Thank you for purchasing and using the JADEN **DLM1** series inverters. Please read the operation manual carefully before putting the inverter to use so as to correctly install and operate the inverter and ensure safety. Please keep the operation manual handy for future reference, maintenance, inspection and repair.

The inverter must be installed, tested and commissoned by specialized personnels. The marks of

~ Danger	! Caution

and other symbols in the manual remind you of the safety precautions during the handling, installation, running and inspection. Please follow these instructions to make sure the safe use of the inverter. In case of any doubt please contact our local agent for consultation. Our professional persons are willing and ready to serve you.

The manual is subject to change without notice.

~ Danger indicates wrong use may kill or injure people.

! Caution indicates wrong use may damage the inverter or mechanical system.

~ Danger

● Be sure to turn off the input power supply before wiring.

● Do not touch any internal electrical circuit or component when the charging lamp is still on after the AC power supply is disconnected, which means the inverter still has high voltage inside and it is very dangerous.

● Do not check components and signals on the circuit boards during operations.

● Do not dissemble or modify any internal connecting cord, wiring or component of the inverter by yourself.

● Be sure to make correct grounding connection of the earth terminal of the inverter.

● Never remodel or replace control boards and components by yourself. It may expose you to an electrical shock or explosion, etc.

! Caution

● Do not make any voltage-withstanding test with any component inside the inverter. These semi-conductor parts are subject to the damage of high voltage.

● Never connect the AC main circuit power supply to the output terminals U.V W of the inverter.

● The main electric circuit boards of CMOS and IC of the inverter are subject to the effect and damage of static electricity. Don’ t touch the main circuit boards.

● Installation, testing and maintenance must be performed by qualifed professional personnel.

● The inverter should be discarded as industrial waste. It is forbidden to burn it

Contents

Ⅰ.Safety Precautions

1.1Introduction

The inverter has been strictly and well packed before ex-work. In consideration of various factors during the transportation special attention should be paid to the following points before the assembly and installation. If there is anything abnormal please notify the dealer or the relevant people of our company.

● Check if the inverter has got any damage or deformation during the transportation and handling.

● Check if there is one piece of DLM1series inverter and one user manual when unpacking it.

●Check the information on the nameplate to see if the specifications meet your order (Operating voltage and KVA value).

● Check if there is something wrong with the innerparts, wiring and circuit board.

● Check if each terminal is tightly locked and if there is any foreign article inside the inverter.

● Check if the operator buttons are all right.

1.2Before Power-up

！Caution

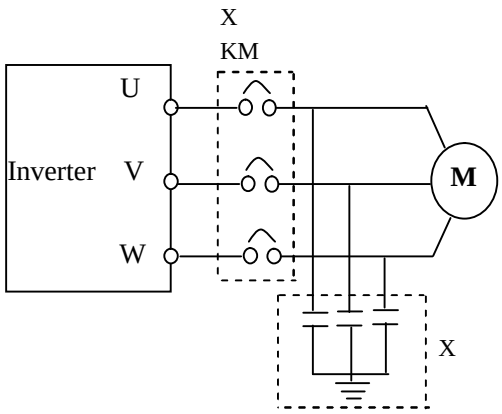
- Check to be sure that the voltage of the main circuit AC power supply matches the input voltage of the inverter.
- E terminals are grounding terminals. Be sure to make correct grounding connection of the earth terminals of the motor and the inverter for safety.
- No contactor should be installed between the power supply and the inverter to be used for starting or stopping of the inverter. Otherwise it will affect the service life of the inverter.

~ Danger

●R(L),S,T(N) terminals are power input terminals, never mixed with U.V.W terminals. Be sure that the wiring of the main circuit is correct. Otherwise it will cause damages of the inverter when the power is applied to it.

！Caution

- Do not carry the front cover of the inverter directly when handling. It should be handled with the base to prevent the fall-off of the front cover and avoid the dropping of the inverter, which may possibly cause the injuries to people and the damages to the inverter.
- Mount the inverter on a metal or other noncombustible material to avoid the risk of fire.
- Install the inverter in a safe location avoiding high temperature, direct sunlight, humid air or water.
- Keep the inverter from the reach of children or persons not concerned. The inverter can only be used at the places accredited by our company. Any unauthorized working environment may have the risks of fire, gas explosion, electric shock and other incidents.
- Install a heat sink or other cooling device when installing more than one inverter in the same enclosure so that the temperature inside the enclosure is kept below 40 to avoid overheat or the risk of fre.
- Be sure to turn off the power supply before dissembling or assembling the operation keypanel and fxing the front cover to avoid bad contact causing faults or non-display of the operator.
- Do not install the inverter in a space with explosive gas to avoid the risk of explosion.
- If the inverter is used at or above 1000m above seal level, the cooling effciency will be reduced, so please run it by de-rating.
- Do not install any switch component like air circuit breaker or contactor at the output of the inverter. If any of such components must be installed because of the requirements of process and others, it must be ensured that the inverter has no output when the switch acts. In addition, it is forbidden to install any capacitor for improvement of power factor or any varistor against thunder at the output. Otherwise it will cause malfunctions, tripping protection and damages of components of the inverter. Please remove them as shown in the below diagram.
- It will affect the service life of the inverter.If a contact is connected to the front end of input of the inverter to control its starts and stops. Generally it is required to control it through Control terminals. Special attention should be paid to its use in the case of frequent starts and stops.
- Please use an independent power supply for the inverter. Do avoid using the common power supply with an electrical welder and other equipment with strong disturbance. Otherwise it will cause the protection or even damage of the inverter.



1.3During Power-up

~ Danger

- Do not plug the connectors of the inverter during the power up to avoid any surge into the main control board due to plugging, which might cause damage to the inverter.
- Always have the protective cover in place before power up to avoid electrical shock.

1.4 JOG operation

Procedures	Panel display after operation	Pilot Lamp
Power-up	F000	FWD、STOP light
△	00.00	FWD、STOP light
△	05.00	FWD、STOP light
RUN	F05.0	FWD、RUN light and Fans operation
STOP	F05.0	FWD、RUN light and Fans operation

1.5During Operation

~ Danger

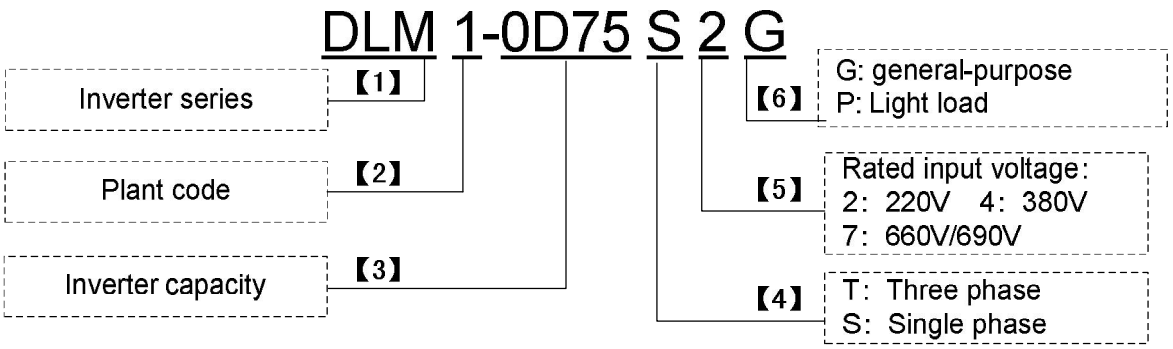
- Never connect or disconnect the motor set while the inverter is in running. Otherwise it will cause over-current trip and even burn up the main circuit of the inverter.
- Never remove the front cover of the inverter while the inverter is powered up to avoid any injury of electric shock.
- Do not come close to the machine when the fault restart function is used to avoid anything unexpected. The motor may automatically restart after its stop.
- The function of STOP Switch is only valid after setting, which is different with the use of emergent stop switch. Please pay attention to it when using it.

！Caution

- Do not touch the heat braking resistor, or other heat elements. These can become very hot.
- Be sure that the motor and machine is within the applicable speed ranges before starting operation because the inverter is quite easy to run from lower speed to higher speed.
- Do not check the signals on circuit boards while the inverter is running to avoid danger.
- Be careful when changing the inverter settings. The inverter has been adjusted and set before ex-work. Do not adjust it wantonly. Please make proper adjustments according to the required functions.
- Do consider the vibration, noise and the speed limit of the motor bearings and the mechanical devices when the inverter is running at or above the frequency of 50Hz.

Ⅱ Product Introduction and installation

2.1 DLM1 Series model description



【1】 Inverter series

Mark	Specification
DLM	M series
DLB	B series

【2】 Plant code

Mark	Specification
1	General purpose

【3】 Inverter capacity

Mark	Specification
0D40	400W
0D75	750W
01D5	1.5KW
02D2	2.2KW

【4】 Power phase

Mark	Specification
S	Single phase

【5】 Input voltage

Mark	Specification
2	220V
4	380V

【6】 Inverter type

Mark	Specification
G	General-purpose
P	Light load

2.2Particular Specifcations

Model	Input Voltage	Power (KW)	Inverter capacity(KVA)	Output Current (A)	Suitable Motor (KW)
DLM1-0D40S2G	Single phase220V 50Hz	0.4	1.0	2.5	0.4
DLM1-0D75S2G	Single phase220V 50Hz	0.75	2.0	5.0	0.75
DLM1-01D5S2G	Single phase220V 50Hz	1.5	2.8	7.0	1.5

2.3General Specifications

Inverter Series		DLM1
Control Mode		SPWM
Input Power		330~440V for 380V power; 170~240V for 220V power
5-Digits Display& Status Indicator Lamp		Displaying frequency, current, revolution, voltage, counter, temperature, forward or reserve running, and fault, etc.
Communication		RS-485
Operation Temperature		-10~40
Humidity		0-95% Relative Humidity(without dew)
Vibration		Below 0.5G
Frequency Control	Range	0.10~600.00Hz
	Accuracy	Digital: 0.01%(-10~40), Analog: 0.1% (25±10)
	Set Resolution	Digital: 0.01Hz, Analog: 1‰ of Max. Operating Frequency
	Output Resolution	0.01Hz
	Operator Setting Method	Press directly ← to set (or use potentiometer).
	Analog Setting Method	External Voltage 0-5V，0-10V，4-20mA，0-20mA.
	Other Functions	Frequency lower limit, starting frequency, stopping frequency &three skipfrequencies can be respectively set.
General Control	Ramp Control	Selectable 4-speed steps ramp-up and -down time (0.1-6500s).
	V/F Curve	Set V/F curve at will
	Torque Control	Torque increase is settable by max. 10.0%. The starting torque can reach 150% at 1.0Hz.

