor is short-circuited to ground at power-on of the AC drive. If this function is enabled, the AC drive's UVW will have voltage output a while after power-on.

10.08	Braking unit action starting voltage	Default	Model depended
	Setting Range	200.0～2000.0V	

The starting voltage Vbreak of the built-in braking unit action, the setting reference of this voltage value: 800 ≥ Vbreak ≥ (1.414Vs+30)

Vs—input AC supply voltage of inverter

Note: Improper setting of this voltage may cause the built-in braking unit to operate abnormally!

10.09	Fault auto reset times	Default	0
	Setting Range	0 ～20	

It is used to set the times of fault auto resets if this function is used. After the value is exceeded, the AC drive will remain in the fault state.

10.10	DO action during fault auto reset	Default	0
	Setting Range	0: Not act; 1: Act	

It is used to decide whether the DO acts during the fault auto reset if the fault auto reset function is selected.

10.11	Time interval of fault auto reset	Default	1.0s
	Setting Range	0.1s ～	

It is used to set the waiting time from the alarm of the AC drive to fault auto reset.

10.12	Input phase loss protection/contactor energizing protection selection	Default	11
	Setting Range	Unit's digit: Input phase loss protection Ten's digit: Contactor energizing 0: Disabled 1: Enabled	

Select whether to protect input phase loss or contactor pull-in.

The three-phase 380v voltage level of the DSI-100 inverter is only 18.5kw and above has the function of input phase loss protection and contactor pull-in.

Below 18.5kw, no matter if 10.12 is set to 0 or 1, there is no input phase loss, contactor pull-in combined protection function.

10.13	Output phase loss protection selection	Default	1
	Setting Range	0: Disabled 1: Enabled	

Select whether to protect the output phase loss.

If you select 0 and the output phase loss actually occurs, no fault will be reported. At this time, the actual current is larger than the current displayed on the panel, and there is a risk. Use with caution.

10.14	1st fault type	0 ～99
10.15	2nd fault type	
10.16	3rd (latest) fault type	

It is used to record the types of the most recent three faults of the AC drive. 0 indicates no fault. For possible causes and solution of each fault, refer to alarm information for details.

10.17	Frequency upon 3rd fault	It displays the frequency when the latest fault occurs.
10.18	Current upon 3rd fault	It displays the current when the latest fault occurs.
10.19	Bus voltage upon 3rd fault	It displays the bus voltage when the latest fault occurs.
10.20	Digital Input status upon 3rd fault	It displays the status of all DI terminals when the latest fault occurs. The sequence is as follows: BIT9 BIT8 BIT7 BIT6 BIT5 BIT4 BIT3 BIT2 BIT1 BIT0 DI0 DI9 DI8 DI7 DI6 DI5 DI4 DI3 DI2 DI1 If the X terminal is ON, the setting is 1. If the X terminal is OFF, the setting is 0. The value is the equivalent decimal number converted from the X terminal status.
10.21	Output terminal status upon 3rd fault	It displays the status of all output terminals when the latest fault occurs. The sequence is as follows: BIT4 BIT3 BIT2 BIT1 BIT0 DO2 DO1 REL2 REL1 FMP If an output terminal is ON, the setting is 1. If the output terminal is OFF, the setting is 0. The value is the equivalent decimal number converted from the DO terminal statuses.
10.22	AC drive status upon 3rd Fault	Reserved
10.23	Power-on time upon 3rd Fault	It displays the present power-on time when the latest fault occurs.
10.24	Running time upon 3rd Fault	It displays the present running time when the latest fault occurs.
10.27	Frequency upon 2nd fault	Same as 10.17～10.24
10.28	Current upon 2nd fault	
10.29	Bus voltage upon 2nd fault	
10.30	Second fault input terminal	
10.31	Second fault output terminal	
10.32	Second fault inverter state	
10.33	Second fault power-on time	
10.34	Second fault running time	

10.37	First fault frequency	Same as 10.17～10.24
10.38	First fault current	
10.39	First fault bus voltage	
10.40	First fault input terminal	
10.41	First fault output terminal	
10.42	First fault inverter state	
10.43	First fault power-on time	
10.44	First fault running time	

10.47	Fault protection action selection 1		Default	00000
	Setting Range	Unit's digit	Motor overload (Err11)	
		0	Coast to stop	
		1	Stop according to the stop mode	
		2	Continue to run	
		Ten's digit	Power input phase loss (Err12)	
		Hundred's digit	Power output phase loss (Err13)	
		Thousand's digit	External equipment fault (Err15)	
		Ten thousand's digit	Communication fault (Err16) (Same as unit's digit)	
10.48	Fault protection action selection 2		Default	00000
	Setting Range	Unit's digit	Encoder fault (Err20)	
		0	Coast to stop	
		1	Switch over to V/F control, stop according to the	
		2	Switch over to V/F control, continue to run	
		Ten's digit	EEPROM read-write fault (Err21)	
		0	Coast to stop	
		1	Stop according to the stop mode	
		Hundred's digit	Reserved	
		Thousand's digit	Motor overheat (Err25) (Same as unit's digit in	
		Ten thousand's digit	Accumulative running time reached (Err26) (Same as unit's digit in 10.47)	
10.49	Fault protection action selection 3		Default	00000
	Setting Range	Unit's digit	User-defined fault 1(Err27) Same as unit's digit in 10.-47	
		Ten's digit	User-defined fault 2(Err28) Same as unit's digit in 10.-47	

		Hundred's digit	Accumulative power-on time reached (Err29) Same as unit's digit in 10.-47	
		Thousand's digit	Load becoming 0 (Err30)	
		0	Coast to stop	
		1	Stop according to the stop mode	
		2	Continue to run at 7% of rated motor frequency and resume to the set frequency if the load Recovers	
		Ten thousand's digit	PID feedback lost during running (Err31) Same as unit's digit in 10.-47	
10.50	Fault protection action selection 4		Default	00000
	Setting Range	Unit's digit	Too large speed deviation, (Err42) Same as unit's digit in 10.47	
		Ten's digit	Motor over-speed (Err43) Same as unit's digit in 10.47	
		Hundred's digit	Initial position fault (Err51) Same as unit's digit in 10.47	
		Thousand's digit	Speed feedback fault (Err52) Same as unit's digit in 10.47	
		Ten thousand's digit	Reserved	

• If "Coast to stop" is selected, the AC drive displays Err** and directly stops.
• If "Stop according to the stop mode" is selected, the AC drive displays A** and stops according to the stop mode. After stop, the AC drive displays Err**.
• If "Continue to run" is selected, the AC drive continues to run and displays A**. The running frequency is set in 10.54.

10.54	Frequency selection for continuing to run upon fault		Default	0
	Setting Range	0	Current running frequency	
		1	Set frequency	
		2	Frequency upper limit	
		3	Frequency lower limit	
		4	Backup frequency upon abnormality	
10.55	Backup frequency upon abnormality		Default	100.0%
	Setting Range		0.0% ～100.0%(maximum frequency)	

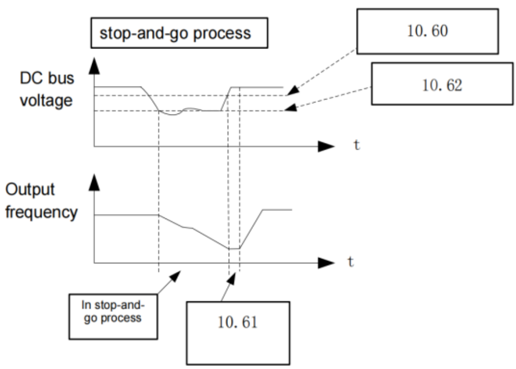
If a fault occurs during the running of the AC drive and the handling of fault is set to "Continue to run", the AC drive displays A** and continues to run at the frequency set in 10.54.
The setting of 10.55 is a percentage relative to the maximum frequency.

10.59	Action selection at instantaneous power failure		Default	0
	Setting Range	0	Invalid	
		1	Decelerate	
		2	Decelerate to stop	
10.60	Action pause judging voltage at instantaneous power failure		Default	90.0%
	Setting Range		80.0% ～100.0%	
10.61	Voltage rally judging time at instantaneous power failure		Default	0.50s
	Setting Range		0.00s ～100.00s	
10.62	Action judging voltage at instantaneous power failure		Default	80.0%
	Setting Range		60.0% ～100.0%(standard bus voltage)	

Upon instantaneous power failure or sudden voltage dip, the DC bus voltage of the AC drive reduces. This function enables the AC drive to compensate the DC bus voltage reduction with the load feedback energy by reducing the output frequency so as to keep the AC drive running continuously.

• If 10.59 = 1, upon instantaneous power failure or sudden voltage dip, the AC drive decelerates. Once the bus voltage resumes to normal, the AC drive accelerates to the set frequency. If the bus voltage remains normal for the time exceeding the value set in 10.61, it is considered that the bus voltage resumes to normal.

• If 10.59 = 2, upon instantaneous power failure or sudden voltage dip, the AC drive decelerates to stop.



AC drive action diagram upon instantaneous power failure

Remark:

(1) In the case of constant bus voltage control, when the power grid is restored, the output frequency of the inverter will continue to run to the target frequency. In deceleration stop mode, when the power grid is restored, the inverter will continue to decelerate to 0Hz and stop until the inverter sends a start command again. .

(2) The purpose of non-stop instantaneous power failure is to ensure that when the power supply of the grid is abnormal, the motor can decelerate and stop normally, so that after the power grid returns to normal power supply, the motor can be started immediately, and the motor will not suddenly owe when the power supply of the grid is abnormal. In the large inertia system, it takes a long time for the motor to coast to stop. When the power supply is normal, since the motor is still rotating at a high speed, starting the motor at this time will easily cause the inverter to generate an overload or overcurrent fault.

10.63	Protection upon load becoming 0		Default	0
	Setting Range	0	Disabled	
		1	Enabled	
10.64	Detection level of load becoming 0		Default	10.0%
	Setting Range		0.0% ～100.0% (rated motor current)	
10.65	Detection time of load becoming 0		Default	1.0s
	Setting Range		0.0s ～60.0s	

If protection upon load becoming 0 is enabled, when the output current of the AC drive is lower than the detection level (10.64) and the lasting time exceeds the detection time (10.65), the output frequency of the AC drive automatically declines to 7% of the rated frequency. During the protection, the AC drive automatically accelerates to the set frequency if the load resumes to normal.

10.67	Over-speed detection value	Default	20.0%
	Setting Range	0.0% ～50.0%(maximum frequency)	
10.68	Over-speed detection time	Default	1.0s
	Setting Range	0.0s ～60.0s	

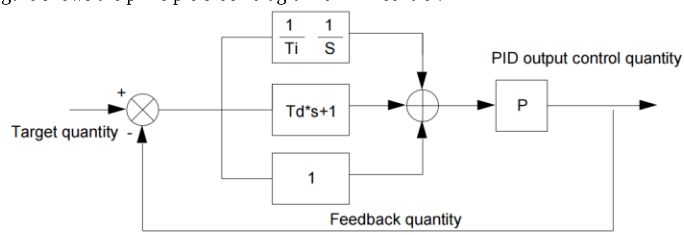
This function is valid only when the AC drive runs in the CLVC mode. If the actual motor rotational speed detected by the AC drive exceeds the maximum frequency and the excessive value is greater than the value of 10.67 and the lasting time exceeds the value of 10.68, the AC drive reports Err43 and acts according to the selected fault protection action.

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

Group 11 Process Control PID Functions

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.



Principle block diagram of PID control

11.00	PID setting source		Default	0
	Setting Range	0	11.01 Setting	
		1	AI1	
		2	AI2	
		3	AI3 (Keyboard Potentiometer)	
		4	PULSE Pulse (DI5)	
		5	Communication	
		6	Multi-reference	

11.01	PID digital setting	Default	50.0%
	Setting range	0.0% ～100.0%	

11.00 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%. The PID feedback is also a relative value.

The purpose of PID control is to make the PID setting and PID feedback equal.

11.02	PID Feedback source		Default	0
	Setting range	0	AI1	
		1	AI2	
		2	AI3 (Keyboard Potentiometer)	
		3	AI1-AI2	
		4	PULSE Pulse (DI5)	
		5	Communication	
		6	AI1+AI2	
		7	MAX(|AI1|,|AI2|)	
		8	MIN (|AI1|,|AI2|)	

This parameter 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%.

11.03	PID action direction		Default	0
	Setting range	0	Positive effect	
		1	Negative effects	

0: Forward action

When the feedback value is smaller than the PID setting, the AC drive's output frequency rises. For example, the winding tension control requires forward PID action.

1: Reverse action

When the feedback value is smaller than the PID setting, the AC drive's output frequency reduces. For example, the unwinding tension control requires reverse PID action.

Note that this function is influenced by the DI function 35 "Reverse PID action direction".

11.04	PID setting feedback range	Default	1000
	Setting range	0 ～65535	

This parameter is a non-dimensional unit. It is used for PID setting display (00.15) and PID feedback display (00.16). Relative value 100% of PID setting feedback corresponds to the value of 11.04. If 11.04 is set to 2000 and PID setting is 100.0%, the PID setting display (00.15) is 2000.PID

11.05	Proportional gain Kp1	Default	20.0
	Setting range	0.0 ～100.0	
11.06	Integral time Ti1	Default	2.00s
	Setting range	0.01s ～10.00s	
11.07	Differential timeTd1	Default	0.000s
	Setting range	0.00 ～10.000	

• 11.05 (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.
• 11.06 (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 11.06. Then the adjustment amplitude reaches the maximum frequency.
• 11.07 (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.

11.08	Cut-off frequency of PID reverse rotation	Default	2.00Hz
	Setting range	0.00 ～Max frequency	

In some cases, only when the PID output frequency is negative (that is, the inverter is reversed), can the PID control the given amount and the feedback amount to the same state, but too high reverse frequency is not allowed in some occasions , 11.08 is used to determine the upper limit of the reverse frequency.

When the frequency source is PID, the upper and lower limits and the range of frequency output:

For example: frequency source is pure PID or main + PID

1) The inversion cut-off frequency is 0 or the inversion is prohibited (that is, any of the following three)

(1) 11.08=0, 09.13=0;

(2) 11.08=0, 09.13=1;

(3) 11.08=0, 09.13=1

Output upper limit: upper limit frequency

Output lower limit: lower limit frequency

Output range: lower limit frequency ~ upper limit frequency (ie 01.14 ~ 01.12)

2) Inversion cut-off frequency is not 0 and inversion is not prohibited (ie 11.08=0, 09.13=0)

Output upper limit: upper limit frequency

Output lower limit: Invert cutoff frequency

Output range: reverse cutoff frequency ~ upper limit frequency

11.09	PID deviation limit	Default	0.0%
	Setting range	0. 0% ～100.0%	

If the deviation between PID feedback and PID setting is smaller than the value of 11.09, PID control stops. The small deviation between PID feedback and PID setting will make the output frequency stabilize, effective for some closed-loop control applications.

11.10	PID deviation limit	Default	0.10%
	Setting range	0．00% ～100.00%	

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

11.11	PID setting change time	Default	0.00s
	Setting range	0.00s ～650.00s	

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.

11.12	PID feedback filter time	Default	0.00s
	Setting range	0.00s ～60.00s	
11.13	PID output filter time	Default	0.00s
	Setting range	0.00s ～60.00s	

11.12 is used to filter the PID feedback, helping to reduce interference on the feedback but slowing the response of the process closed-loop system.

11.13 is used to filter the PID output frequency, helping to weaken sudden change of the AC drive output frequency but slowing the response of the process closed-loop system.

11.15	Proportional gain Kp2		Default	20.0
	Setting range		0.0 ～100.0	
11.16	Integral time Ti2		Default	2.00s
	Setting range		0.01s ～10.00s	
11.17	Differential time Td2		Default	0.000s
	Setting range		0.00 ～10.000	
11.18	PID parameter switchover condition		Default	0
	Setting range	0	No switchover	
		1	Switchover via DI	
		2	Automatic switchover based on deviation	
11.19	PID parameter switchover deviation 1		Default	20.0%
	Setting range		0.0% ～11.20	
11.20	PID parameter switchover deviation 2		Default	80.0%
	Setting range		11.19 ～100.0%	

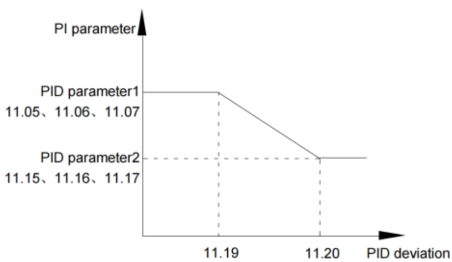
In some applications, PID parameters switchover is required when one group of PID parameters cannot satisfy the requirement of the whole running process.

These parameters are used for switchover between two groups of PID parameters. Regulator parameters 11.15 to 11.17 are set in the same way as 11.05 to 11.07.

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 (11.05 to 11.07) is selected. If the DI is ON, group 2 (11.15 to 11.17) is selected.

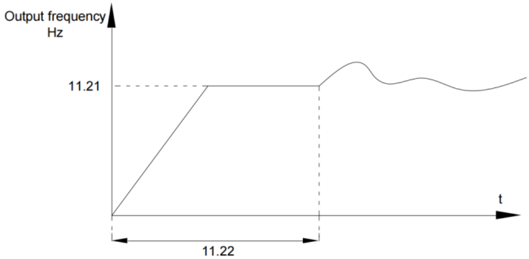
If you select automatic switchover, when the absolute value of the deviation between PID feedback and PID setting is smaller than the value of 11.19, group 1 is selected. When the absolute value of the deviation between PID feedback and PID setting is higher than the value of 11.20, group 2 is selected. When the deviation is between 11.19 and 11.20, the PID parameters are the linear interpolated value of the two groups of parameter values.



PID parameters switchover

11.21	PID initial value	Default	0.0%
	Setting range	0.0% ～100.0%	
11.22	PID initial value holding time	Default	0.00s
	Setting range	0.00s ～650.00s	

When the inverter starts, the PID output is fixed at the PID initial value of 11.21, and the PID starts the closed-loop adjustment operation after the PID initial value hold time of 11.22. Figure 6-36 is a functional schematic diagram of PID initial value.



PID initial value function

11.25	PID integral property		Default	00
	Setting range	Unit's digit	Integral separated	
		0	Invalid	
		1	Valid	
		Ten's digit	Whether to stop integral operation when the output reaches the limit	
		0	Continue integral operation	
		1	Stop integral operation	

- Integral separated

If it is set to valid, , the PID integral operation stops when the DI allocated with function 38 "PID integral pause" is ON In this case, only proportional and differential operations take effect.

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

- Whether to stop integral operation when the output reaches the limit

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

11.26	Detection value of PID feedback loss	Default	0.0%
	Setting range	0.0%: Not judging feedback loss;	
11.27	Detection time of PID feedback loss	Default	0.0s
	Setting range	0.0s ～20.0s	

These parameters are used to judge whether PID feedback is lost.

If the PID feedback is smaller than the value of 11.26 and the lasting time exceeds the value of 11.27, the AC drive reports Err31 and acts according to the selected fault protection action.

11.28	PID operation at stop	Default	0
	Setting range	0	No PID operation at stop
		1	PID operation at stop

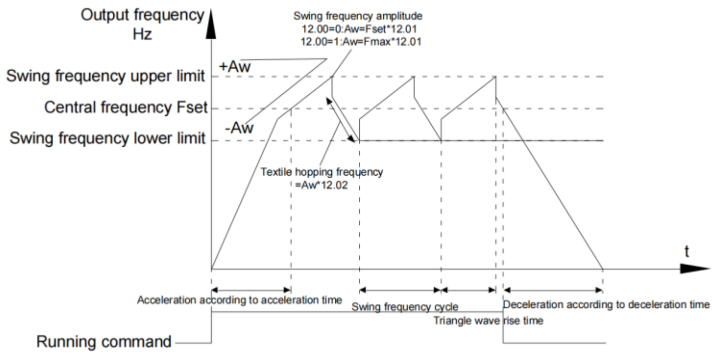
It is used to select whether to continue PID operation in the state of stop. Generally, the PID operation stops when the AC drive stops.

Group 12: Swing Frequency, Fixed Length and Count

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 AC drive 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.

The swing amplitude is set in 12.00 and 12.01. When 12.01 is set to 0, the swing amplitude is 0 and the swing frequency does not take effect.



Schematic diagram of swing frequency operation

12.00	Swing frequency setting mode		Default	0
	Setting range	0	Relative to the central frequency	
		1	Relative to the maximum frequency	

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

• 0: Relative to the central frequency (01.07 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 (01.10 maximum output frequency)

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

12.01	Swing frequency amplitude	Default	0.0%
	Setting range	0.0% ～100.0%	
12.02	Jump frequency amplitude	Default	0.0%
	Setting range	0.0% ～50.0%	

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.
• If relative to the central frequency (12.00 = 0), the actual swing amplitude AW is the calculation result of 01.07 (Frequency source selection) multiplied by 12.01.
• If relative to the maximum frequency (12.00 = 1), the actual swing amplitude AW is the calculation result of 01.10 (Maximum frequency) multiplied by 12.01.
Jump frequency = Swing amplitude AW x 12.02 (Jump frequency amplitude).
• If relative to the central frequency (12.00 = 0), the jump frequency is a variable value.
• If relative to the maximum frequency (12.00 = 1), the jump frequency is a fixed value.
The swing frequency is limited by the frequency upper limit and frequency lower limit.

12.03	Swing frequency cycle	Default	10.0s
	Setting range	0.0s ～3000.0s	
12.04	Triangular wave rising time coefficient	Default	50.0%
	Setting range	0.0% ～100.0%	

12.03 specifies the time of a complete swing frequency cycle.
12.04 specifies the time percentage of triangular wave rising time to 12.03 (Swing frequency cycle).

• Triangular wave rising time = 12.03 (Swing frequency cycle) x 12.04 (Triangular wave rising time coefficient, unit: s)

• Triangular wave falling time = 12.03 (Swing frequency cycle) x (1 – 12.04 Triangular wave rising time coefficient, unit: s)

12.05	Setting Length	Default	1000m
	Setting range	0m ～65535m	
12.06	Actual Length	Default	0m
	Setting range	0m ～65535m	
12.07	Pulse/meter	Default	100.0
	Setting range	0.1 ～6553.5	

The preceding parameters are used for fixed length control.

The length information is collected by DI terminals. 12.06 (Actual length) is calculated by dividing the number of pulses collected by the DI terminal by 12.07 (Number of pulses each meter).

When the actual length 12.06 exceeds the set length in 12.05, 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, DI5 must be used.

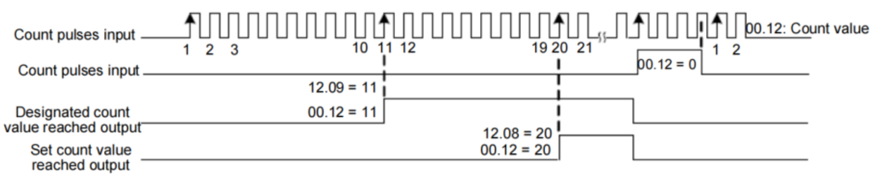
12.08	Set count value	Default	1000
	Setting range	1 ～65535	
12.09	Designated count value	Default	1000
	Setting range	1 ～65535	

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, DI5 must be used.

When the count value reaches the set count value (12.08), the DO terminal allocated with function 8 (Set count value reached) becomes ON. Then the counter stops counting.

When the counting value reaches the designated counting value (12.09), the DO terminal allocated with function 9 (Designated count value reached) becomes ON. Then the counter continues to count until the set count value is reached.

12.09 should be equal to or smaller than 12.08.



Reaching the set count value and designated count value

Group13 Multi-stage speed command and simple PLC function

The multi-stage speed command of DSI-100 has more functions than the usual multi-stage speed. In addition to realizing the multi-stage speed function, it can also be used as a voltage source for VF separation and a given source for process PID. For this reason, the dimensions of multi-segment instructions are relative.

The simple PLC function is different from the user programmable function of DSI-100. Simple PLC can only complete the simple combined operation of multi-segment instructions.

13.00	Multi-reference 0	Default	0.0%
	Setting range	-100.0% ～100.0%	
13.01	Multi-reference 1	Default	0.0%
	Setting range	-100.0% ～100.0%	
13.02	Multi-reference 2	Default	0.0%
	Setting range	-100.0% ～100.0%	
13.03	Multi-reference 3	Default	0.0%
	Setting range	-100.0% ～100.0%	
13.04	Multi-reference 4	Default	0.0%
	Setting range	-100.0% ～100.0%	
13.05	Multi-reference 5	Default	0.0%
	Setting range	-100.0% ～100.0%	
13.06	Multi-reference 6	Default	0.0%
	Setting range	-100.0% ～100.0%	
13.07	Multi-reference 7	Default	0.0%
	Setting range	-100.0% ～100.0%	
13.08	Multi-reference 8	Default	0.0%
	Setting range	-100.0% ～100.0%	
13.09	Multi-reference 9	Default	0.0%
	Setting range	-100.0% ～100.0%	
13.10	Multi-reference 10	Default	0.0Hz
	Setting range	-100.0% ～100.0%	
13.11	Multi-reference 11	Default	0.0%
	Setting range	-100.0% ～100.0%	
13.12	Multi-reference 12	Default	0.0%
	Setting range	-100.0% ～100.0%	
13.13	Multi-reference 13	Default	0.0%
	Setting range	-100.0% ～100.0%	
13.14	Multi-reference 14	Default	0.0%
	Setting range	-100.0% ～100.0%	
13.15	Multi-reference 15	Default	0.0%
	Setting range	-100.0% ～100.0%	

Multi-reference 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. As process PID setting source, it does not require conversion.

Multi-reference can be switched over based on different states of DI terminals. For details, see the descriptions of group 05.

13.16	Simple PLC running mode		Default	0
	Setting range	0	Stop after the AC drive runs one cycle	
		1	Keep final values after the AC drive runs	
		2	Repeat after the AC drive runs one cycle	

The AC drive stops after running one cycle, and will not start up until receiving another command.

• 1: Keep final values after the AC drive runs one cycle

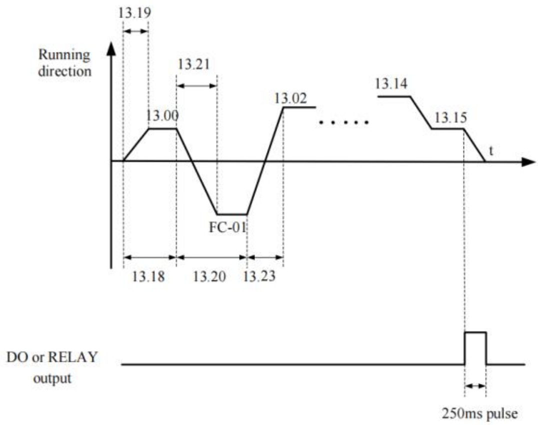
The AC drive keeps the final running frequency and direction after running one cycle.

• 2: Repeat after the AC drive runs one cycle

The AC drive automatically starts another cycle after running one cycle, and will not stop until receiving the stop command.

Simple PLC can be either the frequency source or V/F separated voltage source.

When simple PLC is used as the frequency source, whether parameter values of 13.00 to 13.15 are positive or negative determines the running direction. If the parameter values are negative, it indicates that the AC drive runs in reverse direction.



Simple PLC when used as frequency source

13.17	Simple PLC retentive selection		Default	00
	Setting range	Unit's digit	Retentive upon power failure	
		0	No	
		1	Yes	
		Ten's digit	Retentive upon stop	
		0	No	
		1	Yes	

PLC retentive upon power failure indicates that the AC drive memorizes the PLC running moment and running frequency before power failure and will continue to run from the memorized moment after it is powered on again. If the unit's digit is set to 0, the AC drive restarts the PLC process after it is powered on again.

PLC retentive upon stop indicates that the AC drive records the PLC running moment and running frequency upon stop and will continue to run from the recorded moment after it starts up again. If the ten's digit is set to 0, the AC drive restarts the PLC process after it starts up again.

13.18	Running time of simple PLC reference 0	Default	0.0s(h)
	Setting range	0.0s(h) ～6553.5s(h)	
13.19	Acceleration/deceleration time of simple PLC reference 0	Default	0
	Setting range	0 ～3	
13.20	Running time of simple PLC reference 1	Default	0.0s(h)
	Setting range	0.0s(h) ～6553.5s(h)	
13.21	Acceleration/deceleration time of simple PLC reference 1	Default	0
	Setting range	0 ～3	
13.22	Running time of simple PLC reference 2	Default	0.0s(h)
	Setting range	0.0s(h) ～6553.5s(h)	
13.23	Acceleration/deceleration time of simple PLC reference 2	Default	0
	Setting range	0 ～3	
13.24	Running time of simple PLC reference 3	Default	0.0s(h)
	Setting range	0.0s(h) ～6553.5s(h)	
13.25	Acceleration/deceleration time of simple PLC reference 3	Default	0
	Setting range	0 ～3	
13.26	Running time of simple PLC reference 4	Default	0.0s(h)
	Setting range	0.0s(h) ～6553.5s(h)	
13.27	Acceleration/deceleration time of simple PLC reference 4	Default	0
	Setting range	0 ～3	
13.28	Running time of simple PLC reference 5	Default	0.0s(h)
	Setting range	0.0s(h) ～ 6553.5s(h)	
13.29	Acceleration/deceleration time of simple PLC reference 5	Default	0
	Setting range	0 ～3	
13.30	Running time of simple PLC reference 6	Default	0.0s(h)
	Setting range	0.0s(h) ～6553.5s(h)	
13.31	Acceleration/deceleration time of simple PLC reference 6	Default	0
	Setting range	0 ～3	
13.32	Running time of simple PLC reference 7	Default	0.0s(h)
	Setting range	0.0s(h) ～6553.5s(h)	
13.33	Acceleration/deceleration time of simple PLC reference 7	Default	0
	Setting range	0 ～3	
13.34	Running time of simple PLC reference 8	Default	0.0s(h)
	Setting range	0.0s(h) ～6553.5s(h)	
13.35	Acceleration/deceleration time of simple PLC reference 8	Default	0
	Setting range	0 ～3	
13.36	Running time of simple PLC reference 9	Default	0.0s(h)
	Setting range	0.0s(h) ～6553.5s(h)	
13.37	Acceleration/deceleration time of simple PLC reference 9	Default	0
	Setting range	0 ～3	

13.38	Running time of simple PLC reference 10	Default	0.0s(h)
	Setting range	0.0 s(h) ～6553.5s(h)	
13.39	Acceleration/deceleration time of simple PLC reference 10	Default	0
	Setting range	0 ～3	
13.40	Running time of simple PLC reference 11	Default	0.0s(h)
	Setting range	0.0s(h) ～6553.5s(h)	
13.41	Acceleration/deceleration time of simple PLC reference 11	Default	0
	Setting range	0 ～3	
13.42	Running time of simple PLC reference 12	Default	0.0s(h)
	Setting range	0.0s(h) ～6553.5s(h)	
13.43	Acceleration/deceleration time of simple PLC reference 12	Default	0
	Setting range	0 ～3	
13.44	Running time of simple PLC reference 13	Default	0.0s(h)
	Setting range	0.0s(h) ～6553.5s(h)	
13.45	Acceleration/deceleration time of simple PLC reference 13	Default	0
	Setting range	0 ～3	
13.46	Running time of simple PLC reference 14	Default	0.0s(h)
	Setting range	0.0s(h) ～6553.5s(h)	
13.47	Acceleration/deceleration time of simple PLC reference 14	Default	0
	Setting range	0 ～3	
13.48	Running time of simple PLC reference 15	Default	0.0s(h)
	Setting range	0.0s(h) ～6553.5s(h)	
13.49	Acceleration/deceleration time of simple PLC reference 15	Default	0
	Setting range	0 ～3	
13.50	Time unit of simple PLC running	Default	0
	Setting range	0	S (Second)
		1	H (Hours)

13.51	Reference 0		Default	0
	Setting range	0	Set by 13.00	
		1	AI1	
		2	AI2	
		3	AI3 (Keyboard Potentiometer)	
		4	PULSE	
		5	PID	
		6	Set by preset frequency (01.08), modified via terminal UP/DOWN	

It determines the setting channel of reference 0. You can perform convenient switchover between the setting channels. When multi-reference or simple PLC is used as frequency source, the switchover between two frequency sources can be realized easily.

Group14 Communication parameters

Please refer to "DSI-100 Communication Protocol"

Group 17 User Password

17.00	User’s password	Default	0
	Setting range	0 ～65535	

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 17.00 is set to 00000, the previously set user password is cleared, and the password protection function is disabled.

<table>
<tr><td rowspan="4">17.01</td><td colspan="2">Restore default</td><td>Default</td><td>0</td></tr>
<tr><td rowspan="3">Setting range</td><td>0</td><td colspan="2">No option settings</td></tr>
<tr><td>1</td><td colspan="2">Restore factory settings except motor parameters</td></tr>
<tr><td>2</td><td colspan="2">Clear records</td></tr>
</table>

1: Restore the factory setting, excluding motor parameters

After setting 17.01 to 1, most of the functional parameters of the inverter are restored to the factory default parameters, but the motor parameters, frequency command decimal point (01.22), fault record information, cumulative running time (08.09), cumulative power-on time (08.13), cumulative Power consumption (08.14) is not restored.

2: Clear record information

Clear the inverter fault record information, cumulative running time (08.09), cumulative power-on time (08.13), and cumulative power consumption (08.14).

<table>
<tr><td rowspan="7">17.02</td><td colspan="2">AC drive parameter display property</td><td>Default</td><td>11</td></tr>
<tr><td rowspan="6">Setting range</td><td>Unit's digit</td><td colspan="2">Group U display selection</td></tr>
<tr><td>0</td><td colspan="2">No display</td></tr>
<tr><td>1</td><td colspan="2">Display</td></tr>
<tr><td>Ten's digit</td><td colspan="2">Group A display selection</td></tr>
<tr><td>0</td><td colspan="2">No display</td></tr>
<tr><td>1</td><td colspan="2">Display</td></tr>
<tr><td rowspan="7">17.03</td><td colspan="2">Individualized parameter display property</td><td>Default</td><td>00</td></tr>
<tr><td rowspan="6">Setting range</td><td>Unit's digit</td><td colspan="2">User-defined parameter display selection</td></tr>
<tr><td>0</td><td colspan="2">No display</td></tr>
<tr><td>1</td><td colspan="2">Display</td></tr>
<tr><td>Ten's digit</td><td colspan="2">User-modified parameter display selection</td></tr>
<tr><td>0</td><td colspan="2">No display</td></tr>
<tr><td>1</td><td colspan="2">Display</td></tr>
</table>

The setting of parameter display mode aims to facilitate you to view different types of parameters based on actual requirements. The DSI-100 provides the following three parameter display modes.

Parameter Name	Description
AC drive parameter display	Display function codes of the AC drive in sequence of 01 to 16, 18 to 33 and 00 Group.
User-defined parameter display	Display a maximum of 32 user-defined parameters included in group 15.
User-modified parameter display	Display the parameters that are modified.

If one digit of 17.03 is set to 1, you can switch over to different parameter display modes by pressing key QUICK. By default, the AC drive parameter display mode is used.
The display codes of different parameter types are shown in the following table.

Parameter Display Mode	Display
AC drive parameter	-bASE
User-defined parameter	-USEr
User-modified parameter	--C--

The DSI-100 provides display of two types of individualized parameters: user-defined parameters and user-modified parameters.
• You-defined parameters are included in group PE. You can add a maximum of 32 parameters, convenient for commissioning.
In user-defined parameter mode, symbol "u" is added before the function code. For example, 02.00 is displayed as u02.00.
• You-modified parameters are grouped together, convenient for on-site troubleshooting.
In you-modified parameter mode, symbol "c" is added before the function code. For example, 02.00 is displayed as c02.00.

17.04	Parameter modification property		Default	0
	Setting range	0	Modifiable	
		1	Not modifiable	

It is used to set whether the parameters are modifiable to avoid mal-function. If it is set to 0, all parameters are modifiable. If it is set to 1, all parameters can only be viewed.

Group18~22 Reserved

Group 23 Control optimization parameters

23.00	DPWM switching upper	Default	8Hz
	Setting range	5.00Hz～Max. frequency	

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 this parameter, the waveform is 7-segment continuous modulation.
If the frequency is higher than the value of this parameter, the waveform is 5-segment intermittent modulation.
The 7-segment continuous modulation causes more loss to switches of the AC drive but smaller current ripple.
The 5-segment intermittent modulation causes less loss to switches of the AC drive 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 04.11. For loss to AC drive and temperature rise, refer to parameter 01.15.

23.01	PWM modulation mode		Default	0
	Setting range	0	Asynchronous modulation	
		1	Synchronous modulation	

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.
At low output frequency (100 Hz or lower), synchronous modulation is not required. This is because asynchronous modulation is preferred when the ratio of carrier frequency to output frequency is high. 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.

23.02	Dead-zone compensation mode		Default	1
	Setting range	0	No compensation	
		1	Compensation mode 1	

Generally, you need not modify this parameter. 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 AC drive, compensation mode 2 is recommended.

23.03	Random PWM depth		Default	0
	Setting range	0	Random PWM invalid	
		1～10	PWM carrier frequency random depth	

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.

23.04	Rapid current-limiting enable		Default	1
	Setting range	0	Disabled	
		1	Enabled	

The rapid current limit function can reduce the AC drive's overcurrent faults at maximum, guaranteeing uninterrupted running of the AC drive.
However, long-time rapid current limit may cause the AC drive to overheat, which is not allowed. In this case, the AC drive will report Err40, indicating the AC drive is overloaded and needs to stop.

23.05	Current detection compensation	Default	5
	Setting range	0～100	

It is used to set the AC drive current detection compensation. Too large value may lead to deterioration of control performance. Do not modify it generally

23.06	Under-voltage point setup	Default	Model depended
	Setting range	200.0V～2000.0V	

It is used to set the voltage value of the inverter undervoltage fault Err09 fault. The factory default value is related to the model.

Voltage Class	Nominal Value of Undervoltage threshold
Single-phase 220 V	200 V
Three-phase 220 V	200 V
Three-phase 380 V	350 V
Three-phase 480 V	450 V
Three-phase 690 V	650 V

23.09	Over-voltage point setup	Default	Model depended
	Setting range	200.0V～2500.0V	

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.

Voltage Class	Default Overvoltage Threshold
Single-phase 220 V	400.0 V
Three-phase 220 V	400.0 V
Three-phase 380 V	810.0 V
Three-phase 480 V	890.0 V
Three-phase 690 V	1300.0 V

Overvoltage thresholds for different voltage classes

Note: The default value is also the upper limit of the inverter's internal overvoltage protection. This parameter setting takes effect only when the set value of 23.09 is less than the ex-factory value of each voltage level. When it is higher than the factory value, the factory value shall prevail.

Chapter 7 Fault Display and settlement

7.1 Guidance on the adjustment of the inverter before commissioning

1）Drive in Open-loop Vector Control （01.01=0）

The AC drive implements control of the motor speed and torque without an encoder for speed feedback. In this control mode, motor auto-tuning is required to obtain the motor related

Error	Solution
Overload or Over current detected during motor start	◆ Set motor parameters（02.01~02.05）according to motor nameplate. ◆ Select a proper motor auto-tuning mode by setting 02.37 and perform motor auto-tuning. If possible, select dynamic auto-tuning
Poor torque or speed response and motor oscillation at speeds below 5 Hz	◆ 1. If motor torque and speed response are too slow, increase the setting of 03.00 (speed loop proportional gain 1) by 10 gradually or decrease the setting of 03.01 (speed loop integral time 1) by 0.05 gradually. ◆ 2. If motor oscillation occurs, decrease the setting of 03.00 and 03.01.
Poor torque or speed response and motor oscillation at speeds above 5 Hz	◆ 1. If motor torque and speed response are too slow, increase the setting of 03.03 (speed loop proportional gain 2) by 10 gradually or decrease. the setting of 03.04 (speed loop integral time 4) by 0.05 gradually. ◆ 2. If motor oscillation occurs, decrease the setting of 03.03 and 03.04.
Low speed accuracy	◆ If speed error when motor runs with load is large, increase the setting of 03.06 (vector control slip compensation gain) by 10% gradually.
Obvious speed fluctation	◆ If motor speed fluctuation is large, increase the setting of 03.07 (SVC torque filter time) by 0.001s gradually.
Too loud motor noise	◆ Increase the setting of 01.15 (carrier frequency) by 1.0 kHz gradually. Note that increase in carrier frequency will result in an increase in the leakage current of the motor.
Insufficiency motor torque	◆ Check whether torque upper limit is small. If yes, please Increase the setting of 03.10 (digital setting of torque upper limit in speed control mode) in the speed control mode ; Increase the torque reference in the torque control mode.
Obvious speed fluctuation	◆ If motor speed fluctuation is large, increase the setting of 03.07 (SVC torque filter time) by 0.001s gradually.
Too loud motor noise	◆ Increase the setting of 01.15 (carrier frequency) by1.0 kHz gradually. Note that increase in carrier frequency will result in an increase in the leakage current of the motor.

Insufficient motor torque	◆ Check whether torque upper limit is small. If yes, please: Increase the setting of 03.10 (digital setting of torque upper limit in speed control mode in the speed control mode.

2）Drive in V/F Control (01.01=2 factory default)

It is applicable to application without an encoder for speed feedback. You need to set rated motor voltage and rated motor frequency correctly.

Error	Solution
Motor oscillation during running	1.Increase the setting of 04.11 (V/F oscillation suppression gain) by 10 gradually. The permissible maximum setting here is 100.
Over current during start	1.Decrease the setting of 04.01 (torque boost) by 0.5% gradually.
Too loud motor noise	1.Increase the setting of 01.15 (carrier frequency) by 1.0 kHz gradually. Note that increase in carrier frequency will result in an increase in the leakage current of the motor.
Very large current during running	1. Set rated motor voltage (02.02) and rated motor frequency (02.04) correctly. 2. Decrease the setting of 04.01 (torque boost) by 0.5% gradually.
Over voltage detected when heavy load is suddenly removed or during deceleration	1. Ensure that 04.23 (voltage limit selection) is set to 1 (enabled). Increase the setting of 04.24/04.25 (frequency gain/voltage gain for voltage limit) by 10 gradually. The permissible maximum setting here is 100. 2. Decrease the setting of 04.22 (voltage limit 770v) by 10 V gradually. The permissible minimum setting here is 700 V.
Over current detected when heavy load is suddenly added or during acceleration	1. Increase the setting of 04.20 (04.20 factory default set 20) by 10 gradually. The permissible maximum setting here is 100. 2. Decrease the setting of 04.18 (04.18 factory default is 150%) by 10% gradually. The permissible minimum setting here is 50%.

7.2 Fault Display

When a fault occurs during running, The operation panel displays the fault code such as shown in the following figure.

Fault	Displ	Fault reason	Error settlement
Over current during acceleration	E.oC1	Ground fault or short circuit exists in the output circuit.	◆ Check whether short-circuit occurs on the motor, motor cable or contactor.
		Control mode is SVC but motor auto-tuning is not performed.	◆ Set motor parameters according to motor nameplate and perform motor auto-tuning.
		Acceleration time is too short.	◆ Increase acceleration time.
		The over current stall prevention parameters are set improperly.	◆ Ensure that current limit is enabled (04.19 = 1). ◆ The setting of current limit level (04.18) is too large. Adjust it between 120% and 150%. ◆ The setting of current limit gain (04.20) is too small. Adjust it between 20 and 40.
		Customized torque boost or V/F curve is not appropriate.	◆ Adjust the customized torque boost or V/F curve.
		The spinning motor is started.	◆ Enable the catching a spinning motor function or start the motor
		The AC drive suffers external interference.	◆ View historical fault records. If the current value is far from the over current level, find interference source. If external interference does not exist, it is the drive board or hall device problem.
Over current during deceleration	E.oC2	Ground fault or short circuit exists in the output circuit.	◆ Check whether short-circuit occurs on the motor, motor cable or contactor.
		Control mode is SVC but motor auto-tuning is not performed.	◆ Set the motor parameters according to the motor nameplate and perform motor auto-tuning.
		Acceleration time is too short.	◆ Increase acceleration time.
		The over current stall prevention parameters are set	◆ Ensure that current limit is enabled (04.19 = 1) ◆ The setting of current limit level

		improperly.	(04.18) is too large. Adjust it between 120% and 150%. ◆ The setting of the current limit gain (04.20) is too small. Adjust it between 20 and 40.
		Braking unit and braking resistor are not installed.	◆ Install braking unit and braking resistor.
		The AC drive suffers external interference.	◆ View historical fault records. If the current value is far from the over current level, find interference source. If external interference does not exist, it is the drive board or hall device problem.
Over current at constant speed	E.oC3	Ground fault or short circuit exists in	◆ Check whether short-circuit occurs on the motor, motor cable or contactor.
		Control mode is SVC but motor auto-tuning is not performed	◆ Set motor parameters according to motor nameplate and perform motor auto-tuning.
		The over current stall prevention parameters are set improperly.	◆ Ensure that current limit is enabled (04.19). ◆ The setting of current limit level (04.18) is too large. Adjust it between 120% and 150%. ◆ The setting of current limit gain (04.20) is too small. Adjust it between 20 and 40.
		The AC drive power class is small.	◆ If output current exceeds rated motor current or rated output current of the AC drive during stable running, replace a drive of larger power class.
		The drive suffers external interference.	◆ View historical fault records. If the current value is far from the over current level, find interference source. If external interference does not exist, it is the drive board or hall device
Over voltage during acceleration	E.oU1	Input voltage is too high.	◆ Adjust input voltage to normal range.
		An external force drives motor during acceleration.	◆ Cancel the external force or install a braking resistor.

		The over voltage stall prevention parameters are set improperly.	◆ Ensure that the voltage limit function is enabled (04.23). ◆ The setting of voltage limit (04.22) is too large. Adjust it between700 V and 770 V. ◆ The setting of frequency gain for voltage limit (04.24) is too small. Adjust it between 30 and 50.
		Braking unit and braking resistor are not installed.	◆ Install braking unit and braking resistor.
		Acceleration time is too short.	◆ Increase acceleration time.
Over voltage during deceleration	E.oU2	The over voltage stall prevention parameters are set improperly.	◆ Ensure that the voltage limit function is enabled (04.23). ◆ The setting of voltage limit (04.22) is too large. Adjust it between 700 V and 770 V. ◆ The setting of frequency gain for voltage limit (04.24) is too small. Adjust it between 30 and 50.
		An external force drives motor during deceleration.	◆ Cancel the external force or install braking resistor.
		Deceleration time is too short.	◆ Increase deceleration time.
		Braking unit and braking resistor are not installed.	◆ Install braking unit and braking resistor.
Over voltage at constant speed	E.oU3	The over voltage stall prevention parameters are set improperly.	◆ Ensure that the voltage limit function is enabled (04.23) ◆ The setting of voltage limit (04.22) is too large. Adjust it between 700 V and 770 V. ◆ The setting of frequency gain for voltage limit (04.24) is too small. Adjust it between 30 and 50. ◆ The setting of frequency rise threshold during voltage limit (04.26) is too small. Adjust it between 5 Hz and 20 Hz.
		An external force drives motor during running.	◆ Cancel the external force or install a braking resistor

Pre-charge resistor fault	E.Br	Input voltage is not in arranged range	◆ Arrange voltage in a reasonable range
Under voltage	E.LU	Instantaneous power failure occurs	◆ Enable the power dip ride through function (10.59).
		The AC drive's input voltage is not within the permissible range.	◆ Adjust the voltage to normal range.
		The bus voltage is abnormal.	◆ Contact the agent or Pentax Inverter.
		The rectifier bridge, the buffer resistor, the drive board or the control board are abnormal.	◆ Contact the agent or Pentax Inverter.
AC drive overload	E.oL1	Load is too heavy or locked-rotor occurs on motor.	◆ Reduce load or check motor and mechanical conditions.
		The AC drive power class is small.	◆ Replace a drive of larger power class.
Motor overload	E.oL2	10.01 (Motor overload protection gain) is set improperly.	◆ Set 10.01 correctly.
		Load is too heavy or locked-rotor occurs on motor.	◆ Reduce load or check motor and mechanical conditions.
Output phase loss	E.PHo	Motor winding is damaged.	◆ Check resistance between motor wires. ◆ Replace motor is winding is damaged.
		The cable connecting the AC drive and the motor is abnormal.	◆ Check for wiring errors and ensure the output cable is connected properly Correct wiring.
		The AC drive's three-phase outputs are unbalanced when the motor is running.	◆ Check whether the motor three-phase winding is normal.
		The drive board or the IGBT is abnormal.	◆ Contact the agent or Pentax Inverter.

Overheat	E.oH1	The ambient temperature is too high.	◆ Lower the ambient temperature.
		The ventilation is clogged.	◆ Clean the ventilation.
		The fan is damaged.	◆ Replace the cooling fan.
		Thermally sensitive resistor of IGBT is damaged.	◆ Replace the damaged thermally sensitive resistor.
		The AC Drive Inverter module is damaged.	◆ Replace the AC Drive Inverter module.
Out project fault	E.SET	External fault signal is input via S.	◆ Confirm that the mechanical condition allows restart (09.18) and reset the operation.
Communication fault	E.CE	Host computer is in abnormal state.	◆ Check the cable of host computer.
		Communication cable is abnormal.	◆ Check the communication cables.
		The serial port communication protocol (01.28) of extension communication card is set improperly.	◆ Set extension communication card correctly.
		Communication parameters in group Pd are set improperly.	◆ Set communication parameters in group Pd properly.
		After all the preceding checking are done but the fault still exists, restore the default settings.	
Contactor fault	E.CoN	Drive board and power supply are abnormal.	◆ Replace drive board or power supply board.
		Contactor is abnormal.	◆ Replace contactor.
		The lightning protection board is abnormal.	◆ Replace the lightning protection board.
Current detection failure	E.oCC	The hall is abnormal.	◆ Replace the hall .
		The drive board is abnormal.	◆ Replace the drive board.
Motor self learning faulty	E.TE	Motor parameters are not set according to nameplate.	◆ Set motor parameters correctly according to nameplate.

		Motor auto-tuning times out.	◆ Check the cable connecting AC drive and motor.
		The encoder is abnormal.	◆ Check whether 02.27 (encoder pulses per revolution) is set correctly.Check whether signal lines of encoder are connected correctly and securely.
EEPROM read-write fault	E.EEP	The EEPROM chip is damaged.	◆ Replace the main control board.
Short circuit to ground	E.STG	Motor is short circuited to the ground.	◆ Replace cable or motor.
Accumulative running time reached	E.TIo	Accumulative running time reaches the setting value.	◆ Clear the record through parameter initialization.
User-defined fault 1	E.USE 1	User-defined fault 1 is input via S.	◆ Reset the operation.
User-defined fault 2	E.USE 2	User-defined fault 2 is input via virtual S	◆ Reset the operation.
Accumulative power reach error	E.PUT O	Accumulative power-on time reached	◆ Use the parameter initialization function to clear the record information
Load loss	E.LO AD	Working current <10.64	◆ Check whether the load is off or 10.64, 10.65 parameter set Whether to meet the actual operating conditions
PID feedback lost during running	E.PId	PID feedback <11.26 set value	◆ Check PID feedback or set 11.26 properly.
Pulse-by-pulse current limit fault	E.CB C	Load is too heavy or locked-rotor occurs on motor.	◆ Reduce load or check motor and mechanical conditions
		The AC drive power class is small.	◆ Replace a drive of larger power class.
Motor switchover fault during running	E.SrU N	Motor switchover via terminal during drive running of the AC drive.	◆ Perform motor switchover after the AC drive stops.
Speed error	E.SSD	Encoder parameters are set improperly.	◆ Set encoder parameters properly.

		Motor auto-tuning is not performed.	◆ Perform motor auto-tuning.
		10.69 (detection level of speed error) and 10.70 (detection time of speed error) are set incorrectly.	◆ Set data correctly based on actual condition
Motor over speed	E.oS	Encoder parameters are set improperly.	◆ Set encoder parameters properly.
		Motor auto-tuning is not performed.	◆ Perform motor auto-tuning.
		10.67 (Over speed detection level) and 10.68 (Over speed detection time) are set incorrectly.	◆ Set data correctly based on the actual situation.
Motor over temperature fault	E.oH2	1. The temperature sensor wiring is loose 2. Motor temperature is too high	◆ Detect temperature sensor wiring and troubleshoot ◆ Reduce the carrier frequency or take other cooling measures to dissipate heat to the motor
wrong initial position	E.INIT	The motor parameters and the actual deviation are too large	◆ Re-confirm whether the motor parameters are correct, focusing on whether the rated current is set too small
High water pressure failure	A-HP	The feedback pressure value is greater than the high pressure alarm value setting (15.04)	◆ Check the feedback value of the pressure sensor
Low water pressure failure	A-LP	The feedback pressure value is less than the low pressure alarm value setting (15.05)	◆ Check the feedback value of the pressure sensor

Chapter 8 RS485 Communication Protocol

8.1 Modbus communication protocol

8.1.1 Introduction

DSI-100 series inverters provide RS485 communication interface, and use the international standard MODBUS communication protocol for master-slave communication. Users can realize centralized control through PC/PLC, control host computer, etc. (setting inverter control commands, operating frequency, relevant function code parameters, monitoring inverter working status and fault information, etc.) to meet specific application requirements.

8..1.2 Details

1. Contents of the agreement

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

2. Application method

The inverter is connected to the "single master and multiple slave" PC/PLC control network with RDI485 bus.

8.1.3 The bus structure

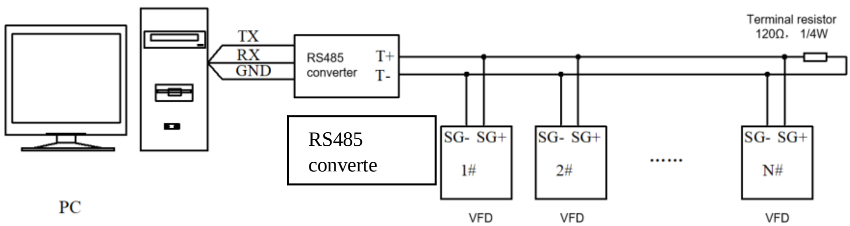
(1) Interface mode: RS485

(2) Transmission method:

Asynchronous serial, half-duplex transmission mode. At the same time, only one of the master and slave can send data and the other can only receive data. In the process of serial asynchronous communication, data is sent frame by frame in the form of messages.

(3) Topological structure:

Single master multi-slave system. The setting range of the slave address is 1 to 247, and 0 is the broadcast communication address. Slave addresses in the network must be unique. As shown below:



8.1.4 Description of the agreement

DSI-100 series inverter communication protocol is an asynchronous serial master-slave MODBUS communication protocol. Only one device (host) in the network can establish the protocol (called "query/command"). Other devices (slaves) can only respond to the "query/command" of the host by providing data, or make corresponding actions according to the "query/command" of the host. The host here refers to a personal computer (PC), industrial control equipment or a programmable logic controller (PLC), etc., and the slave refers to a 300 inverter. The master can not only communicate with a certain slave, but also publish broadcast information to all the lower slaves. For the "inquiry/command" of the host that is accessed individually, the slave must return a message (called a response). For the broadcast information sent by the host, the slave does not need to respond to the host.

8.1.5 Communication data structure

The MODBUS protocol communication data format of DSI-100 series inverter is divided into RTU (remote terminal unit mode).

(1) In RTU mode, the format of each byte is as follows:

Using RTU mode, message transmission starts with a pause interval of at least 3.5 character times. This is the easiest to implement with a variety of character times at the network baud rate (as shown in T1-T2-T3-T4 in the figure below). The first field of the transfer is the device address. The transfer characters that can be used are 0...9,A...F in hexadecimal. The network device continuously detects the network bus, including the pause interval. When the first field (address field) is received, each device decodes it to determine whether it is destined for its own. After the last transmitted character, a pause of at least 3.5 character times marks the end of the message. A new message can start after this pause. The entire message frame must be transmitted as a continuous stream. If there is a pause of more than 1.5 character times before the frame is complete, the receiving device will flush the incomplete message and assume that the next byte is the address field of a new message. Likewise, if a new message follows the previous message in less than 3.5 characters, the receiving device will consider it a continuation of the previous message. This will cause an error because the value in the final CRC field cannot be correct.

RTU frame format:

Frame header START	T1-T2-T3-T4 (3.5 bytes transfer time)
Slave address field ADDR	Communication address: 0～247 (decimal) (0 is the broadcast address)
Function code field CMD	03H: read slave parameters; 06H: write slave parameters
DATA field DATA（N-1）… DATA（0）	2*N bytes of data, this part is the main content of communication and the core of data exchange in communication.
CRC CHK Low bits	Detection value: CRC check value (16BIT)
CRC CHK High bits	
Frame end END	T1-T2-T3-T4 (3.5 bytes transfer time)

CMD (command command) and DATA (data word description) command code: 03H, read N words (Word) (up to 16 words can be read) For example: the start address of the inverter whose slave address is 01 is 0107 consecutive Read 2 consecutive values host command information RTU host command information

START	T1-T2-T3-T4
ADDR	01H
CMD	03H
Start address high bit	01H
Start address low bit	07H
Number of data high bit	00H
Number of data low bit	02H
CRC CHK low bit	Its CRC CHK value to be calculated
CRC CHK high bit	
END	T1-T2-T3-T4

RTU slave response information

START	T1-T2-T3-T4
ADDR	01H
CMD	03H
Number of bytes	04H
DATA address 0007H high bit	13H
DATA address 0007H low bit	88H
DATA address 0008H high bit	13H
DATA address 0008H low bit	88H

CRC CHK low bit	Its CRC CHK value to be calculated
CRC CHK high bit	
END	T1-T2-T3-T4

Check method - CRC check method:

CRC (Cyclical Redundancy Check)

Using the RTU frame format, the message includes an error detection field based on the CRC method. The CRC field detects the content of the entire message. The CRC field is two bytes containing a 16-bit binary value. It is calculated by the transmitting device and added to the message. The receiving device recalculates the CRC of the received message and compares it with the value in the received CRC field. If the two CRC values are not equal, it means that there is an error in the transmission.

The CRC is stored in 0xFFFF first, and then a process is called to process the consecutive 8-bit bytes in the message with the value in the current register. Only the 8Bit data in each character is valid for CRC, and the start and stop bits and parity bits are invalid. In the process of CRC generation, each 8-bit character is XORed with the contents of the register independently, and the result is moved to the direction of the least significant bit, and the most significant bit is filled with 0. The LSB is extracted and detected. If the LSB is 1, the register is individually ORed with the preset value. If the LSB is 0, it is not performed. The whole process is repeated 8 times. After the last bit (8th bit) is completed, the next 8-bit byte is XORed with the current value of the register independently. The value in the final register is the CRC value after all bytes in the message are executed.

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

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

8.2 Address Definition of Communication Parameters

This part is the content of communication, which is used to control the operation of the inverter, the status of the inverter and the setting of related parameters.

Read and write function code parameters (some function codes cannot be changed and are only used by manufacturers):

Function code parameter address marking rules:

The rules are represented by the function code group number and label as the parameter address:

High byte: 70（00）、F0～FF（01-16）、A0～AC（18-30）

Lower byte: 00～FF

Such as: 02.10, the address is expressed as F10A (hexadecimal);

18.01, the address is represented as A001 (hexadecimal);

Note:

Group 00: Only parameters can be read, and parameters cannot be changed;

Group 16: Neither can read parameters nor change parameters; some parameters cannot be changed when the inverter is running; some parameters cannot be changed no matter what state the inverter is in; when changing the function code parameters, pay attention to the parameters The range, units, and related descriptions.

In addition, because the EEPROM is frequently stored, the service life of the EEPROM will be reduced. Therefore, some function codes do not need to be stored in the communication mode, but only need to change the value in the RAM. To realize this function, just change the high-order **F** of the function code address (01~16) to **0**, and then change the high-order **A** of the function code address (18~30) to **4**.

The following table:

Function code group number	Function code communication access address（EEPROM）	Communication modification function code address (RAM)
00	0x7000-0x70FF	
01~16	0xF000-0xFFFF	0x0000-0x0FFF
18~30	0xA000-0xACFF	0x4000-0x4CFF

The corresponding function code addresses are shown as follows:

High byte: 00～0F (01~16), 40～4F (18~30)

Lower byte: 00～FF

For example, the function code 02.10 is not stored in the EEPROM, and the address is expressed as 010AH; this address indicates that it can only be written to RAM, but cannot be read, and it is an invalid address when reading.

Stop/Run Parameters Section:

Parameter address	Parameter Description
1000H	* Communication setup value(-10000~10000)(Decimal)
1001H	Running frequency
1002H	Bus voltage
1003H	Output voltage
1004H	Output current
1005H	Output power
1006H	Output torque
1007H	Running speed
1008H	DI input status
1009H	DO output status
100AH	AI1voltage
100BH	AI2 voltage
100CH	AI3 voltage
100DH	Counting value input
100EH	Length value input
100FH	Load speed
1010H	PID setup
1011H	PID feedback
1012H	PLC process
1013H	PULSE input pulse frequency, unit 0.01kHz

1014H	Feedback speed, unit 0.1Hz
1015H	Rest running time
1016H	AI1 voltage before correction
1017H	AI2 voltage before correction
1018H	AI3 voltage before correction
1019H	Line speed
101AH	Current power on time
101BH	Current running time
101CH	PULSE input pulse frequency, unit 1Hz
101DH	Communication setup value
101EH	Actual feedback speed
101FH	Main frequency X display
1020H	Auxiliary frequency Y display

Caution：

The communication setup value is percentage of the relative value, 10000 corresponds to 100.00%，-10000 corresponds to -100.00%.For data of dimensional frequency,the percentage value is the percentage of the maximum frequency.

Control command input to the inverter (write-only)

Command word address	Command function
2000	0001：Forward operation
	0002：Reverse operation
	0003：Forward jog
	0004：Reverse jog
	0005：Free stop
	0006：Deceleration stop
	0007：Fault reset

Read inverter status：(read-only)

Status word address	Status word function
3000	0001：Forward operation
	0002：Reverse operation
	0003：Stop

Parameters lock password check：(if the return is the 8888H, it indicates the password checksum pass)

Password address	Contents of input password
1F00	*****

The address for communication parameter initialization is 1F01H, and its data content is defined as follows:

Parameter initialization communication address	Command content

1F01H	1: Restore factory parameters
	2:Clear record information
	4:Restoring user backup parameters
	5:Backup user current parameters

Digital output terminal control：(write-only)

Command address	Command content
2001	BIT0：DO1 Output control BIT1：DO2 Output control BIT2 RELAY1 Output control BIT3：RELAY2 Output control BIT4：Y1R Output control BIT5 : VDO1 BIT6 : VDO2 BIT7 : VDO3 BIT8 : VDO4 BIT9 : VDO5

Analog output AO1 control： (write-only)

Command address	Command content
2002	0~7FFF indicates 0％~100％

Analog output AO2control： (write-only)

Command address	Command content
2003	0~7FFFindicates 0％~100％

(PULSE) output control ： (write-only)

Command address	Command content
2004	0~7FFFindicates 0％~100％

Inverter fault description:

fault address	fault code	fault information
8000H		0000:No fault
		0001:Reserved
	E.oC1	0002:Speed-up over current（oC1）
	E.oC2	0003:Speed-down over current（oC2）
	E.oC3	0004:Constant speed over current（oC3）
	E.oU1	0005:Speed-up over voltage（oU1）
	E.oU2	0006:Speed-down over voltage（oU2）
	E.oU3	0007:Constant speed over voltage（oU3）
	E.Br	0008:Buffer resistance overload fault
	E.LU	0009:Under-voltage fault（LU）
	E.oL2	000A:Inverter overload（oL2）
	E.Ol1	000B:Motor overload（oL1）
	E.PHI	000C:Input phase lost（PHI）

	E.PHo	000D:Output phase lost（PHo）
	E.oH1	000E:IGBT Module overheating（oH1）
	E.SET	000F:External fault（EF）
	E.CE	0010:Communication fault（CE）
	E.CoN	0011:DC Contactor fault
	E.oCC	0012:Current detection fault（oCC）
	E.TE	0013:Motor tuning fault（TE）
	E.Enco	0014:Encoder/PG card fault
	E.EEP	0015:EEPROM faulty（EEP）
	E.INT	0016:Inverter hardware fault
	E.STG	0017:Motor earthing short-circuit fault
	E.BL	0018:Reserved
	E.oH2	0019:Reserved
	E.TIo	001A:Running time arrive fault
	E.USE1	001B:User defined fault 1
	E.USE2	001C:User defined fault 2
	E.PUTo	001D:Power on time arrive fault
	E.LOAD	001E:Load off
	E.PId	001F:PID feedback lost during operation（PIDE）
	E.CBC	0028:Fast current limit timeout fault
	E.SrUN	0029:Motor shifting fault during operation
	E.SDD	002A:Excessive speed deviation
	E.oS	002B:Motor over speed
	E.OH2	002D:Motor over-temperature
	E.INIT	005A:Encoder line number setup fault
	E.FDB	005B:Encoder not connected
	E.INIT	005C:Initial position error
	E.ESD	005D:Speed feedback fault

Communication fault information describing data (fault code)：

Communication fault address	Fault function description
8001	0000：No fault 0001：Password error 0002：Command code error 0003：CRC check error 0004：Invalid address 0005：Invalid parameter 0006：Parameter change invalid 0007：The system is locked 0008：Operating EEPROM

Pentax DSI-200 Series Frequency Inverter

User's Manual

Pentax INVERTERS

Foreword

Thank you for using the DSI-200 series of high-performance vector inverter.
This guide explains how to properly use DSI-200 series inverter. Before using (installation, operation, maintenance, inspection, etc.), be sure to carefully read the instructions. Understanding of product safety precautions before using this product.

General notes
● This manual due to product improvement, specifications change, as well as to the instructions of their ease of use will be appropriate changes. We will update the information number of instructions, issued a revised edition. ● This icon in the instructions with the products you ordered may be different, please refer to the specific documentation for products supplied. ● Due to damage to or loss need to order the manual, please contact OULU or OULU agents to order it as per the information number on the cover.

When get the product, please read following：

Items	Ensure way
And the order of the types of goods, models are consistent	Please confirm the DSI-200 side of the brand name
Whether there are parts damaged or damaged	Check the overall appearance and check for damage in shipping
Screws and other fastening parts are loose	If necessary, check with a screwdriver
Brochures, warranty cards and other accessories	DSI-200 manual and corresponding accessories

1. Definition of security

In this manual, safety issues the following two categories：

Warning: Due to the dangers posed against the required operation, may result in serious injury and even death.

Caution: Due to the dangers posed against the required operation, may lead to moderate harm or minor injuries, and damage to the equipment.

Installation, commissioning and maintenance of the system, please carefully read this chapter (safety precautions), follow the required safety precautions to operate. In case of any injuries and losses caused as a result of illegal operations that is nothing to do with OULU.

1.1 Safety precautions

Before Installation

Warning
● Do not install inverter finding the control system with water in, or inverter with missing parts or damaged parts. ● Please do not install inverter when the packing list is not consistent with the physical name.

Caution

- Carefully handled when loading, otherwise it may damage the inverter.
- Please don’t use the damaged driver or missing parts inverter, there may be risk of injury.
- Do not touch components of the control system, otherwise it will cause danger of static electricity.

During Installation

Warning

- Mount the inverter on incombustible surface like metal, and keep away from flammable substances. Otherwise it may cause fire.
- Do not twist the mounting bolt of the equipment, especially the screw bolt marked in RED.

Caution

- Do not drop the conducting wire stub or screw into the inverter. Otherwise, it may cause damage to the inverter.
- Please install the inverter at the place of less direct sunlight and vibration.
- Please mind the location of its installation when more than two inverters are installed in one cabinet, so that radiation effect is promised.

During Wiring

Warning

- Operation shall be performed by the professional engineering technician. Otherwise there will be unexpected danger.
- There shall be circuit breaker between the inverter and power supply. Otherwise, there may be fire.
- Make sure the power is disconnected prior to the connection. Otherwise there will be danger of electric shock.
- The earth terminal shall be earthed reliably. Otherwise there may be danger of electric shock.

Caution

- Never connect the input power supply to the output terminals (U, V, W) of the inverter. Note the terminal mark, do not connect the wrong line! Otherwise the drive is damaged!
- Please refer to the manual for the wire diameter. Otherwise there may be an accident!
- Never stop the braking resistor directly between the DC bus (+) and (-) terminals. Otherwise cause a fire!
- Encoder must use shielded wire, and the shield must ensure that the single-ended reliable grounding!

Before Power-on

Warning

- Please confirm whether the power voltage class is consistent with the rated voltage of the inverter and the Input terminal (R、S、T) and Output terminal (U、V、W) cable connecting positions are correct, and check whether the external circuit is short circuited and whether the connecting line is firm, otherwise it may damage the inverter.
- Do not frequently turn ON/OFF power .If continuously ON/OFF power is needed, please make sure the time interval more than 1 minute.

Caution

- The cover must be well closed prior to the inverter power-on. Otherwise electric shock

	may be caused!
●	All the external fittings must be connected correctly in accordance with the circuit provided in this manual. Or accident may occur.

Upon Power-on

	Warning
●	Do not open the cover of the inverter upon power-on. Otherwise there will be danger of electric shock!
●	Do not touch the inverter and its surrounding circuit with wet hand. Otherwise there will be danger of electric shock.
●	Do not touch the inverter terminals (including control terminal). Otherwise there will be danger of electric shock.
●	At power-on, the inverter will perform the security check of the external strong current circuit automatically. Thus, at this time please do not touch the terminals U、V、W, or the terminals of motor, otherwise there will be danger of electric shock.

	Caution
●	If the parameter identification is required, pay attention to the danger of injury arising from the rotating motor. Otherwise accident may occur.
●	Do not change the factory settings at will. Otherwise it may damage the equipment.

During the Operation

	Warning
●	Do not touch the fan, heat sink or discharge resistor to sense the temperature. Otherwise, you may get burnt.
●	Detection of signals during the operation shall only be conducted by qualified technician. Otherwise, personal injury or equipment damage may be caused.

	Caution
●	Do not control run/stop by using contactor. Or equipment damage may be caused!
●	Avoid anything falling into the equipment when inverter is running. Or damage may be caused.

Maintenance

	Warning
●	Do not perform professional training personnel Do not carry out maintenance and maintenance of the inverter. Otherwise it is personal injury or equipment damage!
●	Do not charge the equipment for repair and maintenance. Otherwise there is danger of electric shock!
●	After confirming that the input power of the inverter is de-energized for 10 minutes, the drive can be maintained and serviced. Otherwise the residual charge on the capacitor will cause harm to people!
●	All pluggable plug-ins must be plugged in the case of power failure!
●	After the Inverter is replaced, the parameters must be set and checked.

2. Product Information

2.1 Name rule

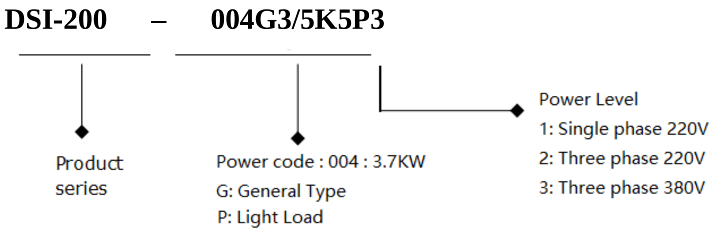


Figure 2-1 Name rule

2.2 Nameplate specification

Variable Frequency Inverter
MODEL: DSI-200-004G3/5K5P3
POWER: 4Kw / 5.5 Kw
INPUT: 3PH 400V~ 10.5A 50Hz/60Hz
OUTPUT: 3PH 0-400V~ 9A 50HZ/60HZ
Pentax Inverter

Figure 2-2 Nameplate

2.3 DSI-200 Inverter product series

Model	Power KVA	Input current A	Output current A	Match motor KW
Single-phase:220V,50/60Hz				
DSI-200-K40G1	1.0	5.4	2.3	0.4
DSI-200-K75G1	1.5	8.2	4.0	0.75
DSI-200-1K5G1	3.0	14.0	7.0	1.5
DSI-200-2K2G1	4.0	23.0	9.6	2.2
Three-phase:380V,50/60Hz				
DSI-200-K75G3	1.5	3.4	2.1	0.75
DSI-200-1K5G3	3.0	5.0	3.8	1.5
DSI-200-2K2G3	4.0	5.8	5.1	2.2
DSI-200-004G3/5K5P3	5.9	10.5	9.0	3.7
DSI-200-5K5G3/7K5P3	8.9	14.6	13.0	5.5

2.4 Technical data

Item		Specification
Basic function	Highest frequency	Vector control: 0～500Hz; V/F control: 0～500Hz
	Carrier frequency	0.8kHz-12kHz the carrier frequency can be adjusted automatically according to the load characteristics.
	Input frequency resolution	Digital setting: 0.01HZ Analog setting: Maximum frequency × 0.025%
	Control mode	Open loop vector control (SVC) and V/F control
	Start torque	G type: 0.5Hz/150%（SVC） P type: 0.5Hz/100%
	Speed range	1：100 （SVC）
	Speed control accuracy	±0.5%（SVC）
	Overload capacity	G type: 150% rated current 60sec; 180% rated current 3sec P type: 120% rated current 60sec; 150% rated current 3sec
	Torque boost	Auto-torque boost; manual torque boost 0.1%~30.0%
	V/F curve	Three types: linear type; Multi-point type; the nth power of V/F curve
	ACC/DEC curve	Linear or S curve of ACC/DEC ways. Four types of ACC/DEC Time, ACC/DEC time range is 0.0~6500.0s
	DC brake	DC brake frequency: 0.00Hz~ max frequency, brake time: 0.0s~36.0s,brake action current: 0.0%~100.0%
	JOG Control	JOG frequency range: 0.00Hz~50.00Hz. JOG speed-up/down time: 0.0s~6500.0.s
	Simple PLC, multi-stage speed running	Via built-in PLC or control terminal can realize max 16 stage speed running
	Built-in PID	Can realize process control close-loop system conveniently
	Auto-adjust voltage (AVR)	When grid voltage changes, can keep output voltage steadily automatically
	Over current and over	During running, limit current and voltage automatically, protect from tripping off frequently for over voltage and over current.
	Quick current-limit function	Reduce over current error on max extent, protect inverter normal running
	Torque limitation and control	“digger” feature, inverter could limit torque automatically, prevent over current tripping off;

Item		Specification
Personable function	Outstanding perform	Using high-perform current vector control
	Instance stop not stop	During instant power-off, by motor feedback energy, inverter compensates voltage-drop to keep running for short time.
	Quick current-limit function	Reduce over current error on max extent
	Timing control	timing control function: setting time range: 0.0min~6500.0min
	Command source	control panel, control terminal, communication; can be switched by several modes
	Frequency source	digital setting, analog voltage setting, analog current setting, pulse setting, communication setting, can be switched by several methods
Running	Input terminal	Standard: 5 digital input terminal, one of them support max 100KHz HS pulse input;2 analog input terminal, one of them support 0~10V voltage input, A1 support 0~10V voltage or 0~20mA current input,
	Output terminal	Standard: 1 high-speed pulse output terminal(optional open collector),support 0~100kHzpulse 1 digit output terminals; 2 relay output terminal 2 analog output terminals, one of them support 0~20mA current output;
Display and keypad	LED display	Can display parameter
	Press-key locking and function selection	Realize press-key partial or full locking, define part press-key function range, to avoid wrong operation
	Protection function	Power-on motor short circuit test, output phase-loss protection, over-current protection, over-voltage protection, under-voltage protection, overheat protection, overload protection etc.
Environment	Application site	Indoor, without direct sunlight, no powder, corrosive gas, combustion air, oil dust, water steam, water drop or salt etc.
	Altitude level	Less than 1000m, Derating below 1000m, the rated output current is reduced by 1% for every 100m increase
	Environment temperature	-10℃~+40℃（During 40℃~50℃， please reduce capacity use）

Item		Specification
	Humidity	<95% RH, no water drop condensed

2.5 Schematic diagram of the dimensions of the inverter

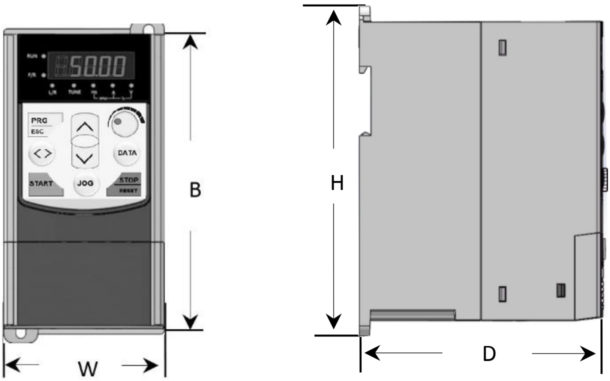
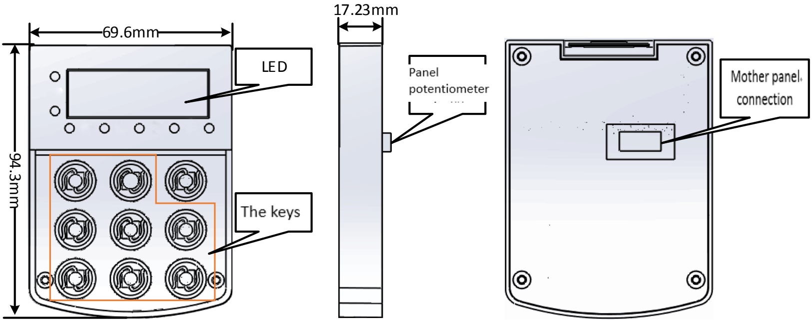


Figure 2-4 Schematic diagrams of the dimensions of the inverter

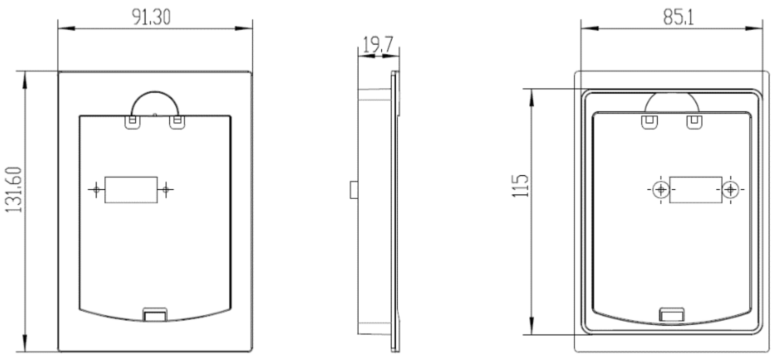
2.5.1 Mechanical

<table>
<tr><th rowspan="2">Model Type</th><th colspan="4">Outsize （mm）</th><th rowspan="2">Install hole</th></tr>
<tr><th>B</th><th>W</th><th>H</th><th>D</th></tr>
<tr><td>DSI-200-K40G1</td><td rowspan="7">155</td><td rowspan="7">84</td><td rowspan="7">170</td><td rowspan="7">127</td><td rowspan="7">Φ5.7</td></tr>
<tr><td>DSI-200-K75G1</td></tr>
<tr><td>DSI-200-1K5G1</td></tr>
<tr><td>DSI-200-2K2G1</td></tr>
<tr><td>DSI-200-K75G3</td></tr>
<tr><td>DSI-200-1K5G3</td></tr>
<tr><td>DSI-200-2K2G3</td></tr>
<tr><td>DSI-200-004G3/5K5P3</td><td>183</td><td>91</td><td>193</td><td>142</td><td>Φ4.7</td></tr>
</table>

2.5.2 Operation panel shape



2.5.3 Shape and size of the panel tray



2.6 The daily maintenance and maintenance of the inverter

2.6.1 Daily Maintenance

In order to avoid faults of the frequency converter, ensure the normal operation of equipment and prolong the service life of the frequency converter, daily maintenance is necessary for the frequency converter.

Examine Items:
1) Whether the sound in the motor running abnormal changes
2) Whether or not vibration is generated during motor operation
3) Whether the inverter installation environment has changed

4) Whether the inverter cooling fan is working properly
5) Whether the inverter overheating

Daily cleaning:
1) Always keep the drive in a clean state.
2) Effectively remove the dust on the surface of the inverter to prevent dust into the inverter inside. Especially metal dust.
3) Effectively remove the inverter cooling fan oil.

2.6.2 Regular Maintenance
Please check the place where you are difficult to check. Periodically check items:
1) Check the duct and clean it regularly
2) Check if the screws are loose
3) Check that the inverter is subject to corrosion
4) Check whether the terminal has a trailing mark
5) Main circuit insulation test
Reminder: When measuring the motor insulation resistance with a megger (please use a DC 500V megger), disconnect the main circuit from the inverter. Do not use insulation resistance meter to test the control circuit insulation. No need for high voltage test (factory completed)

2.6.3 Inverter replacement parts
Inverter parts are mainly cooling fan and filter electrolytic capacitors, the life and the use of the environment and maintenance are closely related. The general life time is:

Device Name	Life Time
Fan	2 ~ 3year
Electrolytic capacitor	4 ~ 5year

The user can determine the replacement age according to the run time.
1) Cooling fan
 Possible cause of damage: bearing wear, leaf aging.
Criteria: fan blades, etc. whether there is cracks, whether the sound when the sound is abnormal vibration.
2) Filter electrolytic capacitors
Possible causes of damage: Poor input power quality, higher ambient temperature, frequent load transitions, and electrolyte aging. Criteria: whether the liquid leakage, safety valve has been protruding, the determination of electrostatic capacitance, insulation resistance determination.

