To the user

——Notices of Onsite Installation and Operation

Respectful User:

Thanks for your selection of CDI inverter manufactured by Delixi Hangzhou Inverter Co., Ltd. In order that you can better use the product, please pay attention to the following:

1.After installed and commissioned, fasten the components, especially connecting bolt of the line, which shall cause fire accident due to heat at the connection if not fastened.

2.Design of installation on the site should be reasonable to maintain excellent ventilation.

3.In and out lines of the inverter should not be connected reversely. Otherwise, it shall lead to inverter explosion.

4.Starting and stopping the motor directly by power-on and power-off the main circuit of the inverter shall cause frequent jumping faults to the inverter.

5.When selecting inverter type, configure the inverter as per actual load power (load working current). When there is heavy load, type selection can be magnified by 1 to 2 shifts. Smaller type shall cause overcurrent or overload jumping faults to the inverter.

6.Protection level of the inverter is IP20, that is, it can prevent a foreign matter with a diameter of 12.5mm or greater from completely entering, without waterproof function.

7.Inverter if stored for more than half a year should be powered with a voltage regulator to increase voltage gradually. Otherwise, there is danger of electric shock and explosion.

8.If line connecting the inverter to the motor exceeds 50m, it is required to add AC output inductor. Otherwise, the inverter and the motor are in danger of damage.

In order that you can use the product safely for a long time, you need to carefully inspect the product, regularly power off it to clean and maintain. For any trouble in process of inspection, please notify us by phone or mail. Our service hotline is 0571-85243785. We shall send professional to your site as per your trouble to assist you in solving the trouble and ensure the product is operated safely and reliably.

Common connection diagrams:

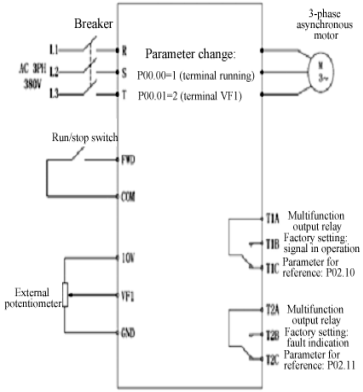

Figure 1: External stop/start, adjusting speed by external potentiometer

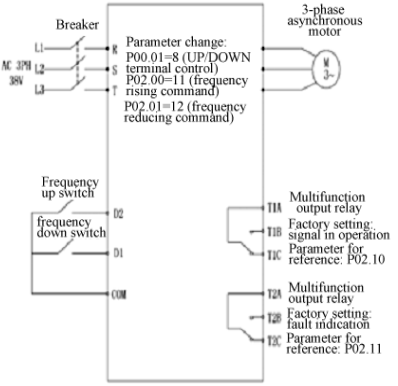

Figure 2: frequency control by up/down terminals

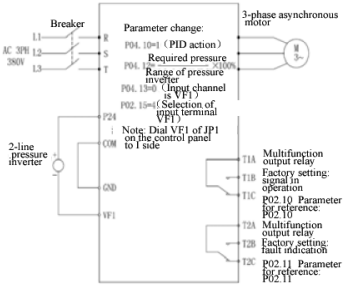

Figure 3: PID control for water supply at permanent pressure (pressure transmitter)

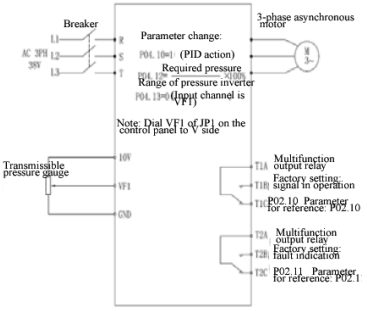

Figure 4: PID control for water supply at permanent pressure (transmissible pressure gauge)

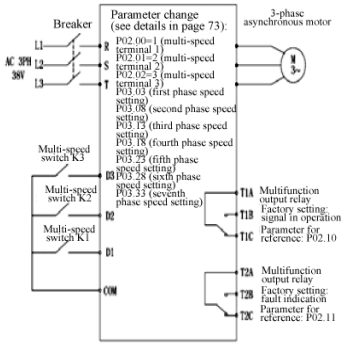

Figure 5: Inverter Multi-speed Control

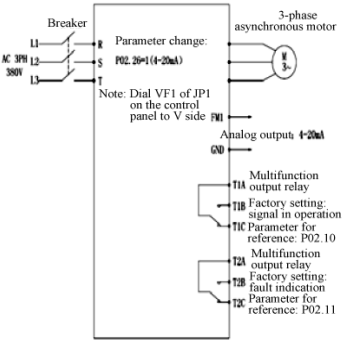

Figure 6: Inverter output at 4-20mA

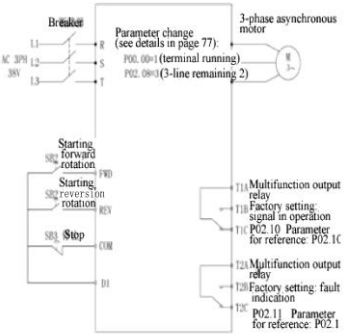

Figure 7: 3-line maintaining control mode

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Foreword

Thank you for choosing CDI9200 Series Frequency Conversion Governor manufactured by DELIXI (Hangzhou) Inverter Co.,Ltd.

Before using it, please read this manual carefully so as to guarantee correct operation. Erroneous operation might result in malfunction, faults or shortened life span of the equipment, or even personal injury. Therefore, users are advised to read carefully this manual and abide by it during operation. The manual is a standard attached document. Please keep it for maintenance and repair in the future.

Aside from operation instructions, this manual also presents some wiring diagrams for your reference. If you have any difficulty or special demands for using the inverter, please contact our offices or distributors. You may also contact the customer service centre of our head office for our quality service. The manual noted that its content might change without further notice.

Please confirm following content during unpackaging:

1. If the product is damaged during process of transportation, if parts are damaged and dropped, or if main body is bruised.
2. If rated value marked on nameplate is consistent with your order requirement, or if there are ordered unit, acceptance certificate, operation manual and guarantee shed in package.

The Company strictly complies with quality system during production and packaging, for any inspection miss, please contact our Company or supplier for settlement.

Warning

Chapter 1 Safety Operation and Notices

Please read the manual carefully before install, operate, maintain or check CDI9200 series converter.

To protect yourself, the equipment, and the property from any possible harm, please do read this chapter before using our CDI9200 Series Inverters. Precautions relevant to operation safety are categorized as "warning " and "attention".

Warning

: Potentially dangerous condition, which maybe cause severe body injuries or dead if relevant requirement is ignored.

Attention

: Potentially dangerous condition, which maybe cause middle, light injuries or device damage if relevant requirement is ignored, it also applies to unsafe operation.

1.1 Examination and Acceptance

Items to be examined are as follows:

Items	Note
1. Does the model conform to your order?	Check the Model indicated on the nameplate on one side of the inverter.
2. Is there any damage to the components?	Survey the external appearance of the inverter and make sure that no damage has occurred during transportation
3. Are the components properly fastened?	Remove the front cover and examine all visible components with appropriate tools.
4. Do you have the user's manual, the quality certificate and the warranty claims form?	Check for the user's manual, the quality certificate and the warranty claims form

If any of the above items is problematic, please contact us or our distributors.

1.2 Precautions for safe operation:

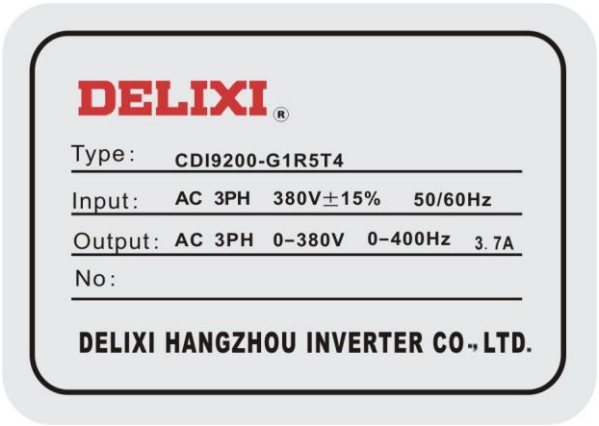
 Warning	1. Installation and maintenance should be performed by professional only.
	2. Vertify that rated voltage of the inverter should conform with voltage level of AC power supply. Otherwise it shall cause hurt to human body or fire accident.
	3. Do not make supply power of AC loop connect with outputting terminal U, V and W. The connection will damage converser, thus guarantee card sho8uld be nonserviceable.
	4. Only connect it to input power supply after the panel is well installed. Do not remove the external lid when it is powered; otherwise it may cause electric shock.
	5. Forbid touching high voltage terminal inside the inverter when it is powered on; otherwise, there is danger of electric shock.
	6. Because there is an amount of capacitance stored electric energy inside the inverter, maintenance should be implemented at least 10 minutes after the power is off. At this time, charging indicator should be off thoroughly or positive or negative bus voltage is confirmed to be below 36V; otherwise there is danger of electric shock.
	7. Do not turn on or off line and connector when the circuit is powered on; otherwise it can cause hurt to human body.
	8. Electric elements can be easily damaged by static electricity. Do not touch electric elements.
 Electro Static Discharge (ESD)	9. This inverter should not undergo voltage withstand test, which might result in damages to the semiconductor devices in it.
	10. Before switching on the power supply, please put the cover board in position. Otherwise, electric shock or explosion might occur.
	11. Never confuse the input terminals. Otherwise, explosion or damage to the property might occur.
	12. For converter of which storage period exceeds half year, please increase the input voltage gradually by using regulator, to prevent from electric shock and explosion.
	13. Do not operate the inverter with wet hand; otherwise, there is danger of electric shock.
	14. All parts should be replaced by professional only. It is strictly prohibitive to remain stub or metal object in machine, to prevent from fire.
	15. After replaced control board, please perform relevant parameter setting before operation to prevent from damage of materials.

 Attention	1. If the motor is used for the first time or has been in leisure for a long time, remember to check its insulation first. It is advisable to use a 500V megger. Make sure the insulation resistance should not be less than 5MΩ.
	2. If you need to operate the inverter at frequencies beyond 50Hz, please consider the support capability of the mechanical devices.
	3. The output at certain frequencies might encounter the resonance points of load devices. This can be avoided by resetting the jump frequency parameter of the inverter.
	4. Do not use three-phase inverters as two-phase ones. Otherwise, fault or damage might occur.
	5. In regions at an altitude of more than 1000 meters, the heat dissipation capability of the inverter might be compromised because of the thin air. Therefore, de-rated operation will be necessary. In such cases, please contact us for technical advice.
	6. The standard matched motor is a four-pole squirrel-cage asynchronous machine. In case of discrepancy, please choose appropriate inverters in accordance with the rated current of the motor.
	7. Do not start or stop the inverter with contactors. Otherwise, damage might occur to the equipment.
	8. Do not modify factory parameter of converter without authorization, or damage might be caused.

Chapter 2 Product Information

2.1 Nameplate data and naming rule

Nameplate data: for example CDI9200- G1R5T4:



Nameplate data **Type description**

CDI 9200 G 1R5 T4

Delixi converter

Design number

Series number
G: General type **P**: Pump type
ZS: Injection Moulding type
GS: Isobaric water supply system
GY: Intelligent machine

Power of equipped electromotor (KW)
1R5 = 1.5KW
015 = 15KW

Voltage class
(rated voltage):
T2=220V
T4=380V
T6=660V

2.2 Technical Specifications

Control	Control mode		Control of space voltage vector
	Frequency Resolution		Digital: 0.01Hz(below 100Hz), 0.1 Hz(above 100Hz) Analog: 0.05Hz/50Hz, output frequency range: 0~400Hz
	Frequency accuracy		Digital: 0.01% of the maximum output frequency Analog: 0.1% of the maximum output frequency
	V/F curve		Linear, square root, random V/F
	Overload Capability		1 minute for 150% of the rated current; 0.5 seconds for 200% of the rated current(characteristics are inversely proportional to time)
	Torque ompensation		Manual torque compensation(0~30%), automatic torque compensation
Operation	Input signal	Operating mode	Keyboard/terminal/RS485 communication
		Frequency setting	Analog: 0 - 10V/0~5V，2~10V/-10V~+10V，4 - 20 mA /0-20 mA Digital: keyboard/RS485 communication
		Starting signal	Corotation, reversion
		Multiple stage speed	Up to eight speed is allowable (by using multiple function terminal)
		Acceleration and deceleration time	0-6000 second, acceleration and deceleration time is switchable Acceleration and deceleration mode: linear, S-type
		Emergency stop	Interrupt output of converter.
		Inching motion	Idle operation
		Automatic operation	Operate automatically according to parameter set (7 stage speed)
		Fault reset	Reset fault state automatically if protective function is effective
	Output signal	Running state	Frequency inspection class, overload alarm, over voltage, under voltage, overheat, running, stop, constant speed, automatic program running
		Fault output	Contact output －AC 250V 1A, DC 30V 1A
		Analog output	Choose from output frequency, output current, and output voltage VF1、VF2、｜VF1- VF2｜(output voltage: 0 - 10V，0~20mA，4~20mA)
	Running function		DC brake, frequency restriction, frequency jump, slip compensation, protection against backward rotation, PID Control and so on
Protective function	Converter protection		Over current at constant speed, or during acceleration or deceleration; over voltage at constant speed, or during acceleration or deceleration; protection against module fault; under voltage; overheat; overload; protection against exterior faults; protection against EEPROM fault
	Converter alarm		Locked protection, overload alarm, temperature sensor fault.
	Instantaneous powerdown		Lower than 15 msec: Continuous operation Bigger than 15 msec: Automatic restart is allowable
Display	Key board	Running informatin	Set frequency, output current, output voltage, bus voltage, input signal, feedback value, module temperature, output frequency, synchronous speed of the motor and so on（Can be set up P05.00-P05.24）
		Error informatin	Running state of fault protection, four fault information are saved.
Environment	Ambient temperature		-10 ℃ ～ 40 ℃
	Storage temperature		-20 ℃ ～ 65 ℃
	Ambient humidity		90 % RH in max .(no dewing)
	Height/vibration		Below 1,000 m, below 5.9m/sec ₹=0.6g)
	Application position		No corrosive gas, inflammable gas, oil mist, dust and others
Cooling mode			Air-blast cooling

2.3 CDI9200 Inverters

400V voltage level

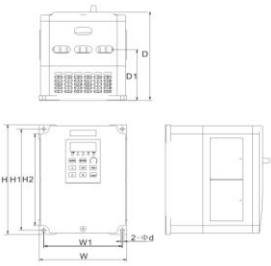
Inverter type (**G**: load with permanent torque P: fan motor and pump load)	Rated capacity （**KVA**）	Rated input current （**A**）	Rated output current（**A**）	Matchable Motor（**kW**）
CDI9200-G0R75T4	1.5	3.4	2.3	0.75
CDI9200-G1R5T4	3.0	5.0	3.7	1.5
CDI9200-G2R2T4	4.0	5.8	5.0	2.2
CDI9200-G3R7T4/P5R5T4	5.9/8.5	10.5/15.5	8.8/13	3.7/5.5
CDI9200-P3R7T4	5.9	10.5	8.8	3.7
CDI9200-G5R5T4/P7R5T4	8.5/11	15.5/20.5	13/17	5.5/7.5
CDI9200-G7R5T4/P011T4	11/17	20.5/26	17/25	7.5/11
CDI9200-G011T4/P015T4	17/21	26/35	25/32	11/15
CDI9200-G015T4/P018.5T4	21/24	35/38.5	32/37	15/18.5
CDI9200-G018.5T4/P022T4	24/30	38.5/46.5	37/45	18.5/22
CDI9200-G022T4/P030T4	30/40	46.5/62	45/60	22/30
CDI9200-G030T4/P037T4	40/50	62/76	60/75	30/37
CDI9200-G037T4/P045T4	50/60	76/92	75/90	37/45
CDI9200-G045T4/P055T4	60/72	92/113	90/110	45/55
CDI9200-G055T4	72	113	110	55
CDI9200-P075T4	100	157	152	75
CDI9200-G075T4/P093T4	100/116	157/180	152/176	75/93
CDI9200-G093T4/P110T4	116/138	180/214	176/210	93/110
CDI9200-G110T4/P132T4	138/167	214/256	210/253	110/132
CDI9200-G132T4/P160T4	167/200	256/305	253/300	132/160
CDI9200-G160T4/P185T4	200/224	305/344	300/340	160/185
CDI9200-G185T4/P200T4	224/250	344/383	340/380	182/200
CDI9200-C200T4/P220T4	250/276	383/425	380/420	300/220
CDI9200-G220T4	276	425	420	220
CDI9200-P250T4	316	484	480	250
CDI9200-G250T4/P280T4	316/355	484/543	480/540	250/280
CDI9200-G280T4/P315T4	355/395	543/605	540/600	280/315
CDI9200-G315T4/P355T4	395/467	605/714	600/680	315/355
CDI9200-G355T4/P375T4	447/467	683/714	680/710	355/375
CDI9200-G375T4	467	714	710	375
CDI9200-P400T4	494	753	750	400
CDI9200-G400T4	494	753	750	400
CDI9200-P500T4	612	934	930	500
CDI9200-G500T4	612	934	930	500

Order explanation:

During order, please enter type, specification of the product, and provide parameter, load type, or other information relating to the motor as much as possible. For any special requirement, please consult with technology department of the Company.

2.4 Appearance and installation size

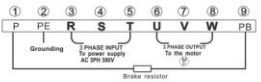
Type 1



Type	W	W1	H	H1	H2	D	D1	Φd
CDI9200-G0R7S7-4								
CDI9200-G1R5T4	134	120	184	170	154	148	85	5
CDI9200-G2R2T4								

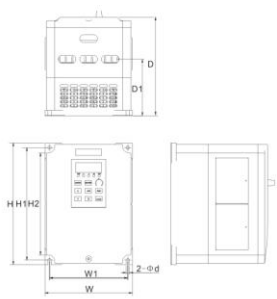
Dimension unit:Millmeter

COnnection of main circuit:



Note:
1. Machine type 1 has a built-in brake unit.
2. Machine type 1 adopts plastic housing.
3. Order to arrange the terminals are based on the real products.

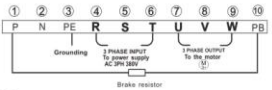
Type 2



Type	W	W1	H	H1	H2	D	D1	Φd
CDI9200-G3R7T4-P5R5T4	159	145	229	215	199	160	95	5
CDI9200-P3R7T4								

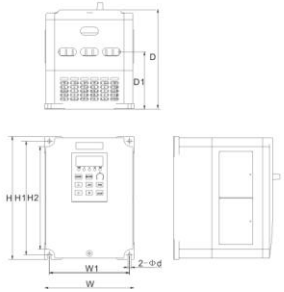
Dimension unit:Millmeter

COnnection of main circuit:



Note:
1. Machine type 2 has a built-in brake unit.
2. Machine type 2 adopts plastic housing.
3. Order to arrange the terminals are based on the real products.

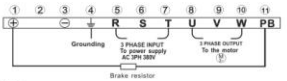
Type 3



Type	W	W1	H	H1	H2	D	D1	Φd
CDI9200-G5R5T4-P7R5T4	204	188	304	288	270	194	142	5
CDI9200-G7R5T4-P011T4								

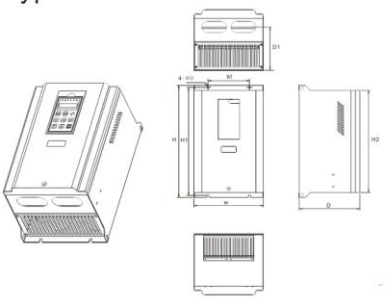
Dimension unit:Millmeter

COnnection of main circuit:



Note:
1. Order to arrange the terminals are based on the real products.

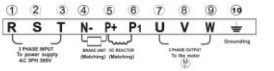
Type 4



Type	W	W1	H	H1	H2	D	D1	Φd
CDI9200-G011T4/P015T4	235	140	380	365	346	205	146	7
CDI9200-G015T4/P018T4								

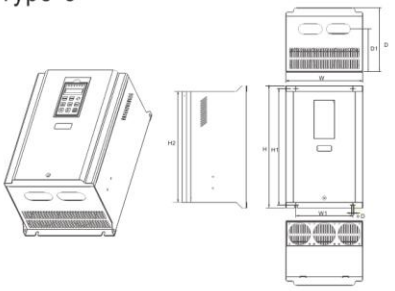
Dimension unit:Millmeter

COnnection of main circuit:



Note:
1. Order to arrange the terminals are based on the real products.

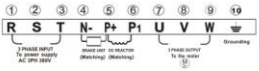
Type 5



Type	W	W1	H	H1	H2	D	D1	Φd
CDI9200-G018T4/P022T4	270	200	430	410	390	225	152	8
CDI9200-G022T4/P030T4								

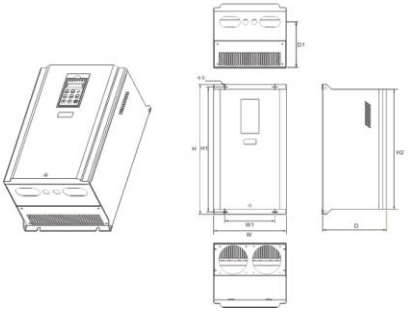
Dimension unit:Millmeter

COnnection of main circuit:



Note:
1. Order to arrange the terminals are based on the real products.

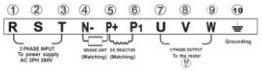
Type 6



Type	W	W1	H	H1	H2	D	D1	Φd
CDI9200-G030T4/P037T4	290	200	520	500	480	255	182	10
CDI9200-G037T4/P045T4								

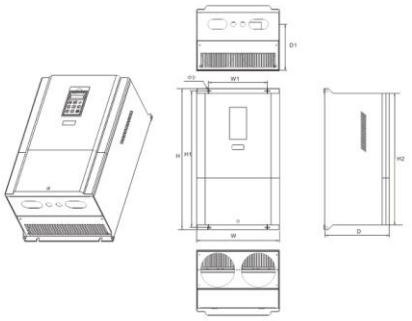
Dimension unit:Millmeter

COnnection of main circuit:



Note:
1. Order to arrange the terminals are based on the real products.

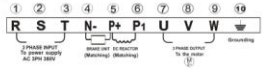
Type 7



Type	W	W1	H	H1	H2	D	D1	⌀d
CDI9200-G045T4/P055T4	352	250	600	580	560	273	195	10
CDI9200-G055T4								

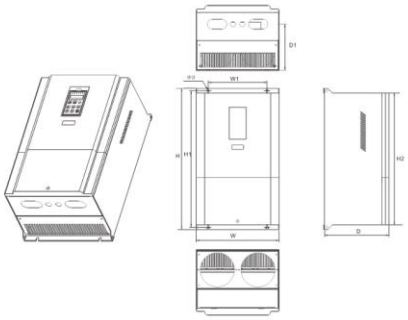
Dimension unit:Millmeter

Cönnection of main circuit:



Note:
1. Order to arrange the terminals are based on the real products.

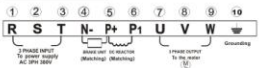
Type 8



Type	W	W1	H	H1	H2	D	D1	⌀d
CDI9200-P075T4	400	300	700	670	640	307	220	12
CDI9200-G075T4/P093T4								

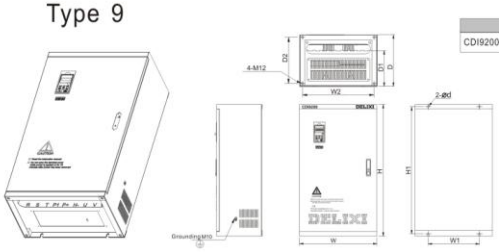
Dimension unit:Millmeter

Cönnection of main circuit:



Note:
1. Order to arrange the terminals are based on the real products.

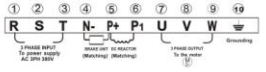
Type 9



Type	W	W1	W2	H	H1	D	D1	D2	⌀d
CDI9200-G093T4/P110T4	470	300	435	750	720	320	217	290	12

Dimension unit: Millmeter

Cönnection of main circuit:



Note:
1. Order to arrange the terminals are based on the real products.

2.5 Routine maintenance

(1) Routine maintenance

Under influence of temperature, humidity, dust and vibration, internal elements of converter should be aged, which should cause potential fault, or decrease service life of converter. Therefore, it is significant to perform routine maintenance and regular inspection with the converter.

Routine maintenance item:

A If running sound of motor is abnormal.

B If vibration is created during operation of motor.

C If installing condition of converter is changed.

D If radiating fan of converter works normally.

E If converter is in state of overheat.

Daily cleanness:

A Keep cleanness of converter.

B Remove dust from surface of converter effectively, to prevent converter from incursion of dust, or metal dust.

C Remove oil sludge form radiating fan of converter effectively.

(2) Regular inspection

Please inspect corner pockets of converter regularly.

Regular inspection item:

A Inspect air flue, and clean it regularly.

B Inspect if screw is loosened.