	Multi-Inputs	6 multi-function input terminals for8–speed steps control, program operation, switching of 4-speed Ramp, UP/DOWN function, counter, external emergency stop and other functions.
	Multi-Outputs	2 multi-function output terminals for displaying of running, zero speed,counter, external abnormity, program operation and other information and warnings.
	Other Functions	AVR (auto voltage regulation), Deceleration stop or free-stop, DC brake, auto reset and restart, frequency track, PLC control, traverse function, drawing control, auto energy-savingsetc.
Protection Functions	Overload Protection	Electronic relay protection motor Drive (150%/1 min for constant torque; 120%/1min for fans/pumps)
	FUSE Protection	FUSE activates and motor stops.
	Over-voltage	DC Voltage ＞400V for 220V class DC Voltage ＞800V for 380V class
	Under-Voltage	DC Voltage ＜200V for 220V class DC Voltage ＜400V for 380V class
	Instant Stop and Restart	Restarted by frequency track after instantaneous stop.
	Stall Prevention	Anti-stall during Acc/Dec run
	Output End Shorts	Electronic circuit protecting
	Other Functions	Heat sink over-heat protection, restriction of reverse running, direct start after power on, fault reset, parameter lock, etc.

2.4 Storage and Installation

The inverter must be kept in its original package box before installation. Pay attention to the followings when keeping it in storage if the inverter is not used for the time being:

- It must be stored in a dry place without rubbish or dust.
- The suitable temperature for storage is between -20 and +65 .
- The relative humidity required is 0-95% without condensation.
- There is no corrosive gas or liquid in the storage ambience.
- It's better to lay the inverter on a rack and keep it in a proper package.
- It is better not to store the inverter for long time. Long time storage of the inverter will lead to the deterioration of electrolytic capacity. If it needs to be stored for a long time make sure to power it up one time within a year and the power-up time should be at least above five hours. When powered up the voltage must be increased slowly with a voltage regulator to the rated voltage value.

2.5 Installation Site and Environment

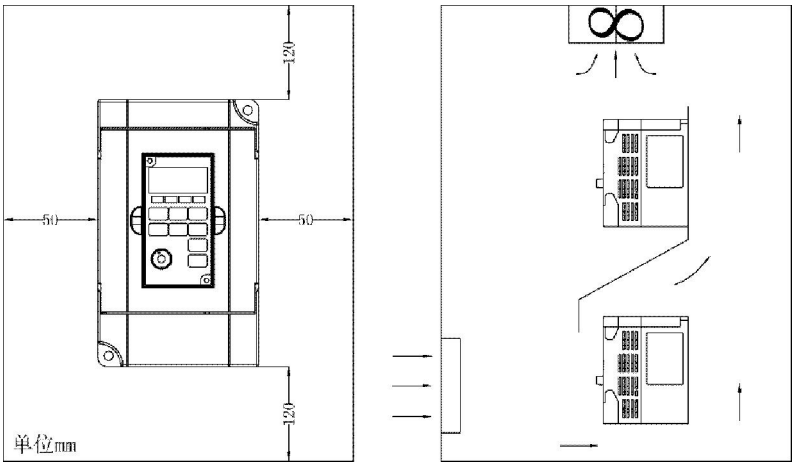
The inverter should be installed at the following location:

- Ambient temperature -5 to 40 with good ventilation;
- No water drop and low moisture;
- Free from direct sunshine, high temperature and heavy dust fall;
- Free from corrosive gas or liquid;
- Less dust, oil gas and metallic particles;
- Free from vibration and easy for service and inspection;
- Free from the interference of electromagnetic noise;

Attention: The ambient conditions of the inverter will affect its service life.

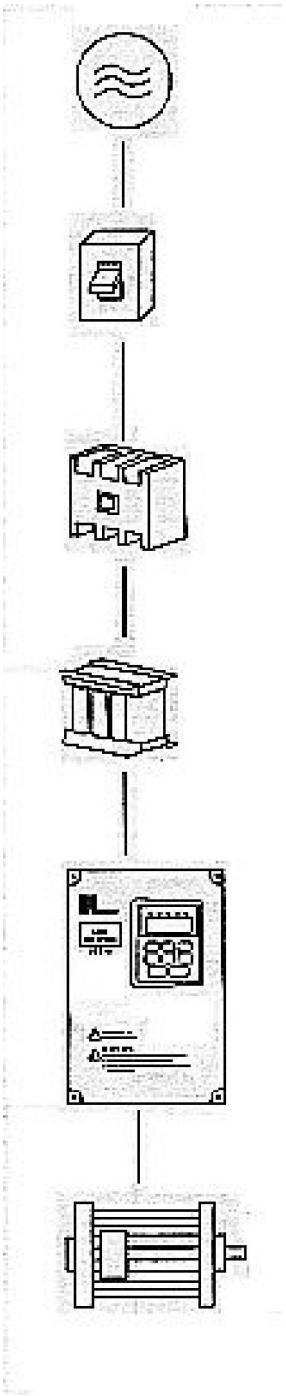
2.6Installation and Direction

- There must be enough space left around the inverter for easy maintenance and cooling. See Diagram;
- The inverter must be installed vertically with good ventilation for effective cooling;
- If there is any instability when installing the inverter, please put a flat board under the inverter bottom base and install it again. If the inverter is installed on a loose surface, stress may cause damage of parts in the main circuit so as to damage the inverter;
- The inverter should be installed on non-combustible materials, such as iron plate.
- If several inverters are installed, upper and lower, together in one cabinet, please add heat dissipation plates and leave enough space between the inverters. See Diagram.



Ⅲ Wiring

3.1Main Circuit Wiring Schematic Diagram



Power supply:

● Verify that the inverter's rated voltage coincides with AC power supply voltage to avoid a damage of the inverter.

No fuse breaker:

● Refer to the related list.

Ground fault circuit interrupter:

● Use one of anti-high harmonic.

Electromagnetic contactor:

● Note: Do not use the electromagnetic contactor as the on/off button of power supply for the inverter.

AC reactor:

●It is recommended to install an AC reactor for power factor improvement if the input capacity is more than 1000KVA

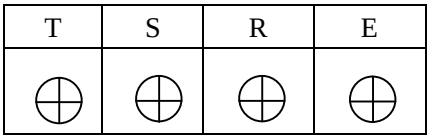
Inverter:

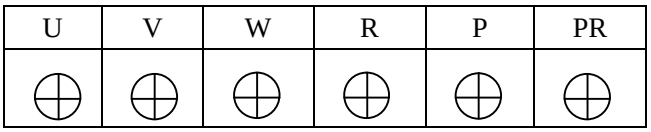
●Be sure to make correct connections of the main circuit wires and control signal wires of the inverter.

●Be sure to make correct setting of parameters for the inverter.

3.2Descriptions of Terminal Blocks

1、 Arrangement of Main circuit Terminals





2、Arrangement of Control Circuit Terminals

FA	FB	FC		DRV	FWD	REV	RST	SPL	SPM	SPH	GND	AM	VI	AI	+10

3、Function Description of Main circuit Terminals

Symbol	Function Description
R、S、T	Input terminal of AC line power.
U、V、W	Output terminal of the inverter
P+、PR	Connector for braking resistor (optional). Connector for DC reactor
E	Ground terminal

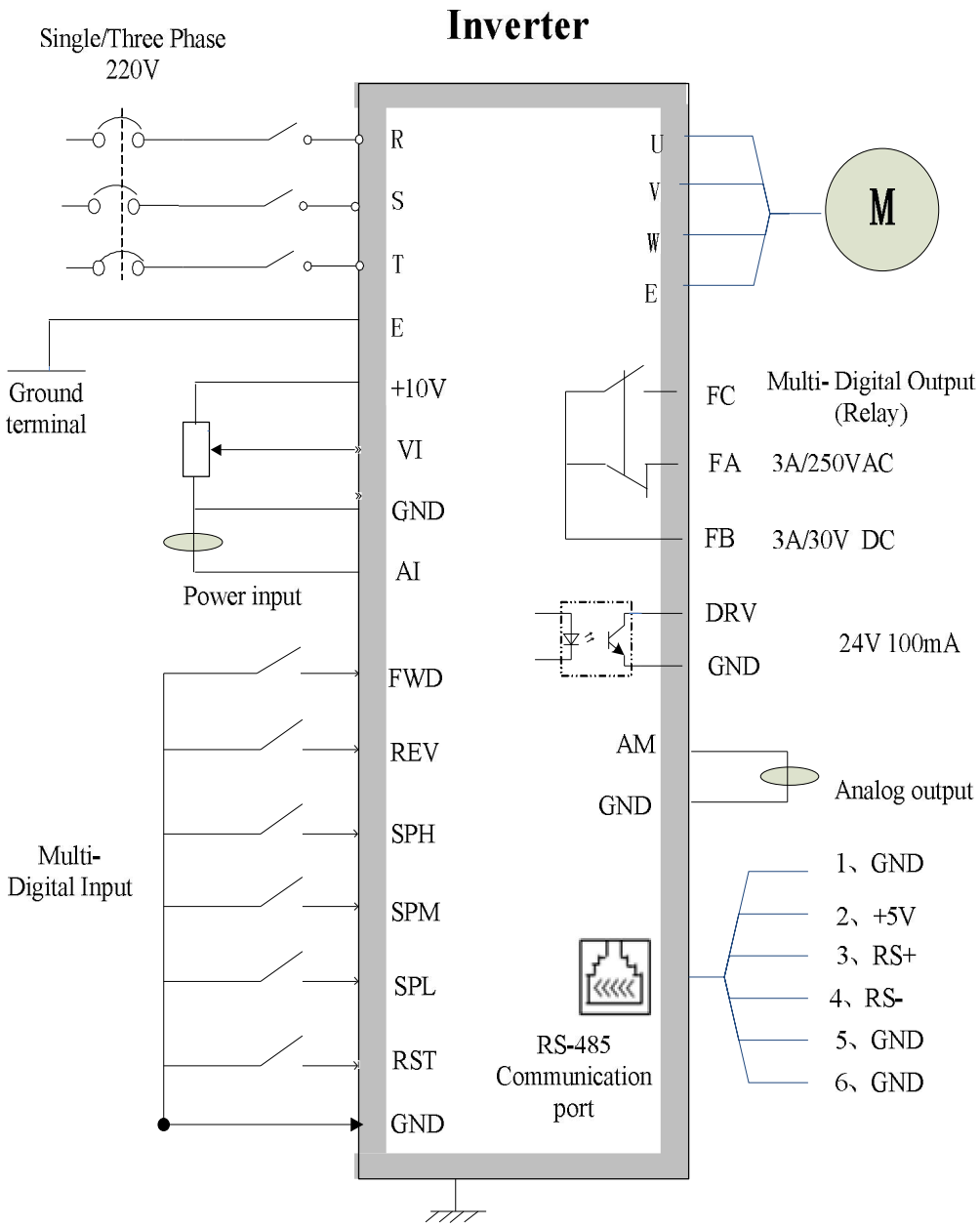
4、Function Description of Control Circuit Terminals