2.6.4 Storage of the inverter
Users to buy the inverter, the temporary storage and long-term storage must pay attention to the following:
1) Stored in the original packaging as far as possible into the company's packaging.
2) Prolonged storage will lead to the deterioration of electrolytic capacitors, must ensure that within 2 years through a power, power time of at least 5 hours, the input voltage must be slowly raised to the rated voltage regulator.

2.7 Guides for Selection of Brake Components
(*): Figure 2-1 is the guide data, the user can choose according to the actual situation of different resistance and power, (but the resistance must not be less than the recommended value in the table, the power can be large.) The choice of braking resistor The actual application of the motor power generation to determine the power, and system inertia, deceleration time, bit energy load and so

have a relationship, the need for customers according to the actual situation. The greater the inertia of the system, the shorter the deceleration time required, the more frequent the braking, the greater the choice of the braking resistor, the smaller the resistance.

2.7.1 The choice of resistance

When braking, the regenerative energy of the motor is almost entirely consumed on the braking resistor. According to the formula: U * U / R = Pb

Formula U - System Brake Voltage for Stable Braking

(Different systems are not the same, for the 380VAC system generally take 700V)

Pb ---- brake power

2.7.2 Power selection of braking resistor

The braking power is theoretically the same as the brake power, but the derating is 70%. According to the formula: 0.7 * Pr = Pb * D

Pr - the power of the resistor

D ---- Brake frequency (regeneration process the proportion of the entire process)

Normal case	Elevator	Open and take	Centrifuge	accidental braking resistor	Normal use
Brake frequency value	20% ~30%	-20 ~30%	50%~60%	-5%	10%

Guidance are listed in the table below, the user can choose according to actual situation of different resistance tolerance and power (But resistance must not less than the recommended value in the table, power can be large)

Model Type	Braking resistor Recommended power	Recommended resistance Recommended resistance	brake unit	Notes
DSI-200-K40G1	80W	≥200Ω	Standard built-in	No special instructions
DSI-200-K75G1	80W	≥150Ω		
DSI-200-1K5G1	100W	≥100Ω		
DSI-200-2K2G1	100W	≥70Ω		
DSI-200-K75G3	150W	≥300Ω		
DSI-200-1K5G3	150W	≥220Ω		
DSI-200-2K2G3	250W	≥200Ω		
DSI-200-004G3/5K5P3	300W	≥130Ω		
DSI-200-5K5G3/7K5P3	400W	≥90Ω		

3. Mechanical and Electrical Installation

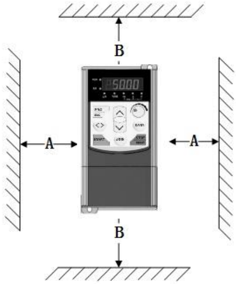
3.1 Mechanical Installation

3.1.1 Installation environment:

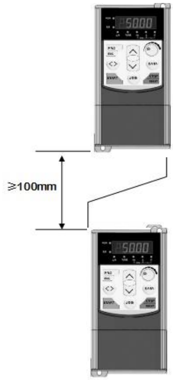
1) Ambient temperature: The ambient temperature has a great influence on the life of the inverter. Do not allow the operating temperature of the inverter to exceed the permissible temperature range (-10 ℃ ~ 40 ℃).

2) Mount the inverter on the surface of the flame retardant and attach it to the mounting bracket vertically with screws. Inverter work easy to produce a lot of heat, there should be enough space around the heat.

3) Please install it where it is not easy to vibrate. Vibration should not be greater than 0.6G. Special attention away from the punch and other equipment.
4) To avoid the place in the direct sunlight, wet, there are drops of water.
5) To avoid installed in the air corrosive, flammable, explosive gas of the place.
6) To avoid the equipment in the oil, dust, dust and more places.



Monomer installation drawing



Up and down the installation drawing

Figure 3-1 DSI-200 installation diagram

Unit installation: When the inverter power is not greater than 22kW can not consider the A size. When greater than 22kW, A should be greater than 50mm. Up and down installation: Install the thermal insulation baffle when the inverter is installed up and down

Power level	Installment size	
	B	A
≤15kW	≥100mm	Not requirement
18.5Kw~30kW	≥200mm	≥50mm
≥37kW	≥300mm	≥50mm

3.1.2

Mechanical installation need to focus on the heat problem. So please note the following:
1) Please install the inverter vertically, so that the heat can be distributed upwards. But can not be inverted. If the cabinet has more frequency converter, it is best to install side by side. Please refer to Figure 3-1 for the installation of the insulation baffle.
2) Installation space Follow the example shown in Figure 3-1 to ensure the cooling space of the inverter. However, please consider the layout of the cabinet when the heat dissipation of other devices.
3) The mounting bracket must be flame retardant.
4) For metal dust applications, it is recommended to install the radiator cabinet. At this time fully sealed cabinet space as much as possible.

3.2 Electrical Installation

3.2.1 Selection of external electrical components

Model	Empty open （MCCB） A	Recommended Contactor A	Recommended input side Main circuit lead wire mm^2	Recommended output side main Circuit wire mm^2	Recommended control circuit Wire mm^2
Single phase 220V					
DSI-200-K40G1	16	10	2.5	2.5	1.0
DSI-200-K75G1	16	10	2.5	2.5	1.0
DSI-200-1K5G1	20	16	4.0	2.5	1.0
DSI-200-2K2G1	32	20	6.0	4.0	1.0
Three phase 380V					
DSI-200-K75G3	10	10	2.5	2.5	1.0
DSI-200-1K5G3	16	10	2.5	2.5	1.0
DSI-200-2K2G3	16	10	2.5	2.5	1.0
DSI-200-004G3/5K5P3	25	16	4.0	4.0	1.0
DSI-200-5K5G3/7K5P3	32	25	4.0	4.0	1.0

3.2.2 Connect with peripheral devices

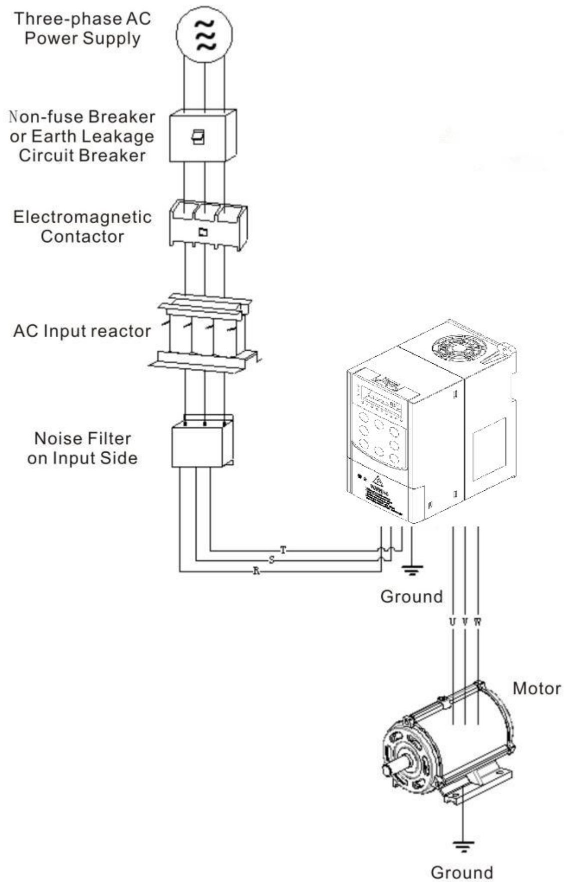


Figure 3-2 Connection to peripheral devices

3.2.3 Instructions for the use of external electrical components

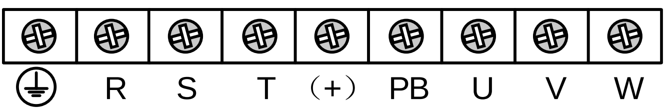
Name	Function
Air switch	When the downstream device is over current, disconnect the power supply
Contactor	The inverter should be operated up and down, and the frequency converter should be avoided by the contactor (Less than twice per minute) or direct start operation.

Name	Function
AC input Reactor	Improve the input side of the power factor; effectively eliminate the input side of the high harmonics, to prevent the voltage waveform Distortion caused by other equipment damage; to eliminate the power supply phase imbalance caused by the input current imbalance.
EMC AC output filter	Reduce the conduction and radiation interference of the inverter to the outside; reduce the conduction from the power supply side to the inverter Interference, improve the anti-interference ability of the inverter.
DC Reactor	Improve the input side of the power factor; improve the efficiency of the whole machine and thermal stability. Effectively eliminate the loss The impact of the high-order harmonic on the inverter, reducing external conduction and radiation interference.
AC output filter	Inverter output side generally contains more high-order harmonics. When the distance between the motor and the inverter, because the line There is a large distributed capacitance in the road. Where a harmonic may produce resonance in the loop, bringing two Aspect: ◆Damage to the motor insulation performance, long time will damage the motor. ◆produce a large leakage current, causing frequent protection of the inverter. General frequency converter and motor distance over 100m, it is recommended to install the output AC reactor.

3.3 Terminal block diagram

3.3.1 Description of Major Loop Terminal Block

a) The Major Loop Terminal Block Distribution Diagram of 0.4KW-5.5KW （as shown in fig. 3-3a）



Terminal symbol	Function description
⏚	Ground terminal
R、S、T	R, S, T: Connected to the grid three-phase AC power supply R, S: Connect to the grid single-phase AC power supply

U、V、W	Connect three-phase (380V or 220V) AC motor
+	Filter capacitor DC side voltage positive terminal
PB	DC braking resistor can be connected to +

3.3.2 Terminals of Control Loop:

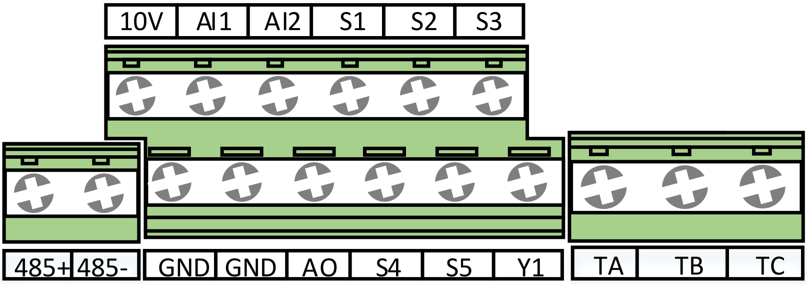


Fig. 3-4 Control Loop Wiring Terminal Diagram

3.4 Standard Wiring Diagram

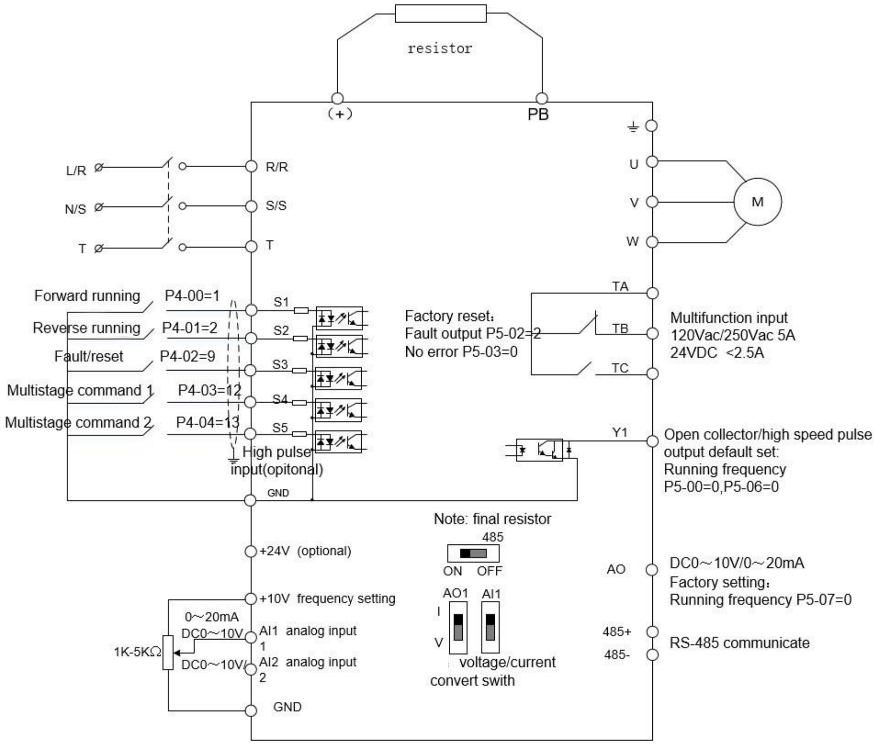


Figure 3-5 Standard wiring diagram

3.4.1 Control panel terminal instructions

Terminal name	Function and description
S1～S5	Multi-function digital input
+10V-GND	+10V power supply for this unit (current: 10mA)
AI1-GND AI2-GND	Analog input, voltage (0~10V) / current (0~20mA) can be selected through the motherboard Input impedance: 22kΩ (voltage input) / 250Ω (current input) (AI2 Can only be input voltage 0~10V)
GND	Reference zero potential of +10V, input signal common
Y1	High-speed pulse or open collector output terminal, its corresponding common terminal is GND; output frequency range: 0~100 kHz
AO1	Analog output terminal, where AO1 can select voltage or current output through the DIP switch
TA-TB-TC	Relay output, TA common, TB normally closed, TC normally open; contact capacity: AC250V/3A, DC30V/1A
485+、485-	485 communication port, 485 differential signal positive and negative terminals, standard 485 communication interface, please use twisted pair or shielded cable

4. Operation Display and Application Examples

4.1 Operation and display interface

4.1.1 Panel diagram

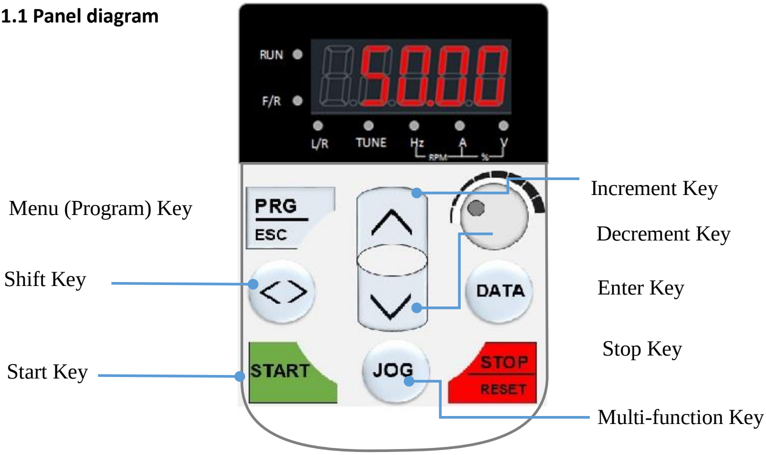


Figure 4-1 Operation panel

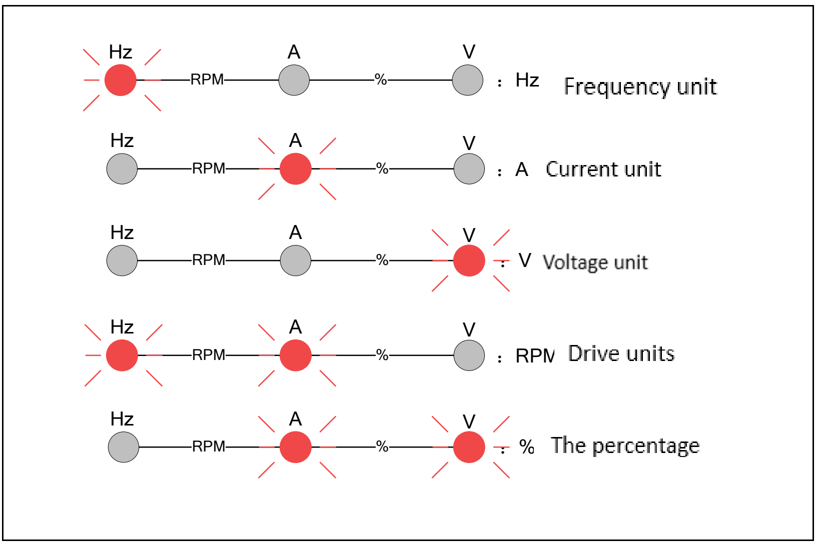
4.1.2 Keys on LED Operating Panel

Key	Key name	Key function
PRG	Programming	Enter or exit Level I menu. Return to the previous menu.
DATA	Confirm	Enter each level of menu interface. Confirm displayed parameter setting.
▲	UP Increment	Data or function code increase
▼	DOWN Decrement	Data or function code decrease
	Shift key	In the shutdown display interface and run the display interface, you can cycle to select the display parameters; modify the parameters, you can select the parameters of the modified bit
RUN	RUN	Start the AC drive when using the operating panel control mode.
STOP	stop/reset	Stop the AC drive when the drive is in the RUNNING status, controlled by P7-02 Perform a reset operation when the drive is in the FAULT status. Not control by P7-02
JOG	Quick multi-function key	as defined by the setting of P7-01

4.1.3 Lights

Light is off， light is on， light flashes

Light statue		Statue Description
RUN/TUNE	RUN TUNE	Light off ：running
	RUN TUNE	Light on ：running
FWD/REV	FWD REV	Light off ：normal work
	FWD REV	Light on ：Reverse run
TRIP Self-learning / torque control / fault indicator	TRIP	Light off ：normal work
	TRIP	Light on ：Torque control
	TRIP	Slow flash ：Motor self-learning （1 times/s）
	TRIP	Quick flash ：error（4 times/s）



4.2 Function code view, modify method description

DSI-200 the operation panel of the inverter adopts the three-level menu structure to set the parameters and so on. The third level menu is: Function parameter group (level Ⅰ menu) → Function code (Ⅱ level menu) → Function code setting value (Ⅲ grade menu)

The operation flow is shown in Figure 4-2

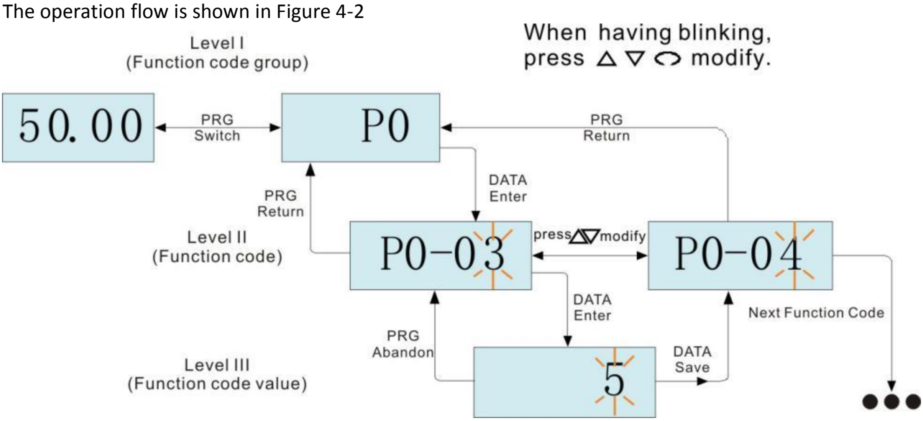


Figure 4-2 Three-level menu operation flow chart

Note: When operating in a three-level menu, press PRG or ENTER to return to the secondary menu. The difference between the two is: ENTER key will save the parameters after the return to the secondary menu, and automatically transferred to the next function code; and press the PRG key is straight back to the secondary menu, do not store parameters and return to the current function code

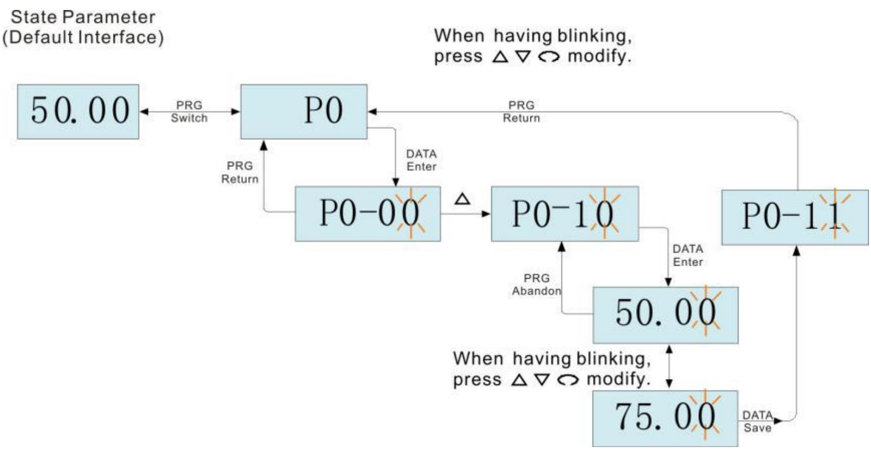


Figure 4-3

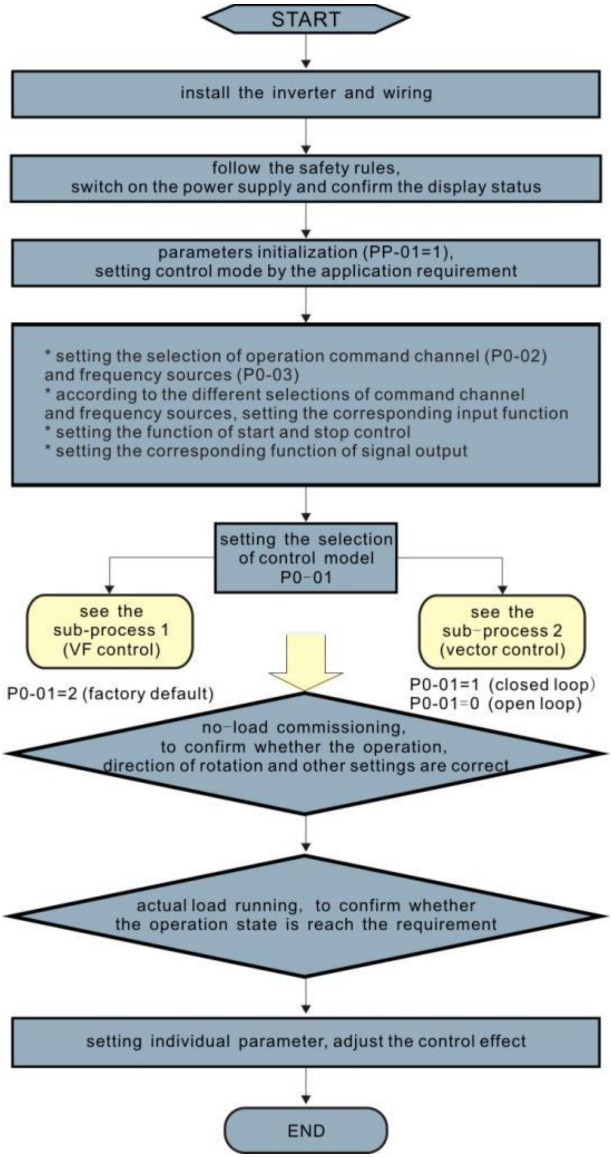
When operating in Level III menus, if the parameter does not include a flashing digit, then it is not possible to modify that parameter. There are two possible reasons for this:

1）The function parameter you have selected is read-only。

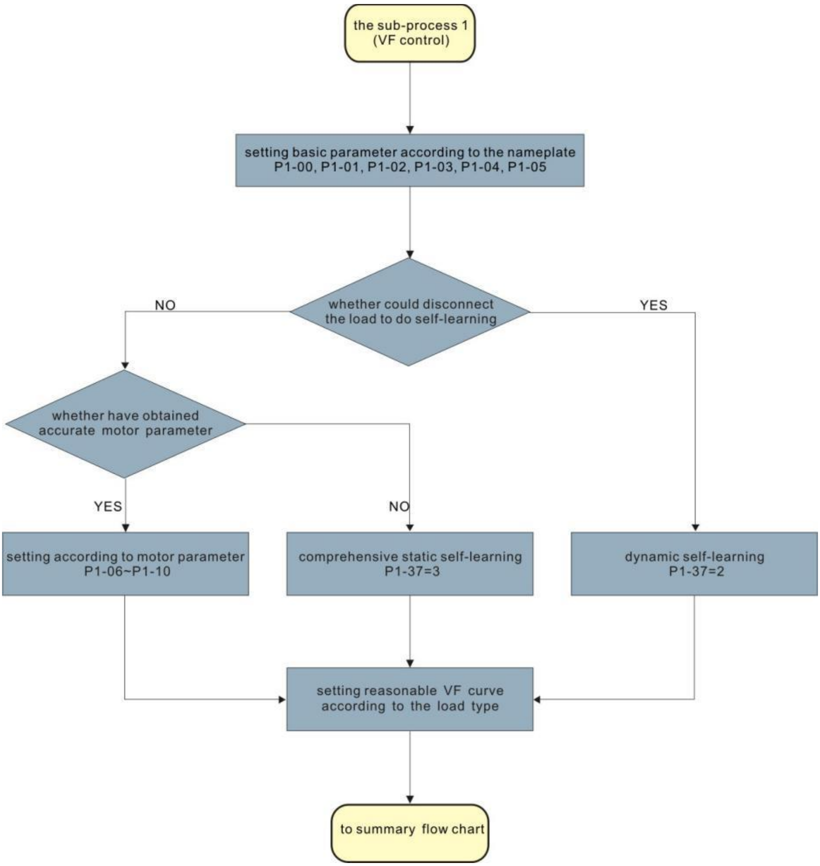
2）The displayed function parameter cannot be modified while the AC drive is in the RUNNING status. You can modify these types of parameter only when the AC drive is in the STOP status.

4.4 Inverter debugging flow chart

4.3.1. Inverter debugging flow chart



4.3.2 Inverter commissioning sub-flow chart 1



UN key on the keyboard panel to start the self-learning operation of the motor parameters.

5. Function Parameters Table

PP-00 is set to a non-zero value, that is, the parameter protection password is set. In the function parameter mode and the user changes the parameter mode, the parameter menu must enter the password correctly and cancel the password.
The parameter menu in user-defined parameter mode is not password protected.
P group, a group is the basic function parameters, d group is the monitoring function parameters. The symbols in the function table are described below:
"☆": Indicates that the set value of the parameter is in the inverter is in shutdown, running state, can be changed;
"★": Indicates that the set value of this parameter cannot be changed when the inverter is running;
"●": Indicates that the value of the parameter is the actual detection record value, cannot be changed;
"*": Indicates that the parameter is "factory parameter", only the manufacturer settings, prohibit the user to operate;

5.1 basic function data

Function Code	Name	Set Range	default	Alteration
P0 Basic Function Group				
P0-01	Motor 1 control mode	0: No speed sensor vector control (SVC) 1: Reserved 2: V / F control	2	★
P0-02	Command source selection	0: Operation panel instruction channel 1: Terminal command channel 2:Communication command channel	0	☆
P0-03	Main frequency reference setting A channel selection	0:digital setting (preset frequency P0-08, UP / DOWN can be modified, power is not memory) 1:digital setting (preset frequency P0-08, UP / DOWN can be modified, power-down memory 2: AI1 3: AI2 4:AI3(Keyboard potentiometer) 5:High-speed pulse input setting (S5) 6: multi-segment instructions 7: Simple PLC 8: PID 9: communication given 10: Reserved	4	★
P0-04	Auxiliary frequency source B command input selection	With P0-03 (main frequency source A instruction input	0	★
P0-05	Auxiliary frequency source B Reference object selection	0: relative to maximum frequency 1: Relative to frequency source A	0	☆
P0-06	Auxiliary frequency source B command range	0% ~ 150%	100%	☆
Function Code	Name	Set Range	default	Alteration

Function Code	Name	Set Range	default	Alteration
P0-07	Frequency source combination mode selection	Bit: frequency source selection 0: Main frequency source A 1: main and auxiliary operation results (operation relationship determined by ten) 2: Main frequency source A and auxiliary frequency source B switch 3: Main frequency source A and master and slave operation result switching 4: auxiliary frequency source B and master and slave operation result switching Ten: frequency source main and auxiliary operation relationship 0: main + auxiliary 1: main - auxiliary 2: the two maximum 3: the two minimum	00	☆
P0-08	Preset frequency	0.00Hz ~ max frequency（P0-10）	50.00Hz	☆
P0-09	Running direction	0:Same direction 1：opposite direction	0	☆
P0-10	Max. frequency	50.00Hz ~ 500.00Hz	50.00Hz	★
P0-11	Setting channel of frequency upper limit	0: P0-12 is set 1: AI1 2: AI2 3:AI3(Keyboard potentiometer) 4:High-speed pulse setting (S5) 5: Communication given	0	★
P0-12	Frequency reference upper limit	Upper limit P0-14 ~ max frequency P0-10	50.00Hz	☆
P0-13	Frequency reference upper limit offset	0.00Hz ~ max frequency P0-10	0.00Hz	☆

Function Code	Name	Set Range	default	Alteration
P0-14	Frequency reference lower limit	0.00 Hz to frequency upper limit P0-12	0.00Hz	☆
P0-15	Carrier frequency	0.8kHz ~ 12.0kHz	Model determined	☆
P0-16	Carrier frequency adjusted with temperature	0：no　　1：yes	1	☆
P0-17	Acceleration time 1	0.00s ~ 65000s *P0-19	Model determined	☆
P0-18	Deceleration time 1	0.00s ~ 65000s *P0-19	Model determined	☆
P0-19	Acceleration/Deceleration time unit	0：1 S 1：0.1 S 2：0.01 S	1	★
P0-21	Frequency offset of Auxiliary frequency setting channel for main and auxiliary calculation	0.00Hz ~ max frequency P0-10	0.00Hz	☆
P0-22	Frequency reference resolution	2：0.01Hz	2	★
P0-23	Retentive of digital setting frequency upon stop	0: do not remember 1: memory	1	☆
P0-24	Motor parameter group selection	0: 1st motor parameter 1: 2nd motor parameter	0	★
P0-25	Acceleration/Deceleration time base frequency	0: maximum frequency (P0-10) 1: Set frequency 2：100Hz	0	★
P0-26	Base frequency for UP/DOW modification during running	0: Run frequency 1: Set frequency	0	★
P0-27	The run command is tied to the main frequency source A command selection：	Bit: Operation panel command Bind frequency source selection 0: no binding 1: Digital setting frequency 2: AI1 (Note: J6 jumper) 3: AI2 4: AI3 5: High-speed pulse input setting (S5) 6: multi-speed 7: Simple PLC 8: PID	0000	☆

P0-27	The run command is tied to the main frequency source A command selection：	9: communication given Ten: Terminal Command Binding Frequency Source Selection Hundreds: communication command binding frequency source selection	0000	☆
P0-28	Serial port commas. protocol	0：Modbus communication	0	☆
P1 Motor 1 Parameters				
P1-00	Motor type selection	0: Ordinary asynchronous motor 1:Variable frequency asynchronous motor	0	★
P1-01	Rated motor power	0.1kW～1000.0kW	Model dependent	★
P1-02	Rated motor voltage	1V～2000V	Model dependent	★
P1-03	Rated motor current	0.01 to 655.35 A	Model dependent	★
P1-04	Rated motor frequency	0.01Hz～Max frequency	Model dependent	★
P1-05	Rated motor speed	1rpm～65535rpm	Model dependent	★
P1-06	Stator resistance	0.001Ω～65.535Ω	Auto-tuning dependent	★
P1-07	Rotor resistance	0.001Ω～65.535Ω	Auto-tuning dependent	★
P1-08	Leakage inductive reactance	0.01mH～655.35mH	Auto-tuning dependent	★
P1-09	Mutual inductive	0.1mH～6553.5mH	Auto-tuning dependent	★
P1-10	No-load current	0.01A～P1-03	Auto-tuning	★
Function Code	Name	Set Range	default	Alteration

P1-37	Motor auto-tuning method selection	0: no operation 1:Asynchronous machine static part of the parameters of self-learning 2:asynchronous machine dynamic complete self-learning 3:asynchronous machine static complete self-learning	0	★
P2 Vector Control Parameters				
P2-00	Speed loop proportional gain 1	1 ~ 100	30	☆
P2-01	Speed loop integral time 1	10 ~ 1000（Said 0.01s to 10.00s）	0.50s	☆
P2-02	Switch over frequency 1	0.00 ~ P2-05	5.00Hz	☆
P2-03	Speed loop proportional gain 2	1 ~ 100	20	☆
P2-04	Speed loop integral time 2	0.01s ~ 10.00s	1.00s	☆
P2-05	Switch over frequency 2	P2-02 ~ max frequency(P0-10)	10.00Hz	☆
P2-06	SVC slip compensation gain	50% ~ 200%	100%	☆
P2-07	SVC Speed feedback filter time constant	0.000s ~ 0.100s	0.015s	☆
P2-09	Torque limit source in speed control	0: Function code P2-10 setting 1: AI1 2: AI2 3: AI3(keyboard potentiometer) 4: High-speed pulse input setting (S5) 5: Communication given 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) 1-7 option full scale corresponds to P2-10	0	☆
P2-10	Digital setting of torque limit in	0.0% ~ 200.0%	150.0%	☆
Function Code	Name	Set Range	default	Alteration

P2-11	Torque limit source in speed control (in regenerative state)	0: Function code P2-12 setting (no distinction between electric and power generation) 1: AI1 2: AI2 3: AI3 4:High-speed pulse input setting 5: communication given 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) 8: Function code P2-12 setting 1-7 The full scale of the option corresponds to P2-12	0	☆
P2-12	Digital setting of torque limit in speed control (in regenerative state)	0.0% ~ 200.0%	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 separation selection	0: Disabled 1: Enabled	0	☆
P2-20	Max output voltage	-	-	-
P2-21	Max. torque coefficient of field weakening area	50~200%	100%	☆
P2-22	Regenerative power limit selection	0: Disabled 1: Enabled	0	☆
P2-23	Regenerative power limit	0~200%	Model dependent	☆

P3 V/F Control Parameters

Function Code	Name	Set Range	default	Alteration
P3-00	V/F curve setting	0: Straight line 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: VF complete separation mode 11: VF semi-separation mode	0	★
P3-01	Torque boost	0.0%：（Ineffective） 0.1% ~ 30.0%	Model dependent	☆
P3-02	Cut-off frequency of torque boost	0.00Hz ~ max frequency	50.00Hz	★
P3-03	Multi-point V/F frequency 1	0.00Hz ~ P3-05	0.00Hz	★
P3-04	Multi-point V/F voltage 1	0.0% ~ 100.0%	0.0%	★
P3-05	Multi-point V/F frequency 2	P3-03 ~ P3-07	0.00Hz	★
P3-06	Multi-point V/F voltage 2	0.0% ~ 100.0%	0.0%	★
P3-07	Multi-point V/F frequency 3	P3-05 ~ motor rated frequency（P1-04）	0.00Hz	★
P3-08	Multi-point V/F voltage 3	0.0% ~ 100.0%	0.0%	★
P3-09	V/F Slip compensation gain	-	-	-
P3-10	V/F over-excitation gain	0 ~ 200	64	☆
P3-11	V/F oscillation suppression gain	0 ~ 100	40	☆
P3-13	Voltage source for V/F separation	0: digital setting (P3-14) 1: AI1 (Note: J6 jumper) 2: AI2 3: AI3 4: High-speed pulse input setting (S5) 5: multi-segment instructions 6: Simple PLC 7: PID 8: communication given Note: 100.0% corresponds to the motor rated voltage	0	☆
Function Code	Name	Set Range	default	Alteration

P3-14	Digital setting of voltage for V/F	0V ~ motor rated voltage	0V	☆
P3-15	Voltage rise time of V/F separation	0.0s ~ 1000.0s Note: 0v to rated motor voltage	0.0s	☆
P3-16	Voltage decline time of V/F separation	0.0s~1000.0s Note: time of 0v to rated motor voltage	0.0s	☆
P3-17	Stop mode selection for V/F separation	0: Frequency and voltage 1:Declining to 0	0	☆
P3-18	Current limit level	50~200%	150%	★
P3-19	Current limit selection	0：useless 1：useful	1	★
P3-20	Current limit gain	0~100	20	☆
P3-21	Compensation factor of speed multiplying current limit level	50~200%	50%	★
P3-22	Voltage limit	650V~800.0V	770V	★
P3-23	Voltage limit selection	0：useless 1：useful	1	★
P3-24	Frequency gain for voltage limit	0~100	30	☆
P3-25	Voltage gain for voltage limit	0~100	30	☆
P3-26	Frequency rise threshold during	0~50Hz	5Hz	★
P4 Input Terminals				
P4-00	S1 function selection	0: no function 1: Forward run (FWD) or run command 2: Reverse running (REV) or forward and reverse running direction (Note: When setting 1, 2, it needs to be used with P4-11) 3: Three-wire operation control 4: Forward jog (FJOG) 5: Reverse Jog (RJOG) 6: terminal UP	1	★

<table>
<tr><td>P4-01</td><td>S2 function selection</td><td rowspan="3">7: Terminal DOWN
8: Free parking
9: Fault reset (RESET)
10: Run pause
11: External fault normally open input
12: Multi-stage command terminal 1
13: Multi-stage command terminal 2
14: Multi-stage command terminal 3
15: Multi-stage command terminal 4
16: acceleration and deceleration time selection terminal 1
17: Acceleration/deceleration time selection terminal 2
18: Frequency command switching
19: UP/DOWN setting is cleared (terminal, keyboard)
20: Control command switching terminal 1
21: acceleration and deceleration prohibited
22: PID suspension
23: Simple PLC status reset
24: swing frequency pause
25: Counter input
26: Counter reset
27: length count input
28: Length reset
29: Torque control is prohibited
30: High speed pulse input (only valid for S5)
31: Reserved
32: Immediate DC braking
33: External fault normally closed input
34: Frequency modification enabled
35: PID direction is reversed
36: External parking terminal 1</td><td>2</td><td>★</td></tr>
<tr><td>P4-02</td><td>S3 function selection</td><td>9</td><td>★</td></tr>
<tr><td>P4-03</td><td>S4 function selection</td><td>12</td><td>★</td></tr>
</table>

P4-04	S5 function selection	37: Control command switching terminal 2 38: PID score suspension 39: Frequency source A and preset frequency switching 40: Frequency source B and preset frequency switching 41: Motor terminal selection function 42: Reserved 43: PID parameter switching 44: User-defined fault 1 45: User-defined fault 2 46: Speed control / torque control switching 47: Emergency stop 48: External parking terminal 2 49: Deceleration DC braking 50: This running time is cleared. 51:Two-wire / three-wire switching 52:Reverse frequency prohibition 53-59: Reserved	13	★
P4-10	S1~S5 filter time	0.000s ~ 1.000s	0.010s	☆
P4-11	Terminal control mode	0: two lines 1 1: two lines 2 2: three lines 1 3: three lines 2	-	★
P4-12	Terminal UP/DOWN rate	0.001Hz/s ~ 65.535Hz/s	1.00Hz/s	☆
P4-13	AI curve 1 min. input	0.00V ~ P4-15	0.00V	☆
P4-14	Corresponding percentage of AI curve 1 min. input	-100.0% ~ +100.0%	0.0%	☆
P4-15	AI curve 1 max. input	P4-13 ~ +10.00V	10.00V	☆
P4-16	Corresponding percentage of AI curve 1 max. input	-100.0% ~ +100.0%	100.0%	☆

Function Code	Name	Set Range	default	Alteration
P4-17	AI1 filter time	0.00s ~ 10.00s	0.10s	☆
P4-18	AI curve 2 min. input	0.00V ~ P4-20	0.00V	☆
P4-19	Corresponding percentage of AI curve 2 min. input	-100.0% ~ +100.0%	0.0%	☆
P4-20	AI curve 2 max. input	P4-18 ~ +10.00V	10.00V	☆
P4-21	Corresponding percentage of AI curve 2 max. input	-100.0% ~ +100.0%	100.0%	☆
P4-22	AI2 filter time	0.00s ~ 10.00s	0.10s	☆
P4-23	AI3 curve min. input	-10.00V ~ P4-25	0.00V	☆
P4-24	Corresponding percentage of AI curve 3 min. input	-100.0% ~ +100.0%	0.0%	☆
P4-25	AI curve 3 max. input	P4-23 ~ +10.00V	10.00V	☆
P4-26	Corresponding percentage of AI curve 3 max. input	-100.0% ~ +100.0%	100.0%	☆
P4-27	AI3 filter time	0.00s ~ 10.00s	0.10s	☆
P4-28	Pulse min. input	0.00kHz ~ P4-30	0.00kHz	☆
P4-29	Corresponding percentage of pulse min. input	-100.0% ~ 100.0%	0.0%	☆
P4-30	Pulse max. input	P4-28 ~ 100.00kHz	50.00kHz	☆
P4-31	Corresponding percentage of pulse max. input	-100.0% ~ 100.0%	100.0%	☆
P4-32	Pulse filter time	0.00s ~ 10.00s	0.10s	☆

Function Code	Name	Set Range	default	Alteration
P4-33	AI curve selection	Bit: AI1 curve selection 1: curve 1 (2 points, see P4-13 ~ P4-16) 2: Curve 2 (2 points, see P4-18 ~ P4-21) 3: curve 3 (2 points, see P4-23 ~ P4-26) 4: curve 4 (4 points, see A6-00 ~ A6-07) 5: curve 5 (4 points, see A6-08 ~ A6-15) Ten: AI2 curve selection, ibid Hundreds: AI3 curve selection, ibid	321	☆
P4-34	Setting selection when AI less than min. input	Bit: AI1 is lower than the minimum input setting 0: corresponds to the minimum input setting 1: 0.0% Ten: AI2 is lower than the minimum input setting, ibid Hundreds: AI3 is lower than the minimum input setting, ibid	000	☆
P4-35	S1 delay	0.0s ~ 3600.0s	0.0s	★
P4-36	S2 delay	0.0s ~ 3600.0s	0.0s	★
P4-37	S3 delay	0.0s ~ 3600.0s	0.0s	★
P4-38	S1~S5 active mode selection 1	0: active high 1: active low Bit: S1 Ten: S2 Hundred places: S3 Thousands of bits: S4 Million: S5	00000	★

Function Code	Name	Set Range	default	Alteration
5 **Output Terminals**				
P5-00	HY1 terminal output mode	0: pulse output (HDP) 1: Switching output (HDY)	1	☆
P5-01	HDY function selection	0: No output 1: The inverter is running 2: fault output (fault stop) 3: Frequency level detection FDT1 output 4: frequency arrives 5: Zero speed operation (no output at shutdown) 6: motor overload pre-alarm 7: Inverter overload pre-alarm 8: Set the count value to reach 9: Specifies that the count value arrives 10: length to reach 11: PLC cycle is complete 12: The cumulative run time arrives 13: Frequency limit 14: Torque limit 15: Ready to run 16: AI1> AI2 17:upper limit frequency arrival 18: Lower frequency arrival (operation related) 19: Under voltage status output 20: communication settings	0	☆

P5-02	function selection（RO1A-RO1B-RO1C）	21:Positioning completed (reserved) 22:positioning close (reserved) 23: zero speed running 2 (also output when stopped) 24: The total power-up time arrives 25: Frequency level detection FDT2 output 26: Frequency 1 reaches the output 27: Frequency 2 reaches the output 28: current 1 reaches the output 29: current 2 reaches the output 30: Timing arrival output 31: AI1 input is overrun 32: Underload 33: reverse running 34: zero current state 35: Module temperature arrives 36: Output current is exceeded 37: Lower frequency arrival (shutdown also output) 38: Alarm output (continued) 39:Motor over temperature warning 40: This run time arrives 41: fault output (for free stop	2	☆
P5-06	HDP function selection	0: operating frequency 1: Set frequency 2: Output current 3: Output torque 4: Output power 5: Output voltage 6: High speed pulse input (100.% corresponds to 100.0 kHz) 7: AI1 (Note: J6 jumper) 8: AI2 9: AI3	0	☆

P5-07	AO1 function selection	10: length 11: count value 12: communication settings 13: motor speed 14: Output current: 100.0% vs. 1000.0A 15:Output voltage: 100.0% corresponds to 1000.0V 16: motor output torque (actual value, relative motor percentage)	0	☆
P5-09	HDO output frequency	0.01kHz ~ 100.00kHz	50.00kHz	☆
P5-10	AO1 zero offset coefficient	-100.0% ~ +100.0%	0.0%	☆
P5-11	AO1 gain	-10.00 ~ +10.00	1.00	☆
P5-17	HDY output delay	0.0s ~ 3600.0s	0.0s	☆
P5-18	Relay 1 output delay	0.0s ~ 3600.0s	0.0s	☆
P5-20	DO output delay	0.0s ~ 3600.0s	0.0s	☆
P5-22	active mode selection	0: Positive logic 1: anti logic Bit: HDO (HDY) Ten: RO1A Hundred places: RO2A Thousands of bits: DO Million: reserved	00000	☆

Function Code	Name	Set Range	default	Alteration
P6	**Start/Stop Control**			
P6-00	Start mode	0: Direct start 1:Catching a spinning motor 2: Pre-excited start 3: SVC quick start	0	☆
P6-01	Mode of catching a spinning motor	0: From stop frequency 1: From 50 Hz 2: From max. frequency	0	★
P6-02	Speed of catching a spinning motor	1 ~ 100	20	☆
P6-03	Start frequency	0.00Hz ~ 10.00Hz	0.00Hz	☆
P6-04	Start frequency holding time	0.0s ~ 100.0s	0.0s	★
P6-05	DC injection braking 1 level/Pre excitation level	0% ~ 100%	50%	★
P6-06	DC injection braking 1 active time /Pre-excitation active time	0.0s ~ 100.0s	0.0s	★
P6-07	Acceleration/Deceleration mode	0:Linear acceleration deceleration 1:S-curve acceleration deceleration A (static) 2:S curve acceleration/ deceleration B (dynamic)	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: Coast to stop	0	☆
P6-11	DC injection braking 2 start frequency	0.00Hz ~ max frequency(P0-10)	0.00Hz	☆
P6-12	DC injection braking 2 delay time	0.0s ~ 100.0s	0.0s	☆
P6-13	DC injection braking 2 level	0% ~ 100%	50%	☆
P6-14	DC injection braking 2 active time	0.0s ~ 100.0s	0.0s	☆
P6-15	Braking use ratio	0% ~ 100%	100%	☆
P6-18	Catching a spinning motor current limit	30%~200%	Model dependent	☆

Function Code	Name	Set Range	default	Alteration
P6-21	Demagnetization time (effective for SVC)	0.00~5.00s	Model dependent	☆
P7 Keypad Operation and LED Display				
P7-01	JOG default display check	0: JOG is invalid 1:Operation panel command channel and remote command channel (terminal command channel or communication command channel) switch 2: Forward and reverse switching 3: moving forward 4: reverse jog	0	★
P7-02	STOP/RESET key function	0: The STOP / RES key stop function is valid only during keyboard operation 1: STOP / RES key shutdown is active in any mode of operation	1	☆
P7-03	LED display running parameters 1	0000 ~ FFFF Bit00:Operating frequency 1 (Hz) Bit01: Set frequency(Hz) Bit02: Bus voltage (V) Bit03: Output voltage(V) Bit04: Output current(A) Bit05:Output over(kW) Bit06: Output torque (%) Bit07: S terminal input status Bit08:HDO output status Bit09: AI1 voltage (V) Bit10: AI2 Voltage (V) Bit11: AI3 Voltage (V) Bit12: Count value Bit13: Length value	1F	☆

Function Code	Name	Set Range	default	Alteration
		Bit14:Load speed display Bit15: PID setting		
P7-04	LED display running parameters 2	0000 ~ FFFF Bit00: PID feedback Bit01: PLC stage Bit02: High-speed pulse input frequency (kHz) Bit03: Operating frequency 2 (Hz) Bit04:Remaining runtime Bit05:AI1 before correction voltage (V) Bit06: AI2 before correction voltage (V) Bit07: AI3 Correction before voltage (V) Bit08: Line speed Bit09: Current power-on time (Hour) Bit10: Current running time (Min) Bit11: High-speed pulse input frequency (Hz) Bit12:Communication set point Bit13: Encoder feedback speed (Hz) Bit14: Main frequency A display (Hz) Bit15:Secondary frequency B display (Hz)	0	☆
P7-05	LED display stop parameters	0000 ~ FFFF Bit00: Set frequency (Hz) Bit01: Bus voltage (V) Bit02: S input status Bit03: HDO output status Bit04: AI1 voltage (V) Bit05: AI2 voltage (V) Bit06: AI3 voltage (V) Bit07: Count value Bit08: Length value Bit09: PLC stage Bit10: Load speed Bit11: PID setting	33	☆

		Bit12: High-speed pulse input frequency (kHz)		
P7-06	Load speed display coefficient	0.0001 ~ 6.5000	1.0000	☆
Function Code	Name	Set Range	default	Alteration
P7-07	Heatsink temperature of AC Drive IGBT	-20.0℃ ~ 120.0℃	-	●
P7-09	Accumulative running time	0h ~ 65535h	-	●
P7-12	Number of decimal places for load speed display	Bit: d0-14 the number of decimal places 0: 0 decimal places 1: 1 decimal place 2: 2 decimal places 3: 3 decimal places Ten: d0-19 / d0-29 the number of decimal places 1: 1 decimal place 2: 2 decimal places	21	☆
P7-13	Accumulative power-on time	0h ~ 65535h	-	●
P7-14	Accumulative power consumption	0kW ~ 65535kwh	-	●
Group P8: Auxiliary Functions				
P8-00	Jog frequency reference	0.00 Hz to max. frequency	2.00 Hz	☆
P8-01	Jog acceleration time	0.0s to 6500.0s	20.0s	☆
P8-02	Jog deceleration time	0.0s to 6500.0s	20.0s	☆
P8-03	Acceleration time 2	0.0s to 6500.0s	Model dependent	☆
P8-04	Deceleration time 2	0.0s to 6500.0s	Model dependent	☆
P8-05	Acceleration time 3	0.0s to 6500.0s	Model dependent	☆
P8-06	Deceleration time 3	0.0s to 6500.0s	Model dependent	☆
P8-07	Acceleration time 4	0.0s to 6500.0s	0.0s	☆
P8-08	Deceleration time 4	0.0s to 6500.0s	0.0s	☆

Function Code	Name	Set Range	default	Alteration
P8-09	Frequency jump 1	0.00 Hz to max. frequency	0.00 Hz	☆
P8-10	Frequency jump 2	0.00 Hz to max. frequency	0.00 Hz	☆
P8-11	Frequency jump band	0.00 Hz to max. frequency	0.00 Hz	☆
P8-12	Forward/Reverse run switch over dead-zone time	0.0s to 3000.0s	0.0s	☆
P8-13	Reverse RUN selection	0, 1	0	☆
P8-14	Running mode when frequency reference lower than frequency lower limit	0:running for lower frequency 1:stop 2:zero speed	0	☆
P8-15	Droop rate	0.00% to 100.00%	0.00%	☆
P8-16	Accumulative power-on time threshold	0 to 65000 h	0 h	☆
P8-17	Accumulative running time threshold	0 to 65000 h	0 h	☆
P8-18	Startup protection selection	0:non protect 1 :protect	0	☆
P8-19	Frequency detection value1	0.00 Hz to max. frequency	50.00Hz	☆
P8-20	Frequency detection hysteresis 1	0.0% to 100.0% (FDT 1)	5.0%	☆
P8-21	Detection width of target frequency reached	0.0% to 100.0% (P0-10)	0.0%	☆
P8-22	Jump frequency function whether valid	0:invalid, 1:valid	0	☆
P8-25	Switchover frequency of accel time 1 and accel time 2	0.00 Hz to max. Frequency(P0-10)	0.00 Hz	☆
P8-26	Switchover frequency of decel time 1 and decel time 2	0.00 Hz to max. frequency (P0-10)	0.00 Hz	☆
P8-27	Set highest priority to terminal JOG function	0:invalid, 1:valid	0	☆
P8-28	Frequency detection value (FDT2)	0.00 Hz to max. frequency	50.00 Hz	☆

Function Code	Name	Set Range	default	Alteration
P8-29	Frequency detection hysteresis (FDT2)	0.0% to 100.0% ()	5.0%	☆
P8-30	Detection of frequency 1	0.00 Hz to max. Frequency (P0-10)	50.00 Hz	☆
P8-31	Detection width of frequency 1	0.0% to 100.0% (max. Frequency P0-10)	0.0%	☆
P8-32	Detection of frequency 2	0.00 Hz to max. Frequency P0-10	50.00 Hz	☆
P8-33	Detection width of frequency 2	0.0% to 100.0% (max. Frequency P0-10)	0.0%	☆
P8-34	Zero current detection level	0.0% to 300.0% (rated motor current)	5.0%	☆
P8-35	Zero current detection delay	0.01s to 600.00s	0.10s	☆
P8-36	Output over current threshold	0.0% (no detection) 0.1% to 300.0% (rated motor current)	200.0%	☆
P8-37	Output over current detection delay	0.00s to 600.00s	0.00s	☆
P8-38	Detection level of current 1	0.0% to 300.0% (rated motor current)	100.0%	☆
P8-39	Detection width of current 1	0.0% to 300.0% (rated motor current)	0.0%	☆
P8-40	Detection level of current 2	0.0% to 300.0% (rated motor current)	100.0%	☆
P8-41	Detection width of current 2	0.0% to 300.0% (rated motor current)	0.0%	☆
P8-42	Timing function	0:invalid, 1:valid	0	★
P8-43	Running time setting channel	0 to 3	0	★
P8-44	Running time	0.0 to 6500.0 min	0.0 min	★

Function Code	Name	Set Range	default	Alteration
P8-45	AI1 input voltage lower limit	0.00 V to P8-46	3.10 V	☆
P8-46	AI1 input voltage upper limit	P8-45 to 10.00 V	6.80 V	☆
P8-47	IGBT temperature threshold	0°C to 100°C	75°C	☆
P8-48	Cooling fan working mode	0, 1	0	☆
P8-49	Wakeup frequency	P8-51 to max. frequency (P0-10)	0.00 Hz	☆
P8-50	Wakeup delay time	0.0s to 6500.0s	0.0s	☆
P8-51	Hibernating frequency	0.00 Hz to wakeup frequency (P8-49)	0.00 Hz	☆
P8-52	Hibernating delay time	0.0s to 6500.0s	0.0s	☆
P8-53	Running time threshold this time	0.0 to 6500.0 min	0.0 min	☆
P8-54	Output power correction coefficient	0.0% to 200.0%	100.0%	☆
Group P9: Fault and Protection				
P9-00	Motor overload protection	0:forbid , 1:permit	1	☆
P9-01	Motor overload protection gain	0.20 to 10.00	1.00	☆
P9-02	Motor overload pre-warning coefficient	50% to 100%	80%	☆
P9-03	Over voltage protection gain	0 (no over voltage stall) to 100	30	☆
P9-04	Over voltage protection voltage	650 to 800 V	770 V	☆
P9-07	Detection of short-circuit to ground upon power-on	00 to 11	01	☆

Function Code	Name	Set Range	default	Alteration
P9-08	Braking unit applied voltage	650 to 800 V	720 V	★
P9-09	Auto reset times	0 to 20	0	☆
P9-10	Selection of DO action during auto reset	0: no work , 1:work	0	☆
P9-11	Delay of auto reset	0.1s to 100.0s	1.0s	☆
P9-12	Input phase loss/pre-charge relay protection	-	-	☆
P9-13	Output phase loss protection	0: forbid 1 :permit	01	☆
P9-14	1st fault type	0: no fault 1: reserved 2: Accelerating over current 3: Deceleration over current 4: Constant speed over current 5: Accelerating over voltage 6: Deceleration overvoltage 7: Constant speed over voltage 8: snubber resistor overload 9: Under voltage 10: Inverter overload 11: Motor overload 12: Reserved 13: Output phase loss 14: Module overheating 15: External fault 16: Communication error 17: Contactor abnormality 18: Abnormal current detection 19: Motor self-learning abnormality 20: Encoder/PG card is abnormal 21: Parameter read and write exception 22: Inverter hardware is abnormal	-	●
P9-15	2nd fault type		-	●

P9-16	3rd (latest) fault type	23: Motor short circuit to ground 24: Reserved 25: Reserved 26: Run time arrives 27: User-defined fault 1 28: User-defined fault 2 29: Power on time arrives 30: Under load 31: Loss of PID feedback at run time 40: Fast current limit timeout 41: Switching motor during operation 42: The speed deviation is too large 43: Motor over speed (reserved) 45: Motor over temperature 51: Initial position error 55: slave failure during master-slave control	-	●
P9-17	Frequency upon 3rd fault	-	-	●
P9-18	Current upon 3rd fault	-	-	●
P9-19	Bus voltage upon 3rd fault	-	-	●
P9-20	DI state upon 3rd fault	-	-	●
P9-21	DO state upon 3rd fault	-	-	●
P9-22	AC drive state upon 3rd fault	-	-	●
P9-23	Power-on time upon 3rd fault	-	-	●
P9-24	Running time upon 3rd fault	-	-	●
P9-27	Frequency upon 2nd fault	-	-	●
P9-28	Current upon 2nd fault	-	-	●

Function Code	Name	Set Range	default	Alteration
P9-29	Bus voltage upon 2nd fault	-	-	●
P9-00	Motor overload protection	0, 1	1	☆
P9-30	DI state upon 2nd fault	-	-	●
P9-31	DO state upon 2nd fault	-	-	●
P9-32	AC drive state upon 2nd fault	-	-	●
P9-33	Power-on time upon 2nd fault	-	-	●
P9-34	Running time upon 2nd fault	-	-	●
P9-37	Frequency upon 1st fault	-	-	●
P9-38	Current upon 1st fault	-	-	●
P9-39	Bus voltage upon 1st fault	-	-	●
P9-40	DI state upon 1st fault	-	-	●
P9-41	DO state upon 1st fault	-	-	●
P9-42	AC drive state upon 1st fault	-	-	●
P9-43	Power-on time upon 1st fault	-	-	●
P9-44	Running time upon 1st fault	-	-	●

Function Code	Name	Set Range	default	Alteration
P9-47	Fault protection action selection 1	Unit: Motor overload (FU11) 0: Free parking 1: Stop by stop mode 2: continue to run Ten digits: input phase loss (FU12) (reserved) Hundreds place: output phase loss (FU13) Thousands: External Fault (FU15) 10,000 digits: communication error (FU16)	00000	☆
P9-48	Fault protection action selection 2	Unit: keep(FU 20) 0: Free parking Ten digits: function code read and write exception (FU21) 0: Free parking 1: Stop by stop mode Hundreds place: Inverter overload fault action selection (FU10) 0: Free stop 1: derating operation Thousands: Motor overheating (FU45) 10,000: Run time arrives (FU26)	00000	☆
P9-50	Fault protection action selection 4	Unit: Speed deviation is too large (FU42) 0: Free parking 1: Stop by stop mode 2: continue to run Ten places: motor over speed (FU43) Hundreds place: initial position error (FU51)	00000	☆
P9-54	Frequency selection for continuing to run upon fault	0: Run at the current operating frequency 1: run at the set frequency 2: Run at the upper limit frequency 3: Run at the following frequency limit 4: Run at abnormal standby frequency	0	☆

Function Code	Name	Set Range	default	Alteration
P9-55	Backup frequency upon fault	0.0% to 100.0% (max. frequency)	100.0%	☆
P9-59	Power dip ride-through function selection	0: invalid 1: Bus voltage constant control 2: Deceleration stop	0	★
P9-60	Threshold of power dip ride through function disabled	80% to 100%	85%	★
P9-61	Judging time of bus voltage recovering from power dip	0.0s to 100.0s	0.5s	★
P9-62	Threshold of power dip ride through function enabled	60% to 100%	80%	★
P9-63	Load lost protection	0: Disabled 1: Enabled	0	☆
P9-64	Load lost detection level	0.0% to 100.0%	10.0%	☆
P9-65	Load lost detection time	0.0s to 60.0s	1.0s	☆
P9-67	Over speed detection level	0.0% to 50.0% (max. frequency)	20.0%	☆
P9-68	Over speed detection time	0.0s to 60.0s	1.0s	☆
P9-69	Detection level of speed error	0.0% to 50.0% (max. frequency)	20.0%	☆
P9-70	Detection time of speed error	0.0s no check 0.0s to 60.0s	5.0s	☆
P9-71	Power dip ride-through gain Kp	0 to 100	40	☆
P9-72	Instantaneous stop non-stop integral coefficient Ki	0 to 100	30	☆
P9-73	Deceleration time of power dip ride-through	0.0s to 300.0s	20.0s	★

Group PA: PID Function				
Function Code	Name	Set Range	default	Alteration
PA-00	PID reference setting channel	0: PA-01 setting 1: AI1 2: AI2 3: AI3 (keyboard potentiometer) 4: High-speed pulse input setting (S5) 5: Communication given 6: Multiple instructions are given	0	☆
PA-01	PID digital setting	0.0% to 100.0%	50.0%	☆
PA-02	PID Feedback	0: AI1 1: AI2 2: AI3 (keyboard potentiometer) 3: AI1-AI2 4: High-speed pulse input setting (S5) 5: Communication given 6: AI1+AI2 7:MAX(|AI1|, |AI2|) 8:MIN(|AI1|, |AI2|)	0	☆
PA-03	PID operation direction	0: Positive action 1: Reaction	0	☆
PA-04	PID reference and Feedback range	0 to 65535	1000	☆
PA-05	Proportional gain Kp1	0.0 to 1000.0	20.0	☆
PA-06	Integral time Ti1	0.01s to 10.00s	2.00s	☆
PA-07	Differential time Td1	0.000s to 10.000s	0.000s	☆
PA-08	PID output limit in reverse direction	0.00 Hz to max. Frequency (P0-10)	0.00 Hz	★
PA-09	PID error limit	0.0% to 100.0%	0.0%	☆

Function Code	Name	Set Range	default	Alteration
PA-10	PID differential limit	0.00% to 100.00%	0.10%	☆
PA-11	PID reference change time	0.00s to 650.00s	0.00s	☆
PA-12	PID feedback filter time	0.00s to 60.00s	0.00s	☆
PA-13	PID output filter time	0.00s to 60.00s	0.00s	☆
PA-14	Reserved	-	-	-
PA-15	Proportional gain Kp2	0.0 to 1000.0	20.0	☆
PA-16	Integral time Ti2	0.01s to 10.00s	2.00s	☆
PA-17	Differential time Td2	0.000s to 10.000s	0.000s	☆
PA-18	PID parameter switchover condition	0: Do not switch 1: Switched through the S terminal 2: Automatic switching according to deviation 3: Automatic switching according to the operating frequency	0	☆
PA-19	PID error 1 for auto switchover	0.0% to PA-20	20.0%	☆
PA-20	PID error 2 for auto switchover	PA-19 to 100.0%	80.0%	☆
PA-21	PID initial value	0.0% to 100.0%	0.0%	☆
PA-22	PID initial value active time	0.00s to 650.00s	0.00s	☆

Function Code	Name	Set Range	default	Alteration
PA-25	PID integral property	Unit position: integral separation 0: invalid 1: valid Ten digits: Whether to stop the integration after outputting to the limit 0: Continue to score 1: stop the points	00	☆
PA-26	Detection level of PID feedback loss	0.0%: No detection 0.1% to 100.0%	0.0%	☆
PA-27	Detection time of PID feedback loss	0.0s to 20.0s	0.0s	☆
PA-28	Selection of PID operation at stop	0: stop does not operate 1: Operation at shutdown	0	☆
Group PB: Wobble Function, Fixed Length and Count				
PB-00	Wobble setting mode	0: relative to the center frequency 1: relative to the maximum frequency	0	☆
PB-01	Wobble amplitude	0.0% to 100.0%	0.0%	☆
PB-02	Wobble step	0.0% to 50.0%	0.0%	☆
PB-03	Wobble cycle	0.0s to 3000.0s	10.0s	☆
PB-04	Triangular wave rising time coefficient	0.0% to 100.0%	50.0%	☆
PB-05	Set length	0 to 65535 m	1000 m	☆
PB-06	Actual length	0 to 65535 m	0 m	☆
PB-07	Number of pulses per meter	0.1 to 6553.5	100.0	☆
PB-08	Set count value	1 to 65535	1000	☆

Function Code	Name	Set Range	default	Alteration
PB-09	Designated count value	1 to 65535	1000	☆
Group PC: Multi - Reference and Simple PLC Function				
PC-00	Reference 0	-100.0% to 100.0%	0.0%	☆
PC-01	Reference 1	-100.0% to 100.0%	0.0%	☆
PC-02	Reference 2	-100.0% to 100.0%	0.0%	☆
PC-03	Reference 3	-100.0% to 100.0%	0.0%	☆
PC-04	Reference 4	-100.0% to 100.0%	0.0%	☆
PC-05	Reference 5	-100.0% to 100.0%	0.0%	☆
PC-06	Reference 6	-100.0% to 100.0%	0.0%	☆
PC-07	Reference 7	-100.0% to 100.0%	0.0%	☆
PC-08	Reference 8	-100.0% to 100.0%	0.0%	☆
PC-09	Reference 9	-100.0% to 100.0%	0.0%	☆
PC-10	Reference 10	-100.0% to 100.0%	0.0%	☆
PC-11	Reference 11	-100.0% to 100.0%	0.0%	☆
PC-12	Reference 12	-100.0% to 100.0%	0.0%	☆
PC-13	Reference 13	-100.0% to 100.0%	0.0%	☆
PC-14	Reference 14	-100.0% to 100.0%	0.0%	☆
PC-15	Reference 15	-100.0% to 100.0%	0.0%	☆
PC-16	Simple PLC running mode	0: Single run end shutdown 1: the end of a single run to maintain the final value 2: Always cycle	0	☆

Function Code	Name	Set Range	default	Alteration
PC-17	Simple PLC retentive selection	Unit: Power-down memory selection 0: Power failure does not remember 1: Power-down memory Ten digits: stop memory selection 0: stop without memory 1: shutdown memory	00	☆
PC-18	Running time of simple PLC reference 0	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-19	Acceleration/deceleration time of simple PLC reference 0	0 to 3	0	☆
PC-20	Running time of simple PLC reference 1	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-21	Acceleration/deceleration time of simple PLC reference 1	0 to 3	0	☆
PC-22	Running time of simple PLC reference 2	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-17	Simple PLC retentive selection	Unit: Power-down memory selection 0: Power failure does not remember 1: Power-down memory Ten digits: stop memory selection 0: stop without memory 1: shutdown memory	00	☆
PC-18	Running time of simple PLC reference 0	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-19	Acceleration/deceleration time of simple PLC reference 0	0 to 3	0	☆
PC-20	Running time of simple PLC reference 1	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-21	Acceleration/deceleration time of simple PLC reference 1	0 to 3	0	☆

Function Code	Name	Set Range	default	Alteration
PC-22	Running time of simple PLC reference 2	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-23	Acceleration/deceleration time of simple PLC reference 2	0 to 3	0	☆
PC-24	Running time of simple PLC reference 3	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-25	Acceleration/deceleration time of simple PLC reference 3	0 to 3	0	☆
PC-26	Running time of simple PLC reference 4	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-27	Acceleration/deceleration time of simple PLC reference 4	0 to 3	0	☆
PC-28	Running time of simple PLC reference 5	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-29	Acceleration/deceleration time of simple PLC reference 5	0 to 3	0	☆
PC-30	Running time of simple PLC reference 6	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-31	Acceleration/deceleration time of simple PLC reference 6	0 to 3	0	☆
PC-32	Running time of simple PLC reference 7	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-33	Acceleration/deceleration time of simple PLC reference 7	0 to 3	0	☆
PC-34	Running time of simple PLC reference 8	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-35	Acceleration/deceleration time of simple PLC reference 8	0 to 3	0	☆
PC-36	Running time of simple PLC reference 9	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-37	Acceleration/deceleration time of simple PLC reference 9	0 to 3	0	☆

Function Code	Name	Set Range	default	Alteration
PC-38	Running time of simple PLC reference 10	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-39	Acceleration/deceleration time of simple PLC reference 10	0 to 3	0	☆
PC-40	Running time of simple PLC reference 11	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-41	Acceleration/deceleration time of simple PLC reference 11	0 to 3	0	☆
PC-42	Running time of simple PLC reference 12	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-43	Acceleration/deceleration time of simple PLC reference 12	0 to 3	0	☆
PC-44	Running time of simple PLC reference 13	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-45	Acceleration/deceleration time of simple PLC reference 13	0 to 3	0	☆
PC-46	Running time of simple PLC reference 14	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-47	Acceleration/deceleration time of simple PLC reference 14	0 to 3	0	☆
PC-48	Running time of simple PLC reference 15	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-49	Simple PLC section 15 acceleration and deceleration time selection	0-3	0	☆
PC-50	Simple PLC runtime unit	0:S 1:H	0	☆
PC-51	Multi-segment instruction 0 given mode	0: Function code PC-00 given 1: AI1 2: AI2 3: AI3 (keyboard potentiometer) 4: High speed pulse input 5: PID 6: preset frequency (P0-08) is given, UP/DOWN can be modified	0	☆

Group PD: Communication				
Function Code	Name	Set Range	default	Alteration
Pd-00	General baud rate setting	it: MODBUS 0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS Ten: keep hundred: reserved Thousands of bits:: keep	6005 5005	☆ ☆
Pd-01	MODBUS data format	0: no parity (8-N-2) 1: Even check (8-E-1) 2: Odd parity (8-O-1) 3: No parity (8-N-1)	0	☆
Pd-02	Local address	0: Broadcast address; 1 to 247	1	☆
Pd-03	MODBUS response delay	0ms ~ 20ms	2 ms	☆
Pd-04	Communication timeout	0.0: invalid 0.1s to 60.0s	0.0 s	☆
Pd-05	Modbus protocol selection and PROFIBUS-DP data frame	Bit: MODBUS 0: non-standard MODBUS protocol 1: Standard MODBUS protocol Ten: keep	30	☆
Pd-06	Current resolution read by communication	0: 0.01 1: 0.1	0	☆

Group PE: User-Defined Parameters				
Function Code	Name	Set Range	default	Alteration
PE-00	User-defined parameter 0	P0-00~PP-xx A0-00~Ax-xx d0-00~d0-xx d3-00~d3-xx	d3-17	☆
PE-01	User-defined parameter 1		d3-18	☆
PE-02	User-defined parameter 2		P0.00	☆
PE-29	User-defined parameter 29		P0.00	☆
Group PP: Function Parameter Management				
PP-00	User password	0 ~ 65535	0	☆
PP-01	Parameter initialization	0: No operation 1: Restore factory parameters except motor parameters 2: Clear records 4: Back up current user parameters 501: Restore user backup parameters	0	☆
PP-02	Parameter display property	Bit: d group display selection 0: not displayed 1: display Ten: Group A shows the selection 0: not displayed 1: display	11	★
PP-03	Selection of individualized parameter display	Bit: user custom parameter group display selection 0: not displayed 1: display Ten: User Change Parameter Group Display Selection 0: not displayed 1: display	00	☆

PP-04	Selection of parameter modification	0: Can be modified 1: cannot be modified	0	☆
Group A0: Torque Control and Limit				
Function Code	Name	Set Range	default	Alteration
A0-00	Speed/Torque control selection	0：Speed control 1：Torque control	0	★
A0-01	Torque reference source in torque control	0：Digital setting 1（A0-03） 1：AI1 2：AI2 3：AI3（Keyboard potentiometer） 4：High-speed pulse input (S5) 5：Communications given6：MIN（AI1,AI2） 7：MAX（AI1,AI2） （1-7 options of full scale, corresponding A0-03 digital setting）	0	★
A0-03	Torque digital setting in torque control	-200.0% ~ 200.0%	150.0%	☆
A0-05	Forward max. frequency in torque control	0.00 Hz to max. frequency (P0-10)	50.00Hz	☆
A0-06	Reverse max. frequency in torque control	0.00 Hz to max. frequency（P0-10）	50.00Hz	☆
A0-07	Acceleration time in torque control	0.00s ~ 65000s	0.00s	☆
A0-08	Deceleration time in torque control	0.00s ~ 65000s	0.00s	☆
Group A5: Control Optimization				
A5-00	DPWM switchover frequency upper limit	5.00 Hz to max. frequency	8.00 Hz	☆

Function Code	Name	Set Range	default	Alteration
A5-01	PWM modulation pattern	0, 1	0	☆
A5-02	Dead zone compensation mode selection	0, 1	1	☆
A5-03	Random PWM depth	0 to 10	0	☆
A5-04	Over current fast prevention	0, 1	1	☆
A5-05	Voltage over modulation coefficient	100% to 110%	105%	★
A5-06	Under voltage threshold	210 to 420 V	350 V	☆
A5-08	Dead-zone time adjustment	100% to 200%	150%	★
A5-09	Over voltage threshold	200.0 to 2500.0 V	Model dependent	★
Para. No.	Para. Name	Setting Range	Default	Property
Group A6: AI Curve Setting				
A6-00	AI curve 4 min. input	-10.00 V to A6-02	0.00 V	☆
A6-01	Corresponding percentage of AI curve 4 min. input	-100.0% to 100.0%	0.0%	☆
A6-02	AI curve 4 inflexion 1 input	A6-00 to A6-04	3.00 V	☆
A6-03	Corresponding percentage of AI curve 4 inflexion 1 input	-100.0% to 100.0%	30.0%	☆
A6-04	AI curve 4 inflexion 2 input	A6-02 to A6-06	6.00 V	☆
A6-05	Corresponding percentage of AI curve 4 inflexion 2 input	-100.0% to 100.0%	60.0%	☆
Function Code	Name	Set Range	default	Alteration

A6-06	AI curve 4 max. input	A6-04 to 10.00 V	10.00 V	☆
A6-07	Corresponding percentage of AI curve 4 max. input	-100.0% to 100.0%	100.0%	☆
A6-08	AI curve 5 min. input	-10.00 V to A6-10	-10.00 V	☆
A6-09	Corresponding percentage of AI curve 5 min. input	-100.0% to 100.0%	-100.0%	☆
A6-10	AI curve 5 inflexion 1 input	A6-08 to A6-12	-3.00 V	☆
A6-11	Corresponding percentage of AI curve 5 inflexion 1 input	-100.0% to 100.0%	-30.0%	☆
A6-12	AI curve 5 inflexion 2 input	A6-10 to A6-14	3.00 V	☆
A6-13	Corresponding percentage of AI curve 5 inflexion 2 input	-100.0% to 100.0%	30.0%	☆
A6-14	AI curve 5 max. input	A6-12 to 10.00 V	10.00 V	☆
A6-15	Corresponding percentage of AI curve 5 max. input	-100.0% to 100.0%	100.0%	☆
A6-24	Jump point of AI1 input corresponding setting	-100.0% to 100.0%	0.0%	☆
A6-25	Jump amplitude of AI1 input corresponding setting	0.0% to 100.0%	0.5%	☆
A6-26	Jump point of AI2 input corresponding setting	-100.0% to 100.0%	0.0%	☆
A6-27	Jump amplitude of AI2 input corresponding setting	0.0% to 100.0%	0.5%	☆
A6-28	Jump point of AI3 input corresponding setting	-100.0% to 100.0%	0.0%	☆
Group AC: AI/AO Correction				
Function Code	Name	Set Range	default	Alteration

AC-00	AI1 measured voltage 1	-10.00 to 10.000 V	factory corrected	☆
AC-01	AI1 displayed voltage 1	-10.00 to 10.000 V	factory corrected	☆
AC-02	AI1 measured voltage 2	-10.00 to 10.000 V	factory corrected	☆
AC-03	AI1 displayed voltage 2	-10.00 to 10.000 V	factory corrected	☆
AC-04	AI2 measured voltage 1	-10.00 to 10.000 V	factory corrected	☆
AC-05	AI2 displayed voltage 1	-10.00 to 10.000 V	factory corrected	☆
AC-06	AI2 measured voltage 2	-10.00 to 10.000 V	factory corrected	☆
AC-07	AI2 displayed voltage 2	-10.00 to 10.000 V	factory corrected	☆
AC-08	AI3 measured voltage 1	-10.00 to 10.000 V	factory corrected	☆
AC-09	AI3 displayed voltage 1	-10.00 to 10.000 V	factory corrected	☆
AC-10	AI3 measured voltage 2	-10.00 to 10.000 V	factory corrected	☆
AC-11	AI3 displayed voltage 2	-10.00 to 10.000 V	factory corrected	☆
AC-12	AO1 target voltage 1	-10.00 to 10.000 V	factory corrected	☆
AC-13	AO1 measured voltage 1	-10.00 to 10.000 V	factory corrected	☆
Function Code	Name	Set Range	default	Alteration
AC-14	AO1 target voltage 2	-10.00 to 10.000 V	factory corrected	☆
AC-15	AO1 measured voltage 2	-10.00 to 10.000 V	factory corrected	☆

AC-16	AO2 target voltage 1	-10.00 to 10.000 V	factory corrected	☆
AC-17	AO2 measured voltage 1	-10.00 to 10.000 V	factory corrected	☆
AC-18	AO2 target voltage 2	-10.00 to 10.000 V	factory corrected	☆
AC-19	AO2 measured voltage 2	-10.00 to 10.000 V	factory corrected	☆

5.2 monitoring parameters

Para. No.	Para. Name	Display Range	Communication add
Group dO: Monitoring Parameters			
dO-00	Running frequency	0.01Hz	7000H
dO-01	Frequency reference	0.01Hz	7001H
dO-02	Bus voltage	0.1V	7002H
dO-03	Output voltage	1V	7003H
dO-04	Output current	0.01A	7004H
dO-05	Output power	0.1kW	7005H
dO-06	Output torque	0.1%	7006H
dO-07	S state INPUT stature	1	7007H
dO-08	HDO output state	1	7008H
dO-09	AI1 voltage /current	0.01V/0.01mA	7009H
dO-10	AI2 voltage	0.01V	700AH
dO-11	AI3 voltage	0.01V	700BH
dO-12	Count value	1	700CH
dO-13	length value	1	700DH
Para. No.	Para. Name	Display Range	Communication add
dO-14	Load speed display	1	700EH
dO-15	PID reference	1	700FH
dO-16	PID feedback	1	7010H
dO-17	PLC stage	1	7011H
dO-18	Pulse reference	0.01kHz	7012H
dO-19	feedback speed	0.01Hz	7013H

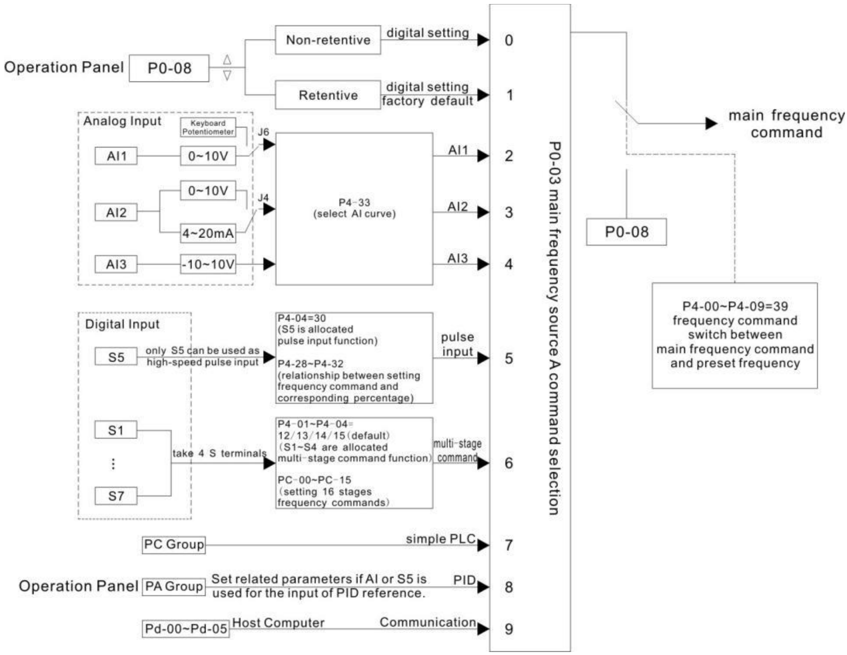
dO-20	Remaining running time	0.1Min	7014H
dO-21	AI1 voltage(V)/ current (MA) before correction	0.001V/0.01mA	7015H
dO-22	AI2 voltage(V) before correction	0.001V	7016H
dO-23	AI3 voltage before correction	0.001V	7017H
dO-24	Motor speed	1m/Min	7018H
dO-25	Accumulative power-on time	1Min	7019H
dO-26	Accumulative running time	0.1Min	701AH
dO-27	Pulse reference	1Hz	701BH
dO-28	Communication reference	0.01%	701BH
dO-29	Encoder feedback speed	0.01%	701CH
dO-30	Main frequency A reference	0.01Hz	701DH
dO-31	Auxiliary frequency B reference	0.01Hz	701EH
dO-32	Viewing any register address value	0.01Hz	701FH
dO-34	Motor temperature	1	7020H
dO-35	Target torque	1℃	7022H
dO-36	Resolver position	0.1%	7023H
dO-37	Power factor angle	0.1°	7025H
dO-38	ABZ position	1	7026H
dO-39	Target voltage upon V/F separation	1V	7027H
Para. No.	Para. Name	Display Range	Communication add
dO-40	Output voltage upon V/F separation	1V	7028H
dO-41	S state display	1	7029H
dO-42	HDO state display	1	702AH
dO-43	S set for function state display 1	1	702BH

dO-44	S set for function state display 2	1	702CH
dO-45	fault information	1	702DH
dO-58	Phase Z counting	1	703AH
dO-59	Frequency Reference		703BH
dO-60	Running frequency	0.01%	703CH
dO-61	AC drive state	1	703DH
dO-62	Current fault code	1	703EH
dO-65	Torque upper limit	0.1%	7041H
dO-73	Motor Series	0: motor1 1: motor2	7029H
dO-74	AC drive output torque	-100-100%	702AH

6. Parameter Description

Function code	Description	Application
P0-01： 1st motor speed control mode	Set 0：non-speed Sensor vector control （SVC）	Refers to open loop vector control, suitable for the usual high-performance control occasions, a drive can only drive a motor. Such as machine tools, centrifuges, drawing machines, injection molding machines and other loads.
	Set 1： Reserved	-
	Set 2：V/F control （speed degree open loop control） （Factory default）	Applicable to the load requirements are not high, or a drive drag multiple motor occasions, such as fans, pump load. Can be used for a drive drag more than one motor occasions.