C Inspect if converter is corrosive.

D Inspect if there is arc on surface connecting terminal.

E Insulated test of major loop

Note: Please disconnect major loop and converter while testing insulation resistance by using megohmmeter (500V DC megohmmeter). Do not measure insulation of control loop with megohmmeter. And high voltage test is needless (finished in ex works).

(3) Replacement of wearing parts

Wearing parts of converter includes cooling fan, filter ELCC, of which service life depend on operating environment and maintenance condition closely.

User could confirm replacement period according to the operating time.

A Cooling fan

Potential damage reason: Shaft abrasion and vane aging.

Critical standard: If there is crack on vane of fan, or if abnormal sound occurs during starting.

B Filter ELCC

Potential damage reason: Bad input power, higher ambient temperature, frequent load switch, or aging of electrolyte.

Critical standard: If liquid leaks, if safety valve bulged out, measure of static capacitance, and measure of insulated resistance.

(4) Storage of converter

After purchased the device, please pay attention to following points while storing it:

A Please store it in original package as much as possible.

B Long term storage should cause aging of ELCC, please electrify it for 5 hours above twice a year during storing, in mode of raising voltage to rated voltage slowly via transformer.

(5) Guarantee of converter

Maintenance free is limited to the converter only.

For fault or damage occurs during normal application of device sold in home (Bar code date):

A And perform guaranteed repair in 18 months after delivery.

For exported device (not included China), the Company should provide guaranteed repair in six months after delivery at purchase site.

For products manufactured by the Company, we will provide paid service for life anytime, or anywhere applied it.

All sale, product, and agent units of the Company should provide products with after sale service, of which service terms include:

A Provide "Class Ⅲ" inspection service at site of the unit. (Include fault elimination)

B Refer to after sell service contract concluded between the Company and agents.

C Request for compensated after-sell service from agent of the Company (without reference to guaranteed repair).

Our Company should take responsibility of guaranteed repair, guaranteed exchange, and guaranteed return for quality and accident responsibility relating to the product, but user could affect insurance for further responsibility compensation guarantee from insurance agent.

Guarantee term of the product should be effective in 18 months after Bar code date.

For fault caused in following reason, user could obtain compensated maintenance only even guarantee term is effective:

A Problem caused in incorrect operation (based on user's manual) or repair, modification without authorization.

B Problem caused in violation of critical requirement.

C Damage caused in undeserved transportation after purchased.

D Aging or fault caused in bad environment.

E Damage caused in earthquake, fire, disaster, lightning strike, abnormal voltage or other natural disaster and incidental disaster.

F Damage occurs in transportation. (Note: transportation mode should be appointed by user of themselves, the Company should assist agent to conduct transfer of goods).

G Brand, trade mark, SN, nameplate marked by manufacturer is damaged or unjustifiable.

H Failure to pay off fund according to purchase contract.

I Failure to describe actual conditions relating to installation, distribution, operation, maintenance, or other condition to the Company.

The Company should carry out responsibility of "Three guarantee" abovementioned only after received the returned goods, and confirmed responsibility attribution.

Should it involve an unpaid or untimely settlement due to the buyer, the ownership hereof still belongs to the supplier. In addition, the latter will assume no liability hereinabove, and the buyer shall have no disagreement.

All relevant service fees shall be calculated in accordance with the identical standards of the factory. In the event that an agreement or a contract exist, its priority shall be performed.

Chapter 3 Installation and cConnection of Inverter

3.1 Installation of front cover and number keyboard

3.1.1 Installation of front cover

 Warning	1.Raise unit body by propping the seat; do not hold front cover and raise the unit while moving it. Otherwise main body maybe fall down and cause body injure.
	2.Please install converter onto nonflammable materials (for example: Metal). Violation of the rule maybe causes fire.
	3.Please install a fan or other cooling device if installed device in a cabinet, of which inlet temperature should be lower than 40℃. Overheat maybe causes fire or damages the device.

This Section describes the necessary construction, setting condition, and space required by installation of CDI9200 series converter.

It is needless to take down front cover and manipulater for general installation. Please disassemble manipulater carefully because it connects with internal circuit via cables. Pull out cable before assemble manipulater and panel, or plug should be damaged.

3.1.2 Installation of number keyboard

1. 0.37～7.5KW, take down and re-install digital operating keyboard as per the following method:

A Take down digital operating keyboard:

Take down front lid and take out the digital operating keyboard from the clapboard.

B: Re-install the digital operating keyboard:

Press the digital operating keyboard into the clapboard keyboard framework and cover with the front lid.

2. 11～500KW, take down and re-install digital operating keyboard as per the following method:

A Take down digital operating keyboard:

Press lock clasp of number keyboard and take out it from front cover.

B Re-install the digital operating keyboard:

Press number keyboard into keyboard frame of panel, the lock clasp should lock number keyboard automatically.

3.2 Selection of the Site and Space for Installation

Selection of installing position:

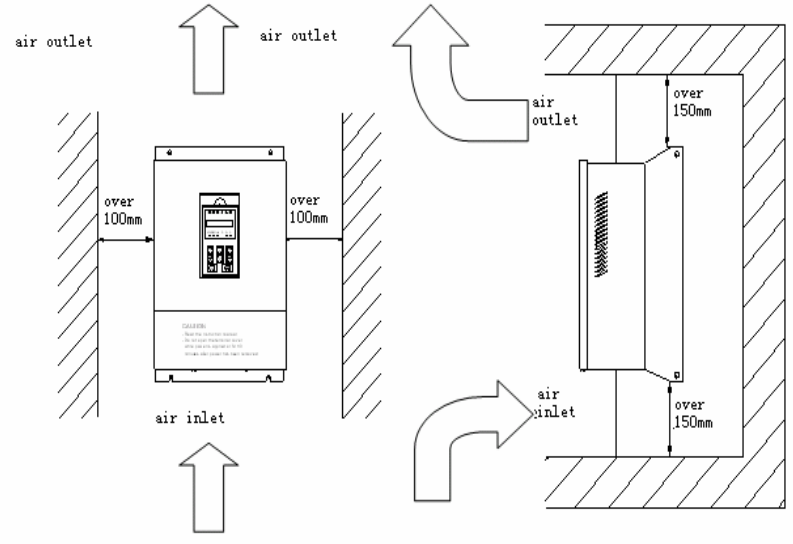
 Warning	**1**. Prevent from sunniness; Don't use in the open air directly.
	2. Don't use in the corrosive gas and liquid environment.
	3. Don't use in the oil fog and splash environment.
	4. Don't use in the salt spray environment.
	5. Don't use in the moist and rain environment.
	6. Please equip the unit with filters device if metal dust or fiber wadding existing in air.
	7. Do not use the unit in mechanical shock or vibration condition.
	8. It is necessary to adopt cooling measure if ambient temperature is higher than 40℃.
	9. It is recommended to use the unit in temperature range of -10℃~+40℃ because fault maybe occur in overcool or overheat condition.
	10. Keep the unit away from power supply noise, high-power application, such as electric welder should impact application of the unit.
	11. Emissive material should impact application of the unit.
	12. Keep the unit away from combustible material, attenuant and solvent.

For ensuring perfect performance and long-term service life, please comply abovementioned advices while installing CDI9200 series converter to prevent the unit from damage.

Chapter 3 Installation and Connection of Inverter

Selection of the installation space:

for vertical installation of CDI9200 series inverters, adequate cooling room should be left, so as to ensure effective cooling

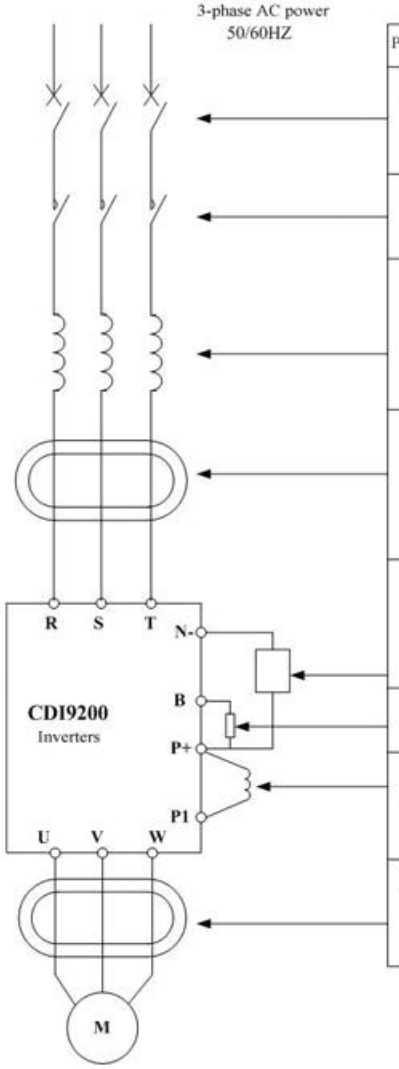


Installation space of CDI9200 inverters

Attention	**1**、The spaces to be left above/below and on the two sides of the inverter are required both for the model with open bracket (IP00) and that with closed bracket (IP20)
	2、Permissible temperature at the air inlet: -10℃ ~ +40℃
	3、Adequate cooling spaces should be reserved both above and below the inverter, so as to facilitate gas admission and emission.
	4、Do not drop anything into the air passage during installation. Otherwise the fan might be damaged.
	5、Mount filtering devices at the air inlet in cases of floating fiber or cotton or heavy dust.

3.3 Wiring of the Peripherals and Optional parts

The following is a standard method to connect CDI9200 peripheral equipment and optional components:



Perpherals and options	Instructions
※ Breaker without fuse MCCB	Used to quickly cut off fault current of the inverter and prevent the inverter and its line fault to cause power failure.
※ Electromagnetic contactor MC	Cut off main power when the inverter is at fault to prevent power down and restarting after the fault
※ AC reactor DCL	Used to improve input power factor, reduce upper harmonics and restrain power surge
※ Radio noise filter NF	Used to reduce radio disturbance produced by the inverter
※ Regeneration brake unit Ub	Selected when brake torque cannot meet the requirements, used for occasion with large inertia load and frequency brake or quick stop (machine type below 7.5KW has built-in brake unit)
Regeneration brake resistor Rb	
※ DC reactor DCL	Used to improve power factor and restrain current peak
※ Radio noise filter NF	Used to reduce radio disturbance produced by the inverter

Note: Those labeled with "※" are optional parts

Chapter 3 Installation and Connection of Inverter

3.4 Wiring of the main circuit

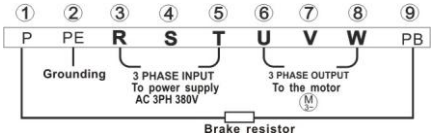
3.4.1 Wiring diagram for the main circuit and precautions

This section describes connection of main circuit of CDI9200 inverters.

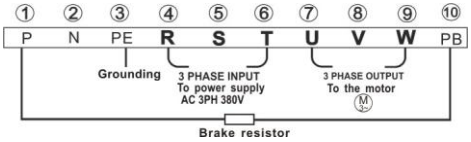
Dangerous	**1**. Do not make power supply of AC main loop connect with output terminal U, V, and W.
	2. Please connect unit only after shut down the power supply.
	3. Verify if the crating voltage of converter is same as the input voltage of it.
	4. Do not perform withstand test with converter.
	5. Fasten terminal screw with appointed fasten torque.

Attention	**1**. Please check if grounding terminal is grounded before connect main loop. (Refer to 3.6)
	2. Terminal sequence should base on actual object.
	3. Rated input voltage: 220V (AC single phase)/380V (three-phase), frequency: 50/60Hz
	4. Allowable fluctuation voltage: +10%~－15% (fluctuation ±20%) Frequency: ±2%

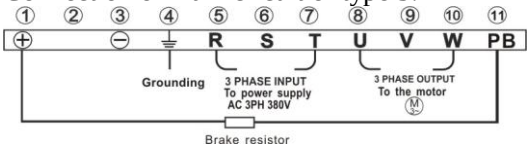
Connection of main circuit of type 1:



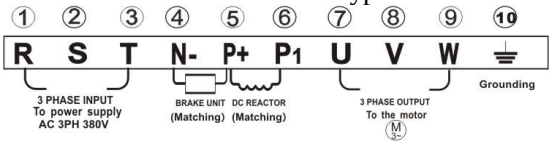
Connection of main circuit of type 2:



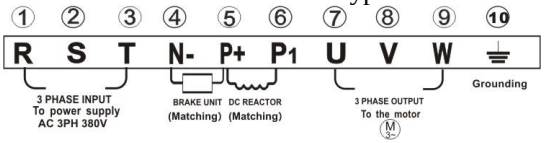
Connection of main circuit of type 3:



Connection of main circuit of type 4-7:



Connection of main circuit of type 8-9:



3.4.2 Precautions for wiring the input side of the main circuit

1、Installation of the Circuit Breaker (MCCB)

To protect the circuit, a MCCB or fuse should be installed between the power supply of the main circuit and the input terminals of R, S, or T of CDI9200 series.

2、Residual current circuit breaker

When selecting residual current circuit breakers for connection to input terminals of R, S, or T, the one that is not affected by high frequency is preferred, in order to avoid any possible misoperation. For example: NV series (manufactured in 1988 or later on) by Mitsubishi Electric; EG and SG series (manufactured in 1984 or later on) by Fuji Electric; or CDM1 Series Circuit Breakers made by DELIXI Group Co.,Ltd.

3、Installation of the electromagnetic contactor (MC)

The inverter may be used even if no electromagnetic contactor is installed on the power supply side.

Electromagnetic contactor can take the place of MCCB for the sequence break of the main circuit. However, when the primary side is switched off, the regeneration brake will not function and the motor will stop running.

When the primary side is closed/open, the electromagnetic contactor can cause loads to start/stop, but frequent close/open will lead to inverter fault. Therefore, while using the brake resistor unit, you can always realize sequential control through the trip contact of the overload relay when the electromagnetic contactor is switched off.

4、Phase sequence connection of the terminals

The phase lines of the input power supply can be connected to any one of the terminals R, S or T on the terminal board, regardless of phase sequences.

5、AC reactor

When an inverter is connected to a large-capacity power transformer (600KVA or beyond), or when a phase lead capacitor (power factor compensator) is connected or disconnected, the peak current through the input power circuit will be so strong that it will damage the rectifier-converter. Installing a DC reactor (optional) in the inverter or adding an AC reactor (optional) at the input end can effectively improve the power factors at the power supply side.

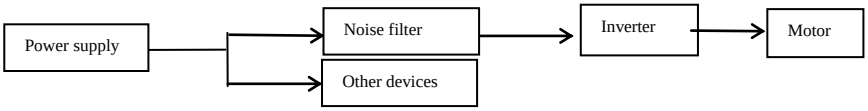
6、Surge absorber

If a perceptual load (such as electromagnetic contactor, relay, solenoid valve, electromagnetic coil, electromagnetic brake and so on) is connected in the adjacent area, a surge suppressor should also be used while operating the inverter.

7、Setting of a noise filter at the power supply side

Noise filter can be used to reduce the high-frequency noise flowing from the inverter to the power supply. Wiring example 1: please use noise filters exclusively designed for inverters.

It is set as follows:



3.4.3 Precautions for wiring the output side of the main circuit

1. Connection of the output terminals to the load

Connect the output terminals U, V and W respectively to the leading-out wires U, V and W of the motor. Use the forward rotation instruction for verification. (CCW: observed from the load side, the motor runs counterclockwise). If the motor is not running in the right direction, switch any two of terminals U, V and W.

2. It is absolutely forbidden to connect input power supply to terminals U, V or W!

3. Short circuit or grounding of the output circuit is forbidden. Refrain from directly touching the output circuit or bringing the output wire in contact with the chassis of the inverter. Otherwise, electric shock or grounding fault might occur. In addition, always guard the output wire against short circuit.

4. It is forbidden to connect phase-lead capacitors or LC/RC noise filters
Do not connect phase-lead capacitor or LC/RC noise filters to the output circuit.

5. Refrain from installing magnetic starter

If a magnetic starter or electromagnetic contactor is connected to the output circuit, the inverter will trigger the operation of over-current protection circuit because of the surge current resultant from the inverter's connection to the load. The magnetic contactor should not operate until the inverter has stopped outputting.

6. Installation of thermal overload relay

The inverter is equipped with an electronic overload protection mechanism. Admittedly, a thermal over-load relay should be installed when an inverter is used in driving several motors or when a multi-pole motor is used. In addition, the rated current of the thermal over-load relay should be the same as the current shown on the nameplate of the motor.

7. Setting of noise filter on the output side

Mounting a special-purpose noise filter on the output side of the inverter can reduce radio noise and interfering noise. Interfering noise: because of electromagnetic interference, the noise might affect the signal line and result in the misoperation of the controller. Radio noise: the noise can be produced from radio transmitters because of high-frequency waves emitted from the inverter or cables.

8. Countermeasures for interfering noise

Aside from using noise filters, threading all the connecting wires into a ground metal pipe can also restrain interfering noise generated at the output terminal. If we put signal lines over 30cm away, the effect of interfering noise will be abated.

9. Countermeasures for radio noise

Aside from input and output wires, the inverter itself also emits noise. It will help to handle the problem if we install noise filters at the input and output sides of the inverter or apply shielded lines to the iron case of the inverter. It is also very important to make sure that the connecting wire between the inverter and the motor should be as short as possible.

10. The wire distance between the inverter and the motor

If the total wire length between the inverter and the motor is too long or the carrier frequency of the inverter (primary IGBT switch frequency) is rather high, the harmonic leakage current from the cables will exert negative influence on the inverter and other external devices.

If connection line between the inverter and the motor is too long, carrier frequency of the inverter can be reduced as below. Carrier frequency is set up by constant **P04.01**.

Table of wire distance between the inverter and the motor

Wire distance between the inverter and the motor	Not exceeding 50m	Not exceeding 100m	Beyond 100m
Carrier frequency （Set value of parameter P04.01）	10KHz or lower	5KHz or lower	3KHz or lower

Note:

Output reactors should be installed when the wire distance exceeds 100 meters. Otherwise, the motor may get burnt down. External thermal relays may cause unnecessary operations due to the high frequency current from the distributed capacitance in the output lines of the inverter. As far as Low-capacity models of the 400V Series (especially those below 7.5KW) is concerned, the ratio of their current to the rated current of the inverter will become bigger if their wiring lines are rather long (over 50m). As a result, external thermal relays may carry out unnecessary operations.

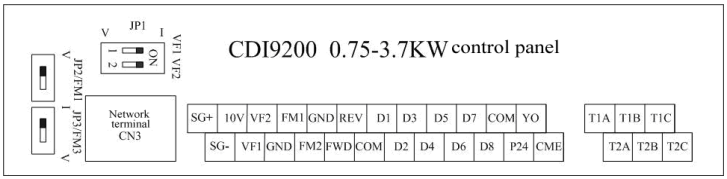
3.4.4 Wiring and Supporting Peripherals for 380V-level Main Circuits

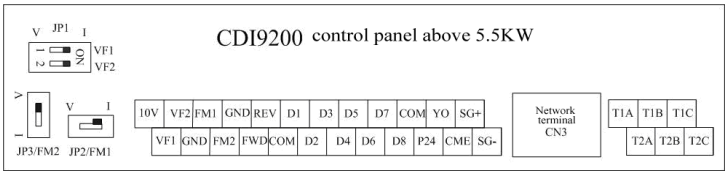
Specification	Matched motor (kW)	Wire gage (mm^2)	Terminal bolts in the main circuit	Fuse-free air breaker (MCCB) A	Electromagnetic contactor (MC) A	Adjusted overload relay RT value A
CDI9200-GR75T4	**0.75**	**2.5**	**M3.5**	**10**	**10**	**2.2**
CDI9200-G1R5T4	**1.5**					**4**
CDI9200-G2R2T4	**2.2**	**4**				**6**
CDI9200-G3R7T4	**3.7**			**15**	**20**	**9.5**
CDI9200-G5R5T4	**5.5**	**6**		**30**		**12.5**
CDI9200-G7R5T4	**7.5**					**17**
CDI9200-G011T4	**11**	**10**		**50**	**35**	**24**
CDI9200-G015T4	**15**		**M5**	**60**		**32**
CDI9200-G018T4	**18.5**	**16**		**75**	**50**	**38**
CDI9200-G022T4	**22**		**M6**	**100**		**45**
CDI9200-G030T4	**30**	**25**		**125**	**80**	**60**
CDI9200-G037T4	**37**		**M8**			**75**
CDI9200-G045T4	**45**	**35**		**150**	**100**	**89**
CDI9200-G055T4	**55**			**175**	**180**	**108**
CDI9200-G075T4	**75**	**60**	**M10**	**225**		**144**
CDI9200-G093T4	**93**			**350**	**250**	**172**
CDI9200-G110T4	**110**	**90**				**202**
CDI9200-G132T4	**132**			**400**	**400**	**240**
CDI9200-G160T4	**160**	**120**	**M12**	**500**		**290**
CDI9200-G185T4	**185**	**150**		**600**	**600**	**340**
CDI9200-G200T4	**200**	**180**		**600**	**600**	**362**
CDI9200-G220T4	**220**	**240**				**415**
CDI9200-G250T4	**250**	**270**	**M16**	**800**		**470**
CDI9200-G280T4	**280**					**530**
CDI9200-G315T4	**315**	**350**		**1000**	**1000**	**600**
CDI9200-G400T4	**400**					**780**
CDI9200-G450T4	**450**	**450**				**900**
CDI9200-G500T4	**500**					**1000**

Chapter 3 Installation and Connection of Inverter

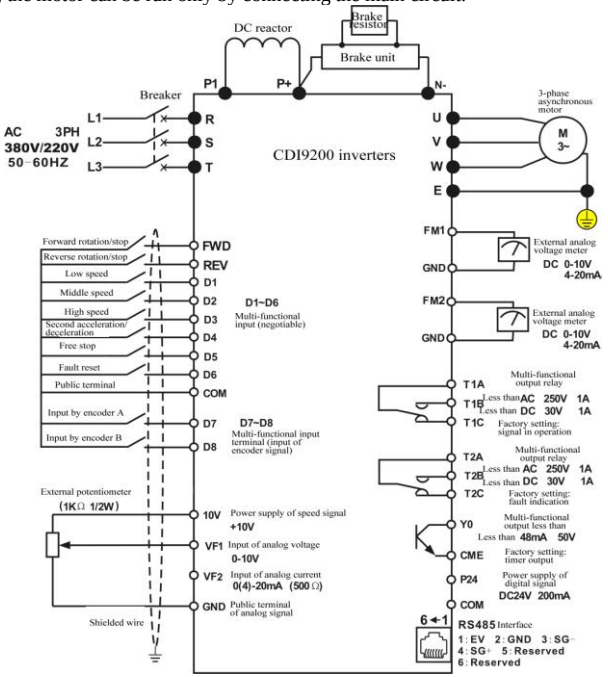
3.5 Connection of control circuit

3.5.1 Arrangement and connection of controlling circuit terminals





The following is connection diagram of main circuit and control circuit. When operated with digital keyboard, the motor can be run only by connecting the main circuit.



Note:

1、For control terminal, frequency setting and monitor instrument, shielding wire or twisted pair wire required (wiring in ellipse).

2、Maximal output current of 10V (+10V) control loop terminal is 50mA.

3、Multi-function analog output is used for monitoring instruction。

4、COM and GND are the common terminals for I/O and analog signals respectively. Please do not connect the common terminals to each other or to earth.

5、For prevent from interfere, please distributing control loop apart from main loop and heavy current loop (relay contact, 220V program loop).

6、Input switch of external terminal (except relay contact) is passive input signal, power input maybe damage the converter.

7、Separate the conducting wires of the control circuit from those of the main circuit and other power cables so as to avoid malfunction caused by noise interference. Shielded Twisted Pair should be used in wiring the control circuit; the shielding sheath should be connected to terminal E of the inverter and the wire distance should be less than 50 meters.

8、In diagram of the control panel, JP1, JP2 and JP3 are jumpers, functioning as below:

1 of JP1 controls VF1 channel to select voltage/current signal input. When current input is selected, switch of JP1 is at I side; when voltage input is selected, at V side.

2 of JP1 controls VF2 channel to select voltage/current signal input. When current input is selected, switch of JP1 is at I side; when voltage input is selected, at V side.

JP2 controls FM1 channel to select voltage/current signal output. When current output is selected, switch of JP2 is at I side; when voltage output is selected, at V side.

JP3 controls FM2 channel to select voltage/current signal output. When current output is selected, switch of JP3 is at I side; when voltage output is selected, at V side.

Connection method of controlling circuit terminal:

Insert the line below terminal rows and use slotted screwdriver to screw tight. Wire sheath should be skinned off by about 7mm.

3.5.2 Function of control circuit terminal:

Following sheet summarize function of control circuit terminal, which is connected according to function respectively.