Symbol	Function Description	Default setting
FWD	Multi- Digital Input 1	Forward
REV	Multi- Digital Input 2	Reverse
RST	Multi- Digital Input 3	Reset
SPH	Multi- Digital Input 4	High-speed
SPM	Multi- Digital Input 5	Medium-speed
SPL	Multi- Digital Input 6	Low-speed
GND	Common&Ground	
+10	Power Supply for Analog Setting	+10V
VI	Multi- Analog input	Voltage
AI	Multi- Analog input	0~20mA
DRV	Multi-Digital Output 1 (optical-coupler)	DC24V/100mA
FA/FB/FC	Multi- Digital Output (Relay)	3A/250V
AM	Multi- Analog Output	0~10V
RS+ 、RS-	RS485 Communication port	

3.3Basic Connection Diagram

The wiring of the inverter is divided into two parts, main circuit terminal connections and control circuit terminal connections. The user can see the main circuit terminals and the control circuit terminals after removing the cover of enclosure. The terminals must be connected correctly as the following wiring circuit diagrams.

The following diagram shows the Default setting standard connection of Model DLM1



3.4Precautions on Wiring

(1) For the main circuit wiring:

- While wiring the sizes and specifcations of wires should be selected and the wiring should be executed according to the electrical engineering regulations to ensure the safety.
- It is better to use shielded wire or wire and conduit for power cord and ground the shielded layer or two ends of wire conduit.
- Be sure to install a Non Fuse Breaker (NFB) between the power supply and the input terminals (R.S.T). (If using ground fault circuit interrupter, please choose one corresponding to high frequency)
- Never connect AC power to the output terminal (U.V.W) of the inverter.
- Output wires mustn't be in touch of the metal part of the inverter enclosure, or it will result in earth short-circuit.
- Phase-shifting capacitors, LC, RC noise filters, etc, can never be connected to the output terminals of the inverter.
- The main circuit wire must be enough far away from other control equipments.
- When the wiring between the inverter and the motor exceeds 15 meters (shielded wire) or 50 meters (No shielded wire), much higher dV/dT will be produced inside the coil of the motor, which will cause the destruction to the interlay or insulation of the motor. Please use a dedicated AC motor for the inverter or add a reactor at the inverter.
- Please lower the carrier frequency when there is a longer distance between the inverter and the motor. Because the higher the carrier frequency is the bigger the leakage current of high-order harmonics in the cables will be. The leakage current will have unfavorable effect on the inverter and other equipment.

Specifcations of Non Fuse Breaker and Wire

Model	NFB (A)	Input wire (mm2)	Output wire (mm2)	Control wire (mm2)	Screw
DLM1-0D40S2G	16	2.5	2.5	1	M4
DLM1-0D75S2G	16	2.5	2.5	1	M4
DLM1-01D5S2G	16	2.5	2.5	1	M4

Attention: The parameters in the list are only for reference and should not be regarded as standard.

(2) For control circuit wiring (signal line)

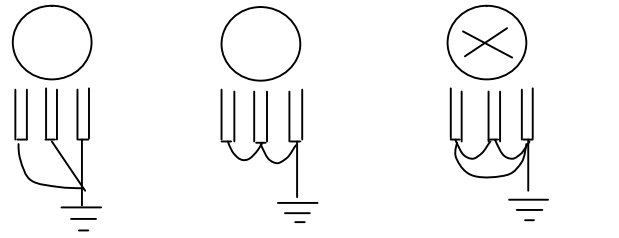
- The signal line should be separately laid in a different conduit with the main circuit wire to avoid any possible interference.
- Please use the shielded cable with the size of 0.5-2mm2 for signal lines.
- Use the control terminals on the control panel correctly according to our needs.

(3)Grounding

- Grounding terminal E. Be sure to make correct grounding 220V class: The third grounding method (Grounding resistance should be 100Ω or lower.)
  380V class: The special third grounding method (Grounding resistance should be 10Ω or lower.)
- Choose grounding wires according to the basic length and size of the technical requirements of the electric equipment.
- Do avoid sharing grounding wire with other large power equipment such as electric welder,

power machine, etc. The grounding wire should be kept away from the power supply wires for large power equipment.

- The grounding method for several inverters together should be done as the frst and second diagrams below. Avoid the third.



(a) Good (b) Good (c) Not Good

3.5 Optional parts

Optional parts	Function
Circuit breaker and CFCI	Wiring protected of the drive should be sure to set the circuit breaker in the power supply side. Please use a GFCI with anti higher harmonics.
Electromagnetic contactor	In order to avoid burning the brake resistor, please set the electromagnetic contactor used on the coil to ground surge absorber.
Surge absorbers	Absorption of electromagnetic contactor and control relays switch inrush current.
Isolation transformer	Output and input of the isolation transformer can reduce interference.
The braking resistor	Renewable energy consumption of the motor and shorten the deceleration time.

(1)CFCI

Within the inverte, within the motor and the input and output leads all have the capacitance of the ground. Due to the higher carrier frequency used, the inverter earth leakage current is large, especially the high-capacity models. When using the GFCI, sometimes our malfunction can lead to protection circuit. So when you use of GFCI should pay attention to the GFCI selection, while appropriate to reduce the carrier frequency, shorten lead and so on.

(2)Braking resistor

Model	Braking resistor' s Metering		Brake torque 10%ED	Special motor
	W	Ω		KW
DLM1-0D40S2G	80	200	125	0.4
DLM1-0D75S2G	100	200	125	0.75
DLM1-01D5S2G	300	100	125	1.5

Attention:

① Please select the company developed resistance value and using frequency;

② If you use not our company provided the braking resistor and braking module, which led to the drive or other equipment damage, our ompany does not bear any responsibility;

③ When you install the braking resistor, you should consider the safety of the environment, the flammable, and the distance is greater than 100mm converter;

④ If you want to change the resistance and power numbers, please contactwith us;

⑤ If you need a braking resistor or braking resistor,you need order separately;

⑥ Such as large mechanical inertia, please increase the capacity of the braking resistor.

Ⅳ Maintenance and Troubleshooting

4.1Maintenance checks Notes

- Before maintenance check, please be sure to cut off the inverter input (RST) power;
- Make sure the power of inverter is cut off, the display disappears, and until the internal high-voltage light is off, then you can start the implementation of maintenance, inspection;
- During the inspection, the internal power, cables and cable roots must be not pull up and mismatch, otherwise it will lead to inverters not work;
- Do not leave any parts inside the inverter, when mounting screws and other accessories;
- After installing should keep the inverter clean, avoid dust, oil mist and moisture.

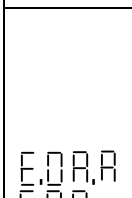
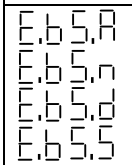
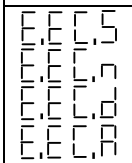
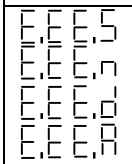
4.2 Regular inspection program

- Please make sure the voltage of supply power conforms to the required voltage of inverter; (Especially attention to the power cable and the motor if there is damaged.)
- Please check wiring terminals and connectors, if there are loose; (Please make sure power line terminals are not off shares.)
- Please pay attention to dust inside the inverter, iron and corrosive liquids;
- Please do not measure the insulation resistance of the inverter;
- Please check the inverter output voltage, output current, output frequency; (That can not be much difference between the results and the rated.)
- Please check the surrounding temperature, if there is between -5 ~ 40 and the installation environment is well ventilated;
- Humidity: maintained at 90% or less; (Can not bear water droplets.)
- Please pay attention to abnormal sound and vibration in operation; (The drive can not be placed where vibration.)
- Please clean the vent regularly.

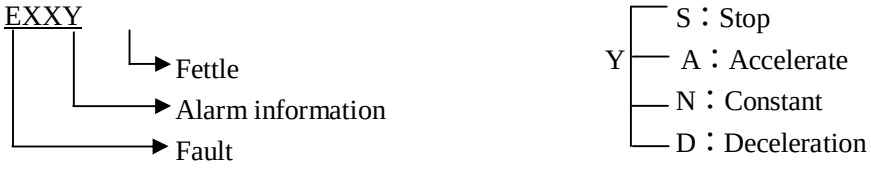
4.3Fault information and troubleshooting

DLM series inverters have relatively complete protections including overload, phase short circuit, to-ground short circuit, undervoltage, over temperature and overcurrent protection. When the inverter protection triggers, please follow the information in the table below to identify the reasons.