P0-03	Main frequency source A selection	Factory default	4
	Set range	0: digital setting (preset frequency P0-08, UP / DOWN can be modified, power is not memory) 1: digital setting (preset frequency P0-08, UP / DOWN can be modified, power-down memory) 2: AI1 3: AI2 4: AI3 5: High-speed pulse setting (S5) 6: Multi-step command 7: PLC 8: PID 9: Communication	



Pic 6-1

Select the input channel for the given frequency of the drive. AI1, AI2, AI3, high-speed pulse setting (S5), multi-segment instructions, PLC, PID, and so on.

Notes: P0-23 is "digital setting frequency stop memory selection", P0-23 is used to select whether the correction amount of frequency is memorized or cleared when the inverter is stopped. P0-23 no relate to shut down, not related to power-down memory, the application should pay attention.

8：PID

Select the output of the process PID control as the operating frequency. Generally used in the field of closed-loop control technology, such as constant pressure closed-loop control, constant tension closed-loop control and other occasions.

When PID is used as the frequency source, it is necessary to set the parameters related to PID function of PA group.

9：Communication given

The frequency is given by communication.

When a point-to-point communication slave is used and the received data is given as a frequency, the host uses the data transfer as the communication set point (see A8 group description)

Otherwise the host computer communication address 0 × 1000 given data, the data format is -100.00% to 100.00%, 100.00% refers to the relative maximum frequency P0-10 percentage.

DSI-200 support two kinds of host computer communication: Modbus, CAN link, these two kinds of communication cannot be used at the same time.

The CANlink protocol is always valid

P0-04	Auxiliary frequency source B command selection	Factory default	0
	Set range	0: digital setting (preset frequency P0-08, UP / DOWN can be modified, power is not memory) 1: digital setting (preset frequency P0-08, UP / DOWN can be modified, power-down memory) 2: AI1 (J6 jumper) 3: AI2 4: AI3 5: High-speed pulse setting (S5) 6: Multi-step command 7: PLC 8: PID 9: Communication reference	

The auxiliary frequency source is the same as the main frequency source A when it is used as a separate frequency reference channel (i.e., the frequency source is selected as A to B switch). Refer to the description of P0-03.

When the auxiliary frequency source is used as a cascade reference (i.e., the composite frequency reference for the main frequency source A and the auxiliary frequency source B), it is important to note:

1) When the auxiliary frequency source is digital, the preset frequency (P0-08) does not work, the user through the keyboard ▲, ▼ key (or multi-function input terminal UP, DOWN) frequency adjustment, directly in the main given the frequency on the basis of adjustment.

2) When the auxiliary frequency source is set for analog input (AI1, AI2, and AI3) or pulse input, enter 100% of the setting, corresponding to the auxiliary frequency source range, which can be set by P0-05 and P0-06.

3) The frequency source is a pulse input reference, similar to the analog reference.

Tip: Auxiliary frequency source B selection with the main frequency source A selection, cannot be set to the same channel, that is, P0-03 and P0-04 do not set the same value, otherwise easily lead to confusion.

0-05	Auxiliary frequency source B selection	Factory default	0
	Set range	0 ： Relative to the maximum frequency 1 ： Relative to the main frequency source A	
0-06	Auxiliary frequency source B command range	Factory default	100%
	Set range	0% ~ 150%	

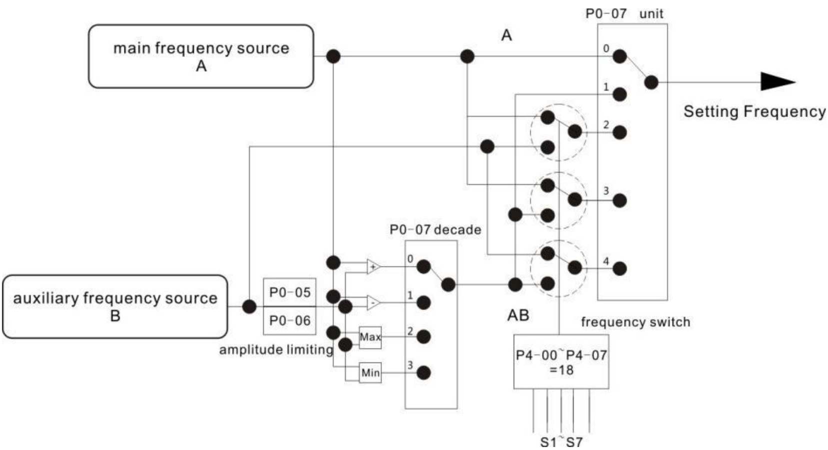
These parameters are used to determine the adjustment range of the auxiliary frequency source when the frequency source is selected as "frequency combination" (i.e., P0-07 = 1, 3 or 4).

P0-05 is used to determine the object corresponding to the auxiliary frequency source range, which can be selected relative to the maximum frequency or relative to the main frequency source A. If the range is selected relative to the main frequency source, the range of the auxiliary frequency source Frequency A changes

P0-07	Frequency source combination mode selection		Factory default	00
	Set range	Bit	Frequency source selection	

		0: Main frequency source A 1: Main and auxiliary operation result (calculation relationship is determined by ten bits) 2: Main frequency source A and auxiliary frequency source B switching 3: Main frequency source A and master and slave operation result switching 4: auxiliary frequency source B and master and slave operation result switching
		Bit: Frequency source main and auxiliary operation relationship
		0 ： main+auxiliary 1 ： main-auxiliary 2 ： max 3 ： min.

Use this parameter to select the frequency reference channel. The frequency reference is achieved by a combination of the main frequency source A and the auxiliary frequency source B （ Pic 6-2 ）



When the frequency source is selected as the main and auxiliary operation, the offset frequency can be set by P0-21, and the offset frequency is superimposed on the main and auxiliary operation results to flexibly cope with various requirements.

P0-08	Preset the set frequency	Factory default	50.00Hz
	Set range	0.00 ~ max frequency（ The frequency source selection mode is valid for the digital setting ）	

When the frequency source is selected as "digital setting", the function code value is the frequency of the inverter.

P0-09	Motor rotation direction	Factory default	0
	Set range	0 ：same direction 1 ：opposite direction	

By changing the function code, you can change the motor wiring without changing the motor to achieve the purpose of changing the motor, its role is equivalent to adjust the motor (U, V, W) any two lines to achieve the direction of rotation of the motor.

Note: After the parameter is initialized, the motor running direction will return to its original state. For the system after debugging is strictly prohibited to change the motor steering occasions with caution.

P0-10	Max output frequency	Factory default	50.00 Hz
	Set range	50.00Hz ~ 500.00Hz	

DSI-200 analog input, high-speed pulse input (S5), multi-segment instructions, as the frequency of the respective 100.0% are relative to the P0-10 calibration.

P0-11	Running frequency upper limit frequency selection	Factory default	0
	Set range	0：P0-12 settings 1：AI1 2：AI2 3：AI3 4:High speed pulse input（S5） 5：Communication settings	

Defines the source of the upper limit frequency. The upper limit frequency can be from the digital setting (P0-12), or from the analog input, the high speed pulse input setting or the communication reference.

When using the analog (AI1, AI2, AI3) setting, high-speed pulse input setting (S5) or communication setting, similar to the main frequency source, see P0-03 introduction.

For example, when the torque control mode is adopted in the winding control field, the upper limit frequency can be set by analog quantity in order to avoid the phenomenon of "speeding". When the inverter is running to the upper limit frequency value, the inverter will run at the upper limit frequency.

P0-13	Running frequency upper limit offset	Factory default	0.00Hz
	Set range	0.00Hz ~ max frequency P0-10	

When the upper limit frequency is set for analog or high speed pulse, P0-13 is used as the offset of the set value, and the offset frequency is superimposed on the upper limit frequency value of P0-11 setting as the final upper limit frequency setting value.

P0-14	Running frequency lower limit offset	Factory default	0.00Hz
	Set range	0.00Hz ~ upper frequency P0-12	

When the frequency command is lower than the lower limit of P0-14, the inverter can be stopped, run at the lower limit frequency or run at zero speed. What mode of operation can be used through P8-14 (setting frequency lower than lower frequency operation mode) setup.

P0-17	acceleration time 1	Factory default	Motor type confirmation
	Set range	0s ~ 65000s（P0-19=0）	

P0-18	Deceleration 1	Factory default	Motor type confirmation
	Set range	0s ~ 65000s（P0-19=0）	

The acceleration time refers to the time required for the frequency converter to change from zero frequency to acceleration / deceleration reference frequency (P0-25), see t1 in Figure 6-3. Deceleration time refers to the frequency converter from the acceleration and deceleration reference frequency (P0-25 determined), deceleration to zero frequency required time, see Figure 6-3

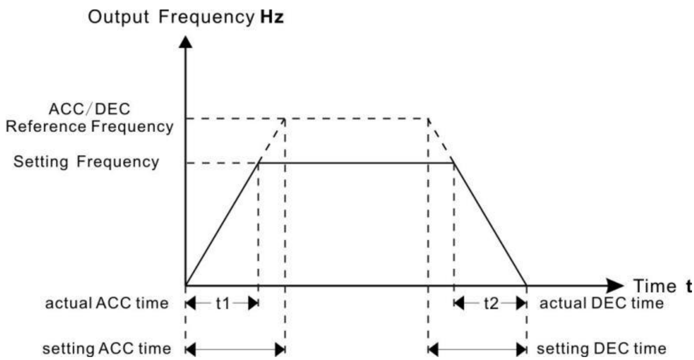


Figure6-3 acceleration/Deceleration time shows diagram

DSI-200 provides four groups of acceleration and deceleration time, the user can use the digital input terminal S switch selection, four sets of acceleration and deceleration time through the following function code settings:

Group one：P0-17、P0-18;

Group two：P8-03、P8-04;

Group three：P8-05、P8-06;

Group four：P8-07、P8-08;

P0-21	Combined frequency of auxiliary frequency source	Factory default	0.00Hz
	Set range	0.00Hz ~ max frequency P0-10	

This function code is valid only when the frequency source is selected as the master and slave operation.

When the frequency source is the main auxiliary operation, P0-21 is used as the bias frequency, and the result of the main and auxiliary operation is superimposed as the final frequency setting value, so that the frequency setting can be more flexible.

P0-22	Frequency command resolution	Factory default	2
	Set range	1：0.1Hz	2：0.01Hz

This parameter is used to determine the resolution of all frequency dependent function codes.

P0-23	Digital setting frequency stop memory selection	Factory default	1
	Set range	0：non-memory	1：memory

This function is valid only when the frequency source is digital.

"No memory" means that the digital setting frequency value is restored to the value of P0-08 (preset frequency) after the inverter is stopped, and the frequency correction of the keyboard ▲, ▼ key or terminal UP and DOWN is cleared.

"Memory" means that the digital setting frequency is set to the set frequency of the last stop time when the inverter is stopped, and the frequency correction of the keypad ▲, ▼ key or terminal UP and DOWN remains valid.

P0-25	Acceleration / deceleration time reference frequency	Factory default	0
	Set range	0：max frequency（P0-10） 1： set frequency 2：100Hz	

Acceleration/deceleration time, is from zero to P0-25 set the frequency between the acceleration and deceleration time, Figure6-3 for the acceleration and deceleration time diagram.

When P0-25 = 1, the acceleration / deceleration time is related to the set frequency. If the frequency is changed frequently, the acceleration of the motor is changed, and the application needs attention.

P0-26	Run time frequency command UP / DOWN reference	Factory fault	0
	Set range	0：operating frequency	1：set frequency

This parameter is valid only when the frequency source is digital.

Used to determine the keyboard ▲, ▼ key or terminal UP / DOWN action, the way to amend the set frequency, that is, the target frequency is based on the operating frequency increase or decrease, or in the set frequency based on the increase or decrease.

The difference between the two settings, the inverter is in the acceleration and deceleration process is obvious, that is, if the inverter running frequency and set the frequency is different, the different options vary widely.

P0-27	The run command is tied to the main frequency source A command selection		Factory fault	0000
	Set range	bit	Operation panel command Bind frequency source selection	

		0：No bundles 1：Numeric setting frequency source 2：AI1 3：AI2 4：AI3 5：High speed pulse input setting（S5） 6：Multi - step instructions 7：simple PLC 8：PID 9：Communication given	
		Ten	The terminal command binds the frequency source selection（0～9，the same as bit）
		hundred	Communication command binding frequency source selection（0～9，the same as bit）

Define the combination of three run command channels and nine frequency reference channels to facilitate synchronous switching.
The meaning of the above frequency reference channel is the same as the main frequency source A selection P0-03, see the P0-03 function code description.
Different run command channels can be bundled with the same frequency given channel.
When the command source has a bundled frequency source, the set frequency source of P0-03 ~ P0-07 is no longer active when the command source is valid.

P1 group First motor parameter

Function code	Function definition	Factory default	Set range	parameter
P1-00	Motor 1 type choose	0	0	Ordinary asynchronous motor
			1	Variable frequency induction motor
P1-01	Motor 1 rated power	Model determined	0.1kW ～ 1000.0kW	P1-00 ~ P1-05 is the motor nameplate parameter. In the use of V / F, SVC, control, in order to obtain better control performance, the need for motor parameters of self-learning, and the correct set of motor nameplate parameters Closely related.
P1-02	Motor 1 rated voltage	Model determined	1V ～ 2000V	
P1-03	Motor 1 rated current	Model determined	0.01A ～ 655.35A (AC motor frequency≤ 55kW)	
P1-04	Motor 1 rated frequency	Model determined	0.01Hz ～max frequency	
P1-05	Motor 1 rated rmp	Model determined	1rpm ～ 65535rpm	

P1-06	Asynchronous motor 1 stator power Resistance	Model determined	0.001Ω ~ 65.535Ω (AC motor frequency≤ 55kW)	P1-06 ~ P1-10 is the parameters of the induction motor, can be obtained through the motor self-learning. Among them, the asynchronous part of the asynchronous parameters of self-learning can only get P1-06 ~ P1-08 three parameters, asynchronous machine dynamic complete learning can get P1-06 ~ P1-10, you can also get the encoder phase sequence P1-30. If the scene is not on the motor self-learning, according to the motor manufacturers to provide the parameters, enter the corresponding function code.
P1-07	Asynchronous motor 1 rotor electric Resistance	Model determined	0.001Ω ~ 65.535Ω (AC motor frequency≤ 55kW)	
P1-08	Asynchronous motor 1 leakage inductance	Model determined	0.01mH ~ 655.35mH (AC motor frequency≤ 55kW)	
P1-09	Asynchronous motor 1 mutual inductance	Model determined	0.1mH ~ 6553.5mH (AC motor frequency≤ 55kW)	
P1-10	Asynchronous motor 1 No-load current	Model determined	0.01A ~ P1-03 (AC motor frequency≤ 55kW)	

P2 group Vector control parameters

P2 group function code is only valid for vector control, invalid for VF control.

P2-00	Speed loop proportional gain	Factory default	30
	Set range	1 ~ 100	
P2-01	Speed loop integration time 1	Factory default	0.50s
	Set range	0.01s ~ 10.00s	
P2-02	Switch the low frequency 1	Factory default	5.00Hz
	Set range	0.00 ~ P2-05	
P2-03	Speed loop proportional gain 2	Factory default	20
	Set range	0 ~ 100	
P2-04	Speed loop integration time 2	Factory default	1.00s
	Set range	0.01s ~ 10.00s	
P2-05	Switch high frequency 2	Factory default	10.00Hz
	Set range	P2-02 ~ max output frequency	

Inverter running at different frequencies, you can choose a different speed loop PI parameters. When the operating frequency is less than the switching frequency 1 (P2-02), the speed loop PI adjustment parameters are P2-00 and P2-01. When the operating frequency is greater than the switching frequency 2, the speed change PI adjustment parameters are P2-03 and P2-04. The speed loop PI parameter between the switching frequency 1 and the switching frequency 2 is a two-way PI parameter linear switching, as shown in Figure 6-4

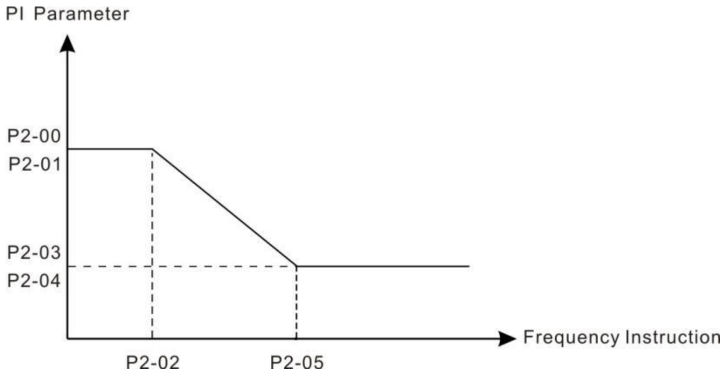


Figure 6-4 PI Parameter diagram

By setting the speed factor and the integration time of the speed regulator, you can adjust the velocity dynamic response characteristics of the vector control.

Increase the proportional gain, reduce the integration time, can speed up the dynamic response of the speed loop. But the proportional gain is too large or the integration time is too small may cause the system to oscillate. Suggested adjustment method is:

If the factory parameters can not meet the requirements, the parameters in the factory value on the basis of fine-tuning, first increase the proportional gain to ensure that the system does not oscillate; and then reduce the integration time, the system has a faster response characteristics, overshoot and smaller.

Note: If the PI parameter is set incorrectly, it may cause the speed overshoot to be too large. Even in the overshoot when the over voltage failure

P2-06	Vector control slip gain	Factory default	100%
	Set range	50% ~ 200%	

For speed sensorless vector control, this parameter is used to adjust the speed accuracy of the motor: when the motor is loaded with low speed, the parameter is increased.

For speed sensor vector control, this parameter can adjust the size of the output current of the inverter under the same load.

P2-07	SVC speed feedback filter time constant	Factory default	0.015s
	Set range	0.000s ~ 0.100s	

SVC over-feedback filter time only when P0-01=0 into effect, increase P2-07 can improve the motor stability, but the dynamic effect becomes weak, otherwise the corresponding dynamic enhancement, but too small will cause the motor shock, so no adjustment.

Speed loop filter time constant is small, the inverter output torque may fluctuate significantly, but the speed of response fast.

P2-09	Torque upper limit source in speed control	Factory default	0
	Set range	0：P2-10 1：AI1 2：AI2 3：AI3 4：High speed pulse input setting（S5） 5：Communication settings 6：MIN(AI1，AI2) 7：MAX(AI1，AI2)	
P2-10	Speed setting mode of torque upper limit digital setting	Factory default	150.0%
	Set range	0.0% ~ 200.0%	
P2-11	Speed control mode Torque upper limit command channel selection (power generation)	Factory default	0
	Set range	0：P2-10 1：AI1 2：AI2 3：AI3 4: High speed pulse input setting(S5) 5：Communication settings 6：MIN(AI1，AI2) 7：MAX(AI1，AI2) 8：Function code P2-12 setting	
P2-12	Speed control mode Torque upper limit Digital setting (power generation)	Factory default	150.0%
	Set range	0.0% ~ 200.0%	

In the speed control mode, the maximum value of the inverter output torque is controlled by the torque upper limit source.

P2-09 is used to select the set value of the upper limit of the torque, when the analog, high-speed pulse, communication settings corresponding to the set.

100% corresponds to P2-10, and P2-10 100% of the inverter rated current.

AI1, AI2, AI3 settings see P4 group AI curve related introduction (by P4-33 select the respective curve)

High speed pulse see P4-28 ~ P4-32 introduction

Select the communication settings, if the current point-to-point communication from the machine and receive data as a torque given, the direct transmission by the host torque digital settings, see A8 group point-to-point communication description; otherwise, by the host computer through the communication address 0 × 1000 write -100.00% to 100.00% of the data, of which 100.00% corresponds to P2-10.

P2-13	Excitation adjustment proportional gain	Factory default	2000
	Set range	0 ~ 60000	
P2-14	Excitation adjustment integral gain	Factory default	1300

	Set range	0 ~ 60000	
P2-15	Torque adjustment proportional gain	Factory default	2000
	Set range	0 ~ 60000	
P2-16	Torque adjustment integral gain	Factory default	1300
	Set range	0 ~ 60000	

Vector control current loop PI adjustment parameters, the parameters in the asynchronous machine after the self-learning will automatically get, generally do not need to modify.

Need to be reminded that the current loop integral regulator, not the use of integral time as a dimension, but directly set the integral gain. The current loop PI gain setting is too large, which may cause the entire control loop to oscillate. Therefore, when the current oscillation or torque fluctuation is large, the PI proportional gain or integral gain can be reduced manually.

P2-22	Power generation limit is	Set range	0
	Set range	0：no effect 1：effect	
P2-23	Power generation limit	Factory default	Motor ensure
	Set range	0.0~200.0%	

For the cam load, rapid acceleration and deceleration, load sudden drop and other applications, and not using the braking resistor, you can enable the power generation limit (set P2-22 = 1), effectively reduce the motor brake process bus voltage Red, to avoid the occurrence of over-voltage failure. The upper limit of the power generation P2-23 is the percentage of the rated power of the motor and still occurs when the power limit is enabled. When over voltage, adjust P2-23 downwards.

P3 group V/F Control parameters

This function code is valid only for V / F control and is not valid for vector control.

V / F control suitable for fans, pumps and other general load, or a frequency converter with multiple motors, or inverter power and motor power difference between the larger applications.

P3-00	V/F Curve setting	Factory default	0
	Set range	0：line V/F 1：Multipoint V/F 2：square V/F 3：1.2 times V/F 4：1.4 times V/F 6：1.6 times V/F 8：1.8 times V/F 9：Reserved 10：VF Completely separate mode 11：VF Semi-separation mode	

- 0: Straight line V / F. Suitable for ordinary constant torque load.
- 1: multi point V / F. Suitable for dehydration machines, centrifuges and other special load. At this time by setting P3-03 ~ P3-08 parameters, you can get any VF relationship curve.
- 2: square V / F. Suitable for fans, pumps and other centrifugal load.
- 3 ~ 8: between the linear VF and square VF VF relationship between the curve.

- 10: VF complete separation mode. At this time the output frequency of the inverter and the output voltage are independent of each other, the output frequency is determined by the frequency source, and the output voltage is determined by P3-13 (VF separation voltage source).
- VL complete separation mode, the general application of induction heating, inverter power supply, torque motor control and other occasions.
- 11：VF Semi-separation mode.

In this case V and F are proportional, but the proportional relationship can be set by the voltage source P3-13, and the relationship between V and F is also related to the rated voltage of the motor of P1 group and the rated frequency.

Assuming that the voltage source input is X (X is a value of 0 to 100%), the relationship between the inverter output voltage V and the frequency F is:

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

P3-01	Torque boost	Factory default	Motor ensure
	Set range	0.1% ~ 30%	
P3-02	Torque boost cutoff frequency	Factory default	50.00Hz
	Set range	0.00Hz ~ max output frequency	

In order to compensate for the V / F control low frequency torque characteristics, the low frequency inverter output voltage to do some lifting compensation. But the torque boost setting is too large, the motor is easy to overheat, the inverter is easy to overcurrent.

It is recommended to increase this parameter when the load is heavy and the motor starting torque is not enough. The torque boost can be reduced when the load is light.

When the torque boost is set to 0.0, the inverter will be automatically boosted, and the inverter will automatically calculate the required torque boost according to the parameters such as motor stator resistance.

Torque boost torque cutoff frequency: Under this frequency, the torque boost torque is valid, beyond this set frequency, torque boost failure, as shown in Figure 6-5.

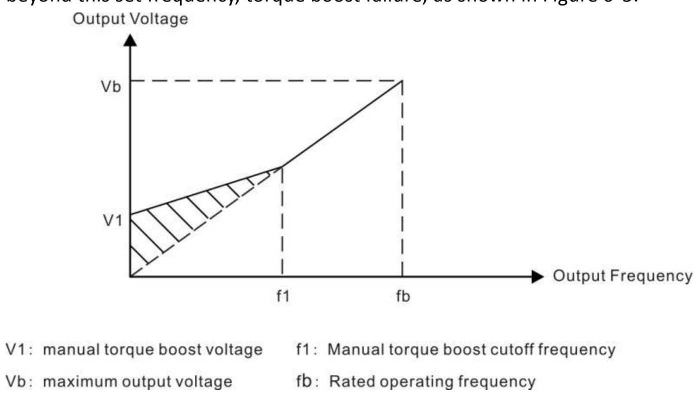


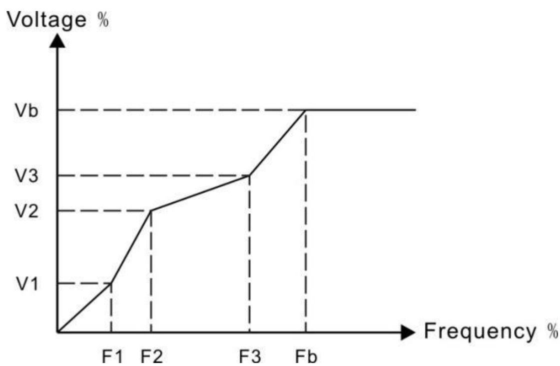
Figure 6-5 Manual torque boost diagram

P3-03	Multipoint VF frequency point P1	Factory default	0.00Hz
	Set range	0.00Hz ~ P3-05	
P3-04	Multi point VF voltage point V1	Factory default	0.0%
	Set range	0.0% ~ 100.0%	
P3-05	Multi point VF frequency point P2	Factory default	0.00Hz
	Set range	P3-03 ~ P3-07	
P3-06	Multi point VF voltage point V2	Factory default	0.0%
	Set range	0.0% ~ 100.0%	
P3-07	Multi point VF frequency point F3	Factory default	0.00Hz
	Set range	P3-05 ~ motor rated frequency （P1-04） Notes：No.2 motor rated frequency A2-04	
P3-08	Multi point VF voltage point V3	Factory default	0.0%
	Set range	0.0% ~ 100.0%	

P3-03 ~ P3-08 six parameters define multi-segment V / F curve.

Multi-point V / F curve according to the motor load characteristics to set, it should be noted that the relationship between the three voltage points and frequency points must meet: V1 <V2 <V3, F1 <F2 <F3. Figure 6-6 for the multi-point VF curve set diagram.

Low voltage setting at high frequencies may cause the motor to overheat or burn, and the frequency converter may over-current stall or over current protection.



V1-V3：Multi-speed V / F Section 1-3 Voltage percentage

Vb：motor rated voltage

F1-F3：Multi-step speed V / F Division 1-3 Frequency percentage

Fb：Rated motor operating frequency

Figure 6-6 multi point V/F Curve setting diagram

P3-10	VF Over-excitation gain	Factory default	64
	Set range	0 ~ 200	

In the inverter deceleration process, the over-excitation control can inhibit the bus voltage rise, to avoid over-voltage failure. The greater the over-excitation gain, the stronger the suppression effect.

It is necessary to increase the over discharge gain when the inverter decelerates the over voltage alarm. But the over-excitation gain is too large, easily lead to increased output current, the need to trade in the trade-off.

In the case of a small increase in inertia, there is no voltage rise in the motor deceleration, it is recommended to set the over-excitation gain of 0; for the case of a braking resistor, it is also recommended that the over-excitation gain be set to zero.

P3-11	VFO scillation suppression gain	Factory default	40
	Set range	0 ~ 100	

The gain of the selection method is to effectively suppress the oscillation under the premise of taking as small as possible, so as not to adversely affect the VF operation. Select this gain to 0 when there is no oscillation of the motor. Only when the motor is significantly oscillating, only need to increase the gain, the greater the gain, the more obvious inhibition of oscillation.

When using the suppression oscillation function, the motor rated current and no-load current parameters are required to be accurate, otherwise the VF oscillation suppression effect is not good.

P3-13	VF Separate voltage source	Factory default	0
	Set range	0：number setting（P3-14） 1：AI1 2：AI2 3：AI3 4：High speed pulse input setting（S5） 5：Multi - step instructions 6：Simple PLC 7：PID 8：Communication given 100.0% Corresponds to the motor rated voltage（P1-02、A2-02）	
P3-14	VF Separate voltage digital setting	Factory default	0V
	Set range	0V ~ motor rated voltage	

Separation is generally used in induction heating, inverter power supply and torque motor control and other occasions.

When selecting VF separation control, the output voltage can be set via function code P3-14, or from analog, multi-step instructions, PLC, PID or communication reference. When the non-digital setting is used, each set of 100% corresponds to the rated voltage of the motor. When the percentage of analog output is negative, the set absolute value is used as the effective setting value.

➢ 0：number setting （P3-14）

The voltage is set directly from P3-14

➢ 1：AI1 2：AI2 3：AI3

➢ The voltage is determined by the analog input terminal.

➢ 4、High speed pulse setting（S5）

The voltage reference is given by the terminal pulse.

Pulse given signal specifications: voltage range 9V ~ 30V, the frequency range 0 kHz ~ 100 kHz.

➢ 5、Multi - step instructions

When the voltage source is a multi-segment instruction, set the P4 group and PC group parameters to determine the correspondence between the given signal and the given voltage.

➢ 6、Simple PLC

When the voltage source is a simple PLC, you need to set the PC group parameters to determine the given output voltage

➢ 7、PID

➢ Output voltage according to PID closed loop. For details, refer to the PA group PID introduction.

➢ 8、Communication given

The voltage is given by the host computer by means of communication.

The VF separation voltage source selection is similar to the frequency source selection mode, see the description of the P0-03 main frequency source selection. Among them, all kinds of selection corresponding to the set of 100.0%, refers to the voltage rated voltage (take the corresponding set value should be absolute value)

P3-15	VF voltage acceleration time	Factory default	0.0s
	Set range	0.0s ~ 1000.0s	

VF separation rise time refers to the output voltage from 0V to the motor rated voltage required time. As shown in Figure 6-7:

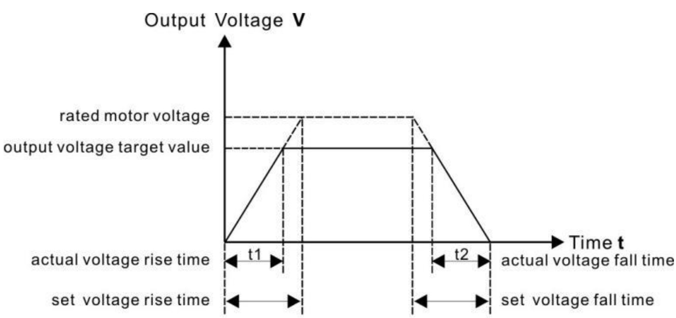


Figure 6-7 V/F Separation diagram

P4 Group Input Terminal

DSI-200 series inverter comes standard with seven multi-function digital input terminals (where S5 can be used as high-speed pulse input terminal), three analog input terminals, two relay outputs, one optocoupler collector output.

Function code	Name	Factory default	Notes
P4-00	S1 Terminal function selection	1（Forward run）	Standard
P4-01	S2 Terminal function selection	4（Moving forward）	Standard
P4-02	S3 Terminal function selection	9（Fault reset）	Standard
P4-03	S4 Terminal function selection	12（Multi-speed 1）	Standard
P4-04	S5 Terminal function selection	13	Standard

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

Set value	Function	Description
0	Non-function	The unused terminal can be set to "no function" to prevent malfunction.
1	Forward running （FWD）	Through the external terminal to control the inverter forward and reverse.
2	Reverse run （REV）	
3	Three-wire operation control	Through this terminal to determine the inverter running mode is three-wire control mode. For details, please refer to Function code P4-11 ("terminal command mode").
4	Moving forward （FJOG）	FJOG for the jog forward run, RJOG for the jog reverse run. Jogging frequency, Refer to the function codes P8-00, P8-01, and P8-02 for the acceleration / deceleration time.
5	Reversal point （RJOG）	
6	Terminal UP	When the frequency is given by the external terminal, the frequency is increased and decremented. The frequency source is set to When the digit is set, adjust the set frequency up and down.
7	Terminal DOWN	

Set value	Function	Description
8	Freely stop	The inverter blocks the output, and the motor stop process is not controlled by the inverter, This way with. The meaning of free parking as described in P6-10 is the same.
9	Fault reset （RESET）	Use the terminal to perform a fault reset function. With the same function as the RESET key on the keyboard. Use this function to enable remote fault reset.
10	Working stop	The drive decelerates, but all operating parameters are memorized. Such as PLC parameters, wobble parameters, PID parameters. When the terminal signal disappears, the inverter returns to the running state before stopping.
11	External fault normally open input	When the signal is sent to the inverter, the inverter reports fault FU15, and according to the fault protection action side (Refer to function code P9-47 for details).
12	Multi-speed	Through the four terminals of the 16 states, to achieve 16 speed or 16 other instructions The setting. See Table 1 for details.
13	Multi-speed terminal 2	
14	Multi-speed	
15	Multi-speed	
16	Acceleration/ deceleration time selection terminal 1	Through the four terminals of the four states, to achieve four kinds of acceleration and deceleration time selection, the details See Schedule 2
17	Acceleration/ deceleration time selection terminal 2	
18	Frequency source switching	Used to switch between different frequency sources. Depending on the frequency source selection function code (P0-07) is set when setting between two frequency sources
19	UP/DOWN set 0 （terminal、 keyboard）	When the frequency is given as a digital frequency reference, this terminal can clear the terminal UP / DOWN or Keyboard UP / DOWN changes the frequency value, so that the given frequency to restore the value set to P0-08.

Set value	Function	Description
20	Run command to switch the terminal 1	When the run command is set to terminal control (P0-02 = 1), this terminal can be terminal controlled with Keyboard control switch.
21	Acceleration/ deceleration is prohibited	Ensure that the frequency converter is not affected by external signals (except for the stop command), to maintain the current output frequency.
22	PID stop	PID Temporary failure, the inverter to maintain the current output frequency, no longer the frequency of the source PID adjustment.
23	PLC statue reset	When the PLC is paused during execution, the inverter can be restored to this time through this terminal Simple PLC initial state.
24	Pendulum pause	The frequency converter outputs at the center frequency. The wobble function is paused.
25	Register input	The input terminal of the count pulse.
26	Register reset	The counter status is cleared.
27	Length count input	Length count input terminal.
28	Length reset	The length is cleared
29	Torque control disabled	Prohibit the inverter torque control, the inverter into the speed control mode
30	High speed pulse input setting（Only valid for S5）	S5 as a high-speed pulse input terminal function.
31	keep	keep
32	Immediate DC braking	When the terminal is valid, the inverter will switch directly to the DC braking state
33	External fault normally closed input	When the external fault normally closed signal into the inverter, the inverter reported failure EF and shutdown.
34	Frequency modification enabled	If the function is set to active, the frequency converter does not respond to the frequency change when the frequency changes, until the terminal status is invalid.
35	PID the direction of action is reversed	When the terminal is active, the direction of PID action is opposite to that set by PA-03
36	External parking terminal 1	When the keyboard is in control, the inverter can be used to stop the inverter, which is equivalent to the STOP key on the keyboard.

Set value	Function	Description
37	Run command to switch the terminal 2	Used for switching between terminal control and communication control. If the command source is selected for terminal control, The system is switched to communication control when the terminal is valid;
38	PID Points are suspended	When the terminal is active, the integral adjustment function of the PID is halted, but the PID proportional and differential adjustment functions are still active.
39	Frequency source A and preset preset frequency switching	When the terminal is active, the frequency source A is replaced with the preset frequency (P0-08)
40	Frequency source B and preset frequency switching	When the terminal is active, the frequency source B is replaced with the preset frequency (P0-08)
41	Motor selection terminal 1	The terminal is valid, then switch to the second motor, A2 group motor parameters are valid;
42	keep	keep
43	PID Parameter switch	PA-15 ~ PA-07 is used when the PID parameter is used when the PID parameter is the S terminal (PA-18 = 1) and the terminal is invalid.
44	User defined fault 1	When user fault 1 and 2 are valid, the inverter will alarm FU1 and FU2 respectively. The inverter will select the action mode selected by P9-49 according to the fault protection action.
45	User defined fault 2	
46	Speed control / torque control switching	The frequency converter is switched between torque control and speed control mode. When the terminal is inactive, the inverter operates in the mode defined by A0-00 (speed / torque control
47	Brake	When the terminal is active, the inverter stops at the fastest speed, and the current is at the set current limit during the stop. This function is used to meet the requirements of the inverter as soon as possible when the system is in a state of emergency.
48	External parking terminal 2	In any control mode (panel control, terminal control, communication control), the terminal So that the inverter deceleration stop, then deceleration time is fixed to deceleration time 4.
49	Deceleration of DC braking	When the terminal is active, the inverter first decelerates to the stop DC brake start frequency, and then switches to DC braking state.

Set value	Function	Description
50	This run time is cleared	When the terminal is valid, the time of the inverter running this time is cleared, this function needs to be set (P8-42) and the run time to reach (P8-53) with the use.
51	Two-wire/ three-wire switch	Used to switch between two-wire and three-wire controls. If P4-11 is set to 0 (two-wire type 1), the function of the terminal is valid, switch to three-wire 1. If P4-11 is set to 1 (two-wire type 2), the function of the terminal is valid, switch to three-wire 2. If P4-11 is set to 2 (three-wire type 1), the function of the terminal is valid, switch to two-wire 1. If P4-11 is set to 3 (three-wire type 2), the function of the terminal is valid, switch to two-wire 2.
52	Reverse frequency is disabled	When the terminal is active, the inverter actually set the frequency to 0 even if the reverse frequency is set. And the reverse frequency disabled (P8-13) function the same.

Schedule 1 Multi-segment Instruction Function Description

4 multi-stage instruction terminals can be combined into 16 states, 16 of which correspond to 16 command settings. As shown in Table 1:

K_4	K_3	K_2	K_1	Instruction set	Corresponding parameters
OFF	OFF	OFF	OFF	Multi - step instructions 0	PC-00
OFF	OFF	OFF	ON	Multi - step instructions 1	PC-01
OFF	OFF	ON	OFF	Multi - step instructions 2	PC-02
OFF	OFF	ON	ON	Multi - step instructions 3	PC-03
OFF	ON	OFF	OFF	Multi - step instructions 4	PC-04
OFF	ON	OFF	ON	Multi - step instructions 5	PC-05
OFF	ON	ON	OFF	Multi - step instructions 6	PC-06
OFF	ON	ON	ON	Multi - step instructions 7	PC-07
ON	OFF	OFF	OFF	Multi - step instructions 8	PC-08
ON	OFF	OFF	ON	Multi - step instructions 9	PC-09
ON	OFF	ON	OFF	Multi - step instructions 10	PC-10
ON	OFF	ON	ON	Multi - step instructions 11	PC-11
ON	ON	OFF	OFF	Multi - step instructions 12	PC-12
ON	ON	OFF	ON	Multi - step instructions 13	PC-13
ON	ON	ON	OFF	Multi - step instructions 14	PC-14
ON	ON	ON	ON	Multi - step instructions 15	PC-15

When the frequency source is selected as multi-step speed, the function code PC-00 ~ PC-15 100.0%, corresponding to the maximum frequency P0-10.

Multi-segment instructions, in addition to the multi-speed function, can also be used as a given source for PID or as a voltage source for VF separation control to meet the need to switch between different set points.

Schedule 2 Acceleration / deceleration time selection terminal function description

Terminal 2	Terminal 1	Acceleration or deceleration time selection	Corresponding parameters
OFF	OFF	acceleration time 1	P0-17、P0-18
OFF	ON	acceleration time 2	P8-03、P8-04
ON	OFF	acceleration time 3	P8-05、P8-06
ON	ON	acceleration time 4	P8-07、P8-08

P4-10	S1~S7 Filter time	Factory default	0.010s
	Set range	0.000s ~ 1.000s	

Set the software filter time for S1 to S7 terminal status. If the use of occasions, input terminals susceptible to interference caused by malfunction, this parameter can be increased to enhance the anti-jamming capability. But the increase in the filter time will cause the S-terminal response to slow.

P4-11	The terminal controls the operating mode	Factory default	0
	Set range	0：two wires 1 1：two wires 2 2：three wires 1 3：three wires 2	

This parameter defines four different ways of controlling the drive to run through an external terminal.

Note: For convenience of explanation, the S1, S2, and S2 terminals of the multi-function input terminals S1 to S10 are selected as external terminals. That is, by setting the value of P4-00 ~ P4-02 to select the functions of S1, S2 and S2 three terminals. For details, please refer to the setting range of P4-00 ~ P4-09.

0: Two-wire mode 1: This mode is the most commonly used two-wire mode. By the terminal S1, S2 to determine the positive and reverse operation of the motor. The function is set as follows:

Function	Name	Set range	Function description
P4-11	Terminal request	0	Two wire 1
P4-00	S1 Terminal function selection	1	Forward run （FWD）
P4-01	S2 Terminal function selection	2	Reverse run（REV）

K1	K2	Running Command
1	0	forward running
0	1	reserve running
1	1	stop
0	0	stop

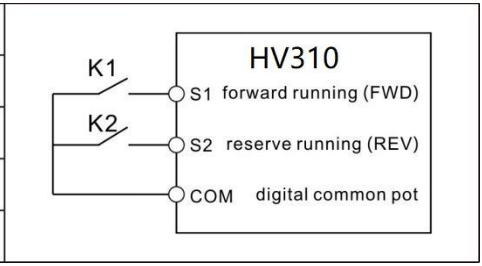


Figure 6-8 Two-line mode 1

As shown in the figure above, in this control mode, K1 is closed and the inverter is running forward. K2 closed reverse, K2, K1 closed or disconnected at the same time, the inverter stops running.

3: Three-wire control mode 2: When this mode is used, S3 is enable terminal, the S1 terminal function is the operation enable terminal, and the S2 terminal function determines the running direction. The function is set as follows

Function	Name	Set number	Function description
P4-11	Terminal command mode	3	Three wires 2
P4-00	S1 Terminal function selection	1	Run enable
P4-01	S2 Terminal function selection	2	Positive and negative direction of operation

K1	K2	Running
1	0	forward
1	1	reserve
0	0	Stop
0	1	stop

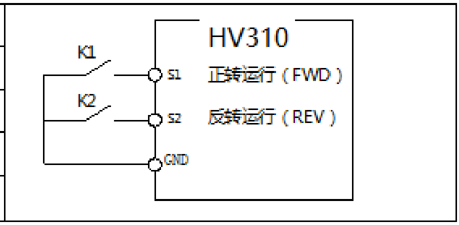


Figure 6-9 three wires model 2

As shown in the figure above, the control mode in K1 closed state, K2 disconnect the inverter forward. K2 closed inverter reverse; K1 off, the inverter stops running.

2: three-wire control mode 1: This mode S3 to enable the terminal, the direction of the control by the S1, S2

Function setting as follow shows：

Function	Name	Set value	Function description
P4-11	Terminal order way	2	Three wires 1
P4-00	S1 terminal function choose	1	Forward running （FWD)
P4-01	S2 terminal function choose	2	Reverse running（REV）

P4-02	S3 terminal function choose	3	Three points running control

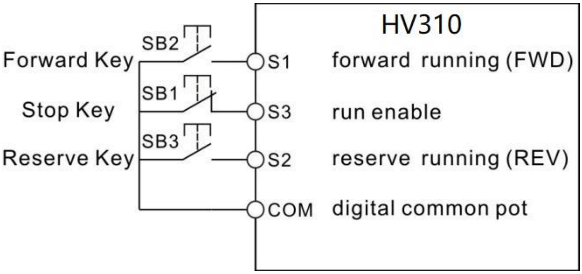


Figure 6-10 Three wire operation control 1

As shown in the above figure, the control mode is in the SB1 button closed state, press the SB2 button inverter forward, press the SB3 button inverter reverse, SB1 button off instantaneous inverter shutdown. Normal start and run, must keep the SB1 button closed state, SB2, SB3 button command in the closing action along the entry into force, the inverter running state to the three buttons the last button action prevail.

3: three-wire control mode 2: S3 of this mode to enable the terminal, run the command given by the S1, the direction determined by the state of S2.

Function setting as follow：

Function	Name	Set value	Function description
P4-11	Terminal function choose	3	THREE PHASE 2
P4-00	S1 Terminal function choose	1	RUNNING
P4-01	S2 Terminal function choose	2	Forward and reverse direction of operation.
P4-02	S3 Terminal function choose	3	Three - wire operation control

K	Running Direction
0	forward running
1	reserve running

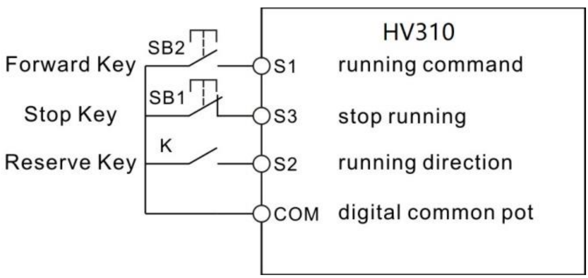


Figure 6-11 Three - wire control mode 2

As shown in the figure above, the control mode is in the SB1 button closed state, press the SB2 button inverter running, K disconnect the inverter forward, K closed inverter reverse; SB1 button off instantaneous inverter shutdown. During normal startup and operation, the SB1 button must be closed and the command of the SB2 button will take effect at the closing action edge.

For setting the terminal UP / DOWN to adjust the set frequency, the speed of the frequency change, that is, the amount of change per second.

P4-12	Terminal UP/DOWN Frequency change rate		Factory default	1.00Hz/s
	Set range	0.01Hz/s ~ 65.535Hz/s		

P4-13	AI curve 1 min input		Factory default	0.00V
	Set range	0.00V ~ P4-15		
P4-14	AI Curve 1 minimum input corresponds to setting		Factory default	0.0%
	Set range	-100.00% ~ 100.0%		
P4-15	AI Curve 1 maximum input		Factory default	10.00V
	Set range	P4-13 ~ 10.00V		
P4-16	AI Curve 1 maximum input corresponds to setting		Factory default	100.0%
	Set range	-100.00% ~ 100.0%		
P4-17	AI1 Input filter time		Factory default	0.10s
	Set range	0.00s ~ 10.00s		

The function code is used to set the relationship between the analog input voltage and the set value it represents.

When the analog input voltage is greater than the set "maximum input" (P4-15), the analog voltage is calculated according to the "maximum input"; Similarly, when the analog input voltage is less than the set "minimum input" P4-13), the minimum input or 0.0% is calculated according to the setting of "AI lower than minimum input setting" (P4-34).

When the analog input is current input, 1mA current is equivalent to 0.25V voltage.

AI1 input filter time, used to set the AI1 software filter time, when the field analog is easy to be disturbed, please increase the filter time, so that the test simulation tends to be stable, but the larger the filter time on the analog test The response speed is slow, how to set the need to be based on the actual application of trade-offs.

In different applications, the meaning of the corresponding nominal value of 100.0% of the analog setting is different. Please refer to the description of each application section.

The following illustrations are two typical settings:

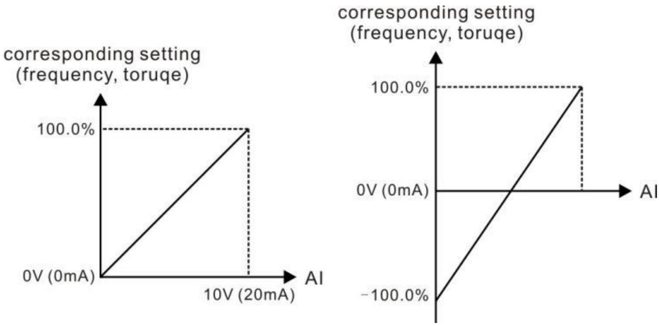


Figure 6-12 Correspondence between simulation reference and set

P4-18	AI Curve 2 minimum input		Factory default	0.00V
	Set range	0.00V ~ P4-20		
P4-19	AI Curve 2 minimum input corresponds to setting		Factory default	0.0%
	Set range	-100.00% ~ 100.0%		
P4-20	AI Curve 2 maximum input		Factory default	10.00V
	Set range	P4-18 ~ 10.00V		
P4-21	AI Curve 2 max input corresponds to setting		Factory default	100.0%
	Set range	-100.00% ~ 100.0%		
P4-22	AI2 Input filter time		Factory default	0.10s
	Set range	0.00s ~ 10.00s		

For the function and use of curve 2, please refer to the description of curve 1.

P4-23	AI Curve 3 minimum input		Factory default	0.00V
	Set range	0.00s ~ P4-25		
P4-24	AI Curve 3 minimum input corresponds to setting		Factory default	0.0%
	Set range	-100.00% ~ 100.0%		
P4-25	AI Curve 3 maximum input		Factory default	4.00V
	Set range	P4-23 ~ 10.00V		
P4-26	AI Curve 3 maximum input corresponds to setting		Factory default	100.0%
	Set range	-100.00% ~ 100.0%		
P4-27	AI3 Input filter time		Factory default	0.10s
	Set range	0.00s ~ 10.00s		

For the function and use of curve 3, please refer to the description of curve 1.

P4-28	High speed pulse minimum input		Factory default	0.00kHz
	Set range	0.00kHz～P4-30		
P4-29	High-speed pulse minimum input corresponding setting		Factory default	0.0%
	Set range	-100.00%～100.0%		
P4-30	High speed pulse maximum input		Factory default	50.00kHz
	Set range	P4-28～50.00kHz		
P4-31	High-speed pulse maximum input corresponding setting		Factory default	100.0%
	Set range	-100.00%～100.0%		
P4-32	Pulse input filter time		Factory default	0.10s
	Set range	0.00s～10.00s		

This set of function codes is used to set the relationship between the S5 pulse frequency and the corresponding setting.

The pulse frequency can only be input to the inverter via the S5 channel.

The application of this group of functions is similar to curve 1, please refer to the description of curve 1.

P4-33	AI curve		Factory default	321
	Set range	Bit	AI1 curve choose	
			1：curve 1（2 point，see P4-13～P4-16） 2：curve 2（2 point，see P4-18～P4-21） 3：curve 3（2 point，see P4-23～P4-26） 4：curve 4（4 point，see A6-00～A6-07） 5：curve 5（4 point，see A6-08～A6-15）	
		Ten	AI2 curve choose（1～5，same as above）	
		Hundred	AI3 curve choose（1～5，same as above）	

The function code of the bit, ten, hundreds of bits were used to select, analog input AI1, AI2, AI3 corresponding to the set curve. 3 Each of the five types of curves can be selected for each analog input.

Curve 1, curve 2, curve 3 are 2-point curve, set in the P4 group function code, and curve 4 and curve 5 are 4-point curve, need to set in the A6 group function code.

P4-34	AI Below minimum input setting selection		Factory value	000
	Set range	Bit	AI1 Below minimum input setting selection	
		0 ： Corresponds to the minimum input setting 1 ： 0.0%		
		Ten	AI2 Below minimum input setting selection（ 0 ~ 1 ， same as	
		hundred	AI3 Below minimum input setting selection（ 0 ~ 1 ， same as	

The function code is used to set the setting of the analog quantity when the analog input voltage is less than the set "minimum input".

The function code of the bit, ten, hundred, respectively, corresponding to the analog input AI1, AI2, AI3.

If the option is 0, when the AI input is lower than the "minimum input", the corresponding setting of the analog quantity is the curve "minimum input corresponding setting" (P4-14, P4-19, P4-twenty four).

If 1 is selected, the analog value is set to 0.0% when the AI input is below the minimum input.

P4-35	S1 delay time	Factory default	0.0s
	Set range	0.0s ~ 3600.0s	
P4-36	S2 delay time	Factory default	0.0s
	Set range	0.0s ~ 3600.0s	
P4-37	S3 delay time	Factory default	0.0s
	Set range	0.0s ~ 3600.0s	

Used to set the delay time for the inverter to change when the S-terminal status changes.

Currently only S1, S2, S3 with the delay time to set the function.

P4-38	S1~S5 Terminal valid mode selection 1		Factory value	00000
	Set range	Bit	S1 Terminal valid status setting	
		0 ： Active high 1 ： active low		
		Ten	S2 Terminal valid status setting（ 0 ~ 1 ， see above ）	
		Hundred	S3 Terminal valid status setting（ 0 ~ 1 ， see above ）	
		Thousand	S4 Terminal valid status setting（ 0 ~ 1 ， see above ）	
		Million	S5 Terminal valid status setting（ 0 ~ 1 ， see above ）	

Used to set the active status mode of the digital input terminal.
When the selection is active high, the corresponding S terminal is valid when connected to the GND, and the switch is invalid.
When the selection is active low, the corresponding S terminal is inactive with GND and is disabled.

P5 Group Output terminal

DSI-200 series inverter comes standard with two multi-function analog output terminals, one multi-function digital output terminal, two multi-function relay output terminals, one HDO terminal (can be selected as high-speed pulse output terminal, Open-circuit switch output)

P5-00	HY1 Terminal output mode selection		Factory default	1
	Set range	0 ： Pulse output （ HDP ） 1 ：Switch output （ HDY ）		

The HDO terminal is a programmable multiplex terminal that can be used as a high-speed pulse output terminal or as a switch output terminal with open collector.

When the pulse is output, the maximum frequency of the output pulse is 100 kHz. Refer to P5-06 for the related function.

P5-01	HDY Output function selection （ Open collector output terminal ）	Factory default	0
P5-02	relay1 Output function selection （ RO1A-RO1B-RO1C ）	Factory default	2

The function of the multi-function output terminal is described below ：

Set value	Function	description
0	Non-output	The output terminal has no function
1	The inverter is running	Indicates that the inverter is running and has an output frequency (which may be zero). At this time, the ON signal is output.
2	Error output(error stop ）	When the inverter fails and the fault is stopped, the ON signal is output.
3	Frequency level detection FDT1 output	Please refer to the description of function codes P8-19 and P8-20.
4	Frequency reached	Please refer to the description of function codes P8-19 and P8-20.
5	Zero speed operation (non output when stop work ）	When the inverter is running and the output frequency is 0, the ON signal is output. This signal is OFF when the drive is in the stop state.
6	Motor overload warning	Before the motor overload protection operation is performed, it is judged based on the threshold value of the overload pre-alarm, and the ON signal is output after the pre-alarm threshold is exceeded. Refer to function code P9-00 ~ P9-02 for motor overload parameter setting.
7	AC drive overload warning	10 seconds before the inverter overload protection occurs, the ON signal is output。
8	Set number reached	When the count value reaches the value set by PB-08, the ON signal is output.
9	Specifies that the count value arrives	When the count value reaches the value set by PB-09, the ON signal is output. The counting function refers to the PB group function description
10	Length reached	When the actual length of the detection exceeds the length set by PB-05, the ON signal is output.
11	PLC cycle finished	When the simple PLC run to complete a cycle, the output of a width of 250ms pulse signal.
12	The cumulative run time arrives	When the accumulated running time of the inverter exceeds the set time of P8-17, the ON signal is output.

Set value	Function	description
13	Frequency limit	When the set frequency exceeds the upper limit frequency or lower limit frequency, and the inverter output frequency also reached the upper limit frequency or lower limit frequency, the output ON signal.
14	Torque limit	In the speed control mode, when the output torque reaches the torque limit value, the inverter is in the stall protection state and outputs the ON signal at the same time.
15	Ready to run	When the inverter main circuit and the control circuit power supply has been stable, and the inverter does not detect any fault information, the inverter is in the running state, the output ON signal.
16	AI1>AI2	When the analog input AI1 value is greater than the AI2 input value, the output ON signal.
17	Upper limit frequency arrival	When the operating frequency reaches the upper limit frequency, the ON signal is output.
18	Lower frequency arrival (Not output when stopped)	When the operating frequency reaches the lower limit frequency, the ON signal is output. In shutdown mode, the signal is OFF.
19	Under voltage status output	When the inverter is in the undervoltage condition, the ON signal is output.
20	Communication settings	Please refer to the communication protocol.
21	Keep	keep
22	keep	keep
23	Zero speed running 2 (Also output when stopped)	When the inverter output frequency is 0, the ON signal is output. The signal is also on in the shutdown state
24	The accumulated power-up time arrives	When the accumulated time (P7-13) of the inverter exceeds the set time of P8-16, the ON signal is output.
25	Frequency level detection FDT2 output	Please refer to the description of function codes P8-28 and P8-29.
26	Frequency 1 reaches the output	Please refer to the description of function codes P8-30 and P8-31.
27	Frequency 2 reaches the output	Please refer to the description of function codes P8-32 and P8-33.
28	Current 1 reaches the output	Please refer to the description of function codes P8-38 and P8-39.
29	Current 2 reaches the output	Please refer to the description of function codes P8-40 and P8-41.
30	Timed arrival output	When the timer function selection (P8-42) is valid, the inverter will output the ON signal after the running time reaches the set time.
31	AI1 enter the limit	When the value of analog input AI1 is greater than P8-46 (AI1 input protection upper limit) or less than P8-45 (AI1 input protection lower limit), the ON signal is output.
32	Underload	When the inverter is in the under load state, the ON signal is output.
33	Reverse run	When the inverter is running in reverse operation, the ON signal is output
34	Zero current state	Please refer to the description of function codes P8-28 and P8-

Set value	Function	description
		29
35	Module temperature arrives	The inverter module radiator temperature (P7-07) reaches the set module temperature When the arrival value (P8-47) is reached, the ON signal is output
36	Software current limit	Please refer to the description of function codes P8-36 and P8-37
37	Lower frequency arrival (Shutdown also output)	When the operating frequency reaches the lower limit frequency, the ON signal is output. The signal is also ON in the shut down state
38	Warning output	When the inverter fails, and the fault processing mode for the continued operation, the inverter alarm output.
39	Motor over temperature alarm	When the motor temperature reaches P9-58 (motor overheat pre-alarm threshold), the ON signal is output. (Motor temperature can be viewed by d0-34)
40	The run time arrives	When the inverter starts running for more than the time set by P8-53, the ON signal is output.
41	Fault output	Fault output (for freewheel failure and undervoltage is not output)

P5-06	HDP Output function selection（Pulse output terminal）	Factory default	0
P5-07	AO1 Output function selection	Factory default	0

HDP terminal output pulse frequency range of 0.01 KHz ~ P5-09 (HDO output maximum frequency), P5-09 can be set between 0.01kHz ~ 100.00kHz.

Analog output AO1 and AO2 output range of 0V ~ 10V, or 0mA ~ 20mA.

Pulse output or analog output range, and the corresponding function of the scaling relationship as shown in the following table:

Set value	Function	Pulse or analog output 0.0% to 100.0% of the corresponding function
0	Working frequency	0 ~ max output frequency
1	Set frequency	0 ~ max output frequency
2	Output current	0 ~ 2 times motor rated current
3	Output torque（Absolute value）	0 ~ 2 times rated Output torque
4	Output power	0 ~ 2 times rated power
5	Output voltage	0 ~ 1.2times AC drive output voltage
6	High speed pulse input	0.01kHz ~ 100.00kHz
7	AI1	0V ~ 10V
8	AI2	0V ~ 10V（or 0 ~ 20mA）

Set value	Function	Pulse or analog output 0.0% to 100.0% of the corresponding function
9	AI3	0V ~ 10V
10	Length	0 ~ max set length
11	Number setting	0 ~ max number
12	Communication settings	0.0% ~ 100.0%
13	Motor speed	0 ~ The maximum output frequency corresponds to the speed
14	Output current	0.0A~1000.0A
15	output voltage	0.0V~1000.0V
16	Output torque (actual value)	-2 times the motor rated torque~2 times the motor rated torque

P5-09	HDP output max frequency	Factory default	50.00kHz
	Set range	0.01kHz ~ 100.00kHz	

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

P5-10	AO1 Zero partial coefficient	Factory default	0.0%
	Set range	-100.0% ~ +100.0%	
P5-11	AO1 profits	Factory default	1.00
	Set range	-10.00 ~ +10.00	

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

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

Among them, AO1, AO2 zero partial coefficient of 100% corresponds to 10V (or 20mA), the standard output is no zero bias and gain correction, the output 0V ~ 10V (or 0mA ~ 20mA) corresponding to the amount of analog output.

For example, if the analog output content is the operating frequency, it is desirable to output 8V when the frequency is 0 and 3V when the frequency is the maximum frequency. The gain should be set to "-0.50" and the zero bias should be set to "80%".

P5-17	HDY output the delay time	Factory setting	0.0s
	Set range	0.0s ~ 3600.0s	
P5-18	Relay 1 outputs the delay time	Factory setting	0.0s
	Set range	0.0s ~ 3600.0s	

Set the output terminal HDY, relay 1, relay 2, from the state change to the actual output to produce changes in the delay time

P5-22	HDO Output terminal valid status selection		Factory default	00000
	Set range	bits	HDY Effective state selection	
		0 ： Positive logic 1 ： Anti logic		
		tens	RO1A Valid status settings (0 ~ 1 ， as above)	
		One hundred	RO2A Valid status settings (0 ~ 1 ， as above)	
		Thousands /	keep	

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

0: Positive logic, digital output terminal and corresponding common terminal are connected to active state and are disconnected to invalid state;

1: Anti-logic, digital output terminal and the corresponding common terminal connected to an invalid state, open to a valid state.

P6 Group Start-Stop control

P6-00	Start running mode	Factory default	0
	Set range	0 ： Direct start 1: Speed tracking restart 2:Pre-excitation start (AC induction motor) 3:SVC Quick Start	

- 0:direct start

If the DC braking time is set to 0, the drive will start from the start frequency.

If the DC braking time is not 0, the DC braking will start and then start from the starting frequency. For small inertia loads, the motor may have a rotating occasion at start-up.

- 1:speed tracking restart

The inverter first to determine the speed and direction of the motor, and then to track the motor frequency to start, the rotation of the motor to implement smooth and no impact start. For a large inertia load instantaneous power failure to restart. In order to ensure the performance of speed tracking and restart, it is necessary to set the parameters of motor P1 group accurately.

- 2: asynchronous machine pre-excitation start

It is only valid for asynchronous motors and is used to establish a magnetic field before the motor is running.

Pre-excitation current, pre-excitation time See function code P6-05, P6-06 Description.

If the pre-excitation time is set to 0, the inverter will cancel the pre-excitation process and start from the start frequency. Pre-excitation time is not 0, then the pre-excitation and then restart, can improve the motor dynamic response performance.

If the DC braking time is set to 0, the drive will start from the start frequency.

If the DC braking time is not 0, the DC braking will start and then start from the starting frequency. For small inertia loads, the motor may have a rotating occasion at start-up.

P6-03	Direct start frequency		Factory default	0.00Hz
	Set range	0.00Hz ~ 10.00Hz		

P6-04	Start frequency hold time	Factory default	0.0s
	Set range	0.0s ~ 100.0s	

To ensure the motor torque at start-up, set the appropriate starting frequency. In order to fully establish the magnetic flux when starting the motor, it is necessary to start the frequency for a certain time.The start frequency P6-03 is not limited by the lower limit frequency. But the set target frequency is less than the starting frequency, the inverter does not start, in standby mode. During the forward / reverse switching, the start frequency hold time does not work.
The start frequency hold time is not included in the acceleration time but is included in the operation time of the simple PLC.

P6-05	DC braking current / pre-excitation current before starting	Factory default	50%
	Set range	0% ~ 100%	
P6-06	DC braking time before start / pre-excitation time	Factory default	0.0s
	Set range	0.0s ~ 100.0s	

Start the DC brake, generally used to stop the operation of the motor and then start. Pre-excitation for the first induction motor to establish a magnetic field and then start to improve the response speed.

The start of the DC brake is valid only when the start mode is a direct start. At this point the inverter first set the DC braking current to start the DC braking, after starting the DC braking time and then start running. If the DC braking time is set to 0, it will not start directly without DC braking. The greater the DC braking current, the greater the braking force.

If the starting mode is pre-excitation start of the asynchronous machine, the inverter will set the magnetic field in advance according to the set pre-excitation current, and then start the operation after the set pre-excitation time. If the pre-excitation time is set to 0, it is not directly pre-energized.

Starting the DC braking current / pre-excitation current is the percentage of the rated current relative to the inverter.

P6-07	Acceleration and deceleration mode selection	Factory default	0
	Set range	0: linear acceleration/deceleration 1 ： S curve acceleration / deceleration A (static) 2 ：S curve acceleration/deceleration B (dynamic)	

- 0 ： linear acceleration and deceleration

The output frequency is incremented or decremented by line.

- 1 ：S curve acceleration and deceleration A (static)

The output frequency is incremented or decremented according to the S curve. The S-curve is used in places where gentle start or stop is required, such as elevators, conveyor belts, etc.

➢ 2：S curve acceleration and deceleration B (dynamic)

Generally used for high-speed areas above the rated frequency of the need for rapid acceleration and deceleration occasions.

P6-08	S Curve start time ratio	Default value	30.0%
	Set range	0.0% ~ （100.0%-P6-09）	
P6-09	S Curve start time ratio	Default value	30.0%
	Set range	0.0% ~ （100.0%-P6-08）	

Function codes P6-08 and P6-09 respectively define the start and end time ratios of the S curve acceleration and deceleration A, and the two function codes are satisfied: P6-08 + P6-09 ≤ 100.0%.

P6-10	Stop way choose	Factory value	0
	Set range	0：Decelerate to Stop 1：Coast to Stop	

➢ 0：Decelerate to Stop

Once the stop command is input, the AC drive decreases the output frequency based on the deceleration time to 0 and stop.

➢ 1：Coast to Stop

Once the stop command is input, the AC drive immediately stops output. The motor then coasts to stop based on the mechanical inertia.

P6-11	DC braking to stop start frequency	Factory default	0.00Hz
	Setting Range	0.00Hz ~ Max frequency	
P6-12	DC braking to stop delay time	Factory default	0.0s
	Setting Range	0.0s ~ 36.0s	
P6-13	DC braking to stop current	Factory default	50%
	Setting Range	0% ~ 100%	
P6-14	DC braking to stop time	Factory default	0.0s
	Setting Range	0.0s ~ 36.0s	

DC braking to stop start frequency: The inverter starts DC braking t stop when the running frequency decreases to the value set in this parameter in the process of deceleration to stop.

DC braking to stop delay time: When the running frequency decreases to DC braking to stop start frequency in P6-11, the inverter stops output for a period of time and then starts DC injection braking. This prevents the occurrence of fault such as over current caused by direct DC injection braking at high speed.

DC braking to stop current: it is the output current of DC braking and relative to the percentage of motor rated current. The greater the value, the greater the DC braking effect, but the greater the

heating of the motor and inverter.
DC braking to stop time: DC brake hold time. If this value is 0, the DC braking process is canceled. The DC braking process is shown in Figure 6-13.

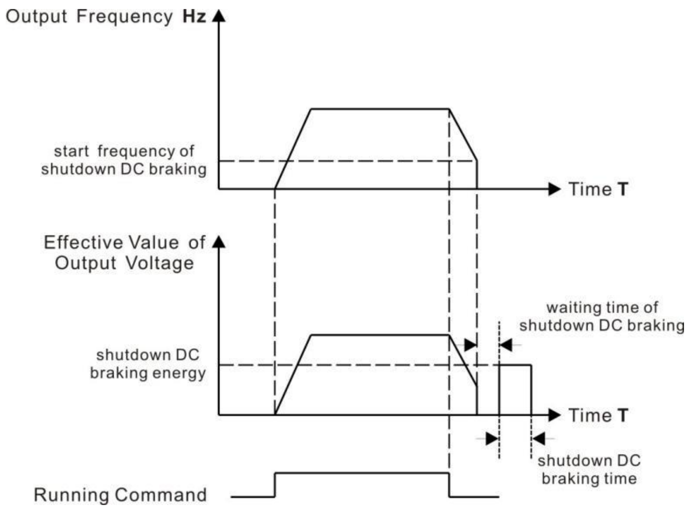


Figure 6-13 DC braking process

P7 Group Keypad and display

P7-03	LED display running parameters 1 running parameters 1		Factory default	1F
	Setting Range	0000 ~ FFFF	Bit 0: Running frequency 1 (Hz) Bit 1: Setting frequency (Hz) Bit 2: Bus voltage (V) Bit 3: Output voltage (V) Bit 4: Output current (A) Bit 5: Output power (kW) Bit 6: Output torque (%) Bit 7: S input state (V) Bit 8: HY1 output state Bit 9: AI1 voltage (V) Bit 10: AI2 voltage (V) Bit 11: AI3 voltage (V) Bit 12: Count value Bit 13: Length value Bit 14: Load speed display Bit 15: PID reference If a parameter needs to be displayed during running, set Corresponding bit to 1, and set P7-03 to hexadecimal equivalent.		
P7-04	LED display running parameters 2		Factory default	0

	Setting Range	0000 ~ FFFF	7 6 5 4 3 2 1 0 Bit 0: PID feedback Bit 1: PLC stage Bit 2: High-speed pulse reference (kHz) Bit 3: Running frequency 2(Hz) Bit 4: Remaining running time Bit 5: AI1 voltage before correction (V) Bit 6: AI2 voltage before correction (V) Bit 7: AI3 voltage before correction (V) 15 14 13 12 11 10 9 8 Bit 8: Motor speed Bit 9: Current power-on time (Hour) Bit 10: Current running time (Min) Bit 11: High-speed pulse input reference (Hz) Bit 12: Communication reference Bit 13: Encoder feedback speed (Hz) Bit 14: Main frequency A display (Hz) Bit 15: Auxiliary frequency B display (Hz) If a parameter needs to be displayed during running, set Corresponding bit to 1, and set F7-04 to hexadecimal equivalent.

For display running parameters, it set which display parameters to view during running.
The most available state parameters are 32, according to the values of P7-03 and P7-04, to select the state parameters that need to be displayed, and the display order begins at the lowest bit of P7-03.

P7-05	LED display stop parameters	Factory	0

	Setting Range	0000 ~ FFFF	0: Frequency reference (Hz) 1: Bus voltage (V) 2: S input state 3: HDO output state 4: AI1 voltage (V) 5: AI2 voltage (V) 6: AI3 voltage (V) 7: Count value 8: Length value 9: PLC stage 10: Load speed 11: PID reference 12: High speed pulse input reference (kHz) 13: Reserved 14: Reserved 15: Reserved If a parameter needs to be displayed during stop, set corresponding bit to 1, and set P7-05 to hexadecimal equivalent

P8 Group Auxiliary Function

P8-00	Jog frequency reference		Factory default	2.00Hz
	Setting Range	0.00Hz ~ Maximum frequency		
P8-01	Jog acceleration time		Factory default	20.0s
	Setting Range	0.0s ~ 6500.0s		
P8-02	Jog deceleration time		Factory default	20.0s
	Setting Range	0.0s ~ 6500.0s		

This function parameter defines frequency reference and acceleration/deceleration time during Jog running.

During Jog running, P6-00 must be set to 0 (direct start) and P6-10 must be set to 0 (Decelerate to stop).

P8-03	Acceleration time 2		Factory default	Model determination
	Setting Range	0. 0s ~ 6500.0s		

P8-04	Deceleration time 2		Factory default	20.0s
	Setting Range	0. 0s ~ 6500.0s		
P8-05	Acceleration time 3		Factory default	Model determination
	Setting Range	0. 0s ~ 6500.0s		
P8-06	Deceleration time 3		Factory default	Model determination
	Setting Range	0. 0s ~ 6500.0s		
P8-07	Acceleration time 4		Factory default	Model determination
	Setting Range	0. 0s ~ 6500.0s		
P8-08	Deceleration time 4		Factory default	Model determination
	Setting Range	0. 0s ~ 6500.0s		

DSI-200 provides totally four groups of acceleration/deceleration time for selection (P0-17、 P0-18 and the above three groups of acceleration/deceleration time).

These four groups of acceleration/deceleration time define are same, please reference P0-17、P0-18 of instruction.
By using the different combination of multi-function digital input terminal S, we can switch over the selection of 4 groups four groups of acceleration/deceleration time. Please refer to the relevant instructions in function code P4-01 ~ P4-05.

P8-09	Frequency jump 1		Factory default	0.00Hz
	Setting Range	0.00Hz ~ Maximum frequency		
P8-10	Frequency jump 2		Factory default	0.00Hz
	Setting Range	0.00 Hz ~ Maximum frequency		
P8-11	Frequency jump band		Factory default	0.00Hz
	Setting Range	0.00 ~ Maximum frequency		

When the frequency is set in the range of the frequency jump, the actual running frequency will run at the frequency jump point of the setting frequency nearby. By setting frequency jump, the inverter can avoid the mechanical resonance of the load.
DSI-200 can be set with two separate frequency jump point. If both are set to 0, the frequency jump function is disabled.For the principle of jump frequency and jump frequency range, please refer to figure 6-14.

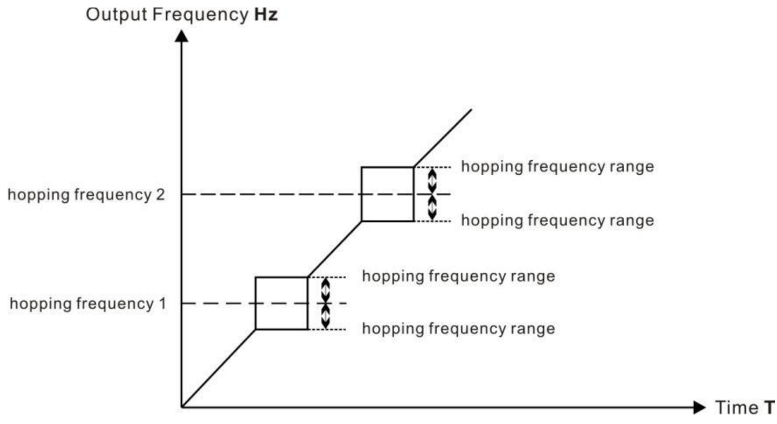


Figure 6-14 Frequency jump principle

P8-12	Forward/Reverse run Switch over dead-zone time	Factory default	0.0s
	Setting Range	0.00s ~ 3000.0s	

In the process of setting the inverter forward and reverse, the switchover time in the output 0Hz is shown in figure 6-15.

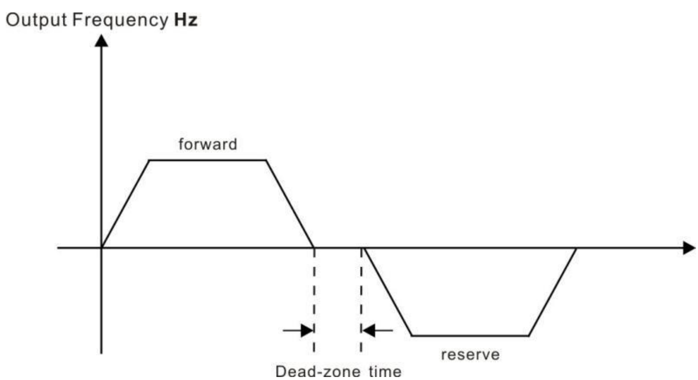


Figure 6-15 Forward/Reverse run switch over dead-zone time

P8-13	Forbid reverse run selection	Factory default	0
	Setting Range	0： Enabled	1：Disabled

This parameter sets whether the inverter is allowed to run in reverse mode, and P8-13 = 1 is set in the case where the motor is not allowed to reverse.

P8-14	Running mode when frequency reference lower than frequency lower limit	Factory default	0
	Setting Range	0：Run at frequency reference lower limit 1：Stop 2：Run at zero speed	

When the frequency reference is lower than the frequency lower limit, the operating state of the inverter can be selected by this parameter. DSI-200 provides three operating modes to meet various application requirements.

P8-15	Droop rate	Factory default	0.00%
	Setting Range	0.00 ~ 10.00%	

This function is typically used for load distribution when multiple motor drag the same load.
For droop control,as the load increases, the inverter output frequency drops.so many motors drive the same load, the motor with more heavy load of output frequency drop more, thus can reduce the load of the motor, realize the motor load evenly.
This parameter refers to the frequency drop output value when the rated load is output.

P8-16	Accumulative power-on time threshold	Factory default	0h
	Setting Range	0h ~ 65000h	

Multi-function digital terminal HDO output ON signal when accumulative power-on time of the AC drive (P7-13) exceeds value set in FP-16.
Set the cumulative time to reach 100 hours: P8-16 = 100.
Then, when the accumulated power time reaches 100 hours, the inverter output faulty of FU29.

P8-17	Accumulative running time threshold	Factory default	0h
	Setting Range	0h ~ 65000h	

This parameter is used to set up the running time of the inverter.
When the cumulative running time (P7-09) arrives at the set running time, the multi-function digital terminal HDO output ON signal.

P8-18	Start-up terminal protection	Factory default	0
	Setting Range	0：no protection	1：protection

This parameter relates to the safety protection of the frequency inverter.
If the parameter is set to 1, if the inverter is powered on and run command is valid(such as terminal with the run command close before electricity), the frequency inverter does not respond to run command, you must firstly remove run command one time, after run command is vaild again,frequency inverter will response run command.
In addition, if the parameter is set to 1, if the frequency inverter fault reset and run command is valid, the frequency inverter also does not respond run command, you must firstly remove run command to avoid running protection state.
Setting this parameter to 1 can prevent the motor from responding run command and becoming dangerous in the event of electrifying or failure reset when do not know all situation.

P8-19	Frequency detection value FDT1	Factory default	50.00Hz
	Setting Range	0.00Hz ~ max. frequency	
P8-20	Frequency detection hysteresis FGT1	Factory default	5.0%
	Setting Range	0.0% ~ 100.0%（FDT1 level）	

When running frequency exceeds the detection value, the multi-function digital terminal HDO output ON signal.
When the running frequency is lower than the detection value, HDO output OFF signal.
The above parameters are used to set the detection value of the output frequency and the lag value of the output action end. P8-20 is the percentage of the lag frequency relative to the frequency detection value P8-19. Figure 6-16 show FDT function.

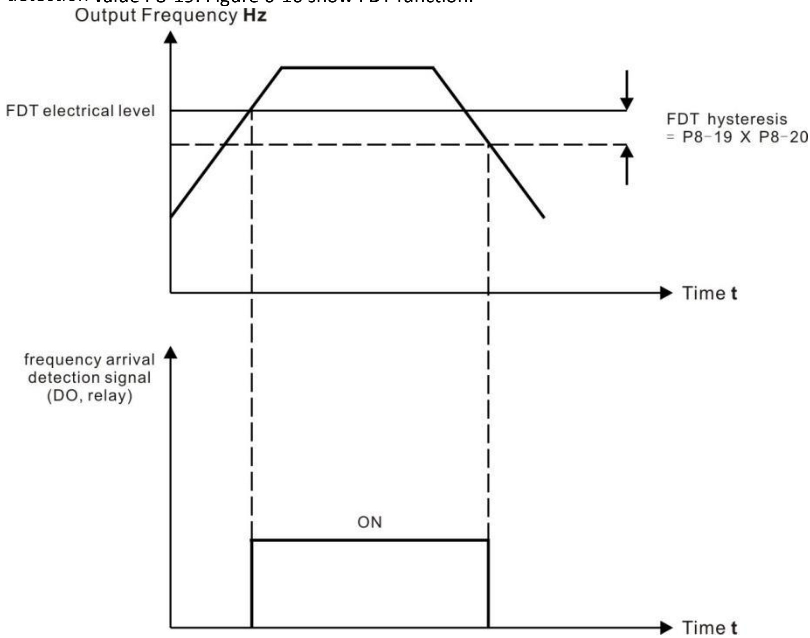


Figure 6-16 FDT electrical level function

P8-21	Detection width of target frequency reached	Factory default	0.0%
	Setting Range	0.00 ~ 100%max. frequency	

When the run frequency of the inverter is in a certain range of the target frequency, multi-function terminal HDY outputs the ON signal.
This parameter is used to set the detection range of the frequency arrival, which is the percentage relative to the maximum frequency. Figure 6-17 is a schematic diagram of frequency arrival.

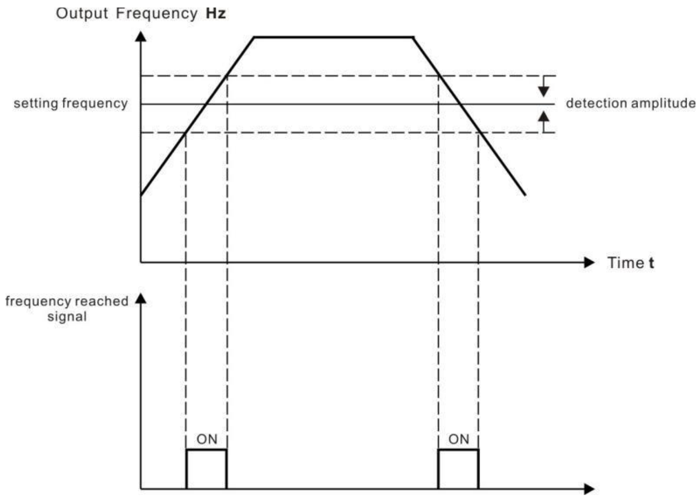


Figure 6-17 schematic dia gram of frequency arrival detection

P8-22	Frequency jump function valid during acceleration/deceleration	Factory default	0
	Setting Range	0 ：invalid	1 ：valid

The function code is used to set whether the frequency jump is valid during acceleration and deceleration.