Sort	Terminal	Signal function	Description		Signal level
MF input signal	FWD	Run/stop in positive direction	Forward operation when closed Stop when open		Photoelectric coupler insulation Input: ON/OFF Internal 24VDC/8mA
	REV	Run/stop in reversal direction	Backward operation when closed Stop when open		
	D1	Multi-speed command 1	Become effective after closed	MF contact input, set via P02.00～P02.05	
	D2	Multi-speed command 2	Become effective after closed		
	D3	Multi-speed command 3	Become effective after closed		
	D4	Three-wire running control	Become effective after closed		
	D5	Free stop	Become effective after closed		
	D6	Fault reset	Reset when closed		
	D7	Encoder pulse input			
	D8	Encoder pulse output			
	COM	MF common input terminal			
Analog input signal	10V	+10V power output	+10V power supply of analog command.		+10V Maximum allowed current 50mA
	VF1	Analog output voltage/cunent	0～10V 0/4～20mA	Set up P02.15 and P02.19	0 ~ +10V （20KΩ）
	VF2	Analog output voltage/cunent	0～10V 0/4～20mA		0/ 4~20mA （500Ω）
	GND	Common ground of analog signal	0V		
MF output signal	YO	Open-set electrode output	Signaling that the inverter is in operation	P02.09=14	Maximal load is 48V 50mA
	CME	Common points of open collector output			
	COM	Digital power ground			
	P24	Power supply of digital signal	External power supply is provided		Output between COM DC24V, 200mA in max.

	T1A	Under-voltage stop (Normal open/closed contact）	In operation, connection between terminal T1A and T1C breaks off and connection between T1A and T1B closes up.	P02.10=0	Contact capability 250VAC，1A or below 30VDC，2A or below
	T1B				
	T1C				
	T2A	Fault indicator output	When at fault, connection between terminal T2A and T2C breaks off and connection between T2A and T2B closes up.	P02.11=13	
	T2B				
	T2C				
Analog output signal	FM1	Frequency meter output	0~+10V/0~20mA/ 4~20mA/ frequency Fmax		Output 0~10V/4~20mA Load 2mA or below
	FM2				
	GND	Common points of analog signals			
Communication Signal	A/B(CN3)	RS-485 positive and negative communication signals			

3.6 Grounding

1、Grounding resistance value:

200V level：100Ω or value below it

400V level：10Ω or value below it

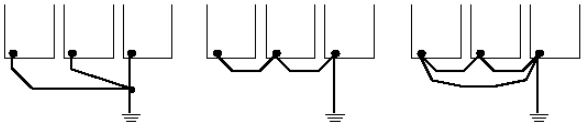
660V level： 5Ω or value below it

2、Prevent CDI9200 inverter, welding machine, motor or other huge current electrical equipment from earthing. Ensure all earthing lines and wires of huge current electrical equipment are separately laid inside the pipe.

3、Please use approved grounding wire of which length should be as shorter as possible.

4、When several CDI9200 inverters are used in parallel, please ground the device as shown by Figure (a), instead of Figure (c) which may form a loop.

5、Grounding of CDI9200 inverters and motor can be connected as per Figure (d).



(a) Correct （b）Incorrect （c）Non-recommended

（d）Correct （e）Non-recommended

6、Connection inspection:

Please perform following items if installation and connection are completed.

A If connection is correct.

B If stub or screw remains in device.

C If screws are fastened firmly.

D If bare conductor on terminal contacts with other terminals.

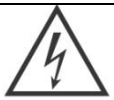
Chapter 4 Keyboard Operation and Running

4.1 Selection of operating mode

CDI9200 inverters provide 3 control modes, including keyboard operation, terminal operation and RS-485 operation. The user can select relative control mode as per onsite circumstances and working requirements. See description of Parameter 00.00 for pecific selection.

4.2 Test run and inspection

4.2.1 Precautions and inspection before test run

 Dangerous	1. Input power can be connected only after front lid is installed. Do not remove external lid when powered, otherwise it may lead to electric shock.
	2. Do not get close to the inverter or the load when selecting re-try because it may suddenly restart after being stopped just a moment ago. (Even though the inverter can restart, its mechanical system can safeguard individual safety) otherwise it may cause hurt to human body.
	3. Because function setting can defunction the stop button, it is required to install an independent emergency button; otherwise it may cause hurt to human body.
 **Attention**	1. Do not touch the radiator or resistor beause its temperature is very high; otherwise it may lead to burn.
	2. Because low speed can be easily changed to high speed, it is required to confirm safe working scope of the motor and mechanical equipment before operation; otherwise it may cause hurt to human body and damage to equipment.
	3. If necessary, separately install a contracting brake; otherwise it may cause hurt to human body.
	4. Do not change connection during operation; otherwise the equipment or inverter may be damaged.

For ensuring operation safety, please relieve mechanical connector before first operation to separate motor from mechanical equipment and prevent from dangerous. Please perform following inspection before test run:

A If connection between lead and terminal is correct.
B If lead thrum cause short circuit.
C If screw terminal is fastened firmly.
D If motor is installed firmly.

4.2.2 Test run

After preparation, connect to power supply and inspect if frequency converter works normally.
After connected to power supply, indicator of number keyboard is luminous.
Please cut off power supply immediately if any problem abovementioned occurs.

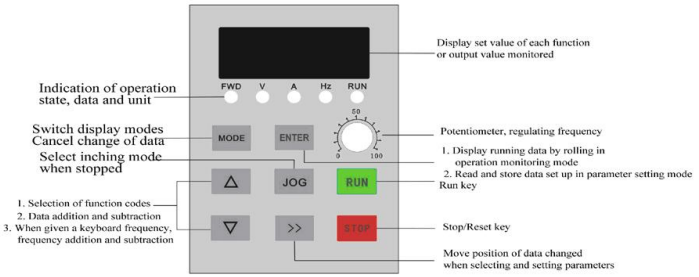
4.2.3 Operating inspection

Please verify following items during operation:

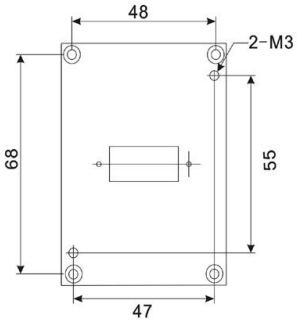
A If motor rotates smoothly.
B If rotation direction of motor is correct.
C If abnormal vibration or noise occurs accompanying with operation of motor.
D If acceleration and deceleration are smooth.
E If current match with load value.
F If LED state indicator and number keyboard displays correctly.

4.3 Operating method of keyboard.

4.3.1 (1) 0.75-7.5KW Keys on keyboard and their functions



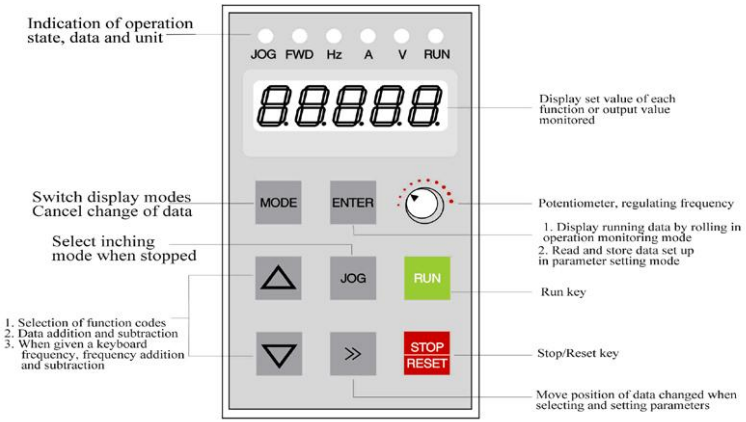
Installation holes on bottom of the keyboard



Functions of Indicators

No	Name	Name in Chinese	Description
1	FWD	Foreword	Foreword indicator, when rotates foreword, it turns on and when rotates reversely, OFF.
2	Hz	Hertz	Unit
3	A	Amp	Unit
4	V	v	Unit
5	RUN	Run	It turns on when the inverter is running.

（2）11-500KW Keys on keyboard and their functions



Installation sizes of operation keyboard

72mm × 136mm

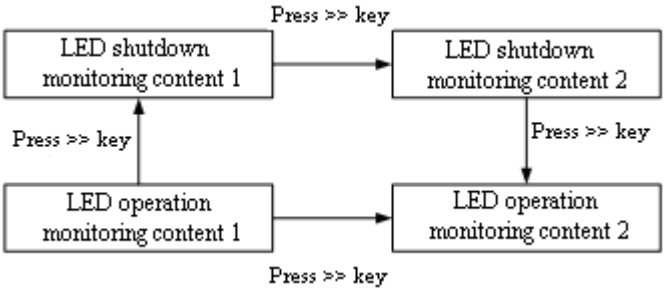
Functions of Indicators

No.	Name	Name in Chinese	Description
1	JOG	Actin-inch	Indicates when it is currently inching running; select by JOG key
2	FWD	Foreword	Foreword indicator, when rotates foreword, it turns on and when rotates reversely, OFF.
3	Hz	Hertz	Unit
4	A	Amp	Unit
5	V	v	Unit
6	RUN	Run	It turns on when the inverter is running.

4.3.2 Keyboard display mode

1、Operate data monitoring mode

It is possible to check current state information of converter by press >> if monitor mode is run.



2、Fault/alarm monitor mode

A In state of running monitor, the unit should display information relating to fault and warning if fault and alarm occurs.

B Reset fault by press STOP/RESET if fault disappears.

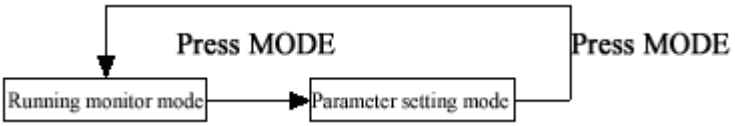
C Please cut off power supply and reset the unit if serious fault occurs.

D Keyboard should display fault code continuously until fault is eliminated (refer to Section Seven).

3、Parameter setting method

Converter parameter and inspection on running state of converter are settable.

Please adjust parameter value properly to obtain perfect running state.



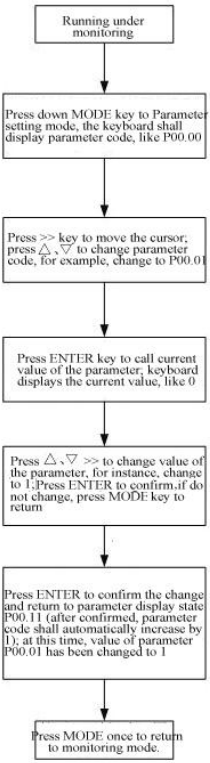
4、Function of combination key

Parameter P00.00=0, it means the converter is controlled by the keyboard, ENTER, △ and ▽ on the keyboard can be used to realize switching function of forward run and reverse run on the monitoring mode.

ENTER+△ Switch to forward run.

ENTER+▽ Switch to reverse run.

4.3.3 Parameter check and set methods (using digital keyboard)



Example: the following is an example to change value of P00.10 from 010.0 to 016.1:

1	50.00	Display set frequency 50.00Hz; Press MODE key to enter parameter setting mode
2	P00.00	Parameter P00.00 appears, at the same time the pointer points to the last digital bit "0" and twinkles. Press △、▽ to select parameter code to set; press >> key to move the data bit.
3	P00.10	Press △、▽>> to change value displayed to P00.10, then ENTER.
4	010.0	Check whether factory-set value of the parameter is 010.0; at the same time the pointer points to the last digital bit "0".
5	016.1	Press △、▽>> to change value displayed to 016.1, then ENTER.
6	P00.11	Data storage writes in 016.1; P00.10 displays the accelerating time has been changed from '010.0 to 016.1. at this time return to display parameter P00.11
7	P00.10	If directly press MODE instead of ENTER in step 5, the keyboard shall return to display P00.10. and the data changed is not stored. Accelerating time is still 010.0.
8	50.00	Then press MODE again to return to running under monitoring mode to display the set frequency.

Note: And it is impossible to modify data under following conditions.

1. It is impossible to adjust parameter during operation of converter. (Refer to function sheet)

2、Start parameter protection in P04.42 (parameter write-in protection)

4.3.4 Frequency setting of keyboard

It is possible to set frequency via mode of number keyboard and keyboard POT, which should be selected by modifying parameter P00.01.

1、Set frequency via number keyboard directly

A Set value of parameter P00.01 as 1.

B While the inverter is running, press △ or ▽to enter frequency-setting mode.

C Press △ or ▽ again to adjust the frequency to the intended value, like 48.00Hz.

D After adjustment, the set frequency should be saved into parameter P00.02 automatically.

E Press MODE to return to parameter setting, and press MODE again to return running monitor mode.

F It is possible to modify frequency setting value during operation only.

2、Set frequency via keyboard POT

Firstly, set value of P00.01as 0, and adjust frequency to required value by rotating POT knob on keyboard rightwards or leftwards, of which setting value should not be saved to P00.02 automatically.

Chapter 5 Tables of Function Parameters

Description

1、Function parameters of CDI9200 inverters are divided into 5 groups as per the functions. Each group includes several function codes, which can be set with different values. When operated with the keyboard, parameter groups corresponds to first level menus, function codes to second level menus and set values of function codes to third level menus.

2 、P××.×× in function sheet or other section of the manual denotes "××" function code of sort "××"; For example, "P00.01" denotes 01 function code of sort P00.

3、Content explanation of function sheet:

Column 1 "function code": serial number of function code parameter; column 2 "name": full name of function parameter; column 3 "set scope": scope of valid set value of function parameters; column 4 "min. unit": minimum unit of set value of function parameters; column 5 "factory setting": original set value of function parameters when delivered out of the factory; column 6 "change limit": change property of function parameters (that is, whether change and changing conditions are allowed); column 7 "reference page": page referred to of function parameters.

Modification limit of parameter is explained as following:

"○" denotes setting value of the parameter is modifiable in state of stop or running;

"×" denotes setting value of the parameter is nonmodifiable (set in factory) in running state.

Explanation:

1. Please read the manual carefully while modifying parameter of converter. And contact our Company for any problem occurs during operation. No data submits to customer modification, violation of it maybe causes serious fault, or significant property loss, of which consequences should be born by User!
2. It denotes user's operation is error if "d.Err" displayed on LED.

Basic Function Parameters—P00 Group

Function code	Name	Setting range	Min. unit	Factory setting	Modification limit	Reference page
P00.00	Selection of operation control mode	0 Keyboard 1 Terminal 2 RS-485 3 Selection by multi-functional terminal	1	0	O	48
P00.01	Setting mode selection of operation frequency	0 Keyboard POT 1 Digital keyboard setting 2 Terminal VF1 3 Terminal VF2 4 Number keyboard+ analog terminal 5 VF1+VF2 6 Min{VF1, VF2} 7 Max{VF1, VF2} 8 Up/down terminal control mode 1 9 Up/down terminal control mode 2 10 Terminal impulse control mode 1 11 Terminal impulse control mode 2 12 RS-485 reference 13 Switch frequency setting 14 Selection by multi-functional terminal	1	0	O	
P00.02	Keyboard frequency setting	0.00 ～ maximum frequency	0.01Hz	50.00Hz	O	52
P00.03	Running direction controlled via panel	0 Forward rotation 1 Reverse rotation	1	0	O	
P00.04	Maximum frequency	50.00~400.0Hz	0.01Hz	50.00Hz	O	
P00.05	V/F curve mode	0 Linear 1 Square 1 2 Square 2 3 Fold lind mode	1	0	X	
P00.06	Torque compensating voltage	0~30%	1%	As per machine type	O	53
P00.07	Intermediate voltage	0~100%	1%	50%	O	54
P00.08	Intermediate frequency	0~ Motor rated frequency	0.01Hz	25.00Hz	O	

P00.09	Accelerating/decelerating mode	0 Straight line 1 S curve	1	0	O	54
P00.10	Accelerating time 1	0. 1~6000S	0.1S	Machine type	O	55
P00.11	Decelerating time 1	0. 1~6000S	0.1S	Machine type	O	
P00.12	Upper frequency	Lower frequency~highest frequency	0.01Hz	50.00Hz	O	56
P00.13	Lower frequency	0.00~ Upper frequency	0.01Hz	0.00Hz	O	
P00.14	Lower frequency operation mode	0 Stop 1 Run	1	1	O	
P00.15	Type selection	0 G (with permanent torque load) 1 P (fan or pump type load)	1	0	×	
P00.16	Motor rated power	0.4~999.9KW	0.1	Machine type	×	57
P00.17	Motor rated frequency	10.00~Highest frequency	0.01Hz	50.00Hz	×	
P00.18	Motor rated voltage	100~450V	1V	380V	×	
P00.19	Motor rated current	0.1~999.9A	0.1	Machine type	O	
P00.20	Motor no-load current	0.1~999.9A	0.1	Machine type	O	
P00.21	Motor pole-pairs	1~4	1	2	O	
P00.22	Motor rated speed	1~20000 rounds	1	1476	O	
P00.23	Overload protection modes	0 None 1 Common motor 2 Varible frequency motor	1	1	O	
P00.24	Motor overload protection ratio setting	20~130%	1%	100%	O	
P00.25	Motor pre-overload alarm level	0~100% (Overload accumulated percentage)	1	50%	O	58

Auxiliary Function Parameters—P01 Group

Function code	Name	Setting range	Min. unit	Factory setting	Modification limit	Reference page
P01.00	Start mode	0 Start frequency 1 Brake before start 2 Rotation tracking	1	0	O	58
P01.01	Start DC brake voltage	0~15%	1%	1%	O	59
P01.02	Start DC brake time	0.0~20.0S	0.1S	0.0S	O	
P01.03	Stop mode	0 Deceleration stop 1 Free stop	1	0	O	60
P01.04	Original frequency of DC powerdown	0.00~10.00Hz	0.01Hz	0.00Hz	O	
P01.05	DC brake voltage of powerdown	0~15%	1%	0%	O	61
P01.06	DC brake time of powerdown	0.0~20.0S	0.1S	0.0S	O	
P01.07	Dead zone time	0.0~20.0S	0.1 S	0.0S	O	
P01.08	Stopping mode selection of ambient fault	0 Free stop 1 Stop by way of shutdown	1	1	O	
P01.09	Overload stop	0 Free stop 1 Stop by way of shutdown	1	1	O	
P01.10	Function of power on	0 No action 1 Act	1	1	O	64
P01.11	Waiting time of power on	2~20.0S	0.1S	5.0S	O	
P01.12	Waiting time of fault recovery	2~60S	1S	5S	O	
P01.13	Times to try to restore the fault	0 Not start auto restore 1~9 times 10 No limit	1	0	O	

P01.14	Slip frequency compensation	0.00~10.00	0.01	0.00	O	62
P01.15	Impulse frequency reference	0.01~2.50	0.01	0.10	O	63
P01.16	Starting frequency	0.00~10.00Hz	0.01Hz	1.0Hz	O	
P01.17	Starting frequency hold-on time	0.0~10.0S	0.1S	0.0S	O	
P01.18	Inching frequency	0.1~20.00Hz	0.01Hz	2.00Hz	O	
P01.19	inching accelerating time	0.1~60.0S	0.1S	Machine type	O	
P01.20	Inching decelerating time	0.1~60.0S	0.1S	Machine type	O	
P01.21	Accelerating time 2	0.1~6000S	0.1S	Machine type	O	64
P01.22	Decelerating time 2	0.1~6000S	0.1S	Machine type	O	
P01.23	Accelerating time 3	0.1~6000S	0.1S	Machine type	O	
P01.24	Decelerating time 3	0.1~6000S	0.1S	Machine type	O	
P01.25	Accelerating time 4	0.1~6000S	0.1S	Machine type	O	
P01.26	Decelerating time 4	0.1~6000S	0.1S	Machine type	O	
P01.27	Hopping frequency 1	Hopping frequency 2~upper frequency	0.01Hz	0.0Hz	O	
P01.28	Hopping frequency 2	Hopping frequency 3~ hopping frequency 1	0.01Hz	0.0Hz	O	
P01.29	Hopping frequency 3	Lower frequency ~ hopping frequency 2	0.01Hz	0.0Hz	O	
P01.30	Scope of hopping frequency	0.00~10.00HZ	0.01Hz	0.0Hz	O	
P01.31	External frequency full scale setting	1.0kHz ~ 50.0kHz	0.1kHz	20.0kHz	O	65
P01.32	UP/DOWN set speed	0.1 ~ 99.9 Hz/S	0.1Hz/S	1.0Hz/S	O	
P01.33	restart after power off	0 None 1 action	1	0	O	
P01.34	AVR funtion	0 None 1 action	1	0	O	
P01.35	No-tripping control	0 None 1 action	1	0	O	
P01.36	Keyboard setting frequency compensation	0 OFF 1 ON	1	0	O	

Input/Output Terrminals—P02 Group

Function code	Name	Setting range	Min. unit	Factory setting	Modification limit	Reference page
P02.00	D1 terminal function	0 Unused 1 Multiplex frequency terminal 1 2 Multiplex frequency terminal 2 3 Multiplex frequency terminal 3 4 Forward rotation inching control 5 Reverse rotation inching control 6 Three-wire running control 7 Acceleration time /deceleration time terminal 1 8 Acceleration/deceleration time terminal 2 9 Free parking input 10 External reset input 11 Frequency up(UP) 12 Frequency down (Down) 13 DC brake control 14 NORM OPEN input of external fault 15 NORM CLOSR input of external fault 16 PLC running pause instruction 17 Frequency source selection 1 18 Frequency source selection 2 19 Frequency source selection 3 20 Frequency source 4 21 PID control cancel 22 Timer input 23 Wobbulating switch 24 PLC operation invalid 25 Reset PLC stop state 26 Operation command source 1 27 Operation command source 2 28 Counter input 29 Counter clear 30 Length clear input 31 Length count input (only for D6) 32 Impulse frequency input (only for D6) 33 Encoder impulse A input (only for D7, D8) 34 Encoder impulse B input (only for D7, D8)	1	1	O	66
P02.01	D2 terminal function			2		
P02.02	D3 terminal function			3		
P02.03	D4 terminal function			6		
P02.04	D5 terminal function			9		
P02.05	D6 terminal function			10		
P02.06	D7 terminal function			33		
P02.07	D8 terminal function			34		

P02.08	Operation control modes for the external terminals	0 Two-wire system control mode 1 1 Two-wire system control mode 2 2 3-line control mode 1 3 3-line control mode 2	1	0	O	70
P02.09	Functions for output terminal YO of the open collector poles	0 Signaling inverter in operation 1 Signaling frequency arrival 2 Frequency level inspection signal (above) 3 Frequency level inspection signal (equal to) 4 Frequency level inspection signal (less than) 5 Overload alarm signal 6 External fault shutdown 7 Undervolatge shutdown 8 Output frequency to upper limit 9 Output frequency to lower limit 10 PLC phase operation completed 11 PLC circulation cycle completed 12 Inverter operated at zero speed 13 Fault indication 14 Timer output 15 VF1 (VF2) signal lost 16 inverter prepared 17 Set length arriving indication 18 Set counting value arriving 19 Cycle counting value arriving 20 Overload pre-alarm signal	1	14	O	71
P02.10	Programmable relay T1A, T1B, T1C output			0		
P02.11	Programmable relay T2A, T2B, T2C output			13		
P02.12	Detected frequency width upon arrival	0.00~10.00HZ	0.01 Hz	2.00 Hz	O	72
P02.13	Frequency-level signal detection	0.00~maximum frequency	0.01 Hz	10.00 Hz	O	
P02.14	Frequency inspection scope	0.00~50.00HZ	0.01 Hz	5.00 Hz	O	

P02.15	Analog quantity imput terminal VF1	0 0~10V /0~20mA 1 10~0V/20~0mA 2 0~5V /0~10mA 3 5~0V/10~0mA 4 2~10V/4~20mA 5 10~2V/20~4mA	1	0	O	
P02.16	Analog quantity imput VF1 filtering time	0.01~20.00S	0.01	0.10S	O	
P02.17	VF1 frequency offset	-50.0~+50.0Hz	0.1Hz	0.0Hz	O	
P02.18	VF1 frequency gain set	1~200%	1%	100%	O	73
P02.19	Analog quantity imput terminal VF2	0 0~10V/0~20mA 1 10~0V/20~0mA 2 0~5V/0~10mA 3 5~0V/10~20mA 4 2~10V/4~20mA 5 10~2V/20~4mA	1	0	O	
P02.20	Analog quantity imput VF2 filtering time	0.01~20.00S	0.01	0.10S	O	
P02.21	VF2 frequency offset	-50.0~+50.0Hz	0.1Hz	0.0Hz	O	
P02.22	VF2 frequency gain set	1~200%	1%	100%	O	
P02.23	Auxiliary adjusting quantity set	-100.0%~+200.0%	0.1%	100.0%	O	75
P02.24	uxiliary quantity reference channel	0 VF1 1 VF2	1	0	O	