Fault Display	Fault content and description	Approach
E.OC.A	Acceleration-Overcurrent	1. Please check the motor for short circuit, especially output lines; 2. Prolong acceleration time; 3. The capacity of inverter is too small, please increase the capacity; 4. Reduce the torque increaseset value.
E.OC.n	Constant speedOvercurrent	1. Please check the motor for short circuit, and output line insulation; 2. Check whether the motor jis jammed or mechanical load is abruptly changed; 3. The capacity of inverter is too small, please increase the capacity; 4. Please check if the grid voltage is abruptly changed.
E.OC.d E.OC.S	Deceleration-Overcurrent; Stop-Overcurrent	1. Please check the motor for short circuit, and output line insulation; 2. Increase the deceleration time; 3. The capacity of inverter is too small, please increase the capacity; 4. DC braking is too large, please reduce the value of DC braking; 5. Inverter failure, contact distributor.
E.GF.S E.GF.A E.GF.n E.GF.d.	Short circuit to ground	1. Please check the motor for short circuit, and output line insulation; 2. Inverter failure, contact distributor.
E.ou.S E.ou.A E.ou.n E.ou.d	Stop-Overvoltage Acceleration-Overvoltage Constant-speed-Overvoltage Deceleration-Overvoltage	1. Increase the deceleration time, or install brake resistor; 2. Improve grid voltage.
E.Fb.S E.Fb.n E.Fb.A E.Fb.d	Blown fuse	Contact distributor

Fault Display	Fault content and description	Approach
	Under Voltage	1. Please check the input voltage; 2. Please check if the load is abruptly changed; 3. Please make sure if there is a missing phase.
	Inverter Overheat	1. Please check if the fansis stalled; 2. Please make sure the temperature is normal; 3. Please keep air convection.
	Inverter overload 150% 1 minute	1. The capacity of inverter is too small, please increase the capacity; 2. Please check the mechanical load, if there is stuck; 3. Reset the V/F curve.
	Motor overload 150% 1 minute	1. Please check the mechanical load, if there is a sudden change; 2. The motor doesn't match with the inverter; 3. Motor thermal insulation deterioration; 4. Voltage fluctuations; 5. Please make sure if there is a missing phase. 6. Mechanical load increases.
	Motor Over-torque	1. Please check the mechanical load, if there is sudden change; 2. The motor doesn't match inverter;
	Auxiliary coil of electromagnetic contactor feedback	Contact distributor
	Braking transistor damage	Contact distributor
	CPU fault	Contact distributor
	E^2Prom fault	Contact distributor

Er	External interference	Isolate the source of interference
Es	Emergency Stop	Emergency Stop status
20	4~20mAz	Connect break
Pr	Parameter setting error	Set parameter correctly
DCb	DC braking	DC braking status

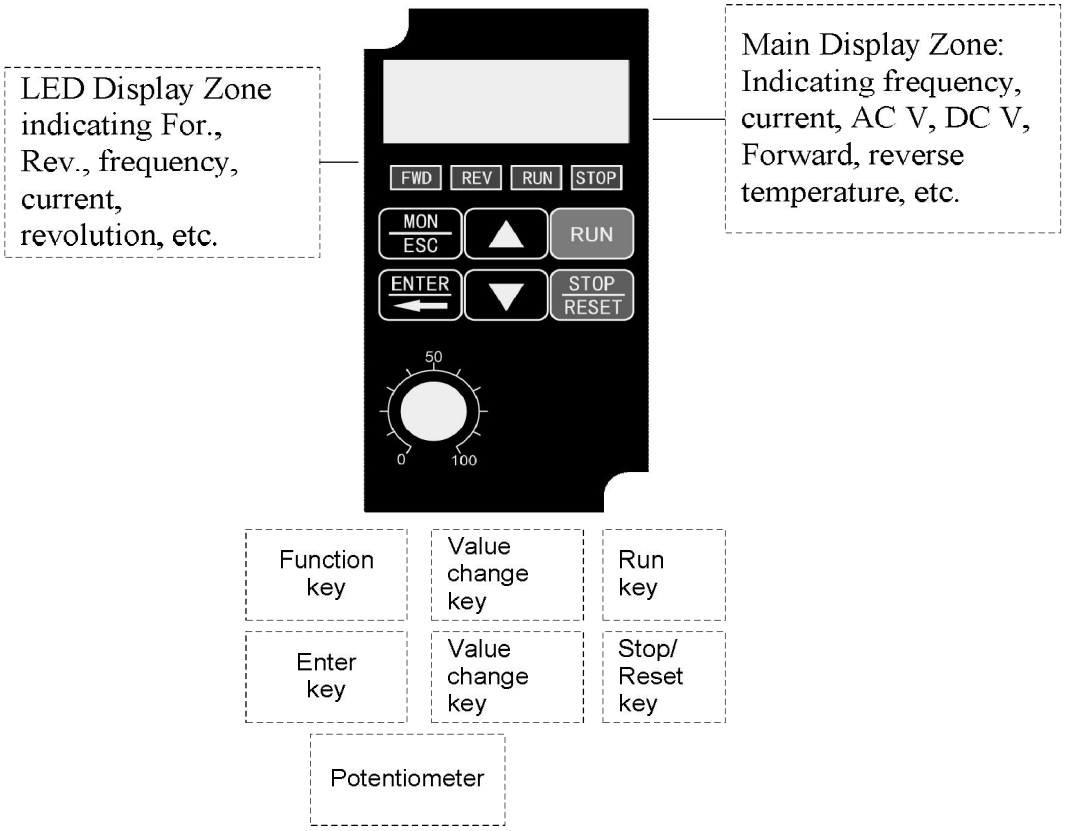


Code Table:

A	B	C	D	E	F	G	H	O	S	N	L	T	P	R	U	2
																

Ⅴ Instruction of the Digital Operator

5.1 Description of the DigitalOperator



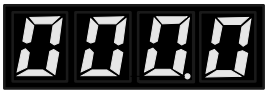
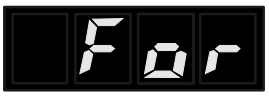
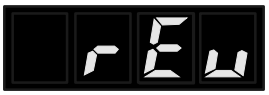
5.2 Description of Indicator Lamp Status

1、Description of Indicator Lamp Status

Indicator lamp	Status	Description
FWD	on	The motor is in forward rotation.
REV	on	The motor is in reverse rotation.
RUN	on	Run
STOP	on	Stop

2、Description of Display Items

No.	Display	Meaning
1		Present output frequency is 50.00HZ
2		Present set frequency is 50.00HZ

No.	Display	Meaning
3		Present output current is 2.0A
4		Present output voltage is 220V
5		Present DC voltage is 540V
6		Present inverter’ s temperature is 39.0
7		Present counter’ s value
8		I Present feedback value of PID is 50%
9		Speed
10		Forward
11		Reverse

5.3Operation Examples

1、DC voltage, temperature, counter, PID feedback value, and the speed can only be displayedafter setting specific parameter.

2、When under FWD, REV, PXXX and parameter content state, after a few seconds the display can be automatically restored to the frequency, voltage, current, etc. interface.

3、When in running and stopping status, original interface is still shown, but the corresponding content will vary depending on the operating conditions. Meanwhile the indicator status will change accordingly.

4、"Confirm / left": short-press to move left; long-press to confirm.

Ⅵ Parameter Overview

P000 Main Frequency	**
Set Range: 0.00—600.00 HZUnit: 0.01Hz	Factory Setting: 0.00

When using digital operator, the inverter will run at the setting value of P000. During running, the running frequency can be changed by pressing the ▲ or ▼ key. During multi-speed running, the main frequency is the first speed frequency.

When using external terminals, if P013 is set to 1, i.e. the running frequency is given by external terminals, the first speed step is given by the potentiometer or external analog commands.

The setting of main frequency is limited by the maxoperation frequency.

P001 Acceleration Time		
Set Range: 0.1—6500.0	Unit: 0.1s	Factory Setting: 5.0
P002 Deceleration Time		
Set Range: 0.1—6500.0S	Unit: 0.1s	Factory Setting: 5.0

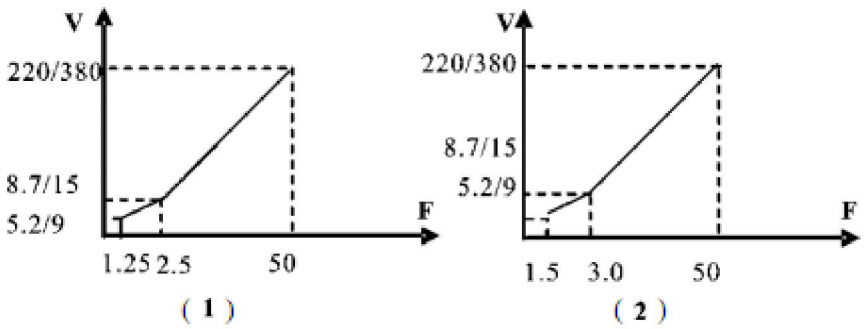
Accelerat ing Time means the time needed for the inverter frequency from 0Hz to 50Hz. Decelerating Time means time needed for inverter frequencyfrom maximum frequency to 0Hz.

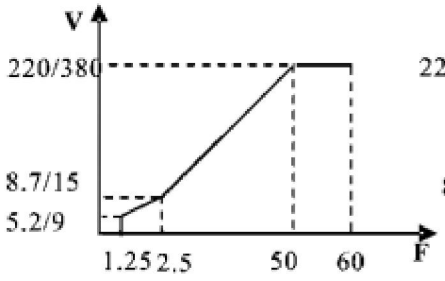
DLM1 Series inverters have 4 Accel/Decel Times. For Accel/Decel Time 2.3.4 the different accelerating and deceleratingtime can be selected through the external terminals and by switching of Accel/Decel Time according to actual needs. In the internal control multi-speed, different Accel/Decel time can be selected through simple PLC.

P003 V/F Curve		
Set Range: 0—16	Unit: 1	Factory Setting: 0

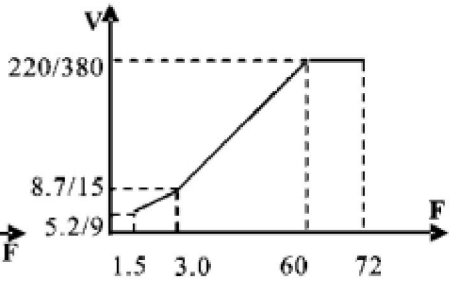
0: Wanton curve

1~16: 16 curves are wanton and available.