If set to be valid, when the running frequency is in the frequency jump range, the actual running frequency will jump over frequency jump boundary. Figure. 6-18 is a schematic diagram of frequency jump valid during acceleration and deceleration.

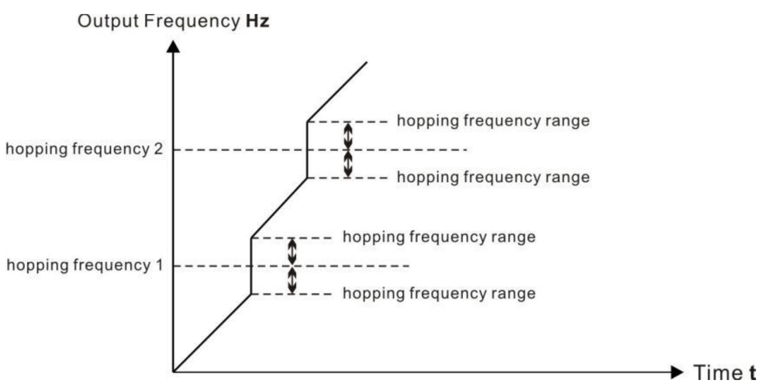


Figure. 6-18 schematic diagram of frequency jump valid during acceleration and deceleration.

P8-25	Switch over frequency of acceleration time 1 and acceleration time 2	Factory default	0.00Hz

	Setting Range	0.00Hz ~ max. frequency	
P8-26	Switch over frequency of deceleration time 1 and deceleration time 2	Factory default	0.00Hz
	Setting Range	0.00Hz ~ max. frequency	

This function is valid when the motor is selected as motor 1 and is not switched over through the S terminal to select the acceleration and deceleration time. During the frequency inverter running process, not through the S terminal, but in accordance with the frequency run range, choose different acceleration and deceleration.

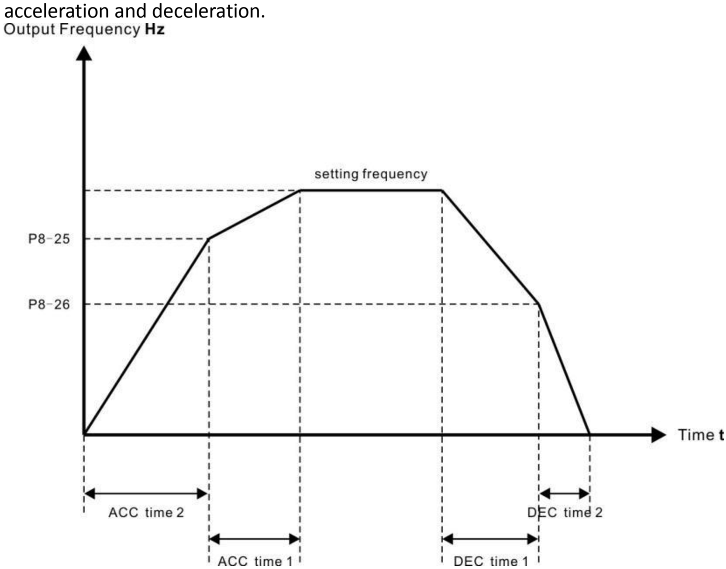


Figure 6-19 Acceleration/Deceleration time switch over

During acceleration, if the running frequency is below P8-25, acceleration time 2 is selected. If it is above P8-25, acceleration time 1 is selected.

During deceleration, if the running frequency is above P8-26, deceleration time 1 is selected. If it is below P8-26, deceleration time 2 is selected.

P8-27	Set highest priority to terminal JOG function	Factory default	0
	Setting Range	0：invalid	1：valid

This parameter is used to set whether the terminal JOG function has the highest priority.

When the terminal JOG function is given priority, if the terminal JOG occurs during running, the frequency inverter is switched to the terminal JOG status.

P8-28	Frequency detection value 2 （FDT2）	Factory default	50.00Hz
	Setting Range	0.00Hz ~ max. frequency	

P8-29	Frequency detection hysteresis FDT2	Factory default	5.0%
	Setting Range	0.0% ~ 100.0%（FDT2 electric level）	

The frequency detection function is exactly the same as the function of FDT1. Please refer to the relevant instructions of FDT1 with the function code P8-19 and P8-20.

P8-30	Detection of frequency 1	Factory default	50.00Hz
	Setting Range	0.00Hz ~ max. frequency	
P8-31	Detection width of frequency 1	Factory default	0.0%
	Setting Range	0.0% ~ 100.0%（max. frequency）	
P8-32	Detection of frequency 2	Factory default	50.00Hz
	Setting Range	0.00Hz ~ max. frequency	
P8-33	Detection width of frequency 2	Factory default	0.0%
	Setting Range Range	0.0% ~ 100.0%（max. frequency）	

When the output frequency of the inverter is within positive and negative detection range of frequency detection value, the multi-functional terminal DO outputs the ON signal.
DSI-200 provides two sets of random arrival frequency detection parameters, respectively setting frequency value and frequency detection range. Figure 6-20 is a schematic diagram of the detection of frequency function.

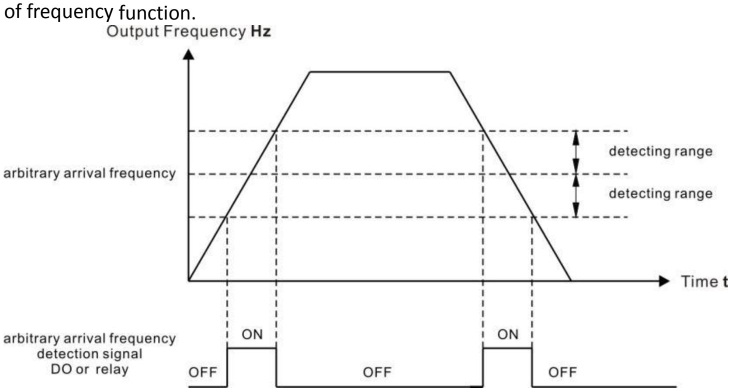


Figure 6-20 Detection of frequency arrive function.

P8-34	Zero current detection level	Factory default	5.0%
	Setting Range	0.0% ~ 300.0%（rated motor current)	

P8-35	Zero current detection delay	Factory default	0.10s
	Setting Range	0.00s ~ 600.00s	

When the output current of the inverter is less than or equal to the detection level of the zero current and the delay time exceeds the zero current detection delay time, the multi-function terminal HY1 outputs the ON signal. Figure 6-21 is a schematic diagram of zero current detection.

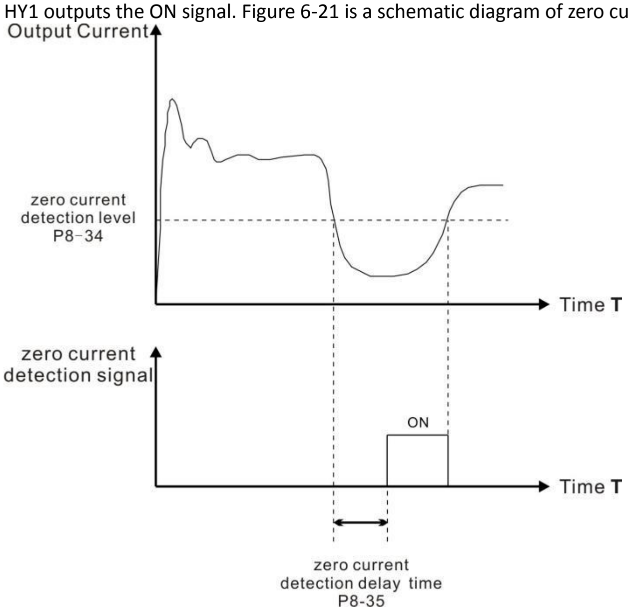


Figure 6-21 Zero current detection.

P8-36	Output over current threshold	Factory default	200.0%
	Setting Range	0.0% (no detection) ; 0.1% ~ 300.0% (rated motor current)	
P8-37	Output over current detection delay	Factory default	0.00s
	Setting Range	0.00s ~ 600.00s	

If the inverter output current is equal to or more than the value set in P8-36 and the delay time exceeds the value set in P8-37, multi-function terminal HY1 output on signal.Figure 6-22 Output current limit.

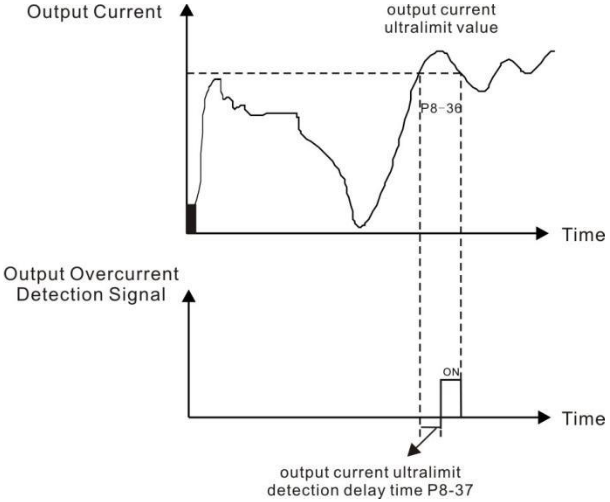


Figure 6-22 Output current limit.

P8-38	Detection level of current 1		Factory default	100.0%
	Setting Range	0.0% ~ 300.0%（ rated motor current ）		
P8-39	Detection width of current 1		Factory default	0.0%
	Setting Range	0.0% ~ 300.0%（ rated motor current ）		
P8-40	Detection level of current 2		Factory default	100.0%
	Setting Range	0.0% ~ 300.0%（ rated motor current ）		
P8-41	Detection width of current 2		Factory default	0.0%
	Setting Range	0.0% ~ 300.0%（ rated motor current ）		

When the output current of the inverter reach into the positive and negative detection width, the multi-function terminal HY1 outputs the ON signal.
DSI-200 provides two sets of arrival current detection width parameters. Figure 6-23 is functional schematic diagram.

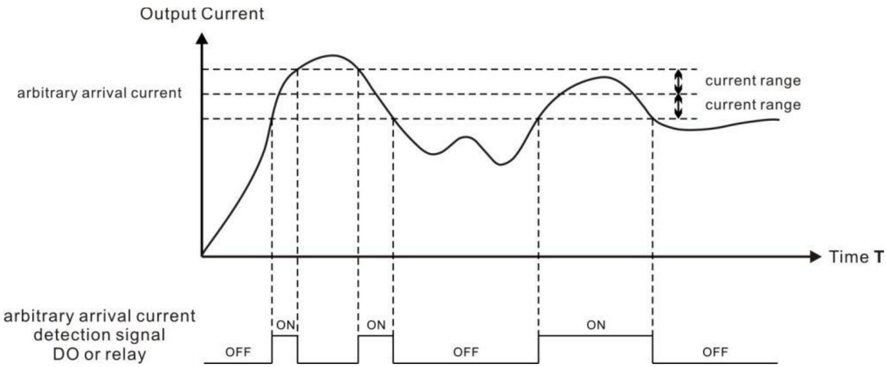


Figure 6-23 Current detection

P8-42	Timing function	Factory default	0
	Setting Range	0 ： invalid　　1 ： valid	
P8-43	Running time setting channel	Factory default	0
	Setting Range	0 ： set by P8-44　　1 ： AI1 2 ： AI2　　3 ： AI3	
		(100% of analog input corresponds to the value of P8-44)	
P8-44	Running time	Factory default	0.0Min
	Setting Range	0.0Min ~ 6500.0Min	

This set of parameters is used to set the timing function of the inverter.
When the P8-42 timing function is selected, the frequency inverter starts the timing ,after reacheing the set running time, the frequency inverter automatically stops, and the multi-function termainal HY1 outputs the ON signal.
Each time the inverter starts, it starts clocking from 0, and the remaining running time can be checked by d0-20.
The run time is set by P8-43 and P8-44, and the time unit is minute

P8-45	AI1 input voltage lower limit	Factory default	3.10V
	Setting Range	0.00V ~ P8-46	
P8-46	AI1 input voltage upper limit	Factory default	6.80V
	Setting Range	P8-45 ~ 10.00V	

When the analog input AI1 is greater than P8-46, or the AI1 input is less than P8-45, the inverter multi-function terminal HDO outputs "AI1 input more than limitation" of ON signal, which is used to indicate whether the input voltage of the AI1 is within the set range.

P8-47	IGBT temperature threshold	Factory default	75℃
	Setting Range	0℃~100℃	

When the temperature of the inverter radiator reaches the temperature, the multi-function terminal HDO output "module temperature overheat" of ON signal.

P8-48	Cooling fan working mode	Factory default	0
	Setting Range	0：Working during drive running 1：Working continuously	

The parameter sets cooling fan operation mode,when the value set to 0, inverter in the running state makes fan to work, When the drive stops, the fan works if heatsink temperature is above 40°C and stops if heatsink temperature is below 40°C.
When the value set to 1, the fan keeps working after power-on.

P8-49	Wake up frequency	Factory default	0.00Hz
	Setting Range	Hibernating frequency（P8-51）~ max. frequency（P0-10）	
P8-50	Wake up delay time	Factory default	0.0s
	Setting Range	0.0s ~ 6500.0s	
P8-51	Hibernating frequency	Factory default	0.00Hz
	Setting Range	0.00Hz ~ wake up frequency（P8-49）	
P8-52	Hibernating delay time	Factory default	0.0s
	Setting Range	0.0s ~ 6500.0s	

The hibernating and wakeup function is used in water supply application.
During drive running, when frequency reference is equal to or smaller than P8-51, the Iinverter enters hibernating state after delay set in P8-52.
In hibernating state a, if run command is valid, when frequency reference is equal to or larger than P8-49, the AC drive wakes up after delay set in P8-50.
Generally, set wakeup frequency equal to or higher than hibernating frequency. If they are set to 0, the function is disabled.
When frequency reference setting channel is PID reference, whether to perform PID operation in hibernating state is determined by PA-28, perform PID operation in stop state(PA-28 = 1).

Group P9: Fault and Protection

P9-00	Motor overload protection	Factory default	1
	Setting Range	0:Disabled 1：Enabled	
P9-01	Motor overload protection gain	Factory default	1.00
	Setting Range	0.20 ~ 10.00	

P9-00 = 0:No motor overload protection, there may be the risk of overheating damage to the motor, it is recommended install a thermal relay between inverter output (U, V, W) and the motor.
P9-00 = 1: At this point, the inverter will judge whether the motor is overloaded according to the inverse time limit curve of the motor overload protection.
The inverse time limit curve of motor overload protection is: 220% * (P9-01) * motor rated current for 1 minutes, the alarm indicates motor overload fault; 150% * (P9-01) * motor rated current for 60 minutes, then the alarm indicates motor overload.
The user needs to set the value of P9-01 correctly according to the actual overload capacity of the motor. The parameter is too large to lead to overheating of the motor without warning and become dangerous.

P9-02	Motor overload pre-warning coefficient	Factory default	80%
	Setting Range	50% ~ 100%	

This function is used to give a pre-warning signal to the control system through the HDO before the overload fault protection of the motor. The warning coefficient is used to determine how warning is performed before the overload protection of the motor. The greater the value, the smaller the amount of early warning.

When the output current of the inverter is larger than that of the overload reverse time curve x P9-02, the multi-function terminal HDO of the inverter outputs "the motor overload alarm" of ON signal.

P9-03	Over voltage stall protection gain	Factory default	30
	Setting Range	0 （no over voltage stall））~ 100	
P9-04	Over voltage stall protection voltage	Factory default	770V
	Setting Range	650V~800V	

The P9-03 function is equivalent to P3-24 and will change along with P3-24. The P9-04 function is equivalent to P3-22.

P9-09	Auto faulty reset times	Factory default	0
	Setting Range	0 ~ 20	

When the frequency inverter chooses to fault reset automatically, it is used to set the number of automatic reset. If more than this value, the inverter remains in a state of faulty.

P9-10	Selection of HDO action during auto Faulty reset	Factory default	0
	Setting Range	0：Not act	1：act

If the inverter has set up the automatic reset function, the multi-function terminal HDO will whether or not act during the automatic reset by P9-10 decide.

P9-11	Interval time of faulty auto reset	Factory default	1.0s
	Setting Range	0.1s ~ 100.0s	

This parameter indicates the wait time between the self alarm of the frequency converter and the reset of the automatic fault.

P9-54	Frequency selection for continuing to run during fault reset	Factory default	0
	Setting Range	0：Current running frequency 1：Frequency reference 2：Frequency upper limit 3：Frequency lower limit 4：Backup frequency for abnormality	

P9-55	Backup frequency for	Factory default	100.0%
	Setting Range	0.0% ~ 100.0 %(max. frequency)	

When a fault occurs during the inverter running and the method of handling is set to continue running, the frequency inverter displays A** and runs at the frequency determined by the P9-54. When you select the backup frequency for abnormality, the value is the percentage relative to the maximum frequency by P9-55 determine.

P9-59	No stop function selection during instantaneous power dip	Factory default	0
	Setting Range	0：Invalid 1：Bus voltage constant control 2：Decelerate to stop	
P9-60	Threshold voltage of instantaneous stop action suspend	Factory default	85.0%
	Setting Range	80.0% ~ 100.0%（380V type）100% correspond to540V	
P9-61	Judging time of bus voltage recovering from power dip	Factory default	0.50s
	Setting Range	0.00s ~ 100.00s	
P9-62	Threshold voltage of instantaneous power dip judging	Factory default	80.0%
	Setting Range	60.0% ~ 100.0%（standard bus voltage）	

This function ensures the system to run continuously at occurrence of momentary power loss or reduce.

The inverter compensates DC bus voltage reduction with real-time energy feedback by reducing output frequency, maintain the frequency inverter continue to run.

If P9-59=1, when the instantaneous power failure or the voltage suddenly reduces, the frequency inverter reduces speed, when the bus voltage returns to normal, the frequency inverter speeds up to the set frequency to run. The basis of judging bus voltage recovery is that the bus voltage is normal and the duration is longer than the P9-61 setting time.

If P9-59=2, when the instantaneous power failure or the voltage suddenly reduces, the frequency inverter slows down until stop.

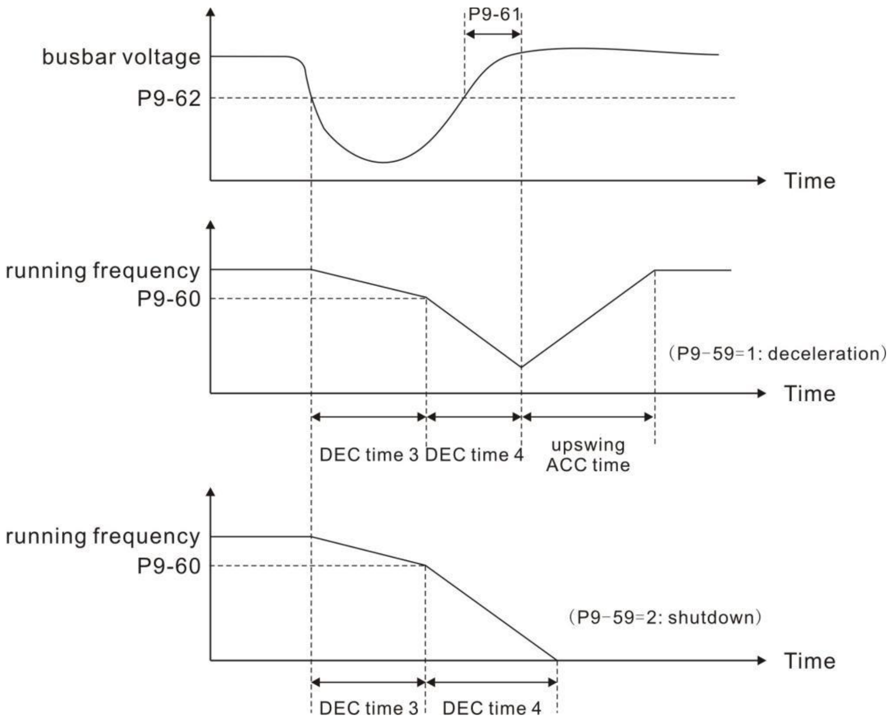


Figure 6-24 action during instantaneous power failure

P9-63	Load lost protection	Factory default	0
	Setting Range	0 ：invalid 1 ：valid	
P9-64	Load lost detection level	Factory default	10.0%
	Setting Range	0.0% ~ 100.0%（ Rated motor current ）	
P9-65	Load lost detection time	Factory default	1.0s
	Setting Range	0.0s ~ 60.0s	

If load lost protection function is valid, when output current of the inverter falls below detection level (P9-64) for longer than time set in
F9-65, the inverter responds load lost protection to act automatically (protection action is determined by P9-49, factory default is free stop). Once load recovers during protection, the inverter recover to frequency reference.

P9-67	Over speed detection level	Factory default	20.0%
	Setting Range	0.0% ~ 50.0 %(max. frequency)	
P9-68	Over speed detection time	Factory default	1.0s（ When is 10.0s,cancel muti-speed detection ）
	Setting Range	0.0s:non check 0.1s ~ 60.0s	

These function parameters define motor over speed detection that is effective only for vector control

with speed sensor.
When detected motor speed exceeds reference frequency and the excess is larger than the value of P9-67 for longer than time set in P9-68, the inverter warns FU43 and acts according to the faulty protection set.
If overspeed detection time is 0.0S, it will cancel over speed detection.

P9-69	Detection level of speed error	Factory default	20.0%
	Setting Range	0.0% ~ 50.0 %(max. frequency)	
P9-70	Detection time of speed error	Factory default	5.0s
	Setting Range	0.0s:non check 0.1s ~ 60.0s	

This function is effective only for vector control with speed sensor.
When detected motor speed is different from frequency reference and the difference is larger than the value of P9-69 for longer than the time set in P9-70, the inverter warns FU43 and acts according to the faulty protection set.
If detection time of speed error is 0.0S, it will cancel detection of speed error.

P9-71	Gain Kp during no stop function with instantaneous power dip	Factory default	40
	Setting Range	0~100	
P9-72	Integral coefficient Ki during no stop function with instantaneous power dip	Factory default	30
	Setting Range	0~100	

This function is effective only for P9-59=1.During no stop function with instantaneous power dip,if it is under voltage, enlarge Kp and Ki.

P9-73	Deceleration time of power dip	Factory default	20.0s
	Setting Range	0~300.0s	

This function is effective only for P9-59=2 .

PA group Process control PID function

PID control is a common method of process control. By comparing the difference between the controlled feedback signal and the target signal, the output frequency of the inverter is adjusted to form the closed-loop system, and the controlled quantity is stabilized. Target value.

It is suitable for process control such as flow control, pressure control and temperature control. Figure 6-25 shows the control block diagram of process PID.

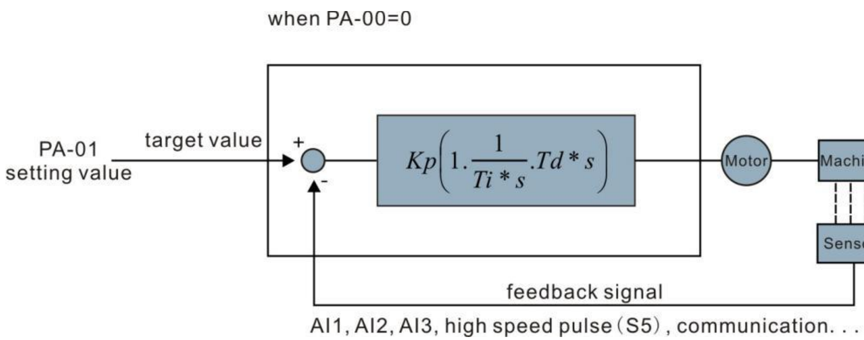


Figure 6-25 process PID schematic block diagram

PA-00	PID given source selection	Factory default	0
	Set range	0:PA-01 setting 1:AI1 2：AI2 3:AI3 4:high speed pulse input setting（S5） 5:Communication given 6: multi-segment instructions	
PA-01	PID given value	factory default	50.0%
	Set range	0.0% ~ 100.0%	

This parameter is used to select the target volume of the process PID.

The set value of the process PID is the relative value, and the setting range is 0.0% ~ 100.0%. The same PID feedback is the relative amount, the role of PID is to make the two relative amount of the same.

PA-02	PID feedback source selection	Factory default	0
	Set range	0：AI1 1：AI2 2：AI3 3：AI1 - AI2 4：high speed pulse input setting（S5） 5：Communication given 6：AI1+AI2 7：MAX（|AI1|,|AI2|） 8：MIN （|AI1|,|AI2|）	

This parameter is used to select the feedback channel of the process PID。

The set value of the process PID is the relative value, and the setting range is 0.0% ~ 100.0%

PA-03	PID role direction	Factory default	0
	Set range	0：Positive effect 1：reaction	

Positive function: When the PID feedback signal is less than a given amount, the inverter output frequency increases. Such as the tension of the tension control occasions.

Reaction: When the PID feedback signal is less than a given amount, the inverter output frequency drops. Such as the tension of the tension control occasions. This function is affected by the direction of the multi-function terminal PID action (function 35), the need to pay attention.

PA-04	PID Given feedback range	Factory default	1000
	Set range	0 ~ 65535	

PID given feedback range is dimensionless units for PID reference display d0-15 and PID feedback display d0-16.

The relative value of the given feedback of the PID is 100.0%, corresponding to the given feedback range PA-04. For example, if the PA-40 is set to 2000, the PID reference display d0-15 is 2000 when the PID is set to 100.0%

PA-05	Proportional gain KP1	Factory default	20.0
	Set range	0.0 ~ 1000.0	
PA-06	Integration time Ti1	Factory default	2.00s
	Set range	0.01s ~ 10.00s	
PA-07	derivative time Td1	Factory default	0.000s
	Set range	0.00 ~ 10.000s	

➢ Proportional gain KP1：

Determine the adjustment strength of the entire PID regulator, KP1 the greater the greater the intensity of regulation. The parameter 100.0 indicates that when the PID feedback amount and the deviation of the given quantity are 100.0%, the PID regulator adjusts the output frequency command to the maximum frequency

➢ Integration time Ti1：

Determine the strength of the PID regulator integral adjustment. The shorter the integration time, the greater the adjustment intensity. The integral time is when the PID feedback and the given amount of deviation of 100.0%, the integral regulator through the time continuous adjustment, adjust the amount to reach the maximum frequency.

➢ Derivative time Td1：

Determine the strength of the PID regulator to adjust the rate of change. The longer the differentiation time, the greater the intensity of regulation. The derivative time means that when the amount of feedback changes by 100.0% over that time, the adjustment of the differential regulator is the maximum frequency.

PA-08	PID Reverse cutoff frequency	Factory default	0.00Hz
	Set range	0．00 ~ Max frequency	

In some cases, it is possible for the PID to control the same amount of feedback to the same state only when the PID output frequency is negative (ie, the inverter is reversed), but the excessive inversion frequency is not allowed for some occasions, PA-08 is used to determine the reverse frequency upper limit.

PA-09	PID Deviation limit	Factory default	0.00%
	Set range	0. 0% ~ 100.0%	

When the deviation between the PID set amount and the feedback amount is less than PA-09, the PID stops the adjustment operation. In this way, the output frequency is stable when the deviation between the given feedback and the feedback is small, which is effective for some closed-loop control

PA-10	PID Differential limiting	Factory default	0.10%
	Set range	0．00% ~ 100.00%	

PID regulator, the role of differential is more sensitive, it is easy to cause the system oscillation, for which the PID differential is generally limited to a smaller range, PA-10 is used to set the PID differential output range.

PA-11	PID Given change time	Factory default	0.00s
	Set range	0.00s ~ 650.00s	

PID given change time, that PID set value from 0.0% to 100.0% of the time required.
When the PID reference changes, the PID setpoint changes linearly according to the given change time, reducing the adverse effect of a given mutation on the system.

PA-12	PID Feedback filter time	Factory default	0.00s
	Set range	0.00s ~ 60.00s	
PA-13	PID Output filter time	Factory default	0.00s
	Set range	0.00s ~ 60.00s	

PA-12 is used to filter the PID feedback, which helps to reduce the effect of the amount of feedback on the feedback, but will bring the response performance of the closed-loop system.

PA-13 is used to filter the frequency of the PID output, which will reduce the frequency of the inverter output frequency, but also will bring the response performance of the closed-loop system.

PA-15	Proportional gain KP2	Factory default	20.0
	Set range	0.0 ~ 100.0	
PA-16	Integration time Ti2	Factory default	2.00s
	Set range	0.01s ~ 10.00s	
PA-17	Differential time Td2	Factory default	0.000s
	Set range	0.00 ~ 10.000	
PA-18	PID Parameter switching condition	Factory default	0
	Set range	0: Do not switch 1: Switch through S terminal 2:Automatic switching according to the deviation 3:Automatic switching according to the running frequency	
PA-19	PID Parameter switching deviation 1	Factory default	20.0%
	Set range	0.0% ~ PA-20	
PA-20	PID Parameter switching deviation 2	Factory default	80.0%
	Set range	PA-19 ~ 100.0%	

In some applications, a set of PID parameters can not meet the needs of the entire operation process, the need for different conditions using different PID parameters.

This set of function codes is used for two sets of PID parameters. The regulator parameters PA-15

~ PA-17 settings, and the parameters PA-05 ~ PA-07 similar.

Two sets of PID parameters can be switched through the multi-function digital S terminal, or it can be switched automatically according to the deviation of the PID.

(PA-05 to PA-07) is selected when the terminal is inactive, the parameter group is selected when the terminal is valid, when the multi-function terminal function selection is to be set to 43 (PID parameter switching terminal) 2 (PA-15 to PA-17).

When the absolute value between the reference and feedback is less than the PID parameter switching deviation 1 PA-19, the PID parameter selects the parameter group 1 when the automatic switching is selected. When the absolute value of the deviation between the reference and the feedback is greater than the PID switching deviation 2 PA-20, the PID parameter selection selects the parameter group 2. When the deviation between the reference and the feedback is between the switching deviation 1 and the switching deviation 2, the PID parameter is the linear interpolation value of the two sets of PID parameters, as shown in Figure 6-26.

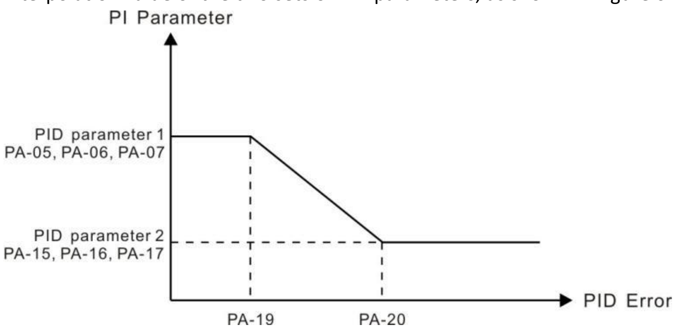


Figure 6-26 PID data parameter switching

PA-21	PID initial value		Factory default	0.0%
	Set range	0.0% ~ 100.0%		
PA-22	PID Initial value hold time		Factory default	0.00s
	Set range	0.00s ~ 650.00s		

When the inverter starts, the PID output is fixed to the PID initial value PA-21, and the PID continues to be closed-loop when the PID is maintained at the initial value of PA-22.

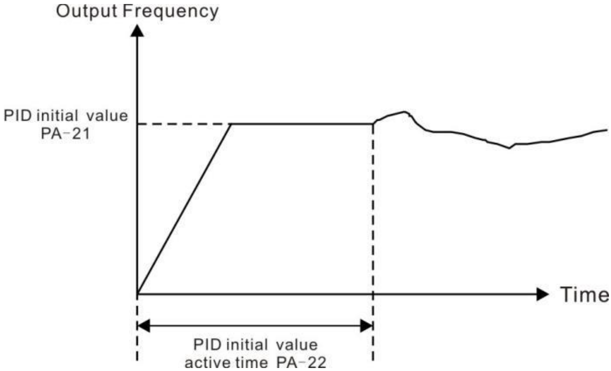


Figure 6-27 shows the function of the PID initial value

PA-25	PID Integral attribute	Factory default	00
	Set range	Bit	Integral separation
		0：invalid	1：valid
		Ten	Whether to stop the integration after outputting the limit value
		0：Continue to score	1：stop to score

Integral separation

If the integral separation is valid, when the multi-function digital S integral is suspended (function 22) is valid, the integral PID integral of the PID stops operation, and PID is only proportional and differential.

When the integral separation selection is invalid, the integral separation is invalid regardless of whether the multi-function digital S is valid or not.

Whether to stop the points after outputting the limit:

After the PID operation output reaches the maximum or minimum value, you can choose whether to stop the integration effect. If the stop is selected, the PID integral stops counting at this time, which may help to reduce the overshoot of the PID.

PA-26	PID Feedback loss detection value		Factory default	0.0%
	Set range	0.0%：Do not judge feedback loss 0.1% ~ 100.0%		
PA-27	PID Feedback loss test value		Factory default	0.0s
	Set range	0.0s ~ 20.0s		

This function code is used to determine if PID feedback is lost.

When the PID feedback is less than the feedback loss detection value PA-26 and the duration exceeds the PID feedback loss detection time PA-27, the inverter alarm fault FU31 is processed and processed according to the selected fault handling method.

PA-28	PID Stop operation		Factory default	0
	Set range	0	Stop non-operation	
		1	Stop operation	

PB Group Wobble, length and count

Wobble function suitable for textile, chemical fiber and other industries, as well as the need for traverse, winding function of the occasion.

Wobble function refers to the inverter output frequency, set the frequency as the center of the upper and lower swing, the operating frequency in the time axis of the track

as shown in Figure 6-28, the swing amplitude is set by PB-00 and PB-01. When PB-01 is set to 0, the swing is 0, and the wobble does not work.

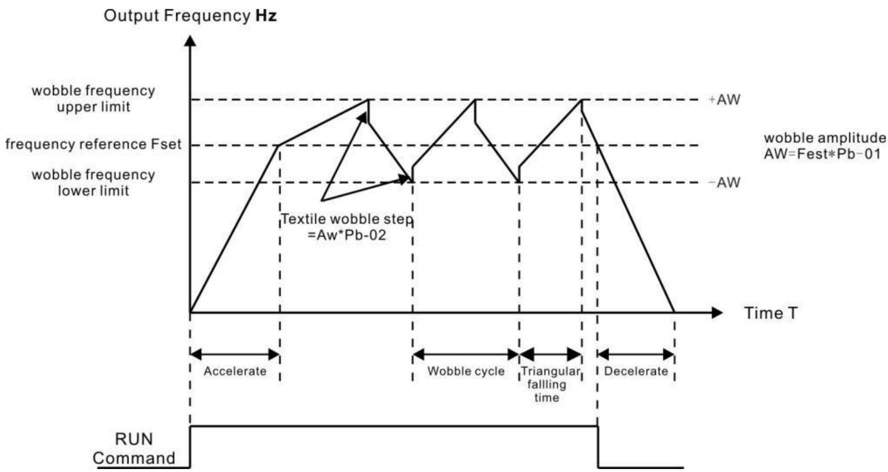


Figure 6-28 Wobble work diagram

PB-00	Swing setting mode	Factory default	0
	Set range	0: relative to center frequency 1: relative to maximum frequency	

Use this parameter to determine the reference for the swing.

- 0: relative center frequency (P0-07 frequency source), for the variable swing system. The swing varies with the center frequency (set frequency).
- 1: relative maximum frequency (P0-10), for the fixed swing system, swing fixed.

PB-01	Wobble amplitude	Factory default	0.0%
	Set range	0.0% ~ 100.0%	
PB-02	Sudden jump frequency	Factory default	0.0%
	Set range	0.0% ~ 50.0%	

Use this parameter to determine the value of the swing value and the sudden jumper frequency.

When setting the swing relative to the center frequency (PB-00 = 0), the swing AW = frequency source P0-07 × swing amplitude PB-01. When setting the swing relative to the maximum frequency (PB-00 = 1), the swing AW = maximum frequency P0-10 × swing amplitude PB-01.

The frequency of the bounce frequency is the percentage of the frequency of the bounce frequency relative to the swing when the wobble frequency is run. If the swing is selected relative to the center frequency (PB-00 = 0), the sudden frequency is the change value. If the swing is selected relative to the maximum frequency (PB-00 = 1), the spurious frequency is a fixed value.

The frequency of the wobble is limited by the upper and lower frequencies.

PB-03	Wobble cycle	Factory default	10.0s
	Set range	0.0s ~ 3000.0s	
PB-04	Triangular wave rise time coefficient	Factory default	50.0%
	Set range	0.0% ~ 100.0%	

Wobble cycle: the time value of a complete wobble cycle.

The triangular wave rise time coefficient PB-04 is the percentage of time that the triangular wave rise time is relative to the wobble cycle PB-03. Triangle wave rise time = wobble cycle PB-03 × triangular wave rise time coefficient PB-04, in seconds.

Triangle wave fall time = wobble cycle PB-03 × (1-triangular wave rise time factor PB-04) in seconds.

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

The above function codes are used for fixed length control.

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

During the length control process, the length reset operation (S function selection is 28) can be performed via the multi-function S terminal. For details, refer to P4-00 to P4-09.

In the application, the corresponding input terminal function needs to be set to "length count input" (function 27), and the S5 port must be used when the pulse frequency is high.

PB-08	Set the count value	Factory default	1000
	Set range	1 ~ 65535	
PB-09	Specify the count value	Factory default	1000
	Set range	1 ~ 65535	

The count value needs to be collected via the multi-function digital input terminal. In the application, the corresponding input terminal function is set to "Counter input" (function 25), and the S5 port must be used when the pulse frequency is high.

When the count value reaches the set count value PB-08, the multi-function digital HDO output "sets the count value to the ON" signal, and the counter stops counting.

When the count value reaches the specified count value PB-09, the multi-function digital HDO outputs the "specified count value arrival" ON signal, and the counter continues counting until the counter is stopped when "Set count value" is set.

The specified count value PB-09 should not be greater than the set count value PB-08. Figure 6-29 for the set count to reach and specify the count value to reach the function of the diagram.

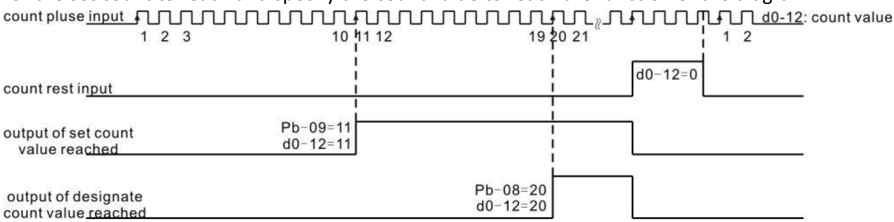


Figure 6-29 Set the count value for the given and specified count values

PC Group Multi-segment instructions and simple PLC functions

DSI-200 multi-segment instructions, than the normal multi-speed has a richer function, in addition to multi-speed function, but also as a VF separation of the voltage source, and the process PID given source. For this reason, the dimensions of the multi-segment instructions are relative values.

Simple PLC function is different from the DSI-200 user programmable function, simple PLC can only complete the simple combination of multi-segment instructions. And user-programmable features to be richer and more practical, please refer to A7 group related instructions.

PC-00~ PC-15	Multi command 0~15	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	

Multi-segment instructions can be used in three cases: as a frequency source, as VF separation of the voltage source, as the process PID set the source.

In the three applications, the dimension of the multi-segment instruction is the relative value, the range is -100.0% ~ 100.0%, which is the percentage of the relative maximum frequency when it is the frequency source. When the VF is the isolated voltage source, Percentage; and since the PID reference is originally a relative value, the multi-segment instruction as the PID setting source does not require dimension conversion.

Multi-segment instructions need to switch according to the different state of multi-function digital S, please refer to the relevant instructions for the P4 group.

PC-16	Simple PLC operation way	Factory default	0
	Set range	0: Single run end stop 1: End of single run to maintain final value 2: Always loop	

Simple PLC functions have two functions: as a frequency source or as a voltage source for VF separation.

Figure 6-30 is a schematic diagram of a simple PLC as a frequency source. Simple PLC as a frequency source, PC-00 ~ PC-15 positive and negative determine the direction of operation, if the negative value that the inverter running in the opposite direction.

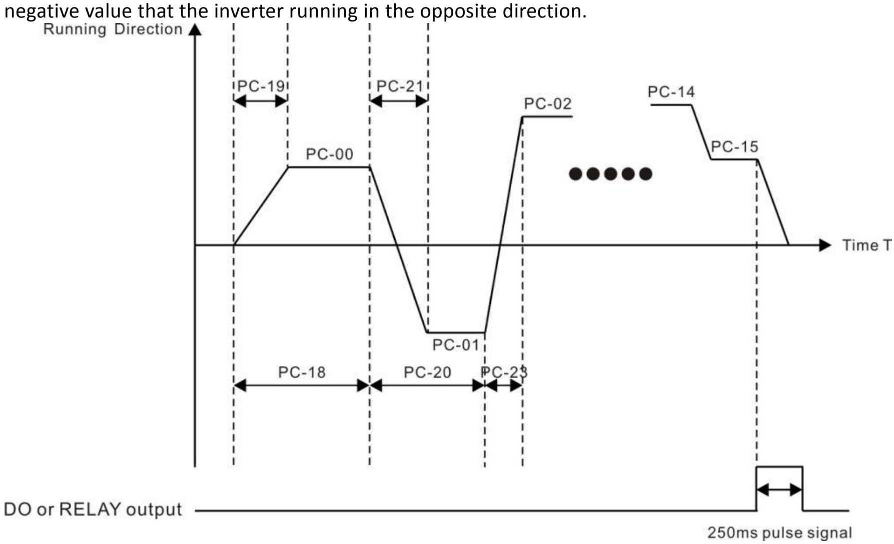


Figure 6-30 simple PLC diagram

As a frequency source, PLC has three operating modes, as VF separation voltage source does not have these three ways. Among them:

- 0: single run end stop

  The inverter to complete a single cycle after the automatic shutdown, you need to give a run command to start again.

- 1: the end of a single run to maintain the final value

  After the inverter completes a single cycle, it automatically keeps the last running frequency and direction.

- 2: has been circulating

  After the inverter completes a cycle, the next cycle is automatically started until the stop command is stopped.

PC-17	Simple PLC power loss memory selection	Factory default	00
	Set range	Bit	Power-down memory selection
		0：Power-down no memory 1：Power-down memory	
		Ten	stop memory selection
		0: no memory	1: downtime memory

PLC power-down memory is memory before power-down PLC running phase and operating frequency, the next power from the memory stage to continue to run. Select no memory, then each time the power is to restart the PLC process.

PLC shutdown memory is recorded when the previous record of the PLC running phase and operating frequency, the next run from the memory stage to continue running. Select no memory, then start each time to start the PLC process.

PC-18	Easy PLC run time 0	Factory default	0.0s（h）
	Set range	0.0s（h）～6553.5s（h）	
PC-19	Easy PLC paragraph 0 acceleration / deceleration time	Factory default	0
	Set range	0～3	
PC-20	Simple PLC 1st run time	Factory default	0.0s（h）
	Set range	0.0s（h）～6553.5s（h）	
PC-21	Easy PLC paragraph 1 acceleration / deceleration time	Factory default	0
	Set range	0～3	
PC-22	Simple PLC 2nd run time	Factory default	0.0s（h）
	Set range	0.0s（h）～6553.5s（h）	
PC-23	Easy PLC paragraph 2 acceleration / deceleration time	Factory default	0
	Set range	0～3	
PC-24	Simple PLC third run time	Factory default	0.0s（h）
	Set range	0.0s（h）～6553.5s（h）	
PC-25	Easy PLC paragraph 3 acceleration / deceleration time	Factory default	0
	Set range	0～3	
PC-26	Simple PLC 4th run time	Factory default	0.0s（h）
	Set range	0.0s（h）～6553.5s（h）	

PC-27	Easy PLC paragraph 4 acceleration / deceleration time	Factory default	0
	Set range	0 ~ 3	
PC-28	Simple PLC fifth run time	Factory default	0.0s (h)
	Set range	0.0s (h) ~ 6553.5s (h)	
PC-29	Easy PLC paragraph 5 acceleration / deceleration time	Factory default	0
	Set range	0 ~ 3	
PC-30	Simple PLC 6th run time	Factory default	0.0s (h)
	Set range	0.0s (h) ~ 6553.5s (h)	
PC-31	Easy PLC paragraph 6 acceleration / deceleration time	Factory default	0
	Set range	0 ~ 3	
PC-32	Simple PLC 7th run time	Factory default	0.0s (h)
	Set range	0.0s (h) ~ 6553.5s (h)	
PC-33	Easy PLC paragraph 7 acceleration / deceleration time	Factory default	0
	Set range	0 ~ 3	
PC-34	Simple PLC 8th run time	Factory default	0.0s (h)
	Set range	0.0s (h) ~ 6553.5s (h)	
PC-35	Easy PLC paragraph 8 acceleration / deceleration time	Factory default	0
	Set range	0 ~ 3	
PC-36	Simple PLC ninth run time	Factory default	0.0s (h)
	Set range	0.0s (h) ~ 6553.5s (h)	
PC-37	Easy PLC paragraph 9 acceleration / deceleration	Factory default	0
	Set range	0 ~ 3	
PC-38	Simple PLC tenth run time	Factory default	0.0s (h)
	Set range	0.0 s (h) ~ 6553.5s (h)	

PC-39	Easy PLC paragraph 10 acceleration / deceleration	Factory default	0
	Set range	0 ~ 3	
PC-40	Simple PLC eleventh run time	Factory default	0.0s (h)
	Set range	0.0s (h) ~ 6553.5s (h)	
PC-41	Easy PLC paragraph 11 acceleration / deceleration	Factory default	0
	Set range	0 ~ 3	
PC-42	Simple PLC twelfth run time	Factory default	0.0s (h)
	Set range	0.0s (h) ~ 6553.5s (h)	
PC-43	Easy PLC paragraph 12 acceleration / deceleration	Factory default	0
	Set range	0 ~ 3	
PC-44	Simple PLC thirteenth run time	Factory default	0.0s (h)
	Set range	0.0s (h) ~ 6553.5s (h)	
PC-45	Easy PLC paragraph 13 acceleration / deceleration	Factory default	0
	Set range	0 ~ 3	
PC-46	Simple PLC fourteenth run time	Factory default	0.0s (h)
	Set range	0.0s (h) ~ 6553.5s (h)	
PC-47	Easy PLC paragraph 14 acceleration / deceleration	Factory default	0
	Set range	0 ~ 3	
PC-48	Simple PLC fifteenth run time	Factory default	0.0s (h)
	Set range	0.0s (h) ~ 6553.5s (h)	
PC-49	Easy PLC paragraph 15 acceleration / deceleration	Factory default	0
	Set range	0 ~ 3	

PC-50	Simple PLC run time unit	Factory default	0
	Set range	0：S（s） 1：h（h）	
PC-51	Multi-step instruction 0 given mode	Factory default	0
	Set range	0: Function code PC-00 reference 1: AI1 2: AI2 3: AI3 4: High speed pulse input 5: PID 6: Preset frequency (P0-08) is given, UP / DOWN can be modified	

This parameter determines the given channel for multi-step instruction 0.
In addition to the PC-00, there are a number of other options that allow you to toggle between multiple short and other ways. In the multi-segment instructions as a frequency source or simple PLC as a frequency source, can easily achieve the two frequency source switching

Pd Group Communication parameters

Please refer to "communication protocol"

PP Group user password

PP-00	User password	Factory default	0
	Set range	0 ~ 65535	

PP-00 set any non-zero number, the password protection function to take effect. The next time you enter the menu, you must enter the correct password, or can not view and modify the function parameters, please keep in mind the user password set.Set the PP-00 to 00000, then clear the set user password, so that the password protection function is invalid.

A0 Group Torque control and qualification

A0-00	Speed / torque control mode selection	Factory default	0
	Set range	0: Speed control 1: Torque control	

Used to select the inverter control mode: speed control or torque control.
DSI-200 multi-function digital S terminal, with two torque control related functions: torque control disabled (function 29), speed control / torque control switch (function 46). The two terminals should be used in conjunction with A0-00 to achieve speed and torque control switching.
When the speed control / torque control switching terminal is invalid, the control mode is determined by A0-00. If the speed control / torque control switching is valid, the control mode is equivalent to the value of A0-00.

A0-01	Torque control mode torque setting source selection	Factory default	0
	Set range	0：digital default（A0-03） 1：AI1 2：AI2 3：AI3 4：High speed pulse input setting(S5) 5：Communication given 6：MIN（AI1,AI2） 7：MAX（AI1,AI2）	

A0-03	Torque control mode torque setting	Factory default	150.0%
	Set range	-200.0% ~ 200.0%	

In any case, when the torque control inhibit terminal is valid, the inverter is fixed to the speed control mode..

A0-01 is used to select the torque setting source, and there are 8 kinds of torque setting modes.

The torque setting uses the relative value, 100.0% corresponds to the rated torque of the inverter. The setting range is -200.0% ~ 200.0%, indicating that the maximum torque of the inverter is 2 times the rated torque of the inverter.

When the torque is given positive, the inverter is running forward When the torque is set to negative, the inverter is running reversely

The torque setting sources are described as follows:

- 0：digital setting（A0-03）

The target torque is used directly with the A0-03 setting

- 1：AI1
- 2：AI2
- 3：AI3

The target torque is determined by the analog input terminal. DSI-200 control board provides three analog input terminals (AI1, AI2, AI3).

AI1 is 0V ~ 10V voltage input, through the J6 jumper selection panel potentiometer or external potentiometer

AI2 can be 0V ~ 10V voltage input, but also for the 4mA ~ 20mA current input, by the control board J4 jumper selection

AI3 is -10V ~ 10V voltage input

AI1, AI2, AI3 input voltage value, and the target torque of the corresponding curve, the user can choose freely through the P4-33.

DSI-200 provides five groups of corresponding relationship curve, in which three groups of curves for the linear relationship (2-point correspondence), 2 groups of 4 points corresponding to any curve, the user can use P4-13 ~ P4-27 function code and A6 group function Code to set.

Function code P4-33 is used to set AI1 ~ AI3 three analog input, select which of the five groups of curves.

AI as the frequency given, the voltage and current input corresponding to the set of 100.0%, refers to the relative torque digital set A0-03 percentage

- 4: High-speed pulse setting (S5)

The target torque reference is given by the terminal S5 high speed pulse.

Pulse given signal specifications: voltage range 9V ~ 30V, the frequency range 0 kHz ~ 100 kHz. The pulse reference can only be input from the multi-function input terminal S5

The relationship between the pulse frequency of the S5 terminal input and the corresponding setting is set by P4-28 to P4-31. The correspondence relationship is a linear relationship of 2 points, and 100.0% of the pulse input is the relative torque number A0-03 percentage.

- 5：Communication given

Refers to the target torque postal communication mode given

When a point-to-point communication slave is received and the received data is given as a torque, use the host to transfer data as the communication reference (see A8 group description)

Otherwise the host computer through the communication address 0 × 1000 given data, the data format is -100.00% to 100.00%, 100.00% refers to the relative torque digital set A0-03 percentage.

A0-05	Torque control forward maximum frequency	Factory default	50.00Hz
	Set range	0.00Hz ~ max frequency （P0-10）	
A0-06	Torque control reverse maximum frequency	Factory default	50.00Hz
	Set range	0.00Hz ~ max frequency（P0-10）	

Used to set the torque control mode, the inverter's forward or reverse maximum operating frequency.

When the inverter torque control, if the load torque is less than the motor output torque, the motor speed will continue to rise, in order to prevent the mechanical system, such as flying accidents, must limit the torque control motor maximum speed.

If you need to achieve dynamic continuous change torque control maximum frequency, you can use the control of the upper frequency of the way to achieve.

A0-07	Torque control acceleration time	Factory default	0.00s
	Set range	0.00s ~ 65000s	
A0-08	Torque control deceleration time	Factory default	0.00s
	Set range	0.00s ~ 65000s	

In the torque control mode, the difference between the output torque and the load torque of the motor determines the speed change rate of the motor and the load. Therefore, the motor speed may change rapidly, resulting in excessive noise or mechanical stress. By setting the torque control acceleration / deceleration time, the motor speed can be changed gently.
However, if the torque response is required, it is necessary to set the torque control acceleration / deceleration time to 0.00s.
For example: two motor hard link drag the same load, in order to ensure uniform distribution of the load, set a frequency converter for the host, the use of speed control, another inverter for the machine and the use of torque control, the actual output of the host Moment as the torque command from the slave, then the torque of the slave machine needs to follow the host quickly, then the torque control acceleration / deceleration time of the slave is 0.00s.

A5 Group Control optimization parameters

A5-00	DPWM Switch the upper limit frequency	Factory default	8.00Hz
	Set range	5.00Hz ~ max frequency	

Only valid for VF control.

Asynchronous machine VF running time to determine the way, below this value for the 7-segment continuous modulation mode, on the contrary for the 5-segment intermittent modulation.

The switching loss of the inverter is larger when the 7-stage continuous modulation is larger, but the current ripple is smaller. The switching loss is smaller and the current ripple is larger in the 5-stage intermittent modulation mode, but it may lead to high frequency The instability of the motor operation, generally do not need to be modified.

Refer to function code P3-11 for VF operation instability. Refer to function code P0-15 for inverter loss and temperature rise.

A5-01	PWM Modulation mode	Factory default	0
	Set range	0: Asynchronous modulation 1: Synchronous modulation	

Only valid for VF control.

Synchronous modulation, refers to the carrier frequency with the output frequency conversion and linear changes to ensure that the ratio of the two (carrier ratio) unchanged, generally used in the output frequency is high, is conducive to the output voltage quality.

At lower output frequencies (below 100 Hz), it is generally not necessary to synchronize the modulation because the ratio of the carrier frequency to the output frequency is relatively high and the asynchronous modulation advantage is more pronounced.

When the operating frequency is higher than 85Hz, the synchronous modulation takes effect, and the frequency is fixed as asynchronous modulation mode.

A5-03	Random PWM depth	Factory default	0
	Setting Range	0：Random PWM invalid 1～10：PWM Carrier frequency random depth	

Set random PWM, you can monotonous harsh motor sound becomes more soft, and can help reduce the external electromagnetic interference. When the random PWM depth is set to 0, the random PWM is disabled. Adjusting the random PWM at different depths will result in different effects.

Set random PWM, you can monotonous harsh motor sound becomes more soft, and can help reduce the external electromagnetic interference. When the random PWM depth is set to 0, the random PWM is disabled. Adjusting the random PWM at different depths will result in different effects.

A5-04	Over current fast prevention	Factory default	1
	Set range	0: Disabled 1: Enabled	

Enable fast current limit function, to minimize the inverter over current fault, to ensure that the inverter running without interruption.

If the inverter is in a fast current limit for a long time, the inverter may be overheated and other damage. This is not allowed. Therefore, the inverter will fail to meet the fault time for a long time, indicating that the inverter is overloaded and needs to be shut down.

A5-05	Voltage over modulation coefficient	Factory default	105%
	Set range	100~110%	

A6 Group AI Curve setting

A6-00	AI curve 4 min. input	Factory default	0.00V
	Set range	-10.00V ~ A6-02	
A6-01	Corresponding percentage of AI curve 4 min. input	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
A6-02	AI curve 4 inflexion 1 input	Factory default	3.00V
	Set range	A6-00 ~ A6-04	
A6-03	Corresponding percentage of AI curve 4 inflexion 1 input	Factory default	30.0%
	Set range	-100.0% ~ 100.0%	
A6-04	AI curve 4 inflexion 2 input	Factory default	6.00V
	Set range	A6-02 ~ A6-06	
A6-05	Corresponding percentage of AI curve 4 inflexion 2 input	Factory default	60.0%
	Set range	-100.0% ~ 100.0%	
A6-06	AI curve 4 max. input	Factory default	10.00V
	Set range	A6-06 ~ 10.00V	
A6-07	Corresponding percentage of AI Curve 4 max. input	Factory default	100.0%
	Set range	-100.0% ~ 100.0%	
A6-08	AI curve 4 min. input	Factory default	-10.00V
	Set range	-10.00V ~ A6-10	
A6-09	Corresponding percentage of AI curve 5 min. input	Factory default	-100.0%
	Set range	-100.0% ~ 100.0%	
A6-10	AI curve 5 inflexion 1 input	Factory default	-3.00V
	Set range	A6-08 ~ A6-12	
A6-11	Corresponding percentage of AI curve 5 inflexion 1 input	Factory default	-30.0%
	Set range	-100.0% ~ 100.0%	
A6-12	AI curve 5 inflexion 2 input	Factory default	3.00V
	Set range	A6-10 ~ A6-14	

A6-13	Corresponding percentage of AI curve 5 inflexion 2 input	Factory default	30.0%
	Set range	-100.0% ~ 100.0%	
A6-14	AI curve 5 max. input	Factory default	10.00V
	Set range	A6-14 ~ 10.00V	
A6-15	Corresponding percentage of AI Curve 5 max. input	Factory default	30.0%
	Set range	-100.0% ~ 100.0%	

The functions of curves 4 and 5 are similar to those of curves 1 to 3, but curves 1 to 3 are straight lines, and curves 4 and 4 are 4-point curves, and a more flexible correspondence can be achieved. Figure 6-31 for the curve 4 to curve 5 of the schematic.

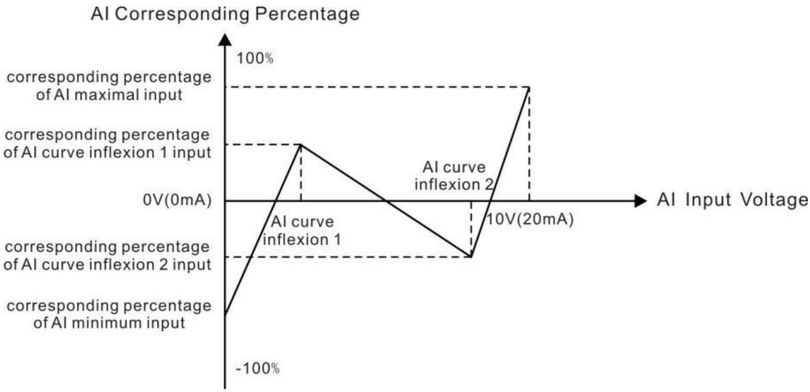


Figure 6-31 Curve 4 and Curve 5 Schematic

Curve 4 and curve 5 should be noted that the minimum input voltage curve, the inflection point 1 voltage, inflection point 2 voltage, the maximum voltage must be increased in turn.

AI curve selection P4-33, used to determine the analog input AI1 ~ AI3 how to choose from 5 curves.

A6-24	AI1 Set jump point	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
A6-25	AI1 Set the jump range	Factory default	0.5%
	Set range	0.0% ~ 100.0%	
A6-26	AI2 Set jump point	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
A6-27	AI2 Set the jump range	Factory default	0.5%
	Set range	0.0% ~ 100.0%	

The jump function means that when the analog quantity is set at the upper and lower range of the jump point, the analog value corresponding to the set value is fixed to the value of the jump point.

For example：

The analog input AI1 voltage fluctuates above 5.00V, the fluctuation range is 4.90V ~ 5.10V, the AI1 minimum input 0.00V corresponds to 0.0%, the maximum input 10.00V corresponds to 100.%, then the detected AI1 correspondence is set at 49.0 % ~ 51.0% fluctuate.

Set the AI1 to set the jump point A6-24 to 50.0%, set AI1 to set the jump amplitude A6-25 to 1.0%, then the AI1 input, after the jump function processing, the AI1 input corresponding to the fixed set to 50.0% AI1 is transformed into a stable input, eliminating the fluctuation.

d0 Group Monitor the parameter group

d0 parameter group is used to monitor the inverter running status information, the customer can view through the panel to facilitate on-site debugging, you can also read the parameters through the communication value for the host computer monitoring. The communication address is 0 × 7000 ~ 0 × 7040

Where d0-00 to d0-31 are the run and stop monitoring parameters defined in P7-03 and P7-04.

d0-15	PID setting	Display range	0 ~ 65535
d0-16	PID feedback	Display range	0 ~ 65535

Display PID set value and feedback value, the value format is as follows:

PID setting = PID setting (percentage) * PA-04
PID feedback = PID feedback (percentage) * PA-04

Chapter 7 Fault Display and settlement

7.1 Guidance on the adjustment of the inverter before commissioning

1） Drive in Open-loop Vector Control （P0-01=0）

The AC drive implements control of the motor speed and torque without an encoder for speed feedback. In this control mode, motor auto-tuning is required to obtain the motor related

Error	Solution
Overload or Over current detected during motor start	◆ Set motor parameters （P1-01~P1-05） according to motor nameplate. ◆ Select a proper motor auto-tuning mode by setting P1-37 and perform motor auto-tuning. If possible, select dynamic auto-tuning
Poor torque or speed response and motor oscillation at speeds below 5 Hz	◆ 1. If motor torque and speed response are too slow, increase the setting of P2-00 (speed loop proportional gain 1) by 10 gradually or decrease the setting of P2-01 (speed loop integral time 1) by 0.05 gradually. ◆ 2. If motor oscillation occurs, decrease the setting of P2-00 and P2-01.
Poor torque or speed response and motor oscillation at speeds above 5 Hz	◆ 1. If motor torque and speed response are too slow, increase the setting of P2-03 (speed loop proportional gain 2) by 10 gradually or decrease. The setting of P2-04 (speed loop integral time 4) by 0.05 gradually. ◆ 2. If motor oscillation occurs, decrease the setting of P2-03 and P2-04.
Low speed accuracy	◆ If speed error when motor runs with load is large, increase the setting of P2-06 (vector control slip compensation gain) by 10% gradually.

Obvious speed fluctation	◆ If motor speed fluctuation is large, increase the setting of P2-07 (SVC torque filter time) by 0.001s gradually.
Too loud motor noise	◆ Increase the setting of P0-15 (carrier frequency) by 1.0 kHz gradually.Note that increase in carrier frequency will result in an increase in the leakage current of the motor.
Insuffcient motor torque	◆ Check whether torque upper limit is small. If yes, please Increase the setting of P2-10 (digital setting of torque upper limit in speed control mode) in the speed control mode; Increase the torque reference in the torque control mode.
Obvious speed fluctuation	◆ If motor speed fluctuation is large, increase the setting of P2-07 (SVC torque filter time) by 0.001s gradually.
Too loud motor noise	◆ Increase the setting of P0-15 (carrier frequency) by1.0 kHz gradually.Note that increase in carrier frequency will result in an increase in the leakage current of the motor.
Insuffcient motor torque	◆ Check whether torque upper limit is small. If yes, please: Increase the setting of P2-10 (digital setting of torque upper limit in speed control mode in the speed control mode.

2) Drive in V/F Control (P0-01=2 factory default)

It is applicable to application without an encoder for speed feedback. You need to set rated Motor voltage and rated motor frequency correctly.

Error	Solution
Motor oscillation during running	1. Increase the setting of P3-11 (V/F oscillation suppression gain) by 10 gradually. The permissible maximum setting here is 100.
Over current during start	1. Decrease the setting of P3-01 (torque boost) by 0.5% gradually.
Too loud motor noise	1. Increase the setting of P0-15 (carrier frequency) by 1.0 kHz gradually. Note that increase in carrier frequency will result in an increase in the leakage current of the motor.
Very large current during running	1. Set rated motor voltage (P1-02) and rated motor frequency (P1-04) correctly. 2. Decrease the setting of P3-01 (torque boost) by 0.5% gradually.
Over voltage detected when heavy load is suddenly removed or during deceleration	1. Ensure that P3-23 (voltage limit selection) is set to 1 (enabled). Increase the setting of P3-24/P3-25 (frequency gain/voltage gain for voltage limit) by 10 gradually. The permissible maximum setting here is 100. 2. Decrease the setting of P3-22 (voltage limit 770v) by 10 V gradually. The permissible minimum setting here is 700 V.
Over current detected when heavy load is suddenly added or during acceleration	1. Increase the setting of P3-20 (P3-20 factory default set 20) by 10 gradually. The permissible maximum setting here is 100. 2. Decrease the setting of P3-18 (P3-18 factory default is 150%) by 10% gradually. The permissible minimum setting here is 50%.

7.2 Fault Display

When a fault occurs during running, the operation panel displays the fault code such as shown in the following figure.

Fault	display	Fault reason	Error settlement
Over current during acceleration	FU02	Ground fault or short circuit exists in the output circuit.	◆ Check whether short-circuit occurs on the motor, motor cable or contactor.
		Control mode is SVC but motor auto-tuning is not performed.	◆ Set motor parameters according to motor nameplate and perform motor auto-tuning.
		Acceleration time is too short.	◆ Increase acceleration time.
		The over current stall prevention parameters are set improperly.	◆ Ensure that current limit is enabled (P3-19 = 1). ◆ The setting of current limit level (P3-18) is too large. Adjust it between 120% and 150%. ◆ The setting of current limit gain (P3-20) is too small. Adjust it between 20 and 40.
		Customized torque boost or V/F curve is not appropriate.	◆ Adjust the customized torque boost or V/F curve.
		The spinning motor is started.	◆ Enable the catching a spinning motor function or start the motor
		The AC drive suffers external interference.	◆ View historical fault records. If the current value is far from the over current level, find interference source. If external interference does not exist, it is the drive board or hall device problem.
Over current during deceleration	FU03	Ground fault or short circuit exists in the output circuit.	◆ Check whether short-circuit occurs on the motor, motor cable or contactor.
		Control mode is SVC but motor auto-tuning is not performed.	◆ Set the motor parameters according to the motor nameplate and perform motor auto-tuning.
		Acceleration time is too short.	◆ Increase acceleration time.
		The over current stall prevention parameters are set improperly.	◆ Ensure that current limit is enabled (p3-19 = 1) ◆ The setting of current limit level (p3-18) is too large. Adjust it between 120% and 150%.

			◆ The setting of the current limit gain (p3-20) is too small. Adjust it between 20 and 40.
		Braking unit and braking resistor are not installed.	◆ Install braking unit and braking resistor.
		The AC drive suffers external interference.	◆ View historical fault records. If the current value is far from the over current level, find interference source. If external interference does not exist, it is the drive board or hall device problem.
Over current at constant speed	FU04	Ground fault or short circuit exists in the output circuit.	◆ Check whether short-circuit occurs on the motor, motor cable or contactor.
		Control mode is SVC but motor auto-tuning is not performed.	◆ Set motor parameters according to motor nameplate and perform motor auto-tuning.
		The over current stall prevention parameters are set improperly.	◆ Ensure that current limit is enabled (P3-19). ◆ The setting of current limit level (P3-18) is too large. Adjust it between 120% and 150%. ◆ The setting of current limit gain (P3-20) is too small. Adjust it between 20 and 40.
		The AC drive power class is small.	◆ If output current exceeds rated motor current or rated output current of the AC drive during stable running, replace a drive of larger power class.
		The drive suffers external interference.	◆ View historical fault records. If the current value is far from the over current level, find interference source. If external interference does not exist, it is the drive board or hall device problem.
Over voltage during acceleration	FU05	Input voltage is too high.	◆ Adjust input voltage to normal range.
		An external force drives motor during acceleration.	◆ Cancel the external force or install a braking resistor.

		The over voltage stall prevention parameters are set improperly.	◆ Ensure that the voltage limit function is enabled (P3-23). ◆ The setting of voltage limit (P3-22) is too large. Adjust it between700 V and 770 V. ◆ The setting of frequency gain for voltage limit (P3-24) is too small. Adjust it between 30 and 50.
		Braking unit and braking resistor are not installed.	◆ Install braking unit and braking resistor.
		Acceleration time is too short.	◆ Increase acceleration time.
Over voltage during deceleration	FU06	The over voltage stall prevention parameters are set improperly.	◆ Ensure that the voltage limit function is enabled (P3-23). ◆ The setting of voltage limit (P3-22) is too large. Adjust it between 700 V and 770 V. ◆ The setting of frequency gain for voltage limit (P3-24) is too small. Adjust it between 30 and 50.
		An external force drives motor during deceleration.	◆ Cancel the external force or install braking resistor.
		Deceleration time is too short.	◆ Increase deceleration time.
		Braking unit and braking resistor are not installed.	◆ Install braking unit and braking resistor.
Over voltage at constant speed	FU07	The over voltage stall prevention parameters are set improperly.	◆ Ensure that the voltage limit function is enabled (P3-23) ◆ The setting of voltage limit (P3-22) is too large. Adjust it between 700 V and 770 V. ◆ The setting of frequency gain for voltage limit (P3-24) is too small. Adjust it between 30 and 50. ◆ The setting of frequency rise threshold during voltage limit (P3-26) is too small. Adjust it between 5 Hz and 20 Hz.
		An external force drives motor during running.	◆ Cancel the external force or install a braking resistor
Pre-charge resistor fault	FU08	Input voltage is not in arranged range	◆ Arrange voltage in a reasonable range
Under voltage	FU09	Instantaneous power failure occurs	◆ Enable the power dip ride through function (P9-59).

		The AC drive's input voltage is not within the permissible range.	◆ Adjust the voltage to normal range.
		The bus voltage is abnormal.	◆ Contact the agent or Inovance.
		The rectifier bridge, the buffer resistor, the drive board or the control board are abnormal.	◆ Contact the agent or Inovance.
AC drive overload	FU10	Load is too heavy or locked-rotor occurs on motor.	◆ Reduce load or check motor and mechanical conditions.
		The AC drive power class is small.	◆ Replace a drive of larger power class.
Motor overload	FU11	P9-01 (Motor overload protection gain) is set improperly.	◆ Set P9-01 correctly.
		Load is too heavy or locked-rotor occurs on motor.	◆ Reduce load or check motor and mechanical conditions.
Output phase loss	FU13	Motor winding is damaged.	◆ Check resistance between motor wires. ◆ Replace motor is winding is damaged.
		The cable connecting the AC drive and the motor is abnormal.	◆ Check for wiring errors and ensure the output cable is connected properly correct wiring.
		The AC drive's three-phase outputs are unbalanced when the motor is running.	◆ Check whether the motor three-phase winding is normal.
		The drive board or the IGBT is abnormal.	◆ Contact the agent or Inovance.
overheat	FU14	The ambient temperature is too high.	◆ Lower the ambient temperature.
		The ventilation is clogged.	◆ Clean the ventilation.
		The fan is damaged.	◆ Replace the cooling fan.
		Thermally sensitive resistor of IGBT is damaged.	◆ Replace the damaged thermally sensitive resistor.
		The AC Drive Inverter module is damaged.	◆ Replace the AC Drive Inverter module.
Out project fault	FU15	External fault signal is input via S.	◆ Confirm that the mechanical condition allows restart (P8-18) and reset the operation.
Communication fault	FU16	Host computer is in abnormal state.	◆ Check the cable of host computer.
		Communication cable is abnormal.	◆ Check the communication cables.
		The serial port communication protocol (P0-28) of extension communication card is set improperly.	◆ Set extension communication card correctly.
		Communication parameters in group Pd are set improperly.	◆ Set communication parameters in group Pd properly.

		After all the preceding checking are done but the fault still exists, restore the default settings.	
Contactor fault	FU17	Drive board and power supply are abnormal.	◆ Replace drive board or power supply board.
		Contactor is abnormal.	◆ Replace contactor.
		The lightning protection board is abnormal.	◆ Replace the lightning protection board.
Current detection failure	FU18	The hall is abnormal.	◆ Replace the hall.
		The drive board is abnormal.	◆ Replace the drive board.
Motor self learning malfunction	FU19	Motor parameters are not set according to nameplate.	◆ Set motor parameters correctly according to nameplate.
		Motor auto-tuning times out.	◆ Check the cable connecting AC drive and motor.
		The encoder is abnormal.	◆ Check whether P1-27 (encoder pulses per revolution) is set correctly.Check whether signal lines of encoder are connected correctly and securely.
EEPROM read-write fault	FU21	The EEPROM chip is damaged.	◆ Replace the main control board.
Short circuit to ground	FU23	Motor is short circuited to the ground.	◆ Replace cable or motor.
Accumulative running time reached	FU26	Accumulative running time reaches the setting value.	◆ Clear the record through parameter initialization.
User-defined fault 1	FU27	User-defined fault 1 is input via S.	◆ Reset the operation.
User-defined fault 2	FU28	User-defined fault 2 is input via virtual S	◆ Reset the operation.
Accumulative power reach error	FU29	Accumulative power-on time reached	◆ Use the parameter initialization function to clear the record information
Load loss	FU30	Working current <P9-64	◆ Check whether the load is off or P9-64, P9-65 parameter set Whether to meet the actual operating conditions
PID feedback lost during running	FU31	PID feedback <PA-26 set value	◆ Check PID feedback or set PA-26 properly.
Pulse-by-pulse current limit fault	FU40	Load is too heavy or locked-rotor occurs on Motor.	◆ Reduce load or check motor and mechanical conditions

		The AC drive power class is small.	◆ Replace a drive of larger power class.
Motor switchover fault during running	FU41	Motor switchover via terminal during drive running of the AC drive.	◆ Perform motor switchover after the AC drive stops.
Speed error	FU42	Encoder parameters are set improperly.	◆ Set encoder parameters properly.
		Motor auto-tuning is not performed.	◆ Perform motor auto-tuning.
		P9-69 (detection level of speed error) and P9-70 (detection time of speed error) are set incorrectly.	◆ Set data correctly based on actual condition
Motor over speed	FU43	Encoder parameters are set improperly.	◆ Set encoder parameters properly.
		Motor auto-tuning is not performed.	◆ Perform motor auto-tuning.
		P9-67 (Over speed detection level) and P9-68 (Over speed detection time) are set incorrectly.	◆ Set data correctly based on the actual situation.

7.3 Faults and Diagnostics

Troubleshoot the fault according to the following table. If the fault cannot be eliminated, contact the agent or Inovance

No.	Error	Reason	Possible Solution
1	There is no display while power-on.	The mains voltage is not input or too low.	◆ Check the power supply.
		The switching power supply on drive board of the AC drive is faulty.	◆ Check bus voltage.
		Wires between control board and drive board and between control board and operating panel break.	◆ Re-plug the 30-core cable

<table>
<tr><td rowspan="3"></td><td rowspan="3"></td><td>Pre-charge resistor of the AC drive is damaged.</td><td rowspan="3">◆ Contact the agent or Inovance.</td></tr>
<tr><td>Control board or operating panel is faulty.</td></tr>
<tr><td>Rectifier bridge is damaged.</td></tr>
<tr><td rowspan="5">2</td><td rowspan="5">"510-H" is displayed while power-on</td><td>Wire between drive board and control board is in poor</td><td>◆ Re-plug the 30-core cable</td></tr>
<tr><td>Related components on control board are damaged</td><td rowspan="4">◆ Contact the agent or Inovance.</td></tr>
<tr><td>The motor or motor cable is short circuited to ground.</td></tr>
<tr><td>The hall is damaged.</td></tr>
<tr><td>The mains voltage is too low.</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">"FU23" is displayed at power-on.</td><td>Motor or motor output cable is short circuited to ground.</td><td>◆ Use a megger to measure insulation resistance of motor and motor cable.</td></tr>
<tr><td>The AC drive is damaged.</td><td>◆ Contact the agent or Inovance.</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">The display is normal while power-on. But after running, “-510-H” is displayed and the drive stops immediately.</td><td>The cooling fan is damaged or locked-rotor occurs.</td><td>◆ Replace the fan.
◆</td></tr>
<tr><td>Short circuit exists in wiring of control terminals.</td><td>Eliminate short circuit fault in control circuit wiring.</td></tr>
<tr><td rowspan="3">5</td><td rowspan="3">FU14 (IGBT overheat) is detected frequently.</td><td>The setting of carrier frequency is too high.</td><td>◆ Reduce carrier frequency (P0-15).</td></tr>
<tr><td>The cooling fan is damaged, or ventilation is clogged.</td><td>◆ Replace the fan or clean the ventilation.</td></tr>
<tr><td>Components inside the AC drive are damaged (thermistor or others).</td><td>◆ Contact the agent or Inovance.</td></tr>
</table>

No.	Error	Reason	Possible Solution
6	The motor does not rotate after the AC drive runs.	Motor and motor wires	◆ Check that wiring between AC drive and motor is normal.

		Related AC drive and motor parameters are set improperly.	Restore the factory parameters and re-set the following ◆ parameters properly: ◆ Encoder parameters ◆ Motor ratings, such as rate motor frequency and rated ◆ motor speed ◆ Motor 1 control mode (P0-01) and command source ◆ selection (P0-02) ◆ P3-01 (torque boost) in V/F control under heavy-load start.
		Cable connection between drive board and control board is in poor contact.	◆ Re-connect wirings and ensure secure connection.
		The drive board is faulty.	◆ Contact the agent or Inovance.
7	S terminals are disabled.	Related parameters are set incorrectly.	◆ Check and set parameters in group P4 again.
		External signals are incorrect.	◆ Re-connect external signal cables.
		Jumper across OP and +24 V becomes loose.	◆ Re-confirm the jumper bar across OP and +24 V.
		The control board is faulty.	◆ Contact the agent or Inovance.
		PG card is faulty.	◆ Contact the agent or Inovance.
		Drive board is faulty.	
8	The AC drive detects over current and over voltage frequently.	Motor parameters are set improperly.	◆ Set motor parameters or perform motor auto-tuning again
		Acceleration/deceleration time is improper.	◆ Set proper acceleration/deceleration time.
		Load fluctuates.	◆ Contact the agent or Inovance.
9	FU17 is detected upon power-on or running.	The pre-charge relay or contactor is not closed.	◆ Check whether the relay or contactor cable is loose. ◆ Check whether the relay or contactor is faulty. ◆ Check whether 24 V power supply of the contactor is faulty. ◆ Contact the agent or Inovance.
10	To slow down or stop when the	Encoder disconnection or overpressure stall protection	◆ A speed sensorless vector control mode(P0-01=1), please check the

	electricity Machine free parking or without brake Ability to	effect	encoder wiring ◆ If the configured braking resistor, should be"Choose overvoltage stall enabled "to" invalid"(set P3-23 = 0), closing overvoltage stall

DSI-200 Definition of Communication Data Address

The DSI-200 series inverter supports Modbus, and the host computer can realize the control, monitoring and function parameter modification and viewing operation of the inverter through the Modbus communication protocol.

DSI-200 communication data can be divided into function code data and non-function code data. The latter includes running commands, running status, operating parameters, alarm information, etc.

I.1 DSI-200 Parameter Data

The parameter data provides important parameters of the AC drive. DSI-200 have group P and Group A. The parameter data is described as below:

DSI-200. Parameter data	P group (read-write)	P0、P1、P2、P3、P4、P5、P6、P7、P8、P9、PA、PB、PC、PD、PE、PF
	A group (read-write)	A0、A1、A2、A3、A4、A5、A6、A7、A8、A9、AA、AB、AC、AD、AE、AF

Communication addresses of parameter data are defined as follows:

For the P0-PF and A0-AF group function code data, the upper eight bits of the communication address are directly the function group number, and the lower eight bits are directly the function code.

The serial number in the group can be as follows:

P0-16 function parameter, its communication address is F010H, where F0H represents the function parameter of group P0, and 10H represents the number 16 of the function group.

Hexadecimal data format.

AC-08 function parameter, its communication address is AC08H, where

ACH stands for AC group function parameter and 08H stands for function code in function group

Serial number 8 hexadecimal data format.

When writing function code data for communication,

For the P0-PF group function code data, its communication address is eight bits high, and it is divided into 00-0F or P0-PF according to whether it is written to the EEPROM.

The lower eight bits are directly assigned to the function code in the function group, for example as follows:

Write function in parameter P0-16;

When the EEPROM is not required to be written, its communication address is 0010H;

When the EEPROM needs to be written, its communication address is F010H;

For the A0-AF group function code data, the communication address is eight bits higher. According to whether it needs to be written to the EEPROM, it is divided into 40-4F or A0-.

AF, the lower eight bits are directly the function code in the function group, for example:

Write function parameters AC-08;

When you do not need to write to EEPROM, its communication address is 4C08H;

When writing to EEPROM, the communication address is AC08H

I.2 Non-Parameter Data

DSI-200. Non-Parameter	Status data (read only)	Group d monitoring parameters, AC drive fault information and AC drive running status

Data	Control parameters (write-only)	Control commands, communication setting values, AO1 control, AO2 control, high-speed pulse (FMP) output control and parameter initialization

1. Status Data

Status data includes group d (monitoring parameters), AC drive fault description and AC drive running status.

- Group d (monitoring parameters)

The high 8 bits in communication address of d0 to dF is 70 to 7F and the low 8

bits indicate the function code number in the group. For example, the communication address of d0-11 is 700BH.

- AC drive fault description

When fault description is read via communication, the communication address is

8000H. You can obtain current fault code of the AC drive by reading the address.

- AC drive running status

When the drive running status is read via communication, the communication address is 8000H. You can obtain current running status information of the AC drive by reading the address. The running status is defined in the following table.

Communication Address of AC Drive's	Running Status Status Definition
3000H	1: Forward run

	2: Reverse run 3: Stop

2. Control Parameters

The control parameters include control command, communication setting values, AO1 control, AO2 control, high-speed pulse (FMP) output control and parameter initialization.