P02.25	Analog quantity input thread break detection	0 Alarm and shut down 1 Operate at lower frequency and output indication signal 2 Not conduct thread break detection	1	2	O	75
P02.26	Analog output 1 cotnrol	0 0~10V/0~20mA 1 2~10V/4~20mA	1	0	O	
P02.27	Analog output 1 setting	0 Output frequency 1 Output voltage 2 Output current 3 VF1 4 VF2 5 |VF1-VF2|	1	0	O	
P02.28	Analog output 1 zero point	0~4000	1	360	O	
P02.29	Analog output 1 full scale point	4000~8000	1	7550	O	
P02.30	Analog output 2 control	0 0~10V/0~20mA 1 2~10V/4~20mA	1	0	O	
P02.31	Analog output 2 setting	0 Output frequency 1 Output voltage 2 Output current 3 VF1 4 VF2 5 |VF1-VF2|	1	0	O	
P02.32	Analog output 2 zero point	0~4000	1	360	O	
P02.33	Analog output 2 full scale point	4000~8000	1	7550	O	
P02.34	Cycle counting value	0~9999	1	0	O	76
P02.35	Setting counting value	0 Cycle counting value	1	0	O	

Multi-step Speed Function Parameters—P03 Group

Function code	Name	Setting range	Min. unit	Factory setting	Modification limit	
P03.00	Setting of programmable multi-speed operation	0 None 2 Constant circulation 1 Single circulation 3 Maintain final value	1	0	O	78
P03.01	Options to break off and restart PLC	0 Restart from first phase 1 Restart from phase frequency when it breaks off	1	0	O	
P03.02	Phase 1 frequency source	0 Decided by phase 1 running frequency 1 Decided by P0.01	1	0	O	
P03.03	Phase 1 running frequency	Lower frequency ~ upper frequency	0.00Hz	5.00Hz	O	79
P03.04	Phase 1 rotating direction	0 forward rotation 1 reverse rotation 2 terminal control	1	0	O	
P03.05	Phase 1 running time	0.0~6000S	0.1S	20.0S	O	
P03.06	Phase 1 running time	1~4	1	1	O	
P03.07	Phase 2 frequency source	0 Decided by phase 2 running frequency 1 Decided by P0.01	1	0	O	
P03.08	Phase 2 running frequency	Lower frequency ~ upper frequency	0.00Hz	10.00Hz	O	
P03.09	Phase 2 rotating direction	0 Forward rotation 1 Reverse rotation 2 Terminal control	1	0	O	
P03.10	Phase 2 running time	0.0~6000S	0.1S	20.0S	O	
P03.11	Phase 2 accelerating /decelerating time	1~4	1	0	O	
P03.12	Phase 3 frequency source	0 Decided by phase 3 running frequency 1 Decided by P0.01	1	0	O	
P03.13	Phase 3 running frequency	Lower frequency ~ upper frequency	0.00Hz	15.00Hz	O	
P03.14	Destroy Phase 3 running direction	0 Forward rotation 1 Reverse rotation 2 Terminal control	1	0	O	
P03.15	Phase 3 running time	0.0~6000S	0.1S	20.0S	O	
P03.16	Phase 3 accelerating/decelerating time	1~4	1	1	O	
P03.17	phase 4 frequency source	0 Decided by phase 4 running frequency 1 Decided by P0.01	1	0	O	
P03.18	Phase 4 running frequency	Lower frequency ~ upper frequency	0.00Hz	20.00Hz	O	
P03.19	Phase 4 rotating direction	0 Forward rotation 1 Reverse rotation 2 Terminal control	1	0	O	

P03.20	Phase 4 running time	0.0~6000S	0.1S	20.0S	O	
P03.21	Phase 4 accelerating/decelerating time	1~4	1	1	O	
P03.22	Phase 5 frequency source	0 Decided by phase 5 running frequency 1 Decided by P0.01	1	0	O	
P03.23	Phase 5 running frequency	Lower frequency ~ upper frequency	0.00Hz	30.00Hz	O	
P03.24	Phase 5 rotating direction	0 Forward rotation 1 Reverse rotation 2 Terminal control	1	0	O	
P03.25	Phase 5 running time	0.0~6000S	0.1S	20.0S	O	
P03.26	Phase 5 accelerating/ decelerating time	1~4	1	1	O	
P03.27	Phase 6 frequency source	0 Decided by phase 6 running frequency 1 Decided by P0.01	1	0	O	
P03.28	Phase 6 running frequency	Lower frequency ~ upper frequency	0.00Hz	40.00Hz	O	79
P03.29	Phase 6 rotating direction	0 Forward rotation 1 Reverse rotation 2 Terminal control	1	0	O	
P03.30	Phase 6 running time	0.0~6000S	0.1S	20.0S	O	
P03.31	Phase 6 accelerating/decelerating time	1~4	1	1	O	
P03.32	Phase 7 frequency source	0 Decided by phase 7 running frequency 1 Decided by P0.01	1	0	O	
P03.33	Phase 7 running frequency	Lower frequency ~ upper frequency	0.00Hz	50.00Hz	O	
P03.34	Phase 7 rotating direction	0 Forward rotation 1 Reverse rotation 2 Terminal control	1	0	O	
P03.35	Phase 7 running time	0.0~6000S	0.1S	20.0S	O	
P03.36	Phase 7 accelerating/decelerating time	1~4	1	1	O	
P03.37	Wobbulating mode	0 Terminal control 1 Valid always	1	0	O	
P03.38	Wobbulating range	0.10~50.00Hz	0.01Hz	5.00Hz	O	
P03.39	Wobbulating running difference	0.00~5.00Hz	0.01Hz	1.00Hz	O	
P03.40	Wobbulating ascending time	0.1~3600s	0.1S	20.0S	O	80
P03.41	Wobbulating descending time	0.1~3600s	0.1S	20.0S	O	
P03.42	Close-up time	0.1~6000S	0.1S	20.0S	O	
P03.43	Break-off time	0.1~6000S	0.1S	20.0S	O	
P03.44	Fixed length switch	0 None 1 action	1	0	O	
P03.45	Set length	0.000~60.000Km	0.001	0.000	O	
P03.46	Actual length	0.000~60.000Km	0.001	0.000	O	
P03.47	Length multiplying factor	0.001~30.000	0.001	1.000	O	81
P03.48	Length correction ratio	0.001~1.000	0.001	1.000	O	
P03.49	Measure axle perimeter	0.01~100.00cm	0.01	10.00cm	O	
P03.50	Axle impulse for each cycle	1~9999	1	1	O	

Other function parameters—P04 Group

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit	Reference page
P04.00	Auto energy-saving running	0 None 1 Action	1	0	O	81
P04.01	Carrier frequency adjusting	1~10 kHz	1kHz	Machine type	X	
P04.02	Overvoltage stalling switch	0 None 1 action	1	0	O	
P04.03	Stalling overvoltage point	120~150%	1%	140%	O	
P04.04	Stalling overcurrent switch	0 None 1 Action	1	0	O	82
P04.05	Stalling overcurrent point	120~200%	1%	160%	O	
P04.06	Stalling overcurrent frequency decreasing rate	0.00~99.99Hz/s	0.01	10.00	O	
P04.07	Auto torque lifting	0 None 1 Action	1	0	O	83
P04.08	Reverse rotation prevention	0 None 1 action	1	0	O	
P04.09	Fan controls	0 No control 1 As per whether running 2 As per temperature	1	1	O	
P04.10	PID controls	0 None 1 action Positive action	1	0	O	84
P04.11	PID reference options	0 Digital setting 1 VF1 2 VF2 3 RS485 reference	1	0	O	
P04.12	PID digital set value	0.0%~100.0%	0.1%	50.0%	O	

P04.13	Feedback input channels	0 Analog input channel VF1 1 Analog input channel VF2 2 VF1+VF2 3 VF1-VF2 4 Min{VF1, VF2} 5 Max{VF1, VF2} 6 Impulse feedback channel	1	0	O	84
P04.14	Proportional gain	0.0% ~ 999.9%	0.1%	10.0%	O	
P04.15	Integration time	0.0(no integration)，0.01~99.99S	0.01S	10.0S	O	
P04.16	Derivation time	0.0(no integration)，0.01~99.99S	0.01S	0.0S	O	
P04.17	Sampling cycle	0.0(No choosing sampling cycle) 0.01~99.99S	0.01S	0.05S	O	85
P04.18	Deviation limit	0.0~20.0%	0.1%	0.0%	O	
P04.19	Preset frequency of closed loop	0.00~Highest frequency	0.01	0.00	O	
P04.20	Preset frequency holding time	0.0~999.9S	0.1	0.0	O	
P04.21	Loop min. running frequency	0.00~P04.22	0.01	0.00	O	
P04.22	Loop max. running frequency	P04.21~Highest frequency	0.01	50.00	O	
P04.23	Impulse of photoencoder during each cycle	1~9999	1	1024	O	
P04.24	Range of transmissible pressure gauge	0.01~20Mpa	0.01	1Mpa	O	86
P04.25	Wakening threshold	0.01~Sleep threshold	0.01	0.01Mpa	O	
P04.26	Sleep threshold	Wakening threshold~ range of pressure gauge	0.01	1Mpa	O	
P04.27	Sleep waiting time	0~999.9S	0.01	0S	O	
P04.28	Baud rate	0 1200bps 1 2400bps 2 4800bps 3 9600bps 4 19200bps 5 38400bps	1	2	O	
P04.29	Data format	0 N 8 1(None) 1 E 8 1 (Even) 2 O 8 1 (Odd)	1	0	O	

P04.30	Code of the machine	1~31	1	1	O	86
P04.31	Time to detect transmission broken off	0~100.0S（0 indicates no detection）	0.1	0S	O	
P04.32	Transmission error handling	0 Alarm 1 Alarm and shut down	1	0	O	
P04.33	Display ratio setting	0.01~200.00	0.01	1.00	O	87
P04.34	LED shutdown monitor content 1	0~24	1	1	O	
P04.35	LED shutdown monitor content 2	0~24	1	4	O	
P04.36	Shutdown monitor 1 show time	0 no switch 1~100S	1	0	O	
P04.37	Shutdown monitor 2 show time	0 no switch 1~100S	1	0	O	
P04.38	LED running monitoring 1	0~24	1	0	O	
P04.39	LED running monitoring 2	0~24	1	2	O	
P04.40	Monitor 1 show time	0 no switch 1~100S	1	0	O	
P04.41	Monitor 2 show time	0 no switch 1~100S	1	0	O	
P04.42	Parameter write-in protection	0 All data rewriting allowed 1 Only P0.02 and this function allows rewriting 2 Only this function allows rewriting	1	0	O	
P04.43	Initialize parameters	0 No action 1 Delete memory information 11 Reset value set at factory	1	0	O	
P04.44	Input factory code	****	1		O	88

Display function parameters--P05 Group

Function code	Name	Setting scope	Min unit	Factory setting	Change limit	Reference page
P05.00	Output frequency					
P05.01	Set frequency					
P05.02	Output current					
P05.03	Output voltage					
P05.04	Bus voltage					
P05.05	Input signal					
P05.06	Given value of closed loop					
P05.07	Feedback value of closed loop					
P05.08	Module temperature					
P05.09	Motor synchronous speed					
P05.10	Motor actual speed					
P05.11	Counter value					
P05.12	Actual length					
P05.13	Set length					
P05.14	Total oveload					
P05.15	Running phase display					
P05.16	Running time of this phase					89
P05.17	Remaining time of this phase					
P05.18	Total working time					
P05.19	Total output power (high)					
P05.20	Total output power (low)					
P05.21	VF1 input					
P05.22	VF2 input					
P05.23	VF1 input (after change)					
P05.24	VF2 input (after change)					
P05.25	First fault					
P05.26	Second fault					
P05.27	Third fault					
P05.28	Fourth fault					
P05.29	OPvercurrent					
P05.30	Overvoltage					
P05.31	Current fault					

Chapter 6 Functional Parameters

6.1 Basic functional parameter group P00

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P00.00	Running control methods	0 Keyboard operating 1 Terminal operating 2 RS-485 operating 3 Selection by multifunctional terminal	1	0	O

Please refer to section 3.5 and relative instructions on function codes **P02.00～P02.07** in parameter group **P02** for connection mode of control through external terminal running command.

Selection by multifunctional terminal: whey terminal P02.00～P02.07 are set to 26 and 27, running command is decided by the state determined by the terminal.

For example：P02.00=26　P02.01=27

D2	D1	Control methods
0	0	Keyboard operating
0	1	Terminal operating
1	0	RS-485 operating
1	1	RS-485 operating

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P00.01	Running frequency setting modes	0 Keyboard potentiometer 1 Digital keyboard setting 2 Terminal VF1 3 Terminal VF2 4 Digital keyboard +analog terminal 5 VF1+VF2 6 Min{VF1, VF2} 7 Max{VF1, VF2} 8 Up/down terminal control mode 1 9 Up/down terminal control mode 2 10 Terminal impulse control mode 1 11 Terminal impulse control mode 2 12 RS-485 reference 13 Switch frequency setting 14 Selection by multi-functional terminal	1	0	O

Select running frequency setting modes of the inverter. CDI9200 general inverters have 15 frequency

setting modes. Current setting frequency of the inverter can be set up when the inverter is shut down or running.

0: When the inverter is running or shut down, set its running frequency through the potentiometer on the operation panel.

1: When the inverter is running, change its set frequency directly through △ and ▽ keys on the panel and store the value changed automatically into **P00.02** to update current set frequency of the inverter (unavailable during shutdown). During running or shutdown, if value of **P00.02** is changed, update current set frequency of the inverter.

2: Control by terminal **VF1**

VF1 is a voltage/current signal input channel with six kinds of analog signal input ranges for option, determining mutual relationship between **VF1** input voltage range and set frequency by changing value of parameter **P02.15**. In this frequency reference mode, **VF1** can be used as

independent frequency reference

3: Control by terminal **VF2**

VF2 is a voltage/current signal input channel with six signal input ranges for option, determining mutual relationship between **VF2** input voltage range and set frequency by changing value of parameter **P02.19**.

In this frequency reference mode, **VF2** can be used as independent frequency reference.

Notes:

Analog reference has two mutually independent physical channels: **VF1** and **VF2**.

Both analog signal input terminals can be selected as main reference and auxiliary reference.

When analog setting mode is selected, specific application data can be defined in parameters **P02.15** and **P02.19.**

Please refer to instructions on **P02.15** and **P02.19** in parameter group **P2** for I/O performance curve of analog input signal and set frequency.

4: Control by digital keyboard +analog terminal

Digital set value of function code **P00.02** is main setting, and set value of an analog signal input in both analog signal channels is auxiliary setting. Sum up both values to be current set frequency of the inverter.

When this setting mode is selected, both set value can be summed up instead of subtraction.

In this setting mode, the part of current set frequency set by **P00.02** (that is, digital set value of current set frequency) can be modified through keys △ and ▽ on keyboard panel. Press down ENTER to confirm and store the value changed into **P00.02**.

If value of **P00.02** is changed during running or shutdown, update digital set value of current set frequency at the same time.

In this setting mode, for the part of current set frequency set by the analog signal, set values of parameters **P02.15**～**P02.24** as per the actual situation.

Analog signal as auxiliary setting can be set as auxiliary set value through multiplying frequency value of relative parameter **P02.15** or **P02.19** with value of parameter **P02.23**.

5: **VF1**+**VF2** control

This setting mode sets up set frequency of current inverter by input of both analog signal channels by setting one of both analog signal channels as main set value through value of parameter **P02.24** and the other as auxiliary set value. Sum up both values to be current set frequency of the inverter.

When this setting mode is selected, both set value can be summed up instead of subtraction.

Frequency value of analog signal as main set to relative parameter **P02.15** or **P02.19**.

Analog signal as auxiliary setting can be set as auxiliary set value through multiplying frequency value of relative parameter **P02.15** or **P02.19** with value of parameter **P02.23**.

Notes:

In frequency reference mode of digital keyboard + analog terminal and **VF1**+ **VF2**:

1. **VF1** and **VF2** select voltage/current signal input through JP1 position on the control panel. When current input is selected, switch of JP1 is at I side. Input resistance of the channel at this time is 500Ω.

2. In **VF1**+**VF2** mode, one of both analog channels is used as main setting and the other as auxiliary setting. But one of the two channels can have not analog signal input and the other set to set frequency as per value of parameter **P02.24** (set as auxiliary set or main set).

3. If auxiliary reference channel is selected, auxiliary reference in form of auxiliary adjusting frequency shall add up to set frequency of main reference to form set frequency, which is limited by upper frequency and lower frequency.

4. In **VF1**+**VF2** mode, auxiliary reference signal is input by selected auxiliary reference channel (VF1) to produce bipolar auxiliary reference adjusting quantity (defined as percentage of maximum set frequency), which shall produce relative auxiliary reference frequency adjusting quantity to adjust set frequency of main reference.

5：Min{VF1,VF2}：Minimum value in the frequencies determined after the channel is changed.

6：Max{VF1,VF2}：Maximum value in the frequencies determined after the channel is changed.

7：Up/down terminal control mode 1

In this mode, set up current set frequency of the inverter through setting funtions of external control terminal。

When this setting mode is selected, preset the following parameters: define functions of two external control terminals as 11 and 12 respectively among parameters **P02.00～P02.07.**

Select and define two terminals among D1～D8	11	Frequency increasing command UP	Hereafter UP terminal
	12	DOWN Frequency decreasing command Down	Hereafter DOWN terminal

When mode 8 or 9 is selected, connection is shown by the diagram below:

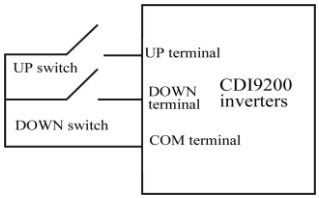


Figure 6.1.1 Connection method of frequency reference mode 8 or 9

Relationship between status setting of both external switches and current set frequency of the inverter is shown by the table below:

Switch of UP terminal	Break off		Close up	
Switch of DOWN terminal	Break off	Close up	Break off	Close up
Current set frequency of the inverter	Remain	Decreasing constantly (till lower frequency)	Increasing constantly (till upper frequency)	Remain

In this frequency setting mode: each time when charging the inverter, current set frequency is set to 0 automatically. After receiving STOP command and completing shutdown process, the inverter shall set current set frequency to 0 automatically. During shutdown and implementation of shutting down, both external control terminals are invalid.

9. Up/down terminal control mode 2

Basically similar to "up/down terminal control mode 1", the differences are:

When starting to shut down after receiving STOP command, current set frequency of the inverter is remembered automatically to be used as initial set frequency for next operation.

During shutdown, UP and DOWN terminals are valid.

10: Terminal impulse control mode 1

Basically similar to "up/down terminal control mode 1", the differences are:

When mode 10 or 11 is selected, connection is shown by the diagram below:

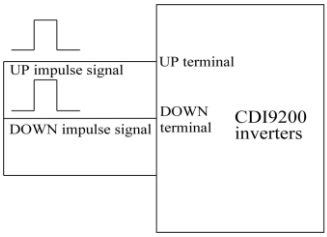
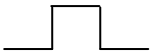
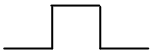


Figure 6.1.2 Connection method of frequency reference mode 10 or 11

In this mode, frequency of parameter **P01.15** is value added to or decreased from each impulse of UP/DOWN terminal.

Terminal	Impulse signal	Current set frequency of the inverter
UP terminal		Each impulse signal adds frequency of P01.15 (till upper frequency)
DOWN terminal		Each impulse signal decreases frequency of P01.15 (till lower frequency)

In this frequency setting mode: each time when charging the inverter, current set frequency is set to 0 automatically. After receiving STOP command and completing shutdown process, the inverter shall set current set frequency to 0 automatically. During shutdown and implementation of shutting down, both external control terminals are invalid.

11: Terminal impulse control mode 2

Basically similar to "up/down terminal control mode 1", the differences are:

When starting to shut down after receiving STOP command, current set frequency of the inverter is remembered automatically to be used as initial set frequency for next operation. (During shutdown, UP and DOWN terminals are valid.)

12: RS485 reference

Running frequency is determined by communication of the upper computer.

13: Switch frequency setting

In this function, output frequency is determined by impulse frequency F of D6 terminal input.

Output frequency=F/external frequency full scale setting*highest frequency

14: Selection by multi-functional terminal

When D1~D8 is set as 17~20 frequency sources, state of the terminal determines frequency source.

D4	D3	D2	D1	Control method
0	0	0	0	Keyboard potentiometer
0	0	0	1	Digital keyboard setting
0	0	1	0	Terminal VF1
0	0	1	1	Terminal VF2
0	1	0	0	Digital keyboard +analog terminal
0	1	0	1	VF1+ VF2
0	1	1	0	Min{VF1，VF2}
0	1	1	1	Max{VF1，VF2}
1	0	0	0	Up/down terminal control mode 1
1	0	0	1	Up/down terminal control mode 2
1	0	1	0	Terminal impulse control mode 1
1	0	1	1	Terminal impulse control mode 2
1	1	0	0	RS485 reference
1	1	0	1	RS485 reference
1	1	1	0	RS485 reference
1	1	1	1	RS485 reference

Notes:

1. When the inverter is in the above working modes, running frequency has no relation with set frequency value of the above 15 frequency set modes: inching running frequency, terminal multi-section running frequency, programmable multi-speed running frequency.

2. In addition to the above 15 frequency setting modes, other special frequency setting modes are:

Parameters P03.00 ～ P03.36 in parameter group P03 can be set as frequency, time, accelerating/decelerating time and direction of each phases during programmable multi-speed running; see instructions on terminal functions 1, 2 and 3 of P02.00～P02.07 for frequency setting as multispeed running of external terminal.

function code	name	setting scope	min. unit	factory setting	change limit
P00.02	keyboard frequency setting	0.00~highest frequency	0.01Hz	50Hz	O

Frequency digital setting parameter P00.02 is valid when **P00.01**=1 is selected.

When **P00.01**=1, set value of P00.02 is set as current set frequency of the inverter directly each time the inverter is charged, or when frequency setting mode 4 (digital keyboard+ analog terminal) is selected, current set frequency of the inverter is its set value.

When the inverter is running or shut down, if set value of P00.02 is changed, update current set frequency of the inverter or digital set value part of current set frequency.

If upper and lower frequencies are changed, set value of P00.02 shall be automatically limited to new ranged set.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P00.03	Running direction of panel control	0 Forward rotation 1 Reverse rotation	1	0	O
P00.04	Highest frequency	50.00~400.0Hz	0.01Hz	50.00Hz	O

Highest frequency is allowed to output by the inverter, as shown by Fmax in Figure 6.1.9. Rated input voltage of the motor correspondes with voltage when the motor runs at rated frequency.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P00.05	V/F curve mode	0 Linear 2 Square 2 1 Square 1 3 Fold line	1	0	X

In Figure 6.1.3, 6.1.4, 6.1.5 and 6.1.6, curve 1 is V/F curve after adding torque compensating voltage under mode of V/F curve and curve 2 is V/F curve without adding torque compensating voltage under mode of V/F curve.

0: Linear mode

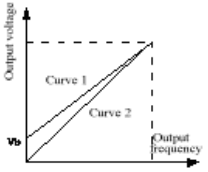


Figure 6.1.3 Permanent torque V/F curve

1: Square 1 mode

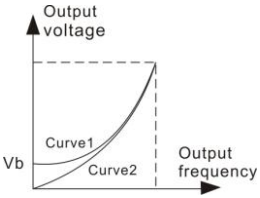


Figure 6.1.4 Decreasing torque mode 1

2: Square 2 mode

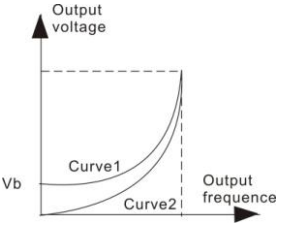


Figure 6.1.5 Decreasing torque mode 2

3: Fold line mode

Thorugh setting of parameters P00.07 and P00.08, the user can define V/F curve mode as required.

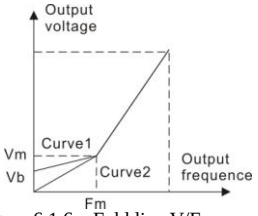


Figure 6.1.6 Fold line V/F curve

Notes:

Generally common load can select curve 0 while fan, pump etc. square torque load can select curve 1.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P00.06	Torque compensating oltage	0~30%	1%	As per machine type	O

To compensate low frequency torque, compensate the low frequency working area by lifting the output voltage, as per Vb in Figure 6.1.3, 6.1.4, 6.1.5 and 6.1.6.

Notes:

Value set when delivered out of factory: 0.75～1.5KW 3%;2.2KW 4%;3.7KW 3%;5.5～11KW 2%; 1% above 15KW. Usually, factory default value can meet the requirements. If overcurrent fault occurs when started, please increase set value of the parameter slowly from 0 till meeting the requirements to start. Do not increase lifting value too quick; otherwise, the equipment may be damaged.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P00.07	Intermediate voltage	0~100%	1%	50%	O
P00.08	Intermediate frequency	Motor rated frequency	0.01Hz	25.00Hz	O

Set up intermediate voltage and frequency of any V/F curve required by the user. Parameter **P00.05**=3, set to fold line mode.