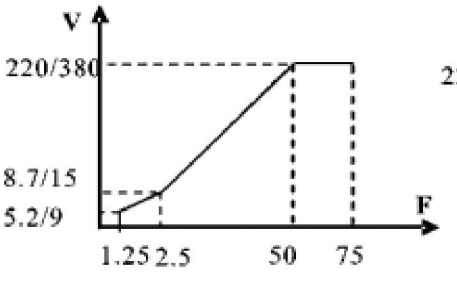




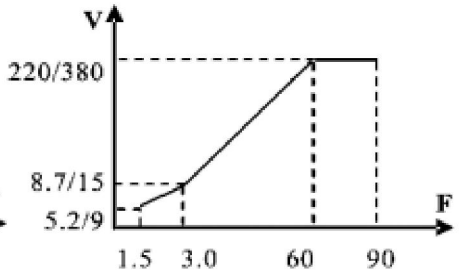
(3)



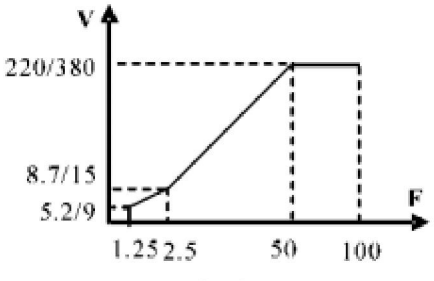
(4)



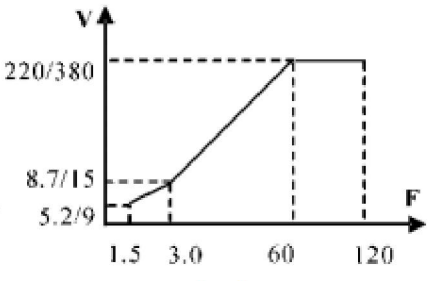
(5)



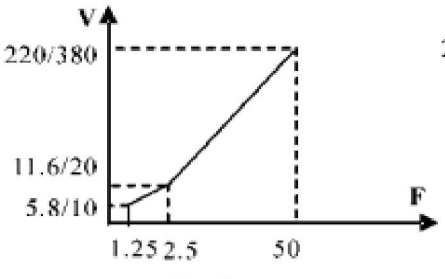
(6)



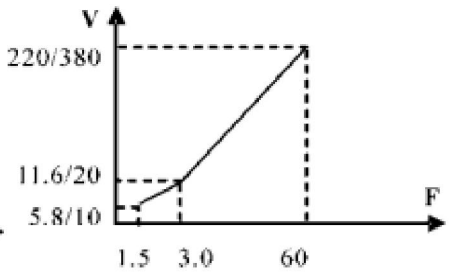
(7)



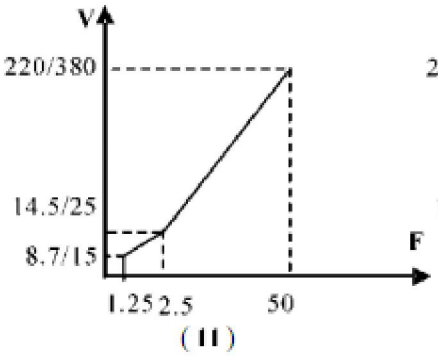
(8)



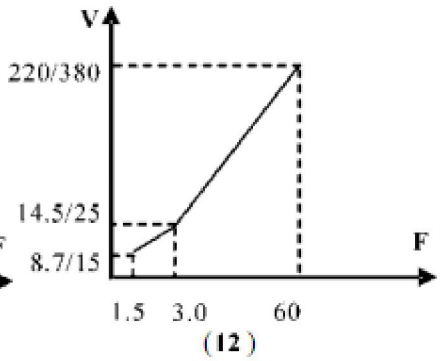
(9)



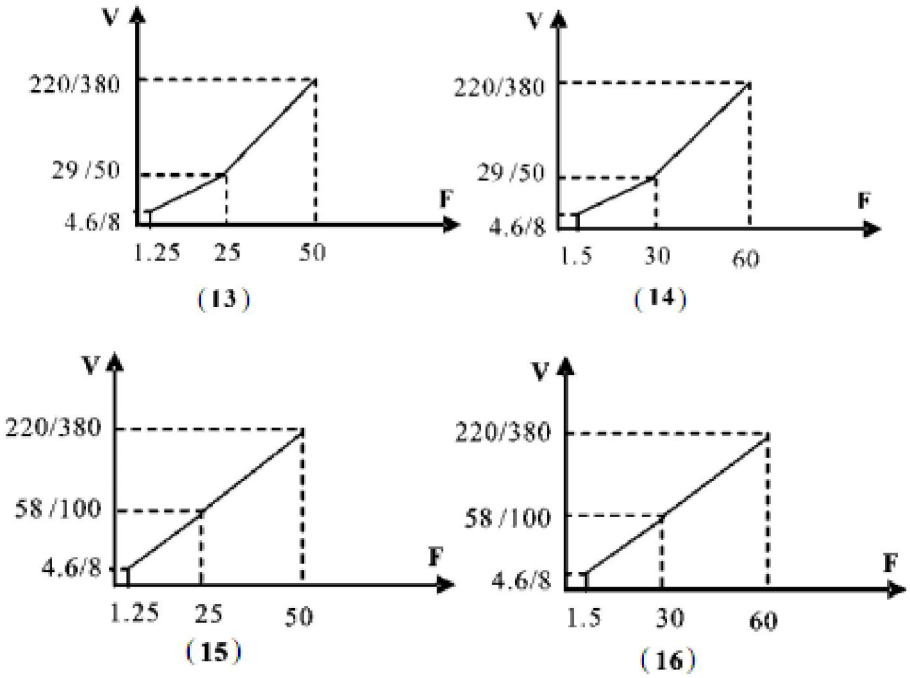
(10)



(11)



(12)



P004Max. Output Voltage Set Range: 0.1—255/510V Unit: 0.1VFactory Setting: 220/380V P005Base Frequency Set Range: 0.01—600.00 Hz Unit: 0.01Hz Factory Setting: 50/60 P006Intermediate Voltage Set Range: 0.1—500.0V Unit: 0.1V Factory Setting: * P007Intermediate Frequency Set Range: 0.01—600.00 HzUnit: 0.01Hz Factory Setting: 2.50

P007 can set any intermediate voltage in the V/F curve. If it is set improperly, it will cause motor over current or under torque, or even an inverter tripping.

P007 set value is limited by P005.

P008Min. Voltage Set Range: 0.1—50.0V Unit: 0.1V Factory Setting: * (undefined)

This parameter can set the lowest starting voltage in the V/F curve.

This setting value is limited by the voltage at the highest operating frequency.

P009Min. Frequency Set Range: 0.1—20.00 HzUnit: 0.01Hz Factory Setting: *

This parameter sets the lowest starting frequency in the V/F curve.

P0010Max Frequency Set Range: 50.00—600.00 HzUnit: 0.01Hz Factory Setting: 50.00

This parameter sets the highest operating frequency of the inverter

P011Frequency Lower Limit		
Set Range: 0.00—600.00	Unit: 0.01Hz	Factory Setting: 0.00

This is set for preventing workers from false operation, avoiding overheat or some other mechanical faults, which might be caused due to too low running frequency. When the setup frequency is below the lower limit the inverter is running at frequency lower limit.

This set value is limited by frequency upper limit.

P012 Operation Command Source		
Set Range: 0—2	Unit: 1	Factory Setting: 0

0: Digital operator;

1: External terminals or potentiometer.

IMPORTANT: CN1 JUMPER (shown at right hand side after opening inverter upper cover). Pin 1 & 2 for panel potentiometer & Pin 2 & 3 for external terminals.

2: Communication ports, such as RS485.

P013 Operation Frequency Source		
Set Range: 0—2	Unit: 1	Factory Setting: 0

0: Digital operator.

1: External terminals or potentiometer.

IMPORTANT: CN1 JUMPER (shown at right hand side after opening inverter upper cover). Pin 1 & 2 for panel potentiometer & Pin 2 & 3 for external terminals.

2: Communication ports, such as RS485.

P014 Starting Mode		
Set Range: 0—1	Unit: 1	Factory Setting: 0

Two starting modes are available for different equipment.

0: Start from the starting frequency.When P092 is set as 0, i.e. DC brake is invalid at start, it starts running fromits starting frequency. When P092 is set to any non zero value, i.e. DC brake is valid when starting, it will first have a DC brakingat start, and then start from the starting frequency. Refer to P091 and P092.

1: Starting by Frequency track. This function can be used in the starting of large inertia load. When starting, the inverter will trace the former speed from the set frequency downward. In case of large inertia equipment, when restarting, it can implement the running command right away withourt waiting for the complete stop of the equipment by tracking the former frequency to save time.

Note: When the inverter is restarted by frequency track, it will start tracking the frequency from its set frequency downward, and search it at the highest speed. When starting, the current will be high, and over current or stall may occur. Be sure to pay attention to the adjustment of current standard position of frequency track. Generally, P095 should be set around 100%. The exact value should be set according to the characteristics of mechanical load.

P015 Stopping Mode		
Set Range: 0—1	Unit: 1	Factory Setting: 0

Two stopping modes are available for the requirements of different equipment.

0: Decelerate to stop.

When P093 is set as 0, DC braking is invalid. When DC braking is invalid, the inverter will decelerate to the stopping frequency, and then stop output, and the motor will coast to stop. When P093 is set for any non-zero value 0, the DC braking is valid, and the inverter will frst decelerate to the stopping frequency, and then stop fnally by DC braking. When stopping, the DC braking is usually used in high position stopping or for position control. Be sure to notice that frequent uses of DC braking will cause the motor overheat.

Related parameters: P091 and P093.

1: Free-running Stop

When the inverter receives a STOP command, it will immediately stop output and the motor will have a free running till a stop. When the free-running stopping mode is selected for the motor, DC braking is invalid.

P016 Reverse Rotation Selection		
Set Range: 0—1	Unit: 1	Factory Setting: 0

0: Reverse Run is forbidden.

1: Reverse Run is allowed.

This function is suitable when the motor cannot have reverse rotation, and to prevent workers from false operation. When the reverse rotation is forbidden, the motor can only rotate forward, and cannot have reverse rotation.

When the reverse rotation is forbidden, if switching between For/Rev rotation on the panel, the panel will show Rev Run, but the motor is actually making forward rotation with the indicator lamp indicating For Run.

P017 STOP key selection		
Set Range: 0—1	Unit: 1	Factory Setting: 0

0: STOP is invalid.

1: STOP is valid.

This parameter set is only valid when P012 is set as l or 2.

When P012 is set for external terminals or communications, the STOP key on the panel can be chosen to be valid or not. When choosing it as valid, the STOP key can stop the inverter in running. When it needs restarting, the former running signal should be released first and then restarting is allowable.