- Control commands

When P0-02 (command source selection) is set to 2 (serial comms.), you can

implement control such as start/stop of the AC drive by using communication address.

The control commands are defined in the following table.

Communication Address of AC Drive's Running Status	Status Definition
2000H	1: Forward run 2: Reverse run 3: Forward jog 4: Reverse jog 5: Coast to stop 6: Decelerate to stop 7: Fault reset

Communication reference

Communication setting values include data set via communication such as frequency reference, torque limit, V/F separation voltage, PID reference and PID feedback. Communication address is 1000H. The range is -10000–10000 and corresponding value range is -100.00% to

100.00%.

● Digital output terminal control

When a Digital output terminal is set for function 20 (Communication setting), Control on DO terminals of the drive is defined in the following table.

Communication Address of Drive Running Status	Status Definition
2001H	BiT0：non BiT1：non BiT2：RELAY1 output control BiT3：RELAY2 output control BiT4：HY1 output control

AO1 control, AO2 control, high-speed pulse (FMP) output control

When AO1, AO2 and FMP are set to function 12 (Communication setting), host computer can implement control on AO and high-speed pulse outputs by means of communication addresses. The definition is provided in the following table.

Communication Address		Command Definition
AO1	2002H	0 ~ 7FFF indicates 0% ~ 100%
AO2	2003H	

Parameter initialization

This function is required when you need to perform parameter initialization on the drive by using host computer.

If PP-00 (User password) is set to a non-zero value, pass password verification first. Host computer performs parameter initialization within 30s after password verification is successful.

Communication address of password verification via communication is 1F00H. Directly write correct user password to this address to perform password verification.

Communication address of parameter initialization by means of communication is 1F01H, defined in the following table.

Communication Address of Parameter Initialization	Command Definition
1F01H	1: Restore default settings 2: Clear records 4: Restore user backup parameters 501: Back up current user parameters

Modbus Communication Protocol

The drive provides RS485 communication interface and supports Modbus-RTU communication protocol so that the user can implement centralized control, such as setting running commands and function codes, and reading running status and fault information of the AC drive, by using a PC or PLC.

J.1 Agreement content

This protocol defines content and format of transmitted messages during serial communication, including master polling (or broadcasting) format and master coding method (function code for the action, transmission data, and error check). The slave uses the same structure in response, including action confirmation, data returning and error check. If an error occurs when the slave receives a message, or the slave cannot complete the action required by the master, the slave returns a fault message as a response to the master

Application

The AC drive is connected to a "single-master multi-slave" PC/PLC control network with RS485 Bus.

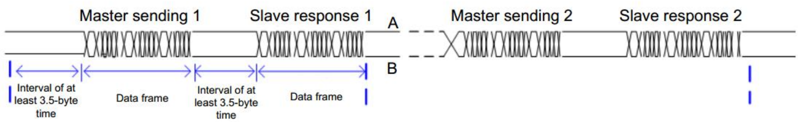
Bus Structure

(1) Topological structure

The system consists of a single master and multiple slaves. In the network, each communication device has a unique slave address. A device is the master (can be a PC, a PLC or an HMI) and initiates communication to perform parameter read or write operations on slaves. The other devices (slaves) provide data to respond to query or operations from the master. At the same moment, either the master or the slave transmits data and the other can only receives data.The address range of the slaves is 1 to 247, and 0 is broadcast address. A slave address must be unique in the network.

(2)Transmission mode

The asynchronous serial and half-duplex transmission mode is used. During asynchronous serial communication, data is sent frame by frame in the form of message. In Modbus-RTd protocol, an interval of at least 3.5-byte time marks the end of the previous message. A new message starts to be sent after this interval.



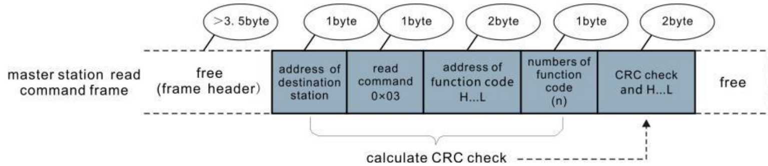
The communication protocol used by the drive is the Modbus-RTd slave communication protocol, which allows the drive to provide data to respond to "query/command" from the master or execute the action according to "query/command" from the master.

The master can be a PC, an industrial device, or a PLC. The master can communicate with a single slave or send broadcast messages to all slaves. When the master communicates with

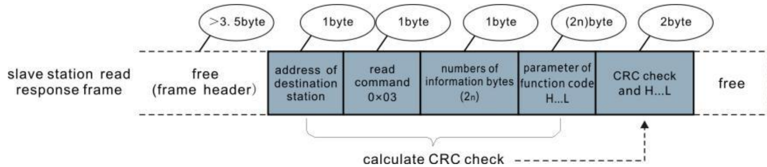
a single slave, the slave needs to return a message (response) to "query/command" from the master. For a broadcast message sent by the master, the slaves need not return a response.

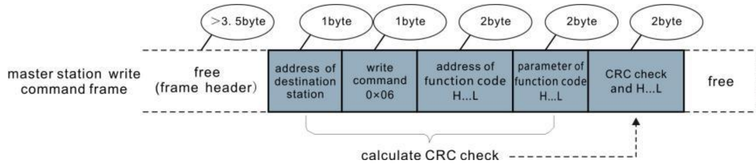
Data Format

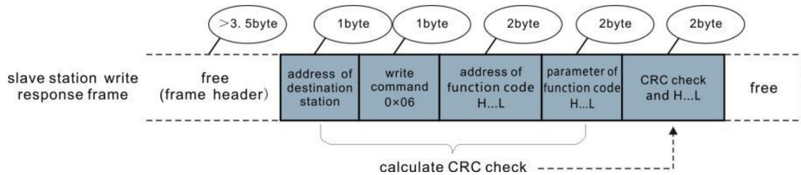
The drive supports reading and writing of word-type parameters only. Reading command is 0x03 and writing command is 0x06. It does not support reading and writing of bytes or bits.



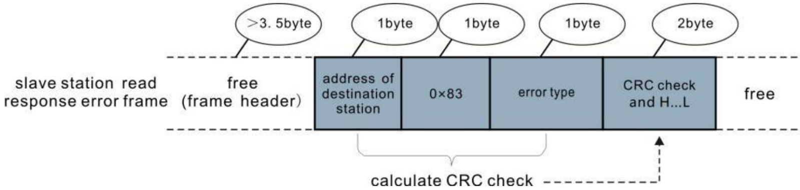
In theory, host computer can read several consecutive parameters (n can reach up to 12) but the last parameter it reads must not jump to the next parameter group. Otherwise, an error occurs on Response.

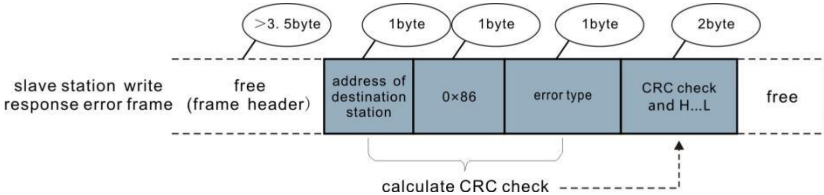






If the slave detects a communication frame error or reading/writing failure is caused by other reasons, an error frame will be returned as follows:





The frame format is described in the following table.

Frame header START	Greater than the 3.5-byte transmission idle time
Slave address (ADR)	Communication address : 1 to 247 0: Broadcast address
Command code (CMD)	03:Read slave parameters 06: Write slave parameters

Function code address H	It is the internal parameter address of the AC drive, expressed in hexadecimal format. The parameters include functional parameters and non-functional parameters (running status and running command). During transmission, low-order bytes follow the high-order bytes.
Function code address L	
Number of function codes H	It is the number of function codes read by this frame. If it is 1, it indicates that one function code is read. During transmission, low bytes follow high bytes. In the present protocol, only one function code is read once, an this field is unavailable.
Number of function codes L	
Data H	It is the response data or data to be written. During transmission, low-order bytes follow the high-order bytes.
Data L	
CRC CHK low bytes	It is the detection value (CRC16 verification value). During transmission, low-order bytes follow the high-order bytes.
CRC CHK high bytes	
END	3.5 byte transmission time.

CRC Check

In Modbus-CRC mode, a message includes a CRC-based error-check field. The CRC field checks content of entire message. The CRC field is two bytes, containing a 16-bit binary value. The CRC field is calculated by transmitting device, and then added to message. The receiving device recalculates a CRC value after receiving message, and compares the calculated value with the CRC value in the received CRC field.

The CRC is first stored to 0xFFFF. Then a procedure is invoked to process the successive 8-bit byte in the message and the value in the register. Only the eight bits in each character are used for the CRC. The start bit, stop bit and the parity bit do not apply to the CRC.

During generation of the CRC, each eight-bit character is in exclusive-OR (XOR) with the content in the register. Then the result is shifted in the direction of the least significant bit (LSB), with a zero filled into the most significant bit (MSB) position. The LSB is extracted and examined. If the LSB was a 1, the register then performs XOR with a preset value. If the LSB was a 0, no performed. This process is repeated until eight shifts have been performed. After the last (eighth) shift, the next eight-bit byte is in XOR with the register's current value, and the process repeats for eight more shifts as described above. The final value of the register, after all the bytes of the message have been applied, is the CRC value.The CRC is added to the message from the low-order byte followed by the high-order byte.

The CRC simple function is as follows: unsigned int crc_chk_value （unsigned char *data_value,unsigned char length）{

```
        unsigned int crc_value=0xFFFF;

        int i;

        while（length--）                        {

                crc_value^=*data_value++;

                for（i=0;i<8;i++）                        {

                        if（crc_value&0x0001）
```

```
= ( crc_value>>1 )
}
else
^0xa001;{   {
}
}

}   crc_value=crc_value>>1;
}
return ( crc_value ) ;
}
```

Definition of Communication Parameter Addresses

Read and Written Parameters Function parameters can be read and written (except those which cannot be changed because they are only for the factory use or for monitoring).

Parameter group No. and parameter identifying No. are used to express parameter address.

● High-order bytes: P0 to PF (groups P), A0 to AF (groups A), 70 to 7F (group d)

● Low-order bytes: 00 to FF

For example, to read parameter P3-12, communication address of P3-12 is expressed as 0xP30C

Note

● Group PF: The parameters cannot be read or changed.

● Group d: These parameters can only be read.

Some parameters cannot be modified when the AC drive is running. Some parameter cannot be modified regardless of status of the AC drive. In addition, pay attention to setting range, unit and description of parameters when modifying them.

Parameter Group	Visited Address	Parameter Address in RAM
P0 ~ PE Group	0×F000 ~ 0×FEFF	0×0000 ~ 0×0EFF
A0 ~ AC Group	0×A000 ~ 0×ACFF	0×4000 ~ 0×4CFF
d0 Group	0×7000 ~ 0×70FF	

Notes: Frequent storage to the EEPROM reduces its service life. Therefore, in communication mode, users can change values of certain parameters in RAM rather than storing the setting.

● For groups P parameters, users only need to change high order F of the function code address to 0. For groups A parameters, users only need to change high order A of the function code address to 4.The function code addresses are expressed as follows:

● High-order bytes: 00 to 0F (groups P), 40 to 4F (groups A)

● Low-order bytes: 00 to FF

For example, if function code P3-12 is not stored into EEPROM, the address is expressed as 030C; if function code A0-05 is not stored into EEPROM, the address is expressed as 4005.

It is an invalid address when being read. Users can also use command code 07H to implement this function.

Stop/RUN Parameters

Para. Address	Description	Address	Description
1000	*Communication setting value (Decimal) -10000~10000	1010	PID setting
1001	Running frequency	1011	PID feedback
1002	Bus voltage	1012	PLC process
1003	Output voltage	1013	Pulse input frequency, unit: 0.01kHz
1004	Output current	1014	Feedback speed, unit: 0.1Hz
1005	Output power	1015	Remaining running time
1006	Output torque	1016	AI1 voltage before correction
1007	Running speed	1017	AI2 voltage before correction
1008	S input indication	1018	AI3 voltage before correction
1009	HDO output indication	1019	Linear speed
100A	AI1 voltage	101A	Current power-on time
100B	AI2 voltage	101B	Current running time
100C	AI3 voltage	101C	Pulse input frequency, unit 1Hz
100D	Counting value input	101D	Communication reference
100E	Length value input	101E	Actual feedback speed
100F	Load speed	101F	Main A frequency reference display
		1020	Auxiliary B frequency reference display

Notes：

Communication setting value indicates percentage: 10000 corresponds to 100.00%, and -10000 corresponds to -100.00%.

With regard to frequency, communication reference is a percentage of P0-10 (maximum frequency). With regard to torque, communication reference is a percentage of P2-10 and A2-48 (corresponding to motor 1 and motor 2, respectively).

Control command input to AC drive (write-only):

Command Word Address	Command Word Function
2000	0001: Forward run 0002: Reverse run 0003: Forward jog 0004: Reverse jog 0005: Coast to stop 0006: Decelerate to stop 0007: Fault reset

Read AC drive state (read-only):

Command Word Address	Command Word function
3000	0001: Forward RUN 0002: Reverse RUN 0003: Stop

Parameter lock password check：（If "8888H" is returned, it indicates that password check is passed.）

Password address	Password Content
1F00	*****

DO terminal control (write-only)

Command Address	Command Content
2001	BIT2: RELAY1 control BIT3: RELAY2 control BIT4: HDO control

AO1 control (write-only)

Command Address	Command Content
2002	0 ~ 7FFF indicate 0% ~ 100%

AO2 control (write-only)

Command Address	Command Content
2003	0 ~ 7FFF indicate 0% ~ 100%

Pulse output control (write-only)

Command Address	Command Content
2004	0 ~ 7FFF indicate 0% ~ 100%

AC drive fault description

AC Drive Fault Address	AC Drive Fault Information

8000	0000: No fault 0001: Reserved 0002:Over current during acceleration, 0003:Over current during deceleration 0004:Over current at constant speed 0005:Over voltage during 0006: Deceleration overvoltage 0007: Constant speed overvoltage 0008: Buffer resistor overload fault 0009: Under voltage fault 000A: Inverter overload acceleration	0014: Encoder/PG card fault 000D:Power output phase loss 000E: IGBT overheat 000F: External fault 0010:Communication fault 0015:Parameter read and write fault 0016:AC drive hardware fault 0017: Motor short circuited to ground 0018: Reserved	001B: User-defined fault 1 001C: User-defined fault 2 001E: Load lost 001F: PID feedback lost during Running 0028: Fast current limit timeout 0029: Motor switch over error during running 002A: Too large speed deviation 002B: Motor over-speed 002D: Motor overheat 005A: Incorrect setting of PPR of the encoder 005B: Not connecting the encoder

Group Pd Communication Parameter Description

<table>
<tr><td rowspan="6">Pd-00</td><td>Baud rate</td><td>Factory default</td><td>6005</td></tr>
<tr><td rowspan="5">Set range</td><td colspan="2">Bit：MODdBS Baud rate</td></tr>
<tr><td>0：300BPS</td><td>5：9600BPS</td></tr>
<tr><td>1：600BPS</td><td>6：19200BPS</td></tr>
<tr><td>2：1200BPS</td><td>7：38400BPS</td></tr>
<tr><td>3：2400BPS</td><td>8：57600BPS</td></tr>
</table>

This parameter is used to set transmission speed between host computer and AC drive.Note that baud rate of host computer must be the same as that of AC drive. Otherwise, communication shall fail. The higher baud rate is, the faster communication will be.

<table>
<tr><td rowspan="2">Pd-01</td><td>MODbus Data</td><td>Factory default</td><td>0</td></tr>
<tr><td>Set range</td><td colspan="2">0: No check <8,N,2>
1: Even parity check <8,E,1>
2: Odd parity check <8,O,1>
3: No check, data format <8,N,1></td></tr>
</table>

Note that data format of host computer must be the same as that of AC drive. Otherwise, communication shall fail.

Pd-02	Local address	Factory default	1
	Set range	1~247 , 0 Broadcast address	

This parameter is used to set address of AC drive. This address is unique (except broadcast address), which is basis for point-to-point communication between host computer and AC drive. When local address is set to 0 (that is, broadcast address), AC drive can only receive and execute broadcast commands of host computer, but will not respond to host computer.

Pd-03	MODbus Response delay	Factory default	2ms
	Set range	0~20ms	

This parameter sets interval between AC drive completing receiving data and AC drive sending data to host computer. If response delay is shorter than system processing time, system processing time shall prevail. If response delay is longer than system processing time, system sends data to host computer only after response delay is up.

Pd-04	Communication timeout	Factory default	0.0 s
	Set range	0.0 s(invalid); 0.1~60.0s	

When this parameter is set to 0.0s, system does not detect communication timeout

When AC drive does not receive communication signal within time set in this parameter, it detects communication timeout fault (FU16). . Generally, this parameter is set to 0.0s. In applications with continuous communication, you can use this parameter to monitor communication status.

Pd-05	Modbus protocol selection	Factory default	30
	Setting Range	Bit: MODBUS 0: Non-standard MODBUS protocol 1: Standard MODBUS protocol Ten: Profibus-DP 0: PPO1 format	

Pd-05 = 1: Select the standard Modbus protocol.

Pd-05 = 0: When reading a command, the number of bytes returned by the slave is one byte greater than the standard Modbus protocol. Refer to the "5 Communication Data Structure" section of this protocol.

Pd-06	Communication read current resolution	Factory default	0
	Set range	0：0.01A；	1：0.1A

Used to determine the output unit of the current value when the communication reads the output current

Pentax®
WATER PUMPS

Pentax DSI-400 Series Frequency Inverter

Users Manual

Foreword

Thank you for using the DSI-400 series of high-performance vector inverter.

New DSI-400 series is a general current vector control inverter integrated with the performance and features in a high degree.

DSI-400 with industry-leading drive performance and functionality control, using unique current vector control algorithm can efficiently drive induction motor to achieve high accuracy, high torque and high-performance control.

Customer success, Market Service！DSI-400 in terms of performance and control are worthy of trust!

This guide explains how to properly use DSI-400 series inverter. Before using (installation, operation, maintenance, inspection, etc.), be sure to carefully read the instructions. Understanding of product safety precautions before using this product.

General notes
● This manual due to product improvement, specifications change, as well as to the instructions of their ease of use will be appropriate changes. We will update the information number of instructions, issued a revised edition. ● Due to damage to or loss need to order the manual, please contact PENTAX or PENTAX agents to order it as per the information number on the cover. ● This icon in the instructions with the products you ordered may be different, please refer to the specific documentation for products supplied.

Definition of security

In this manual, safety issues the following two categories：

Warning： Due to the dangers posed against the required operation, may result in serious injury and even death;

Caution： Due to the dangers posed against the required operation, may lead to moderate harm or minor injuries, and damage to the equipment;

Installation, commissioning and maintenance of the system, please carefully read this chapter (safety precautions), follow the required safety precautions to operate. PENTAX is not responsible in case of any injuries and losses caused as a result of improper operations.

Safety precautions

Before Installation

⚠ **Warning**
Do not install inverter finding the control system with water in, or inverter with missing parts or damaged parts. Please do not install inverter when the packing list is not consistent with the physical name.

⚠ **Warning**
Carefully handled when loading, otherwise it may damage the inverter. Please don't use the damaged driver or missing parts inverter, there may be risk of injury. Do not touch components of the control system, otherwise it will cause danger of static electricity.

During Installation

⚠ **Warning**
Mount the inverter on incombustible surface like metal, and keep away from flammable substances. Otherwise it may cause fire. Do not twist the mounting bolt of the equipment, especially the screw bolt marked in RED. Prohibit the use in the dangerous environment where inflammable or combustible or explosive gas, liquid or solid exists. Or it may cause electric shock or fire.

⚠ **Caution**
Do not drop the conducting wire stub or screw into the inverter. Otherwise ,it may cause

damage to the inverter.

Please install the inverter at the place of less direct sunlight and vibration.

Please mind the location of its installation when more than two inverters are installed in one cabinet, so that radiation effect is promised.

During Wiring

Warning

Operation shall be performed by the professional engineering technician. Otherwise there will be unexpected danger.

There shall be circuit breaker between the inverter and power supply. Otherwise, there may be fire.

Make sure the power is disconnected prior to the connection. Otherwise there will be danger of electric shock.

The earth terminal shall be earthed reliably. Otherwise there may be danger of electric shock.

Warning

Please don't put the power line and the signal line from the same pipeline，when operating wiring, please make power line and signal line apart above 30cm.

The encoder must use shielded cable, and the shield must ensure that a single side of a reliable ground!

Do not connect the input power cable to the output terminals(U、V、W).Attention to the terminals of the mark and do not make wrong connection. Otherwise it may damage the inverter.

The brake resistor must be connected between the terminals (P+)、(PB). and never connect to DC bus terminals (P+)、(P-) , otherwise it may cause fire.

Ensure the wiring meet the EMC requirements and the local safety standard.

The wire size shall be determined according to the manual. Otherwise, accident may be caused!

Before Power-on:

Caution
Any part of the inverter need not to carry on pressure test,which has been done before leaving factory.Or accident may be caused. Please confirm whether the power voltage class is consistent with the rated voltage of the inverter and the Input terminal (R、S、T) and Output terminal(U、V、W)cable connecting positions are correct, and check whether the external circuit is short circuited and whether the connecting line is firm,otherwise it may damage the inverter. Do not frequently turn ON/OFF power .If continuously ON/OFF power is needed, please make sure the time interval more than 1 minute.

Caution
The cover must be well closed prior to the inverter power-on. Otherwise electric shock may be caused! All the external fittings must be connected correctly in accordance with the circuit provided in this manual.Or accident may occur.

Upon Power-on

Warning
Do not open the cover of the inverter upon power-on.Otherwise there will be danger of electric shock! Do not touch the inverter and its surrounding circuit with wet hand. Otherwise there will be danger of electric shock. Do not touch the inverter terminals (including control terminal). Otherwise there will be danger

of electric shock.

At power-on, the inverter will perform the security check of the external strong-current circuit automatically. Thus, at this time please do not touch the terminals U、V、W, or the terminals of motor, otherwise there will be danger of electric shock.

If the parameter identification is required, pay attention to the danger of injury arising from the rotating motor. Otherwise accident may occur.

Do not change the factory settings at will. Otherwise it may damage the equipment.

During the Operation

Warning

Do not touch the fan, heat sink or discharge resistor to sense the temperature. Otherwise, you may get burnt.

Detection of signals during the operation shall only be conducted by qualified technician. Otherwise, personal injury or equipment damage may be caused.

Cautions

Do not control run/stop by using contactor. Or equipment damage may be caused!

Avoid anything falling into the equipment when inverter is running.Or damage may be caused.

Maintenance

Warning

Do not carry out repairs and maintenance of equipment with power on. Otherwise, there is a risk of electric shock!

No specially trained personnel can not make inverter implementation of repairs and maintenance. Otherwise, personal injury or equipment damage may be caused!

Make sure the inverter when the inverter voltage is lower than AC36V implementation of the maintenance and repair, five minutes after power prevail. Otherwise, the residual charge on the capacitor will cause damage!

Make the inverter parameter settings, only with all pluggable plug in and out in the case of power outages!

Precautions

●Motor Insulation Inspection

Motor in use for the first time, placed a long time before re-use and periodic inspection should be done, the motor insulation should be checked, to prevent the motor winding insulation failure and damage to the inverter. To motor insulation check connection separate from the inverter, 500V megger is recommended, should ensure that the measured insulation resistance of not less than 5MΩ.

●Motor Thermal Protection

If the rated capacity of the motor Yes not match those of the inverter, especially when the rated power of the inverter is higher than the rated power of the motor, be sure to adjust the inverter motor protection parameter values , or thermal relay shall be mounted for motor protection.

●Running with Frequency higher than Power Frequency

This inverter can provide output frequency from 0Hz to 3200Hz. If the customer is required to run 50Hz above, consider the mechanical endurance of the device.

●Vibration of Mechanical Device

The inverter may encounter the mechanical resonance point at certain output frequencies, which can be avoided by setting the skip frequency parameters in the inverter.

●Motor Heat and Noise

Since the output voltage of inverter is PWM wave and contains certain harmonics, the temperature rise, noise and vibration of the motor comparing with the power frequency will be increased slightly.

●Use with the voltage different with the rated voltage

If the DSI-400 series inverter is used outside the allowable working voltage range as specified in this manual, it is easily lead to the inverter devices damage. If needed, use the corresponding boost or lower voltage transformer processing.

●The output side with the pressure-sensitive devices or to improve the power factor capacitor

Since the inverter output is PWM wave, the output side if installed with capacitors to improve the power factor or lightning varistors. Easily lead to the inverter instantaneous overcurrent or even damage the drive, do not use.

●Switching Devices like Contactors Used at the Input and Output terminal

If a contactor is installed between the power supply and the input terminal of the inverter, it is not allowed to use the contactor to control the startup/stop of the inverter. Necessarily need to use the contactor control inverter start and stop of not less than an hour. Frequent charge and discharge will reduce the service life of the capacitor inside the inverter. If switching devices like contactor are installed between the output terminal and the motor, should ensure that the inverter output off operation, otherwise easily lead to the inverter module damage.

●Change Three-phase Input to Two-phase Input

It is not allowed to change the DSI-400 series three-phase inverter into two-phase. Otherwise, it may cause fault or damage to the inverter. This operation must be handed under PENTAX technical guidance.

●Lightning Surge Protection

The series inverter has lightning over current protection device, and has certain self-protection ability against the lightning. In applications where lightning occurs frequently, the user shall install additional protection devices in front of the inverter.

●Altitude and Derating Use

Altitude of over 1000m of the region, the heat sink's cooling effect of the inverter may turn poorer due to the thin air. Therefore, it needs to derate the inverter for use. This case please contact our technical advice.

●Some Special Use

If the user needs to use the inverter with the methods other than the recommended wiring diagram in this manual, such as DC bus, please consult our company.

●Cautions of Inverter scrapped

The electrolytic capacitors on the main circuit and the PCB may explode when they are burnt. Emission of toxic gas may be generated when the plastic parts are burnt. Processed as industrial waste.

●Adaptable Motor

1) The standard adaptable motor is four-pole squirrel-cage asynchronous induction motor or permanent magnetic synchronous motor. If such motor is not available, be sure to select adaptable motors in according to the rated current of the motor.

2) The cooling fan and the rotor shaft of the non-frequency-conversion motor adopt coaxial connection. When the rotating speed is reduced, the heat sink cooling effect will be reuduced. Therefore, overheating occasions should be retrofitted with a strong exhaust fan or replace the variable frequency motor.

3) Since the inverter has built-in standard parameters of the adaptable motors, it is necessary to perform motor parameter identification or modify the default values so as to comply with the actual values as much as possible, or it may affect the performance and protective properties.

4)Since short circuit cable or internal circuit of motor may cause alarm,or even machine explosion,please do insulation and short circuit test before the initial use as well as daily maintenance.Note：be sure to do this test, inverter and tested parts must be all separated!

EMC Guidance

According to the national standard of GB/T12668.3, DSI-400 complys with the requirements for electromagnetic interference and anti-electromagnetic interference.

DSI-400 series inverter meet international standard as below,the products have passed CE certification.

IEC/EN 61800-5-1 ：2003 Safety Regulationson Commissionable Electric Drive System

IEC/EN 61800-3：2004 Commissionable Electric Drive System

To obtain good electromagnetic compatibility in general industrial environment, please refer to the following instruction：

Installation of EMC guidance：

1) Ground wire of inverter and other electrical products should be well grounded.

2) Try not set parallel arrangement for inverter input/output power line and weak electric signal lines, set vertical arrangement if possible.

3) The inverter output power line is recommended to use shielded cable, or steel shielded power line, and shielding layer should be reliable grounded. Twisted pair shielded control cable is recommended for wiring of interference device.

4) If the distance between the inverter and the motor exceeds 100 meters, output filter or reactor shall be installed.

Input filter installation EMC guidance：

1) Note：The filters should strictly be used according to the rated value. As filter belongs to class I appliances, filter metal shell ground shold be large area well connected to installation cabinet metal gound, and good conductive continuity is required. Otherwise there will be risk of electric shock and serious impact on the EMC effect.

2) EMC test proves, filter and PE end must be connected to the same public ground, otherwise it will seriously affect the EMC effect.

3) Filter should be installed as close as possible to the inverter power supply input.

Section I. Product Information

PENTAX frequency inverters have been tested and inspected before leaving the manufacturer. Before unpacking the product, please check product packaging for shipping damage caused by careless transportation and whether the specifications and type of the product complies with the order. If any questions, please contact the supplier of PENTAX products, or directly contact the company.

※ Inspect that the contents are complete (one unit of DSI-400 frequency inverter, one operation manual).

※ Check the nameplate on the side of the frequency inverter to ensure that the product you have received is right the one you ordered.

1.1 Nameplate specification

1.2 Model specification

Variable Frequency Inverter

MODEL: DSI-400-1K5G3-00

POWER: 1.5KW

INPUT: 3PH 400V~ 5.2A 50Hz/60Hz

OUTPUT: 3PH 0-400V~ 3.7A 50HZ/60HZ

Pentax Inverter

DSI-400 – K75 G3-00

Inverter Series	
K75	0.75kW
1K5	1.5kW
011	11kW
018	18.5kW
055	55kW
110	110kW

No.	Voltage
1	Single-phase220V
3	Three-phase380V
00	Option Card

No.	Inverter Type
G	General type
P	Fan pump type

GP unification Model description	Users check factory models through P0.00. P type is one lower power than G type. E.g：If you need 11kw P type, 7.5kw G type could be selected as a replacement. Its input current is the rated input current (20.5A) of 7.5kw G type, but its rated power is that of 11kw G type, and output current is the rated output current(25A) of 11kw G type.

	Though inverter hardware of GP unification is different, there are some optimization of software parameters for different load types . P type model is only suitable for pump, fan etc light load models, can not work at the rated current or more than the rated frequency for a long time.

1.3 Product series

Inverter model	Motor adapter		Rated input A	Rated output A
	kW	HP		
1PH single phase input：AC 220V，50/60Hz				
DSI-400-K40G1-00	**0.4**	0.5	5.9	**2.5**
DSI-400-K75G1-00	**0.75**	1	8.3	**4**
DSI-400-1K5G1-00	**1.5**	2	14.1	**7**
DSI-400-2K2G1-00	**2.2**	3	24.2	**10**
DSI-400-004G1-00	**4.0**	5.5	34.0	**16**
3PH 3-phase input：AC 380V，50/60Hz				
DSI-400-K75G3-00	**0.75**	1	4.3	**2.5**
DSI-400-1K5G3-00	**1.5**	2	5.2	**3.7**
DSI-400-2K2G3-00	**2.2**	3	6.0	**5**
DSI-400-004G3-00	**4.0**	5	10.5	**8.5**
DSI-400-5K5G3-00	**5.5**	7.5	15.5	**13**
DSI-400-7K5G3-00	**7.5**	10	20.5	**16**
DSI-400-011G3-00	**11.0**	15	27.5	**25**
DSI-400-015G3-00	**15.0**	20	37.1	**32**
DSI-400-018G3-00	**18.5**	25	41.9	**38**
DSI-400-022G3-00	**22**	30	49.3	**45**
DSI-400-030G3-00	**30**	40	65.7	**60**
DSI-400-037G3-00	**37**	50	80.6	**75**

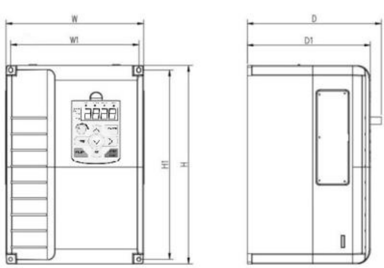
DSI-400-045G3-00	**45**	60	96.4	**90**
DSI-400-055G3-00	**55**	70	117.6	**110**
DSI-400-075G3-00	**75**	100	166.4	**150**
DSI-400-093G3-00	**90**	125	184.3	**170**
DSI-400-110G3-00	**110**	150	226.8	**210**
DSI-400-132G3-00	**132**	175	268.1	**250**
DSI-400-160G3-00	**160**	210	321.1	**300**
DSI-400-187G3-00	**185**	245	368.0	**340**
DSI-400-200G3-00	**200**	260	406.6	**380**
DSI-400-220G3-00	**220**	300	442.7	**415**
DSI-400-250G3-00	**250**	350	503.0	**470**
DSI-400-280G3-00	**280**	370	555.9	**520**
DSI-400-315G3-00	**315**	500	650.7	**600**
DSI-400-355G3-00	**355**	420	734.5	**650**
DSI-400-400G3-00	**400**	530	787.6	**725**
DSI-400-450G3-00	**450**	595	846.0	**820**
DSI-400-500G3-00	**500**	670	885.0	**860**

Table 1-3

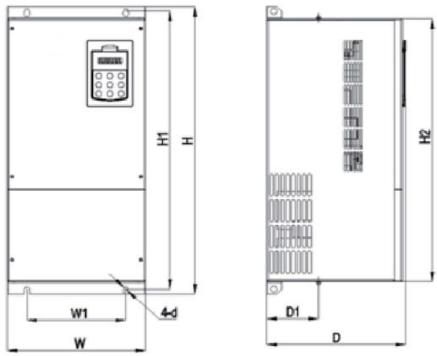
1.4 Product shape

1.4.1 Product Outline, Mounting Dimension, and Weight

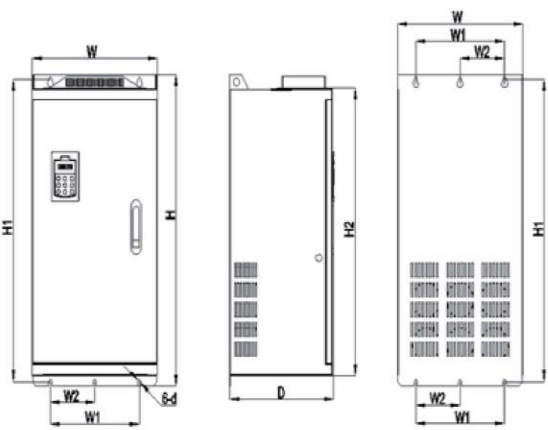
DSI-400−K40G1 ~ DSI-400−2K2G1K, DSI-400−R75G3~ DSI-400-022G3/030P3 class



DSI-400−030G3/037P3~DSI-400-090G3/110P3 class



DSI-400−110G3/132P3~DSI-400-315G3/355P3 class



DSI-400−355G3/400P3~DSI-400-500G3 class

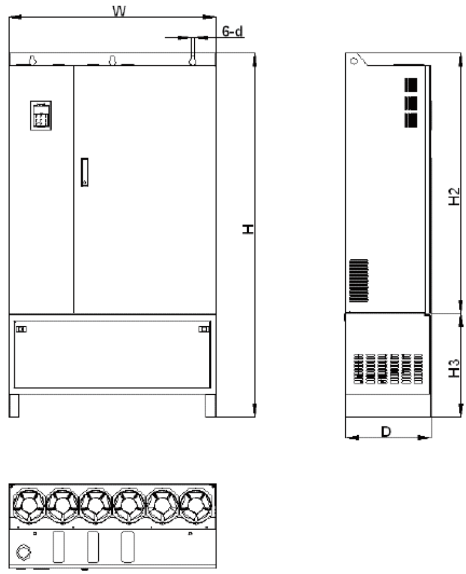

W
6-d
H
H2
H3
D

Fig.1−4 Product outline and mounting dimension

Shape DIM	Shape dimension（mm）			Installation dimension（mm）				note
	W	H	D	W1	H1	D1	Assembly	
DSI-400-K40G1	118	185	164	106	175	156	M4	
DSI-400-K75G1								
DSI-400-1K5G1								
DSI-400-2K2G1								
DSI-400−K75G3								
DSI-400-1K5G3								
DSI-400-2K2G3								
DSI-400-004G3								
DSI-400-5K5G3								
DSI-400-7K5G3/011P3	160	247	190	148	235	182	M5	
DSI-400-011G3/015P3								
DSI-400-015G3/018P3	220	320	210	205	306	202	M5	
DSI-400-018G3/022P3								
DSI-400-022G3/030P3								
DSI-400-030G3/037P3	250	400	244	230	380	232	M7	
DSI-400-037G3/045P3								
DSI-400-045G3/055P3	280	583	290	200	562	150	M10	
DSI-400-055G3/75P3								
DSI-400-075G3/90P3	300	688	340	200	667	——	M10	
DSI-400-090G3/110P3								

DSI-400-110G3/132P3	420	840	350	300	815	——	M11	
DSI-400-132G3/160P3								
DSI-400-160G3/185P3								
DSI-400−185G3/200P3	640	1035	395	500	1003	——	M13	
DSI-400−200G3/220P3								
DSI-400−220G3/250P3								
DSI-400−250G3/280P3								
DSI-400−280G3/315P3								
DSI-400−315G3/355P3								
DSI-400−355G3/400P3	960	1240	400	740	1205	——	M14	
DSI-400−400G3/450P3								
DSI-400−450G3								
DSI-400−500G3								

1.5 Standard specification

Item		Specifications	
Basic function	Control system	High performance of current vector control technology to realize asynchronous motor and synchronous motor control	
	Drive performance	High efficiency driving for induction motor and synchronous motor	
	Maximum frequency	Vector control：0~500Hz; V/F control：0~3200Hz	
	Carrier frequency	0.5k~16kHz;the carrier frequency will be automatically adjusted according to the load characteristics	
	Input frequency resolution	Digital setting： 0.01Hz Analog setting： maximum frequency ×0.025%	
	Control mode	Open loop vector control(SVC) Closed loop vector control(FVC) V/F control	
	Startup torque	Type G：0.5Hz/150%(SVC)；0Hz/180%(FVC)	
	Speed range	1：100(SVC)	Speed range
	Speed stabilizing precision	±0.5%(SVC)	Speed stabilizing precision
	Torque control precision	±5%(FVC)	
	Over load capability	G type： rated current 150% -1 minute, rated current 180% -3 seconds;	
	Torque boost	Auto torque boost function；Manual torque boost 0.1%~30.0%	
	V/Fcurve	Linear V/F, Multi-point V/F and Square V/F curve (power of 1.2, 1.4, 1.6, 1.8, 2)	
	V/F separation	In 2 ways：separation ,semi separation	
	Acc. /dec curve	Straight line or S curve acceleration and deceleration mode. Four kinds of acceleration and deceleration time. Acceleration and deceleration time range between 0.0s to 6500.0s	
	DC brake	DC brake frequency：0.00Hz to maximum frequency,brake time：0.0s to 36.0s, and brake current value： 0.0% to 100.0%.	
	Jog control	Jog frequency range：0.00Hz~50.00Hz. Jog acceleration/deceleration time 0.0s~6500.0s.	

	Simple PLC and MS speed running	It can realize at maximum of 16 segments speed running via the built-in PLC or control terminal.
	Built-in PID	It is easy to realize process-controlled close loop control system
	Auto voltage regulation (AVR)	It can keep constant output voltage automatically in case of change of network voltage.
	Over-voltage/current stall control	It can limit the running voltage/current automatically and prevent frequent over-voltage/current tripping during the running process
	Quick current limit	Minimize the over-current fault,protect normal operation of the inverter
	Torque limit & control	"Excavators" characteristics,automatically limit torque during operation,prevent frequent over-current trip; Closed loop vector mode can realize the torque control.
Personalized	Instantaneous stop non-stop	When instantaneous power off,voltage reduction is compensated through load feedback energy,which could make inverter keep running in a short period of time.
	Rapid current limit	To avoid inverter frequent over-current fault.
	Virtual IO	5 groups of virtual DI,DO to realize simple logic control
	Timing control	Timing control function：settimerange0Min~6500.0Min
	Multiple motor switch	4 groups of motor parameter,which can realize 4-motor switch control
	Multi-threaded bus support	Standard MODBUS：RS485
	Multi-encoder support	Support difference,open collector, UVW, rotary transformer, sine cosine encoder etc.
Running	Running command channel	Three types of channels：operation panel reference,control terminal reference and serial communication port reference.These channel scan be switched in various modes.
	Frequency source	There are totally eleven types of frequency sources, such as digital reference, analog voltage reference, analog current reference, pulse reference, MS speed, PLC, PID and serial port reference.
	Auxiliary frequency source	11 kinds of auxiliary frequency source which can flexible achieve auxiliary frequency tuning, frequency synthesis
	Input terminal	Standard： There are 7 digital input terminals,DI5 can be used as100kHz high-speed input pulse. 2 analog input terminals which can be used as 0-10V voltage input or

		0~20mA current input.
	Output terminal	Standard： 2 digital output terminals, FM is high-speed pulse output terminal (can be chosen as open circuit collector type), support 0~100kHz square wave signal; 2 relay output terminal; 2 analog output terminals, support 0~20mA output current or 0~10V output voltage;
Keyboard operation	LED display	Realize parameter setting,status monitoring function
	Keyboard potentiometer	Equipped with keyboard potentiometer or coding potentiometer
	Key lock&function selection	Realize button locking,define operation range for part of buttons to prevent operation fault.
	Protection function	It can implement power-on motor short-circuit detection,input/output phase loss protection, over current protection,over voltage protection,under voltage protection,overheating protection and overload protection.
	Optional parts	Differential input PG card, UVW differential input PG card, rotating inverter PG card, OC input PG card.
Environment	Using place	Indoor,and be free from direct sunlight,dust,corrosive gas, combustible gas,oil smoke, vapor,drip salt.
	Altitude	Below 1000m
	Ambient temperature	-10 ℃ to +40 ℃ (Derating use when under ambient temperature of 40 ℃ to 50 ℃)
	Humidity	Less than 95%RH, without condensing
	Vibration	Less than 5.9 m/s2(0.6g)
	Storage temperature	－20℃~＋60℃

Table：1-5.1

Section II.　Installation &Wiring

2.1　Use of the environment

1) Ambient temperature-10℃~40℃.
2) Avoid electromagnetic interference and keep the unit away from the source of interference.
3) Prevent dropping water, steam, dust powder, cotton fiber or fine metal powder from invasion.
4) Prevent oil, salt and corrosive gas from entering it.
5) Avoid vibration. Vibration should be less than 0.6G. Keep away from punching machine etc.
6) Avoid high temperature, moisture or being wet due to raining, with the humidity below 95%RH (non-condensing).
7) Prohibit the use in the dangerous environment where inflammable or combustible or explosive gas, liquid or solid exists.

2.2　Handling and installation

※ When transporting inverter, right lifting tools are required to prevent inverter from damaging.

※ The number of stacked box of the inverter are not permitted higher than the limit.

※ Please don’t run the inverter if there is damage or lacking of components.

※ Do not place heavy objects on the frequency inverter.

※ Please prevent screw, cable pieces or other conductive objects or oil etc inflammable objects invading the frequency inverter.

※ Do not make it fall or have a strong impact.

※ Confirm if the installation location and object could withstand the weight of the inverter. The frequency inverter must be installed by wall hooking、indoor room with adequate ventilation, with enough space left between it and the adjacent objects or retaining board (walls) around, as shown in the picture below：

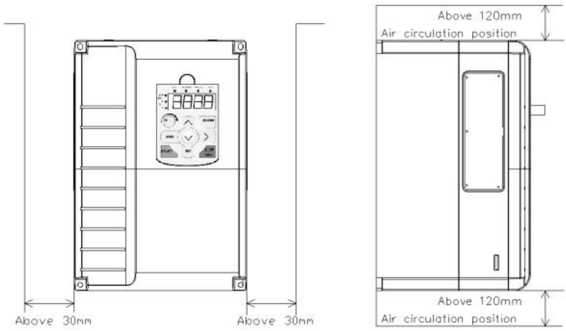


Fig. 2-2.1

Heat dissipation problems should be concerned when doing mechanical installation, please mind rules belows：

1) Mounting space is shown in 2-2.1, which could ensure the heat sinking space of the inverter. However, the heat sinking of other devices in the cabinet shall also be considered.
2) Install the inverter vertically so that the heat may be expelled from the top.However, the equipment cannot be installed upside down. If there are multiple inverters in the cabinet, parallel installation is better. In the applications where up-down installation is required, please install the thermal insulating guide plate referring to the Fig. 2-2.2 for standalone installation and up-down installation.
3) Installing support must be flame retardant materials.
4) It is suggested that cooling cabinet be put outside at places where powder dust exists. Space inside the sealed cabinet shall be large as much as possible.

2.4 Wiring

The wiring of frequency inverter includes two parts： main circuit and control circuit. Users must ensure correct connections according to the following connection diagram.

2.4.1 DSI-400 diagram

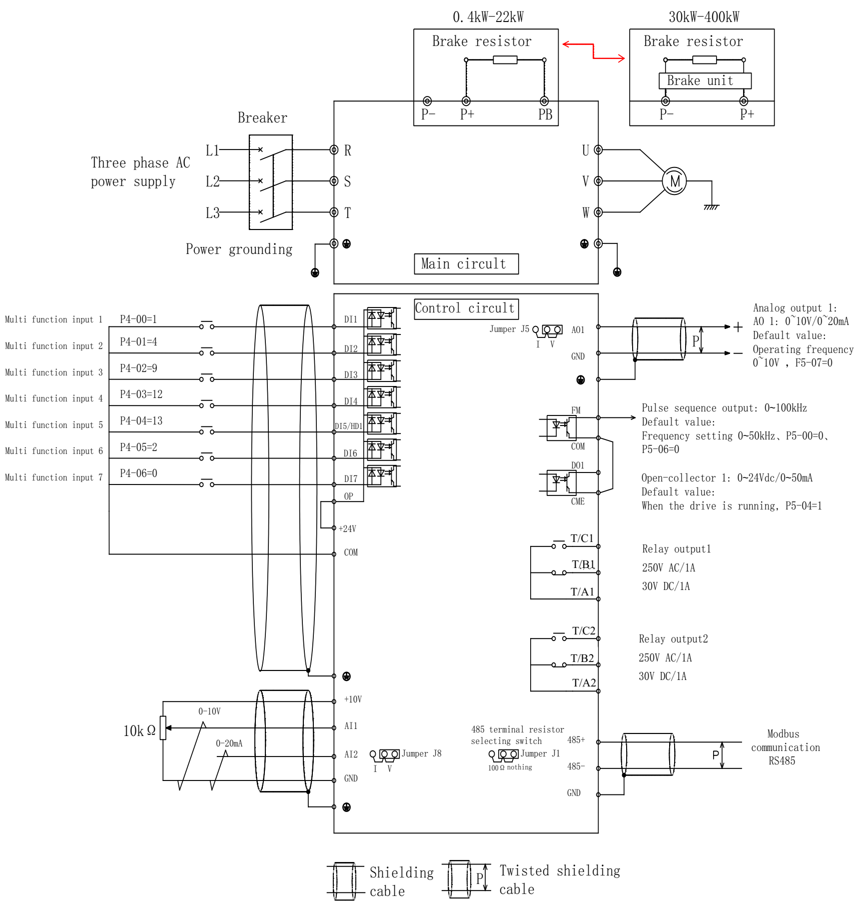


Fig. 2-4.1

2.5 Main circuit terminals (G type)

2.5.1 DSI-400 main circuit terminals

Terminal Name	Function description
R、S、T	Three phase power input terminal
P+、PB	External Break resistor reserved terminal(0.4KW~22KW)
U、V、W	Three phase AC output terminal
PE	Earth terminal

2.5.2 Caution of Main Circuit wiring

1）Input Power R、S、T：

□ AC Drive input side connection, no phase sequence requirements.

The specifications and installation methods of the external power wiring should comply with the local regulations and related IEC standards.

Please refer to the following table for power cable wiring：

2.6 Control circuit terminals

2.6.1 Control circuit terminal arrangement

DSI-400 Control circuit terminals

485+	485-	GND	DI1	DI2	DI3	DI4	DI5	DI6	DI7	COM
+10V	AI1	AI2	GND	AO1	DO1	FM	CME	COM	OP	+24V

T/A1	T/B1	T/C1
T/A2	T/B2	T/C2

2.6.2 Control circuit terminals description

Terminals function description：

Type	Terminal sign	Terminal Name	FunctionDescription
Power supply	+10V-GND	External terminal of 10V power supply	Provide +10V power supply for external units, with maximum output current of 10mA. It is generally used as the operating power supply for the external potentiometer. The potentiometer resistance range is 1kΩ to 5kΩ.
	+24V-COM	External terminalof24V power supply	Provide +24V power supply for external units. It is generally used as the operating power supply for digital input/output terminal and the external sensor. Maximum output current： 200mA
	OP	External power input terminals	When using external signal to drive DI1~DI7 ,OP should be connected to external power supply, connection with +24V(J9) as factory default.
Analog input	AI1-GND	Analog input terminal 1	Input voltage range： DC 0V to 10V
	AI2-GND	Analog input terminal 2	1.Input range：DC 0V~10V/4mA~20mA，chosen by jumper J8 on control board 2.Input impedance： 22kΩ of voltage input, 500Ω of current input.
Digital Input	DI1-OP	Digital Input 1	1. Optical coupling isolation，bipolar input. 2. Input impedance：4.7kΩ. 3. Electrical level input range：9V~30V.
	DI2-OP	Digital Input 2	
	DI3-OP	Digital Input 3	
	DI4-OP	Digital Input 4	

	DI5-OP	Digital Input 5	1. Input impedance：2.4 kΩ.
	DI6-OP	Digital Input 6	Same as DI1
	DI7-OP	Digital Input 7	Same as DI1
	HDI DI5-OP	High-speed pulse input terminal	DI5 can be used as high-speed pulse input channel. Maximum input frequency：100kHz.
Analog output	AO1-GND	Analog output 1	The voltage or current output is determined by jumper J5 on the control panel. Output voltage range： 0V to 10V Output current range： 0mA to 20mA.
Digital Output	DO1-CME	Digital output 1	Optical coupling isolation,dual polarity open collector output. Output voltage range：0V to 24V Output current range：0mA to 50mA
	FM-CME	High-speed pulse output	High-speed pulse output , maximum frequency can reach 100kHz. Function code P5.00 as constraints. As open collector output, the function is same as DO1.
Relay output1	TA1-TB1	Normally closed	Contact driving capacity：AC250V，3A，COSø=0.4
	TA1-TC1	Normally open	
Relay output2	TA2-TB2	Normally closed	Contact driving capacity：AC250V，3A，COSø=0.4
	TA2-TC2	Normally open	
communication	485+ 485-	MODBUS	MODBUS port, non isolation

2.6.3 Description of wiring of control terminals

1） Analog input terminal

Because the weak analog signal will be easily affected by the external interference, generally shielded cable shall be used, the cable length shall be as short as possible and no longer than 20 meters, as shown in Fig. 2-6.1. In case the analog signal is subject to severe interference, analog signal source side shall be installed with filter capacitor or ferrite magnetic ring, as shown in Fig.2-6.2.

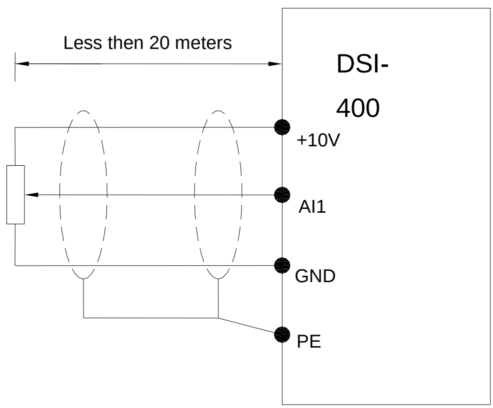


Fig. 2-6.1 Analog input terminal wiring diagram

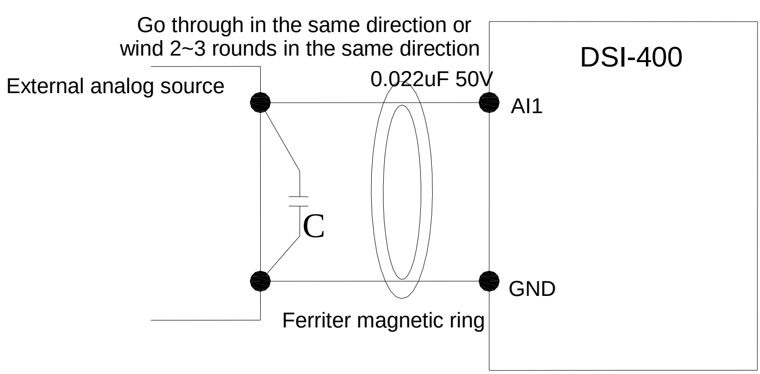


Fig.2-6.2Analog input terminal processing wiring diagram

2) Digital input terminal

It needs to employ shielded cable generally, with wiring distance of no longer than 20 meters. When valid driving is adopted, necessary filtering measures shall be taken to prevent the interference to the power supply.

It is recommended to use the contact control mode.

a) DI terminal wiring method (The drain wiring mode)

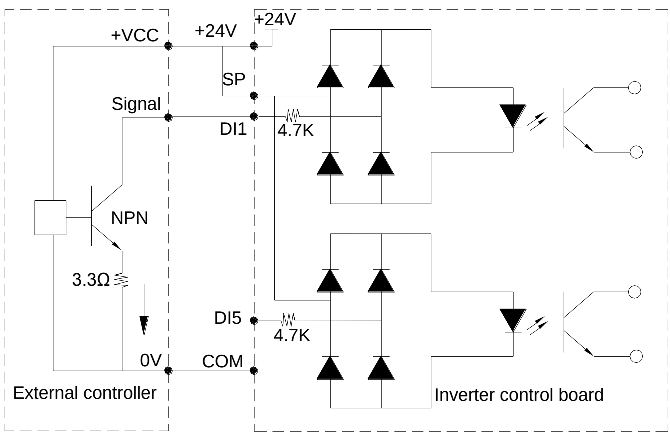


Fig.2-6.3 Drain wiring mode

This is one of the most commonly used connection mode. If you use an external power supply, J9 jumper must be removed, and connect the external positive power supply to OP,while negative power supply to DI port.

b)DI terminal wiring method (The source wiring mode)

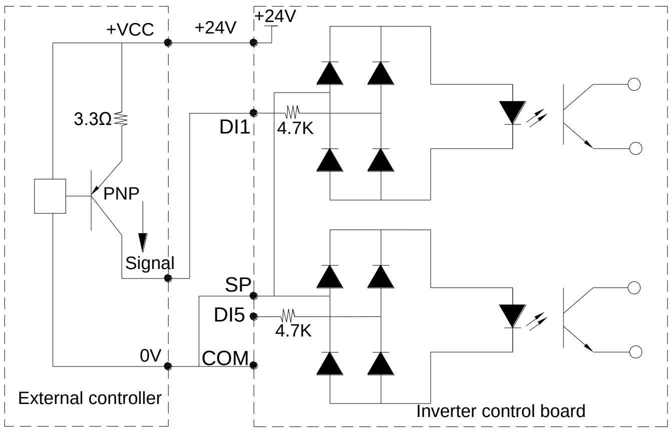


Fig. 2-6.4 Source wiring mode

This connection mode must make OP of jumper J9 connect to COM port,and connect +24V and public terminal of external controller together.If you use an external power supply,jumper J9 must be removed,and connect external negative power supply to OP ,while positive power supply to DI port.

2） Digital output terminal

When drive relay is essential for digital output terminal,you should add absorption diode to both sides of relay coil.Or +24V dc power supply will be easily damaged.

Caution： The polarity of the absorption diode must be installed correctly according to the picture below.Or +24V dc power supply will immediately get burnt after digital output terminal outputs.

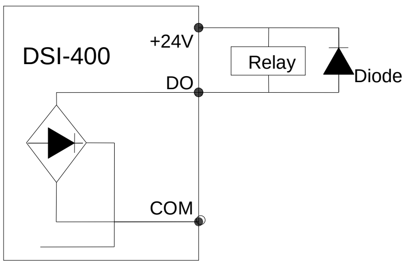


Fig. 2-6.5 Digtal output terminal wiring diagram

2.7 Standby circuit

Inverter fault or jump may cause great breakdown loss or other accident. To avoid this happens, please add the standby circuit below to ensure security.

Note: Confirm and test the running characteristic of the standby circuit, make sure that the industrial phase and the converter phase are in the same direction.

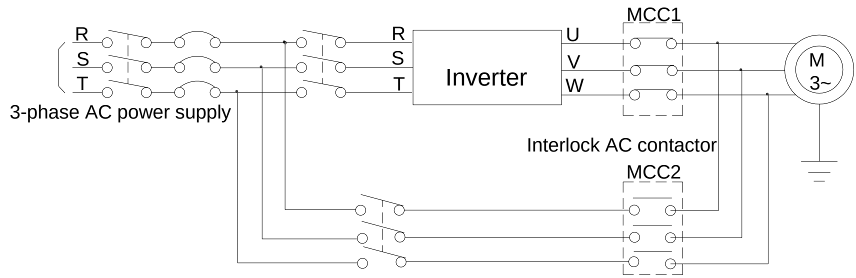


Fig. 2-7.1

Section III. Fittings

3.1 Connection with peripheral devices

3.1.1 Connection of the Product and Peripheral Devices

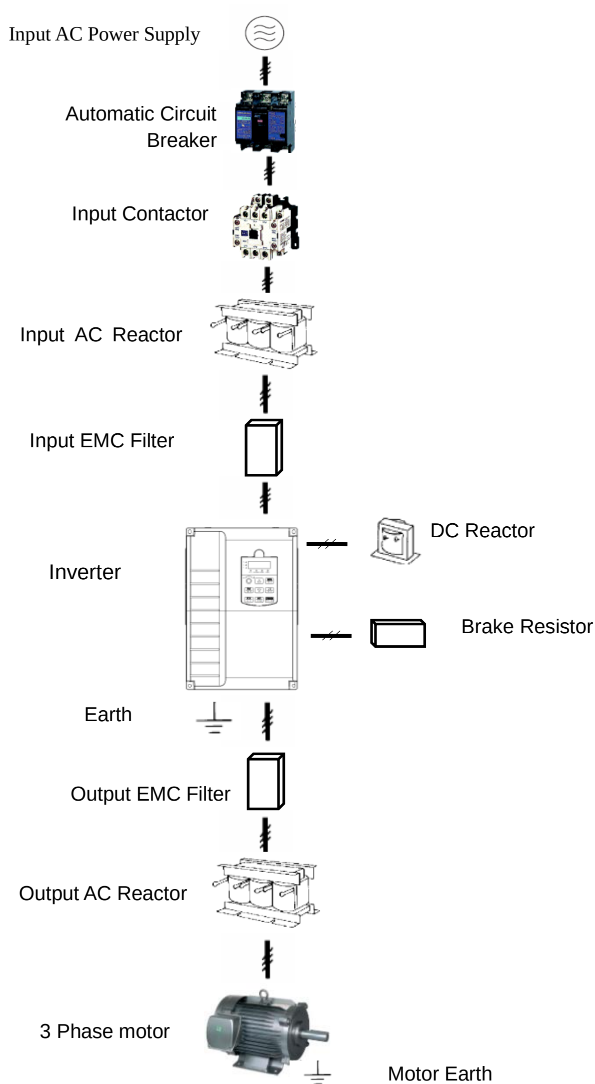


Fig.3-1 Connection diagram of the product and peripheral devices

3.1.2 Peripheral Electric Parts of DSI-400

Part Name	Installation Location	Function Description
Circuit breaker	The front-end of the input circuit	Disconnect the power supply in case of downstream equipment is over current
Contactor	Between the circuit breaker and the inverter input side	Power-on and power-off of the inverter.Frequent power-on/power-off operation(at least once per minute) on the inverter should be avoided
AC input reactor	Inputsideof the inverter	Improve the power factor of the input side： 1.Eliminate the high order harmonics of the input side effectively, and prevent other equipment from damaging due to voltage waveform deformation. 2.Eliminate the unbalanced input current due to the unbalanced power phases.
EMC input filter	Input side of the inverter	1.Reduce the external conduction and radiation interference of the inverter; 2.Reduce the conduction interference flowing from thepower end to the inverter, thus improving the anti-interference capacity of the inverter. 3.The common size of 3-phase EMI noise filter is shown as following： confirm the power supply is 3-phase three lines or 3-phase four lines or single phase. Grounding wire is as short as possible, try to place the filter near the converter. Please choose EMI filter when the inverter is used in residential area, commercial area, science area as well as situations where higher demand to prevent radio interference is needed or meeting CE、UL、CSA standard but existing equipment that anti-interference ability is not sufficient. If needing the filter, please connect with the company.
DC reactor	DSI-400 series can adopt external DC reactor according to the need.	Improve the power factor of the input side： 1.Improve the overall efficiency and thermal stability 2.Effectively reduce the influence of high order

		harmonics at the input side on the inverter and reduce the external conduction and radiation interference.
AC output reactor	Between the inverter output side and the motor,close to the inverter	The inverter output side generally has higher harmonic.When the motor is far from the inverter, since there are many capacitors in the circuit, certain harmonics will cause resonance in the circuit and bring in the following results： 1.Degrade the motor insulation performance and damage the motor for the long run 2.Generate large leakage current and cause frequent inverter protection action 3.In general, if the distance between the inverter and the motor exceeds 100 meters, output AC reactor should be installed
Output EMI filter	Between the inverter output side and the motor,close to the inverter	The fittings can restrain the disturbance noise and lead line leak current produced in the output side.

Table：3-1.1

3.2 Mounting hole dimension

3.2.1 Braking unit & Braking resistance

When customers choose the type with braking,there will be braking unit inside the inverter, maximum braking torque is 50%.Please refer to the table below and choose the matched braking resistance separately.

Shape DIM	Braking unit	Braking unit			Braking moment %
		Braking		Quantity	
DSI-400−K40G1	Standard built−in	100W	300Ω	1	220
DSI-400−K75G1		120W	200Ω	1	125
DSI-400−1K5G1		300W	100Ω	1	125
DSI-400−2K2G1		300W	70Ω	1	120
DSI-400−K75G3		100W	300Ω	1	130
DSI-400−1K5G3		200W	300Ω	1	125
DSI-400−2K2G3		200W	200Ω	1	135
DSI-400−3K7G3		400W	150Ω	1	135
DSI-400−5K5G3		500W	100Ω	1	135
DSI-400−7K5G3		800W	75Ω	1	130
DSI-400−011G3		1040W	50Ω	1	135
DSI-400−015G3		1560W	40Ω	1	125
DSI-400−018G3		4800W	32Ω	1	125
DSI-400−022G3		4800W	27.2Ω	1	125
DSI-400−030G3	outlay	6000W	20Ω	1	125
DSI-400−037G3		9600W	16Ω	1	125
DSI-400−045G3		9600W	13.6Ω	1	125
DSI-400−055G3		6000W	20Ω	2	135
DSI-400−075G3		9600W	13.6Ω	2	145

Table：3-2.1

If you need accessories in the table,please declare in order.

For larger built-in braking torque,please use the PENTAX　braking unit.do ou can refer to PENTAX　braking unit manual for details.

Other large power models do not contain a built-in braking.If large power model need to be equipped with braking function,please choose PENTAX　braking unit.

External DC reactor installation：

For DSI-400 series inverter, external DC reactor can be ordered according to your needs.When installation,you should tear down copper platoon between DC+1 and DC+2 of inverter main circuit.And then add reactor between DC+1 and DC+2,wiring between reactor terminals and inverter terminals DC+1 and DC+2 have no polarity. After installation of dc reactor,short circuit copper platoon between DC+1 and DC+2 is no more used.

3.2.2 Specifications of circuit breaker、cable and contactors

Shape DIM	breaker（A）	contactor（A）	R、S、T、⊕、B、⊖、U、V、W			Terminal screwPE ⏚		
			Terminal screw	Fastening Moment (N·m)	Wire standard (mm^2)	Terminal screw	Fastening Moment (N·m)	Wire standard (mm^2)
DSI-400−K40G1	16	10	M4	1.2～1.5	2.5	M4	1.2～1.5	2.5
DSI-400−K75G1	25	16	M4	1.2～1.5	2.5	M4	1.2～1.5	2.5
DSI-400−1K5G1	32	25	M4	1.2～1.5	4	M4	1.2～1.5	2.5
DSI-400−2K2G1	40	32	M4	1.2～1.5	6	M4	1.2～1.5	4
DSI-400−K75G3	10	10	M4	1.2～1.5	2.5	M4	1.2～1.5	2.5
DSI-400−1K5G3	16	10	M4	1.2～1.5	2.5	M4	1.2～1.5	2.5
DSI-400−2K2G3	16	10	M4	1.2～1.5	2.5	M4	1.2～1.5	2.5
DSI-400−3K7G3	25	16	M4	1.2～1.5	4	M4	1.2～1.5	4
DSI-400−5K5G3	32	25	M4	1.2～1.5	6	M4	1.2～1.5	6
DSI-400−7K5G3	40	32	M4	1.2～1.5	6	M4	1.2～1.5	6
DSI-400−011G3	63	40	M5	2.5～3.0	6	M5	2.5～3.0	6
DSI-400−015G3	63	63	M5	2.5～3.0	6	M5	2.5～3.0	6
DSI-400−018G3	100	63	M6	4.0～5.0	10	M6	4.0～5.0	10
DSI-400−022G3	100	100	M6	4.0～5.0	16	M6	4.0～5.0	16
DSI-400−030G3	125	100	M6	4.0～5.0	25	M6	4.0～5.0	16
DSI-400−037G3	160	100	M8	9.0～10.0	25	M8	9.0～10.0	16
DSI-400−045G3	200	125	M8	9.0～10.0	35	M8	9.0～10.0	16
DSI-400−055G3	315	250	M10	17.6～22.5	50	M10	14.0～15.0	25
DSI-400−075G3	350	330	M10	17.6～22.5	60	M10	14.0～15.0	35
DSI-400−090G3	315	250	M10	17.6～22.5	70	M10	14.0～15.0	35
DSI-400−110G3	350	330	M10	17.6～22.5	100	M10	14.0～15.0	50
DSI-400−132G3	400	330	M12	31.4～39.2	150	M12	17.6～22.5	75
DSI-400−160G3	500	400	M12	31.4～39.2	185	M12	17.6～22.5	50×2
DSI-400−200G3	630	500	M12	48.6～59.4	240	M12	31.4～39.2	60×2
DSI-400−220G3	800	630	M12	48.6～59.4	150×2	M12	31.4～39.2	75×2
DSI-400−280G3	1000	630	M12	48.6～59.4	185×2	M12	31.4～39.2	100×2
DSI-400−315G3	1000	800	M14	48.6～59.4	250×2	M14	31.4～39.2	125×2
DSI-400−355G3	1200	800	M14	48.6～59.4	325×2	M14	31.4～39.2	150×2
DSI-400−400G3	1500	1000	M14	48.6～59.4	325×2	M14	31.4～39.2	150×2

Table：3-2.3

Section IV.　Keyboard Operation

4.1　Keyboard size

4.1.1　DSI-400 keyboard specification

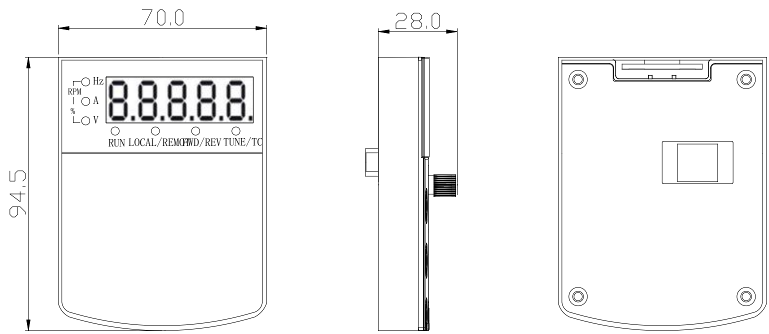


Fig. 4-1.1

4.1.2　Keyboard warehouse JP3 dimension

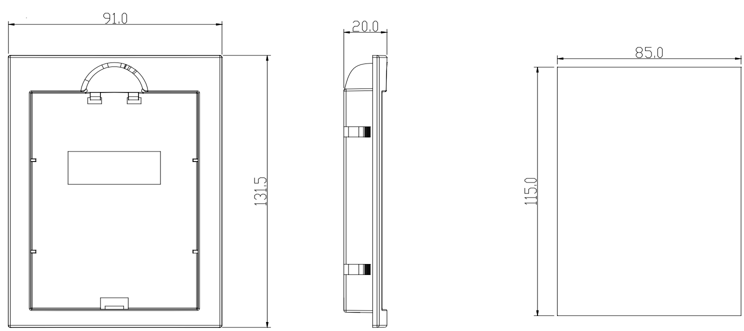


Fig. 4-1.2

4.2 Display Interface

Modification of function parameter, monitoring of inverter operation, control of inverter operation (start and stop) can be performed through the operation panel.Its shape and function area are shown as below：

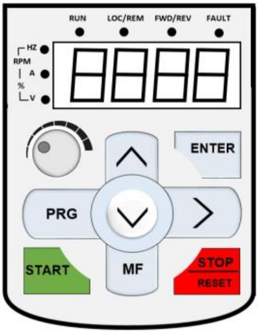


Fig. 4-2.1

4.2.1 Function description of operation panel

Keyboard Parameter	Description
FWD/REV	Forward/Reserved Running Light *ON：forward running *OFF：Reserved running
RUN	Running indicator *ON：running state *OFF：stop state
LOCAL/REMOT	Command source indicator keyboard operation, terminal operation and remote operation(communication control) indicator *ON：terminal operation control state *OFF：keyboard operation control state *Flashing：remote operation control state

TUNE/TC	Tuning/Fault indicator *ON：torque control mode *Slow flashing：tuning state *Quick flashing：fault state
Hz A V RPM(Hz+A) %(A+V	Unit indicator * Hz　 frequency unit *A　current unit *V voltage unit *RMP(Hz+A)revolving speed unit *％(A+V)percentage
Digital display	Digital display area *5-bit LED display,monitor set frequency,output frequency,various monitoring data,alarm code etc.
PRG+>/SHIFT=QUICK	Menu mode selection code,shift different menu mode according to the value of PP.03 (Function parameter mode as default)
PRG	Programming key *Primary menu enter or exit
>/SHIFT	Shift key *On the stop display interface or running display interface, it can be used to circularly select the display parameters. When modifying the parameters, it can be used to select the bits of parameter for modification
ENTER	Confirmation key *Gradually step into the menu screen,set parameters confirmation
∧	Increase key *Increase of the data or function code
∨	Decrease key *Decrease of the data or function code
MF/REV	Multi-function selection key *It is used as functions witching selection according to P7-01.

Potentiometer	Potentiometer * P0.03 is set to 4 as default;
RUN	Running key * It is used to start the running of the inverter under keyboard control mode
STOP/RESET	Stop/reset * In running status,it can stop the running by pressing this key. In alarm status,it can reset operation with this key. The characteristics of this key are limited by function code P7.02.

Table 4-2.1

4.3 Examples for parameter setting

4.3.1 Description of function code viewing and modification method

The operation panel of DSI-400 inverter adopts three-level menu structure to perform parameter setting.The three-level menu includes：function parameter group(level1menu)→ function code(level 2 menu)→setting value of function code(level 3 menu).The operation process is as shown in Figure below.

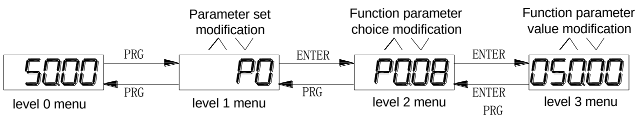


Table 4-3.1

Caution： When operating on level 3 menu, press PRG key or ENTER key to return to level 2 menu. The difference between ENTER and PRG keys is that pressing ENTER KEY will save the setup parameter and return to level 2 menu and then automatically shift to the next function code, while pressing PRG key will directly return to level 2 menu without saving the parameter, and it will return to the current function code.

Take the modification of function code P3.02(ranging from 10.00Hz to 15.00Hz) as an example. (The boldface bit indicates the flashing bit).

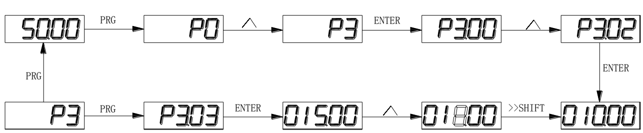


Table 4-3.2

In level 3 menu, if the parameter has no flashing bit, it indicates that the function code cannot be modified. The possible reasons include：

1) The function code is an unchangeable parameter, such as actual detection parameter, running record parameter, etc.

2) The function code cannot be modified in running status but can be modified after the unit is stopped.

4.3.2 Parameter display mode

Parameter display mode is mainly established to view different arrangement forms of function parameters according to user's actual needs.3 kinds of display mode：

Name	Description

Function parameter mode	Sequence display inverter function parameters ,there are P0~PF、A0~AF、U0~UF function groups respectively.
User set parameter mode	User set individual function parameters(32 at most), parameters that needed to be displayed can be set through PE group
User modify parameter mode	Inconsistent with factory default parameters

Table 4-3.1

Relevant function parameters PP.02、PP.03, set as below：

PP.02	Parameters display mode attributes		Default value	11
	Set range	1bit	U group display selection	
		0	No display	
		1	Display	
		10bit	A group display selection	
		0	No display	
		1	Display	
PP.03	Individual parameter mode display selection		Default value	00
	Set range	1bit	User set parameter display selection	
		0	No display	
		1	Display	
		10bit	User modify parameter display selection	
		0	No display	
		1	Display	

Table 4-3.2

When there is 1bit display existing in the individual parameter mode display selection(PP.03), you can enter different parameter display mode by pressing PRG+>>/SHIFT key at the same time. Each parameter display codes：

Parameter display mode	Display
Function parameter mode-FunC	-FunC
User set parameter mode -USEt	-USEt
User modify parameter mode -U--C	-U--C

Table 4-3.3

Switching mode as below：

E.g：To switch current function parameter mode to user set parameter mode.

Fig. 4-3.3

4.3.3 User set parameter operation mode

User set menu is established for quick checkup and modification. The display mode is "uP3.02",which represents function parameter P3.02. It has the same effect of modifying parameter in user set menu and normal programming state.

Function parameters of user set menu come from PE group.PE group chooses function parameter：when PE is set to P0.00 ,it means no choosing,totally 30 functions can be set. If display "NULL" when entering menu, it means user set menu is null.

16 parameters have been stored at initial time for user's convenience：

P0.01：Control mode	P0.02：Command source selection
P0.03：Main frequency source selection	P0.07：Frequency source selection
P0.08：Preset frequency	P0.17：Acceleration time
P0.18：Deceleration time	P3.00：V/F curve set
P3.01：Torque boost	P4.00：DI1Terminal function selection
P4.01：DI2terminal function selection	P4.02：DI3 terminal function selection
P5.04：DO1output selection	P5.07：AO1 output selection
P6.00：Startup mode	P6.10：Stop mode

Users could modify the user set parameter according to specific need of your own.

4.3.4 Check method of state parameter

When the inverter is in stop or running status, multiple status parameters can be displayed. It can select if this parameter is to be displayed in binary bit with the function codes P7.03 (running parameter1) , P7.04 (running parameter2) and P7.05(stop parameter).

In stop status, there are 4 running state parameter：set frequency, bus voltage,analog input voltage AI1, analog input voltage AI2 which of them are of default display.Other display parameters respectively：DI input state,DO output state,analog input voltage AI3, actual count value, actual length value, PLC running steps, load speed display, PID set, PULSE input pulse frequency and 3 reserved parameters (whether to display or not is determined by function code P7.05 binary bit choice). Selected parameter are switched in sequence order.

In running status, there are a total of 5 running status parameters, including：setup frequency, running frequency, bus voltage,output voltage,output current ,which of them are of default display. Other display parameters respectively ：output power, output torque, DI input state,DO output state, analog input voltage AI1, analog input voltage AI2, analog input voltage AI3, actual count value, actual length value, linear velocity, PID set, PID feedback etc. Whether to display or not is determined by function code P7.03、P7.04 binary bit choice. Selected parameter are switched in sequence order.

When inverter power on after powered off , the display parameter is the one that chosen before power off as default.

4.3.5 Password Setting

The inverter provides user password protection function. When PP.00 is set to non-zero value, it is user password and enabled after exiting the function code editing status. When the user presses the PRG key again, "-----"will be displayed to require the user to enter user password, or the user cannot enter the general menu.

To cancel the password protection function, the user needs to enter the relevant interface through password, and change the PP.00 setting to 0.

4.3.6 Motor parameter automatic tuning

Vector control running mode：before running, user must accurately input motor nameplate parameters. DSI-400 series inverter will be matching standard motor parameter according to this nameplate. Vector control methods are very much dependent on motor parameters, to get good control performance, accurate control motor parameters must be acquired.

Motor parameter auto tuning procedure is as follows：

Firstly, select command source(P0.02) as operation panel command channel.Secondly, input parameters below in accordance with motor actual parameter：

Motor selection	Parameter	
Motor 1	P1.00：Motor type selection	P1.01：Motor rated power
	P1.02：Motor rated voltage	P1.03：Motor rated current
	P1.04：Motor rated frequency	P1.05：Motor rated revolving speed
Motor 2	A2.00：Motor type selection	A2.01：Motor rated power
	A2.02：Motor rated voltage	A2.03：Motor rated current
	A2.04：Motor rated frequency	A2.05：Motor rated revolving speed
Motor 3	A3.00：Motor type selection	A3.01：Motor rated power
	A3.02：Motor rated voltage	A3.03：Motor rated current

	A3.04：Motor rated frequency	A3.05：Motor rated revolving speed
Motor 4	A4.00：Motor type selection A4.02：Motor rated voltage A4.04：Motor rated frequency	A4.01：Motor rated power A4.03：Motor rated current A4.05：Motor rated revolving speed

Table 4-3.4

E.g：Asynchronous motor parameter tuning

If motor and the load can be totally separated, please select P1.37(Motor 2\3\4 as A2\A3\A4.37) to 2(Asynchronous machine complete tuning), then press RUN key on keyboard panel, inverter will automatically calculate the motor of the following parameters：

Motor selection	Parameter
Motor 1	P1.06：Asynchronous motor stator resistance P1.07： Asynchronous motor rotor resistance P1.08： Asynchronous motor leakage inductance P1.09： Asynchronous motor mutual inductance P1.10： Asynchronous motor no-load current
Motor 2	A2.06： Asynchronous motor stator resistance A2.07： Asynchronous motor rotor resistance A2.08： Asynchronous motor leakage inductance A2.09： Asynchronous motor mutual inductance P2.10： Asynchronous motor no-load current
Motor 3	A3.06： Asynchronous motor stator resistance

	A3.07： Asynchronous motor rotor resistance A3.08： Asynchronous motor leakage inductance A3.09： Asynchronous motor mutual inductance P3.10： Asynchronous motor no-load current
Motor 4	A4.06： Asynchronous motor stator resistance A4.07： Asynchronous motor rotor resistance A4.08： Asynchronous motor leakage inductance A4.09： Asynchronous motor mutual inductance P4.10： Asynchronous motor no-load current

Table4-3.5

If motor and the load can not be totally separated, please select P1.37(Motor 2\3\4 as A2\A3\A4.37) to 1(Asynchronous machine static tuning), then press RUN key on keyboard panel.

4.4 Test running

DSI-400 General machine type factory setting value

Code	Factory setting	Description
P0.01	0	Speed sensorless vector control(SVC)
P0.02	0	Operation panel command channel(LED OFF)
P0.03	4	AI3(Potentiometer)

Users set motor parameters P1.00~P1.05 to correct values, after parameters auto tuning, motor operation can be directly controlled through keyboard, while frequency can be set through keyboard potentiometer.

Section V.　Parameter Function Table

Caution：

The symbols in the function table are explained as follows：

"★"：indicates that the parameter setup value cannot be modified when the inverter is in the running status.

"●"：indicates that the parameter value is the actual detection record and cannot be modified.

"☆"：indicates that the parameter setup value can be modified when the inverter is in stop status and running status.

"▲"：indicates that the parameter is "Factory default parameter" and can be set only by the manufacturer, and the user is forbidden to perform any operation.

"-"：indicates that the parameter factory value is relevant to power or model, for specifications please refer to corresponding parameter description.

"Change limit" indicates if the parameter is adjustable during operation.

When PP.0 is set to non-zero value, it means that the parameter protection password is set and only when correct password is input can the user enter the parameter menu. To cancel the password, PP.00should be set to 0.

In the user set parameter mode , parameter menu is not protected by password protection.

P group, A group are of basic function parameters, U group is the monitor function group.

5.1　Monitor function group：U0.00-U0.61

U0 parameter group is used to monitor inverter running status .Customers can check through panel for field commissioning as well as read parameter value through communication for position machine monitoring. Among which, U0.00~U0.31 is defined for running or stop monitor parameter by P7.03 and P7.04.

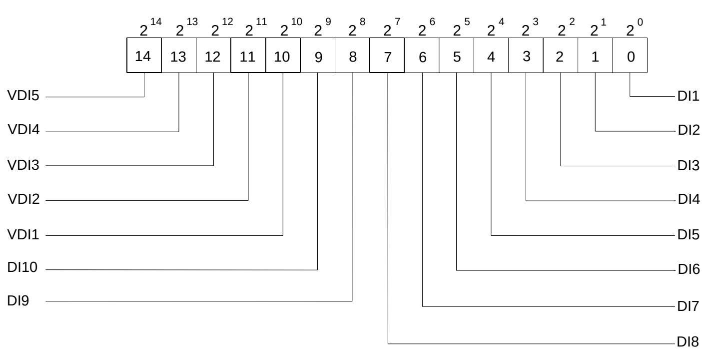
For specific parameter function code、parameter name and minimum unit, please refer to the table below.