Intermediate voltage is percentage of motor rated voltage, Vm in Figure 6.1.6.

Intermediate frequency is a frequency above or equal to lower frequency but less or equal to motor rated frequency, Fm in Figure 6.1.6.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P00.09	Accelerating/decelerating mode	0 Straight line 1 S curve	1	0	O

0: Straight line

During the accelerating/decelerating process, output frequency and accelerating/decelerating time of the inverter are in a linear relationship, increasing or decreasing as per permanent slope as shown by Figure 6.1.7.

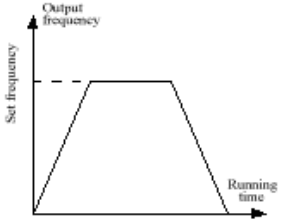


Figure 6.1.7 Straight line acceleration/deceleration

1: S curve

During the accelerating/decelerating process, relationship between output frequency and accelerating/decelerating time of the inverter are in curve S relation, increasing or decreasing as per permanent slope as shown by Figure 6.1.8.

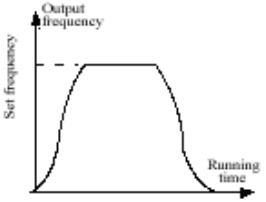


Figure 6.1.8 Curve S Acceleration/deceleration

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P00.10	Accelerating time 1	0.1~6000S	0.1S	Machine type	O
P00.11	Decelerating time 1	0.1~6000S	0.1S	Machine type	O

Accelerating time 1 refers to the time the inverter requires to increase from forbidding to highest frequency, as T1 in Figure 6.1.9.

Decelerating time 2 refers to the time the inverter output requires to decrease from max. output frequency to forbidding, as T2 in Figure 6.1.9.

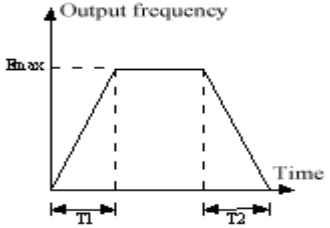


Figure 6.1.9 Definitions of Decelerating and Accelerating Time

The diagram below shows the process both accelerating and decelerating time are switched.

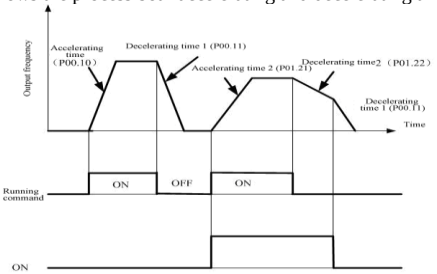


Figure 6.1.10 Switch between both accelerating and decelerating time

Switch of accelerating and decelerating time

CDI9200 inverters have 4 groups of parameters of accelerating and decelerating time. Other accelerating and decelerating time (2, 3, 4) are defined in parameters **01.21**～**P01.26**.

Default accelerating and decelerating time of the inverter is accelerating and decelerating time 1 (**P00.10**, **P00.11**).

If other accelerating and decelerating time group is selected, it is required to selec by groups through control terminal (please refer to **P02.00**～**P02.07** terminal function 7 and 8 of parameter group **P02**).

During programmable multi-speed running, selection of accelerating and decelerating time group, set up in function codes (please refer to **P03.00**～**P03.36** of parameter group P03).

Accelerating time and decelerating time during JOG running are separately set up in P01.19 and P01.20.

Notes:

1. Accelerating time is only valid in normal accelerating process, excluding starting DC brake time and starting frequency remaining time.

2. Decelerating time is only valid in normal decelerating process, excluding shutdown DC brake time.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P00.12	Upper frequency	Lower frequency~highest frequency	0.01Hz	50.00Hz	O
P00.13	Lower frequency	0.00~Upper frequency	0.01Hz	0.00Hz	O

Upper frequency is highest frequency set by the user to allow running, as shown by UF in Figure 6.1.11.

Lower frequency is minimum frequency set by the user to allow running, as shown by LF in Figure 6.1.11.

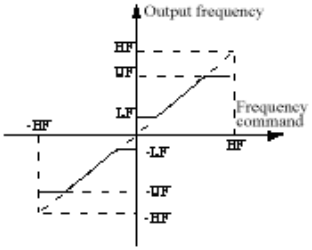


Figure 6.1.11 Defining parameters of frequency limits

Notes:

1. Highest frequency (HF), upper frequency (UF) and lower frequency (LF) should be set up carefully as per actual nameplate parameters and requirements by operation conditions of the motor controlled.

2. Limit of UF and LF is invalid to JOG running.

3. In order to limits by UF and LF, output frequency of the inverter during running is also limited by set values of parameters such as starting frequency, shutdown DC brake starting frequency and jumping frequency.

4. When set frequency is less than LF, output frequency of the inverter shall be at LF; when set frequency is more than UF, the inverter shall run at UF.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P00.14	Lower frequency operation mode	0 Stop 1 Run	1	1	O

0 Stop
1 Run

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P00.15	Type selection	0 G (with permanent torque load) 1 P (fan or pump type load)	1	0	O

0 G (with permanent torque load)
1 P (fan or pump type load)

After this parameter is changed, relative inverter can automatically adjust initial parameters P00.16~P00.22 of the motor as per the machine type.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P00.16	Motor rated power	0.4～999.9KW	0.1	Machine type	O
P00.17	motor rated frequency	10.00～highest frequency	0.1HZ	50HZ	O
P00.18	Motor rated voltage	100～450V	1V	380V	O
P00.19	Motor rated current	0.1～999.9A	0.1	Machine type	
P00.20	Motor no-load current	0.1～999.9A	0.1	Machine type	
P00.21	Motor pole-pairs	1～4	1	2	O
P00.22	Motor rated speed	1~20000 rounds	1	1476	

Set parameters of the motor controlled. To ensure the control performance, please make sure values of P00.16～P00.22 are correctly set up as per nameplate parameters of the motor.

Motor and inverter power grade should match. Usually allows to be less than the inverter by 2 grades or larger by 1 grade. Beyond this scope, the control performance can not be ensured.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P00.23	Overload protection modes	0 No action 1 Common motor 2 Varible frequency motor	1	1	O

0: No action

Without motor overload protection (adopted when the motor is at short time overload condition or external heat relay is selected); in this mode, the inverter has not overload protection for the motor.

1: Common motor (with low speed compensation)

Because heat radiation effect of the common motor becomes worse when running at low speed, relative electronic thermal protection value should be adjusted properly; low speed compensating performance of motor protection mode is to lower protection threshold of motor overload when running frequency is less than 30Hz.

2: Varible frequency motor (without low speed compensation)

Varible frequency motor uses forced air cooling, so that radiating effect is not affected by the rotating speed. Hence, it is not required to lower protection threshold when running at low speed.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P00.24	Motor overload protection ratio setting	20~130%	1%	100%	O

Set value of overload protection ratio is set to 100% when motor rated current is correctly set.

When the motor load is too heavy and overload occurs frequently, this value can be increased properly. But the user should ensure that working circumstance of the motor will not burn the motor.

When rated current driving multiple motors is not correctly set, it cannot protect the motor. At this time configure heat protective relay for each motor.

Overload protection inverse time curve is shown by Figure 6.1.12.

Overload of this series of inverters is: 1 minute at 150% rated current and running 1 hour constantly at 110% rated current.

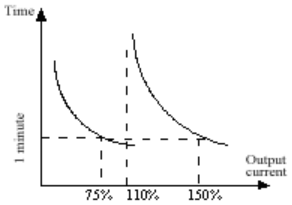


Figure 6.1.12 Overload protection inverse time performance curve

Function code	Name	Setting scope	Min .unit	Factory setting	Change limit
P00.25	Motor pre-overload alarm level	0~100%(Overload accumulated percentage)	1	50%	

According to overload ratio set for P00.24, when total overload exceeds this value, the terminal outputs display signal.

6.2 The parameter of auxiliary fuction P01 group

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.00	Starting modes	0 Start from starting freqeuncy 1 First brake and then start 2 Rotating speed traceing to start	1	0	O

Starting mode function is valid when the inverter reenters running state from shutdown state. That is if reentering running state when the inverter is first charged, power supply restores after instant power off, reset after fault occurs, after it stops freely and after it shuts down normally, the inverter shall be started in the starting mode selected.

0: Starting from starting freqeuncy

When the inverter is put into operation, first set parameters of function codes P01.16 and P01.17 to start from starting frequency and run time (P01.17) set at this frequency; then enter normal accelerating phase to accelerate to set frequency as per parameters of accelerating time, accelerating and decelerating modes set up.

Starting from starting frequency is shown in Figure 6.2.1. The difference is to eliminate brake part of the above starting.

1: First brake and then start from starting frequency

When the inverter is put into operation, first conduct DC brake before starting as per DC brake voltage and DC brake time set for function codes P01.01 and P01.02; then start from this frequency and run for time (P01.17) set as per function codes P01.16 and P01.17; then enter normal accelerating phase to accelerate to set frequency as per parameters of accelerating time, accelerating and decelerating modes set up.

Process that first brakes and then start from starting frequency is shown in Figure 6.2.1.

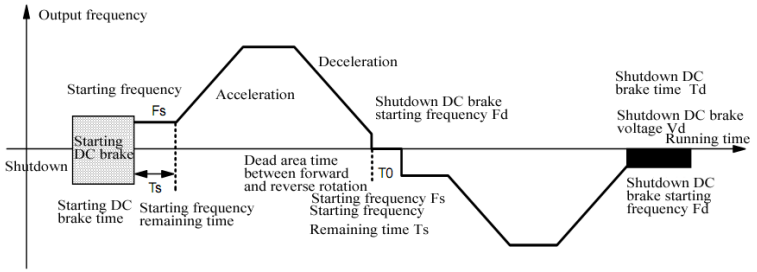


Figure 6.2.1 Diagram of starting mode 1 (forward rotation, reverse rotation and shutdown)

2: Rotating speed traceing to start

When the inverter is put into operation, first inspect rotating speed of the motor and then directly trace current rotating speed of the motor as per inspection result to smoothly start rotating motor without impact.

When this starting mode is selected, rotating inertia of the system should be considered to properly increase set value of accelerating and decelerating time.

When rotating speed tracing to start function is set up, the general power off and restarting process is shown in Figure 6.2.2.

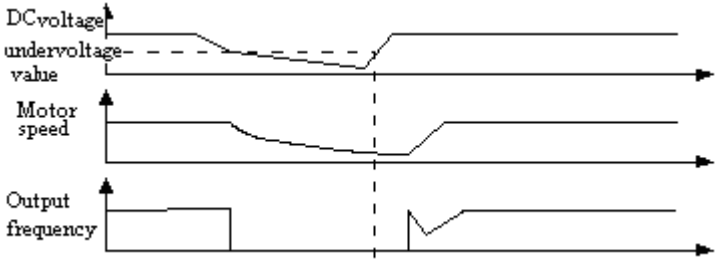


Figure 6.2.2 Diagram of rotating speed tracing power off to start

Notes:

1. Starting mode 0: Proper for occasion where static friction torque is large and load inertia is small, or when the user uses to match external mechanical brake equipment. That is, before the motor restarts after shutdown, the motor axle can remain static.

2. Starting mode 1: Proper for the occasion where load has forward rotation and reverse rotation during shutdown.

3. Starting mode 1: especially fit for restarting after failure reset, restarting after instant power off at various working status.

4. During switch between forward rotation and reverse rotation when the inverter runs normally and during change of set frequency to accelerate, acceleration mode is selected as per starting mode 0.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.01	Starting DC brake voltage	0~15%	1%	1%	O
P01.02	Starting DC brake time	0.0~20.0S	0.1S	0.0S	O

Starting DC brake voltage: percentage of brake voltage when the inverter is started in DC brake mode.

Starting DC brake time: continual time of output DC brake voltage when the inverter is started.

Start DC brake process as per the front part of entering starting frequency operation in Figure 6.2.1.

Notes:

For high speed load with huge inertia, it is improper to adopt the mode of restarting after long time huge current DC brake. It is recommended starting in mode of restarting after rotating speed tracing; when starting DC brake time is set to 0.0S, or DC brake voltage is set to 0%, DC brake function is invalid; both function codes should be valid when P01.00=1.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.03	Shutdown mode	0 Reducing speed to shut down 1 Shut down freely	1	0	O

0: Reducing speed to shut down

After the inverter receives shutdown command, reduce output frequency to reduce speed and shut down as per decelerating time and accelerating/decelerating mode set up.

During the process of reducing speed to shut down, when set frequency is less than shutdown DC brake starting frequency (please refer to P01.04), output frequency of the inverter jumps to 0; at this time, if the inverter selects shutdown DC brake function, perform DC brake and stop after completion; otherwise, the inverter shall stop work directly.

When this shutdown mode is selected, for inverter (7.5kW and below) with built-in brake unit, brake resistor (optional) can be externally connected. When DC bus voltage exceeds the threshold value, add in energy consumption brake automatically; inverter (11kW and above) without built-in brake unit can be configured with an externally connected brake unit and brake resistor (optional), used for energy consumption brake.

This mode is mainly used for normal reducing speed to shut down and occasion of quick brake to shut down (required to externally connect a brake resistor or brake unit).

1: Free shutdown mode (stopping free running)

After the inverter receives shutdown command, stop output immediately; the motor should freely slip to stop as per the inertia.

When this mode is selected, usually match external mechanical contracting brake.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.04	Shutdown DC brake starting frequency	0.00~10.00Hz	0.01Hz	0.00Hz	O

Shutdown DC brake starting frequency: refers to frequency of switching point when output frequency suddenly drops to 0 along the speed reducing curve during the process of speed reduction and shutdown, like Fd as shown in Figure 6.2.1.

During inverter speed reducing and shutdown process, when set frequency is less than shutdown DC brake starting frequency, output frequency jumps to zero, even though DC brake function set by the inverter is invalid.

Shutdown DC brake starting frequency is similarly valid during speed reduction when switching between forward rotation and reverse rotation.

If DC brake function is selected, this frequency is also starting frequency of DC brake at the same time during shutdown.

If running has not strict requirements for shutdown brake, shutdown DC brake starting frequency should be set as small as possible.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.05	Shutdown DC brake voltage	0~15%	1%	0%	O
P01.06	Shutdown DC brake time	0.0~20.0S	0.1S	0.0S	O

Shutdown DC brake time: continual time of output DC brake voltage when the inverter is at shutdown.

As shown by Vd and Td in Figure 6.2.1.

Notes:

If shutdown DC brake function is valid when external terminal is selected, shutdown DC brake time is invalid.

When shutdown DC brake time is set to 0.0s or shutdown DC brake voltage is set to 0%, DC brake is invalid.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.07	Dead area time between forward rotation and reverse rotation	0.0~20.0S	0.0S	2.0S	O

Dead area time between forward rotation and reverse rotation: refers to waiting and remaining time after output frequency of the inverter reduces to zero when the inverter transmits from current rotation direction to opposition direction after receiving reverse running command during operation, as shown by T0 in Figure 6.2.3.

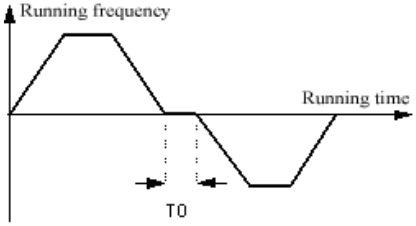


Figure 6.2.3 Dead area time of foreword/reverser rotation

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.08	Stopping due to external faults	0 Free stop 1 Stop by way of shutdown	1	1	O
P01.09	Stopping due to overload	0 Free stop 1 Stop by way of shutdown	1	1	O

Notes:

1. Stop by way of shutdown is to shut down as per mode set in parameter P01.03.

2. Free stop is to stop output and the motor as per free running of inertia afte the inverter receives shutdown command.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.10	Starting throw-in of power supply	0 No action 1 Action	1	1	O

0 No action;

Forbid restarting the motor when power supply is restored after the inverter is powered off instantly or loses power.

1: Action

Allow the motor that is running before power supply of the inverter is restored after the inverter is powered off instantly or loses power to automatically implement restarting by throw-in of power supply.

Notes:

When this parameter P01.10=1:

When external terminal runs to control, power supply of the inverter is restored after the inverter is powered off instantly or loses power. If current combination state of external running control terminal FWD/REV is invalid, power supply throw-in starting function is invlaid. Power supply throw-in starting function can be valid only after the inverter detects that running command of external operation control terminal is valid.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.11	Waiting time of power supply throw-in starting	2~20.0S	0.1S	5.0S	O

Because the inverter implements waiting time before power supply throw-in starting function when the motor is re-powered after instant power off or power down during operation, once the process has running command, the motor shall be started.

This time setting principle is mainly based upon factors such as work restoring time of the equipment related to the inverter after power supply is restored.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.12	Waiting time to try restoring the fault	2~60S	1S	5S	O
P01.13	Times to try to restore the fault	0 Not start auto restore 1~9 times 10 No limit	1	0	O

After fault occurs during operation, the inverter stops output; after reset interval time set in P01.12, the inverter shall reset the fault automatically to continue running.

Times of fault automatic reset is set by P01.13, referring to automatic reset times during operation of the inverter charged or before manual reset. Each time it automatically resets, the parameter reduces by 1. when it is reduced to 0, no auto reset function. Only manual reset or reset signal of external terminal can reset.

When set to 10, it can reset without limit. The parameter restores the originally set value after reset through manual reset or external terminal.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.14	Slip frequency compensation	0.00~10.00	0.01	0.00	O

When the inverter drives asynchronous motor, load increases and slip frequency rises. The parameter can set up compensating frequency and reduce slippage so that the motor runs at rated current at a speed closer to synchronous speed. The user can add slip frequency compensation as per the load.

Notice that once slip frequency compensation is too large, it shall run exceeding synchronous speed. At this time, UF=output frequency+slip frequency×K; k is related to the load current, less than or equal to 1.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.15	Impulse frequency reference	0.01~2.50	0.01	0.10	O

The parameter should be valid in frequency given modes 10 and 11,that is, valid in terminal impulse control mode 1 and terminal impulse control mode 2

Each impulse at UP/DOWN terminal can increase or decrease the frequency.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.16	Starting frequency	0.00~10.00Hz	0.01Hz	1.00Hz	O
P01.17	Starting frequency hold-on time	0.0~10.0S	0.1S	0.0S	O

starting frequency: refers to the initial frequency that the inverter starts from zero frequency, as shown by Fs in Figure 6.2.1. If set value of starting frequency is too large, tripping will occur. As the inverter accelerates and starts, when set frequency is less than the starting frequency, output frequency of the inverter shall be zero.

Starting frequency hold-on time: refers to the time that the inverter runs at starting frequency when started, shown by Ts in Figure 6.2.1.

The starting frequency and starting frequency hold-on time are valide in starting and switching between forward rotation and reverse rotation.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.18	Inching frequency	0.1~20.00Hz	0.01Hz	2.00Hz	O
P01.19	Inching accelerating time	0.1~60.0S	0.1S	Machine type	O
P01.20	Inching decelerating time	0.1~60.0S	0.1S	Machine type	O

Factory setting of inching accelerating time and decelerating time are: by default, 5s for below 75KW (including 75KW), 10s for above 75KW.

P01.18～P01.20 defines parameter of inching operation, as shown by Figure 6.2.4.

In the diagram, ft is inching running frequency, t1 is inching accelerating time, t3 is inching decelerating time, and t2 is inching running time, which is the time that inching running command of the panel or external terminal takes from valid to invalid subtracting inching accelerating time.

Inching running command can be controlled through the operation panel and control terminal.

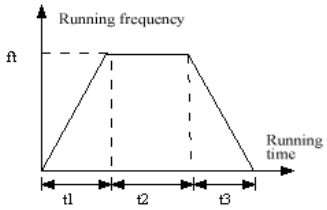


Figure 6.2.4 Parameters of inching running

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.21	Accelerating time 2	0.1~6000S	0.1S	Machine type	O
P01.22	Decelerating time 2	0.1~6000S	0.1S	Machine type	O
P01.23	Accelerating time 3	0.1~6000S	0.1S	Machine type	O
P01.24	Decelerating time 3	0.1~6000S	0.1S	Machine type	O
P01.25	Accelerating time 4	0.1~6000S	0.1S	Machine type	O
P01.26	Decelerating time 4	0.1~6000S	0.1S	Machine type	O

Accelerating and decelerating time 1, 2, 3, 4 (accelerating and decelerating time 1 are defined in P00.10 and P00.11) can be selected by the control terminal as accelerating and decelerating time as the inverter is running. Then can be defined as accelerating and decelerating time when running frequency of each phase switches during simple PLC running. Please see instructions on function code P03.06, P03.11, P03.16, P03.21, P03.26, P03.31, and P03.36 in parameter group P03.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.27	Hopping frequency 1	Hopping frequency 2 ~ UF	0.01Hz	0.00Hz	O
P01.28	Hopping frequency 2	Hopping frequency 3~ hopping frequency 1	0.01Hz	0.00Hz	O
P01.29	Hopping frequency 3	Lower frequency ~ hopping frequency 2	0.01Hz	0.00Hz	O
P01.30	Scope of hopping frequency	0.00~10.00Hz	0.01Hz	0.00Hz	O

Hopping frequency is set so that running frequency of the inverter can avoid mechanical resonance point of the driving system.

In hopping frequency, at most 3 mechanical resonance belts of the driving system can be configured with center frequency, as shown by Figure 6.2.5.

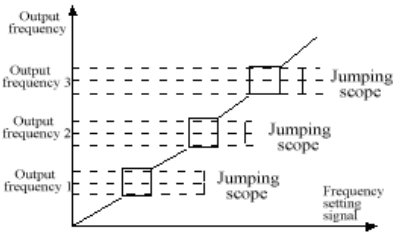


Figure 6.2.5 Hopping frequency and its scope

In P01.30, the widest of the 3 mechanical resonance belts can be set with a frequency scope. After the hopping frequency is set, output frequency of the inverter can be automatically adjusted to outside the mechanical resonance belt to avoid running at resonance frequency even though set frequency of the inverter is within the mechanical resonance frequency belt of the driving system.

Notes:

The 3 hopping frequency scope cannot be set overlapping or nesting.

During the accelerating and decelerating processes, output frequency of the inverter can normally go through the hopping frequency area.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.31	External frequency full scale setting	1.0kHz ~ 50.0kHz	0.1kHz	20.0kHz	O

External frequency full scale setting:

Factory set is 20.0kHz. When function code P00.01 is set to 13, frequency set mode is external switch frequency setting mode. The frequency signal should be input from terminal D8; if function code P01.31 is defined as the set frequency, it corresponds to highest input frequency of D8.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.32	UP/DOWN set speed	0.1 ~ 99.9 Hz/S	0.1kHz	1.0Hz/S	O

UP/DOWN set speed:

Factory set is 1.0Hz/S, refers to frequency increasing speed when UP/DOWN set is used.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.33	Restart after power off	0 No action 1 Action	1	0	O

Restart after power off

Factory set is 0. The motor can run freely after instant power down occurs. After the power is restored, select whether to restart.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.34	AVR function	0 No action 1 Action	1	0	O

Automatic voltage regulation (AVR):

Factory value is 0, Automatic voltage regulation (AVR) is Not valid.

When AVR is valid, the output voltage can be basically maintained at the set value so that the motor

works in original state even the input voltage fluctuates.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.35	No-tripping control	0 No action 1 Action	1	0	O

No-tripping control:

Factory set is 0; the function is not started.

When an inverter with great power runs at 50Hz to drive several motors with small power, if the motor needs to cut in, the inverter shall automatically regulate inside to properly reduce impact current of the motor so that the inverter will not have overcurrent.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P01.36	Keyboard setting frequency compensation	0 OFF 1 ON	1	0	O

When external operated keyboard line is used, line voltage drop will be huge if keyboard line is too long so that when set scope of the panel potentiometer fails to reach 0~50Hz, starting this parameter can compensate this voltage drop.

6.3 The function of I/O Terminals and Multi-speed running P02 group

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P02.00	Function of terminal D1	0 No None 1 Multi-speed terminal 1 2 Multi-speed terminal 2 3 Multi-speed terminal 3 4 Positing rotation inching control 5 Reverse rotation inching control 6 3-line rotation control 7 Accelerating/decelerating time terminal 1 8 Accelerating/decelerating time terminal 2 9 Free stop input 10 External reset input 11 Frequency Up Command (up) 12 Frequency Down Command（down） 13 DC brake control 14 External fault often On input 15 External fault often Off input 16 PLC running temporary stop command 17 Frequency source 1 18 Frequency source 2 19 Frequency source 3 20 Frequency source 4 21 PID control cancelled 22 Timer input 23 Wobbulating switch 24 PLC operation invalid 25 Reset PLC stop state 26 Operation command source 1 27 Operation command source 2 28 Counter input 29 Counter clear 30 Length clear input 31 Length count input 32 Impulse frequency input 33 Encoder impulse A input 34 Encoder impulse B input	1	1	O
P02.01	Function of terminal D2			2	
P02.02	Function of terminal D3			3	
P02.03	Function of terminal D4			6	
P02.04	Function of terminal D5			9	
P02.05	Function of terminal D6			10	
P02.06	Function of terminal D7			33	
P02.07	Function of terminal D8			34	

Terminals D1~~D6 Scope: 【0，1～32】

Terminals D7~~D8 Scope: 【0，1～34】

Control terminals D1～D8 are programmable switching value input terminals. Functions of D1～D8 can be defined respectively by setting **P02.00**～**P02.07.**

For example, if **P02.01=9**, D2 is defined as "Free stop input command"; in operation, when D2 is ON, free stop of the motor can be realized.