P018 S-Curve Time		
Set Range: 0~6500S	Unit: 1	Factory Setting: 0

This parameter can be set for no-impact slow start or slow stop of the inverter when starting or stopping. When starting S-curve the inverter will make accel or decel curve of different speed rates according to Accel/Decel Time.

When P018 is set to 0, S-curve is invalid, i.e. accelorate or decelorate in straight line.

Without consideration of stall, the actual Accel/Decel Time is equal to the set Acel/Decel Time plus S-curve Time.

P019 Carrier frequency (Note: 0 ~ 15 corresponding to 0 ~ 16K Hz)		
Set Range: 0~15	Unit: 1	Factory Setting: 10

The carrier frequency has some affect on the electromagnetic noise of the motor, and meanwhile the level of the carrier frequency has certain relation with the heating capacity of the inverter and the interference to the environment.

See the following table:

Carrier Frequency	Electromagnetic Noise	Heating Capacity	Interference to the Environment
Low ↓ High	High ↓ Low	Small ↓ Large	Little ↓ Great

Carrier frequency corresponding table:

Set Value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Carrier Frequency KHz	1.5	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

As shown in the table above, with a higher carrier frequency, theelectromagnetic noise will be lower, but the interference to othersystems must be prevented. With a lower carrier frequency, theelectromagnetic noise will be a little higher, but the heating capacity will be small. So the carrier frequency should be set as low as possible, especially with large power machines, if thenoice demand is not so high.

P020 Starting Frequency		
Set Range: 0.1—10.0 Hz	Unit: 0.1Hz	Factory Setting: 0.5

Starting frequency is the initial frequency when the inverter is started. If the starting frequency is set to 4.0Hz, the inverter will begin to run at 4.0Hz .

P021 Stopping Frequency		
Set Range: 0.1—10.0 Hz	Unit: 0.1Hz	Factory Setting: 0.5

When the inverter receives a stop command, it will immediately decelerate to the stopping frequency, stop output or start DC brake to a final stop.

If P093 is set to 0, DC brake is invalid when stopping and the inverter will stop output.

If P093 is set to any other parameter except “0”, DC brake is valid; the inverter will stop by DC braking.

P022 Jog Frequency		
Set Range 0.00—600.00	Unit: 0.01Hz	Factory Setting: 5.00

This parameter can realize the jogging function when the inverter is tested. The jog operation can be achieved only through the external terminals, which can be set by multi-function input terminals. Jog frequency is limited by frequency lower/upper limit. While the jog function is implemented, other

commands are invalid. The accelerationtime of jog frequency is set by P023. When using jog function, set external terminals to 07 or 08.

This function is only valid at stop condition. It is invalid at running. When P012 is set to 1, it is valid.

P023 Jog Accel/Decel Time		
Set Range: 0.1—25.0	Unit: 0.1S	Factory Setting: 1.0

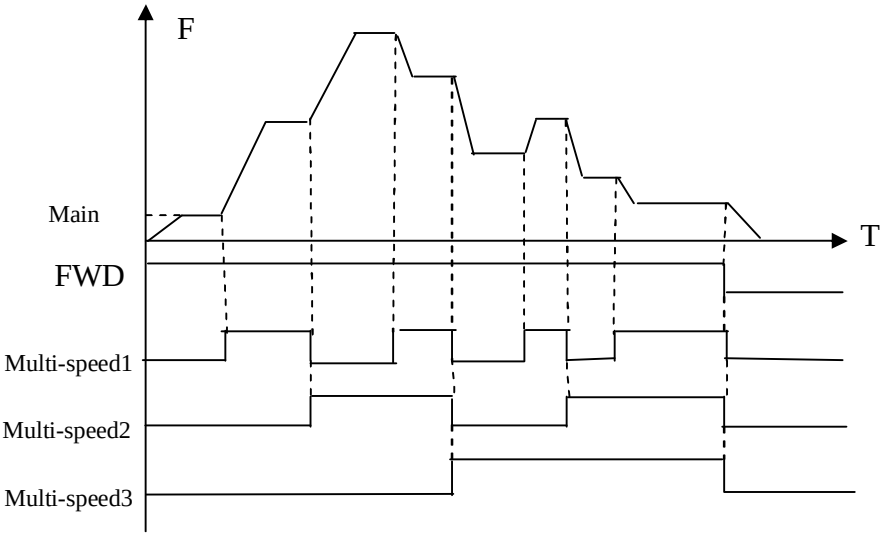
P023 corresponds to Accel/Decel Time of 0~50Hz.

P024 PLC Operation		
Set Range: 0—5	Unit: 1	Factory Setting: 0

0: Normal;

1: External 4 –speed control (refer to P050~P055);

2: External multi-speed control;



Multi-function Terminals			Results
Multi-speed 1	Multi-speed 2	Multi-speed 3	
OFF	OFF	OFF	Main frequency& set by P000
ON	OFF	OFF	Multi-speed1 & set by P035.
OFF	ON	OFF	Multi-speed 2 & set by P036.
ON	ON	OFF	Multi-speed 3 & set by P0375.
OFF	OFF	ON	Multi-speed 4 & set by P038.
ON	OFF	ON	Multi-speed 5 & set by P039.
OFF	ON	ON	Multi-speed 6 & set by P040.
ON	ON	ON	Multi-speed 7 & set by P041.

Note:

(1) To realize excternal 8-speed control, it is only valid when Multi-input is set for Multi-speed 1, 2, 3 and P024 is set to 2.

(2) Multi-speed 1, 2, 3 can make up to 7 speeds. Adding the main frequency it will have 8 speeds.

(3) The frequencies of Speed 1 ~ Speed 7 are determined by P035~P41.

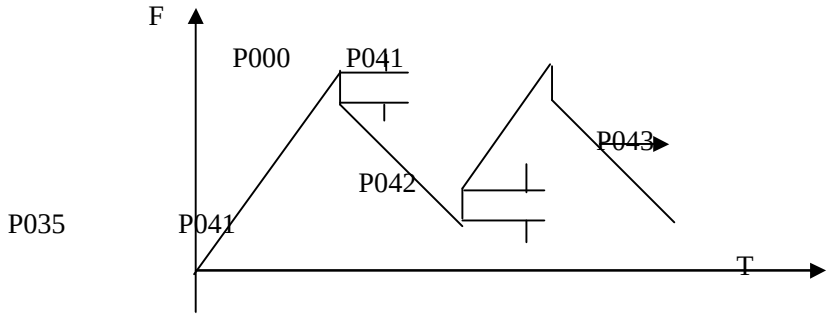
(4) Each Acel/Decel Time is determined by the external multi-function terminal.

(5)The directions of each program running are determined by the external multi-function terminals.

(6) The main frequency can be setby P000 or the potentiometer.

3: Transverse movement

This is a special parameter in the chemical fiber and printing and dying industries to realize transverse movement.Except the commands of stop, external faults and emergency stop all other commands will not be accepted at running.



Note:

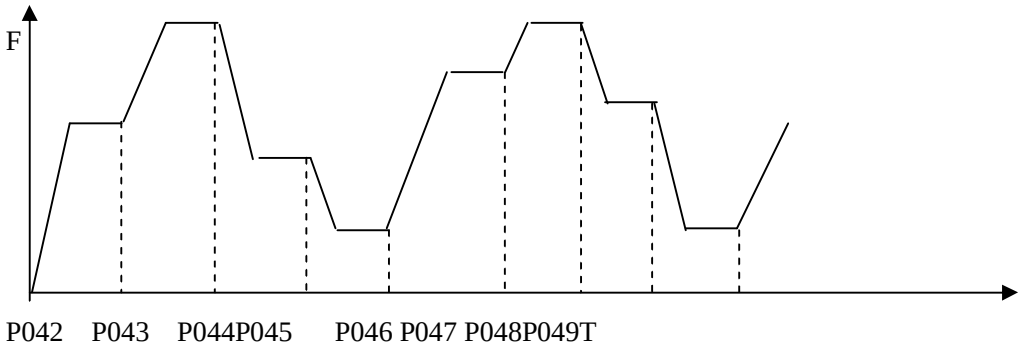
(1) The frequency at each inflection point is determinded by P000 and P035.

(2)Skip Frequency is determined by P041.

(3)Running Time is determined by Timer P042 and P043.

(4)Restart after power off. The running status of frequency will not be memorized.

4: Internal Multi-speed control



Note:

(1) Main speed and 7-speeds compose 8-speeds.

(2) Acel/Decel Time of each speed is set by PLC Acel/Decel Time P027 and P028.

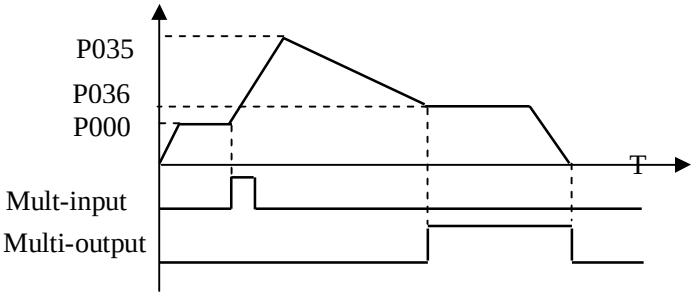
(3) Running Time is set by Timer P042~P049. Set timer to 0 if not used.

(4) Running direction of each speed is determined by P026.

(5 Restart after power off from the main speed. Status before power off will not be memorized.

5: Drawing

This is a special parameter for the constant speed of unwinding and rewinding. By using this function the linear speed can maintain constant at certain accuracy levels.



Note:

(1)Triggered by external multi-function terminals and the drawing actions begin to be implemented.

(2)Actual running time is T=P042×10;

(3) When the drawing is finished the inverter will output at a constant speed set by P036 and the corresponding multi-ouput terminals will activate. Until receiving the Stop command the inverter will stop running and the multi-ouput terminals will reset.

(4) In case of P133=1, it has the memory function at power off. When it restarts after the power off the prior status will be memorized.

(5) The output frequency for drawing can be either up or down.