Function code	Designation	Unit
U0.00	Running frequency(Hz)	0.01Hz
Inverter current actual setting frequency		

U0.01	Setting frequency(Hz)	0.01Hz
Inverter current actual output frequency		
U0.02	DC bus voltage(V)	0.1V
Detection value of DC bus voltage		
U0.03	The output voltage(V)	1V
Inverteractual output voltage		
U0.04	Motor output current(A)	0.01A
Valid value of motor actual current		
U0.05	The output power(kW)	0.1kW
The calculated value of actual output power of motor		
U0.06	Output torque(%)	0.1%
The output torque of the motor		
U0.07	DI input status	1

IO input status，it’s value is a hexadecimal digit.Each bit corresponds to each input terminal state：

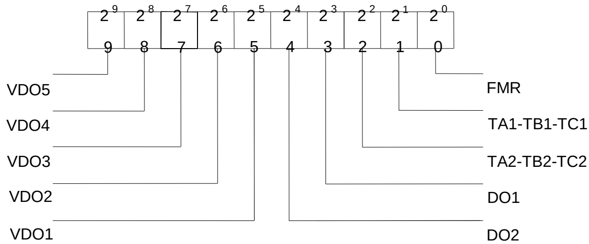
0~14 bit	Input status
0	Invalid
1	Valid



U0.08	Y output status	1

IO output status，it's value is a hexadecimal digit.Each bit corresponds to each output terminal state ：

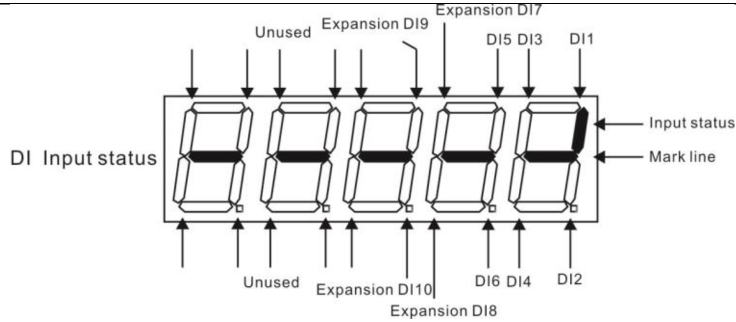
0~9 bit	Output status
0	Invalid
1	Valid



U0.09	AI1 voltage(V)	0.01V
AI1 input voltage, corrected by AC.00~AC.03		
U0.10	AI2 voltage(V)	0.01V
AI2 input voltage, corrected by AC.04~AC.07		
U0.11	AI3 voltage(V)	0.01V
AI3 input voltage, corrected by AC.08~AC.11		
U0.12	Count value	1
Fb function group count function Pb.08~Pb.09		
U0.13	Length value	1
Fb function group fixed length function Pb.05~Pb.07		
U0.14	Load speed display	1
Motor actual running speed		
U0.15	PID set point	1
PID percentage of reference value for running adjustment.		
U0.16	PID feedback	1

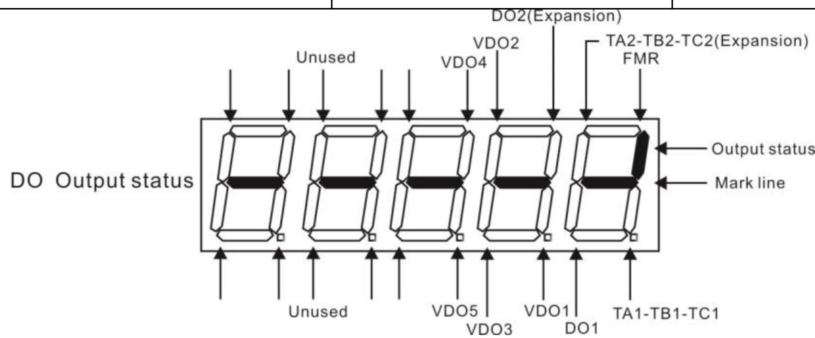
PID percentage of feedback value for running adjustment.		
U0.17	PLC stage	1
PLC program running stage-display		
U0.18	PULSE pulse input frequency(kHz)	0.01kHz
Display PULSE pulse input frequency，unit 0.01Khz		
U0.19	Speed feedback(Unit 0.1Hz)	0.1Hz
synchronous speed，accurate to 0.1hz		
U0.20	Surplus running time	0.1Min
Display surplus running time, used for regular operation control.		
U0.21	AI1 voltage before correction	0.001V
AI1 voltage before correction ,used for AC function group parameter AC.00~AC.03 to correct AI1 voltage		
U0.22	AI2 voltage before correction	0.001V
AI2 voltage before correction ,used for AC function group parameter AC.04~AC.07 to correct AI2 voltage		
U0.23	AI3 voltage before correction	0.001V
AI3 voltage before correction ,used for AC function group parameter AC.08~AC.11 to correct AI3 voltage		
U0.24	Linear velocity	1m/Min
Linear velocity is calculated according to angular velocity and diameter, used for constant tension control and constant linear velocity control.		
U0.25	Current power on time	1Min
The cumulative power on time of the inverter.		
U0.26	Current running time	0.1Min
The cumulative running time of the inverter.		
U0.27	PULSE pulse input frequency	1Hz
Display PULSE pulse input frequency ，unit 1Hz.		
U0.28	Communication set value	0.01%
Communication set value		
U0.29	Encoder feedback speed	0.01Hz

PG feedback speed, accurate to 0.1hz		
U0.30	Main frequency X display	0.01Hz
P0.03 main frequency source set frequency		
U0.31	Auxiliary frequency Y display	0.01Hz
P0.04 auxiliary frequency source set frequency		
U0.32	View arbitrary memory address value	1
To view arbitrary memory address, advanced commissioning function.		
U0.33	Reserve	0.0°
U0.34	Motor temperature	1℃
Display motor temperature. Other device temperature can also be tested through different temperature measuring point.		
U0.35	Target torque(%)	0.1%
Target torque setup.In torque control mode, it is used to check the set target torque.		
U0.36	Rotary variable position	1
It’s rotor position when speed feedback.		
U0.37	Power factor angle	0.1
Current power factor angle，power factor=COS(angle)，angle=0，maximum power.		
U0.38	ABZ position	0.0
ABZ incremental feedback position information of encoder calculation.		
U0.39	VF target voltage separation	1V
VF target voltage when power supply separating.		
U0.40	VF output voltage separation	1V
VF output voltage when power supply separating.		
U0.41	DI input status intuitive display	-



Display DI input status intuitively, offer DI input information more detailed than U0.07, advanced display function.

U0.42	DO output status intuitive display	-



Display DO output status intuitively, offer DO output information more detailed than U0.08, advanced display function.

U0.43	DI function status intuitive display1	1
Display DI function status 1 intuitively ,display(function 01—40)		
U0.44	DI function status intuitive display2	1
Display DI function status 2 intuitively ,display (function 41—80)		
U0.45	Fault information	0
Fault information query.		
U0.46	Reserved	-
U0.47	Reserved	-
U0.48	Reserved	-

-100.00%~100.00%		
U0.60	Running frequency(%)	0.01%
-100.00%~100.00%		
U0.61	Inverter status	1
U0.62	Current fault code	1
U0.63	Point to point communication	0.01%
U0.64	From the number of stations	1
U0.64	Torque limit	0.01%

5-2 Basic function group：P0.00-P0.28

Code	Description/Display	Setting Range		Factory Setting	Change Limit
P0.00	GP type display	G type(constant torque load type)	1	-	●
		P type(draught fan,pump load type)	2		
This parameter is only for the use of viewing the factory model. It is can not be modified. 1：It is applicable to the constant torque load of specified rated parameter 2：It is applicable to the variable torque load of specified rated parameter(draught fan,pump load type)					
P0.01	Motor 1 control mode	Speed sensorless vector control(SVC)	0	2	★
		Speed sensor vector control(FVC)	1		
		V/F control	2		
0：Speed sensorless vector control It refers to the open-loop vector control that is generally applied to high performance control field. One inverter can only drive one motor. E.g：machine tool, centrifugal machine, fiber drawing machine, injection					

molding machine' load etc.

1：Speed sensor vector control

It refers to the closed-loop vector control and encoder must be added to the motor end.Inverter must be matching with the same type PG card of the encoder. This control mode is suitable for high precision speed control and torque control field. One inverter can only drive one motor. E.g：high speed paper making machinery , hoisting machinery , elevator' load etc.

2：V/F control

V/F control mode is suitable for fields that load demand is not high or one inverter can drive multiple motors. E.g：draught fan, pump' load etc.

Tips：Motor parameters must be identified before choosing vector control mode.Only accurate motor parameters can play the advantage of vector control mode. Users can get better performance by adjusting speed regulator group P2 parameters(motor 2,motor 3,motor 4 respectively for group A2,A3,A4)

FVC is generally used for permanent magnet synchronous motor, while part of the small power applications can select V/F control mode. DSI-400 series support specific models of permanent magnet synchronous motor sensorless vector control mode. Please refer to DSI-400 users manual and DSI-400S dedicated users manual for using method.

P0.02	Command source selection	Operation panel command channel(LED off)	0	0	☆
		Terminal command channel(LED on)	1		
		Serial port communication command channel(LED flashing)	2		

Inverter control commands include： run, stop, forward rotation (FWD), Reserved rotation (REV), forward jog (FJOG), Reserved jog (RJOG), etc.

0： Operation panel command channel ("LOCAL/REMOT" LED off);

Perform running command control with RUN, MF.K and STOP/RESET keyson the operation panel.

1： Terminal command channel ("LOCAL/REMOT" LED on);

Perform running command control with multifunctional input terminals such as FWD, REV, FJOG, RJOG, and so on.

2：Serial port communication command channel ("LOCAL/REMOT" LED flashing).

The running command is given by the host computer via the communication mode. For the communication protocol, please refer to "PD group communication parameters"and supplementary explanation of corresponding communication card for details.

P0.03	Main frequency source X selection	Digital setup(Preset frequency P0.08, UP/DOWN can be modified, power off without memory)	0	4	★

		Digital setup(Preset frequency P0.08, UP/DOWN can be modified, power off with memory)	1		
		AI1	2		
		AI2	3		
		AI3(Potentiometer)	4		
		Pulse setup(DI5)	5		
		MS command	6		
		Simple PLC	7		
		PID setup	8		
		Communicaton setup	9		

This parameter is used to select the main reference frequency input channel. Totally 10 main reference frequency channels：

0：Digital setup(power off without memory)

Initial value of set frequency equals to P0.08 “preset frequency”.User can change inverter set frequency value through keyboard ∧ key and ∨ key (or multi-function input terminal UP,DOWN).

Inverter power on after powered off, frequency set value restored to P0.08 “Preset frequency”.

1：Digital setup(power off with memory)

Initial value of set frequency equals to P0.08 “preset frequency”. User can change inverter set frequency value through keyboard ∧ key and ∨ key (or multi-function input terminal UP,DOWN).

Inverter power on after powered off, frequency set value restored to the value that equals to setup of last power off time. Correction is memorized through keyboard ∧ key and ∨ key or terminal UP,DOWN.

What needs to be reminded is, P0.23 is “Digital setup frequency memory selection”. P0.23 is used to select correction whether to be memorized or cleared and is relevant to stop, irrelevant to power off memory, please pay attention during operation.

2：AI1

3：AI2

4：AI3(Potentiometer)

Frequency is determined by analog input terminal. DSI-400 series control board offers 2 analog input terminal(AI1，AI2), optional device TZ5PC1 card can offer 1 isolated analog input terminal(AI3x).

AI1，AI2 can be chosen as 0V~10V voltage input as well as 0mA~20mA current input by the jumper J3，J4 on control board.

AI1、AI2 input voltage value has a corresponding relationship with target frequency, users can choose them at will. DSI-400 offers 5 groups of corresponding relation curve, which 3 of them are linear relationship(2-point correspondence), 2 of them are 4-point correspondence(any curve among them). User can set through P4 group or A6 function code. Function code P4.33 is used to set AI1~AI22-channel analog input. Choose 1 curve among the 5 respectively. For specific correspondence please refer to P4、A6 groups. 5：Pulse setup(DI5) Pulse setup is set through terminal pulse. Signal standard：voltage range 9V~30V, frequency range 0kHz~100kHz. Set pulse can be only input through multi-function input terminal DI5. Relationship between DI5 input pulse frequency and corresponding settings is set through P4.28~P4.31. It is linear relationship(2-point correspondence). Pulse input 100.0% refers to the percentage of P0.10 . 6：MS command MS command running mode is set through different combination mode of digital input DI terminal. There are 4 MS command terminals with 16 status of DSI-400 series. PC group function codes correspond to 16 “MS command”. “MS command” is percentage relative to P0.10(maximum frequency). When digital input terminal DI is used as MS command terminal, user should set through P4 group.For specifications please refer to P4 group. 7：Simple PLC When frequency source is set to 7, running frequency source can be switched to any frequency command during 1~16. User can set frequency command retention time and acceleration/deceleration time respectively.For specifications please refer to PC group . 8：PID Running frequency is the output of PID control process. Generally used for field process closed-loop control. When PID is chosen, user should set relevant parameters of PA group “PID function”. 9：Communication setup Communication setup refers to main frequency source that setting through communication method of position machine.					
P0.04	Auxiliary frequency source Y selection	Digital setup(preset frequency P0.08, UP/DOWN adjustable, power off without memory)	0	0	★
		Digital setup(preset frequency P0.08, UP/DOWN adjustable, power off with memory)	1		

		AI1	2		
		AI2	3		
		AI3(Potentiometer)	4		
		PULSE setup (DI5)	5		
		MS command	6		
		Simple PLC	7		
		PIDsetup	8		
		Communication setup	9		
When the auxiliary frequency source is used as independent frequency reference channel (i.e. frequency source switching from X to Y), it is used in the same way as the relative specifications of P0.03. When the auxiliary frequency source is used as overlap reference (i.e. frequency source selection switching from X plus Y or X to X plus Y), it has special points as follows： 1. When the auxiliary frequency source is digital reference, the preset frequency (P0.08) is nonsensical, and it needs to adjust the main reference frequency through the keys "∧"and "∨" of the keyboard (or UP and DOWN of multifunctional input terminals). 2. When the auxiliary frequency source is analog input reference (AI1、AI2、AI3) or pulse input reference, 100% of input setup is relative to the auxiliary frequency source range,and can be set through P0.05 and P0.06. 3. When the frequency source is pulse input reference, it is similar to the analog value. Prompt： There is difference between the auxiliary frequency source Y selection and the main frequency source X setup value. That is to say, P0.03 and P0.04 cannot use the same frequency reference channel.					
P0.05	Auxiliary frequency source Y range selection	Relative to maximum frequency	0	0	☆
		Relative to frequency source X	1		
P0.06	Auxiliary frequency source Y range	0%~150%		0	☆
When the frequency source selection is frequency overlap reference(P0.07 is set to 1、3 or 4), it is used to determine the adjustment range of auxiliary frequency source. P0.05 is used to determine the relative object within the range. If it is relative to main frequency, that range will vary with the main frequency X.					
P0.07	Frequency source stacking selection	1bit	Frequency source selection	00	☆
		Main frequency source X	0		
		Main /auxiliary operation result (10bit determine operation relationship)	1		

		Switching between X & Y	2		
		Switching between X & option 1	3		
		Switching between Y & option 1	4		
		10bit Relationship between main /auxiliary frequency source			
		Main+auxiliary	0		
		Main-auxiliary	1		
		MAX(main frequency source X, auxiliary frequency source Y)	2		
		MIN(main frequency source X, auxiliary frequency source Y)	3		

This parameter is used to select frequency setup channel, and of realizing frequency setup through the compound of main frequency X and auxiliary frequency Y.

1bit ：Frequency source selection

0：Main frequency source X

Main frequency source X is the target frequency.

1：Main /auxiliary operation result is target frequency，operation relationship see “10 bit” for details.

2：Switching between main frequency source X and auxiliary frequency source Y

When terminal 18 (frequency switching) is invalid, main frequency X is target frequency. On the contrary, auxiliary frequency Y is the target frequency.

3：Switching between main frequency X and main /auxiliary operation result

When terminal 18 (frequency switching) is invalid, main frequency X is target frequency. On the contrary, auxiliary frequency Y is the target frequency.

4：Switching between auxiliary frequency Y and main /auxiliary operation result

When terminal 18 (frequency switching) is invalid, auxiliary frequency Y is the target frequency. On the contrary, main frequency X is target frequency.

10bit ：Relationship between main/auxiliary frequency source

0：Main frequency source + auxiliary frequency source Y

Operation result of main + auxiliary is target frequency. It realizes frequency stacking set function.

1：Main frequency source - auxiliary frequency source Y

Operation result of main - auxiliary is target frequency.

2：MAX(main frequency source X, auxiliary frequency source Y) Choose bigger absolute value of the two as target frequency 3：MIN(main frequency source X, auxiliary frequency source Y) Choose smaller absolute value of the two as target frequency. Besides, when frequency source is main& auxiliary operation,users can set offset frequency through P0.21.By stacking offset frequency on main& auxiliary operation result,it could flexible cope with all kinds of needs.					
P0.08	Preset frequency	0.00Hz to maximum frequency(It is only valid when frequency source is set to “digital setting”)		50.00Hz	☆
When set the frequency source to “digital setting” or “terminal UP/DOWN”, the parameter value is the initial value of the inverter frequency digital setting.					
P0.09	Running direction	Consistent direction	0	0	☆
		Reserved direction	1		
Modification of this parameter can change the rotary direction of the motor without changing any other parameters, which is equivalent to the role of switching the rotary direction through adjusting any two lines of the motor (U, V and W). When needing to change the rotary direction of the motor, users can modify this parameter rather than adjust the wiring of the motor. Caution： When the function code is restored to the factory default value, this parameter value is restored to 0, which should be used prudently in the applications where the motor rotary direction is not allowed to change.					
P0.10	Maximum frequency	50.00Hz~500.00Hz		50.00Hz	★
When analog input, pulse input(DI5), MS command etc are used as frequency source, their respective 100% are relatively calibrated through P0.10. DSI-400 maximum frequency could reach 3200Hz. Users can set decimal digits of frequency command through P0.22 to balance the index of frequency command resolution and frequency input range. When P0.22 is set to 1,frequency resolution ratio is 0.1Hz, P0.10 setting range is 50.0Hz~3200.0Hz；When P0.22 is set to 2, frequency resolution ratio is 0.01Hz, P0.10 setting range is 50.00Hz~320.00Hz.					
P0.11	Frequency source upper limit	P0.12 setup	0	0	★
		AI1	1		
		AI2	2		
		AI3(Potentiometer)	3		
		PULSE setup	4		

		Communication setup	5		

It defines the source of frequency upper limit. Frequency upper limit comes from digital setup (P0.12) or analog input channel. When upper limit is set through analog input, 100% of analog input corresponds to P0.12.

E.g： When winding control field is in the torque control mode, to avoid material break phenomenon,users can set upper limit frequency through analog value. When running frequency reaches value of upper limit , inverter maintains operation at the upper limit frequency.

P0.12	Frequency upper limit	Frequency lower limit(P0.14) to maximum frequency(P0.10)	50.00Hz	☆
P0.13	Frequency upper limit offset	0.00Hz~maximum frequency P0.10	0.00Hz	☆

When upper limit is set through analog value or PULSE setup, P0.13 will be used as analog valueoffset. The addition of offset frequency and analog setup value of frequency upper limit is used as the final setup value of frequency upper limit.

P0.14	Frequency lower limit	0.00Hz to frequency upper limit P0.12	0.00Hz	☆

When the running frequency of the inverter is lower than the frequency lower limit, it can select to run at frequency lower limit or stop the inverter. Refer to P8.14 function code for details.

P0.15	Carrier frequency	0.8kHz~8.0kHz	-	☆

This function is used to adjust the carrier frequency of the inverter. By adjusting the carrier frequency, the motor noise can be reduced, the resonance of the mechanical system can be avoided, so that the leakage current to the ground and the interference of the inverter can be reduced.

When the carrier wave frequency is low, the output current higher harmonic component will be increased, the motor loss will be increased, and the motor temperature rise will also be increased.

When the carrier wave frequency is high, the motor loss is reduced, and the motor temperature rise is reduced, but the inverter loss and inverter temperature rise will be increased, and thus the interference will be increased.

The adjustment of carrier frequency will influence the following items on the performance：

Carrier frequency	low→ high
Motor noise	big→ small
Output current waveform	poor→ well
Motor temperature rise	high→ low
Inverter temperature rise	low→ high
Leakage current	small→ large
Radiation interference	small→ big

Different power of inverter is set with different carrier frequency by the factory. Though user could modify it , attention should be paid：if carrier frequency is set higher than the factory set valule, it will lead to inverter radiator temperature rise increasing. User should take inverter derating use, or there will be danger of overheating alarm.

P0.16	Carrier frequency adjusting with temperature	No	0	0	☆
		Yes	1		

Carrier frequency adjusting with temperature refers to the detecting of radiator temperature. When the temperature is high , carrier frequency automatically decreased to reduce the inverter temperature rise. On the contrary , when the temperature is low, carrier frequency gradually restored to the set value.This function could help to reduce the chance of inverter overheating alarm.

P0.17	Acceleration time 1	0.00s~65000s	-	☆
P0.18	Deceleration time 1	0.00s~65000s	-	☆

The acceleration time means the time t1 needed for the inverter to accelerate from 0Hz to the reference frequency(P0.25).

The deceleration time means the time t2 needed for the inverter to decelerate from the reference frequency (P0.25) to 0Hz.

The descriptionof acceleration and deceleration time are as shown in Fig.5.1：

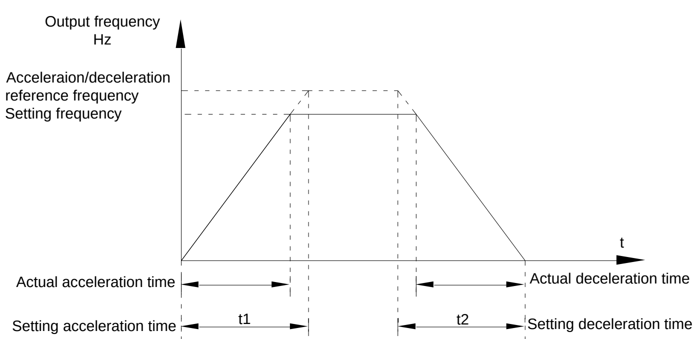


Fig.5-1Acceleration/deceleration time schematic diagram

DSI-400 totally offers 4 groups of speed-up/speed-down time for selection,you can shift through digital input terminal DI,4 groups of them are shown as follows：

GROUP 1：P0.17、P0.18;

GROUP 2：P8.03、P8.04;

GROUP 3：P8.05、P8.06;

GROUP 4：P8.07、P8.08.					
P0.19	Acc./dec. time unit	1second	0	1	★
		0.1 seconds	1		
		0.01 seconds	2		
DSI-400 offers 3 kinds of speed-up /speed down time unit to meet the need of all kinds of scene.Respectively for 1 second、0.1 seconds and 0.01 seconds. Caution：Decimal places as well as corresponding acceleration/deceleration time of the 4 groups may be changed when modifying this function parameter,special attention should be paid in the process of application.					
P0.21	Auxiliary frequency source offset frequency	0.00Hz~Maximum frequencyP0.10		0.00Hz	☆
It is valid only at the time of main/auxiliary operation is chosen. When frequency source is main / auxiliary operation(P0.21 as offset frequency) ,it could make frequency set more flexible by stacking offset frequency on main& auxiliary operation as the final frequency set value.					
P0.22	Frequency command resolution	0.01Hz	2	2	★
This parameter is used to determine all the function code resolution which is relevant to frequency. Caution：Parameter (relating to frequency) decimal digits and corresponding frequency value will change through modifying P0.22. Special attention should be paid during operation.					
P0.23	Digital setup frequency memory selection upon stop	Without memory	0	0	☆
		Memory	1		
This function is only valid when frequency source is digital setup. 0： Without memory Upon power fault or stop of the inverter, set the frequency value back to the setup value of "Preset Frequency" (P0.08). Frequency modification which set through keyboard "∧"、"∨" or terminal UP、DOWN is cleared. 1： Memory Digital setup frequency is the retention that reserved at last stop time. Keyboard "∧"、"∨" or terminal UP、DOWN to make the correction valid.					
P0.24	Motor selection	Motor 1	0	0	★
		Motor 2	1		
DSI-400 support applications that driving 4 motors in time-sharing. 4 motors can be set motor					

<table>
<tr><td colspan="7">nameplate parameters, independent parameter tuning, control mode, parameters relating to operation performance respectively.

Motor 1 corresponding function groups are P1 group and P2 group. Motor 2,motor 3, motor 4 corresponding groups are A2 group, A3 group and A4 group respectively.

Users select current motor through P0.24 function code as well as digital input terminal DI. When function code selection conflicting with terminal DI selection, DI terminal selection is priority.</td></tr>
<tr><td rowspan="3">P0.25</td><td rowspan="3">Acceleration / deceleration reference frequency</td><td colspan="2">Maximum frequency(P0.10)</td><td>0</td><td rowspan="3">0</td><td rowspan="3">★</td></tr>
<tr><td colspan="2">Set frequency</td><td>1</td></tr>
<tr><td colspan="2">100Hz</td><td>2</td></tr>
<tr><td colspan="7">Acceleration / deceleration time means the time needed for the inverter varying from 0Hz to the frequency ofP0.25, Fig5.1 is acceleration / deceleration time schematic diagram.

When P0.25 is chosen to 1, acceleration / deceleration time is connected with set frequency.If set frequency change frequently, the motor acceleration will change,attention should be paid in applications.</td></tr>
<tr><td rowspan="2">P0.26</td><td rowspan="2">Frequency UP/DOWN

reference upon running</td><td colspan="2">Running frequency</td><td>0</td><td rowspan="2">0</td><td rowspan="2">★</td></tr>
<tr><td colspan="2">Set frequency</td><td>1</td></tr>
<tr><td colspan="7">This parameter is only valid when frequency source is digital setting.

To select(through keyboard ∧、∨ key or terminal UP/DOWN) the modifying method of set frequency, namely, target frequency is increasing/decreasing based on the running frequency or setting frequency.

The difference between the two settings become apparently in inverter acceleration and deceleration process.</td></tr>
<tr><td rowspan="9">P0.27</td><td rowspan="9">Command source&frequency source binding</td><td>1bit</td><td colspan="2">Operation panel command bound frequency source selection</td><td rowspan="9">000</td><td rowspan="9">☆</td></tr>
<tr><td colspan="2">Without binding</td><td>0</td></tr>
<tr><td colspan="2">Digital setup frequency source</td><td>1</td></tr>
<tr><td colspan="2">AI1</td><td>2</td></tr>
<tr><td colspan="2">AI2</td><td>3</td></tr>
<tr><td colspan="2">AI3(Potentiometer)</td><td>4</td></tr>
<tr><td colspan="2">PULSE pulse setup(DI5)</td><td>5</td></tr>
<tr><td colspan="2">MS command</td><td>6</td></tr>
<tr><td colspan="2">Simple PLC</td><td>7</td></tr>
</table>

		PID	8		
		Communication setup	9		
		10bit Terminal command bound frequency source selection			
		Without bound	0		
		Digital setup frequency source	1		
		AI1	2		
		AI2	3		
		AI3(Potentiometer)	4		
		PULSE pulse setup(DI5)	5		
		MS command	6		
		Simple PLC	7		
		PID	8		
		Communication setup	9		
		100bit Communication command binding frequency source selection			
		Without bound	0		
		Digital setup frequency source	1		
		AI1	2		
		AI2	3		
		AI3(Potentiometer)	4		
		PULSE pulse setup(DI5)	5		
		MS command	6		
		Simple PLC	7		
		PID	8		
		Communication setup	9		

It defines bound combination between 3 running command channels and 9 frequency setup channels, which is easy to achieve synchronous switching.

Frequency setup channels above have the same definition with P0.03 “main frequency source X selection", please refer to P0.03 for details. Different running command channels can bind the same frequency setup channel. When the command source is valid during command source & frequency source binding, set frequency source of P0.03~P0.07 is invalid.

P0.28	Communication expansion card	Modbus communication card	0	0	☆
		Profibus.DP communication card	1		

DSI-400 series offers 3 kinds of communication mode. All of the 3 need to be equipped with optional communication card .And they can not be used at the same time.

P0.28 is used to set the type of the optional communication card. When user replace the communication card , P0.28 should be properly set.

5-3 Parameters for motor 1：P1.00-P1.37

Code	Description/Display	Setting Range		Factory Setting	Change Limit
P1.00	Motor type selection	General asynchronous motor	0	0	★
		Variable frequency asynchronous motor	1		
P1.01	Rated power	0.1kW~1000.0kW		-	★
P1.02	Rated voltage	1V~2000V		-	★
P1.03	Rated current	0.01A~655.35A(Inverter power≦55kW) 0.1A~6553.5A(Inverter power >55kW)		-	★
P1.04	Rated frequency	0.01Hz~maximum frequency		-	★
P1.05	Rated revolving speed	1rpm~65535rpm		-	★

Function codes above are motor nameplate parameters. No matter VF control or vector control is the choosen mode, users should accurately set the relating parameter according to the motor nameplate.

For better VF or vector control performance, users should tune the motor parameter. The accuracy of the regulation results has intimate relationship with the accuracy of set motor nameplate parameters.

P1.06	Asynchronous motor stator resistance	0.001Ω~65.535Ω(Inverter power <=55kW) 0.0001Ω~6.5535Ω(Inverter power >55kW)		-	★
P1.07	Asynchronous motor rotor resistance	0.001Ω~65.535Ω(Inverter power <=55kW) 0.0001Ω~6.5535Ω(Inverter power >55kW)		-	★
P1.08	Asynchronous motor	0.01mH~655.35mH(Inverter power <=55kW)		-	★

	leakage inductance	0.001mH~65.535mH(Inverter power >55kW)		
P1.09	Asynchronous motor mutual inductance	0.1mH~6553.5mH(Inverter power <=55kW) 0.01mH~655.35mH(Inverter power >55kW)	-	★
P1.10	Asynchronous motor no load current	0.01A~P1.03(Inverter power <=55kW) 0.1A~P1.03(Inverter power >55kW)	-	★

P1.06~P1.10 are parameters for asynchronous motor.Generally, motor nameplate dosen't contain such parameters, users can get them throng inverter auto tuning. Among them, 3 parameters (P1.06~P1.08) can be get through " asynchronous motor static tuning", while all the 5 parameters as well as encoder phase ,current loop PI etc can be get through"asynchronous motor complete tuning". When change the motor rated power (P1.01) or motor rated voltage (P1.02), inverter would automatically modify the P1.06~P1.10 parameter value and restore them to common standard of Y series motor parameter.

If the asynchronous motor is unable to be tuned, users could input above parameters with factory offeredmotor value.

P1.27	Encoder pulses number	1~65535	2500	★

To set ABZ or UVW incremental encoder pulse number per revolution.

In the speed sensor vector control mode, P1.27 must be set accurately.Or motor would not normally operate.

P1.28	Encoder type	ABZ incremental encoder	0	0	★
		Reserved	1		
		Rotary transformer	2		
		Reserved	3		
		Reserved	4		

DSI-400 support multiple encoder types. Different encoder should be equipped with different PG card. For specifications please refer to Appendix IV. All the 5 encoders are suitable for synchronous motor, while only ABZ incremental encoder and rotary transformer are suitable for asynchronous motor.

After installing the PG card, make sure that P1.28 is accurate according to actual situation.

P1.30	ABZ incremental encoder AB phase	Forward	0	0	★
		Reserve	1		

This function code is only valid to ABZ incremental encoder(P1.28=0).It is used to set ABZ incremental encoder AB signal phase sequence.

It is valid for both synchronous motor and asynchronous motor. Users could get ABZ encoder AB phase sequence through asynchronous motor complete tuning or synchronous motor no-load tuning.

P1.34	Rotary transformer pole pairs	1~65535	1	★

Rotary transformer is equipped with pole pairs.When using the encoder, correct parameters must be set to it.

P1.36	PG dropped inspection time	0.0s：no action　0.1s~10.0s	0.0s	★

It is used to set inspection time of encoder disconnection fault.When feedback signal is 0.0s, encoder disconnection fault will not be inspected.

If inverter detected disconnection fault,and the feedback value exceeded the P1.36 setup range.Inverter fault alarm No. 20= E.PG1.

P1.37	Tuning selection	Without operation	0	0	★
		Asynchronous static tuning 1	1		
		Asynchronous complete tuning	2		
		Asynchronous static tuning 2	3		

Caution：Correct motor ratings must be set before tuning

0：No operation, tuning is forbidden.

1：Asynchronous motor static tuning 1

It is used for occasions that asynchronous motor and the load are not easily torn off, which may lead to complete tuning invalid. Correct motor type and motor nameplate parameters P1.00~P1.05 must be set before static tuning. User could get P1.06~P1.08 through tuning.

Action description：Set P1.37 to 1 and then press RUN button, inverter will carry out asynchronous static tuning.

2：Asynchronous complete tuning

Asynchronous complete tuning can guarantee inverter dynamic control performance. Motor and the load should be disconnected to keep motor complete status.

In the process of asynchronous complete tuning , asynchronous complete tuning is taken first, and then accelerate to 80% of motor rated frequency according to P0.17. After keeping the state for a period of time, then decelerate to stop according to P0.18 and stop tuning.

Before asynchronous complete tuning , users should set motor type and motor nameplate parameters P1.00~P1.05 as well as encoder type and encoder pulse numbers P1.27、P1.28.

Inverter can get 5 motor parameters P1.06~P1.10 as well as AB phase sequence P1.30, vector control current loop PI parameter P2.13~P2.16 from tuning.

Action description：Set P1.37 to 2 and then press RUN button, inverter will carry out asynchronous complete tuning.

3：Asynchronous motor static tuning

It is used for no encoder

5-4 Vector control function group：P2.00-P2.23

P2 group function codes are valid for vector control and invalid for V/F control.

Code	Description/Display	Setting Range	Factory Setting	Change Limite
P2.00	Speed loop proportional gain1	1~100	30	☆
P2.01	Speed loop integration time1	0.01s~10.00s	0.50s	☆
P2.02	Switching frequency1	0.00~P2.05	5.00Hz	☆
P2.03	Speed loop proportional gain 2	0~100	20	☆
P2.04	Speed loop integration time 2	0.01s~10.00s	1.00s	☆
P2.05	Switching frequency 2	P2.02~maximum frequency	10.00Hz	☆

Users could choose different speed loop PI parameters under different running frequency. When running frequency is less than the switching frequency(P2.02), adjusting parameters for speed loop PI are P2.00 and P2.01. When running frequency is greater than the switching frequency (P2.02), adjusting parameters for speed loop PI are P2.03 and P2.04. Speed loop PI parameters between switching frequency1 and switching frequency2 are two groups of linear switching. As shown in fig.5.2：

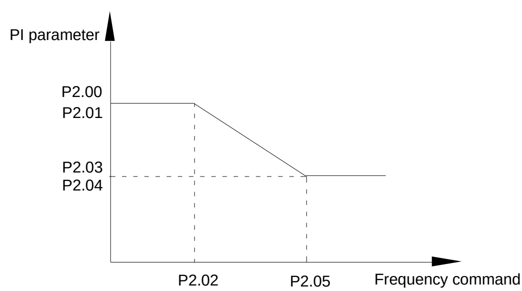


Fig.5-2PI parameter schematic diagram

Users can adjust vector control speed dynamic response characteristics through setting proportional coefficient and integration time of the speed regulator.

Both increasing proportional gain and reducing integration time can accelerate the speed loop dynamic response.But excessive proportional gain or insufficient integration time may led to system oscillation.

Suggestions for regulating method：

If the factory parameters can not meet the requirements, users can fine-tuning it on the basis of factory value parameters. First increase the proportional gain to restrain system oscillation,then reduce integration time so that system has fast response characteristic and smaller overshoot.

Notice：Improper PI parameter setting may lead to excessive speed overshoot , even voltage fault

<table>
<tr><td colspan="6">during overshoot drop.</td></tr>
<tr><td>P2.06</td><td>Vector control slip gain</td><td colspan="2">50%~200%</td><td>100%</td><td>☆</td></tr>
<tr><td colspan="6">This parameter is used to adjust motor steady speed precision for zero-speed sensor vector control mode. Please turn up the parameter value when with load motor running in low speed. On the contrary, when the with load motor running in high speed, please turn down the parameter value.

This parameter is also used to adjust the output current value with the same load for speed sensor vector control.</td></tr>
<tr><td>P2.07</td><td>Speed-loop filter time</td><td colspan="2">0.000s~0.100s</td><td>0.015s</td><td>☆</td></tr>
<tr><td colspan="6">In vector control mode, speed-loop regulator outputs torque current command. P2.07 is used to filter the torque command.

Generally speaking, the parameter needs not to be modified. Users could properly increase the filtering time when speed fluctuation is relatively big, and decrease the value when motor oscillation occurs.

If filtering time is small, inverter output torque might fluctuate greatly, but response speed will be fast.</td></tr>
<tr><td rowspan="8">P2.09</td><td rowspan="8">Torque upper limit source in speed control mode</td><td>P2.10</td><td>0</td><td rowspan="8">0</td><td rowspan="8">☆</td></tr>
<tr><td>AI1</td><td>1</td></tr>
<tr><td>AI2</td><td>2</td></tr>
<tr><td>AI3(Potentiometer)</td><td>3</td></tr>
<tr><td>PULSE setup</td><td>4</td></tr>
<tr><td>Communication setup</td><td>5</td></tr>
<tr><td>Min(AI1,AI2)</td><td>6</td></tr>
<tr><td>Max(AI1,AI2)</td><td>7</td></tr>
<tr><td>P2.10</td><td>Torque upper limit digital setup in speed control mode</td><td colspan="2">0.0%~200.0%</td><td>150.0%</td><td>☆</td></tr>
<tr><td colspan="6">In speed control mode, inverter maximum torque output is controlled by torque upper limit.

Range for 1-7 selections of P2.09 are corresponding to the setting range of P2.10.

P2.09 is used to select torque upper limit source. When P2.09 is set through analog, PULSE setup, communication setup, which 100% corresponding to P2.10. 100% of P2.10 is the rated torque of the inverter.</td></tr>
</table>

P2.11	Torque upper limit source in speed control mode (regenerative)	P2.10	0	0	☆
		AI1	1		
		AI2	2		
		AI3(Potentiometer)	3		
		PULSE setup	4		
		Communication setup	5		
		Min(AI1,AI2)	6		
		Max(AI1,AI2)	7		
P2.12	Torque upper limit digital setup in speed control mode (regenerative)	0.0%~200.0%		150.0%	☆
P2.13	Excitation regulation proportional gain	0~20000		2000	☆
P2.14	Excitation regulation integration gain	0~20000		1300	☆
P2.15	Torque regulation proportional gain	0~20000		2000	☆
P2.16	Torque requlation integration gain	0~20000		1300	☆

Vector control current-loop PI regulation, which is automatically obtained after asynchronous motor complete tuning or synchronous motor complete tuning. It generally needs not to be modified.

Caution：Integration regulator of current loop directly set integration gain without taking integration time as the dimension. Excessive current loop PI gain may lead oscillation to the entire control loop circuit.

If current oscillation or torque fluctuation is relatively big, users could manually turn down the PI proportional gain or integration gain.

P2.17	Speed loop intergral seperation selection	Disable	0	0	☆
		enable	1		
P2.21	Max torque coefficient of field weakening area	50~200%		100%	☆

P2.22	Regenerative power limit selection	Disable	0	0	☆
		enable	1		
P2.23	Regenerative power limit	0.0~200.0%		Mode dependent	☆

5-5 V/F control group：P3.00-P3.26

This function group is only valid for V/F control mode.

V/F control is suitable for general load such as draught fan, pump. It is also appropriate for situations where one inverter driving multiple motors or there is big difference between inverter power and motor power.

Code	Description/Display	Setting Range		Factory Setting	Change Limit
P3.00	V/F curve setup	Beeline V/F	0	0	★
		Multi-point V/F	1		
		VF complete separation mode	10		
		VF semi separation mode	11		

This parameter defines the V/F setup mode so as to meet the requirements of various load characteristics.

0：Beeline V/F

It is suitable for the ordinary constant torque load.

1：Multi-point V/F

It is suitable for special loads such as dehydrator and centrifugal machine. It can be self-defined. Refer to the description of functional codes of Group F1-07 to F1-12 for details.

2~9：Reserved

10：VF complete separation mode

Inverter output frequency and output voltage are mutually independent. Output frequency is decided by frequency source,while output voltage is decided by P3.13(VF separation voltage source).

VF complete separation mode is generally applied in induction heating, inverter power supply, torque motor control fields etc.

11：VF semi separation mode

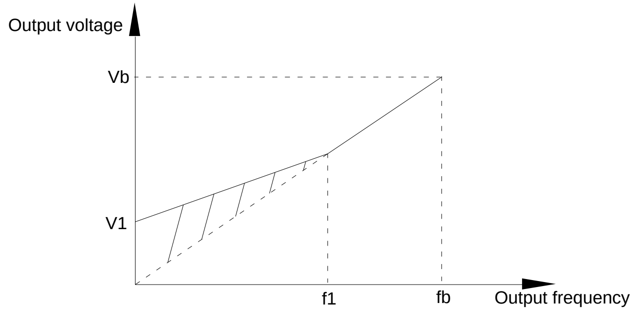
In this case, V is proportional to F. Proportional relationship can be set by the voltage source P3.13.

The relationship between V&F is connected with P1 group(motor rated voltage and rated frequency).

Suppose that voltage source input is X (X from 0~100%), the V,F relationship is：

V/F=2*X*(Motor rated voltage)/(Motor rated frequency)

P3.01	Torque boost value	0.0%~30%	-	★
P3.02	Torque boost cut-off frequency	0.00~Maximum frequency	50.00Hz	★



V1:Manual torque boost voltage　　Vb:Maximum output voltage

f1:Cutt-off frequency of torque boost　　fb：Rated running frequency

Fig. 5-3 Manual torque boost schematic diagram

To compensate the low frequency torque characteristics of V/F control, boost compensation should be made to inverter low frequency output voltage.

Torque hoist： it will be set according to the percentage of input rated voltage to the inverter. Below are explanations of setting torque increase：

1) When the torque hoist is set as 0.0%, the inverter will aYpt auto torque hoist.

2) This parameter can be properly hoisted for small motor, while for large motor; the parameter can be properly decreased.

3) If the torque hoist is set to be too large, the motor may be overheated, and the inverter may be over-current.

Torque hoist cut-off frequency： As shown in Fig. 5.3, the torque hoist is valid when the cutoff frequency below this setting. Otherwise, the torque hoist will be invalid.

P3.03	Multi-point V/F frequency point F1	0.00Hz~P3.05	0.00Hz	★
P3.04	Multi-point V/F voltage point V1	0.0%~100.0%	0.0%	★
P3.05	Multi-point V/F frequency point F2	P3.03~P3.07	0.00Hz	★
P3.06	Multi-point V/F voltage point	0.0%~100.0%	0.0%	★

	V2			
P3.07	Multi-point V/F frequency point F3	P3.05~Motor rated frequency(P1.04)Note：Motor 2\3\4 rated frequency respectively A2.04\A3.04\A4.04	0.00Hz	★
P3.08	Multi-point V/F voltage point V3	0.0%~100.0%	0.0%	★

Six parameters of P3.03 to P3.08 define the multi-point V/F curve.

The setup value of multi-point V/F curve is generally set in accordance with the load characteristics of the motor.

Caution：

1) It must be set as follows： V1＜V2＜V3，F1＜F2＜F3. Fig5.4 is schematic diagram for multi-point V/F curve.

2) If the voltage is set too high at the time of low frequency, it may cause overheating and even burning of the motor as well as stall over current or over current protection of the inverter.

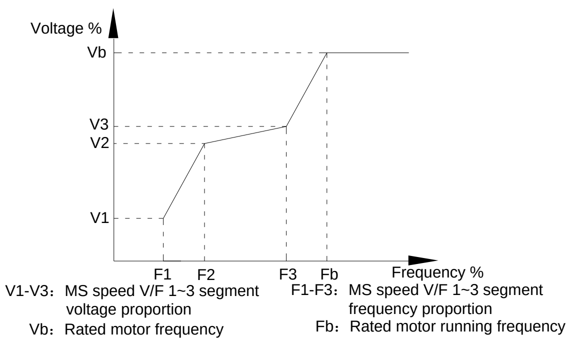


Fig. 5-4 Multi-point V/F curve setup schematic diagram

P3.09	V/F slip compensation gain	0%~200.0%	0.0%	☆

This parameter is only valid for asynchronous motor.

VF slip compensation can compensate asynchronous motor speed deviation ,in this way ,motor rotary speed could be maintained in basically stable state during load change. In general, 100% corresponds to the rated slip of the motor with rated load. For motor rated slip , it can be get through auto calculation of P1 motor rated frequency and rated revolving speed.

The slip compensation gain adjustment may be performed referring to the following principle： When the load is rated load, and the slip compensation coefficient is set to 100%, the rotary speed of the motor is close to the reference speed.

P3.10	VF over-excitation gain	0~200	64	☆

The role of over excitation gain function is to suppress the rise of bus voltage during the inverter deceleration process, thus avoiding occurrence of over voltage fault due to bus voltage exceeding over

voltage protection limitation value. The higher the over excitation gain is, more powerfully the suppression effect is. The setting is described as follows： In the applications where over-voltage alarm easily occurs, it needs to improve the over-excitation gain. Excessive over-excitation gain easily lead to increasing of output current .Users should keep the balance during operation. In the applications where the inertia is very low, the over excitation gain is set to 0, while in the applications where there is brake resistor ,the over excitation gain is set to 0 as well.				
P3.11	VF oscillation suppression gain	0~100	-	☆
When the motor has no oscillation, please select this gain to 0. Only when the motor has obvious oscillation and Yes not run normally can the gain be properly increased. The bigger the gain is, the better oscillation suppression result will be. The gain shall be set as small as possible under the condition that the oscillation is suppressed effectively so as to avoid high influences on the V/F operation. Accurate motor rated current and no-load current parameters are required during using oscillation suppression function, or VF oscillation suppression effect will not be excellent.				
P3.13	VF separation voltage source	Digital setup(P3.14): 0 AI1: 1 AI2: 2 AI3(Potentiometer): 3 PULSE pulse setup(DI5): 4 MS command: 5 Simple PLC: 6 PID: 7 Communication setup: 8 100% corresponding to the rated motor voltage (P1.02、A4.02、A5.02、A5.02)	0	☆
P3.14	VF separation voltage digital setup	0V~rated motor voltage	0V	☆
VF separation is generally applied to induction heating control, inverter power supply control and torque motor control etc. In VF separation control mode, output voltage can be set through function code P3.14, analog value, MS command , PLC, PID or communication setup. When P3.13 is non-numeric setup, each 100% of the setting corresponds to rated moter voltage. When output setting percentage is negative, it's absolute value is the valid setting value.				

0：Digital setup(P3.14) Voltage is directly set through P3.14. 1： AI1 2： AI2 3：AI3(Potentiometer) Voltage is set through analog input terminal. 4： PULSE pulse setup(DI5) voltage set through terminal pulse. Pulse setup signal specification：voltage range 9V~30V, frequency range 0kHz~100kHz. 5： MS command voltage source is MS command. Corresponding relationship between set signal and set voltage is determined through P4 group and PC group. 6： Simple PLC When voltage source is simple PLC, output voltage is set through PC group parameters. 7： PID Output voltage through PID closed loop.For specifications please refer to PA group for PID detailed description. 8：Communication setup Communication setup refers to voltage that set by position machine through communication mode. When the above voltage source selection is 1~8, 0~100% corresponds to output voltage 0V~motor rated voltage.				
P3.15	VF separation voltage rise time	0.0s~1000.0s	0.0s	☆
P3.16	VF separation voltage decline time	0.0s~1000.0s	0.0s	☆
P3.15 refers to the time that needed for output voltage varying from 0V to motor rated voltage.As shown in fig.5-5.				

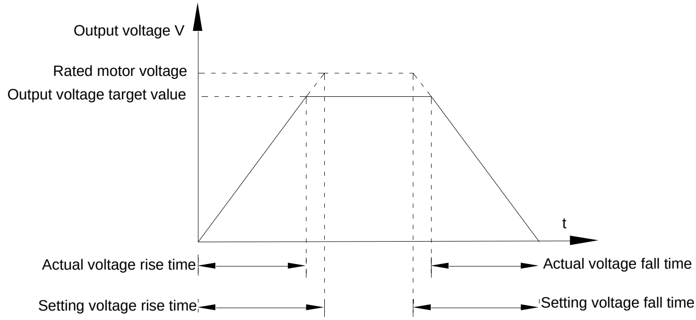


Fig. 5-5 VF separation schematic diagram

P3.17	Stop mode selection for VF separation voltage	Frequency and voltage decline to 0 independently	0	0	☆
		Frequency declining after voltage decline to 0	1		
P3.18	Current limit level	50~200%		150%	★
P3.19	Current limit selection	Disable	0	1	★
		Enable	1		
P3.20	Current limit gain	0~100		20	☆
P3.21	Compensation factor of Speed multiplying current limit	50~200%		50%	★
P3.22	voltage limit	650.0~800.0v		770.0	★
P3.23	voltage limit selection	Disable	0	1	★
		Enable	1		
P3.24	Frequency gain for voltage limit	0~100		30	☆
P3.25	voltage gain for voltage limit	0~100		30	☆
P3.26	Frequency rise threshold during voltage limit	0-50Hz		5	★

5-6 Input terminal：P4.00-P4.40

DSI-400 series inverter has 7 multifunctional digital input terminals (DI1 to DI7), of which DI5 can be used as high-speed pulse input terminal, and DSI-400 series inverter also has 2 analog input terminals.If system needs more input/output terminal, it can be equipped with multi-function input/output expansion card and 1 analog input terminal(AI3x).

Multi-function input/output expansion card has 3 multi-function digit input terminal(DI6~DI10).

Code	Description/Display	Setting Range	Factory Setting	Change Limite
P4.00	DI1terminal function selection	0~59	1	★
P4.01	DI2 terminal function selection	0~59	4	★
P4.02	DI3 terminal function selection	0~59	9	★
P4.03	DI4 terminal function selection	0~59	12	★
P4.04	DI5 terminal function selection	0~59	13	★
P4.05	DI6 terminal function selection	0~59	2	★
P4.06	DI7 terminal function selection	0~59	12	★
P4.07	DI8 terminal function selection	0~59	13	★
P4.08	DI9 terminal function selection	0~59	14	★
P4.09	DI10 terminal function selection	0~59	15	★

These parameters are used to set digital multi-function input terminals, as shown in the table below：

Setting	Function	Specification explanation
0	No- function	Set useless terminals to “no function”, in order to prevent misoperation.
1	Forward command (FWD)	The forward jog and Reserved jog of the inverter are controlled via the external terminals.
2	Reserved command (REV)	
3	Three line running control	Set inverter running mode as three line control mode.For details please refer to function code P4.11(Terminal command mode).
4	FWD JOG command(FJOG)	FJOG refers to jog forward running, RJOG refers to jog Reserved running. For jog running frequency, jog acc./dec. time please refer to P8.00、P8.01、P8.02 for details.
5	REV JOG command(RJOG)	
6	Up command	When command source is set as “Digital Setup”, the increase or decrease of the set frequency is implemented through the external terminal.
7	DOWN command	
8	Free stop	When this terminal command is valid, meaning that the inverter locks the output, the load will free stop according to the mechanical inertia.this way is the same withP6.10
9	Fault reset(RESET)	When this terminal command is valid, inverter’s fault can be reset. It has the same function with RESET key on the keyboard.This function can realize remote fault reset.

	10	Operation suspended	Inverter decelerates to stop, but all operation parameters are memorized. E.g：PLC parameter, swing frequency parameter, PID parameter. When this terminal signal disappeared, inverter restored to running status as before.
	11	External default normally open input	When the inverter detects that the signal occurs , it will report “15=Err15” fault, and handle the fault according to the fault protection action mode.(Please refer to P9.47 for details).
	12	Multi-stage speed terminal1	The setting of 16-segment speeds can be realized by the combinations of the terminal status when the frequency source is “MS Speed”. Refer to schedule 1 for details.
	13	Multi-stage speed terminal2	
	14	Multi-stage speed terminal3	
	15	Multi-stage speed terminal4	
	16	Acc./dec.time selection terminal 1	It can realize 4 kinds of acc./dec. selection mode by 4 combination status of this 2 terminals.For details please refer to schedule2.
	17	Acc./dec.time selection terminal 2	
	18	Frequency source switching	It is used to switch to choose different frequency sources. It realizes switching between 2 kinds of frequency sources according to the setup of P0.07.
	19	UP/DOWN setup reset(terminal and keyboard)	When the frequency source is given as “Digital Setup” and the terminal command is valid, it can clear the frequency values changed through keyboard or terminals UP/DOWN and restore the reference frequency to the setup value of “Preset Frequency"(P0.08).
	20	Running command switching terminal	When command source is set to terminal control (P0.02=1), the terminal could realize switching between terminal control and keyboard control. When command source is set to communication control(P0.02=2), the terminal could realize switching between communication control and keyboard control.
	21	Acc./dec forbidden	When this terminal command is valid, it can maintain the current frequency output while stopping.
	22	PID pause	PID temporary invalid, the inverter maintains the current frequency output and no longer taking PID adjustment of frequency source.
	23	PLC status reset	When this terminal command is valid, it clears the memorized PLC running phase and running time, and

		restores to the initial status of PLC running.
24	Swing frequency pause	When this terminal command is valid, the inverter maintains the frequency output of the swing frequency center, and the swing frequency pauses.
25	Counter input	It is used as input terminal of the counting pulse.
26	Counter reset	When this terminal command is valid, it clears the counting value of the counter to zero.
27	Length counting input	It is used as pulse input terminal of the length counting.
28	Length counting reset	When this terminal is valid, it clears the length counting to zero.
29	Torque control forbidden	It prohibits inverter torque control. Inverter enters in speed control mode.
30	PULSE frequency input(Only valid for DI5)	DI5 is used as pulse input terminal.
31	Reserved	Reserved
32	Immediate DC braking	When this terminal is valid, inverter directly switch to dc braking state.
33	External default normally closed input	When the inverter detects that the signal occurs , it will report "Err15" fault, and stop running.
34	Frequency modification enable	If the function is valid, inverter Yes not respond to frequency change until the function turns to be invalid.
35	PID direction Reservedd	PID and PA.03 set values are set in opposite directions when the terminal is valid.
36	External stop terminal1	It could make inverter stop when in keyboard control. Equivalent to function of STOP key on the keyboard.
37	Control command switching terminal 2	It is used to switch control mode between terminal and communication.
38	PID integration suspension	When it is valid, PID integration regulation function pauses, while PID proportional regulation and differential regulation function are still valid.
39	Frequency source X and preset frequency switching	When it is valid, frequency source X is replaced by the preset frequency P0.08.
40	Frequency source Y and preset frequency switching	When it is valid, frequency source Y is replaced by the preset frequency P0.08.。

41	Motor selection terminal1	It can realize 4 groups of motor parameters switching by 4 combination status of this 2 terminals.For details please refer to schedule3.
42	Motor selection terminal2	
43	PID parameter switching	PA.18=1, the parameter is invalid, PID parameter takes use of PA.05~PA.07. On the contrary, PA.15~PA.17 are taken for the use.
44	User-defined fault 1	When user-defined fault 1&2 are valid, inverter alarm fault number 27= Err27 & 28= Err28 respectively. Inverter will handle the fault according to the mode selected by P9.49.
45	User-defined fault 2	
46	Speed control/ torque control switching	It enables control mode to switch between inverter torque control and speed control. Inverter running in the A0.00 defined mode when the terminal is invalid, and will switch to another mode when it is valid.
47	Emergency stop	Inverter stops at the fastest speed when the terminal is valid. Current is set to the current upper limit during this stop process. This function is used for inverter fast stop , which can meet the stop need in system emergency.
48	External stop terminal 2	This terminal can be used to stopthe inverter in any circumstances (panel control ,terminal control and communication control). Deceleration time is fixed to deceleration time 4.
49	Deceleration DC braking	If it is valid, inverter first decelerates to stop DC braking start frequency and then switches to DC braking state.
50	Running time reset	Inverter running time of this time is cleared if the terminal is valid. It operates with the use of P8.42 and P8.53.
51	Two wire/three wire mode switcher	Two wire//three wire switcher
52	Reserved frequency forbidden	If it is valid,the inverter can not output Reserved frequency
53-59	Reserved	Reserved

Schedule 1　MS command function description

4 MS command terminals, which can be combined into 16 states. For 16 corresponding values, please refer to schedule 1 as below：

K4	K3	K2	K1	Command setup	Corresponding parameter
OFF	OFF	OFF	OFF	MS command 0	PC.00

OFF	OFF	OFF	ON	MS command 1	PC.01
OFF	OFF	ON	OFF	MS command 2	PC.02
OFF	OFF	ON	ON	MS command 3	PC.03
OFF	ON	OFF	OFF	MS command 4	PC.04
OFF	ON	OFF	ON	MS command 5	PC.05
OFF	ON	ON	OFF	MS command 6	PC.06
OFF	ON	ON	ON	MS command 7	PC.07
ON	OFF	OFF	OFF	MS command 8	PC.08
ON	OFF	OFF	ON	MS command 9	PC.09
ON	OFF	ON	OFF	MS command 10	PC.10
ON	OFF	ON	ON	MS command 11	PC.11
ON	ON	OFF	OFF	MS command 12	PC.12
ON	ON	OFF	ON	MS command 13	PC.13
ON	ON	ON	OFF	MS command 14	PC.14
ON	ON	ON	ON	MS command 15	PC.15

When frequency source is set to multi-stage speed mode, 100.0% of function code PC.00~PC.15 are corresponding to maximum frequency P0.10. To meet the need, MS command can be used not only for multi-stage speed function, but also PID setup source or VF separation voltage source.

Schedule 2　Acceleration / deceleration terminal selection description：

Terminal2	Terminal1	Acc./dec. selection	Corresponding parameter
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

Schedule 3　Motor terminal selection description：

Terminal2	Terminal1	Acc./dec. selection	Corresponding parameter
OFF	OFF	Motor 1	P1、P2 group
OFF	ON	Motor 2	A2 group
ON	OFF	Motor 3	A3 group
ON	ON	Motor 4	A4 group

P4.10	DI filter time	0.000s~1.000s	0.010s	☆

If the digital input terminal malfunction because it is vulnerable to interference , users could increase the parameter value to enhance the interference immunity. However, this operation may cause reduced sensitivity of the DI terminal.

P4.11	Terminal command mode	1bit	Terminal input command mode	0	★
		Two-line mode 1	0		
		Two-line mode 2	1		
		Three-line mode1	2		
		Three-line mode2	3		
		Two-line mode 3	4		
		Three-line mode3	5		
		10bit	Terminal input priority mode		
		JOG prior to run command FWD,REV	0		
		run command FWD,REV prior to JOG	1		

0 bit：

This parameter defines 6 different modes of controlling the forward and Reserved rotations of the inverter via the external terminal.

NOTE:：In order to explain，The following arbitrary selection DI1～DI10 multifunctional input terminal DI1、DI2、DI3 three terminals as external terminals，That is, by setting the value ofP4.00～P4.02 to select DI1、DI2、DI3 three terminal functions。Detailed function definition is P4.00～P4.09 setting range

0：Two-line mode 1：

This mode is the most commonly used forward/Reserved rotation control mode. The forward/Reserved rotation of the motor is decided by the Di1, DI2 terminal commands. The descriptions on the terminal running command are as shown as below：

Terminal	Set value	Description
DI1	1	Forward(FWD)
DI2	2	Reserved(REV)

Among them ,DI1、DI2 are DI1~DI10 muti-function input terminal, level valid.

0 invalid，1 valid

K1	K2	Command
0	0	Stop
0	1	Reserved(REV)
1	0	Forward(FWD)
1	1	Stop

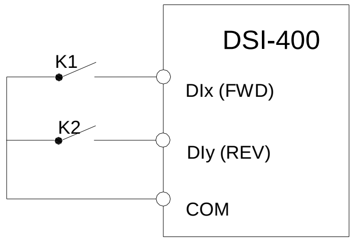


Fig. 5-6 Two-line control mode 1

1： Two-line mode 2：

In this operation mode,DI1 terminal function is to enable operation,while DI2 terminal function is to determine running direction. The descriptions on the terminal running command are as shown as below :

Terminal	Set value	Description
DI1	1	Forward(FWD)
DI2	2	Reserved(REV)

Among them ，DI1、DI2 are DI1~DI10 multi-fuction input terminal, level valid

0 invalid，1 valid

K1	K2	Command
0	0	Stop
0	1	Stop
1	0	Forward(FWD)
1	1	Reserved(REV)

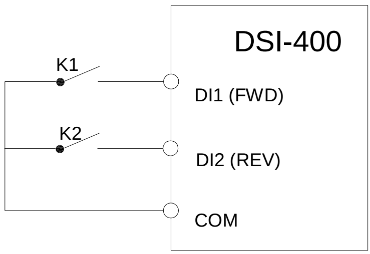


Fig. 5-7 Two-line control mode 2

2：Three-line mode1

In this operation mode, DI3 terminal is the enable terminal, running direction controlled by DI1terminal 、DI2terminal. The descriptions on the terminal running command are as shown as below：

Terminal	Set value	Description
DI1	1	Forward(FWD)
DI2	2	Reserved(REV)
DI3	3	Three-line running control

When in the need of running, users should first connect DI3 terminal. Forward and Reserved running is realized through the rising edge of Di1 or DI2.

When in the need of stop, user should disconnect DI3 terminal to meet the need. Among them, DI1、DI2、DI3 are multi-function input terminal of DI1~DI10. DI1,DI2 are of pulse valid, while DI3 level valid.

0　invalid. 1 valid. X arbitrarily

SB1	SB2	SB3	Command	
0	X	X	Stop	
1	1	0	Forward(FWD)	
1	0	1	Reserved(REV)	
1	1	0->1	Reserved(REV)	
1	0->1	1	Forward(FWD)	

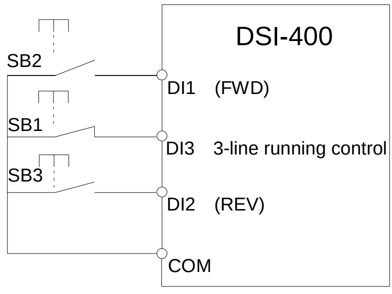


Fig. 5-8 Three-line control mode 1

Among them：

SB1：Stop button

SB2：Forward rotation button

SB3：Reserved rotation button

3：Three-line mode2

In this operation mode, DI3 terminal is the enable terminal, Direction by the state of the DI2 to decide,while DI1 terminal function is to determine running direction. The descriptions on the terminal running command are as shown as below：

Terminal	Set value	Description
DI1	1	Forward(FWD)
DI2	2	Reserved(REV)
DI3	3	Three-line running control

When in the need of running, users should first connect DI3 terminal. DI1 pulse rising edge gives running command signal, while DI2 status gives running direction signal.

When in the need of stop, user should disconnect DI3 terminal to meet the need. Among them, DI1, DI2, DI3 are multi-function input terminals of DI1~DI7. DI1 is of pulse valid, while DI2, DI3is of level valid.

0 invalid. 1 valid. X arbitrarily

SB1	SB2	K	Command	
0	X	X	Stop	
1	1	0	Forward(FWD)	
1	1	1	Reserved(REV)	

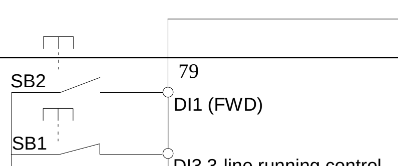


Fig. 5-9 Three-line control mode 2

Among them ：

SB1：Stop button

SB2：Running button

4：Two-line mode3

this operation mode is Priority control two-line mode.The forward/Reserved rotation of the motor is decidedby the Di1, DI2 terminal commands. The descriptions on the terminal running command are as shown as below：

Terminal	Set value	Description
DI1	1	Forward(FWD)
DI2	2	Reserved(REV)

Among them ，DI1、DI2 are DI1~DI10 multi-fuction input terminal, level valid

0 invalid，1valid

K1	K2	Command
0	0	Stop
0	1	Reserved(REV)
1	0	Forward(FWD)
1	0->1	Forward(FWD)

0->1	1	Reserved(REV)

5：Three-line mode3

In this operation mode, DI3 terminal is the enable terminal, running direction controlled by DI1terminal 、DI2terminal. The descriptions on the terminal running command are as shown as below：

Terminal	Set value	Description
DI1	1	Forward(FWD)
DI2	2	Reserved(REV)
DI3	3	Three-line running control

When in the need of running, users should first connect DI3 terminal. Forward and Reserved running is realized through the rising edge of Di1 or DI2

Direction as first control priority control，when DI1 is valid，DI2 pulse rising edge is invalid,when DI2 is valid，DI1 pulse rising edge is invalid,When in the need of stop, user should disconnect DI3 terminal to meet the need. Among them, DI1、DI2、DIn are multi-function input terminal of DI1~DI7. DI1,DI2 are of pulse valid, while DI3 level valid.

0 invalid. 1 valid. X arbitrarily

SB1	SB2	SB3	Command	
0	X	X	Stop	
1	1	0	Forward(FWD)	
1	0	1	Reserved(REV)	
1	1	0->1	Forward(FWD)	
1	0->1	1	Reserved(REV)	

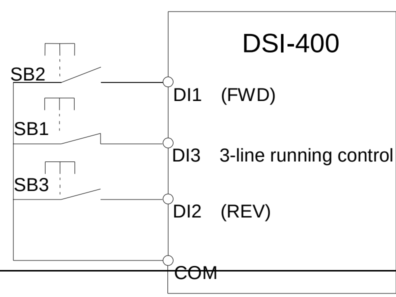


Fig. 5-8 Three-line control mode 1

Among them：

SB1：Stop button

SB2：Forward rotation button

SB3：Reserved rotation button

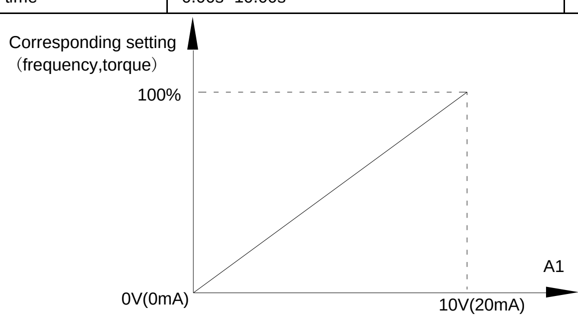
P4.12	Terminal UP/DOWN variation rate	0.01Hz/s~65.535Hz/s	1.00Hz/s	☆

It is used to set the frequency variation rate (frequency variation per second) when adjusting the set frequency with terminals UP/DOWN.

When P0.22 (frequency decimal point) is set to 2, range of P4.12 value is 0.001Hz/s~65.535Hz/s.

When P0.22 (frequency decimal point) is set to 1, range of P4.12 value is 0.01Hz/s~655.35Hz/ s.

P4.13	AI curve 1 minimum input	0.00V~P4.15	0.00V	☆
P4.14	AI curve 1 minimum input corresponding setup	-100.00%~100.0%	0.0%	☆
P4.15	AI curve 1 maximum input	P4.13~10.00V	10.00V	☆
P4.16	AI curve 1 maximum input corresponding setup	-100.00%~100.0%	100.0%	☆
P4.17	AI1 filter time	0.00s~10.00s	0.10s	☆



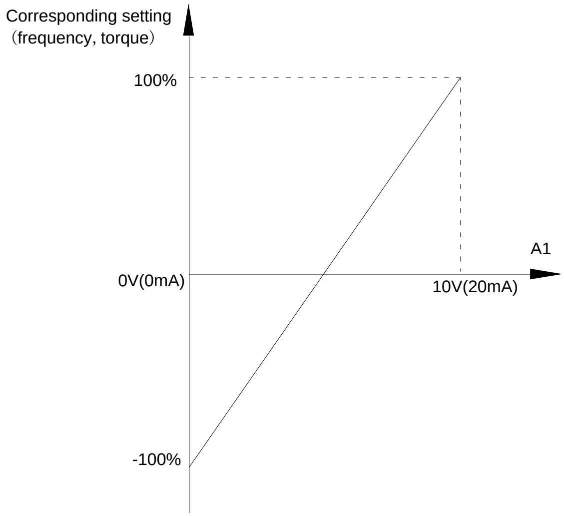


Fig. 5-10 Relationship between analog input and setup value

The parameters mentioned above define the relationship between analog input voltage and the analog input setup value.

When analog input voltage exceeds the setup “maximum input” limit, analog voltage is calculated as “maximum input” .Similarly, when analog input is smaller than the setup “minimum input”,analog voltage is calculated as minimum input or 0.0% according to the setting of P4.34.

AI used as current input terminal ： 1mA current equals to 0.5V voltage.

AI input filtering time is used to set AI1 software filtering time.When field analog quantity is vulnerable, please increase the filtering time so that analog quantity tends to be stable. But excessive filtering time will lead to slow response time to analog detection. User should balance it according to practical application cases.

In various application cases, the nominal value corresponding to 100% of analog reference will be different. Refer to specific application description for the specific value.

Figure 5.10 shows typical setup cases.

P4.18	AI curve 2 minimum input	0.00V~P4.20	0.00V	☆
P4.19	AI curve 2 minimum input corresponding setup	-100.00%~100.0%	0.0%	☆
P4.20	AI curve 2 maximum input	P4.18~10.00V	10.00V	☆

<table>
<tr><td>P4.21</td><td>AI curve 2 maximum input corresponding setup</td><td colspan="2">-100.00%~100.0%</td><td>100.0%</td><td>☆</td></tr>
<tr><td>P4.22</td><td>AI2 filter time</td><td colspan="2">0.00s~10.00s</td><td>0.10s</td><td>☆</td></tr>
<tr><td colspan="6">For function and usage of curve 2, please refer to description of curve 1.</td></tr>
<tr><td>P4.23</td><td>AI curve 3 minimum input</td><td colspan="2">-10.00V~P4.25</td><td>-10V</td><td>☆</td></tr>
<tr><td>P4.24</td><td>AI curve 3 minimum input corresponding setup</td><td colspan="2">-100.00%~100.0%</td><td>0.0%</td><td>☆</td></tr>
<tr><td>P4.25</td><td>AI curve3 maximum input</td><td colspan="2">P4.23~10.00V</td><td>8.60V</td><td>☆</td></tr>
<tr><td>P4.26</td><td>AI curve 3 maximum input corresponding setup</td><td colspan="2">-100.00%~100.0%</td><td>100.0%</td><td>☆</td></tr>
<tr><td>P4.27</td><td>AI3filter time</td><td colspan="2">0.00s~10.00s</td><td>0.10s</td><td>☆</td></tr>
<tr><td colspan="6">For function and usage of curve 3, please refer to description of curve 1.</td></tr>
<tr><td>P4.28</td><td>PULSE minimum input</td><td colspan="2">0.00kHz~P4.30</td><td>0.00kHz</td><td>☆</td></tr>
<tr><td>P4.29</td><td>PULSE minimum input corresponding setup</td><td colspan="2">-100.00%~100.0%</td><td>0.0%</td><td>☆</td></tr>
<tr><td>P4.30</td><td>PULSE maximum input</td><td colspan="2">P4.28~50.00kHz</td><td>50.00kHz</td><td>☆</td></tr>
<tr><td>P4.31</td><td>PULSE maximum input corresponding setup</td><td colspan="2">-100.00%~100.0%</td><td>100.0%</td><td>☆</td></tr>
<tr><td>P4.32</td><td>PULSE filter time</td><td colspan="2">0.00s~10.00s</td><td>0.10s</td><td>☆</td></tr>
<tr><td colspan="6">This group of parameters are used to set relationship between DI5 pulse frequency and it’s corresponding settings.

Pulse frequency can be only input to the inverter through DI5 channel. This function group’s applications are similar to curve 1,please refer to the description of curve 1.</td></tr>
<tr><td rowspan="9">P4.33</td><td rowspan="9">AI curve selection</td><td colspan="2">1bit AI1 curve selection</td><td rowspan="9">321</td><td rowspan="9">☆</td></tr>
<tr><td>Curve1(2 points，see P4.13~P4.16)</td><td>1</td></tr>
<tr><td>Curve2(2 points，see P4.18~P4.21)</td><td>2</td></tr>
<tr><td>Curve3(2 points，see P4.23~P4.26)</td><td>3</td></tr>
<tr><td>Curve4(4 points，see A6.00~A6.07)</td><td>4</td></tr>
<tr><td>Curve5(4 points，see A6.08~A6.15)</td><td>5</td></tr>
<tr><td colspan="2">10bit AI2 curve selection</td></tr>
<tr><td>Curve1(2 points，see P4.13~P4.16)</td><td>1</td></tr>
<tr><td>Curve2(2 points，see P4.18~P4.21)</td><td>2</td></tr>
</table>

			Curve3(2 points，see P4.23~P4.26)	3		
			Curve4(4 points，see A6.00~A6.07)	4		
			Curve5(4 points，see A6.00~A6.07)	5		
		100bit	AI3 curve selection			
			Curve1(2 points，see P4.13~P4.16)	1		
			Curve2(2 points，see P4.18~P4.21)	2		
			Curve3(2 points，see P4.23~P4.26)	3		
			Curve4(4 points，see A6.00~A6.07)	4		
			Curve5(4 points，see A6.00~A6.07)	5		
The 1bit, 10bit, 100bit of the function code are used to choose the set curve of analog input AI1、AI2、AI3 respectively. 3 analog input can choose any curve of the 5 types. Curve1, curve 2, curve 3 are 2 points curve that set through P4 group function codes, while curve 4, curve 5 are 4 points curve that set through A8 group function codes. DSI-400 standard unit offers 3-channel analog input terminals. Multi-function I/O expansion card is needed in the use of AI3x.						
P4.34	AI below minimum input setup selection	1bit	AI1 below minimum input setup selection		000	☆
			Minimum input setup	0		
			0.0%	1		
		10bit	AI2 below minimum input setup selection			
			Minimum input setup	0		
			0.0%	1		
		100bit	AI3 below minimum input set selection			
			Minimum input setup	0		
			0.0%	1		
This function code is used to determine analog quantity corresponding setup when analog input voltage						

<table>
<tr><td colspan="6">below the setup of minimum input.

The 1bit, 10bit, 100bit of the function code are corresponding to the analog input AI1、AI2、AI3 respectively. If the bit is set to 0 and AI is below the minimum setup , the analog input setup is the curve “minimum input corresponding setup”(P4.14、P4.19、P4.24) . If the bit is set to 0 and AI is below the minimum setup , the analog quantity corresponding setup is 0.0%.</td></tr>
<tr><td>P4.35</td><td>DI1 delay time</td><td colspan="2">0.0s~3600.0s</td><td>0.0s</td><td>★</td></tr>
<tr><td>P4.36</td><td>DI2 delay time</td><td colspan="2">0.0s~3600.0s</td><td>0.0s</td><td>★</td></tr>
<tr><td>P4.37</td><td>DI3 delay time</td><td colspan="2">0.0s~3600.0s</td><td>0.0s</td><td>★</td></tr>
<tr><td colspan="6">Only DI1, DI2, DI3 are able to set equipment delay time.

They are used to set delay time to inverter DI terminal state change.</td></tr>
<tr><td rowspan="15">P4.38</td><td rowspan="15">DI terminal effective mode selection 1</td><td>1bit</td><td>DI1 terminal valid state setup</td><td rowspan="15">00000</td><td rowspan="15">★</td></tr>
<tr><td>High level valid</td><td>0</td></tr>
<tr><td>Low level valid</td><td>1</td></tr>
<tr><td>10bit</td><td>DI2 terminal valid state setup</td></tr>
<tr><td>High level valid</td><td>0</td></tr>
<tr><td>Low level valid</td><td>1</td></tr>
<tr><td>100bit</td><td>DI3 terminal valid state setup</td></tr>
<tr><td>High level valid</td><td>0</td></tr>
<tr><td>Low level valid</td><td>1</td></tr>
<tr><td>1000 bit</td><td>DI4 terminal valid state setup</td></tr>
<tr><td>High level valid</td><td>0</td></tr>
<tr><td>Low level valid</td><td>1</td></tr>
<tr><td>1000 0bit</td><td>DI5 terminal valid state setup</td></tr>
<tr><td>High level valid</td><td>0</td></tr>
<tr><td>Low level valid</td><td>1</td></tr>
<tr><td rowspan="2">P4.39</td><td rowspan="2">DI terminal effective mode selection 2</td><td>1bit</td><td>DI6 terminal valid state setup</td><td rowspan="2">00000</td><td rowspan="2">★</td></tr>
<tr><td>High level valid</td><td>0</td></tr>
</table>

		Low level valid	1		
		10bit DI7 terminal valid state setup			
		High level valid	0		
		Low level valid	1		
		100bit DI8 terminal valid state setup			
		High level valid	0		
		Low level valid	1		
		1000 bit DI9 terminal valid state setup			
		High level valid	0		
		Low level valid	1		
		10000bit DI10 terminal valid state setup			
		High level valid	0		
		Low level valid	1		

It is used to set digital input terminal effective mode.

High level valid：Connection between COM and corresponding DI is valid,disconnection invalid.

Low level valid：Connection between COM and corresponding DI is invalid,disconnection valid.

5-7 Output terminal：P5.00-P5.22

DSI-400 series inverter provides two multifunctional analog terminal output selections,two multifunctional relay output terminal, two DO terminal (FM can be used as high speed pulse output terminal as well as open collector switching output).

Code	Description/ Keyboard Display	Setting Range		Factory Setting	Change Limite
P5.00	FM terminal output mode selection	Pulse output(FMP)	0	1	☆
		Switch output(FMR)	1		

Y1 is programmable multiplex terminal, which can be used as high speed pulse output terminal (FMP) or open collector switching output terminal (FMR).

When P5.00 is set to 0, maximum output frequency can reach 10kHz , please refer to P5.06 for related description.

P5.01	FMRselection (open collector output terminal)	0-41	0	☆
P5.02	Relay output selection (TA1.TB1.TC1)	0-41	2	☆
P5.03	Relay output selection (TA2.TB2.TC2)	0-41	0	☆
P5.04	DO1 output selection(open collector output terminal)	0-41	0	☆
P5.05	DO2 output selection	0-41	4	☆

The above 5 function codes are used to select 5 digital output function. TA1.TB1.TC1 and TA2.TB2.TC2 are control board and expansion card relay respectively.

Function selections are as follows：

Set value	Function	Description
0	No output	The output terminals have no function
1	Inverter in operation	When the inverter is running, ON signal is output.
2	Output fault(Stop fault)	When inverter fault happens and stops due to the fault , ON signal is output
3	Frequency level detection FDT1 output	Refer to P8.19 and P8.20 function codes for details
4	Frequency arrival	Refer to P8.21 function codes for details
5	Null speed operation(stop without output)	When inverter is in running status and output 0Hz , ON signal is output. When inverter is in stop status, OFF signal is output.
6	Motor overload pre-alarm	Judgment will be made according to the pre-alarm parameter value before the motor electronic thermal protection is enabled. If it exceeds the pre-alarm parameter value, ON signal will be output. Refer to P9.00 to P9.02 function codes for the descriptions of motor overload.
7	Inverter overload pre-alarm	When it is found that the inverter is overloaded, ON signal will be output before the overload protection occurs.

8	Setup counting value arrived	When the counting value reaches the value of PB.08, it outputs ON signal.
9	Designated counting value arrived	When the counting value reaches the value of PB.09, it outputs ON signal.Refers to PB group for details.
10	Length arrived	When the actual length exceeds the setup value in PB.05, it outputs ON signal.
11	PLC circulation end	When the simple PLC running finishes one circulation, it outputs a pulse signal with width of 250ms.
12	Total running time arrived	When the accumulated running time of the inverter exceeds the setup time (P8.17), it outputs ON signal.
13	Frequency limit	When set frequency exceeds upper limit frequency or lower limit frequency,and inverter output frequency exceeds upper limit frequency or lower limit frequency, it outputs ON signal.
14	Torque limit	In speed control mode, if output torque reaches the torque limit, inverter will be in stall protection status and output ON signal.
15	RUN ready	When the inverter has no fault and the bus voltage works normally and the inverter is ready for running, it outputs ON signal. Upon normal startup, it closes the output.
16	AI1>AI2	When the voltage value of analog input AI1 is bigger than that of analog input AI2, it output ON signal.
17	Frequency upper limit arrived	When the running frequency of the inverter reaches the frequency upper limit, it outputs ON signal.
18	Frequency lower limit arrived (stop without output)	When the running frequency of the inverter reaches the frequency lower limit, it outputs ON signal.And output OFF signal in stop status.
19	Under voltage state output	When inverter is in under voltage status, it outputs ON signal.
20	Communication setup	Please refer to communication protocol.
21	Reserved	Reserved
22	Reserved	Reserved
23	Null speed operation 2(Stop with output)	When inverter output 0Hz , ON signal is output. When inverter is in stop status, ON signal is output.
24	Total power-on time arrival	When accumulated power-on time(P7.13) exceeds

		P8.16 set value, it outputs ON signal.
25	Inspection level of FDT2 frequency	Please refer to function code P8.28、P8.29 for details.
26	Frequency 1 arrival output	Please refer to function code P8.30、P8.31 for details.
27	Frequency 2 arrival output	Please refer to function code P8.32、P8.33 for details.
28	Current 1 arrival output	Please refer to function code P8.38、P8.39 for details.
29	Current 2 arrival output	Please refer to function code P8.40、P8.41 for details.
30	Timing arrival output	When inverter running time reaches the set timming (P8.42 valid), it outputs ON signal.
31	AI1excessive input	When analog input value AI1 is bigger than P8.46 (AI1 input protection upper limit) or smaller than P8.45(AI1 input protection lower limit), it outpus ON signal.
32	Load off	Inverter in load off status, it outpus ON signal.
33	Reserved running	Inverter in Reserved running mode, it outputs ON signal.
34	Zero current state	Please refer to function code P8.28、P8.29 for details.
35	Module temperature arrival	When module radiator temperature(P7.07) reaches the set value of P8.47, it outputs ON signal.
36	Software excessive current	Please refer to function code P8.36、P8.37 for details.
37	Frequency lower limit arrival(stop with output)	When running frequency reaches frequency lower limit, it outputs ON signal.When in stop status ,it outputs ON signal too.
38	Alarm output	When inverter fault with processing mode of continue running, it outputs alarm signal.
39	Motor over temperature alarm	When motor temperature reaches set value of P9.58 , it outputs ON signal.(temperature can be viewed through U0.34)
40	The running time arrival	When the running time exceeds the set value of P8.53 , it outputs ON signal.
41	Alarm output	When inverter fault with processing mode of continue running(uninclude under voltage fault), it outputs alarm signal.