Notes:

1. Encoder signal input can be input only from D7 and D8.

2. When one of the terminals selects a function, the other terminals cannot select this function. Programmable switching value input terminals can reselect None (that is, they can be set to 0 at the same time).

When the user selects multi-section frequency in running, 3 switching value input terminals can be defined as multi-section frequency running control terminals; combination state ON/OFF of the 3 terminals select mutli-section frequency already set in parameters **P03.03**, **P03.08**, **P03.13**, **P03.18**, **P03.23**, **P03.28**, **P03.33,** with precedence over frequency set in P00.01 by frequency given mode. Phase frequency selected for multi-speed running terminal is current set frequency of the inverter. See instructions on these parameters.

P02.00=1, **P02.01=2**, **P02.02=3,** that is, multi-speed control can be realized through external switch,

as shown by Figure 6.2.6.

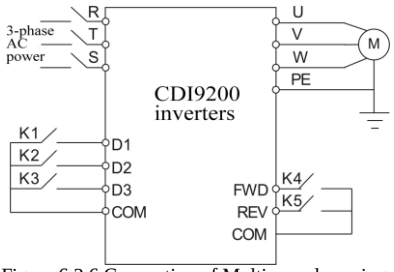


Figure 6.2.6 Connection of Multi-speed running

By combining K1, K2 and K3, mutli-speed running frequency can be selected as per Table 6.2.1. The running process is shown in Figure 6.2.7.

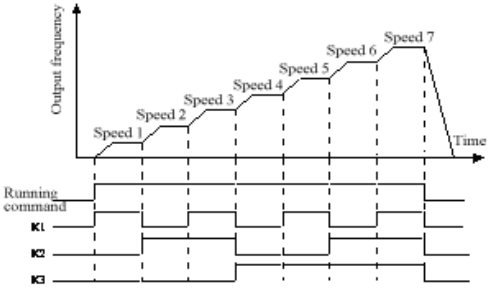


Figure 6.2.7 Multi-speed Running

Table 6.2.1 Selection Table of Multi-speed Running

K3	K2	K1	Frequency Setting
OFF	OFF	OFF	None multi-speed running
OFF	OFF	ON	Multi-section Frequency 1 (P03.03)
OFF	ON	OFF	Multi-section Frequency 2 (P03.08)
OFF	ON	ON	Multi-section Frequency 3 (P03.13)
ON	OFF	OFF	Multi-section Frequency 4 (P03.18)
ON	OFF	ON	Multi-section Frequency 5 (P03.23)
ON	ON	OFF	Multi-section Frequency 6 (P03.28)
ON	ON	ON	Multi-section Frequency 7 (P03.33)

4-5: Inching control of forward rotation and reverse rotation

In terminal control mode (P00.00=1), external terminal can be defined to implement inching control.

JOGF is forward rotation inching running (one of **P02.00**～**P02.07** is set to be 4), JOGR is reverse rotation inching running (one of **P02.00**～**P02.07** is set to be 5). Set frequency of inching running and decelerating/accelerating time are defined in parameters **P01.18**～**P01.20**.

6: 3-line rotation control

This function is used to define input terminal of positive/reverse rotation command in exernal terminal control mode (**P00.00=1**) when 3-line rotation mode is selected. Please see introduction of parameter P02.08.

7-8: Accelerating/decelerating time terminals 1 and 2

Through ON/OFF state combination of multi-section accelerating/decelerating time terminals, selection from accelerating/decelerating time 1～4 can be realized (see instructions on **P00.10**～**P00.11**, **P01.21**～**P01.26**). If the user does not define this function, the inverter shall auto select accelerating/decelerating time 1 except for programmable multi-speed running and inching running. State combination of multi-section accelerating/decelerating time terminals are shown by the table below:

Accelerating/decelerating time terminal 1	Accelerating/decelerating time terminal 2	Selection of accelerating/decelerating time
OFF	OFF	Accelerating time 1/decelerating time 1
ON	OFF	Accelerating time 2/decelerating time 2
OFF	ON	Accelerating time 3/decelerating time 3
ON	ON	Accelerating time 4/decelerating time 4

9: Free stop input

When the terminal defined as this function is ON, the inverter shall stop output immediately to enter shutdown state and the motor shall stop freely.

10: External reset input

When the inverter alarms for fault that occurs, it can be reset through external terminal. Electric level of the function for input signal is valid.

11-12: Frequency Up Command and Frequency Down Command

Please see instructions on frequency set modes 6, 7, 8, 9 in parameter P00.01.

13: DC brake

When the terminal defined as this function is ON and **P01.03=0**, the inverter reduces output frequency in form of reducing speed to shutdown after it receives shutdown command. When the output frequency is less than or equal to starting frequency of shutdown DC brake, output frequency of the inverter directly jumps to 0 to implement DC brake control by parameter **P01.04**～**P01.06**.

14-15: External fault often On input and External fault often Off input

Through this terminal, fault signal of external equipment can be input, used for the inverter to monitor fault in external equipment and interlock. The inverter implement shutdown due to fault and display external equipment fault code "EF" after receiving external equipment fault signal in running; when implementing normal shutdown, this fault signal is invalid. External equipment fault signal can select offen ON input mode or often OFF input mode. As shown by Figure 6.2.8, D4 is defined as offen ON input mode (one of **P02.00**～**P02.07** is set to 14) and D5 is defined as offen OFF input mode (one of **P02.00**～**P02.07** is set to 15); KM1 and KM2 are external equipment fault relay or contactor (using its auxiliary contact).

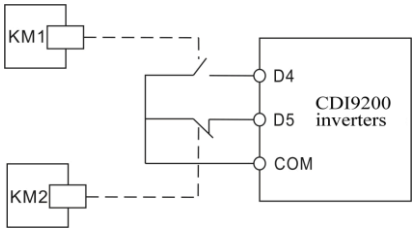


Figure 6.2.8 Often ON/OFF input of external equipment fault

16: PLC running temporary stop command

If defined as this function, when the inverter is in PLC running state and the terminal is ON, PLC in running can be temporarily stopped. When OFF, restore PLC temporarily stopped to running. Please see instructions on **P03.00**～**P03.36** in P02 parameter group for the application method.

17-20: Frequency sources

Use terminal to select frequency given mode. Set any 4 terminals (for example, D1, D2, D3, D4) to be 17, 18, 19, 20 respectively, their frequency source combinations are shown in the table below.

The terminal is 1 when closing up and 0 when breaking off. It is multifunction terminal selection when this function is used. Please see P00.01=14.

21: PID control cancelled, using terminal function to cancel PID control.

22: Timer input, external timer input terminal.

23: Wobbulating switch, the function decides whether to use wobbulating function.

24：PLC operation invalid

Used to realize flexible switch between PLC running state and lower grade running modes, starting/stop control, direction and accelerating/decelerating time observe setting of relative running mode when switching to lower grade running mode.

25: In shutdown state of PLC running mode, this functional terminal can remove information of PLC running phase, running time and frequency in PLC shutdown memory when valid. See introduction to P03.

26-27: Operation command sources

26 Operation command source 1

27 Operation command source 2

28-29: Counter functions

This parameter sets value of the counter inside CDI9200. The counter can be used as triggering terminal by the external terminal at the control circuit.

30：Length clear input.. If valid, this function can clear the actual length function code P03.46 to zero.

31: Length count input

Only valid for multifunction input terminal D6, the function terminal is used for fixed length control to calculate length of impulse input as in P03.45～P03.50.

32: Impulse frequency input

Only valid for multifunction input terminal D6, the function terminal receives impulse signal to be relationship between frequency given, input signal impulse frequency and set frequency.

33-34: Encoder impulses A and B input

Only proper for D7 and D8, other terminals D1～D6 have not functions 33 and 34, used to input speed feedback of the rotator in V/F loop control.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P02.08	External terminal running control modes	0 2-line control mode 1 1 2-line control mode 2 2 3-line control mode 1 3 3-line control mode 2	1	0	O

0: 2-line control mode 1

K1	K2	Running command
0	0	Stop
0	1	Reverse rotation
1	0	Forward rotation
1	1	Stop

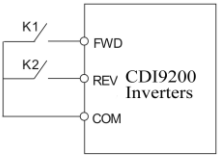


Figure 6.2.9 2-line control mode 1

1: 2-line control mode 2

K1	K2	Running command
0	0	Stop
0	1	Stop
1	0	Forward rotation
1	1	Reverse rotation

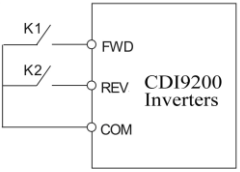


Figure 6.2.10 2-line control mode 2

2: 3-line control mode 1

K	Running directions
0	Forward rotation
1	Reverse rotation

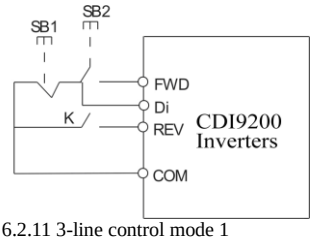


Figure 6.2.11 3-line control mode 1

In Figure 6.2.11, SB1 is often OFF shutdown button and SB 2 is often ON running button. SB1 and SB2 are impulse edge valid; K is running direction selecting button; and Di is the terminal that has been defined as 3-line control mode 1 among D1～D8.

3: 3-line control mode 2

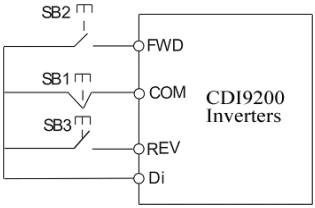


Figure 6.2.12 3-line control mode 2

In Figure 6.2.12, SB1 is often OFF shutdown button, SB2 is often ON forward rotation button and SB3 is off ON reverse rotation button Di is the terminal that has been defined as 3-line control mode 2 among D1～D8.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P02.09	Open collector output terminal YO functions	Inverter running signal 1 Frequency arrival signal 2 Frequency level inspection signal (above) 3 Frequency level inspection signal (equal to) 4 Frequency level inspection signal (less than) 5 Overload alarm signal 6 External fault shutdown 7 Undervolatge shutdown 8 Output frequency arriving at upper limit 9 Output frequency arriving at lower limit 10 PLC phase operation completed 11 PLC circulation cycle completed 12 Inverter operated at zero speed 13 Fault indication 14 Timer output 15 VF1 (VF2) signal lost 16 Inverter prepared 17 Set length arriving indication 18 Set counting value arriving 19 Cycle counting value arriving 20 Overload pre-alarm signal	1	14	O
P02.10	Programmable relay T1A, T1B, T1C output			0	
P02.11	Programmable relay T2A, T2B, T2C output			13	

Functions of open collector are shown in the table below:

0: Signal that the inverter is in operation. When the inverter is in operation, the terminal outputs indicating signal.

Frequency arrival signal, please see instructions on P02.12.

2-4: Frequency level signal inspection, please see instructions on P02.13.

5: Overload alarm signal. When the inverter is overloaded, the terminal inputs indications.

6: External fault shutdown. After the switch input terminal receives external equipment fault signal, the keyboard shows “EF” terminal output signal.

7: Undervolatge shutdown, when DC bus voltage occurs undervoltage, the keyboard LED shows “P.oFF” and the terminal outputs indicating signal at the same time.

8: Output frequency arriving at upper limit. When output frequency of the inverter arrives at upper

frequency, the terminal output indicates signal.

9: Output frequency arriving at lower limit. When output frequency of the inverter arrives at lower frequency, the terminal output indicates signal.

10: PLC phase operation completed. When each operation phase completes in PLC phase, the terminal outputs indicating signal for 1 second.

11: After PLC completes a cycle, the terminal outputs indicating signal.

12: When the inverter is running at zero speed, output indicating signal when the inverter starts the motor at 0 speed.

13: Fault indication. When fault occurs to the inverter, output indicating signal.

14: Timer output. When the timer outputs, the terminal outputs indicating signal.

15: VF1 (VF2) signal lost. When feedback reduces to below inspection voltage, output a contact signal.

16: Inverter prepared, when the inverter is powered on, all is normal.

17: Set length arriving indication

18: Set counting value arriving

19: Cycle counting value arriving

17-19: Refer to instructions on P02.34～P02.35.

20: Overload pre-alarm signal

When total overload is more than value of P00.25, output indicating signal.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P02.12	Frequency arriving at checkout width	0.00~10.00Hz	0.01Hz	2.00Hz	O

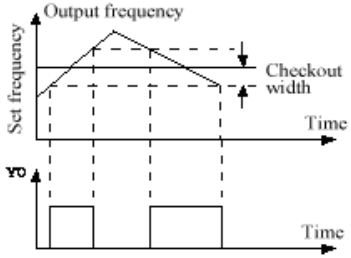


Figure 6.2.13 Frequency arrival signal and frequency arriving at checkout width

As in Figure 6.2.13, when output frequency of the inverter is within positive and negative checkout width of the set frequency, YO outputs indicating signal.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P02.13	Frequency level signal inspection	0.00~Highest frequency	0.01Hz	10.00Hz	O
P02.14	Frequency inspection scope	0.00~50.00HZ	0.01Hz	5.00Hz	O

When the inverter output frequency exceeds certain value, YO outputs indicating signal.

Then when the inverter output frequency reduces, YO continues to output indicating signal till the output frequency reduces below set value of the parameter, as shown in Figure 6.2.14.

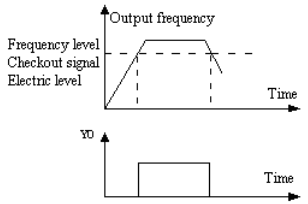


Figure 6.2.14 Frequency level checkout signal

When one of P02.09~P02.11 is set to be 2,

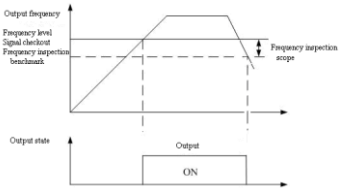


Figure 6.2.15 Output frequency≧ frequency inspection bench

When one of P02.09~P02.11 is set to be 3,

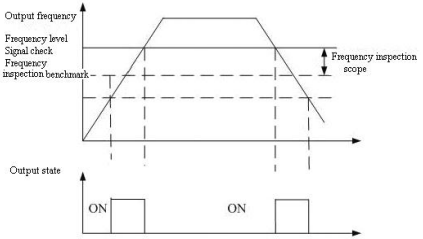


Figure 6.2.16 Output frequency≧ frequency inspection bench

When one of P02.09~P02.11 is set to be 4,

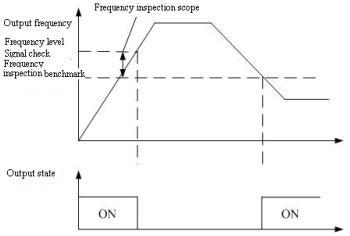
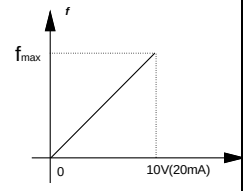


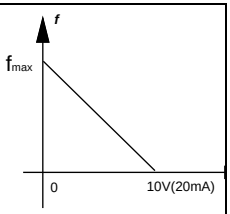
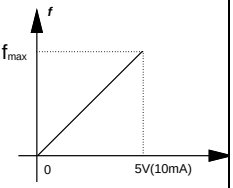
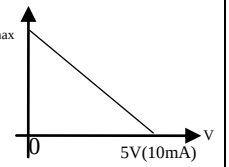
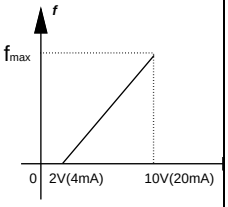
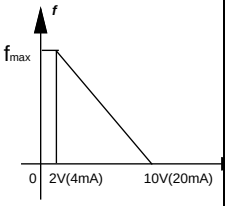
Figure 6.2.16 Output frequency≦ frequency inspection bench

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P02.15	Analog quantity imput terminal VF1	0 0~10V /0~20mA 1 10~0V /20~0mA 2 0~5V /0~10mA 3 5~0V /10~0mA 4 2~10V /4~20mA 5 10~2V /20~4mA	1	0	O
P02.16	Analog quantity imput VF1 filtering time	0.01~20.00S	0.01	0.01S	O
P02.17	VF1 frequency offset	-50.0~+50.0HZ	0.1 HZ	0.0 HZ	O
P02.18	VF1 frequency gain set	1~200%	1%	100%	O
P02.19	Analog quantity imput terminal VF2	0 0~10V /0~20mA 1 10~0V /20~0mA 2 0~5V /0~10mA 3 5~0V /10~20mA 4 2~10V /4~20mA 5 10~2V /20~4mA	1	0	O
P02.20	Analog quantity imput VF2 filtering time	0.01~20.00S	0.01	0.01S	O
P02.21	VF2 frequency offset	-50.0~+50.0HZ	0.1 HZ	0.0 HZ	O
P02.22	VF2 frequency gain set	1~200%	1%	100%	O

CDI9200 provides two analog quantity input channels, both of which can select voltage or current input mode, to be decided by P02.15 and P02.19. The user can select voltage or current input by switch JP1.

Table 6.2.2 I/O performance of analog input signal and set frequency

Value of P02.15	Value of P02.19	VF1 and VF2 input scope	Set frequency scope	Action mode	Mutual relationship between input analog signal and set frequency
0	0	0~10V or 0~20mA	0~Fmax	Direct action	

1	1	10~0V or 20~0mA	0~Fmax	ounteract ion	
2	2	0~5V or 0~10mA	0~Fmax	Direct action	
3	3	5~0V or 10~0mA	0~Fmax	Countera ction	
4	4	2~10V or 4~20mA	0~Fmax	Direct action	
5	5	10~2V or 20~4mA	0~Fmax	Countera ction	

Output frequency=analog signal VFi×VFi frequency set gain +VFI frequency offset.

Input filtering time of VF1 and VF2 of P02.16 and P02.20, the user can set this parameter to determine response time of frequency setting.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P02.23	Auxiliary adjusting quantity set	-100.0%~+200.0%	0.1%	100.0%	O
P02.24	Auxiliary quantity reference channel	0: VF1 1: VF2	1	0	O

Both function codes are valid when **P00.01＝4, 5**. In digital keyboard+ analog terminal and VF1+VF2 mode, auxiliary given is fine tuned on basis of main given. Set frequency =main given frequency+ auxiliary given frequency ×auxiliary regulating value.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P02.25	Analog quantity input thread break detection	0 Alarm and shut down 1 Operate at lower frequency and output indication signal 2 Not conduct thread break detection	1	0	O

0: When 4~20mA signal line is broken, alarm and shut down.

1: When 4~20mA signal line is broken, do not alarm and run at lower frequency. When implementing loop (P04.10=1), running frequency takes the greater one from lower frequency and loop minimum frequency.

2: When 4~20mA signal line is broken, do not inspect the broken line.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P02.26	Analog output 1 cotnrol	0 0~10V/0~20mA 1 2~10V/4~20mA	1	0	O
P02.27	（Analog output 1 setting （0~10V/0~20mA）	0 Output frequency 1 Output voltage 2 Output current 3 VF1 4 VF2 5 |VF1- VF2|	1	0	O
P02.28	Analog output 1 zero point	0~4000	1	360	O
P02.29	Analog output 1 full scale point	4000~8000	1	7550	O
P02.30	Analog output 2 control	0 0~10V/0~20mA 2 2~10V/4~20mA	1	0	O
P02.31	Analog output 2 setting （0~10V/0~20mA）	0 Output frequency 1 Output voltage 2 Output current 3 VF1 4 VF2 5{ VF1- VF2}	1	0	O
P02.32	Analog output 2 zero point	0~4000	1	360	O
P02.33	Analog output 2 full scale point	4000~8000	1	7550	O

CDI9200 provides two ways for current (0-20mA) or voltage (0-10V) analog output. The user can select through switch JP2 (control FM1) and JP3 (FM2).

The user can correct the zero point of FM1 and FM2 through P02.28 and P02.32.

For example, when P02.27 is set to 0, if the output frequency is 0Hz, the error can be eliminated by reducing value of P02.28 if output voltage of FM1 has fine positive voltage. Similarly, if output requency arrives at 50Hz and output voltage of FM1 fails to arrive at 10V, the output voltage can be lifted by increasing P02.29 properly.

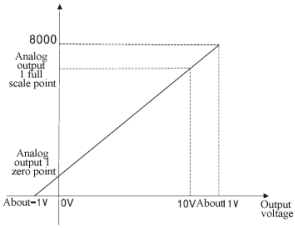


Figure 6.2.17 Analor output zero point 1 and full scale point 1

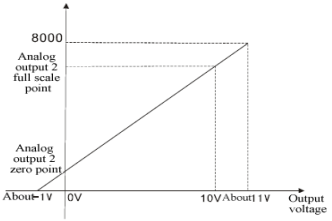
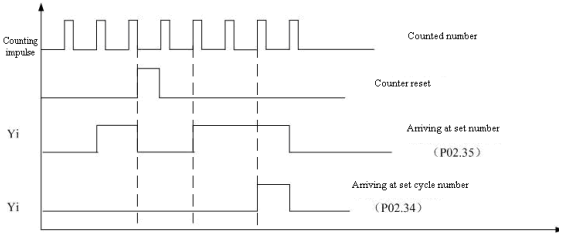


Figure 6.2.18 Analor output zero point 2 and full scale point 2

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P02.34	Cycle counting value	0~9999	1	0	O
P02.35	Setting counting value	0~Cycle counting value	1	0	O



As shown in the diagram, set P02.34 to 4 and P02.35 to 2.

Counting impulse is input through one of D1～D8.

If Yi (P02.09～P02.11) is set to 18, output signal when counting value is greater than 2.

If Yi (P02.09～P02.11) is set to 19, output signal when counting value is greater than 4.

6.4 Parameter group P03

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P03.00	Setting of programmable multi-speed operation	0 None 1 single circulation 2 Constant circulation 3 Maintain final value	1	0	O

0: None 1: single circulation (shutdown after a circulation) 2: Constant circulation (circulate constantly as per the phase parameter set)

3: Maintain final value (after a circulation, run at set frequency of the final phase)

PLC running takes precedence over set frequency of **P00.01** frequency given mode and multi-speed running of external terminal, except for inching running.

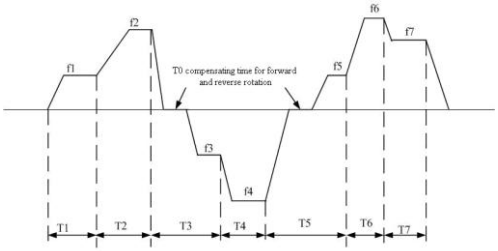


Figure 6.3.1 PLC running diagram

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P03.01	Options to break off and restart PLC	0 Restart from first phase 1 Restart from phase frequency when it breaks off	1	0	O

0: When one terminal of D1~D8 is set to 24 (PLC operation is invalid), the terminal is valid or there is shutdown command input. When function of invalid PLC running is removed or there is shutdown command input again, the inverter shall automatically return to first section running.

1: When the above happens, the inverter continues running at phase frequency when it breaks off and power down shall be stored automatically. When there is input of running command after charged, the inverter similarly start to run at phase frequency when it breaks off. Unless at shutdown, if PLC

shutdown reset terminal has input, then run phase clearing to start from the first phase after starting.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P03.02	Phase 1 frequency source	0 decided by phase 1 running frequency 1 decided by P0.01	1	0	O

0: Decided by the running frequency of phase 1.

1: Decided by P00.01.

Function code	Name	Stting scope	Min. unit	Factory setting	Change limit
P03.03	Phase 1 running frequency	Lower frequency ~ upper frequency	0.00Hz	5.00Hz	O

This function code sets running frequency of phase 1. The running frequency is running set frequency of phase 1 of PLC running and also set frequency of phase 1 of multi-section running of external terminal control.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P03.04	Phase 1 rotating direction	0 forward rotation 1 reverse rotation 2 terminal control	1	0	O

This function code sets running direction of phase 1. The direction is running set direction of phase 1 of PLC running. When set to terminal control 2, it is valid only when P00.00=1. Otherwise, continue the running direction of the lase section.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P03.05	Phase 1 running time	0.0~6000S	0.1S	20.0S	O

This function code sets total running time of phase 1, only used for running time of phase 1 of PLC running, including time used for acceleration or deceleration in phase 1.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P03.06	Phase 1 running time	1~4	1	1	O

This function code is used to select time parameters **P00.10～P00.11** and **P01.21～P01.26** for acceleration and deceleration in this phase.