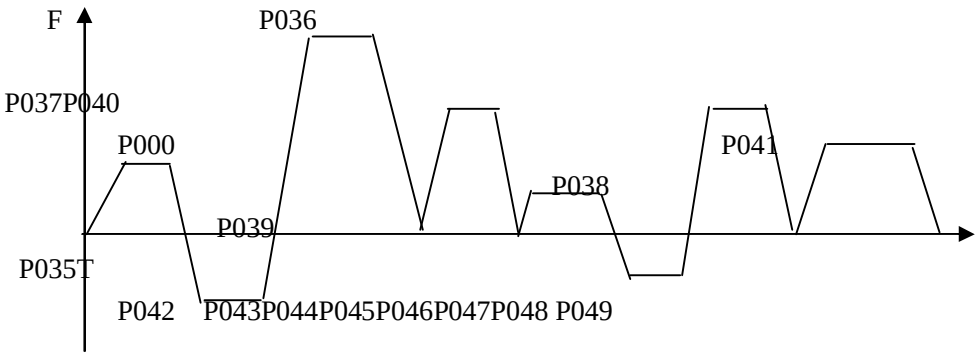
P025 Auto PLC Operation (internal multi-speed)		
Set Range: 0~3	Unit: 1	Factory Setting: 0

Note:

This parameter is only valid when P024 is set to 4. For relevant parameters, refer to P000, P024, P035~P049.

0: Stop after the program runs for onecycle and restart only when another running cammand is given.

1: Loop Run. When the running command is given, the inverter starts to operate in sequence with the speeds and times set by each internal parameter for infinite loops. During the loop run, except the commands of stop, external faults and emergency stop, all other commands will not be accepted.



2: Stop after the program runs automatically for one cycle & stop at intermediate intervals beween different speeds.

(1) When the command of automatic program running is given the inverter will operate according to each parameter, but it will stop frst and then restart at the change of each stage. It will stop automatically after running for onecycle. Only with another running cammand is given the inverter can restart.

(2) The frequencies of each speed are set by P000, P035~P041.

(3) The running times of each speed step are set by P042~P049.

(4) The running direction is set by P026.

3: Loop run & stop at intermediate intervals beween different speeds.

(1) After the auto run command is given the inverter will run according tothe parameters, but at every change of speed it will stop frst and then start again. It will continue and stop until the OFF

command for auto run is given.

(2) When each speed is fnished the corresponding multi-function output will act.

(3) When each pattern run is fnished the corresponding multi-function output will act.

(4) The width of output pulse is 20 ms.

(5) When running again after power off all the actions will be started from the beginning and the previous states will not be memorized.

P026 PLCRotation Direction		
Set Range: 0~255	Unit: 1	Factory Setting: 0

This parameter is only valid when P024 is set to 4.

This parameter determines the rotation directions of each frequency step of P035~P041 and P000 in the pattern run. The setting method is as follows:

The rotation direction is set frst in the binary bit mode, and then converted to a decimal value for the setting of this parameter.

For instance:

bit 0-7

7	6	5	4	3	2	1	0
0	1	0	0	1	0	1	0

0: For 1: Rev

Main Speed(P000)For

Step 1(P035)Rev

Step 2(P036)For

Step 3(P037)Rev

Step 4(P038)For

Step 5(P039)For

Step 6(P040)Rev

Step 7(P041)For

The parameter value 01001010 is converted to a decimal value:

$1\times2^6+1\times2^3+1\times2^1=64+8+2=74$

Then P026=74

P027 PLC Accel. / Decel. Time 1		
Set Range: 0~65535	Unit: 1s	Factory Setting: 0
P028 PLC Accel. / Decel. Time 2		
Set Range: 0~65535	Unit: 1s	Factory Setting: 0

This parameter is only valid when P024 is set to 4.

Thisparameter is to determine the accel/decel time values of Step 1~4 of the internally controlled multi-speed. Its setting method is as follows:

(1) Determine each accel/decel time in in the binary 2 bit mode

Bit1	Bit0	Accel/Decel Time
0	0	Accel/Decel Time 1: P001、P002
0	1	Accel/Decel Time 2: P029、P030
1	0	Accel/Decel Time 3: P031、P032
1	1	Accel/Decel Time 4: P033、P034

(2) Determine the accel/decel time of each speed step in the binary 8 bit mode

Speed No. 4		Speed No. 3		Speed No. 2		Speed No. 1	
t4		t3		t2		t1	
0	1	1	0	0	0	1	1

t1select Accel. Time 4 t3select Accel. Time 3

t2select Accel. Time 1 t4select Accel. Time 2

$1\times2^0+1\times2^1+1\times2^5+1\times2^6=99$

Then P027=99

P028 is set in the same way as P027.

P029 Accel. Time 2
Set Range: 0.1~6500S Unit: 0.1S Factory Setting: 10.0
P030 Decel. Time 2
Set Range: 0.1~6500S Unit: 0.1S Factory Setting: 10.0
P031 Accel. Time 3
Set Range: 0.1~6500S Unit: 0.1S Factory Setting: 50.0
P032 Decel. Time 3
Set Range: 0.1~6500S Unit: 0.1S Factory Setting: 50.0
P033 Accel. Time 4
Set Range: 0.1~6500S Unit: 0.1S Factory Setting: 100.0
P034 Decel. Time 4
Set Range: 0.1~6500S Unit: 0.1S Factory Setting: 100.0

P035 Frequency 2 Factory Setting: 15.0
P036 Frequency 3 Factory Setting: 20.0
P037 Frequency 4 Factory Setting: 25.0
P038 Frequency 5 Factory Setting: 30.0
P039 Frequency 6 Factory Setting: 35.0
P040 Frequency 7 Factory Setting: 40.0
P041 Frequency 8 Factory Setting: 0.50
Set Range: 0.0~600.0Hz Unit: 0.1Hz

P042 PLC Timer 1 Set Factory Setting: 10.0
P043 PLC Timer 2 Set Factory Setting: 10.0
P044 PLC Timer 3 Set Factory Setting: 0.0
P045 PLC Timer 4 Set Factory Setting: 0.0
P046 PLC Timer 5 Set Factory Setting: 0.0
P047 PLC Timer 6 Set Factory Setting: 0.0
P048 PLC Timer 7 Set Factory Setting: 0.0
P049 PLC Timer 8 Set Factory Setting: 0.0
Set Range: 0.0~6500S Unit: 0.1S

P050	Multi-Input FOR	Factory Setting:	02
P051	Multi-Input REV	Factory Setting:	03
P052	Multi-Input RST	Factory Setting:	10
P053	Multi-Input SPH	Factory Setting:	17
P054	Multi-Input SPM	Factory Setting:	18
P055	Multi-Input SPL	Factory Setting:	19
Set Range:	00~32	Unit:	no

00: Invalid: When the terminal is set for null, it can avoid faulse operation.

01: Run: It can be combined with other terminals to combine various control methods.

02: FWDForward rotation

03: REV Reverse rotation

04: STOP

05: FWD/REV

06: JOG

07: Jog Forward rotation

08: Jog Reverse rotation

09: Emergency Stop: It can receive external emergency stop or other fault signals.

10: RST This terminal can be used to reset after the fault is removed.

12: Overheat of radiator or motor: This contact can be used to detect overheat of the radiator or motor to protect the motor and inverter.

13: Externally Controlled Timer 1 start: When the contact is closed, the timer will start and begin to count time. When the timer reaches the point the responding multi-outputs will act.

14: Externally Controlled Timer 2 start

17: High Speed: High, middle and low speed can compose three kinds of different operation patterns.

18: Middle Speed: In the three terminals the high-end signal has priority.

19: Low Speed: Determined by Frequency 3, 4.

20: Multi-speed 1Multi-speed 1, 2, 3 can compose 7-Steps.

21: Multi-speed 2

22: Multi-speed 3

23: Acel/Decel Select 1: This terminal can be used to selcect the acel/decel time of the inverter.

24: Acel/Decel Select 2:

25: UP function: When this terminal switch acts the frequency will increase by one unit.

26: DOWN function: When this terminal switch acts the frequency will decrease by one unit.

27: Counter: When the terminal is set for the counter it can receive the pulse signal of ≤250HZ and count the number.

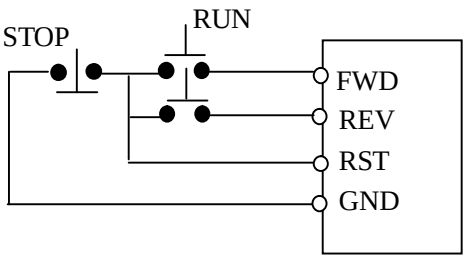
28: Counter reset: the action of this contact can clear the present counting value.

29: Drawing start: When the contact is triggered the actionofdrawing will start.

31: Auto PLC reset suspend: This contact can be used to realize the function of suspending clear-up of Auto PLC.

32: PID valid: PID becomes valid and working.

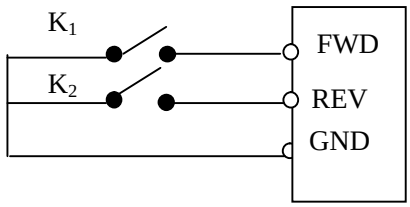
A. Using the three multi-function terminals to form the connection method of three-wire system for the realization of switching FWD/REV, which is extentively applied in the case of switching FWD/REV of photoelectric switches.



P012=1; P050=02
P051=03; P052=04

When triggering FWD, the inverter will rotate forward (starting);
Whentriggering REV, the inverter will rotate reversely;
When pressing STOP, the inverter will stop.