P5.06	FMP output function selection(pulse output	0-16	0	☆

	terminal)			
P5.07	AO1 output function selection	0-16	0	☆
P5.08	AO2 output function selection	0-16	1	☆

FMP terminal output pulse frequency range：0.01kHz~P5.09(FMP maximum frequency output), P5.09 could vary from 0.01kHz to 100.00kHz.

AO1, AO2 output ranges from 0V to 10V, or 0mA to 20mA.

The corresponding value range is shown in the table below：

Setup value	**Function**	**Range**
0	Running frequency	0~maximum output frequency
1	Setup frequency	0~maximum output frequency
2	Output current	0~200%ofthe rated current of the inverter
3	Output torque	0~200% of the rated torque of the inverter
4	Output power	0~200% of the rated power of the inverter
5	Output voltage	0~120% of the rated voltage of the inverter
6	PULSE input	0.01kHz~100.00kHz
7	AI1	0V~10V
8	AI2	0V~10V(Or 0~20mA)
9	AI3	0V~10V
10	Length	0~Maximum length
11	Counting value	0~Maximum counting value
12	Communication setup	0.0%~100.0%
13	Motor revolving speed	0~maximum output frequency corresponding speed
14	Output current	0.0A~1000.0A
15	Output voltage	0.0V~1000.0V
16	Output torque	Actual value, proportion to motor torque

P5.09	FMP maximum output frequency	0.01kHz~100.00kHz	50.00kHz	☆

<table>
<tr><td colspan="6">When the multifunctional terminal output function selects FMP pulse output, it can set the maximum frequency value of output pulse.</td></tr>
<tr><td>P5.10</td><td>AO1 zero offset</td><td colspan="2">-100.0%~+100.0%</td><td>0.0%</td><td>☆</td></tr>
<tr><td>P5.11</td><td>AO1 gain</td><td colspan="2">-10.00~+10.00</td><td>1.00</td><td>☆</td></tr>
<tr><td>P5.12</td><td>Expansion card AO2zero offset</td><td colspan="2">-100.0%~+100.0%</td><td>0.00%</td><td>☆</td></tr>
<tr><td>P5.13</td><td>Expansion card AO2 gain</td><td colspan="2">-10.00~+10.00</td><td>1.00</td><td>☆</td></tr>
<tr><td colspan="6">Function codes above are generally used to modify the zero drift of the analog output and also be used to define required AO output curves.

If b represents zero offset, k represents gain, Y represents actual output, and X represents standard output, the actual output is calculated as follows： Y=kX+b

AO1, AO2 zero offset coefficient 100% corresponds to 10V (20mA).

For example, if the analog output is the running frequency, and it is expected to output 8V (16mA) when the frequency is 0, and output 3V (6mA) at the maximum frequency, the standard output 0V to 10V shall be modified to 8V to 3V output. As per the above formula, AO zero offset coefficient shall be set to “80%”, while A0 gain shall be set to “-0.50”.</td></tr>
<tr><td>P5.17</td><td>FMR output delay time</td><td colspan="2">0.0s~3600.0s</td><td>0.0s</td><td>☆</td></tr>
<tr><td>P5.18</td><td>RELAY1 output delay time</td><td colspan="2">0.0s~3600.0s</td><td>0.0s</td><td>☆</td></tr>
<tr><td>P5.19</td><td>RELAY2 output delay time</td><td colspan="2">0.0s~3600.0s</td><td>0.0s</td><td>☆</td></tr>
<tr><td>P5.20</td><td>DO1 output delay time</td><td colspan="2">0.0s~3600.0s</td><td>0.0s</td><td>☆</td></tr>
<tr><td>P5.21</td><td>DO2 output delay time</td><td colspan="2">0.0s~3600.0s</td><td>0.0s</td><td>☆</td></tr>
<tr><td colspan="6">Set output terminal FMR, relay 1, relay 2, DO1 and DO2 delay time that begins from status changing to real output changing.</td></tr>
<tr><td rowspan="7">P5.22</td><td rowspan="7">DO output terminal valid state selection</td><td>1bit</td><td>FMR valid state selection</td><td rowspan="7">00000</td><td rowspan="7">☆</td></tr>
<tr><td>Positive logic</td><td>0</td></tr>
<tr><td>Negative logic</td><td>1</td></tr>
<tr><td>10bit</td><td>RELAY1 terminal valid state setup</td></tr>
<tr><td>Positive logic</td><td>0</td></tr>
<tr><td>Negative logic</td><td>1</td></tr>
<tr><td>100bit</td><td>RELAY2 terminal valid state setup</td></tr>
</table>

		Positive logic	0		
		Negative logic	1		
		1000 bit: DO1 terminal valid state setup			
		Positive logic	0		
		Negative logic	1		
		10000 bit: DO2 terminal valid state setup			
		Positive logic	0		
		Negative logic	1		

Define output terminal FMR、Relay 1、Relay 2、DO1 andDO2 output logic.

0： Positive logic

Digital output terminals and the corresponding public end connected as effective state, disconnect for invalid state.

1：Negative logic

Digital output terminals and the corresponding public end connected as invalid state, disconnect for effective state.

5-8 Start/stop control：P6.00-P6.25

Code	Description/ Keyboard Display	Setting Range		Factory Setting	Change Limite
P6.00	Start mode	Direct startup	0	0	☆
		Revolving speed tracking startup	1		
		Pre-excitation startup (AC asynchronous motor)	2		
		SVC quick start	3		

0： Direct startup：

When the DC brake time is zero, it starts at the startup frequency.

When the DC brake time is non-zero value, it can perform DC brake before start. It is suitable for the applications where small inertia may cause Reserved rotation at the time of startup.

1：Revolving speed tracking startup：

The inverter firstly judges the revolving speed and direction of the motor and then starts at the frequency corresponding to the tracked rotation velocity of the motor, and performs smooth startup of the motor in rotation without impact.It is suitable for the applications where large inertia is restarted due to transient power shutdownIn order to ensure the performance of the rotation velocity tracking startup, motor parameters (Group P1) should be set correctly.

2：Asynchronous pre-excitation startup

It is only valid for asynchronous motor , and is used to establish magnetic field before motor operation. For pre-excitation current, pre-excitation time please refer to function code P6.05 and P6.06.

If pre-excitation time is set to 0, the pre-excitation process will be canceled ,and start with start frequency. If pre-excitation time is not set to 0, inverter first pre-excitation then starup. In this way, motor dynamic response performance is promoted.

3. Svc quick start

This mode only used in svc control of asynchronous motor. It can reduce the start time.

P6.01	Revolving speed tracking mode	Start from stop frequency	0	0	★
		Start from zero speed	1		
		Start from maximum frequency	2		

In order to complete the rotation speed tracking process in the shortest period, it can select the mode of inverter tracking the rotation velocity of motor：

0： Track downward from the frequency at the time of stop, which is generally selected at first.

1： Track upward from zero frequency, which is used when the inverter is restarted upon long period of power shutdown

2： Track downward from the maximum frequency, which is generally used for power generating load.

P6.02	Revolving speed tracking speed	1~100	20	☆

In the mode of revolving speed tracking startup, it is used to select the speed of rotation tracking. The higher the parameter value is, the faster the tracking velocity is, but too higher value may cause unreliable tracking.

P6.03	Start frequency	0.00Hz~10.00Hz	0.00Hz	☆

P6.04	Start frequency holding time	0.0s~100.0s	0.0s	★

To ensure the torque at the time of startup, proper startup frequency shall be set. In addition, in order to set up magnetic flux when waiting for the startup of the motor, the startup frequency shall remain for a certain period of time before accelerating to the setup frequency.

Start frequency P6.03 is not affected by the lower frequency limit.If the frequency reference value (frequency source) is lower than the startup frequency, the inverter cannot start and will be in standby status.

In positive&negative switching process, startup frequency retention time Yes not work.Startup frequency retention time is not included in the acceleration time,but included in the simple PLC running time.

Example 1：

P0.03＝0 means the frequency source is digital reference.

P0.08＝2.00Hz means the digital setup frequency is 2.00Hz.

P6.03＝5.00Hz means the startup frequency is 5.00Hz.

P6.04＝2.0s means that the startup frequency retention time is 2.0s.

In this case, the inverter will be in the standby status and its output frequency is 0Hz.

Example 2：

P0.03＝0 means the frequency source is digital reference.

P0.08＝10.00Hz means the digital setup frequency is 10.00Hz.

P6.03＝5.00Hz means the startup frequency is 5.00Hz.

P6.04＝2.0s means that the startup frequency retention time is 2.0s.

In this case, the inverter accelerates to 5.00 Hz and remains for 2 seconds, and then accelerates to the setup frequency 10Hz.

P6.05	Start dc braking current /pre-excitation current	0%~100%	0%	★
P6.06	Start dc braking time /pre-excitation time	0.0s~100.0s	0.0s	★

Pre-excitation is used to establish asynchronous motor magnetic field before startup, which would improve response speed.

Start dc current braking is only valid when it is direct startup. Inverter first carries out dc braking according to the setup of start dc current braking , and then carries out operation after start dc braking time.

If dc braking time is set to 0, inverter directly start without dc braking. The bigger the dc braking current is , the greater the braking force is.

If start mode is asynchronous motor pre-excitation start, inverter first establish magnetic field through pre-excitation current setup, then start to run after pre-excitation time. If set pre-excitation time to 0, inverter would directly start without pre-excitation process./

Start dc braking current/pre-excitation current is the relative percentage of rated current.

P6.07	Acceleration/ deceleration mode	Straight acc. /dec.	0	0	★
		S curve acc. /dec. mode A	1		

It is used to select the frequency change mode during the inverter start and stop process.

0： Straight acceleration/ deceleration

The output frequency increases or decreases along the straight line. DSI-400 series inverter provides 4 types of acceleration/deceleration time.It can select acceleration/ deceleration time via the multifunctional digital input terminals.

1：S-curve acceleration/ deceleration mode A

The output frequency increases or decreases along the straight line. S curve is generally used in the applications where start and stop processes are relatively gentle, such as elevator and conveyor belt.The acceleration/ deceleration time is consistent with the straight acceleration/ deceleration time.Function codes of P6.08 and P6.09 can be respectively definedthe time proportion of starting-segment and finishing-segment for S-curve acceleration/ deceleration.

P6.08	Initial-segment time proportion of S-curve	0.0%~(100.0%.P6.09)	30.0%	★
P6.09	Finishing-segment time proportion of S-curve	0.0%~(100.0%.P6.08)	30.0%	★

Function code of P6.08 and P6.09 can be respectively defined the time proportion between the S-curve initial-segment and finishing-segment for S-curve acceleration/ deceleration A. They are required to meet the standard of P6.08+P6.09≤100.0%.

t1 in the Fig.5-11 is the parameters defined by P6.08, in this period of time which the changing slope of output frequency is becoming larger and larger. t2 is defined by parameter P6.09, in this period of time which the changing slope of output frequency change to zero. The changing slope of output frequency is fixing within the time of t1 and t2.

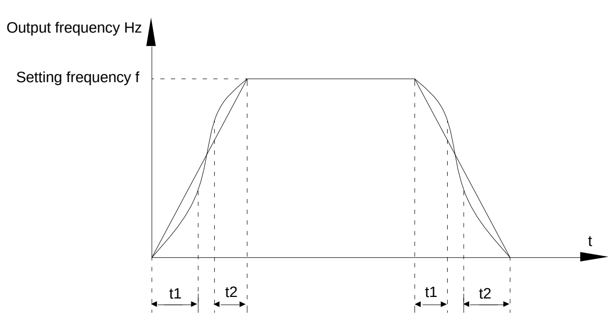


Fig.5-11S-curve acceleration/deceleration schematic diagram A					
P6.10	Stop mode	Speed-down to stop	0	0	☆
		Free stop	1		
0：Deceleration to stop When the stop command is valid, the inverter will decelerate to stop according to the setup deceleration time. 1： Free stop When the stop command is valid, the inverter will terminate the output immediately and the load will coast to stop according to the mechanical inertia.					
P6.11	DC braking initial frequency at stop	0.00Hz~maximum frequency		0.00Hz	☆
P6.12	DC braking waiting time at stop	0.0s~36.0s		0.0s	☆
P6.13	DC braking current at stop	0%~100%		0%	☆
P6.14	DC braking time at stop	0.0s~100.0s		0.0s	☆
DC brake initial frequency at stop： During the process of decelerating to stop, when the running frequency at stop reaches this frequency, it will start the process of DC brake. DC brake waiting time at stop： Prior to the beginning of DC brake at stop, the inverter will terminate the output, and then start DC brake after this delay time. It is used to prevent over current fault due to DC brake which starts at the time of higher velocity. DC brake current at stop： The DC brake quantity added shall be set according to the percentage setting of the rated current of the inverter. The higher the brake current is, more powerful the brake effect is. DC brake time at stop： It refers to the continuous DC brake time. If this DC brake time is set to 0, it indicates that there is no DC brake process, and the inverter will stop according to the setting process of decelerating to stop. The process of DC brake at stop is as shown in Figure below.					

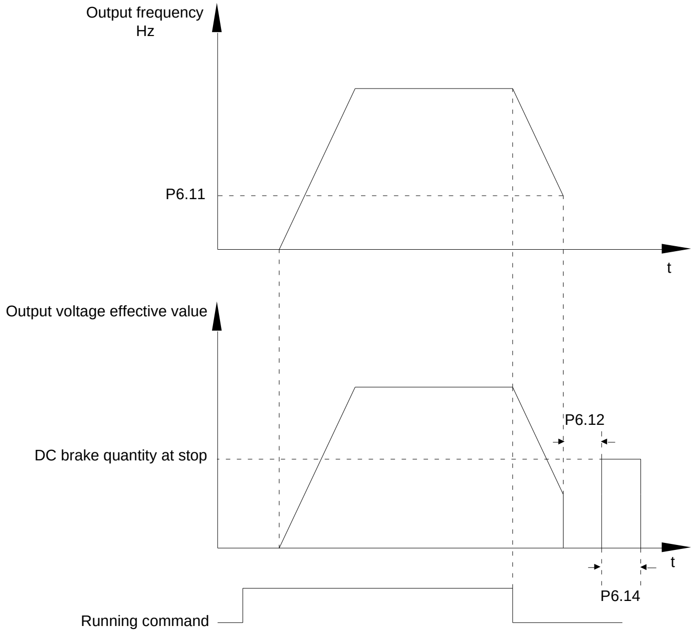


Fig.5-13DC brake schematic diagram

P6.15	Brake utilization ratio	0%~100%	100%	☆

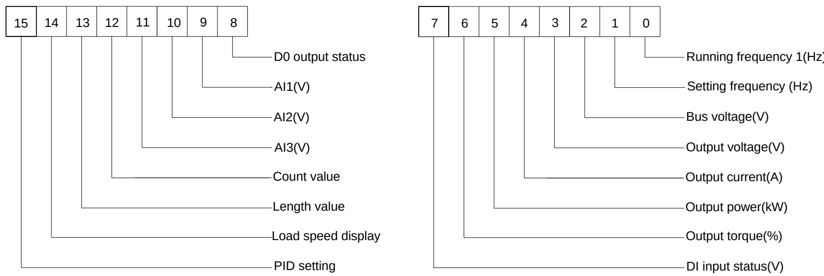
It is only valid for the inverter with built-in brake unit.

It is used to adjust the duty ratio of the brake unit.When the brake utilization ratio is high,then the duty ratio of brake unit action is high,braking effect is strong.But there will be big fluctuation of inverter bus voltage.

P6.18	Catching a spinning motor current limit	30%~200%		Model dependent	★
P6.21	Demagnetization time for svc	0.00-5.00s		Model dependent	☆
P6.23	Over excitation selection	Disable	0	0	☆
		Enable during deceleration	1		
		Enable in whole process	2		
P6.24	Over excitation suppression current gain	0-150%		Model dependent	☆
P6.25	Over excitation gain	1.00-2.50		1.25	☆

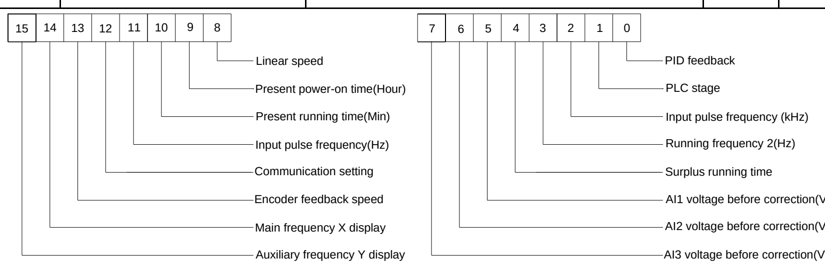
5-9 Keyboard and display：P7.00-P7.14

<table>
<tr><th>Code</th><th>Description/
Keyboard Display</th><th colspan="2">Setting Range</th><th>Factory Setting</th><th>Change Limit</th></tr>
<tr><td rowspan="5">P7.01</td><td rowspan="5">MF/REV key function selection</td><td>MF/REV key invalid</td><td>0</td><td rowspan="5">0</td><td rowspan="5">★</td></tr>
<tr><td>Switching between operation panel command channel&the remote command channel (terminal command channel or serial port command channel)</td><td>1</td></tr>
<tr><td>Switching between FWD&REV rotation</td><td>2</td></tr>
<tr><td>Forward jog command</td><td>3</td></tr>
<tr><td>Reserved jog command</td><td>4</td></tr>
<tr><td colspan="6">It is used to set the functions of multifunctional MF/REV key.
0： Invalid function
1： Operation panel command channel and remote command channel
It can perform switching between the current command source and keyboard control(local operation).The function key is invalid when current command source is keyboard control.
2： Switching between forward and Reserved rotation
Switching the rotary direction of the motor via the MF/REV key on the keyboard is only enabled when the command source is “operation panel command”.
3： Forward jog
It can perform forward jog (FJOG) operation via the MF/REV key on the keyboard.
4： Reserved jog
It can perform Reserved jog (RJOG) operation via the MF/REV key on the keyboard.</td></tr>
<tr><td rowspan="2">P7.02</td><td rowspan="2">STOP/RESET function</td><td>The stop function of STOP/RES key is valid only in the keyboard control mode.</td><td>0</td><td rowspan="2">1</td><td rowspan="2">☆</td></tr>
<tr><td>The stop function of STOP/RES key is valid in any control mode.</td><td>1</td></tr>
<tr><td>P7.03</td><td>LED running display parameter1</td><td colspan="2">0000~FFFF</td><td>1F</td><td>☆</td></tr>
</table>



If the above parameters need to be displayed during the operation, users can set their corresponding positions to 1 and then convert this binary number into decimal number and set it to P7.03.

P7.04	LED running display parameter 2	0000~FFFF	0	☆

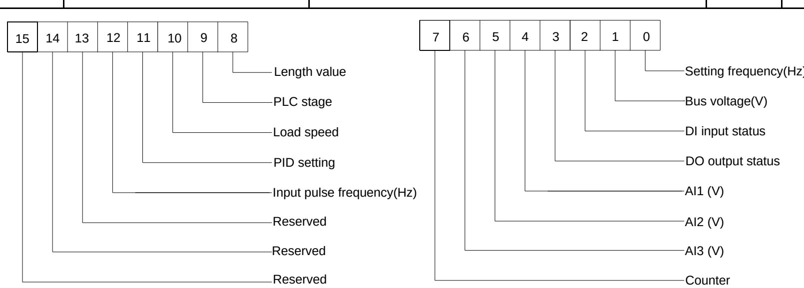


If the above parameters need to be displayed during the operation, users can set their corresponding positions to 1 and then convert this binary number into decimal number and set it to P7.04.

Running display parameter is used to set parameters which can be seen under inverter running state.

32 state parameters can be checked at most,you could choose the needed state parameter through P7.03、P7.04 binary digit,display sequence starts from P7.03 lowest digit order.

P7.05	LED stop display parameter	0000~FFFF	33	☆



If the above parameters need to be displayed at the time of stop, it can set their corresponding positions

to 1 and then convert this binary number into decimal number and set it to P7.05.				
P7.06	Load speed coefficient	0.0001~6.5000	1.0000	☆
When display of the load speed is necessary, P7.06 is used to adjust the corresponding relationship between inverter frequency output and load speed. For details please refer to P7.12.				
P7.07	Inverter module radiator temperature	0.0℃~100.0℃	12℃	●
It is used to display IGBT temperature. Different model’s inverter module is set with different IGBT over temperature protection value.				
P7.08	Product ID		0℃	●
Display inverter product ID				
P7.09	Accumulative running time	0h~65535h	0h	●
It is used to display the accumulated running time of the inverter. When the accumulated running time reaches P8.17 setup running time, the multifunctional digital output terminal(12) will output ON signal.				
P7.10	Performance version number	Display performance version number	-	●
P7.11	Software version No.	Control board software version No.	-	●
P7.12	Load speed display decimal digits	No decimal place 0 One decimal place 1 Two decimal places 2 Three decimal places 3	1	☆
Decimal point position： It is used to set the number of decimal places of the load speed. For example, if the Load speed display coefficient P7.06 is 2.000,load speed display decimal digits is 2(Two decimal places),when inverter running frequency is 40.00Hz,the load speed will be：40.00*2.000=80.00(2 decimal digit display) If the inverter is in stopped state, then load speed displays as corresponding set frequency speed.Take set frequency of 50.00Hz as an example,the stop state load speed is： 50.00*2.000=100.00(Two decimal places)				
P7.13	Accumulative power-on time	0h~65535h	-	●
It displays accumulative power-on time since leaving the factory. When it reaches the set power-on time (P8.17) , multi-function digital output (24) ON signal.				
P7.14	Accumulative power	0~65535	-	●

	consumption			
It displays the inverter accumulative power consumption.				

5-10 Auxiliary function：P8.00-P8.53

Code	Description/ Keyboard Display	Setting Range	Factory Setting	Change Limit
P8.00	Jog running frequency	0.00Hz~maximum frequency	2.00Hz	☆
P8.01	Jog acceleration time	0.0s~6500.0s	20.0s	☆
P8.02	Jog deceleration time	0.0s~6500.0s	20.0s	☆
It defines the reference frequency and acc. / dec. time of the inverter at the time of jogging. The jog process is started and stopped according to direct startup mode(P6.00=0)and decelerate to stop mode(P6.10=0).				
P8.03	Acceleration time 2	0.0s~6500.0s	10.0s	☆
P8.04	Deceleration time 2	0.0s~6500.0s	10.0s	☆
P8.05	Acceleration time 3	0.0s~6500.0s	10.0s	☆
P8.06	Deceleration time 3	0.0s~6500.0s	10.0s	☆
P8.07	Acceleration time 4	0.0s~6500.0s	10.0s	☆
P8.08	Deceleration time 4	0.0s~6500.0s	10.0s	☆
DSI-400 offers 4 groups of speed-up/speed-down time,P0.17/P0.18 and 3 groups above. P8.03 to P8.08 parameters have the same definition with P0.17 and P0.18.You can switch to choose the 4 groups through different combination of DI multi-function digital input terminal.For specific using method,please refer to function code P4.01~P4.05 for details.				
P8.09	Hopping frequency 1	0.00Hz~maximum frequency	0.00Hz	☆
P8.10	Hopping frequency 2	0.00Hz~maximum frequency	0.00Hz	☆
P8.11	Hopping frequency amplitude	0.00Hz~maximum frequency	0.00Hz	☆

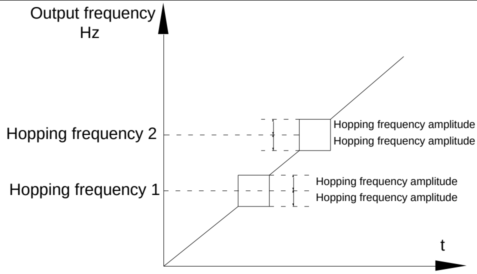


Fig.5-14Skip frequency schematic diagram

When set frequency is within the range of hopping frequency,the actual running frequency will run close to the set frequency of hopping frequency. Inverter can avoid load mechanical resonance by setting hopping frequency.

DSI-400 can set 2 hopping frequency points,if both of them are set to 0,then the hopping frequency function is canceled.Hopping frequency and hopping frequency amplitude schematic is shown in Fig5-14.

P8.12	Dead zone time of forward&Reserved rotations	0.00s~3000.0s	0.0s	☆

It refers to the transit time at the 0Hz output point when the inverter switches between forward rotation and Reserved rotation. As shown in figure 5-15.

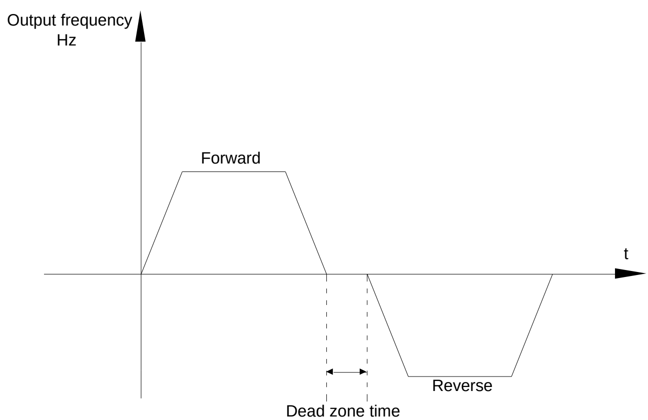


Fig.5-15Rotation dead zone time schematic diagram

P8.13	Reserved rotation control	Reserved rotation enabled	0	0	☆
		Reserved rotation forbidden	1		

It is used to set if the inverter could run in Reserved rotation state. If Reserved rotation is not permitted, P8.13 should be set to 1.

P8.14	Set frequency below lower limit running mode	Run with frequency lower limit	0	0	☆
		stop	1		
		0 speed operation	2		

It is used to select the running status of the inverter when the set frequency is lower than the frequency lower limit. DSI-400 offers 3 kinds of running mode to meet all kins of applications.

P8.15	Droop control	0.00Hz~10.00Hz	0.00Hz	☆

It is used for load distribution when multiple motors drive the same load.

Droop control refers to inverter output frequency decreasing with added load. In this way, motor with heavy load output frequency decrease more, which could decrease the motor load to realize multiple motor load uniformity .

This parameter is the output frequency declining value with rated output load.

P8.16	Accumulative power-on time arrival setup	0h~65000h	0h	☆

When the accumulative power on time (P7.13) reaches the P8.16 set value, inverter multi-function digital DO would output ON signal.

E.g：Inverter outputs fault alarm after 100-hour power-on time：

Virtual terminal DI1 function： user-defined fault1：A1.00=44;

Virtual terminal DI1 valid state：from virtual DO1：A1.05=0000;

Virtual terminal DO1 function： power-on time arrived ：A1.11=24;

Set cumulative power-on time to 100 hours：P8.16=100.

When accumulative power-on time reaches 100 hours, inverter outputs fault number 26= E.ArA.

P8.17	Accumulative running time arrival setup	0h~65000h	0h	☆

When the accumulated running time (P7.09) reaches this set running time, the digital output terminal DO outputs the ON signal of running time arrival.

P8.18	Start protection selection	Invalid	0	0	☆
		Valid	1		

This parameter is used to improve the safety protection coefficient.

If it is set to 1, it has two functions：

1.If running command is valid upon power on (E.g：Closed-state before terminal running command power on), inverter will not respond to the running command. Users should first cancel running command, after running command coming into valid again, the inverter then responds.

2.If running command is valid upon inverter fault reset, inverter will not respond to the running command. Running protection status can be eliminated after canceling the running command.

This can prevent the dangers caused by the automatic running of the motor under unexpected condition.

P8.19	Frequency detection value(FDT1)	0.00Hz~maximum frequency	50.00Hz	☆
P8.20	Frequency detection hysteresis value(FDT1)	0.0%~100.0%(FDT1level)	5.0%	☆

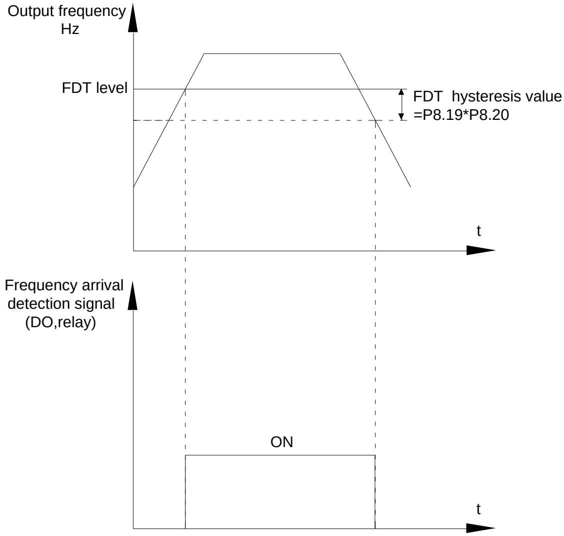


Fig.5-16 FDT level schematic diagram

When the running frequency is higher than the frequency detection value,multi-function terminal DO output ON signal.On the contrary,ON signal is canceled if running frequency is less than a certain value of the detection valule.

It is used to set the detection value of the output frequency and the hysteresis value upon release of the output action.P8.20 is the hysteresis frequency percentage relating to P8.19 frequency detection value.

P8.21	Frequency arrival detection amplitude	0.00~100%maximum frequency	0.0%	☆

When inverter running frequency is in certain target frequency ,multi-function terminal DO outputs ON signal.

P8.21 is used to set frequency arrival detection amplitude,percentage relating to the maximum frequency.Frequency arrival schematic diagram is shown in Fig5-17.

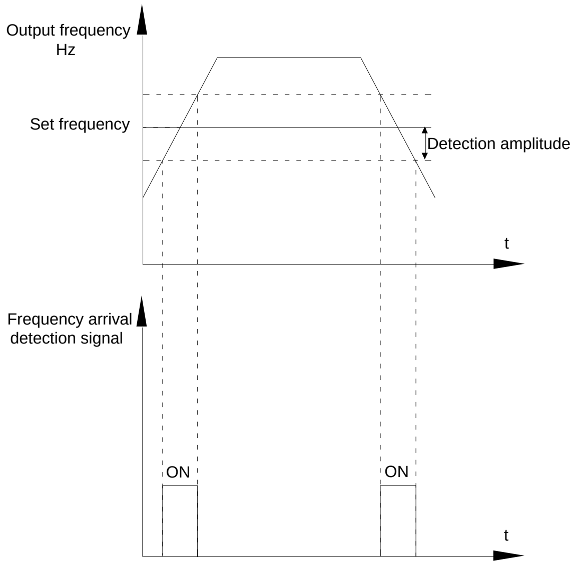


Fig.5-17 Frequency arrival detection amplitude schematic diagram

P8.22	Acc./dec. hopping frequency validity	Invalid	0	0	☆
		Valid	1		

It is used to set whether hopping frequency is effective during process of acceleration/deceleration.

P8.22 =1： Actual running frequency will skip the setting frequency boundary when running within the range of hopping frequency.

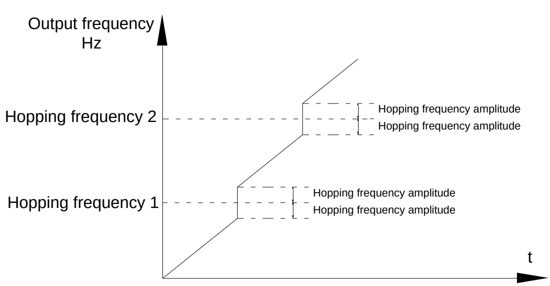


Fig.5-18 Acc./dec. hopping frequency validity schematic diagram

P8.25	Acc. time1 & acc. time 2 frequency switching point	0.00Hz~Maximum frequency	0.00Hz	☆

P8.26	Dec. time1 & dec. time 2 frequency switching point	0.00Hz~Maximum frequency	0.00Hz	☆

It is valid when motor 1 is selected without switching acceleration / deceleration time through DI terminal. In inverter running process, P8.25 & P8.26 choose different acceleration / deceleration time according to the running frequency range.

As shown in fig.5-19：

During acceleration process, if running frequency is less than P8.25 ,then choose acc. time2. If running frequency is greater than P8.25, choose acc. time 1.

During deceleration process, if running frequency is greater than P8.26, then choose dec. time 1. If running frequency is less than P8.26 , choose dec. time 2.

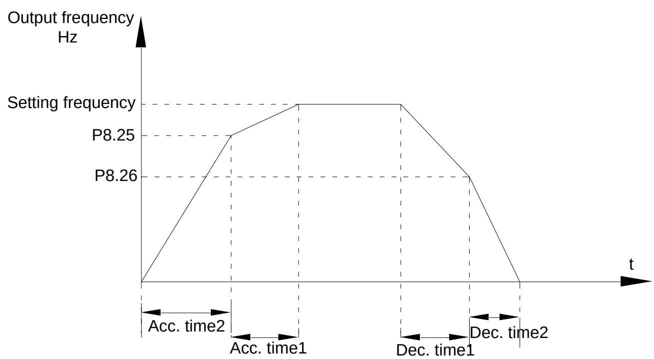


Fig.5-19 Acc./dec. Time switching schematic diagram

P8.27	Terminal jog priority	Invalid	0	0	☆
		Valid	1		

It is used to set if terminal jog function has the highest priority.

When P8.27 is valid, if jog command occurring during running , inverter will switch to jog running mode.

P8.28	Frequency detection value(FDT2)	0.00Hz~Maximum frequency	50.00Hz	☆
P8.29	Frequency detection hysteresis value(FDT2)	0.0%~100.0%(FDT2 level)	5.0%	☆

This frequency detection function and FDT1 function are exactly the same, for details please refer to FDT1 , namely function codes P8.19, P8.20 description.

P8.30	Random frequency arrival detection value1	0.00Hz~Maximum frequency	50.00Hz	☆

P8.31	Random frequency arrival detection range1	0.0%~100.0%(Maximum frequency)	0.0%	☆
P8.32	Random frequency arrival detection value2	0.00Hz~Maximum frequency	50.00Hz	☆
P8.33	Random frequency arrival detection range2	0.0%~100.0%(Maximum frequency)	0.0%	☆

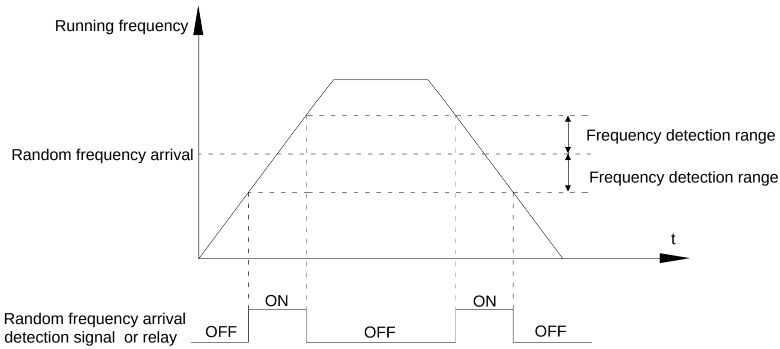


Fig.5-20 Random frequency arrival detection schematic diagram

When inverter output frequency is within the positive & negative detection range of random frequency arrival detection value , multi-funtion terminal DO output ON signal.

P8.34	Zero-current detection level	0.0%~300.0%(Motor rated current)	5.0%	☆
P8.35	Zero-current detection delay time	0.00s~600.00s	0.10s	☆

When inverter output current is less than or equals to zero-current detection level, and the lasting time exceeds zero-current detection delay time,inverter multi-function terminal DO output DO signal. Fig.5-21 is schematic diagram of zero-current detection.

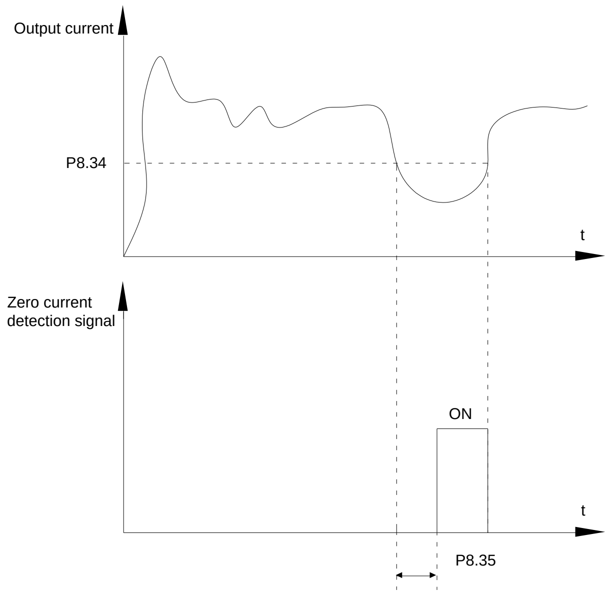


Fig.5-21 Zero-current detection schematic diagram

P8.36	Output current over limit value	0.0%(No detection) 0.1%~300.0%(Motor rated current)	200.0%	☆
P8.37	Output current over limit detection delay time	0.00s~600.00s	0.00s	☆

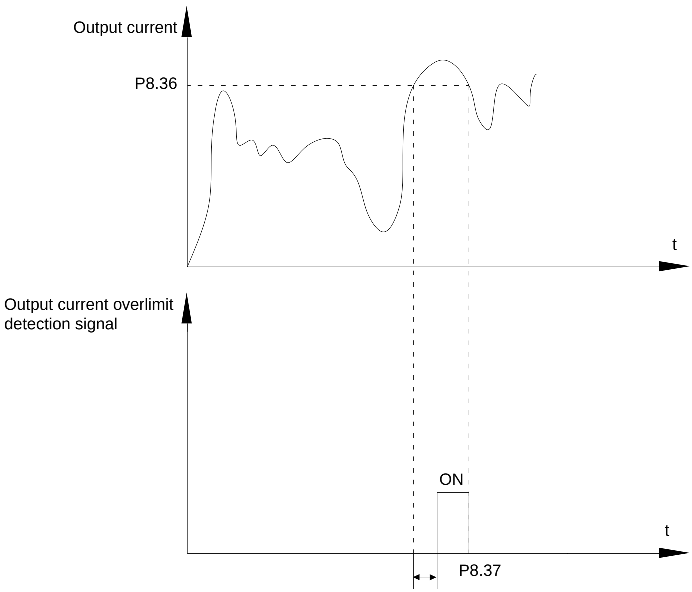


Fig.5-22 Output current over limit detection schematic diagram

When inverter output current is larger than output current over limit value(P8.36) ,and lasting time exceeds the software over limit detection delay time ,inverter multi-function terminal DO output ON signal, fig.5-22 is schematic diagram of output current over limit detection.

P8.38	Random current arrival 1	0.0%~300.0%(Motor rated current)	100.0%	☆
P8.39	Random current arrival range1	0.0%~300.0%(Motor rated current)	0.0%	☆
P8.40	Random current arrival 2	0.0%~300.0%(Motor rated current)	100.0%	☆
P8.41	Random current arrival range2	0.0%~300.0%(Motor rated current)	0.0%	☆

When inverter output current is within the positive & negative detection range of Random arrival current value , multi-funtion terminal DO output ON signal.

DSI-400 offers two groups of Random current arrival range detection parameters ,as shown in fig. 5-23.

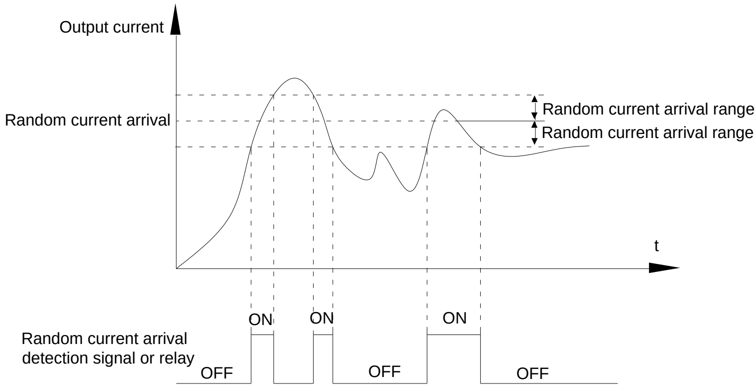


Fig.5-23Random current arrival detection schematic diagram

P8.42	Timing function selection	Invalid	0	0	☆
		Valid	1		
P8.43	Running time timing selection	P8.44 setup	0	0	☆
		AI1	1		
		AI2	2		
		AI3(Potentiometer)	3		
Analog input range 100% corresponds to P8.44.					
P8.44	Timing running time	0.0Min~6500.0Min		0.0Min	☆
This parameter group is used to time inverter running time. When P8.42 is valid, inverter starts timing. Inverter would automatically stop after reaching the timing setup , multi-function terminal DO output ON signal. Each time inverter startup from 0 start the timing, timing surplus running time could be viewed through U0.20. Timing of the operation time is set through P8.43, P8.44, unit minute.					
P8.45	AI1 input voltage protection value lower limit	0.00V~P8.46		3.10V	☆
P8.46	AI1 input voltage protection value upper limit	P8.45~10.00V		6.80V	☆
When analog input AI1 is greater than the set of P8.46 or less than that of P8.47, inverter multi-function DO output ON signal of “AI1 input overrun” , which indicating if AI1 input voltage is within the setup range.					

P8.47	Module temperature arrival	0.00℃~100℃		75℃	☆
Inverter multi-function terminal DO outputs “module temperature arrival” ON signal when inverter radiator temperature arrived the set value of P8.47.					
P8.48	Cooling fan control	Cooling fan runs at motor operation	0	0	☆
		Cooling fan runs after power-on	1		
It is used to select cooling fan action mode. P8.48=0：Cooling fan operates when inverter in running status or radiator temperature over 40℃ in inverter stop status.the fan does not operate when inverter in stopping status and radiator temperature below 40℃ P8.48=1：Cooling fan is always running after power-on.					
P8.49	Wake up frequency	Sleep frequency(P8.51) ~maximum frequency (P0.10)		0.00Hz	☆
P8.50	Wake up delay time	0.0s~6500.0s		0.0s	☆
P8.51	Sleep frequency	0.00Hz~wake-up frequency(P8.49)		0.00Hz	☆
P8.52	Sleep delay time	0.0s~6500.0s		0.0s	☆
This group of function codes are used to realize sleep and wake up function. During operation：when set frequency is less than or equals to sleep frequency(P8.51), inverter would step into sleep state and stop after sleep delay time(P8.52). If inverter is in sleep state and current running command is valid, when set frequency is no less than P8.49 wake-up frequency, inverter will start to run after P8.50 wake-up delay time. Generally, please set wake-up frequency no less than sleep frequency. Sleep function and wake-up function are valid when both wake-up frequency and sleep frequency are set to 0.00 Hz. When enabling sleep function(frequency source ：PID) , PID calculation selection in sleep state is influenced by function code PA.28(PA.28=1).					
P8.53	The running time arrival	0.0Min~6500.0Min		0.0Min	☆
When the running time reached the P8.53 set value, inverter multi-function DO output “Then running time arrival” ON signal.					
P8.54	Out power correction coefficient	0.00~200.00%		100.0%	☆

5-11 Overload and protection：P9.00-P9.70

Code	Description/ Keyboard Display	Setting Range		Factory Setting	Change Limit
P9.00	Motor overload protection selection	Invalid	0	1	☆
		Valid	1		
P9.01	Motor overload protection gain	0.20~10.00		1.00	☆

P9.00=0： Without motor overload protection function. It is recommended to install a thermal relay between the motor and the inverter.

P9.00=1： The inverter has overload protection function for the motor according to motor overload protection inverse time limit curve.

Motor overload protection inverse time limit curve： 220%×(P9.01)× motor rated current,it will report motor overload fault after it lasts for one minute. When the operating current of the motor reaches the current of 150%×(P9.01)times the rated current of the motor, it will report motor overload after it lasts 60 minutes.

Users can set value of P9.01 according to the motor actual overload ability.If the parameter is set too big, it may cause danger of motor overheating damage without inverter fault report.

Code	Description/ Keyboard Display	Setting Range	Factory Setting	Change Limit
P9.02	Motor overload pre-alarm coefficient	50%~100%	80%	☆

This function is used before motor overload fault by giving pre-alarm signal through multi-function terminal DO.This pre-alarm coefficient is used to determine the warning timing before motor overload protection. The higher the value,the shorter the warning timing will be.

When the inverter output current is accumulated more than the product of inverse time limit curve with P9.02,multi-function terminal DO output “Motor overload pre-alarm”ON signal.

Code	Description/ Keyboard Display	Setting Range	Factory Setting	Change Limit
P9.03	Over-voltage stall gain	0(no over-voltage stall)~100	30	☆
P9.04	Over-voltage stall protection voltage	650~800v	770	☆

Over voltagestall： When the output voltageof the inverter reaches setup of over voltage stall protection voltage (P9.04), if the inverter is running with acceleration speed, it will stop acceleration. When the inverter is running with constant speed, it will reduce the output frequency. When the inverter is running with deceleration speed, it will stop deceleration and the operating frequency will not recover normally till the current is less than the current stall protection current (P9.04).

Over voltage stall protectionvoltage： It selects the protection point for over current stall function. When the value is exceeded, the inverter starts to execute the over voltage stall protection function. This value is relative to the percentage of rated voltageof the motor.

Overvoltage stall gain： It adjusts the inverter’s capacity in suppressing the voltage stall. The bigger the value is, the stronger the capacity is. For the load with small inertia, the value should be small. Otherwise, the dynamic response of the system would be slow. For the load with large inertia, the value should be large. Otherwise, the suppressing result will be poor, and over voltage fault may be caused.

When the voltage stall gain is set to 0, the inverter starts to execute the over voltage stall protection

function.					
P9.07	Ground short circuit protection upon power-on	Invalid	0	1	☆
		Valid	1		
It determines whether the motor has ground short circuit fault upon power-on. If this function is valid, the inverter UVW end will output voltage within the period of time after power-on.					
P9.08	Braking unit applied voltage	650-800v		760v	☆
When the dc bus voltage is higher than P9.08, the internal braking of inverter unit works.					
P9.09	Fault auto reset times	0~20		0	☆
When the inverter selects fault auto reset, it is used to set the times of auto reset. If this value is exceeded, the inverter will perform fault protection.					
P9.10	Fault auto reset FAULTDO selection	No action	0	0	☆
		Action	1		
If inverter has been set of fault auto reset function , P9.10 is used to set if FAULT DO actions or not during fault auto reset time.					
P9.11	Fault auto reset interval	0.1s~100.0s		1.0s	☆
The waiting time of the inverter from the fault alarm to auto reset.					
P9.12	Input phase lack protection selection	1bit Input phase lack protection selection		11	☆
		Forbidden	0		
		Allowed	1		
		10bit Contactor attracting protection			
		Forbidden	0		
		Allowed	1		
1bit：It is used to choose whether to protect input phase loss. 10bit：Contactor attracting protection DSI-400 series inverter above 132kW (type G) has input phase fault protection function.For the inverter below 132kW (type P), the input phase fault protection function is invalid at any setup.					
P9.13	Output phase lack protection selection	Invalid	0	1	☆
		valid	1		

It is used to choose whether to protect output open-phase.				
P9.14	The first fault type	0~99	-	●
P9.15	The second fault type	0~99	-	●
P9.16	The latest fault type	0~99	-	●

It records the latest 3 fault types for the inverter： 0 means no fault and 1 to 99 correspond to refer to Chapter 6 for the details.

Table of fault type ：

No.	Fault display	Fault type
0	Reserved	No fault
1	1=Err01	Reserved
2	2= Err02	Acceleration over current
3	3= Err03	Deceleration over current
4	4=Err04	Constant speed over current
5	5=Err05	Acceleration over voltage
6	6= Err06	Deceleration over voltage
7	7=Err07	Constant speed over voltage
8	8=Err08	Control power supply fault
9	9=Err09	Under voltage fault
10	10=Err10	Inverter overload
11	11= Err11	Motor overload
12	12= Err12	Input phase lack
13	13= Err13	Output phase lack
14	14= Err14	Module overheating
15	15= Err15	External equipment fault
16	16= Err16	Communication fault

	17	17=Err17	Contactor fault	
	18	18= Err18	Current inspection fault	
	19	19= Err19	Motor tuning fault	
	20	20= Err20	Encoder /PG card fault	
	21	21= Err21	EEPROM read & write fault	
	22	22= Err22	Inverter hardware fault	
	23	23= Err23	Short circuit to ground fault	
	24	Reserved	Reserved	
	25	Reserved	Reserved	
	26	26= Err26	Total running time arrival fault	
	27	27= Err27	User-defined fault 1	
	28	28=Err28	User-defined fault 2	
	29	29=Err29	Total power-on time arrival fault	
	30	30= Err30	Load off fault	
	31	31= Err31	PID feedback loss during operation fault	
	40	40= Err40	Each wave current limiting fault	
	41	41=Err41	Motor switching fault	
	42	42= Err42	Excessive speed deviation fault	
	43	43= Err43	Motor over speed fault	
	45	45=Err45	Motor over temperature fault	
	51	51= Err51	Initial position fault	
P9.17	Third fault frequency		The latest fault frequency	●
P9.18	Third fault current		The latest fault current	●

P9.19	Third fault bus voltage	The latest fault bus voltage	●
P9.20	Third fault input terminal	The latest fault digital input terminal status, order as below： BIT9 BIT8 BIT7 BIT6 BIT5 BIT4 BIT3 BIT2 BIT1 BIT0 DI0 DI9 DI8 DI7 DI6 DI5 DI4 DI3 DI2 DI1 When input terminal status is ON, it's corresponding binary digit is 1. OFF corresponds to 0. All DI status are converted to decimal display.	●
P9.21	Third fault output terminal	The latest fault digital output terminal status, order as below ： BIT4 BIT3 BIT2 BIT1 BIT0 DO2 DO1 REL2 REL1 FMP When output terminal status is ON, it's corresponding binary digit is 1. OFF corresponds to 0. All status are converted to decimal display.	●
P9.22	Third fault inverter state	Reserved	●
P9.23	Third fault power-on time	The latest fault power-on time	●
P9.24	Third fault running time	The latest fault running time	●
P9.27	Second fault frequency	The latest fault frequency	●
P9.28	Second fault current	The latest fault current	●
P9.29	Second fault bus voltage	The latest fault bus voltage	●
P9.30	Second fault input terminal	The latest fault digital input terminal status, order as below ： BIT9 BIT8 BIT7 BIT6 BIT5 BIT4 BIT3 BIT2 BIT1 BIT0 DI0 DI9 DI8 DI7 DI6 DI5 DI4 DI3 DI2 DI1 When input terminal status is ON, it's corresponding binary digit is 1. OFF corresponds to 0. All DI status are converted to decimal display.	●
P9.31	Second fault output terminal	The latest fault digital input terminal status, order as below ：	●

		BIT4 BIT3 BIT2 BIT1 BIT0 DO2 DO1 REL2 REL1 FMP When output terminal status is ON, it's corresponding binary digit is 1. OFF corresponds to 0. AllDO status are converted to decimal display.		
P9.32	Second fault inverter state	Reserved		●
P9.33	Second fault power-on time	The latest fault power-on time		●
P9.34	Second fault running time	The latest fault running time		●
P9.37	First fault frequency	The latest fault frequency		●
P9.38	First fault current	The latest fault current		●
P9.39	First fault bus voltage	The latest fault bus voltage		●
P9.40	First fault input terminal	The latest fault digital input terminal status, order as below ： BIT9 BIT8 BIT7 BIT6 BIT5 BIT4 BIT3 BIT2 BIT1 BIT0 DI0 DI9 DI8 DI7 DI6 DI5 DI4 DI3 DI2 DI1 When input terminal status is ON, it's corresponding binary digit is 1. OFF corresponds to 0. All DI status are converted to decimal display.		●
P9.41	First fault output terminal	The latest fault digital input terminal status, order as below ： BIT4 BIT3 BIT2 BIT1 BIT0 DO2 DO1 REL2 REL1 FMP When output terminal status is ON, it's corresponding binary digit is 1. OFF corresponds to 0. AllDO status are converted to decimal display.		●
P9.42	First fault inverter state	Reserved		●
P9.43	First fault power-on time	The latest fault power-on time		●
P9.44	First fault running time	The latest fault running time		●
P9.47	Fault protection action selection 1	1bit: Motor overload(Fault No.11= Err11) Free stop: 0	00000	☆

		Stop according to stop mode		1		
		Keep on running		2		
		10bit	Input phase lack(Fault No 12=Err12)			
		Free stop		0		
		Stop according to stop mode		1		
		100 bit	Input phase lack(Fault No 13=Err13)			
		Free stop		0		
		Stop according to stop mode		1		
		1000 bit	External fault(Fault No.15=Err15)			
		Free stop		0		
		Stop according to stop mode		1		
		10000 bit	Abnormal communication(Fault No.16=Err16)			
		Free stop		0		
		Stop according to stop mode		1		
P9.48	Fault protection action selection 2	1bit	Encoder fault (Fault No.20=Err20)		00000	☆
		Free stop		0		
		Switch to VF, stop according to stop mode		1		
		Switch to VF, keep on running		2		
		10bit	Abnormal communication(Fault No.21=Err21)			
		Free stop		0		
		Stop according to stop mode		1		
		100bit	Reserved			
		1000	Motor overheating(Fault No.45= Err45)			

<table>
<tr><td rowspan="2"></td><td rowspan="2"></td><td>bit</td><td colspan="2">(Same with P9.47 1 bit)</td><td rowspan="2"></td><td rowspan="2"></td></tr>
<tr><td>10000 bit</td><td colspan="2">Running time arrival(Fault No.26= Err26) (Same with P9.47 1 bit)</td></tr>
<tr><td rowspan="8">P9.49</td><td rowspan="8">Fault protection action selection 3</td><td>1bit</td><td colspan="2">User-defined fault 1(Fault No.27= Err27) (Same with P9.47 1 bit)</td><td rowspan="8">00000</td><td rowspan="8">☆</td></tr>
<tr><td>10bit</td><td colspan="2">User-defined fault 2(Fault No.28= Err28) (Same with P9.47 1 bit)</td></tr>
<tr><td>100bit</td><td colspan="2">Power-on time arrival(Fault No.29= Err29) (Same with P9.47 1 bit)</td></tr>
<tr><td>1000 bit</td><td colspan="2">Load off(Fault No.30= Err30)</td></tr>
<tr><td colspan="2">Free stop</td><td>0</td></tr>
<tr><td colspan="2">Stop according to stop mode</td><td>1</td></tr>
<tr><td colspan="2">Decelerate to 7% of motor rated frequency. Automatically recover to the set frequency if no load off.</td><td>2</td></tr>
<tr><td>10000 bit</td><td colspan="2">PID feedback lost during operation(Fault No.31= Err31) (Same with P9.47 1 bit)</td></tr>
<tr><td rowspan="5">P9.50</td><td rowspan="5">Fault protection action selection 4</td><td>1bit</td><td colspan="2">Excessive speed deviation(Fault No.42= Err42) (Same with P9.47 1 bit)</td><td rowspan="5">00000</td><td rowspan="5">☆</td></tr>
<tr><td>10bit</td><td colspan="2">Motor super velocity(Fault No.43= Err43)(Same with P9.47 1 bit)</td></tr>
<tr><td>100bit</td><td colspan="2">Initial position fault(Fault No.51= Err51) (Same with P9.47 1 bit)</td></tr>
<tr><td>1000 bit</td><td colspan="2">Reserved</td></tr>
<tr><td>10000 bit</td><td colspan="2">Reserved</td></tr>
<tr><td colspan="7">If it is set to “free stop”, inverter displays E.****,and stop directly.

If it is set to “stop according to stop mode”, inverter displays A.****, and stop according to the set stop mode. Inverter displays E.**** after stopped.</td></tr>
</table>

If it is set to “keep on running”, inverter displays A.**** and continues running. Running frequency is set through P9.54.					
P9.54	Continued to run when fault frequency selection	Operation with the current running frequency	0	0	☆
		Operation with the set frequency	1		
		Operation with the upper limit frequency	2		
		Operation with the lower limit frequency	3		
		Operation with the abnormal backup frequency	4		
P9.55	Abnormal backup frequency	60.0%~100.0%		100.0%	☆
When fault occuring during inverter operation , and the fault processing mode set to continuing to run, inverter would display A** and run with the P9.54 set frequency. When choosing running frequency as abnormal backup frequency, set value of P9.55 is percentage of the maximum frequency.					
P9.56	Reserved	Reserved			☆
P9.57	Reserved	Reserved			☆
P9.58	Reserved	Reserved			☆
P9.59	Transient stop selection	Invalid	0	0	☆
		Deceleration	1		
		Deceleration to stop	2		
P9.60	Transient stop action pause protection voltage	80.0%~100.0%		90.0%	☆
P9.61	Transient stop voltage recovery judgment time	0.00s~100.00s		0.50s	☆
P9.62	Transient stop action judgment voltage	60.0%~100.0%(Standard bus voltage)		80.0%	☆

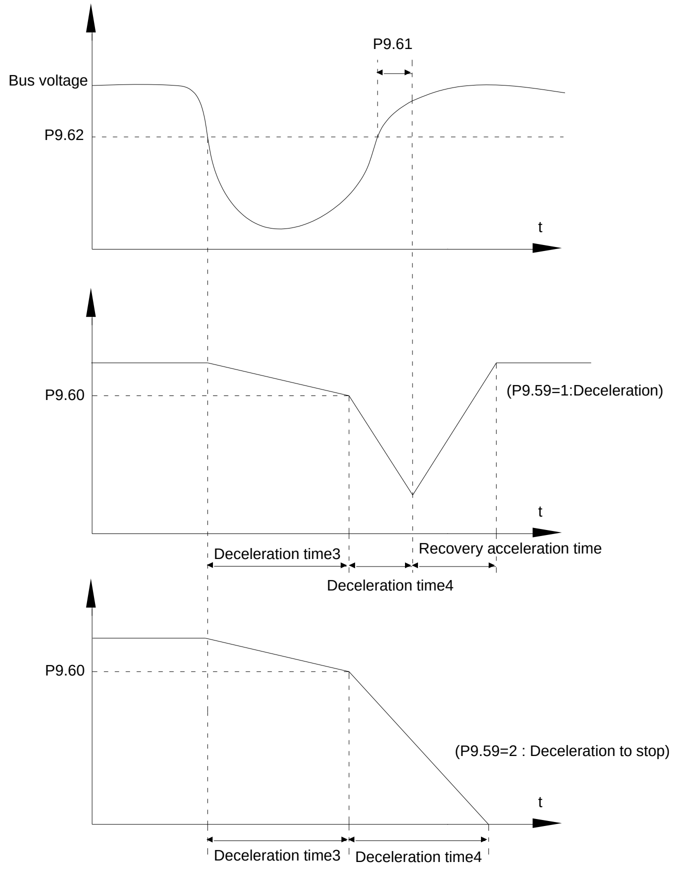


Fig.5-24 Transient stop action schematic diagram

The function defines when instant outage or voltage suddenly drops, inverter compensating dc bus voltage decrease by load feedback energy through decreasing output revolving speed, which maintaining inverter running.

P9.59=1：When instant outage or voltage suddenly drops, inverter decelerates. Inverter normally accelerates to the set running frequency until bus voltage came to normal. Bus voltage has restored to normal is based on normal bus voltage duration time. If the time exceeds P9.61 set value , bus voltage is normal.

P9.59=2：When instant outage or voltage suddenly drops, inverter decelerates to stop.

P9.63	Load-off protection selection	Invalid	0	0	☆
		Valid	1		

P9.64	Load-off detection level	0.0%~100.0%(Motor rated current)	10.0%	☆
P9.65	Load-off detection time	0.0s~60.0s	1.0s	☆
When the protection function is valid and inverter output current is less than load-off detection level P9.64(duration time ＞P9.65), inverter output frequency automatically decreased to 7% of the rated frequency. In the load-off protection period, if the load restored, the inverter automatically restore to the set running frequency.				
P9.67	Over speed detection value	0.0%~50.0%(Maximum frequency)	20.0%	☆
P9.68	Over speed detection time	0.0s~60.0s	1.0s	☆
This function is only valid in speed sensor vector control. Inverter fault alarm when motor actual revolving speed exceeds the set frequency(excess value ＞P9.67 ,duration time ＞P9.68) .Fault No. 43=Err43.				
P9.69	Excessive speed deviation detection value	0.0%~50.0%(Maximum frequency)	20.0%	☆
P9.70	Excessive speed deviation detection time	0.0s~60.0s	5.0s	☆
This function is only valid in speed sensor vector control. Inverter fault alarms when deviation detected between motor actual revolving speed and the set frequency(deviation＞P9.69, duration time＞P9.70). Fault No. 42=Err42. P9.70=0.0s：Excessive speed deviation fault detection is canceled.				
P9.71	Power dip ride-through gain kp	0-100	40	☆
P9.72	Power dip ride-through integral coefficient ki	0-100	30	☆
P9.73	Deceration time of Power dip ride-through	0-300.0s	20.0s	☆

5-12 PID function group：PA.00-PA.28

PID control is a common method used in process control. Through the proportional, integration and differential calculation on the difference between feedback signal and target signal of the controlled parameter, PID control adjusts the output frequency of the inverter and forms negative feedback system, making the controlled parameter stabilized on the target parameter. PID control is applied to several process controls such as flow control, pressure control and temperature control.The schematic diagram for control is as shown in Fig. 5-25.

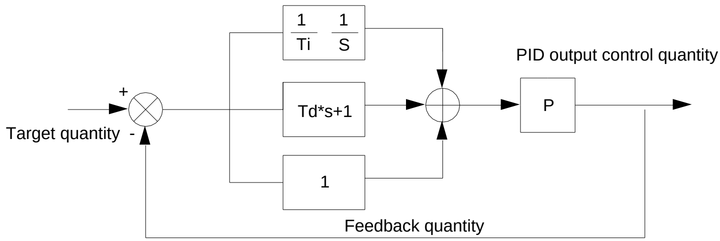


Fig.5-25PID process schematic diagram

Code	Description/ Keyboard Display	Setting Range		Factory Setting	Change Limit
PA.00	PID reference source	PA.01 setup	0	0	☆
		AI1	1		
		AI2	2		
		AI3(Potentiometer)	3		
		PULSE(DI5)	4		
		Communication	5		
		MS command	6		
PA.01	PID reference value	0.0%~100.0%		50.0%	☆
It is used to select target parameter reference channel of process PID. Set target value of process PID is a relative value, set range is 0.0%~100.0%. PID feedback value is a relative value as well,PID play the role of making the two relative value the same.					
PA.02	PID feedback source	AI1	0	0	☆
		AI2	1		
		AI3(Potentiometer)	2		
		AI1－AI2	3		
		PULSE(DI5)	4		
		Communication	5		
		AI1+AI2	6		
		MAX(|AI1|,|AI2|)	7		

		MIN(|AI1|,|AI2|)	8		

It is used to select the feedback channel of PID

Feedback value of process PID is a relative value, set range is 0.0%~100.0%.

PA.03	PID action direction	Positive action	0	0	☆
		Negative action	1		

Positive action： If the feedback signal is smaller than the PID reference signal, it is required to boost the output frequency of the inverter to make PID reach balance. The winding tension PID control is such a case.

Negative action： If the feedback signal is smaller than the PID reference signal, it is required to decrease the output frequency of the inverter to make PID reach balance.The unwinding tension PID control is such a case.

This function is influenced by function 35,please pay attention during operation.

PA.04	PID reference feedback range	0~65535	1000	☆

PID reference feedback range is a dimensionless unit which is used to display U0.15 PID setup and U0.16 PID feedback.

PID reference feedback related to the value 100.0%, corresponding to a given feedback range PA.04.If PA.40 is set to 2000,PID is set to 100.0%,PID given display U0.15 is 2000.

PA.05	Proportional gain K_{p1}	0.0~100.0	20.0	☆
PA.06	Integration time Ti_1	0.01s~10.00s	2.00s	☆
PA.07	Differential time Td_1	0.00~10.000	0.000s	☆

Proportional gain K_{p1}： the parameter determines the adjustable strength of PID regulator. The larger P is, the greater the adjustable strength will be.When the parameter is set to 100.0, it means that when the deviation between PID feedback value and reference value is 100.0%, the range for the PID regulator to regulate the output frequency commands is the maximum frequency (integration effect and differential effect are omitted).

Integration time Ti_1：determines the strength of PID integration regulation. The shorter the integration time , the greater adjustable strength will be.Integration time means that when the deviation between PID feedback value and reference value is 100%, the adjustment by the integration regulator (proportional effect and differential effect are omitted) after continuous adjustment in this period reaches the maximum frequency.

Differential time Td_1： determines the degree of adjustment that PID regulator performs on the derivation between PID feedback value and reference value.Differential time means that if the feedback value changes100% within this time, the adjustment by the differential regulator (proportional effect and differential effect are omitted) will reach the maximum frequency.The longer differential time is, the higher the degree of adjustment will be.

<table>
<tr><td>PA.08</td><td>PID cutoff frequency of Reserved rotation</td><td colspan="2">0.00~maximum frequency</td><td>2.00Hz</td><td>☆</td></tr>
<tr><td colspan="6">In some cases, only when the frequency of the PID output is negative (i.e., frequency inversion) could PID put the reference and feedback to the same state. High inversion frequency is not allowed in some certain cases, PA.08 is used to determine Reserved frequency upper limit.</td></tr>
<tr><td>PA.09</td><td>PID deviation limit</td><td colspan="2">0.0%~100.0%</td><td>0.0%</td><td>☆</td></tr>
<tr><td colspan="6">It is used to set the maximum allowable deviation between the system feedback value and reference value. When the deviation between the PID feedback and reference is within this range, the PID stops adjustment. The deviation limit is calculated according to the percentage of the PID setup source (or feedback source).When deviation between reference value and the feedback value is small,output frequency is stability constant.It's especially effective for some closed loop control occasions.</td></tr>
<tr><td>PA.10</td><td>PID differential amplitude limit</td><td colspan="2">0．00%~100.00%</td><td>0.10%</td><td>☆</td></tr>
<tr><td colspan="6">In PID regulation, the role of differential is relatively sensitive that system oscillation may be easily caused. Therefore, range of PID differential regulation has been limited to a small range. PA.10 is used to set PID differential output range.</td></tr>
<tr><td>PA.11</td><td>PID reference change duration</td><td colspan="2">0.00s~650.00s</td><td>0.00s</td><td>☆</td></tr>
<tr><td colspan="6">PID reference changes according to this parameter value, which corresponds to the time taken for the PID reference to change from 0% to 100%.

When PID reference changed,PID given value linear changes in accordance with given time,which can reduce system adverse effect caused by given mutation.</td></tr>
<tr><td>PA.12</td><td>PID feedback filter time</td><td colspan="2">0.00s~60.00s</td><td>0.00s</td><td>☆</td></tr>
<tr><td>PA.13</td><td>PID output filter time</td><td colspan="2">0.00s~60.00s</td><td>0.00s</td><td>☆</td></tr>
<tr><td colspan="6">PA.12 is used for filtering of PID feedback. The filtering helps to reduce the influence of the feedback interference, but brings response performance of process closed-loop system.

PA.13 is used for filtering of PID output frequency. The filtering helps to reduce the mutations of the output frequency, but brings response performance of process closed-loop system.</td></tr>
<tr><td>PA.14</td><td>Reserved</td><td colspan="2">-</td><td>-</td><td>-</td></tr>
<tr><td>PA.15</td><td>Proportional gain K_{p2}</td><td colspan="2">0.0~100.0</td><td>20.0</td><td>☆</td></tr>
<tr><td>PA.16</td><td>Integration time Ti_2</td><td colspan="2">0.01s~10.00s</td><td>2.00s</td><td>☆</td></tr>
<tr><td>PA.17</td><td>Differential time Td_2</td><td colspan="2">0.00~10.000</td><td>0.000s</td><td>☆</td></tr>
<tr><td rowspan="2">PA.18</td><td rowspan="2">PID parameter switching condition</td><td>No switching</td><td>0</td><td rowspan="2">0</td><td rowspan="2">☆</td></tr>
<tr><td>Switching through DI terminal</td><td>1</td></tr>
</table>

		Switching through deviation 2		
PA.19	PID parameter switching deviation1	0.0%~PA.20	20.0%	☆
PA.20	PID parameter switching deviation2	PA.19~100.0%	80.0%	☆

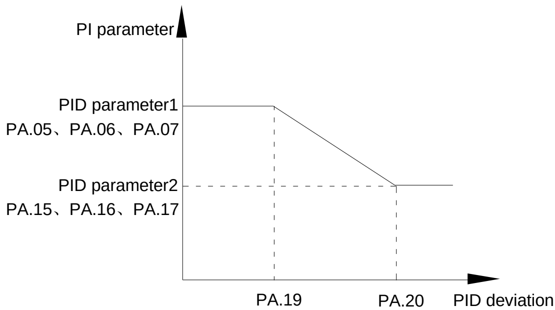


Fig.5-26PID parameter switching schematic diagram

In some applications, one group of PID parameters can not meet the needs of the whole operation process. Different parameters are used for different situations.

This group of function codes is used to switch 2 groups of PID parameters. Regulator parameters PA.15~PA.17 and parameter PA.05~PA.07 have the same setting method.

Two groups of PID parameters can be switched through multi-function digital DI terminal as well as PID deviation auto switching.

PA.18=1：Set multi-function terminal to 43(PID parameter switching terminal). Choose parameter group 1(PA.05~PA.07) when terminal invalid,while valid please choose parameter group 2(PA.15~PA.17).

PA.18=2：When deviation absolute value between reference and feedback is less than PA.19 set value, PID parameters select parameter group 1. When deviation absolute value between reference and feedback is greater than PA.20 set value, PID parameters select group 2. When deviation absolute value between reference and feedback is within the range of switching deviation 1 &2 , PID parameters select linear interpolation value of the 2 PID parameter groups.As shown in 5-26.

PA.21	PID initial value	0.0%~100.0%	0.0%	☆
PA.22	PID initial value retention time	0.00s~650.00s	0.00s	☆

Inverter fixed startup value is PID initial value(PA.21) .PID starts closed-loop regulation after PID initial value retention time(PA.22).

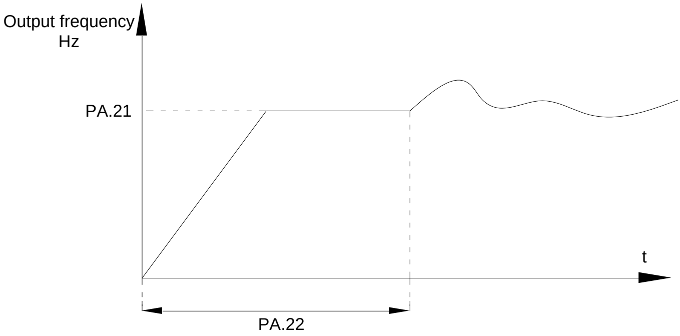


Fig.5-27 PID initial function schematic diagram

This function is used to limit difference between the PID output two beat (2ms/ beat), which suppressing rapid change of PID output, so that the inverter operation tends to be stable.

PA.23	Output deviation forward maximum value	0.00%~100.00%	1.00%	☆
PA.24	Output deviation Reserved maximum value	0.00%~100.00%	1.00%	☆

PA.23 and PA.24 correspond to the output deviation maximum absolute value of forward running and Reserved running respectively.

PA.25	PID integration attribute	1bit	Integration separation	00	☆
		Invalid	0		
		Valid	1		
		10bit	Whether stop integration when reaching output limit		
		Continue integration	0		
		Stop integration	1		

1bit ：Integration separation

If integration separation valid, then when the multi-function digital DI integration suspended (function 22) effective, the PID integration stop operation, and only proportion and differential function effectively.

If integration separation invalid, regardless of validity of multi-function digital DI ,integration separation is invalid.

10bit ：Whether stop integration when reaching output limit

When PID operation output reaches the maximum or minimum value, user could choose whether to stop integration or not.

If you choose to stop integration, then the PID integration stops calculation, which may contribute to the reduction of PID overshoot.					
PA.26	PID feedback loss detection value	No judging	0.0%	0.0%	☆
		0.1%~100.0%	0.1%		
PA.27	PID feedback loss detection time	0.0s~20.0s		0s	☆
This function is used to judge if PID feedback has been lost. When PID feedback value is less than PA.26 set value, and lasted for more than PA.27 set value, inverter fault alarm. Fault No. 31= Err31.					
PA.28	PID stop operation	Stop without operation	0	0	☆
		Stop with operation	1		
It is used to select if PID keeping operation under PID stop status. Generally PA.28=0 in stop status.					

5-13 Fixed length and counting：Pb.05-Pb.09

The swing frequency function is applicable to textile and chemical fiber industries and applications where traversing and winding functions are required.

Swing frequency means that the inverter output frequency swings up and down with the setup frequency as the center, and the trace of running frequency at the time axis is as shown in Fig. 5-28.The swing amplitude is set by Pb.00 and Pb.01.

When Pb.01 is set to 0, it means the swing amplitude is 0, and the swing frequency is invalid.

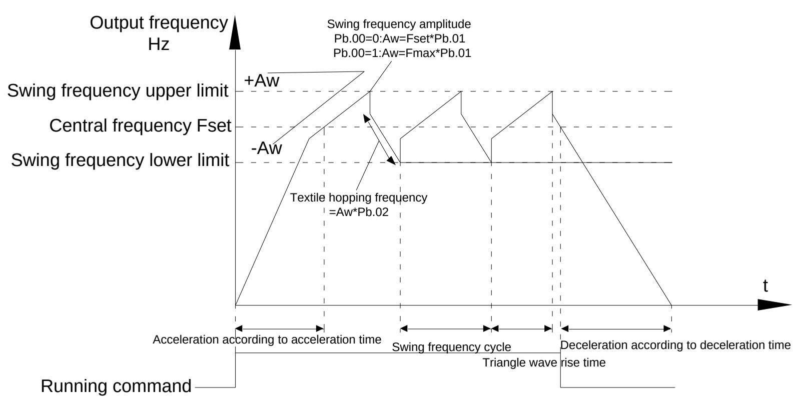


Fig.5-28Swing frequency schematic diagram

Code	Description/	Setting Range	Factory	Change

	Keyboard Display		Setting	Limit
Pb.05	Setup length	0m~65535m	1000m	☆
Pb.06	Actual length	0m~65535m	0m	☆
Pb.07	Pulse number per meter	0.1~6553.5	100.0	☆

The three parameters such as setup length, actual length and number of pulses per meter are mainly used for fixed-length control.

Length information needs to be collected through multi-function digit input terminal,you can get Pb.06 actual length by division of terminal sampling pulse number and Pb.06.When actual length is longer than reference length Pb.05,multi-function digit terminal DO output “length arrival” ON signal.

During the process of fixed-length control,length reset operation(by multi-function terminal DI)is permitted(choose DI function selection as 28),for specifications please refer to P4.00~P4.09.

Set corresponded input terminal function to “length counting input”(function 27).When pulse frequency is high,only DI5 port can be used.

Pb.08	Counting value setup	1~65535	1000	☆
Pb.09	Designated counting value	1~65535	1000	☆

Counting value should be collected through multi-function digital input terminal. Corresponding input terminal should be set to the function of “counter input”(function 25) in application. DI5 terminal should be used when pulse frequency is high.

When counting value reaches Pb.08 set value, multi-function digital output “setup counting value arrival” ON signal, then stop counting.

When counting value reaches Pb.09 set value, multi-function digital output “designated counting value arrival”ON signal, then continues to count until reaching “setup counting value”.

Specified counting value should not be greater than setup counting value Pb.08.

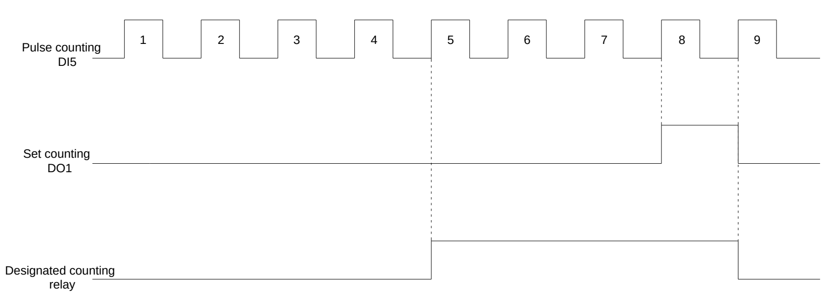


Fig.5-29 Setup counting value&designated counting value schematic diagram

5-14 MS speed function&simple PLC function：PC.00-PC.51

MS speed command of DSI-400 has more abundant function than the usual MS speed function. It could not only realize MS speed function, but also can be used as VF separation voltage source and PID reference source.Therefore, dimension of MS speed command is a relative value.

Simple PLC function is different from DSI-400 user programmable function. Simple PLC can only achieve simple combination of MS speed command, while user programmable function has more abundant and practical uses. For specifications please refer to A7 group.

Code	Description/ Keyboard Display	Setting Range	Factory Setting	Change Limit
PC.00	MS command 0	-100.0%~100.0%	0.0%	☆
PC.01	MS command 1	-100.0%~100.0%	0.0%	☆
PC.02	MS command 2	-100.0%~100.0%	0.0%	☆
PC.03	MS command 3	-100.0%~100.0%	0.0%	☆
PC.04	MS command 4	-100.0%~100.0%	0.0%	☆
PC.05	MS command 5	-100.0%~100.0%	0.0%	☆
PC.06	MS command 6	-100.0%~100.0%	0.0%	☆
PC.07	MS command 7	-100.0%~100.0%	0.0%	☆
PC.08	MS command 8	-100.0%~100.0%	0.0%	☆
PC.09	MS command 9	-100.0%~100.0%	0.0%	☆
PC.10	MS command 10	-100.0%~100.0%	0.0%	☆
PC.11	MS command11	-100.0%~100.0%	0.0%	☆
PC.12	MS command 12	-100.0%~100.0%	0.0%	☆
PC.13	MS command 13	-100.0%~100.0%	0.0%	☆
PC.14	MS command 14	-100.0%~100.0%	0.0%	☆
PC.15	MS command 15	-100.0%~100.0%	0.0%	☆

MS speed command can be used on three occasions：frequency source, VF saparation voltage source, process PID set source.

Dimension of MS speed command is a relative value ranging from -100.0% to 100.0%. When used as command source, it’s the percentage of maximum frequency. When used as VF saparation voltage source, it’s the percentage of motor rated voltage. When used as PID set source, dimension conversion is not needed during the process.

MS command should be selected according to the different states of multi-function digit DI terminals. For details please refer to P4 group.

PC.16	PLC running mode	Single running stop	0	0	☆
		Single running end remaining final value	1		
		Continuous circulation	2		

Simple PLC command can be used on two occasions：frequency source, VF separation voltage source.

Fig 5-30 is the schematic diagram of simple PLC that used as frequency source. Positive & negative of PC.00~PC.15 determines the running direction.

PLC has 3 running modes as frequency source(VF separation voltage source is not provided with the 3 modes)：

0： Single running stop

Upon completion of one single cycle of the inverter, it will stop automatically and will not start until running command is given again.

1：Single running end remaining final value

Upon completion of one single cycle of the inverter, the inverter will remain the running frequency and direction of last one phase. After the inverter restarted upon stop, it will run from the initial status of PLC.

2： Continuous circulation

Upon completion of one single cycle of the inverter, it will enter next cycle and not stop until stop command is given.