0: Accelerating/decelerating time 1, this time is set by function codes **P00.10～P00.11**.

1: Accelerating/decelerating time 2, this time is set by function codes **P01.21～P01.22**.

2: Accelerating/decelerating time 3, this time is set by function codes **P01.23～P01.24**.

3: Accelerating/decelerating time 4, this time is set by function codes **P01.25～P01.26**.

Notice: P03.07~P03.36 are parameter functions in pahse 2~ phase 7. their instructions are similar to phase 1.

Notes:

1. Starting and stopping commands of PLC running are decided by current running command control mode (decided by **P00.00**).

2. If running time of certain phase is set to 0, then this phase can jump over when PLC running. So it can be easily to set phase number of PLC running.

3. If switch input terminal is set to PLC temporary stop function (function 16), the terminal can temporarily stop PLC running. When the terminal is ON, PLC running can be stopped temporarily

and the inverter runs at zero speed; when the terminal is OFF, the inverter returns to the state before temporary stop of PLC running to continue running.

4. When **P04.08=1** (forbid reverse direction), if running command direction of phase 1 is set to reverse rotation, PLC running can be forbidden; if running command direction of intermediate phases is set to reverse rotation, the inverter shall stop.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P03.37	Wobbulating mode	0 Terminal control 1 Valid always	1	0	O
P03.38	wobbulating range	0.10~50.00Hz	0.01Hz	5.00Hz	O
P03.39	Wobbulating running difference	0.00~5.00Hz	0.01Hz	1.00Hz	O
P03.40	Wobbulating ascending time	0.1~3600s	0.1S	20.0S	O
P03.41	Wobbulating descending time	0.1~3600s	0.1S	20.0S	O

When wobbulating mode is 0, one terminal of D1~D8 is 23 and this terminal is valid, run in wobbulating mode.

When wobbulating mode is 1, No matter what state of terminal, it always put to run with wobbulating mode.

According the parameters of wobbulating running up and down to calculate the acceleration and deceleration time, the setting frequency should be slightly higher than the wobbulating running range .

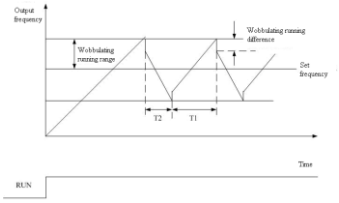


Figure 6.3.2 Wobbulating running

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P03.42	Close-up time	0.0~6000S	0.1S	20.0S	O
P03.43	Break-off time	0.0~6000S	0.1S	20.0S	O

Set timer function close-up and break-off time.

When “Connected” of the timer is longer than time set by P03.42, output of the timer is connected.

When “Break on” input by the timer is longer than time set by P03.42, output of the timer breaks off.

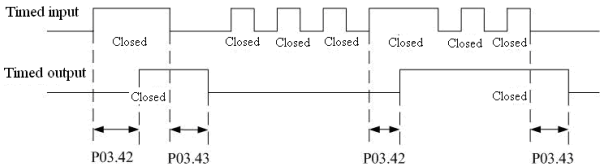


Figure 6.3.3 Timer Functions

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P03.44	Fixed length switch	0 None 1 action	1	0	
P03.45	Set length	0.000~60.000Km	0.001	0.000	
P03.46	Actual length	0.000~60.000Km	0.001	0.000	
P03.47	Length multiplying factor	0.001~30.000	0.001	1.000	
P03.48	Length correction ratio	0.001~1.000	0.001	1.000	
P03.49	Measure axle perimeter	0.01~100.00cm	0.01	10.00cm	
P03.50	Axle impulse for each cycle	1~9999	1	1	

Regrouping function is used to realize shutdown at fixed length.

When the inverter inputs counting impulse from the terminal (D6 is defined as function 31), calculate the length as per impulse quantity (P03.50) and axle perimeter (P03.49) of speed measuring axle in each cycle.

Calculated length=counted impulse quantity/impulse quantity in each cycle* perimeter of measuring axle.

Correct the calculated length through length multiplying factor (P03.47) and length correction ratio (P03.48) to obtain the actual length.

Actual length=calculated length* length multiplying factor/ length correction ratio

After actual length (P03.46) ≧set length (P03.45), the inverter shall automatically send shutdown command to shut down. Before restarting, clear the actual length (P03.46) to zero or correct the actual length (P03.46) < set length (P03.45); otherwise, it cannot be started.

Clear to zero. This function can be realized by setting D1~D8 to 30 length clear input.

6.5 Other function parameter group P04

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.00	Auto energy-saving running	0 None 1 action	1	0	O

Energy-saving running used for load with stable torque.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.01	Carrier frequency adjusting	1~10 kHz	1kHz	Machine type	X

This function sets carrier frequency output by PWM and switch of carrier frequency has 10 options (1～10).

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.02	Overvoltage stalling switch	0 None 1 action	1	0	O
P04.03	Stalling overvoltage point	120~150%	1%	140%	O

Overvoltage stalling protection: During running at decelerating speed, through inspecting bus voltage and comparing with stalling overvoltage point defined by P03.03, if bus voltage exceeds overvoltage point, the inverter stops speed reducing. After bus voltage is lower than overvoltage point, keep reducing speed, as shown in Figure 6.4.1.

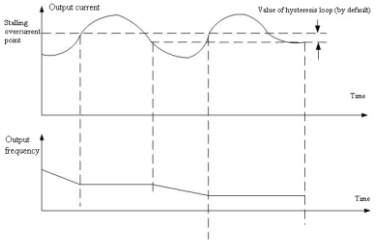


Figure 6.4.1 Overvoltage stalling diagram

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.04	Stalling overcurrent switch	0 None 1 action	1	0	
P04.05	Stalling overcurrent point	120~200%	1%	160%	O

During acceleration and deceleration of the inverter, because accelerating and decelerating time fail to match motor inertia quantity or load changes abruptly, current shall rise quickly. Stalling overcurrent protection is to stop accelerating and decelerating process of the inverter when actual output current reaches stalling overcurrent point by inspecting output current of the inverter and comparing with stalling overcurrent point till the current is lower than stalling overcurrent point; then keep accelerating or decelerating. Stalling overcurrent protection process is shown in Figure 6.4.2.

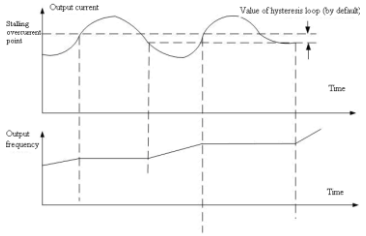


Figure 6.4.2 Stalling overcurrent protection during acceleration

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.06	Stalling overcurrent frequency decreasing rate	0.00~99.99HZ/s	0.01	10.00	

Stalling overcurrent frequency decreasing rate defines speed rate of output frequency when stalling. If frequency decreasing rate is too small during stalling overcurrent action, it may not be easy to get rid of stalling overcurrent state so that may finally cause overload fault; if decreasing rate is too large, then frequency regulating degree intensifies. The inverter may be at electricity generating state for a long time to cause overvoltage protection

During stalling overcurrent, output frequency may change. So in place where output frequency is relatively stable when required to run at constant speed, stalling overcurrent action is not proper to use.

When stalling overcurrent is valid, because setting of current limit is too low, overload capacity of the inverter may be affected. △f=stalling overcurrent frequency decreasing rate *(t2-t1)

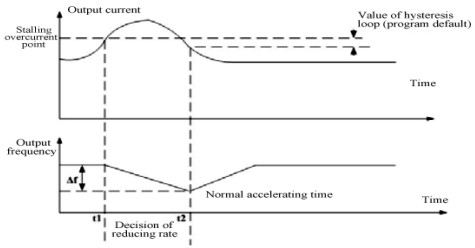


Figure 6.4.3 Stalling overcurrent protection at constant speed

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.07	Auto torque lifting	0 None 1 action	1	0	O

Used to improve torque performance of the motor running at low frequency. Using this function can automatically regulate output voltage of the inverter as per the load current to lift torque when rotating at low frequency and avoid overexcitation when the motor has no load. (This function is used for special motor.)

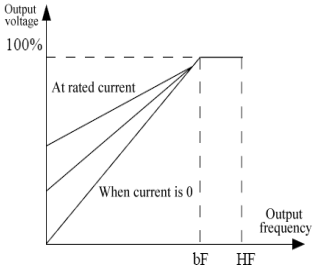


Figure 6.4.4 Auto torque lifting

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.08	Reverse rotation prevention	0 None 1 action	1	0	O
P04.09	Fan controls	0 None 1 as per whether running 2 as per temperature	1	0	O

0 No control, the fan runs after powered.

1 Delay 30s to stope after the fan stops when the inverter is running as per whether controls the running.

2 As per temperature control, if fan control selects option 1, when the inverter is running, the fan rotates when the radiator is above 45℃; if temperature of the radiator is lower than 40℃, the fan stops rotating after a delay of 30s.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.10	PID controls	0 None 1 action 2 Positive action	1	0	O
P04.11	PID reference options	0 digital setting 1 VF1 2 VF2 3 RS485 reference	1	0	O
P04.12	digital set value	0.0%~100.0%	0.1%	50.0%	O
P04.13	Feedback input channels	0 VF1 analog input channel VF1 1 analog input channel VF2 2 VF1 + VF2 3 VF1 – VF2 4 Min{VF1,VF2} 5 Max{VF1,VF2} 6 impulse feedback channel	1	0	O

PID control and given quantity, feedback in PID control are input from the 4 channels in the above. Mutual relationship between input signal and frequency of **VF1** and **VF2** refers to setting of function codes **P02.15~P02.22**; impulse feedback channel from impulse signal of the encoder is input from terminals D7 and D8 (parameter **P02.06** and **P02.07** are set to 33 and 34 respectively).

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.14	Proportional gain	0.0% ~ 999.9%	0.1%	10.0%	O
P04.15	Integration time	0.0 (none Integration) 0.01~99.99S	0.01S	10.0S	O
P04.16	Derivation time	0.0 (none Derivation) 0.01~99.99S	0.01S	0.0S	O

*When proportional gain is great, it responds quickly. But if too great, it may vibrate; when proportional gain is small, it responds slowly. *When integration time is great, it responds slowly and its control of external disturbance shall worsen; on the contrary, when integration time is small, it responds quickly, but if too small, it may vibrate. *Derivation time can set limit for gain provided by the differentiator to ensure that a pure derivation gain can be obtained at low frequency and a permanent derivation gain can be obtained at high frequency.

Notes:

1. Parameter P04.14 increases when no vibration occurs.

2. Parameter P04.15 decreases when no vibration occurs.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.17	sampling cycle	0.0 (None sampling cycle) 0.01~99.99S	0.01S	0.05S	O

Used for sampling time of loop feedback.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.18	Deviation limit	0.0~20.0%	0.1%	0.0%	O

System output relates to maximum deviation rate of loop given value.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.19	Preset frequency of closed loop	0.00~ The highest frequency	0.01	0.00	O
P04.20	Preset frequency holding time	0.0~999.9S	0.1	0.0	O

When PID starts to run, after running for time set by P04.20 at frequency set by P04.19, PID starts to adjust.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.21	Loop min. running frequency	0.00~P04.22	0.01	0.00	O
P04.22	Loop max. running frequency	P04.21~The highest frequency	0.01	50.00	O

Minimum running frequency and maximum running frequency when PID running. If lower frequency is more than minimum running frequency, then run at lower frequency if frequency at running is less than lower frequency but greater than minimum running frequency (please refer to P02.25).

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.23	Impulse of photoencoder during each cycle	1~9999	1	1024	X

Set as per selected impulse of photoencoder each cycle.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.24	Range of transmissible pressure gauge	0.01~20Mpa	0.01	1Mpa	O
P04.25	Wakening threshold	0.01~Sleep threshold	0.01	0.01 Mpa	O
P04.26	Sleep threshold	Wakening threshold~ range of pressure gauge	0.01	1Mpa	O
P04.27	Sleep waiting time	0~999.9S（Sleep when set to 0, this function is invalid）	0.01	0S	O

Range of transmissible pressure gauge: set the value as per the pressure gauge actually used.

Wakening threshold: the parameter defines pressure limit that the system enters from sleeping state to working state. When pipeline pressure is less than this set value, it indicates that pressure of tap water reduces or water consumption increases and variable frequency water supply shall automatically transfer from sleeping state to working state.

Sleep threshold: the parameter defines pressure limit that the system enters sleeping state. When pipeline pressure is more than this set value and the inverter has reached loop minimum operation frequency (P04.21) to operate, it indicates that actual water consumption rapidly reduces or pressure of tap water is normal; after sleep waiting time (P04.27) is delayed, variable frequency water supply system automatically enters sleeping state, shuts down waiting for awakening.

Sleep waiting time: the parameter defines waiting time when variable frequency water supply system meets the sleeping conditions. Only when sleeping conditions are met within this time defined can variable frequency water supply system enters sleeping state.

function code	name	setting scope	min. unit	factory setting	change limit
P04.28	Baud rate	0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps 4:19200bps 5:38400bps	1	2	O
P04.29	data format	0: N 8 1(None) 1: E 8 1 (Even) 2: O 8 1 (Odd)	1	0	O
P04.30	machine code	1~31	1	1	O
P04.31	Time to detect transmission broken off	0~100.0S (0 indicates no detection）	0.1	0S	O
P04.32	Transmission error handling	0 alarm 1 alarm and shut down	1	0	O

Setting scope: 0~100.0S

When P04.28 is set to 1, if during communication between the inverter and computer, one fails to reply after exceeding time set by P04.27, display error and stop the inverter emergent;y. If set to 0, it shall not implement this function.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.33	Display ratio setting	0.01~200.0	0.1	1.0	O

Only output frequency display of this function is valid: display value=output frequency×display ratio setting.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.34	LED shutdown monitor content 1	0~24	1	1	
P04.35	LED shutdown monitor content 2	0~24	1	4	
P04.36	Shutdown monitor 1 show time	0 no switch 1~100S	1	0	
P04.37	Shutdown monitor 2 show time	0 no switch 1~100S	1	0	
P04.38	LED running monitoring 1	0~24	1	0	O
P04.39	LED running monitoring 2	0~24	1	2	O
P04.40	Monitor 1 show time	0 no switch 1~100S	1	0	
P04.41	Monitor 2 show time	0 no switch 1~100S	1	0	

P04.34 and P04.35 determine contents under monitor when shut down.

P04.36 and P04.37 define time to display monitor content 1 and monitor content 2 respectively. When both set to 0, it is required to show monitor content 1 only; otherwise switch between content 1 and content 2 as per set time.

P04.34 and P04.37 determine contents under operation monitor.

The above monitoring contents 30, 31, 33 and 35 can be checked through ShIFt key no matter whether operated or stopped under monitor.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.42	Parameter write-in protection	0 All data rewriting allowed 1 Only P0.02 and this function allows rewriting 2 Only this function allows rewriting	1	0	O

The function code itself allows rewriting at any time: when other function codes are at read only state, change can display “d.Err”.

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.43	Initialize parameters	0 None 1 Delete memory information 11 Reset value set at factory	1	0	O

0: None

The inverter is at normal parameter reading and writing states.

Whether parameter can be changed is related to parameter write-in and protection state and

current working condition of the inverter.

1: Delete memory information

After set to 11 and confirmed, the inverter shall clear memory information of faults.

Fault memory information deletion operation shall delete values stored in all parameters between **P05.25～P05.28**. During this process, keyboard LED displays "-----"; when reading values of **P05.25～P05.28**, keyboard LED displays "non".

2: Reset value set at factory

After set to 11 and confirmed, the inverter shall reset all parameters between P00～P03 to default values when delivered out of factory. During this process, keyboard LED displays "-----".

Function code	Name	Setting scope	Min. unit	Factory setting	Change limit
P04.44	Input factory code	****	1		O

Input of factory code displays the function group used only by the factory.

6.6 Display function parameter group P05

Function parameters **P05.00~P05.31** display current state of the inverter, including:

Function code	Name	Function code	Name
P05.00	Output frequency 0.00~ The highest frequency	P05.16	Running time of this phase
P05.01	Set frequency 0.00~ The highest frequency	P05.17	Remaining time of this phase
P05.02	output current 0.0~999.9A	P05.18	Total working time
P05.03	Output voltage 0.0~450V	P05.19	Total output power (high)
P05.04	Bus voltage 0.0~800V	P05.20	Total output power (low)
P05.05	I/O signal	P05.21	VF1 input
P05.06	Loop set value 0.0%~100%	P05.22	VF2 input
P05.07	Loop feedback 0.0%~100%	P05.23	VF1 input (after change)
P05.08	Module temperature 25 °~85 °	P05.24	VF2 input (after change)
P05.09	Motor synchronous speed	P05.25	The first fault ecord
P05.10	Motor actual speed	P05.26	The second fault ecord
P05.11	Counter value	P05.27	The third fault ecord
P05.12	Actual length	P05.28	The fourth fault ecord
P05.13	Set length	P05.29	The overcurrent ecord
P05.14	Total oveload	P05.30	The overvoltage record
P05.15	Running phase isplay	P05.31	The current fault state

The user can check some current state information of the inverter by setting this paramgeter group, useful for the user to understand working state and faults of the inverter (these information can be checked when the inverter is running).

Display rule for P05.05 in the above table is shown in the diagram below:

As shown in the diagram:

Whether 5-bit digital tube is lightened indicates the terminal having input or output signal.

Example: D1, D3 and D5 input signals, digital tube is lightened. When pole of the open collector outputs, T1 is lightened; when multi-functional relay 1 (T1A, T1B, T1C) or multi-functional relay 2 (T2A, T2B, T2C) outputs, T2 and T3 are lightened.

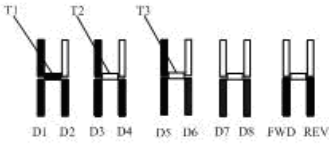
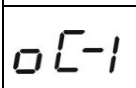
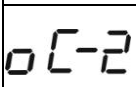
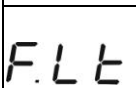
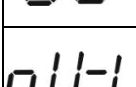
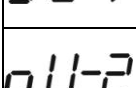
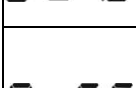
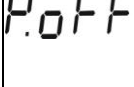


Figure 6.5.1 Input and output signal

Chapter 7 Fault Handling

7.1 Fault Diagnosis and Elimination

Fault display	Description	Details	Fault elimination
	Over-current at constant speed	The output current exceeds the over-current value while the inverter is running at a constant speed	Check whether motor line is in short circuit; Check whether line from the inverter to the motor is too long; Extend acceleration / deceleration time Check the insulation of the motor Increase low-frequency torque compensation
	Over-current at acceleration	When the inverter accelerates, output current exceeds overcurrent (2.2 times of rated current of the inverter)	
	Over-current at deceleration	When the inverter decelerates, output current exceeds overcurrent (2.2 times of rated current of the inverter)	
	Module fault	External fault has triggered automatic module protection	Check the motor coil resistance Check the insulation of the motor Inverter module breakdown
	Over-voltage at constant speed	When the inverter runs at constant speed, DC voltage of the main circuit exceeds this set value. (exceeding 750V)	Check the electric level 200V: about 400VDC 400V: about 750VDC 660V: about 1300VDC Prolong decelerating time and install brake unit and brake resistor. Whether input voltage is too high Whether bus voltage is correctly displayed
	Over-voltage at acceleration	When the inverter accelerates, DC voltage of the main circuit exceeds this set value. (exceeding 750V)	
	Over-voltage at deceleration	When the inverter decelerates, DC voltage of the main circuit exceeds this set value. (exceeding 750V)	
	Under-voltage	Under-voltage in the main circuit, check the electric level: 190VDC for 200V-level 380VDC or less for the 400V-level 700VDCor less for the 660V-level	Check the power line Calibrate inlet voltage Is input voltage too high? Is the bus voltage display correct?
	Overheat	Heat sink temperature ≥oh detection value (about 80℃, from temperature switch)	Check wind machine temperature and ambient temperature, and the ventilation of the heat sink Remove the dirt at the air inlet of the heat sink
	Motor overload	Motor and current exceed the rated current, as in P00.24.	Reduce the load; Increase value of P00.24; Correctly set rated current of the motor.

oL2	Inverter overloaded	Motor and current exceed the rated load	Reduce the motor load; Increase power of the inverter;
EF	External fault	Fault in the external control circuit	Check the external control circuit
EEP	EEPROM fault	Fault in the control unit of the inverter	Restore factory setting and modify necessary functions. If the fault persists, replace the control and plug-in panels
uF-oP	VF1 fault	VF1 set channel is broken	Check whether external terminal line is correctly connected Refer to setting of parameters P02.15, P02.19, P02.25
1F-oP	VF2 fault	VF2 set channel is broken	

7.2 Alarm display and explanation

Alarm display	Content	Explanation
dErr	Wrong parameter setting	Parameter setting is wrong or cannot be changed in operation
StoP	Sharp stop	Double click STOP RESET for emergency shutdown, double click again releases emergency shutdown.
dcon	In DC brake	DC brake parameter or terminal is started and in brake
non	No record of fault	No record of fault
FrEE	Free stop	Free stop parameter or terminal is started and in free stop

7.3 Motor Fault and Its Elimination

If any of the faults below occurs to your motor, find out the causes and take corresponding corrective measures.

If the fault persists, please contact your DELIXI distributor immediately.

Motor Fault and Its Elimination：

Fault	Tips for checking	Corrective measures
The motor does not rotate.	Has the power voltage been delivered to the terminals R, S and T?	Switch on the power supply; switch it off and on again; check power voltage; make sure the terminal bots have been tightened
	Measure the voltages of terminals U, V and W with a rectifier-type voltmeter. Are they right?	Cut off power supply and switch it on again
	Has the motor been locked due to overload?	Reduce load and lift the lock
	Is there any fault information displayed on the monitor of the operator?	Check the fault according to the table of faults
	Has the instruction for forward or reverse rotation been fed in?	Check the wiring
	Has the frequency-setting signal been fed in?	Change the wiring, check the frequency-setting voltage
	Has the running mode been set up correctly?	Put in the correct setup
The motor rotates in opposite direction	Is the wiring of terminals U, V and W correct?	Wire them to the lead wires U, V and W of the motor in accordance with the phase sequence
	Is the input signal connection right for the forward/backward rotation?	Change the wiring
The motor rotates, but is incapable of speed changing.	Is the wiring of the frequency reference circuit correct?	Change the wiring
	Has the operation mode been correctly set up?	Check the selected running mode with an operator
	Is the load too much?	Reduce load
The rotation speed (rpm/min) of the motor is too high or too low.	Are the rated values (number of poles, voltage) right?	Check the technical data on the nameplate of the motor
	Is the acceleration/deceleration gear shifting ratio of the gear wheel right?	Checking the shifting gears (like the gear wheel and so on)
	Has the maximum output frequency been correctly set up?	Check the set value of the maximum output frequency
	Check the voltage between the terminals of the motor with a rectifier-type voltmeter. Is there too much voltage drop?	Check the V/F characteristic value
The rotation speed of the running motor is unsteady	Is the load too much?	Reduce load
	Is the change of load too much?	Reduce load change, increase the motor capacity of the inverter
	What about the power supply. Is it a 3-phase or a single-phase one? If it is a 3-phase one, is there any phase loss?	Check the wiring of the 3-phase power supply for possible phase loss.

Appendix 1 Regular Maintenance and Inspection Methods

Check	Spots	Inspection	Period			Inspection method	Criteria	Measuring instrument
			Daily	Yearly	Biennial			
The entire operating site	Surroundings	Is there any dust? Are the ambient temperature and humidity appropriate?	√			See the precautions	Temperature: -10～+40℃; no dust; humidity: below 90% and no dew formation	Thermometer, hygrometer and a recorder
	Equipment	Is there any abnormal vibration or noise?	√			Look, see	No abnormality	
	Input voltage	Is the input voltage of the main circuit normal?	√			Measure the voltage between the terminals R, S and T		Digital AVO meter/ tester
	The entire operating site	Megger examination (of the resistance between the main circuit and earth) for any loosened parts. Overheat on any parts? Clean?		√		Disconnect the inverter, Short-circuit the terminals R,S,T,U,V,W and measure the resistance between them and the earth. Tighten the bolts Check with naked eyes	Over 5 MΩ and fault free	DC 500V-type megger
	Conductor wiring	Conductor rusty? Wire sheath damaged?		√		Check with naked eyes	No fault	
	Terminals	Any damage?		√		Check with naked eyes	No Fault	
	IGBT module / diode	Check the impedance between terminals			√	Disconnect the inverter, and measure with a tester the resistance between the group of R, S, T<-> +, - and the group of U, V, W <-> +, - respectively		Digital AVO meter / analog measuring meter
	Insulation resistance	Megohmmeter inspection (between output terminal and grounding terminal)			√	Release connection of U, V and W and fasten motor wire	Exceed 5MΩ	500V type megohmmeter

	Filter capacitor	Is there any liquid seepage? Is the safety hole bulging out? Is the capacitor bulging out?	√	√		Check with naked eyes Measure with capacitance meters	No fault exceeds 85% of the rated capacity	Devices for measuring capacitance
	Relay	Any wobbling noise during operation? Any damage to the contacts?		√		Listen Check with naked eyes.	No fault	
	Resistance	Whether resistance insulation is damaged Whether resistor wire is damaged (open circuit)		√		Visual inspection Disconnect one and measure it with test instrument.	There is no fault Error must be within ±10% of resistance value	Digital multimeter/simulation test instrument
Protection circuit and control circuit	Operation check	Is the output voltage balanced for all the phases? After executing sequential protection, there should be no fault in the display circuit		√		Measure the voltage among terminals U, V and W Short circuit and open inverter protection circuit output	For 200V(400) model, the difference in the voltage of each phase should not exceed 4V(8V)	Digital AVO meter/ calibrating voltmeter
Cooling system	Cooling fan	Any abnormal vibration or noise? Any loosened connections?	√	√		Turn the tightening connection of the fan after switching off the power supply	Rotation smooth and no fault	
Display	Meter	Is the displayed value correct?	√	√		Check the reading of the meter outside the panel	Check the set values	Voltmeter/ ammeter
Motor	The entire operating site	Any abnormal vibration or noise? Any abnormal smells?	√			Check with your ears, nose, and eyes; Check for overheat or damage	No fault	

Note: the values in brackets apply to 400V-type inverters.

Appendix 2 Guideline for Selection of Optional parts

Users of this series product can choose to install additional peripherals in accordance with the operating conditions and needs.

A2.1 Alternative Current Reactor (ACL)

Alternative current reactor can be used to suppress the high-order harmonic of the input current from the inverter, thus improve its power factors. It is recommended for the following situations:

1. The ratio of the capacity of the power source to that of the inverter exceeds 10:1.
2. Silicon controlled load or power factor compensation devices with switch control is wired to the same power supply.
3. The 3-phase power has a high degree of voltage unbalance. （≥3%）

Table of Matching Alternating Current Reactors :

Voltage (V)	Power (kW)	Current (A)	Inductance (mH)	Voltage (V)	Power (kW)	Current (A)	Inductance (mH)
220	0.4	2.4	4.6	380	0.75	2.5	7.6
	0.75	4.5	2.4		1.5	4	4.8
	1.5	7	1.6		2.2	6	3.2
	2.2	11	1.0		3.7	9	2.0
	3.7	18	0.6		5.5	13	1.5
	5.5	22	0.5		7.5	17	1.2
	7.5	30	0.4		11	25	0.8
	11	42	0.27		15	32	0.6
	15	55	0.2		18.5	38	0.5
	18.5	70	0.16		22	45	0.42
	22	80	0.14		30	60	0.32
	30	110	0.1		37	75	0.26
	37	145	0.08		45	90	0.21
	45	180	0.06		55	110	0.18
	55	215	0.05		75	150	0.13
	75	285	0.04		93	170	0.11
	93	350	0.03		110	210	0.09
	110	415	0.03		132	250	0.08
					160	300	0.06
					185	350	0.06
					200	380	0.05
					220	415	0.05
					250	480	0.04
					280	520	0.04
					315	600	0.03
					400	780	0.03

A2.2 DC reactor

When the capacity of the power grid far exceeds that of the inverter or when the power capacity is beyond 1000KVA, or when the user expects greatly improved power factor of the power supply, direct current reactors will be necessary. Direct current reactors can be used simultaneously with alternating current reactors, which is effective in reducing higher-order harmonic input.

Among our inverters, those above 11KW can benefit from DC reactors. Standard models above 160KW have been equipped with built-in reactors.

Table of Matching Direct Current Reactors

Voltage V	Power KW	Current A	Inductance μH	Voltage V	Power KW	Current A	Inductance μH
220	11～15	75	450	380	11～15	40	1500
	18.5～30	150	200		18.5～30	75	600
	37～55	300	100		37～55	150	300
	75～90	420	40		75～90	220	200
	110	560	25		110～132	280	140
					160～200	370	110
					220	560	70
					250～280	740	55

A2.3 Radio noise filter

Radio noise filters are used to restrain the transmission of electromagnetic interfering noises generated by the inverter. They can also be used to restrain interference with the motor from external radio, instantaneous impact and surges.

Table of matching 3-phase 3-wire Radio Noise Filters

Voltage (V)	Motor power (kW)	Voltage (V)	Motor power (kW)	Filter model	Key filter parameters					
					Common-mode input loss dB			Derivation-mode input loss dB		
					0.1MHz	1MHz	30MHz	0.1MHz	1MHz	30MHz
220	0.4～0.75	380	0.75～1.5	DL-5EBT1	75	85	55	55	80	60
	1.5～2.2		2.2～3.7	DL-10EBT1	70	85	55	45	80	60
	3.7～5.5		5.5～7.5	DL-20EBT1	70	85	55	45	80	60
	7.5		11～15	DL-35EBT1	70	85	50	40	80	60
	11～15		18.5～22	DL-50EBT1	65	85	50	40	80	50
	18.5～22		30～37	DL-80EBT1	50	75	45	60	80	50
	30		45	DL-100EBK1	50	70	50	60	80	50
	37		55～75	DL-150EBK1	50	70	50	60	70	50
	45～55		93～110	DL-200EBK1	50	70	60	60	70	50

In situations requiring stronger anti-radio interference capability or conformity to CE, UL, or CSA standards, or when there are devices with poor anti-interference capabilities in the vicinity, filters should be installed. While installing, make sure the wiring is as short as possible, that is, the filter should be as close to the inverter as possible.

A2.4 Remote Operation Keyboard

Our series inverters have all been equipped with operation keyboards, exquisitely designed and easily operated. If you wish to use it away from the inverter or other places, an extended cable would serve the purpose. You just need to demand it when you place an order. Since the serial communication mode is employed to link the keyboard and the frame, you can remove the keyboard to work area as far as 10 meters away. Or if you want to or need to work father away, then you can buy a remote operation keyboard from the suppliers concerned, or from our company.

A2.5 Regenerative brake unit and brake resistor

The 7.5KW model and models below 7.5KW of this series are all equipped with regenerative brake function. Brake resistors can be connected if additional brake torque is needed. However, 11KW and above models do not have this function. External brake unit has to be installed if additional brake torque is needed.

In case of 100% brake torque, the resistance value and the power of the brake resistor are as follows:

Appendix 2 Guideline for Selection of Optional parts

Voltage V	Motor Power KW	Resistance value Ω	Resistor power KW	Voltage V	Motor Power KW	Resistance value Ω	Resistor power KW
220	0.75	200	0.1	380			
	1.5	100	0.25		1.5	400	0.25
	2.2	75	0.25		2.2	250	0.25
	3.7	40	0.4		3.7	150	0.4
	5.5	30	0.5		5.5	100	0.5
	7.5	20	0.8		7.5	75	0.8
	11	13.6	2.25		11	50	1
	15	10	3		15	40	1.5
	18.5	8	4		18.5	30	4
	22	6.8	4.5		22	30	4
	30	5	6		30	20	6
	37	5	6		37	16	9
	45	6.8/2	9		45	13.6	9
	55	6.8/2	9		55	20/2	12
	75	6.8/3	13.5		75	13.6/2	18
	90	6.8/3	13.5		90	20/3	18
	110	6.8/4	18		110	20/3	18
					132	20/4	24
					160	13.6/4	36
					185	13.6/5	45
					200	13.6/5	45
					250	13.6/6	54

The above Table is in accordance with 5% ED, 15s continuous braking time.

A2.6 Leakage Protector

Because of the static capacitance between the output/input lead wire and the ground, within the inverter and the motor, and because of the fact that this series inverters are low-noise type and the carrier frequency used is very high, the earth leakage current is relatively strong, especially for large-capacity models. Sometimes, the leakage current may cause the protection circuit to malfunction.

When faced with the above troubles, users should install leakage protector, aside from lowering the carrier frequency and shortening the wire lead. While using leakage protectors, users are advised to take the following precautions:

1. The leakage protector should be placed on the input side of the inverter, preferably behind MCCB.
2. The operating current of the leakage protector should exceed 10 times the leakage current (the aggregate of the circuit, radio noise filter, motor and leakage current from other sources) when the inverter is not operating.

C Appendix 3 Instruction of injection molding machine modification

A3.1 Terminal connection diagram of main circuit

Only apply simple modification terminal connection diagram of converter:

R	S	T	P	N-	E	U	V	W

Three phase 380V power supply input — Grounding end — Connect to injection molding machine motor

Terminal connection diagram of energy saving device of **intelligent cabinet type injection molding machine**:

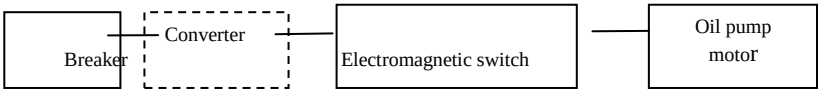
R	S	T	E	U	V	W

Three phase 380V power supply input — Grounding end — Three phase frequency conversion output

Energy saving device of intelligent cabinet type injection molding machine is a power distribution cabinet that civil power can mutually switch over with frequency conversion energy saving. Installation and maintenance are easy. In case converter is failed, it can be quickly switched to power frequency operation mode. The influence on the production caused by converter fault is minimized to utmost.

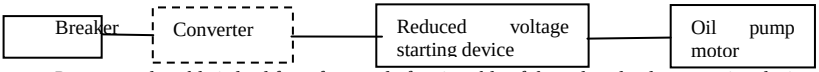
A3.2 Connection method of main circuit for energy saving modification of injection molding machine

For injection molding machine with direct starting and stopping oil pump motor, see circuit as following.



Power supply cable is lead after heat protector of motor and is connected the power supply incoming end of the converter (or intelligent energy saving control cabinet) during modification, the cable of oil pump is connected to output end of the converter (or intelligent energy saving control cabinet).

For injection molding machine with reduced voltage starting oil pump motor, see circuit as following

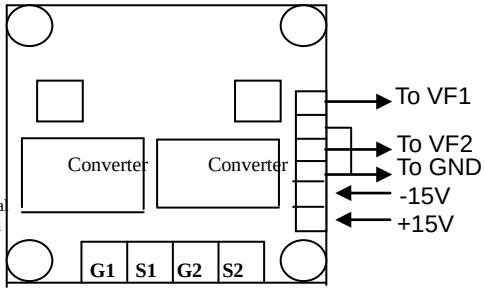


Power supply cable is lead from front end of main cable of the reduced voltage starting device or back end of the circuit breaker and is connected to the power supply incoming end of the converter (or intelligent energy saving control cabinet) during modification, the output end of the converter (or intelligent energy saving control cabinet) is connected to the input end of main circuit with the reduced voltage starting.

A3.3 Explanation of connection method of conversion board：

The conversion board normally locates on the left side of CPU, see as right figure

Current/voltage Current/voltage
G1---Connect to negative end of proportional flow signal
S1---Connect to positive end of proportional flow signal
G2---Connect to negative end of proportional pressure signal
S2---Connect to positive end of proportional pressure signal



In general, the frequency conversion energy saving modification of injection molding machine is completed only when the proportional flow signal is connected, the process engineering requirement of its product is met. Signals in two channels are required in highter requirement.

The customer can connect G1 and S1 in series to the control circuit of the proportional flow circuit, connect G2 and S2 in series to the control circuit of the proportional pressure circuit, connect properly according to the flow direction of the current in the circuit. In order to reduce disturbance of environment on the conversion board, filter should be added on the junction area of **G1, S1** , **G2 and S2.** For the injection molding machine with mechanical arm, filter is also added in the signal end close to the conversion board.

Relationship between signal of conversion board and terminal of converter input：

Proportional flow signal G1/S1→Signal conversion board→VF1(VF1is disposal signal of scaled flow)

Proportional pressure signal G2/S2→Signal conversion board→VF2(VF2 is handling signal of proportional pressure)

Note: scaled flow signal and scale pressure signal are DC current signals varying between 0---1A switched into 0-10V DC voltage signal through signal switching board. When only one scaled flow signal is connected, it should be connected to G1/S1 terminal. When testing or changing the parameters, relative parameters of VF1 should be regulated. When a scaled pressure signal is added, it should be connected to G2/S2 terminal. When testing or changing the parameters, relative parameters of VF2 should be regulated.

A3.4 Adjustment of main parameter:

Code number	Function	Recommended value
P00.00	Selection of operation control mode	1 (terminal operation)
P00.01	Selection of frequency setting mode	2(VF1), 3(VF2),5(VF1+VF2),7(Max(VF1,VF2))
P00.10	Acceleration time	1.0 second (adjusted according to allowed condition)
P00.11	Deceleration time	1.0 second (adjusted according to allowed condition)
P00.13	Lower limit frequency	10 HZ
P00.14	Selection of low limit frequency	0(stop)
P01.12	Waiting time of fault trial resume	2.0 second (adjusted according to allowed condition)
P01.13	Times of fault trial resume	10(limitless times)
P02.18	Frequency set gain of VF1	adjusted according to allowed condition
P02.22	Frequency set gain of VF2	adjusted according to allowed condition
P02.23	Auxiliary quantity regulating (regulating VF1 or VF2 separately)	adjusted according to allowed condition
P02.24	Select given channel of auxiliary quantity	adjusted according to allowed condition

Detailed description of relevant parameter adjustment:

P00.14 Select lower frequency

Setting 0: when frequency set signal is lower than set value of lower frequency (P00.13), the inverter stops output and the motor stops running.

Setting 1: when frequency set signal is lower than set value of lower frequency (P00.13), the inverter still outputs lower frequency and the motor still runs at lower frequency.

When applied to the injection machine, if flow signal is minimum, the motor still runs at low speed and cannot stop. At this time, by setting lower frequency (P00.13) and select **P00.14=0**, the motor can be stopped.

P01.12 Waiting time of fault trial resume

When fault occurs during the operation, the converter stops output; When the resume interval time set by **P01.12** is passed, the converter automatically resets the fault and continues to operate.

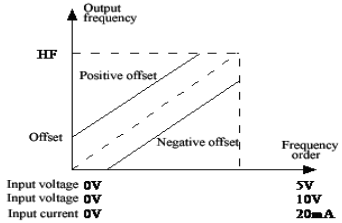
P01.13 Time of fault trial resume

It means the times of automatic resume in last energized operation or before manual resume. The parameter deducts one when it automatically resume one time. When it is o, no automatic resume function is available, it only resumes by manual resume or resume signal from exterior terminal. When it is 10, it can resume with limitless times.

When the converter occasionally trips fault protection, the parameter can ensure the continuity of the production. The parameter resumes to original setting value after manual resume or exterior terminal resume.

When P02.17 or P02.21 uses analog signal to set frequency, output frequency can be set randomly by regulating P02.17 or P02.21 and P02.18 or P02.22.

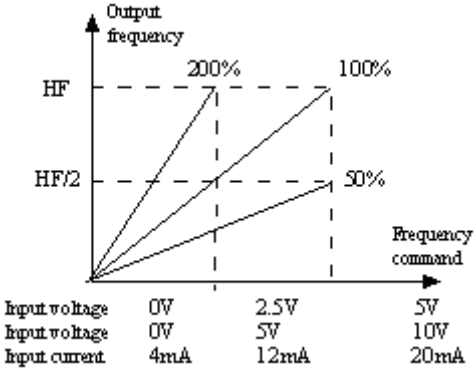
Output frequency=analog signal×frequency set gain +frequency offset.



Offset frequency

Compensate P02.18 or P02.22 when analog signal cannot reach 5V/10V/20mA.

For example, in case setting gain of frequency is 200%, even though input signal can't reach 2.5V/5V/12mA, it also can realize the adjustment between 0 and HF, see as following diagram.



Setting gain rate

For example: when using external 0-10V input signal VF2, frequency regulating scope is 0.00Hz-50.00 Hz, set max. frequency (**P00.04**)= 50.00Hz and upper frequency (**P00.12)**=50.00Hz. If the site only offers 0-8V signal, at this time set as below: VF2 selects **P02.19=0**, analog input frequency offset **P02.21**=0Hz, analog input signal frequency gain **P02.22**=125.0%. If it cannot reach 50Hz at this time, regulate P02.21 to reach.

P02.23, P02.24 are valid when **P00.01=4, 5**. In digital keyboard + analog terminal and VF1+VF2 mode, the auxiliary given can be fine regulated on basis of the main given. Set frequency = **P02.17 (or P02.22) + P02.18 (or P02.22)** × (main given frequency +analog terminal input signal× auxiliary regulating quantity set value).

Appendix 4 Rs-485 Communication Protocol Amendment

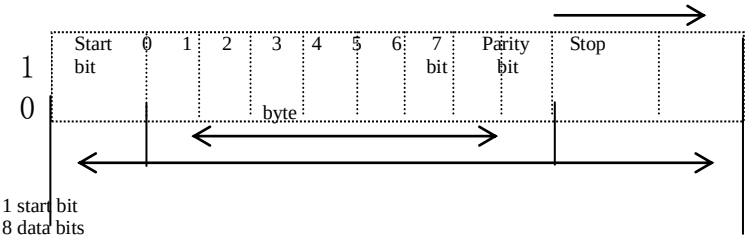
1. RS-485 serial communication terminal is defined as follows:

A: Signal positive terminal

B: Signal negative terminal

Before using the RS-485 serial communication interface, the frequency converter's "RS-485 Baud rate" and "mailing address" must be firstly set by using keyboard.

2. Use asynchronous transmission, more secondary computers (frequency converters) can be used to receive through sending it by one host, without receiving the host request the secondary computers could not take the initiative to send information.
3. Baud rate:
4. Numeric format



1 start bit

8 data bits

Parity check: function code decision

1 stop bit

5. Error correction method:

Information is added with checksum, checksum is equal to the last byte of sum of all the bytes (HEX), converted to ASCII code.

6. Data packet format: similar to the MODBUS and ASCII formats.

Header AKP1P0 D3D2D1D0 S Delimiter

Header: 3ah

Delimiter: 0dh, 0ah

A, K, P1P0, D3D2 D1D0 and S are respectively single-byte hexadecimal numbers, converted to ASCII code.

A: Secondary computer (frequency converter) address: the frequency converter's address range is: (1-31), A must be included.

Note: when the address A=00H, it is efficient to all the secondary computers, and all the secondary computers do not send back information; therefore only running command manipulation and so on can be sent when A = 00H.

K: data packet function

P1P0: parameter number; parameter label, two-byte hexadecimal number, such as P0100 is converted to hexadecimal as 0064.

D3D2D1D0: parameter value; remove the decimal point's parameter value, a total of four-byte hexadecimal number, firstly send the high bit, and then the low bit. (The decimal point position sees the "set value range" of parameters of "parameter list".)

S: checksum byte: S is the last one byte (bit7-bit0) value of sum (A + K + P1P0 + D3 + D2 + D1 + D0) of all the above bytes' hexadecimal system, converted to ASCII code.

Where K, P and D3D2D1D0 are defined as follows:

Appendix 3 Instruction of injection molding machine modification

K	P1P0	D3D2D1D0
K = 00: reserved		
K=01: reserved		
K=02: : send running command	0001 = stop / reset, 0002 = FWD, positive rotation 0003 = REV, reverse rotation, 0004=RESET, reset	00000000h meaningless
K=03: check running status	Host send P1P0: 0000H meaningless Secondary computer reply: 0001 = stop, 0002 = FWD, 0003 = REV, 0004 = failure, 0005 = undervoltage	00000000h meaningless
K=04: operation parameter setting	0001 = Run-time given frequency (two valid decimals)	Remove the decimal point's actual set value
	0007 = run-time given PI (a valid decimal)	Remove the decimal point's actual set value
K=05: function parameter setting (not store)	Parameter label	Remove the decimal point's actual set value
K=06: function parameter setting (store)		
K=07: function parameter query	Parameter label	Host send: 00000000H Secondary computer reply: remove the decimal point's current actual value
K=08: reserved		
K=F0H: Received the command from the host, but the secondary computers can not execute, the secondary computers reply K = FOH	0000h meaningless	00000000h meaningless
K=FCH: When the host sending invalid parameter numbers, the secondary computers reply K = FCH		
K=FDH: If the parameter values sent by the host surpass the limit value, the secondary computers reply K = FDH		
K=FEH: When locked the parameters to be set by the host, the secondary computers reply K = FEH		
K=FFH: The secondary computers reply and checkout errors		

* Note 1: when the host sending all the data packets of setting, if the secondary computers consider it being the correct values, they will reply the received data packets copies.

* Note 2: from K = F0H to K = FFH, is the single-way information the secondary computers

(frequency converters) reply the host; the host does not send this kind of information; such as when found checksum byte error, the host can resend again the original information, but the K = FFH information.

* Note 3: The fault information value is shown as follows:

0	Failure-free	5	OU-1	10	EF
1	Overcurrent	6	OU-2	11	Write parameter failure
2	OC-1	7	Undervoltage	12	VFOP
3	OC-2	8	Overheating	13	IFOP
4	OU	9	Overload	14	FLT

* Note 4: the input and output signals are shown as follows: where T1: Y0 open collector, T2: multifunctional relay 1 (T1A, T1B, T1C), T3: multifunctional relay 2 (T2A, T2B, T2C).

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
T1	T2	T3				D1	D2	D3	D4	D5	D6	D7	D8	FWD	REV

7. Byte intervals <10ms, after receiving a data packet by the frequency converter, the processing time is less than 80ms.

Example 1 operation parameter setting

Under running, 11 # frequency converter changes its "set frequency" as 35.00Hz.

The method is as follows: 35.00 removing decimal as 3500D=0DACH

A = 11 =0BH (The frequency converter's address is "0BH")

K = 04H (The operating parameters setting is "04H")

P1P0 = 0001H (The run-time set frequency is "0001H")

D3 = 00H (The high byte of data is "00H")

D2 = 00H (The secondary high byte of data is "00H")

D1 = 0DH (The secondary low byte of data is "0DH")

D0 = ACH (The low byte of data is "ACH")

S = C9H (The checksum byte is "C9H")

(S=0BH+04H+00H+01H+00H+00H+0DH+ACH =C9H)

The host (computer) successively sends the data packets ASCII of the following bytes:

3ah,30h,42h,30h,34h,30h,30h,30h,31h,30h,30h,30h,30h,30h,44h,41h,43h,43h,39h,0dh,0ah The frequency converters reply the same data to the host.

Example 2 Function parameter setting

It needs to set the 18 # machine's "P0012 acceleration time" value as 990.0 seconds. Parameter label 0012D = 000CH

The method is as follows: 990.0 removing decimal point as 9900D = 26ACH

A = 18 = 12H (The frequency converter's address is "12H")

K = 06H (The function parameter setting is "06H")

P1P0 = 000CH (The numeric order of the parameter label is "000CH")

D3 = 00H (The high byte of data is "00H")

D2 = 00H (The secondary high byte of data is "00H")

D1 = 26H (The secondary low byte of data is "26H")

D0 = ACH (The low byte of data is "ACH")

S = F6H (The checksum byte is "F6H")

(S=12H+06H+00H+69H+00H+00H+26H+ACH=1 F6H)

The host (computer) successively sends the data packets of the following bytes:

3ah,31h,32h,30h,36h,30h,30h,30h,43H,30h,30h,30h,30h,32h,36H,41h,43h,46h,36h,0dh,0ah

If the frequency converter correctly receives the above data packets, the frequency converter will reply the copies of the data packets.

Example 3 Function parameter query

11 # frequency converter queries its "output frequency" under running. Parameter label: 0500D = 01F4H

The method is as follows: A = 11 = 0BH (The frequency converter's address is "0BH")

K = 07H (The function parameter query is "07H")

P1P0 = 01F4H (The output frequency function No. is "01F4H")

D3 = 00H (The high byte of data is "00H")

D2 = 00H (The secondary high byte of data is "00H")

D1 = 00H (The secondary low byte of data is "00H")

D0 = 00H (The low byte of data is "00H")

S = 1 07H (The checksum byte is "07H")

(S=0BH+07H+01H+F4H+00H+00H+00H+00H =1 07H)

The host (computer) successively sends the data packets ASCII of the following bytes:

3ah,30h,42h,30h,37h,30h,31h,46h,34h,30h,30h,30h,30h,30h,30h,30h,30h,30h,37h,0dh,0ah

If the 11 # frequency converter's "output frequency" is 35.00Hz.

35.00 removing decimal as 3500D = 0DACH

D3 = 00H (The high byte of data is "00H")

D2 = 00H (The secondary high byte of data is "00H")

D1 = 0DH (The secondary low byte of data is "0DH")

D0 = ACH (The low byte of data is "ACH")

S = CCH (The checksum byte is "C0H")

(S=0BH+07H+00H+01H+F4H+00H+0DH+ACH =1 C0H)

If the frequency converter correctly receives the host's data packets, the frequency converter will reply the following data packets:

3ah,30h,42h,30h,37h,30h,30h,30h,31h,46h,34h,30h,30h,30h,44h,41h,43h,43h,30h,0dh,0ah