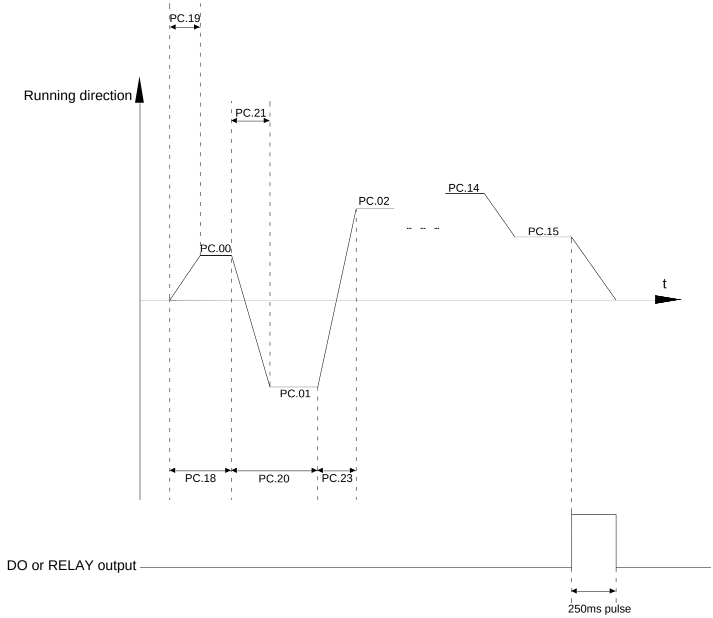


Fig.5-30Simple PLC schematic diagram

<table>
<tr><td rowspan="6">PC.17</td><td rowspan="6">PLC power off memory selection</td><td>1bit</td><td colspan="2">Power off memory selection</td><td rowspan="6">00</td><td rowspan="6">☆</td></tr>
<tr><td colspan="2">Power off without memory</td><td>0</td></tr>
<tr><td colspan="2">Power off with memory</td><td>1</td></tr>
<tr><td>10bit</td><td colspan="2">Stop memory selection</td></tr>
<tr><td colspan="2">Stop without memory</td><td>0</td></tr>
<tr><td colspan="2">Stop with memory</td><td>1</td></tr>
</table>

PLC power off memory refers to memorizing the PLC running stage and running frequency before power off, and continues to run from the memory stage upon next power-on. If 1bit is set to 0, PLC process would restart upon power-on.

PLC stop memory refers to the record of PLC running stage and running frequency of the time before. Next time PLC continues to run from the memory stage. If 10bit is set to 0, PLC process would restart upon power-on.

PC.18	PLC 0segment running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PC.19	PLC 0segment acc./dec. time	0~3	0	☆

PC.20	PLC 1segment running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC.21	PLC 1segment acc./dec. time	0~3	0	☆
PC.22	PLC 2segment running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC.23	PLC 2segment acc./dec. time	0~3	0	☆
PC.24	PLC 3segment running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC.25	PLC 3segment acc./dec. time	0~3	0	☆
PC.26	PLC 4segment running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC.27	PLC 4segment acc./dec. time	0~3	0	☆
PC.28	PLC 5 segment running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC.29	PLC 5segment acc./dec. time	0~3	0	☆
PC.30	PLC 6segment running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC.31	PLC 6segment acc./dec. time	0~3	0	☆
PC.32	PLC 7segment running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC.33	PLC 7segment acc./dec. time	0~3	0	☆
PC.34	PLC 8segment running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC.35	PLC 8segment acc./dec. time	0~3	0	☆
PC.36	PLC 9segment running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC.37	PLC 9segment acc./dec. time	0~3	0	☆
PC.38	PLC 10segment running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC.39	PLC 10segment acc./dec.time	0~3	0	☆
PC.40	PLC 11segment running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC.41	PLC 11segment acc./dec. time	0~3	0	☆
PC.42	PLC 12segment running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC.43	PLC 12segment acc./dec. time	0~3	0	☆
PC.44	PLC 13segment running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC.45	PLC 13segment acc./dec. time	0~3	0	☆
PC.46	PLC 14segment running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆

PC.47	PLC 14segment acc./dec. time	0~3		0	☆
PC.48	PLC 15segment running time	0.0s(h)~6553.5s(h)		0.0s(h)	☆
PC.49	PLC 15segment acc./dec. time	0~3		0	☆
PC.50	Running time unit	S(second)	0	0	☆
		H(hour)	1		
PC.51	MS command 0 reference mode	Function code PC.00 reference	0	0	☆
		AI1	1		
		AI2	2		
		AI3(Potentiometer)	3		
		PULSE	4		
		PID	5		
		Preset frequency(P0.08) reference, UP/DOWN can be modified	6		

It is used to select the reference channel of MS speed 0.

Besides choosing PC.00, MS command 0 has many other options, which is convenient for switching between MS command and other set modes.

Both MS command and simple PLC used as frequency source can easily realize switching between the two frequency sources.

5-15 Communication function group：Pd.00-Pd.06

Please refer to 《*DSI-400communication protocol*》

Code	Description/ Keyboard Display	Setting Range		Factory Setting	Change Limit
Pd.00	Baud rate	1bit	MODBUS	6005	☆
		300BPS	0		
		600BPS	1		
		1200BPS	2		
		2400BPS	3		

		4800BPS	4		
		9600BPS	5		
		19200BPS	6		
		38400BPS	7		
		57600BPS	8		
		115200BPS	9		
		10bit Profibus-DP			
		115200BPS	0		
		208300BPS	1		
		256000BPS	2		
		512000BPS	3		
		100 bit Reserved			
		1000 bit Reserved			
Pd.01	Data format	Without calibration (8-N-2)	0	0	☆
		Even parity calibration(8-E-1)	1		
		Uneven parity calibration(8-O-1)	2		
		8-N-1	3		
Pd.02	Local address	1-247, 0 is broadcast address		1	☆
Pd.03	Response delay	0ms-20ms		2	☆
Pd.04	Excessive communication	0.0(invalid), 0.1s-60.0s		0.0	☆

	time				
Pd.05	Data transform selection	1bit	MODBUS	31	☆
		Non-standard MODBUS protocol	0		
		Standard MODBUS protocol	1		
		10 bit	Profibus-DP		
		PPO1 format	0		
		PPO2 format	1		
		PPO3 format	2		
		PPO5 format	3		
Pd.06	Communication read current resolution	0.01A	0	0	☆
		0.1A	1		

5-16 User customization function code：PE.00-PE.29

Code	Description/ Keyboard Display	Setting Range	Factory Setting	Change Limit
PE.00	User function code 0	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.01	☆
PE.01	User function code 1	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.02	☆
PE.02	User function code 2	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.03	☆
PE.03	User function code 3	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.07	☆
PE.04	User function code 4	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.08	☆
PE.05	User function code 5	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.17	☆
PE.06	User function code 6	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.18	☆
PE.07	User function code 7	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P3.00	☆
PE.08	User function code 8	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P3.01	☆
PE.09	User function code 9	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P4.00	☆

PE.10	User function code 10	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P4.01	☆
PE.11	User function code 11	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P4.02	☆
PE.12	User function code 12	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P5.04	☆
PE.13	User function code 13	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P5.07	☆
PE.14	User function code 14	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P6.00	☆
PE.15	User function code 15	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P6.10	☆
PE.16	User function code 16	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.00	☆
PE.17	User function code 17	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.00	☆
PE.18	User function code 18	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.00	☆
PE.19	User function code 19	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.00	☆
PE.20	User function code 20	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.00	☆
PE.21	User function code 21	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.00	☆
PE.22	User function code 22	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.00	☆
PE.23	User function code 23	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.00	☆
PE.24	User function code 24	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.00	☆
PE.25	User function code 25	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.00	☆
PE.26	User function code 26	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.00	☆
PE.27	User function code 27	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.00	☆
PE.28	User function code 28	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.00	☆
PE.29	User function code 29	P0.00~PP.xx,A0.00~Ax.xx,U0.xx	P0.00	☆

This function group is the user customization function code.

Users can put the required parameters (among all DSI-400 function codes) to the PE group as the user customization function group.

PE group can offer 30 user customization function codes at most.When PE displays P0.00, it means user function code is null.

In user customization function mode, display of the function codes is defined through PE.00~PE.31. Sequence is consistent with the PE function codes, skip P0.00.

5-17 Function code management：PP.00-PP.04

Code	Description/ Keyboard Display	Setting Range		Factory Setting	Change Limit
PP.00	User password	0~65535		0	☆

The password set function is used to prohibit the unauthorized person from viewing and modifying the parameters.

When the parameter is set to any non-zero number, the password protection function is enabled. If no password is needed, change the parameter value to 00000.

After the user password is set and takes effect, when entering the password setting state, if the user password is incorrect, you cannot view and modify the parameter. You can only view the operation display parameters and stop displaying parameters.

Please keep your password in mind. If you set the password mistakenly or forget the password, please contact the manufacturer.

Code	Description/ Keyboard Display	Setting Range		Factory Setting	Change Limit
PP.01	Parameter initialization	No function	0	0	★
		Restore to factory default value,motor parameter not included	1		
		Clear memory	2		
		Restore factory parameters, Including motor parameters	3		
		Backup user current parameter	4		
		Restore user backup parameter	501		

0： No function.

1：Restore to factory default value,motor parameter not included

The inverter restores all the parameters excluding the following parameters of the factory default values：

Motor parameters, P0.22, fault record information, P7.09, P7.13, P7.14.

2：Clear memory

The inverter clears the fault records , P7.09, P7.13 and P7.14 to zero.

3：Restore factory parameters, Including motor parameters

PP.01=3，The inverter restores all the parameters excluding the following parameters of the factory default values

4：Backup user current parameter

It is the backup of user current setting parameters, which is convenient for the user to restore the disordered parameters .

501：Restore user backup parameter

It is used to restore the backup of user parameters, that is, restore the backup parameters which is set through PP.01=501.

PP.02	Parameter display attribute	1bit	U group display selection	11	★
		No display	0		
		Display	1		
		10bit	A group display selection		
		No display	0		
		Display	1		
PP.03	Personalized parameter display selection	1bit	Custom parameter display selection	00	☆
		No display	0		
		Display	1		
		10bit	User change parameter display selection		
		No display	0		
		Display	1		

The establishment of parameter display selection is basically convenient for the users viewing the different arrangement forms of function parameters according to the actual needs. Three display methods are offered as below：

Name	Description
Function parameter mode	Sequence display inverter function parameters, respectively P0~PF、A0~AF、U0~UF.
User customization parameter mode	User customization display of specified function parameters(32 at most). The display parameters is determined through PE group.
User change parameter mode	Parameters which are different from factory default.

When existing display for PP.03, user could switch into different display mode through QUICK key.

Function parameter display mode as default.

Parameter display mode	Display
Function parameter mode-FunC	-FunC
User customization parameter mode-USEt	-USEr
User change parameter mode-U--C	-U--C

Display codes as below：

DSI-400 series offers two groups of personalized parameter display mode：user customization function mode, user change parameter mode.

In user customization parameter mode, sign u is added to the user customization function code as default.

In user change parameter mode, sign c is added to the user customization function code as default. E.g：P1.00 is displayed as cP1.00 .

PP.04	Function codes modification attribute	Can be modified	0	0	☆
		Can not be modified	1		

This function is used to prevent misoperation of the function parameters.

PP.04=0：All the function codes can be modified.

PP.04=1：All the function codes can only be viewed, but not modified.

5-18 Torque control group： A0.00-A0.08

Code	Description/ Keyboard Display	Setting Range		Factory Setting	Change Limit
A0.00	Speed/ torque control mode selection	Speed control	0	0	★
		Torque control	1		

A0.00 is used to select inverter control mode：speed control or torque control.

Multi-function digit DI terminal of DSI-400 is equipped with two functions relating torque control：Torque control banned(Function29), speed control/torque control switching (function 46). The two terminals should be matched with A0.00 to realize switching between speed control and torque control.

A0.00 set the control mode when speed/torque control switching terminal invalid. If the speed/torque control switching terminal is valid, control mode is equivalent to the inversion of A0.00 value.

When function 29 is valid, speed control mode is fixed for the inverter .

A0.01	Torque setup source selection in torque control mode	Digital setup(A0.03)	0	0	★
		AI1	1		
		AI2	2		
		AI3(Potentiometer)	3		
		PULSE	4		
		Communication setup	5		
		MIN(AI1,AI2)	6		
		MAX(AI1,AI2)	7		
A0.03	Torque digital setup in torque control mode	-200.0%~200.0%		150%	☆

A0.01 is used to select torque set source. There are totally 8 kinds of torque set mode.

Torque set is a relative value, which 100% corresponding to inverter rated torque. Set range：200.0%~200.0%.Maximum torque is 2 times that of inverter rated torque

When the torque is set by selection 1~7, 100% of communication ,analog input, pulse input corresponding to A0.03.

A0.05	Torque control forward maximum frequency	0.00Hz~Maximum frequency(P0.10)	50.00Hz	☆
A0.06	Torque control Reserved maximum frequency	0.00Hz~Maximum frequency(P0.10)	50.00Hz	☆

A0.05, A0.06 are used to set forward or Reserved maximum running frequency in torque control mode.

In inverter toque control mode, if load torque is less than motor output toque, the motor revolving speed would speed up. In case of galloping or other accidents of mechanical system , motor maximum revolving speed must be limited.

A0.07	Torque control acc. time	0.00s~65000s	0.00s	☆
A0.08	Torque control dec. time	0.00s~65000s	0.00s	☆

In torque control mode , rate of speed change of motor and load is decided by the difference between motor output toque and load torque. Therefore, motor speed may change fast, causing noise or excessive mechanical stress problems. By setting the torque control acc./dec. time, can make the motor speed changes smoothly.

A0.07 and A0.08 should be set to 0.00s in situations where torque rapid response is needed.

E.g：Two motors drive the same load, to make sure of load uniform distribution , one is set as host inverter(speed control mode) and another is the slave one(torque control mode). Actual output torque of the host inverter is the torque command of the slave, and slave torque is required to quickly follow the host torque, then torque control acc./dec. time is set to 0.00s for the slave inverter.

5-19 Virtual IO： A1.00-A1.21

<table>
<tr><th>Code</th><th>Description/
Keyboard Display</th><th colspan="2">Setting Range</th><th>Factory Setting</th><th>Change Limit</th></tr>
<tr><td>A1.00</td><td>Virtual VDI1 function selection</td><td colspan="2">0~59</td><td>0</td><td>★</td></tr>
<tr><td>A1.01</td><td>Virtual VDI2 function selection</td><td colspan="2">0~59</td><td>0</td><td>★</td></tr>
<tr><td>A1.02</td><td>Virtual VDI3 function selection</td><td colspan="2">0~59</td><td>0</td><td>★</td></tr>
<tr><td>A1.03</td><td>Virtual VDI4 function selection</td><td colspan="2">0~59</td><td>0</td><td>★</td></tr>
<tr><td>A1.04</td><td>Virtual VDI5 function selection</td><td colspan="2">0~59</td><td>0</td><td>★</td></tr>
<tr><td colspan="6">Functions of virtual VDI1~VDI5 are equal to DI terminals on control board. VDI1~VDI5 can be used as multi-function digital input terminals, for details please refer to description of P4.00~P4.09 .</td></tr>
<tr><td rowspan="10">A1.05</td><td rowspan="10">Virtual VD1 terminal valid state set mode</td><td>1bit</td><td>Virtual VDI1</td><td rowspan="10">00000</td><td rowspan="10">★</td></tr>
<tr><td>State of virtual VYx decides whether VDI is effective</td><td>0</td></tr>
<tr><td>Function code A1.06 decide whether VDI is effective</td><td>1</td></tr>
<tr><td>10bit</td><td>Virtual VDI2</td></tr>
<tr><td>State of virtual VYx decides whether VDI is effective</td><td>0</td></tr>
<tr><td>Function code A1.06 decides whether VDI is effective</td><td>1</td></tr>
<tr><td>100 bit</td><td>Virtual VDI3</td></tr>
<tr><td>State of virtual VDOx decides whether VDI is effective</td><td>0</td></tr>
<tr><td>Function code A1.06 decides whether VDI is effective</td><td>1</td></tr>
<tr><td>1000 bit</td><td>Virtual VDI4</td></tr>
</table>

		State of virtual VDOx decides whether VDI is effective	0		
		Function code A1.06 decides whether VDI is effective	1		
		10000 bit	Virtual VDI5		
		State of virtual VDOx decides whether VDI is effective	0		
		Function code A1.06 decides whether VDI is effective	1		
A1.06	Virtual VD1 terminal state	1bit	Virtual VDI1	00000	★
		Invalid	0		
		Valid	1		
		10bit	Virtual VDI2		
		Invalid	0		
		Valid	1		
		100bit	Virtual VDI3		
		Invalid	0		
		Valid	1		
		1000 bit	Virtual VDI4		
		Invalid	0		
		Valid	1		
		10000 bit	Virtual VDI5		

		Invalid	0		
		Valid	1		

State of virtual VDI terminal can be set through 2 setting methods, which is different from common digit input terminals, and select through A1.05.

When choosing the corresponding VDO state as the decision of VDI state , valid state of VDI is depending on VDO output as valid or not. VDIx only binding VDOx(x ：1~5).

Binary bits of function code A1.06 decide vitual input terminal states respectively.

The following example illustrates the method of using virtual VDI.

E.g1：When choosing VDO state deciding VDI state, to complete “AI1 input exceeding limit, inverter fault alarm and stop”：

Set VDI1 to “ user-defined fault 1”(A1.00=44);

Set VDO1 (A1.05=xxx0) to decide VDI1 terminal valid state;

Set VDO1 output function to “AI1 excessive input”(A1.11=31);

When AI1 exceeding the upper / lower limit , VDO1 output ON signal, VDI1 input terminal state is valid, VDI1 receives “ user-defined fault 1”, and inverter fault alarm and stop , fault No. 27= E.USt1.

E.g2：When choosing function code A1.06 deciding VDI state, to complete “ Auto into running state after power-on ”：

Set VDI1 to “Forward command FWD”(A1.00=1);

Set function code (A1.05=xxx1) to decide VDI1 terminal valid state;

Set VDI1 terminal to valid state(A1.06=xxx1);

Set command source to “Terminal control”(P0.02=1);

Set startup protection selection to invalid state.(P8.18=0);

After inverter power-on and the initialization, VDI1 is detected as valid, the terminal corresponding to forward running, which is equivalent to inverter receiving a forward running command, and then start forward running.

A1.07	AI1 as DI function selection	0~59	0	★
A1.08	AI2 as DI function selection	0~59	0	★

<table>
<tr><td>A1.09</td><td>AI3 as DI function selection</td><td colspan="3">0~59</td><td>0</td><td>★</td></tr>
<tr><td rowspan="9">A1.10</td><td rowspan="9">AI as DI valid mode selection</td><td>1bit</td><td colspan="2">AI1</td><td rowspan="9">000</td><td rowspan="9">★</td></tr>
<tr><td colspan="2">High level valid</td><td>0</td></tr>
<tr><td colspan="2">Low level valid</td><td>1</td></tr>
<tr><td>100bit</td><td colspan="2">AI2</td></tr>
<tr><td colspan="2">High level valid</td><td>0</td></tr>
<tr><td colspan="2">Low level valid</td><td>1</td></tr>
<tr><td>1000 bit</td><td colspan="2">AI3(Potentiometer)</td></tr>
<tr><td colspan="2">High level valid</td><td>0</td></tr>
<tr><td colspan="2">Low level valid</td><td>1</td></tr>
<tr><td colspan="7">AI is used as DI for this function group. AI input voltage is greater than 7V, corresponding AI terminal state is high level. AI input voltage is less than 3V, corresponding AI terminal state is low level. 3V~7V for hysteresis loop .

Whether AI (as DI) high level valid or low level valid is determined through function code A1.10. For AI(as DI) function settings, they are same with common DI settings, for details please refer to P4 group .

Fig. 5-31 takes AI input voltage as an example, explains the relationship between AI input voltage and corresponding DI state：</td></tr>
</table>

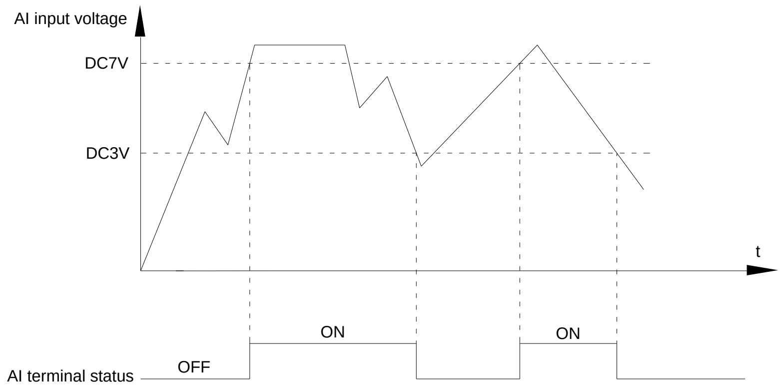


Fig.5-31AI terminal valid state schematic diagram

A1.11	Virtual VDO1 output function	Short circuit with physics DIx internals	0	0	☆
		See P5 group for physics DO output selection	1~40		
A1.12	Virtual VDO2 output function	Short circuit with physics DIx internals	0	0	☆
		See P5 group for physics DO output selection	1~40		
A1.13	Virtual VDO3 output function	Short circuit with physics DIx internals	0	0	☆
		See P5 group for physics DO output selection	1~40		
A1.14	Virtual VDO4 output function	Short circuit with physics DIx internals	0	0	☆
		See P5 group for physics DO output selection	1~40		
A1.15	Virtual VDO5 output function	Short circuit with physics DIx internals	0	0	☆
		See P5 group for physics DO output selection	1~40		
A1.16	VDO1 output delay time	0.0s~3600.0s		0.0s	☆

A1.17	VDO2 output delay time	0.0s~3600.0s		0.0s	☆
A1.18	VDO3 output delay time	0.0s~3600.0s		0.0s	☆
A1.19	VDO4 output delay time	0.0s~3600.0s		0.0s	☆
A1.20	VDO5 output delay time	0.0s~3600.0s		0.0s	☆
A1.21	VDO output terminal valid state selection	1bit VDO1		00000	☆
		Positive logic	0		
		Negative logic	1		
		10bit VDO2			
		Positive logic	0		
		Negative logic	1		
		100bit VDO3			
		Positive logic	0		
		Negative logic	1		
		1000 bit VDO4			
		Positive logic	0		
		Negative logic	1		
		10000 bit VDO5			
		Positive logic	0		
		Negative logic	1		

Virtual digit output function , which is similar with control board DO output function , can be used to cooperate with virtual digit input VDIx, to realize some simple logic control.

When virtual VDOx output function selecting 0, VDO1~VDO5 output states is determined by input states of DI1~DI5 on the keyboard.VDOx and DIx one-to-one corresponding.

When virtual VDOx output function selecting non-zero digits, VDOx function setting and use method are same with P5 group DO output relevant parameters, for details please refer to P5 group.

Similarly, VDOx output valid state can choose positive or negative logic, and set through A1.21.

For VDOx use reference , please refer to applications for VDIx use .

5-20 The second motor control：A2.00-A2.65

DSI-400 can switch operation between 4 motors. The 4 motors could set motor nameplate parameters, tune motor parameters, use V/F control or vector control, set encoder relating parameters and set V/F control or vector control relating parameters respectively.

Groups of A2、A3、A4 are corresponding to motor2、motor3、motor4 respectively. And the layout of the 3 groups of function codes are completely consistent .

For details please refer to relating parameters of motor1.

Code	Description/ Keyboard Display	Setting Range		Factory Setting	Change Limit
A2.00	Motor type selection	General asynchronous motor	0	0	★
		Variable frequency asynchronous motor	1		
		Permanent magnet synchronous motor	2		
A2.01	Rated power	0.1kW~1000.0kW		-	★
A2.02	Rated voltage	1V~2000V		-	★
A2.03	Rated current	0.01A~655.35A(Inverter power <=55kW) 0.1A~6553.5A(Inverter power >55kW)		-	★
A2.04	Rated frequency	0.01Hz~maximum frequency		-	★
A2.05	Rated revolving speed	1rpm~65535rpm		-	★
A2.06	Asynchronous motor stator resistance	0.001Ω~65.535Ω(Inverter power <=55kW) 0.0001Ω~6.5535Ω(Inverter power >55kW)		-	★
A2.07	Asynchronous motor rotor resistance	0.001Ω~65.535Ω(Inverter power <=55kW) 0.0001Ω~6.5535Ω(Inverter power >55kW)		-	★
A2.08	Asynchronous motor leakage	0.01mH~655.35mH(Inverter power <=55kW)		-	★

	inductance	0.001mH~65.535mH(Inverter power >55kW)			
A2.09	Asynchronous motor mutual inductance	0.1mH~6553.5mH(Inverter power <=55kW) 0.01mH~655.35mH(Inverter power >55kW)		-	★
A2.10	Asynchronous motor no load current	0.01A~A2.03(Inverter power <=55kW) 0.1A~A2.03(Inverter power >55kW)		-	★
A2.27	Encoder pulses number	1~65535		2500	★
A2.28	Encoder type	ABZ incremental encoder	0	0	★
		UVW incremental encoder	1		
		Rotary transformer	2		
		Sine/cosine encoder	3		
		UVW encoder	4		
A2.29	Speed feedback PG selection	Local PG	0	0	★
		Expansion PG	1		
		PULSE pulse input(DI5)	2		
A2.30	ABZ incremental encoder AB phase	Forward	0	0	★
		Reserve	1		
A2.31	Encoder installation angle	0.0°~359.9°	0	0	★
A2.32	UVW phase sequence	Forward	0	0	★
		Reserved	1		
A2.33	UVW encoder offset angle	0.0°~359.9°		0.00	★
A2.34	Rotary transformer pole pairs	1~65535		1	★
A2.36	PG dropped inspection time	No action	0.0s	0.0s	★
		0.1s~10.0s	0.1s		
A2.37	Tuning selection	No operation	0	0	★
		Asynchronous static tuning	1		
		Asynchronous complete tuning	2		
		Synchronous static tuning	11		

		Synchronous complete tuning	12		
A2.38	Speed loop proportional gain 1	1~100		30	☆
A2.39	Speed loop integration time1	0.01s~10.00s		0.50s	☆
A2.40	Switching frequency1	0.00~A2.43		5.00Hz	☆
A2.41	Speed loop proportional gain 2	0~100		20	☆
A2.42	Speed loop integration time 2	0.01s~10.00s		1.00s	☆
A2.43	Switching frequency 2	A2.40~maximum output frequency		10.00Hz	☆
A2.44	Vector control slip gain	50%~200%		150%	☆
A2.45	Speed-loop filtering time	0.000s~0.100s		0.000s	☆
A2.47	Torque upper limit source in speed control mode	A2.48 setup	0	0	☆
		AI1	1		
		AI2	2		
		AI3(Potentiometer)	3		
		PULSE setup	4		
		Communication setup	5		
		MIN(AI1,AI2)	6		
		MAX(AI1,AI2)	7		
A2.48	Torque upper limit digital setup in speed control mode	0.0%~200.0%		150.0%	☆
A2.51	Excitation regulation proportional gain	0~60000		2000	☆
A2.52	Excitation regulation integration gain	0~60000		1300	☆
A2.53	Torque requlation proportional gain	0~60000		2000	☆
A2.54	Torque regulation integration gain	0~60000		1300	☆
A2.55	Speed loop integration attribute	1bit Integration separation		0	☆
		Invalid	0		

		Valid	1		
A2.61	Motor2 control mode	Speed sensorless vector control(SVC)	0	0	★
		Speed sensor vector control(FVC)	1		
		V/F control	2		
A2.62	Motor 2 acc./dec. time selection	Same with the first motor	0	0	☆
		Acceleration time1	1		
		Acceleration time 2	2		
		Acceleration time 3	3		
		Acceleration time 4	4		
A2.63	Motor 2 torque hoist	Auto torque hoist	0.0%	-	☆
		0.1%~30.0%			
A2.65	Motor 2 oscillation suppression gain	0~100		-	☆

5-21 Control optimization： A5.00-A5.11

Code	Description/ Keyboard Display	Setting Range		Factory Setting	Change Limit
A5.00	DPWM switching frequency upper limit	0.00Hz~15.00Hz		8.00Hz	☆
A5.00 is only valid for VF control mode. In asynchronous motor VF running mode, square wave determine the continuous modulation mode. Wave value＜A5.00：7-stage continuous modulation mode. Wave value＞A5.00：5-stage continuous modulation mode. In 7-stage continuous modulation mode, inverter switch loss is relatively big, but current ripple is small. In 5-stage continuous modulation mode, inverter switch loss is relatively small, but current ripple is big. High frequency may lead to motor operation instability, generally there is no need of modification. For VF operation instability please refer to P3.11. For inverter loss and temperature rise please refer to P0.15.					
A5.01	PWM modulation mode	Asynchronous modulation	0	0	☆
		Synchronous modulation	1		
This parameter is only valid for VF control mode. Asynchronous modulation refers to carrier frequency that linear changes with output frequency, and ensure that the ratio of them (carrier ratio) remains the same. Generally high output frequency is benefit for output voltage quality. Generally, synchronous modulation is not needed at low frequencies (below 100Hz), because the					

ratio of carrier frequency and output frequency is relatively high,asynchronous modulation advantage is more obvious. When running frequency is greater than 85Hz, synchronous modulation is valid. And fixed as asynchronous modulation mode when below this frequency.					
A5.02	Dead-zone compensation mode selection	No compensation	0	1	☆
		Compensation mode 1	1		
Generally speaking , A5.02 needs not to be modified. Only when the output voltage waveform quality has special requirements or motor appears abnormal phenomenon would users switch the compensation mode.					
A5.03	Random PWM depth	Random PWM invalid	0	0	☆
		PWM carrier frequency random depth	1~10		
Set the random PWM, monotonous and harsh electromagnetic noise can be changed to the heterogeneous and soft, the external electromagnetic interference can be effectively reduced. 0 indicates that the PWM is invalid. Different random PWM depth represents different regulation effect.					
A5.04	Rapid current-limiting enable	Invalid	0	1	☆
		Valid	1		
Enable the rapid current-limiting function so as to minimize inverter overcurrent protection fault and make the inverter work normally. If the inverter long time continuous staying in rapid current-limiting state, it may occur overheating fault, which is not allowed during operation. Fault alarm of long time rapid current-limiting is 40= Err40 , which refers to inverter overload and necessary stop.					
A5.05	Voltage over modulation coefficient	100~110%		105	★
A5.06	Under-voltage point setup	210-420		350	☆
A5.06 is used to set value of inverter under-voltage fault 9= Err09.					
A5.08	Low speed carrier frequency	0.0-8.0khz		0.0	☆
A5.09	Over voltage point setup	200.0V~2500.0V		810.0V	★
A5.09 is over voltage point set through software, which is not related to hardware over voltage point.					
A5.11	Dc injection braking	0.00~5.00hz		0.30hz	☆

	threshold at low speed			

5-22 AI curve setup： A6.00-A6.29

Code	Description/ Keyboard Display	Setting Range	Factory Setting	Change Limit
A6.00	AI curve 4 minimum input	-10.00V~A6.02	0.00V	☆
A6.01	AI curve 4 minimum input corresponding setup	-100.0%~100.0%	0.0%	☆
A6.02	AI curve 4inflection point 1 input	A6.00~A6.04	3.00V	☆
A6.03	AI curve 4 inflection point 1 input corresponding setup	-100.0%~100.0%	30.0%	☆
A6.04	AI curve 4 inflection point 2 input	A6.02~A6.06	6.00V	☆
A6.05	AI curve 4 inflection point 2 input corresponding setup	-100.0%~100.0%	60.0%	☆
A6.06	AI curve 4 maximum input	A6.06~10.00V	10.00V	☆
A6.07	AI curve 4 maximum input corresponding setup	-100.0%~100.0%	100.0%	☆
A6.08	AI curve 4 minimum input	-10.00V~A6.10	-10.00V	☆
A6.09	AI curve 5 minimum input corresponding setup	-100.0%~100.0%	-100.0%	☆
A6.10	AI curve 5 inflection point 1 input	A6.08~A6.12	-3.00V	☆
A6.11	AI curve 5 inflection point 1 input corresponding setup	-100.0%~100.0%	-30.0%	☆
A6.12	AI curve 5 inflection point 2 input	A6.10~A6.14	3.00V	☆
A6.13	AI curve 5 inflection point 2 input corresponding setup	-100.0%~100.0%	30.0%	☆
A6.14	AI curve 5 maximum input	A6.12~10.00V	10.00V	☆
A6.15	AI curve 5 maximum input	-100.0%~100.0%	100.0%	☆

	corresponding setup			

Function of curve 4 and curve 5 are similar with curve 1~curve 3's. Curve 1~curve 3 are straight lines, while curve 4 and curve 5 are 4-point curves which could realize more flexible correspondence.

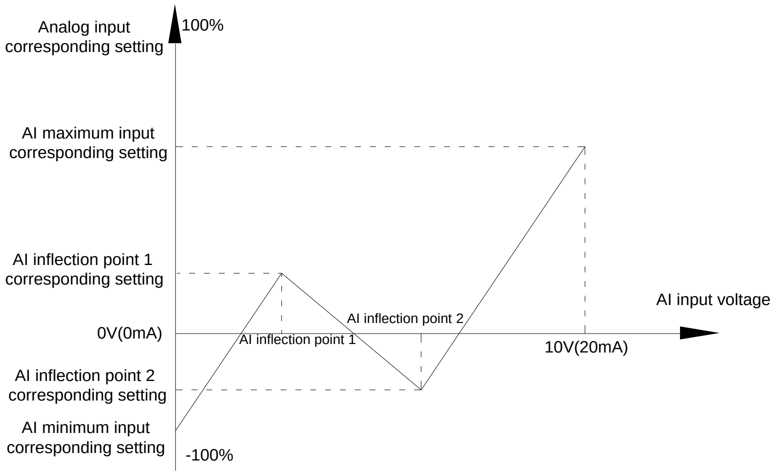


Fig.5-32Curve4 and curve 5 schematic diagram

Notice：When setting curve 4 and curve 5, minimum input voltage, inflection point 1 voltage, inflection point 2 voltage and maximum voltage must be increased in turn.

A6.24	AI1 set hopping point	-100.0%~100.0%	0.0%	☆
A6.25	AI1 set hopping amplitude	0.0%~100.0%	0.5%	☆
A6.26	AI2 set hopping point	-100.0%~100.0%	0.0%	☆
A6.27	AI2 set hopping amplitude	0.0%~100.0%	0.5%	☆
A6.28	AI3 set hopping point	-100.0%~100.0%	0.0%	☆
A6.29	AI3 set hopping amplitude	0.0%~100.0%	0.5%	☆

Analog input AI1~AI3 of DSI-400 are all provided with hopping function for set value.

Hopping frequency refers to fixing of analog corresponding setup to the value of hopping point when analog corresponding setting varies within jump point upper/lower limit.

E.g：

Voltage of analog input AI1 is in 5.00V fluctuation, which range is 4.90V~5.10V. Minimum input 0.00V corresponding to 0.0%, while maximum input 10.00V corresponding to 100.%.The corresponding setting of AI1 fluctuates between 49.0%~51.0%.

Set A5.16 to 50.0% and A5.17 to 1.0%, after hopping function processing, AI1 is fixed as 50.0%. In this way, AI1 is converted into a stable input, and fluctuation is eliminated.

5-23 User programmable card parameters： A7.00-A7.09

Code	Description/ Keyboard Display	Setting Range		Factory Setting	Change Limit
A7.00	User programmable function selection	Invalid	0	0	★
		Valid	1		
A7.01	Control board output terminal control mode selection	Inverter control	0	-	★
		User programmable card control	1		
		1bit	FMP(Y1 as pulse output)		
		10bit	Relay(T/A1-T/B1-T/C1)		
		100 bit	DO1		
		1000 bit	FMR(Y1 as switch output)		
		10000 bit	AO1		
A7.02				-	★
A7.03	FMP output	0.0%-100.0%		0.0%	☆
A7.04	AO1 output	0.0%-100.0%		0.0%	☆
A7.05	Switch output	1bit	FMR	000	☆
		10bit	Relay 1		
		100 bit	DO		
A7.06	Programmable card frequency setup	0.0%-100.0%		0.0%	☆
A7.07	Programmable card torque setup	-200.0%-200.0%		0.0%	☆

A7.08	Programmable card command setup	No command	0	0	☆
		Forward command	1		
		Reserved command	2		
		Forward jog	3		
		Reserved jog	4		
		Free stop	5		
		Decelerate to stop	6		
		Fault reset	7		
A7.09	Programmable card fault setup	No fault	0	0	☆
		Fault code	80-89		

5.24 Point to point communication：A8.00-8.11

Code	Description/ Keyboard Display	Setting Range			Factory Setting	Change Limit
A8.00	Master slave control function selection	Invalid		0	0	☆
		Valid		1		
A8.01	Master slave selection	Master		0	0	☆
		slave		1		
A8.02	Master slave information exchange	0 bit	Do not follow the Master command	0	011	☆
			follow the Master command	1		
		10 bit	Do not send fault information	0		
			send fault information	1		
		100 bit	Do not warning when slave off line	0		

		warning when slave off line	1		
A8.03	Message frame selection	Master slave control frame	0	0	☆
		Droop control frame	1		
A8.04	Receive data zero offset torque	-100.00%～100.00%		0.00	★
A8.05	Receive data gain torque	-10.00～100.0		1.00	★
A8.06	Communication interrupt detection time	0.0s～10.0s		1.0s	☆
A8.07	Communication Master data transmission cycle	0.001s～10.000s		0.001	☆
A8.08	Receive data zero offset frequency	-100.00%～100.00%		0.00	★
A8.09	Receive data gain frequency	-10.00～100.00		1.00	★
A8.10	Reserved			–	
A8.11	view	0.20Hz～10.00Hz		0.5	★

5-25 Extended function group：A9.00-A9.09

Code	Description/ Keyboard Display	Setting Range	Factory Setting	Change Limit
A9.00	Reserved	Reserved	0	●
A9.01	Reserved	0~65535	0	☆
A9.02	Reserved	0~65535	0	☆
A9.03	Reserved	0~65535	0	☆
A9.04	Reserved	0~65535	0	☆
A9.05	Reserved	0~65535	0	☆

A9.06	Reserved	0~65535	0	☆
A9.07	Reserved	0~65535	0	☆
A9.08	Reserved	0~65535	0	☆
A9.09	Reserved	0~65535	0	☆

5-26 AIAO correction： AC.00-AC.19

Code	Description/ Keyboard Display	Setting Range	Factory Setting	Change Limit
AC.00	AI1measured voltage 1	0.500V~4.000V	Factory calibration	☆
AC.01	AI1 display voltage 1	0.500V~4.000V	Factory calibration	☆
AC.02	AI1 measured voltage 2	6.000V~9.999V	Factory calibration	☆
AC.03	AI1 display voltage 2	6.000V~9.999V	Factory calibration	☆
AC.04	AI2 measured voltage 1	0.500V~4.000V	Factory calibration	☆
AC.05	AI2 display voltage 1	0.500V~4.000V	Factory calibration	☆
AC.06	AI2 measured voltage 2	6.000V~9.999V	Factory calibration	☆
AC.07	AI2 display voltage 2	6.000V~9.999V	Factory calibration	☆
AC.08	AI3 measured voltage 1	-9.999V~10.000V	Factory calibration	☆
AC.09	AI3 display voltage 1	-9.999V~10.000V	Factory calibration	☆
AC.10	AI3 measured voltage 2	-9.999V~10.000V	Factory calibration	☆
AC.11	AI3 display voltage 2	-9.999V~10.000V	Factory calibration	☆

This group of function codes are used for calibration of analog input AI , which could eliminate AI input bias and gain influence. Generally , there is no need of calibration in application, for it has been calibrated in factory. When restoring the factory value, the parameter would be restored to the default value of factory calibration.

Measured voltage refers to the actual voltage that has been measured through measuring instrument such as multimeter. Display voltage refers to the display value that has been sampled by the inverter. See U0 group (U0.21、U0.22、U0.23) display.

During calibration, put the multimeter measurement value and the U0 value respectively into the function codes above, inverter would automatically calibrate the AI zero off and gain.

AC.12	A01 target voltage 1	0.500V~4.000V	Factory calibration	☆
AC.13	A01 measured voltage 1	0.500V~4.000V	Factory calibration	☆
AC.14	A01 target voltage 2	6.000V~9.999V	Factory calibration	☆
AC.15	A01 measured voltage 2	6.000V~9.999V	Factory calibration	☆
AC.16	A02 target voltage 1	0.500V~4.000V	Factory calibration	☆
AC.17	A02 measured voltage 1	0.500V~4.000V	Factory calibration	☆
AC.18	A02 target voltage 2	6.000V~9.999V	Factory calibration	☆
AC.19	A02 measured voltage 2	6.000V~9.999V	Factory calibration	☆

This group of function codes are used for calibration of analog output AO. Generally , there is no need of calibration in application, for it has been calibrated in factory. When restoring the factory value, the parameter would be auto restored to the default value of factory calibration.

Target voltage refers to inverter theoretical output voltage, while measured voltage refers to the actual voltage that has been measured through measuring instrument such as multimeter.

Section VI. Fault Diagnosis & Solutions

DSI-400 is able to make full use of the device performance, while implementing effective protection. You may encounter following fault tips during operation, please control the following table analysis the possible causes, and rule out the fault.

-1 Fault alarm and solutions

DSI-400 series can not only make full use of equipment performance but also implement effective protection. DSI-400 series has 51 alarming information and protection function.Once fault occurs, protection function acts,output stops, inverter fault relay contact starts,and fault code is been displayed on the display panel. Before consulting the service department, the user can perform self-check according to the prompts of this chapter, analyze the fault cause and find out t solution. If the fault is caused by the reasons as described in the dotted frame, please consult the agents or our company directly.

Among the 51 items of warning information：

Fault no.22= Err22refers to hardware over-current or over-voltage signal.In most cases hardware over-voltage fault led to fault no.22= Err22 alarming.

Fault name	Inverter unit protection
Panel display	Fault No.1= Err01
Fault investigation	1、Inverter output loop short circuit 2、Two long wiring between motor and inverter. 3、Module overheating 4、Inverter internal wiring loose 5、Main control board anomalies 6、Drive board anomalies 7、Inverter module anomalies
Fault countermeasures	1、Eliminate external faults 2、Add reactor or output filter 3、Check air duct, fan and eliminate existing problems. 4、Insert all connecting wires 5、For technical support

Fault name	Acceleration over current
Panel display	Fault No.2= Err02
Fault investigation	1、Acceleration time too short 2、Improper manual torque boost or V/F curve 3、Low voltage 4、Inverter output loop grouded or short circuit 5、Vector control mode without parameter identification 6、Start the rotating motor 7、Sudden load add in acceleration process 8、Small type selection of inverter.
Fault countermeasures	1、Increase acceleration time 2、Adjust manual torque boost or V/F curve 3、Adjust voltage to normal range 4、Eliminate external faults 5、Parameter identification 6、Select speed tracking start or restart after motor stop 7、Cancel sudden added load 8、Choose inverter of greater power level

Fault name	Deceleration over current
Panel display	Fault No.3= Err03
Fault investigation	1、Inverter output loop grouded or short circuit 2、Vector control mode without parameter identification 3、Deceleration time too short 4、Low voltage

	5、Sudden load add in deceleration process 6、No braking unit and brake resistence installed
Fault countermeasures	1、Eliminate external faults 2、Parameter identification 3、Increase deceleration time 4、Adjust voltage to normal range 5、Cancel sudden added load 6、Install braking unit and brake resistence

Fault name	Constant speed over current
Panel display	Fault No.4= Err04
Fault investigation	1、Inverter output loop grouded or short circuit 2、Vector control mode without parameter identification 3、Low voltage 4、Sudden load add in deceleration process 5、Small type selection of inverter
Fault countermeasures	1、Eliminate external faults 2、Parameter identification 3、Adjust voltage to normal range 4、Cancel sudden added load 5、Choose inverter of greater power level

Fault name	Acceleration over voltage
Panel display	Fault No.5= Err05
Fault investigation	1、No braking unit and brake resistence installed 2、High input voltage

	3、External force drive motor operation during acceleration process 4、Acceleration time too short
Fault countermeasures	1、Install braking unit and brake resistence 2、Adjust voltage to normal range 3、Cancel external force or install brake resistence 4、Increase acceleration time

Fault name	Deceleration over voltage
Panel display	Fault No.6= Err06
Fault investigation	1、High input voltage 2、External force drive motor operation during deceleration process 3、Deceleration time too short 4、No braking unit and brake resistence installed
Fault countermeasures	1、Adjust voltage to normal range 2、Cancel external force or install brake resistence 3、Increase deceleration time 4、Install braking unit and brake resistence

Fault name	Constant speed over voltage
Panel display	Fault No.7= Err07
Fault investigation	1、External force drive motor operation 2、High input voltage
Fault countermeasures	1、Cancel external force or install brake resistence 2、Adjust voltage to normal range

Fault name	Control power supply fault
Panel display	Fault No.8= Err08
Fault investigation	1、Input voltage is not within the specified range
Fault countermeasures	1、Adjust voltage to normal range

Fault name	Undervoltage fault
Panel display	Fault No.9= Err09
Fault investigation	1、Instantaneous power-off 2、Input voltage is not within the specified range 3、Bus voltage anomalies 4、Rectifier and buffer resistance anomalies 5、Drive board anomalies 6、Control board anomalies
Fault countermeasures	1、Reset fault 2、Adjust voltage to normal range 3、For technical support

Fault name	Inverter overload
Panel display	Fault No.10= Err10
Fault investigation	1、Small type selection of inverter. 2、Overload or motor stall
Fault countermeasures	1、Choose inverter of greater power level 2、Reduce the load and check the motor and mechanical condition

Fault name	Motor overload

Panel display	Fault No.11= Err11
Fault investigation	1、Small type selection of inverter 2、Improper setup of P9.01 3、Overload or motor stall
Fault countermeasures	1、Choose inverter of greater power level 2、Set P9.01 correctly 3、Reduce the load and check the motor and mechanical condition

Fault name	Input phase lack
Panel display	Fault No.12= Err12
Fault investigation	1、Drive board anomalies 2、Lightning protection board (BESP) anomalies 3、Control board anomalies 4、3-phase input power-supply anomalies
Fault countermeasures	1、Replace driver, power- supply board or contactor 2、For technical support 3、Eliminate external loop faults

Fault name	Output phase lack
Panel display	Fault No.13= Err13
Fault investigation	1、Wiring between motor and inverter anomalies 2、Inverter unbalanced 3-phase output 3、Drive board anomalies 4、Module anomalies
Fault countermeasures	1、Eliminate external loop faults 2、Check 3-phase winding and eliminate faults

	3、For technical support

Fault name	Module overheating
Panel display	Fault No.14= Err14
Fault investigation	1、Air duct block 2、Fan damage 3、High ambient temperature 4、Module thermistor damage 5、Inverter module damage
Fault countermeasures	1、Clean air dust 2、Replace the fan 3、Reduce ambient temperature 4、Replace thermistor 5、Replace inverter module

Fault name	External equipment fault
Panel display	Fault No.15= Err15
Fault investigation	1、Input external fault signal through DI 2、Input external fault signal through IO
Fault countermeasures	1、Reset operation

Fault name	Communication fault
Panel display	Fault No.16= Err16
Fault investigation	1、Abnornal communication cable 2、Wrongly set communication expansion card P0.28

	3、Wrongly set communication parameter PD group 4、Position machine operation anomalies
Fault countermeasures	1、Check the communication cable 2、Set communication expansion card type correctly 3、Set communication parameter correctly 4、Check position machine cable

Fault name	Contactor fault
Panel display	Fault No.17= Err17
Fault investigation	1、Input phase lack 2、Drive board , contactor anomalies
Fault countermeasures	1、Eliminate external loop faults 2、Replace driver, power- supply board or contactor

Fault name	Current inspection fault
Panel display	Fault No.18= Err18
Fault investigation	1、Drive board anomalies 2、Hall devices anomalies
Fault countermeasures	1、Replace drive board 2、Replace hall devices

Fault name	Motor tuning fault
Panel display	Fault No.19= Err19
Fault investigation	1、Parameter identification process overtime 2、Wrongly set motor parameters
Fault	1、Check wire between inverter and motor

countermeasures	2、Set motor parameters correctly according to the nameplate

Fault name	Encoder /PG card fault
Panel display	Fault No.20= Err20
Fault investigation	1、Encoder anomalies 2、PG card anomalies 3、Encoder type mismatch 4、Encoder connections fault
Fault countermeasures	1、Replace encoder 2、Replace PG card 3、Set motor encoder type correctly 4、Eliminate circuit faults

Fault name	EEPROM read & write fault
Panel display	Fault No.21= Err21
Fault investigation	1、EEPROM chip damage
Fault countermeasures	1、Replace main control board

Fault name	Inverter hardware fault
Panel display	Fault No.22= Err22
Fault investigation	1、Presence of overvoltage 2、Presence of overcurrent
Fault countermeasures	1、Treat according to overvoltage fault 2、Treat according to overcurrent fault

Fault name	Short circuit to ground fault
Panel display	Fault No.23= Err23
Fault investigation	1、Motor short circuit to ground
Fault countermeasures	1、Replace cable or motor

Fault name	Total running time arrival fault
Panel display	Fault No.26= Err26
Fault investigation	1、Total running time arrive the set value
Fault countermeasures	1、Clear record information using parameter initialization function

Fault name	User-defined fault 1
Panel display	Fault No.27= Err27
Fault investigation	1、Input user-defined fault 1 signal through multi-function terminal DI 2、Input user-defined fault 1 signal through virtual IO function
Fault countermeasures	1、Reset operation

Fault name	User-defined fault 2
Panel display	Fault No.28= Err28
Fault investigation	1、Input user-defined fault 2 signal through multi-function terminal DI 2、Input user-defined fault 2 signal through virtual IO function
Fault countermeasures	1、Reset operation

Fault name	Total power-on time arrival fault

Panel display	Fault No.29= Err29
Fault investigation	1、Total power-on time arrive the set value
Fault countermeasures	1、Clear record information using parameter initialization function

Fault name	Load off fault
Panel display	Fault No.30= Err30
Fault investigation	1、Inverter running current less than P9.64
Fault countermeasures	1、Confirm whether load off or P9.64, P9.65parameter settings is inaccordance with the actual operating condition

Fault name	PID feedback loss during operation fault
Panel display	Fault No.31= Err31
Fault investigation	1、PID feedback less than PA.26 set value
Fault countermeasures	1、Check PID feedback signal or set PA.26 to a proper value

Fault name	Each wave current limiting fault
Panel display	Fault No.40= Err40
Fault investigation	1、Excessive load or motor stall 2、Small type selection of inverter.
Fault countermeasures	1、Reduce the load and check the motor and mechanical condition 2、Choose inverter of greater power level

Fault name	Motor switching fault
Panel display	Fault No.41= Err41
Fault investigation	1、Change current motor selection during inverter operation

Fault countermeasures	1、Switch the motor after inverter stopped.

Fault name	Excessive speed deviation fautl
Panel display	Fault No.42= Err42
Fault investigation	1、Improper set inspection parameters P9.69、P9.60 2、Wrongly set encoder parameters 3、No parameter identification
Fault countermeasures	1、Set inspection parameters properly according to actual situation 2、Set motor encoder parameters correctly 3、Motor parameter identification

Fault name	Motor over speed fault
Panel display	Fault No.43= Err43
Fault investigation	1、No parameter identification 2、Wrongly set encoder parameters 3、Improper set inspection parameters P9.69、P9.60
Fault countermeasures	1、Motor parameter identification 2、Set motor encoder parameters correctly 3、Set inspection parameters properly according to actual situation

Fault name	Motor overtemperature fault
Panel display	Fault No.45= Err45
Fault investigation	1、Temperature sensor wiring loose 2、Motor over temperature
Fault countermeasures	1、Check sensor wiring and eliminate fault

	2、Reduced carrier frequency or take other cooling measures for the motor

Fault name	Initial position fault
Panel display	Fault No.51= Err51
Fault investigation	1、Excessive deviation between motor parameters and the paractical value
Fault countermeasures	1、Reconfirm motor parameter settings, pay attention to the rated current value

6-2 Common fault and solutions

During the inverter using process, the following faults may occur. Please conduct simple fault analysis by referring to the methods below:

No.	Fault Phenomenon	Possible Cause	Solution
1	No display or error codes occur upon power-on	Abnormal input power supply,switch power supply fault of driven board, rectifier bridge damage, inverter buffer resistance damage, control board/keyboard fault, control board/driven board/keyboard disconnection	Check input power supply, bus voltage, re-plug 26 core cable, consult the manufacturer
2	Display“510” upon power-on	Poor contact between driven board and control board, device damage on control board, motor or motor cable short circuited, hall fault, grid under voltage	Re-plug 26 core cable, consult the manufacturer
3	“Error 23=Err23” alarming upon power on	The motor or the output line is short circuited to the earth 、 the inverter is damaged.	Measure the insulation of the motor and output line with magneto-ohmmeter, consult the manufacturer.
4	The inverter displays normally upon power-on, but “510” is displayed upon running and stops immediately	The fan is either damaged or blocked, peripheral controlter short circuited	Replace the fan,exclude external short-circuit fault
5	Frequent fault reportERR14=Err14(module overheating)	The carrier frequency is set too high, the fan is damaged or the air duct is blocked, inverter internal components damaged	Replace the fan,clean air duct, reduce carrier frequency(P0.15) ,consult manufacturer.
6	Motor no rotating after inverter power-on	Motor or motor cable, wrongly set inverter parameters(motor parameter), poor contact	Replace the motor or remove the mechanical fault, check and reset the parameters, confirm connection between

		between driven board and control board, driven board fault	inverter and motor
7	DI terminal invalid	Wrongly set inverter parameters, wrong external signal, SP and +24V jumper loosening, control board fault	Check and reset the P4relevant parameters,reconnect cables, reconfirm PLC and +24V jumper, consult the manufacturer.
8	Closed loop vector control, motor speed cannot ascend	Encoder fault; PG card fault; drive board fault; encoder wrong connection or poor contact	Replace encoder&reconfirm connections; replace PG card; consult manufacturer.
9	The inverter frequently reports over current fault & over voltage fault	Motor wrongly set parameters,improper acc./dec. time, load fluctuation	Reset motor parameters or motor tuning, set proper acc./dec.time,consult manufacturer.

Caution：

※ After power off and within 5 minutes of charging indicator light(！CHARGE)out , please not touch any spare parts inside the machine. The operator must use instrument to confirm capacitor discharge is completed, then could implement machine operation, or there may be electric shock risk!

※ Please do not touch the printed circuit board and IGBT etc internal device without electrostatic prevention measures. Or it could lead to the damage of components

Section VII. Inspection & Maintenance

7-1 Inspection and Maintenance

Under normal working conditions, in addition to daily inspection, the frequency converter should be subject to regular inspection (for example inspection for overhaul or as specified but at an interval of at most six months). Please refer to the following table in order to prevent faults.

Daily	Regular	Check item	Check details	Method	Criterion
√		LED display	If any abnormal display	Visual check	As per use state
√	√	Fan	If any abnormal noise or vibration	Visual and audible check	No anomalies
√		Surrounding conditions	Temperature, humidity, dust content, harmful gas, etc.	Visual\audible\sensory check	As per 2-1 item
√		Input output voltage	If any abnormal input, output voltage	Measure R, S, T and U, V, W terminals	As per standard specifications
	√	Main circuit	Fasteners whether loose, if any signs showing overheat, discharging, or too high dust content, or the air piping is blocked	Check visually, tighten the fastenings, and clean the related parts	No anomalies
	√	Electrolytic capacitor	If any abnormal appearance	Check visually	No anomalies
	√	Current-conducting leads or blocks	Loose or not	Check visually	No anomalies
	√	Terminals	If the screws or bolts loose	Tighten the loose screws or bolts	No anomalies

"√" means need daily check or regularly check.

For inspection,DO not disassemble or shake the parts without reason, or pull off the plug-in-parts at Random. Otherwise, the unit will not operate normally, or can not enter the mode of fault display, or causes faults of components or even parts of the main switch components IGBT module is damaged.

When needing measurement, the user should note that much different results will be gained possibly if the measuring is performed with different instruments. It is recommended that the input voltage be measured with pointer-type voltmeter, output voltage with rectification voltmeter, input and output current with tong-test ammeter, and power with electrically-driven wattmeter.

7-2 Regular replacement of the device

In order to ensure the operation reliability of the frequency converter, in addition to regular maintenance and inspection, all the parts suffering long-term mechanical wear should be replaced at a regular interval, which includes all cooling fans and the filtering capacitors of main circuits for energy buffer and interchange and PCBs. For continuous use under normal conditions, these parts can be replaced according to the following table and the operating environment, loads and the current state of frequency converter.

Part name	Standard replacement years
Cooling fan	1~3 years
Filtering capacitor	4~5 years
PCB (printed circuit board)	5~8 years

7-3 Storage

The following actions must be taken if the frequency converter is not put into use immediately after delivery to the user and need to keep well for the time being or stored for a long time：

※ Stored in a dry and adequately-ventilated place without dust and metal powder at the temperature specified in the specifications.

※ If the frequency converter is not put into use after one year, a charge test should be made, so as to resume the performance of the filtering capacitor of main circuit in it. For charging, a voltage regulator should be used to slowly increase the input voltage of the frequency converter until it reaches the rating, and the charge should last more than 1~2 hours. This test should be made at least once a year.

※ Don't perform breakdown test at Random, for this test will cause shorter life of the frequency converter. The insulation test must be performed after the insulation resistance is measured with a 500-volt mega ohm and this value must not be less than 4MΩ.

7-4 Measuring and Judgment

※ If the current is measured with the general instrument, imbalance will exists for the current at the input terminal. Generally, differing by not more than 10% is normal. If it differs by 30%, inform the factory to replace the rectification bridge, or check if the error of three-phase input voltage is above 5V.

※ If the three-phase output voltage is measured with a general multi-meter, the read data is not accurate due to the interference of carrier frequency and only for reference.

7-5 Safety Precaution

※ Only specially trained persons are allowed to disassemble,replace the drive components.

※ Before the inspection and maintenance,inverter must be confirmed at least 5 minutes after power off or charged (CHARGE) light is off,otherwise there is risk of electric shock.

※ Avoid metal parts leaving in the drive, or it may result in equipment damage.

Appendix I　RS485Communication Protocol

I-1　RS485 communication

DSI-400 series inverter as internal RS485 communication circut. It contains the following resources：

Table 2Jumper description

Jumper number	Description
J1	RS485 Termination resistor selection

I-2　Communication protocol

I-2-1　Protocol content

The serial communication protocol defines the information content and format of the use of the transmission in serial communication. Including： the host polling (or broadcast) format、host encoding methods. Concent including： require action of the function code, data transmission and error checking and so on. Slave machine's response is the same structure, including： action confirmation, return data and error checking. Slave error occurred when receiving information, or can not do what the host request action, it will organize a fault messages the response back to the host computer.

Application mode：

The inverter accessing with “ single main multi-slave” PC/PLC control network which equipped with RS485 bus.

Bus structure：

(1)Interface mode

RS485 hardware interface

(2)Transmission mode

Asynchronous serial, half-duplex transmission. At the same time host and slave computer can only permit one to send data while the other can only receive data. Data in the process of serial asynchronous communication is in the message format and sent one frame by one frame.

(3)Topological mode

In single-master system, the setup range of slave address is 1 to 247. Zero refers to broadcast communication address. The address of slave must is exclusive in the network. That is one condition of one slave machine.

I-3 Protocol Description

DSI-400 series inverter communication protocol is an asynchronous serial master-slave Modbus communication protocol, only one device in the network (master) to establish protocol (known as the "query / command"). Other device (slave) can only provide data response to the host query / command, or make the appropriate action according to the host query / command. Host refers to a personal computer (PC), industrial control equipment, or programmable logic controller (PLC), etc. The slave indicates DSI-400 inverter. Host can not only communicate separately with the slave, but also broadcast messages tothe lower machine. For separate access to the host query / command, the slave should return a message (called the response), and for broadcast information issued by host machine , feedback needs not to be responded to the host.

Communication data structure DSI-400 series inverter Modbus protocol communication data format is as follows： using RTU mode, messages are sent at least at interval of 3.5 bytes times pause. In a variety of bytes in the network baud rate of time, this could be most easily achieved (see below T1-T2-T3-T4 shown). The transmission of a do main is the device address.

Transmission characters are hexadecimal 0...9, A...F. Network equipment continue to detect the network bus, including a pause interval of time. When the first field (the address field) is received, each device decodes it to determine whether sent to their own. At least 3.5 bytes times pause after the last transmitted character, a calibration of the end of the message. A new message may start after this pause.

The entire message frame must be used as a continuous stream. If the pause time frame prior to the completion of more than 1.5 byte times, the receiving device will refresh the incomplete message and assumes that the next byte will be the address field of a new message. Similarly, if a new message starts in less than 3.5 bytes times following the previous message, the receiving device will consider it a continuation of the previous message. This will set an error, as the value in the final CRC field will not be valid for the combined messages.A typical message frame is shown below.

RTU frame format：

START	3.5-character time
Slave address ADDR	Communication address：1~247
Command code CMD	03：Read slave parameters；06：Write slave parameters
DATA(N-1)	Function code parameter address,function code parameter number,function code parameter value,etc.
DATA(N-2)	
………………………	

DATA0	
CRC CHK low order	Detection value：CRC value。
CRC CHK high order	
END	At least 3.5-character time

CMD(command instructions) and DATA(material words description)

Command code：03H，reads N words(There are 12 characters can be read at most). For example：the inverter start address F0.02 of the slave machine address 01 continuously reads two consecutive values.

Host command

ADR	01H
CMD	03H
Start address high order	F0H
Start address low order	02H
Register number high order	00H
Register number low order	02H
CRC CHK low order	CRC CHK values to be calculated
CRC CHK high order	

Slave response

PD.05=0：

ADR	01H
CMD	03H
Byte number high order	00H
Byte number low order	04H
Data P002H high order	00H
Data P002H low order	00H

Data P003H high order	01H
CRC CHK low order	CRC CHK values to be calculated
CRC CHK high order	

PD.05=1：

ADR	01H
CMD	03H
Byte number	04H
Data F002H high order	00H
Data F002H low order	00H
Data F003H high order	00H
Data F003H low order	01H
CRC CHK low order	CRC CHK values to be calculated
CRC CHK high order	

Command code：06H write a word

For example： Write 5000(1388H) into F00AH which slave address is 02H.

Master command information

ADR	02H
CMD	06H
Data address high order	F0H
Data address low order	0AH
Data content high order	13H
Data content low order	88H
CRC CHK low order	CRC CHK values to be calculated
CRC CHK high order	

Slave response

ADR	02H
CMD	06H
Data address high order	F0H
Data address low order	0AH
Data content high order	13H
Data content low order	88H
CRC CHK low order	CRC CHK values to be calculated
CRC CHK high order	

I-4 Cyclical Redundancy Check：

Cyclical Redundancy Check—CRC mode：CRC(Cyclical Redundancy Check) is in RTU frame format, message contains an error-checking field that is based on a CRC method. The CRC field checks the contents of the entire message. The CRC field is two bytes, containing a 16-bit binary value. The CRC value is calculated by the transmitting device, which appends the CRC to the message. The receiving device recalculates a CRC during receipt of the message, and compares the calculated value to the actual value it received in the CRC field. If the two values are not equal, an error results. The CRC is started by 0xFFFF. Then a process begins of applying successive 8-bit bytes of the message to the current contents of the register. Only the eight bits of data in each character are used for generating the CRC. Start and stop bits, and the parity bit, DO not apply to the CRC.

During generation of the CRC, each eight-bit character is exclusive XOR with the register contents. Then the result is shifted in the direction of the least significant bit (LSB), with a ZERO filled into the most significant bit (MSB) position. The LSB extracted and examined. If the LSB was 1, the register then exclusive XOR with a preset, fixed value. If the LSB was 0, no exclusive XOR takes place. This process is repeated until 8 shifts have been performed. After the last (8) shift, the next eight-bit byte is exclusive XOR with the register's current value, and the process repeats for 8 more shifts as described above. The final contents of the register, after all the bytes of the message have been applied, is the CRC value.

When CRC appended to the message, the low byte is appended first, and then the high byte.

CRC calculation program：

```
unsigned int cal_crc16  (unsigned char *data, unsigned int length)
{
unsigned int i,crc_result=0xffff;
while(length--)
{
crc_result^=*data++;
for(i=0;i<8;i++)
{
if(crc_result&0x01)
crc_result=(crc_result>>1)^0xa001;
else
```

```
crc_result=crc_result>>1;
 }
 }
crc_result=((crc_result&0xff)<<8)|(crc_result>>8);
return(crc_result);
```

I-5 Communication parameter address

The chapter is about communication contents, it's used to control the inverter operation, the status of the inverter and related parameter setup. Read and write function code parameters (Some function codes are not able to be changed, only for the manufacturer use.). The mark rules of function code parameters address：

The group number and mark of function codes are parameter address for indication rules.

High byte：F0~FF(P group), A0~AF(A group), 70~F(U group)Low byte：00~FF

For example： P3.12, the address indicates F30C

Caution：

Group PF： Parameters could not be read or be modified.

Group U： Parameters could be read but not be modified.

Some parameters can not be changed during operation, some parameters regardless of the kind of state the inverter in, the parameters can not be changed. Change the function code parameters, pay attention to the scope of the parameters, units, and relative instructions.

Besides, if EEPROM is frequently stored, it will reduce the service life of EEPROM. In some communication mode, function code needn't to be stored as long as changing the RAM value.

Group P： to achieve this function, change high order F of the function code address into 0.

Group A： to achieve this function, change high order A of the function code address to be 4.

Corresponding function code address are indicated below：

High byte： 00~0F(P group), 40~4F(A group)Low byte： 00~FF

For example：

Function code P3.12 can not be stored into EEPROM, address indicates to be 030C,function code A0-05 can not be stored in EEPROM, address indicates to be 4005；This address can only act writing RAM, it can not act reading, when act reading, it is invalid address. For all parameters, command code 07H can be used to achieve this function.

Stop/running parameter：

Parameter addr.	Parameter description
1000	* Communication setup value(-10000~10000)(Decimal)
1001	Running frequency
1002	Bus voltage

1003	Output voltage
1004	Output current
1005	Output power
1006	Output torque
1007	Running speed
1008	DI input status
1009	DO output status
100A	AI1voltage
100B	AI2 voltage
100C	AI3 voltage
100D	Counting value input
100E	Length value input
100F	Load speed
1010	PID setup
1011	PID feedback
1012	PLC process
1013	PULSE input pulse frequency, unit 0.01kHz
1014	Feedback speed, unit 0.1Hz
1015	Rest running time
1016	AI1 voltage before correction
1017	AI2 voltage before correction
1018	AI3 voltage before correction
1019	Line speed
101A	Current power on time
101B	Current running time
101C	PULSE input pulse frequency, unit 1Hz
101D	Communication setup value
101E	Actual feedback speed
101F	Main frequency X display
1020	Auxiliary frequency Y display

Caution：

The communication setup value is percentage of the relative value, 10000 corresponds to 100.00%， -10000 corresponds to -100.00%.For data of dimensional frequency,the percentage value is the percentage of the maximum frequency.For data of dimensional torque, the percentage is P2.10, A2.48, A3.48, A4.48 (Torque upper digital setup, corresponding to the first, second, third, fourth motor).

Control command input to the inverter (write-only)

Command word address	Command function
2000	0001：Forward operation
	0002：Reserved operation
	0003：Forward jog
	0004：Reserved jog
	0005：Free stop
	0006：Speed-Down stop
	0007：Fault reset

Read inverter status：(read-only)

Status word address	Status word function
3000	0001：Forward operation
	0002：Reserved operation
	0003：Stop

Parameters lock password check：(if the return is the 8888H, it indicates the password checksum pass)

Password address	Contents of input password
1F00	*****

Digital output terminal control：(write-only)

Command address	Command content
2001	BIT0：DO1 Output control BIT1：DO2 Output control BIT2 RELAY1 Output control BIT3：RELAY2 Output control BIT4：FMR Output control BIT5：VY1 BIT6：VY2 BIT7：VY3 BIT8：VY4

	BIT9：VY5

Analog output AO1 control：(write-only)

Command address	Command content
2002	0~7FFF indicates 0％~100％

Analog output AO2control：(write-only)

Command address	Command content
2003	0~7FFFindicates 0％~100％

(PULSE)output control ：(write-only)

Command address	Command content
2004	0~7FFFindicates 0％~100％

Inverter fault description：

Inverter fault address	Inverter fault information
8000	0000：No fault 0001：Reserved 0002：Speed-up over current 0003：Speed-down over current 0004：Constant speed over current 0005：Speed-up over voltage 0006：Speed-DOWN over voltage 0007：Constant speed over voltage 0008：Buffer resistance overload fault 0009：Under-voltage fault 000A：Inverter overload 000B：Motor overload 000C：Input phase lost 000D：Output phase lost 000E：Module overheating

	000F：External fault 0010：Communication fault 0011：Contactor fault 0012：Current detection fault 0013：Motor tuning fault 0014：Encoder/PG card fault 0015：Parameter read and write fault 0016：Inverter hardware fault 0017：Motor earthing short-circuit fault 0018：Reserved 0019：Reserved 001A：Running time arrive fault 001B：User defined fault 1 001C：User defined fault 2 001D：Power on time arrive fault 001E：Load off 001F：PID feedback lost during operation 0028：Fast current limit timeout fault 0029：Motor shifting fault during operation 002A：Excessive speed deviation 002B：Motor over speed 002D：Motor over-temperature 005A：Encoder line number setup fault 005B：Encoder not connected 005C：Initial position error 005E：Speed feedback fault

Communication fault information describing data (fault code)：

Communication fault address	Fault function description
8001	0000：No fault 0001：Password error

	0002：Command code error 0003：CRC check error 0004：Invalid address 0005：Invalid parameter 0006：Parameter change invalid 0007：The system is locked 0008：Operating EEPROM

Pd group communication parameters description

Pd.00	Baud rate	Factory default value	6005
	Setup range	1 bit：MODUBS baud rate 0：300BPS 1：600BPS 2：1200BPS 3：2400BPS 4：4800BPS 5：9600BPS 6：19200BPS 7：38400BPS 8：57600BPS 9：115200BPS	

This parameter is used to set the data transfer rate between the host computer and the inverter. Caution：The baud rate of the position machine and the inverter must be consistent.

Or,communication is impossible.The higher the baud rate is,the faster the communication is.

Pd.01	Data format	Factory default value	0
	Setup range	0：No check：data format <8,N,2> 1：Even parity check：data format <8,E,1> 2：Odd parity check：data format <8,O,1> 3：No check：data format <8-N-1>	

The data format of the position machine and the inverter setup must be consistent, Otherwise communication is impossible.

Pd.02	Local address	Factory default value	1
	Setup range	1~247，0 is broadcast address.	

When the local address is set to 0, that is the broadcast address, achieve position machine's broadcast function. The local address is unique (except for the broadcast address), which is the basis for the position machine and the inverter point to point communication.

Pd.03	Response delay	Factory default value	2ms
	Setup range	0~20ms	

Response delay： It refers to the interval time from the inverter finishes receiving data to sending data to the position machine. If the response delay is less than the system processing time, then the response based on the time delay of the system processing time. If the response delay is more than the system processing time, after the system process the data, it should be delayed to wait until the response delay time is up, then sending data to host machine.

Pd.04	Communication Overtime	Factory default value	0.0 s
	Setup range	0.0 s (Invalid) 0.1~60.0s	

When the function set to 0.0s, the communication overtime parameter is invalid.

When the function code is set to valid value, if the interval time between one communication with the next communication exceeded the communications overtime, the system will report communication fault error (fault serial 16= E.CoF1) . Under normal circumstances, it will be set to invalid value. If the system of continuous communication, setting parameters, you can monitor the communication status.

Pd.05	Communication protocol selection	Factory default value	0
	Setup range	0：Non standard Modbus protocol 1：Standard Modbus protocol	

Pd.05=1：Select Standard Modbus protocol.

Pd.05=0：Reading command, the slave returns the number of bytes which has one more byte than the standard Modbus protocol, for specific please refer to the protocol, the part of the "5 communication data structure”.

Pd.06	Communication read the current resolution	Factory default value	0
	Setup range	0：0.01A 1：0.1A	

To determine when the communication reads the output current, what the output current value unit is.

Appendix II Parameter Settings List

Parameters factory default values are shown as below:

Code	Description/Display	Factory setting	Set value 1	Set value 2	Page
U0	**Monitor function group: U0.00-U0.61**				**40**
U0.00	Running frequency	0.01Hz			40
U0.01	Set frequency	0.01Hz			40
U0.02	DC bus voltage	0.1V			40
U0.03	The output voltage	1V			40
U0.04	Motor output current	0.01A			40
U0.05	The output power	0.1kW			41
U0.06	Output torque	0.1%			41
U0.07	DI input status	1			41
U0.08	Y output status	1			41
U0.09	AI1 voltage	0.01V			41
U0.10	AI2 voltage	0.01V			41
U0.11	AI3 voltage	0.01V			41
U0.12	Count value	1			42
U0.13	Length value	1			42
U0.14	Load speed display	1			42
U0.15	PID set point	1			42
U0.16	PID feedback	1			42
U0.17	PLC stage	1			42
U0.18	PULSE pulse input frequency	0.01kHz			42
U0.19	Speed feedback	0.1Hz			42

U0.20	Surplus running time	0.1Min			42
U0.21	AI1 voltage before correction	0.001V			42
U0.22	AI2 voltage before correction	0.001V			42
U0.23	AI3 voltage before correction	0.001V			42
U0.24	Linear velocity	1m/Min			42
U0.25	Current power on time	1Min			42
U0.26	Current running time	0.1Min			42
U0.27	PULSE pulse input frequency	1Hz			42
U0.28	Communication set value	0.01%			42
U0.29	Encoder feedback speed	0.01Hz			43
U0.30	Main frequency X display	0.01Hz			43
U0.31	Auxiliary frequency Y display	0.01Hz			43
U0.32	View arbitrary memory address	1			43
U0.33	Synchronous motor rotor position	0.0°			43
U0.34	Motor temperature	1℃			43
U0.35	Target torque	0.1%			43
U0.36	Rotary variable position	1			43
U0.37	Power factor angle	0.1			43
U0.38	ABZ position	0.0			43
U0.39	VF target voltage separation	1V			43
U0.40	VF output voltage separation	1V			43
U0.41	DI input status intuitive display	-			43
U0.42	DO output status intuitive display	-			44
U0.43	DI function status intuitive display1	1			44
U0.44	DI function status intuitive display2	1			44

U0.45	Fault information	0			44
U0.46	Reserved	-			44
U0.47	Reserved	-			44
U0.48	Reserved	-			44
U0.58	Z signal counter	-			44
U0.59	Set frequency	0.01%			44
U0.60	Running frequency	0.01%			44
U0.61	Inverter status	1			44
U0.62	Current fault code	1			44
U0.63	Point to point communication	0.01%			44
U0.64	number of Slave	1			44
U0.65	Torque limit	0.01%			44
P0	**Basic function group：P0.00-P0.28**				45
P0.00	GP type display	-			45
P0.01	Motor 1 control mode	0			45
P0.02	Command source selection	0			45
P0.03	Main frequency source X selection	4			46
P0.04	Auxiliary frequency source Y selection	0			47
P0.05	Auxiliary frequency source Y range selection	0			48
P0.06	Auxiliary frequency source Y range	100%			48
P0.07	Frequency source stacking selection	00			48
P0.08	Preset frequency	50.00Hz			49
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A7.06	Programmable card frequency setup	0.0%			135
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A8.05	Receive data gain torque	1.00			
A8.06	Communication interrupt detection time	1.0s			
A8.07	Communication Master data transmission cycle	0.001s			
A8.08	Receive data zero offset frequency	0.00%			
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Appendix III Recommended accessories selection

1.Brake unit braking resistor selection：

Motor adapter	Brake unit model	Number of brake units	Resistance configuration	Resistance quantity	brake torque(10%ED)%
0.40	inverter inlay		70W 750Ω	1	230
0.75	inverter inlay		100W 300Ω	1	130
1.5	inverter inlay		200W 300Ω	1	125
2.2	inverter inlay		200W 200Ω	1	135
3.7	inverter inlay		400W 150Ω	1	135
5.5	inverter inlay		500W 100Ω	1	135
7.5	inverter inlay		800W 75Ω	1	130
11	inverter inlay		1000W 60Ω	1	135
15	inverter inlay		1560W 45Ω	1	125
18.5	inverter inlay		4800W 32Ω	1	125
22	inverter inlay		4800W 27.2Ω	1	125
30	DBU-4030	1	6000W 20Ω	1	125
37	DBU-4045	1	9600W 16Ω	1	125
45	DBU -4045	1	9600W 13.6Ω	1	125
55	DBU -4030	2	6000W 20Ω	2	135
75	DBU -4045	2	9600W 13.6Ω	2	145
110	DBU -4030	3	9600W 20Ω	3	100
160	DBU -4220	1	40KW 3.4Ω	1	140
220	DBU -4220	1	60KW 3.2Ω	1	110
300	DBU -4220	2	40KW4.5Ω	2	110

600	DBU -4220	4	40KW 4.5Ω	4	110

2. Input AC reactor

Motor power	Input reactor model	Shape dimension W*D*H （mm）	Installation dimension （mm）	Note
0.75	HSG10A/5V-4007	140*85*140	75*55Φ6	
1.5	HSG10A/5V-4015	140*85*140	75*55Φ6	
2.5	HSG10A/5V-4022	140*85*140	75*55Φ6	
4	HSG15A/5V-4037	140*85*140	75*55Φ6	
5.5	HSG15A/5V-4055	140*85*140	75*55Φ6	
7.5	HSG20A/5V-4075	175*130*140	82*75Φ6	
11	HSG30A/5V-4110	175*130*140	82*75Φ6	
15	HSG40A/5V-4150	210*120*190	110*70Φ8	
18	HSG50A/5V-4180	210*120*190	110*70Φ8	
22	HSG60A/5V-4220	210*165*170	110*85Φ8	
30	HSG80A/5V-4300	210*165*170	110*85Φ8	
37	HSG110A/5V-4370	210*165*170	110*85Φ8	
45	HSG125A/5V-4450	210*165*170	110*85Φ8	
55	HSG150A/5V-4550	270*170*220	155*85Φ10	
75	HSG200A/5V-4750	290*190**255	170*85Φ10	
93	HSG250A/5V-4930	290*190*230	170*105Φ10	
110	HSG275A/5V-41100	290*190*230	170*105Φ10	
132	HSG330A/5V-41320	320*240*230	193*130Φ10	
160	HSG450A/5V-41600	330*210*290	193*130Φ10	

185	HSG500A/5V-41850	330*210*290	193*130Φ10	
200	HSG510A/5V-42000	330*210*290	193*130Φ10	
220	HSG540A/5V-42200	330*210*290	193*130Φ10	
250	HSG625A/5V-42500	330*220*290	193*140Φ10	
315	HSG800A/5V-43150	330*240*290	193*150Φ10	
375	HSG1000A/5V-43750	350*280*290	193*150Φ10	
400	HSG1100A/5V-44000	350*280*290	193*150Φ10	

3. Output AC reactor

Motor power KW	Output reactor model	Shape dimension W*D*H （mm）	Installation dimension （mm）	Note
0.75	HSG10A/9V-4007	140*85*140	75*55Φ6	
1.5	HSG10A/9V-4015	140*85*140	75*55Φ6	
2.5	HSG10A/9V-4022	140*85*140	75*55Φ6	
4	HSG15A/9V-4037	140*85*140	75*55Φ6	
5.5	HSG15A/9V-4055	140*85*140	75*55Φ6	
7.5	HSG20A/9V-4075	140*85*140	75*55Φ6	
11	HSG30A/9V-4110	210*165*170	110*85Φ8	
15	HSG40A/9V-4150	210*165*170	110*85Φ8	
18	HSG50A/9V-4180	210*165*170	110*85Φ8	
22	HSG60A/9V-4220	210*165*170	110*85Φ8	
30	HSG80A/9V-4300	270*190*230	155*100Φ10	
37	HSG110A/9V-4370	270*190*230	155*100Φ10	
45	HSG125A/9V-4450	270*190*230	155*100Φ10	
55	HSG150A/9V-4550	290*200*230	170*115Φ10	
75	HSG200A/9V-4750	300*230*230	173*135Φ10	

93	HSG250A/9V-4930	330*230*230	190*130Φ10	
110	HSG275A/9V-41100	330*230*230	190*130Φ10	
132	HSG330A/9V-41320	340*230*230	212*130Φ10	
160	HSG450A/9V-41600	330*220*290	193*140Φ10	
185	HSG500A/9V-41850	330*220*290	193*140Φ10	
200	HSG510A/9V-42000	330*220*290	193*140Φ10	
220	HSG540A/9V-42200	330*220*290	193*140Φ10	
250	HSG625A/9V-42500	350*280*290	193*150Φ10	
315	HSG800A/9V-43150	350*280*290	193*150Φ10	
375	HSG1000A/9V-43750	400*300*350	240*200Φ10	
400	HSG1100A/9V-44000	400*300*350	240*200Φ10	

Warranty Agreement

1. The warranty period of the product is 18 months (refer to the barcode on the equipment). During the warranty period, if the product fails or is damaged under the condition of normal use by following the instructions, PENTAX Electric will be responsible for free maintenance.

2. Within the warranty period, maintenance will be charged for the damages caused by the following reasons:

a. Improper use or repair/modification without prior permission

b. Fire, flood, abnormal voltage, other disasters and secondary disaster

c. Hardware damage caused by dropping or transportation after procurement

d. Improper operation

e. Trouble out of the equipment (for example, external device)

3. If there is any failure or damage to the product, please correctly fill out the Product Warranty Card in detail.

4. The maintenance fee is charged according to the latest Maintenance Price List of PENTAX Electric.

5. The Product Warranty Card is not re-issued. Please keep the card and present it to the

maintenance personnel when asking for maintenance.

6. If there is any problem during the service, contact PENTAX Electric's agent or PENTAX Electric directly.

7. This agreement shall be interpreted by PENTAX Electric Limited.