B. Use RUN, GND, FWD/REV to combine for Starting, Stopping and For/Rev:



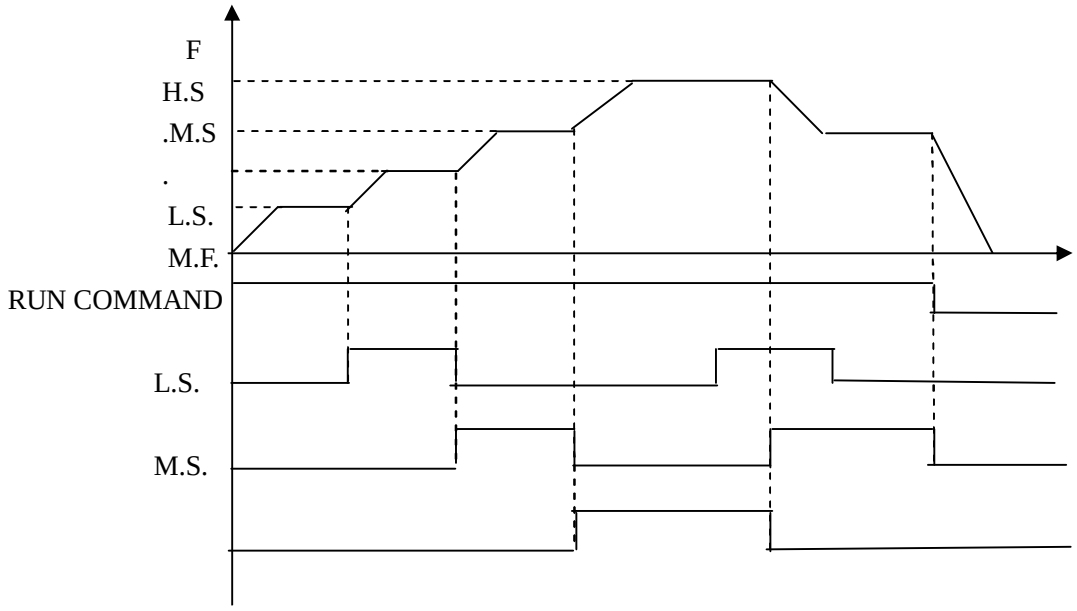
Select the terminals of FWD and REV
Parameter setting: P012=1 to set the exterminal control.
P050=01 to set RUN
P051=05 to set F/R
When K2 is open it rotates forward, while K2 is closed it rotates

C. Description of Accel/Decel Time 1 and 2 Select

- It is only valid when P024 is set to 0, 1, 2.
- Any two multi-function input terminals can be combined to 4 kinds of Accel/Decel for selection.
- The related multi-function input terminals are set to Accel/Decel Select 1,2.Take the terminals of SPH and SPM as example, when the terminals of SPH P053 is set to 23 and the terminals of SPM to 24, then the terminals of SPH and SPM should be Accel/Decel Time 1, 2 Select.

SPH Terminal	SPM Terminal	Result
OFF	OFF	Accel/Decel Time 1
ON	OFF	Accel/Decel Time 2
OFF	ON	Accel/Decel Time 3
ON	ON	Accel/Decel Time 4

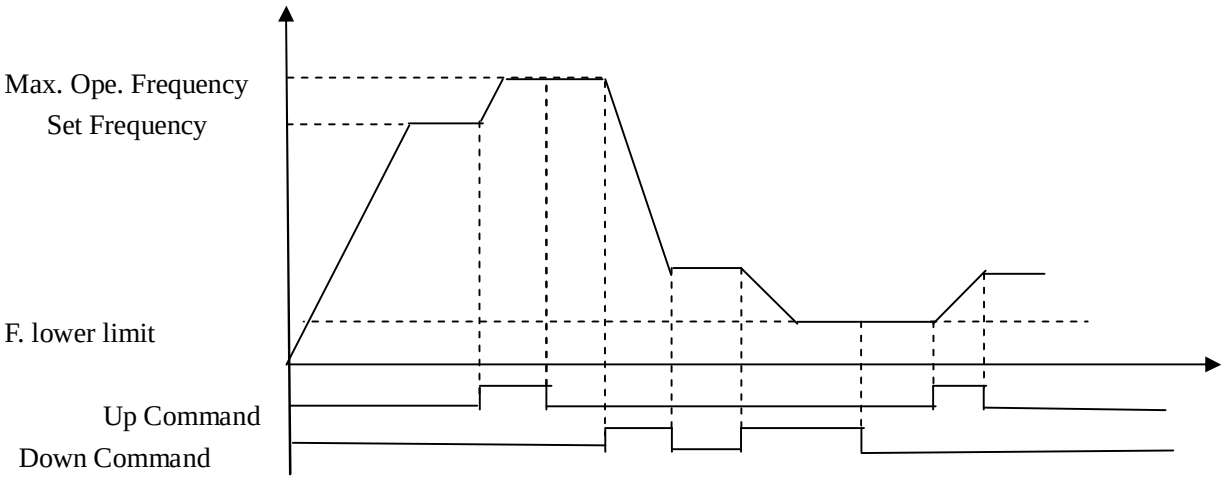
D. Function description of High, middle and low terminals:



H.S.

RUN	SPL Terminal	SPM Terminal	SPH Terminal	Result
ON	OFF	OFF	OFF	Main frequency and frequency run with the set value of P000.
ON	ON	OFF	OFF	Low speed and frequency run with the set value of P035.
ON	ON/OFF	ON	OFF	Intermediate speed and frequency run with theset value of P036.
ON	ON/OFF	ON/OFF	ON	High speed and frequency run with the set value of P037.

E. Description of UP and DOWN Function



UP	DOWN	Result
ON	OFF	Frequency up
OFF	ON	Frequency down
ON	ON	No up, no down

Note:

(1) The function of UP and DOWN is only valid when the operation of Operator is delected for the source of the running frequency, i.e. P013=0.

(2) When UP is closed the inverter’ s frequency will increment.

(3) When DOWN is closed the inverter’ s frequency will decrement.

(4) When both UP and DOWNare closed at the same time the frequency will neither increase nor decrease. It is regaded as invalid.

(5) When the frequency reaches the max. operation frequency it will not increase.

(6) When the frequency reaches the min. frequency or its lowe limit, it will not decrease.

(7) It has the function of memory, including the memory for power-off. (Setting P60=1)

(8) When adopting the function of UP and DOWN,its up and down speed rate is determined by the present Accel/Decel time.

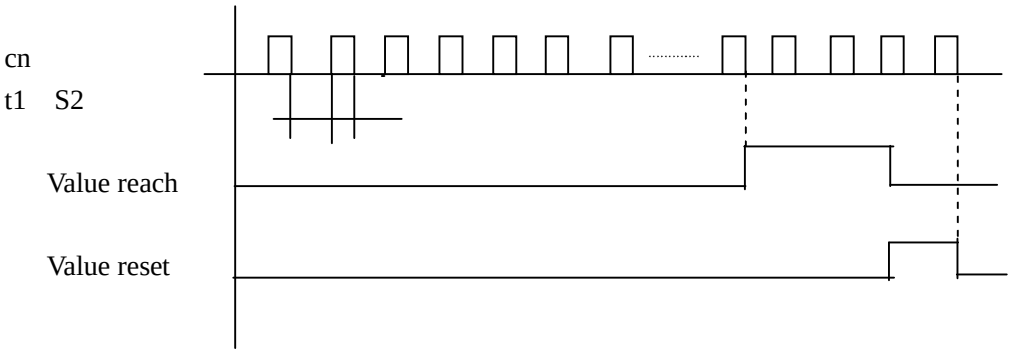
⑼ When keeping pressing UP or DOWN，the frequency will increase or decrease rapidly.

⑽ The function of UP and DOWN is valid in operation, not during standy by.

F. Description of Multi-speed 1, 2 and 3 Functions

They are only valid when P024 is set to 2. Details refer to P024.

G. Description of Counter Function



Note:

⑴ The signal width triggered should not be lower than 2msec(t1、S2≥2msec);

⑵When the counting value is reached the corresponding multi-functionoutput contact will act.

⑶ This counter is reverse counter. When the counter is reset the setting value will be displayed and then start counting.

⑷ When the counting value is reached the displayed value is 0. It will not count againand only start counting after it reset.

⑸ It has the function of memory. When P132=1, the counting result can be memorized for power-off.

P056	Multi-Output DRV	Factory Setting: 01
P057Multi-Output FA, FB, FC		Factory Setting: 02
Set range: 00—32		Unit: nil

00: Invalid. When the terminal is set for no function it can prevent false action.

01: Running. The contact will act when the inverter is running or receiving running command signals.

02: Fault indication. The contact will act when the inverter detects abnormal condition.

03: Zero Speed: The contact will act when the output frequency is lower than starting frequency.

04: DC Braking indication: The contact will act when the inverter is in DC braking condition.

05: Set Frequency reach: The contact will act when the output frequency reaches the set frequency.

06: Random Frequency 1 Reach: The contact will act when the output frequency reaches the designated frequency (P070).

07: Random Frequency 2 reach: The contact will act when the output frequency reaches the designated frequency (P071).

08: In Accel: The contact will act when the inverter is in acceleration status.

09: In Decel: The contact will act when the inverter is in deceleration status.

10: Inverter Overload alarm: The contact will act when the inverter detects overload.

11: Motor Overload alarm: The contact will act when the inverter detects overloadof motor.
12: Over-torque detect: The contact will act when the inverterdetects over torque.
13: Undervoltage alarm: The contact will act when the inverterdetects under voltage.
14: Single Step end: The contact will act and output a pulsewhen the inverter fnishes a single step.
15: Process end: The contact will act and output a pulse when the inverter finishes all the steps in implementation of pattern operation (i.e. after one cycle).
16: Set Counter reach: The contact will act when the inverterimplements the external counter and the counting value is equal to the set value (P064).
17: Intermediate Counter reach: The contact will act when the inverter implements the external counter and the countingvalue is more than or equal to the set value (P065).
18: Externally Controlled Timer 1 reach: The contact will act when the timer reaches the set value.
19: Externally Controlled Timer 1 reach
20: 4 20mA disconnected. When the AI input signal is opend the contact will act.
27: Drawing Reach: The contact will act when the drawing action is fnished. The contact will automatically reset when the inverter stops.
28: PID Lower Limit alarm: This contact will act when the PID feedback quantity is lower than the lower limit (P108).
29: PID Upper Limit alarm: This contact will act when the PID feedback quantity is higher than the upper limit (P107).
30: Fan run: When the inverter is working in high temperature or in running, this contact will act.
31: Electromagnetic Relay act: When the contact pulls in the corresponding multi-function terminal will act.
32: Braking Resistor act: When the inverter in running and the DC voltage reaches the braking voltage the contact will act.

P058 Multi output AM		
Set Range: 0~7	Unit: 1	Factory Setting: 0

Function: In combination with P059 it can be connected to a frequency meter with the measuring range of 0~10V for external monitoring.
0: Analog Output: 0~10V corresponds to 0~ Max operation frequency.
1: Analog Output: 0~10V corresponds to 0~ 2 times Rated current.
2: Analog Output: 0~10V corresponds to 0~1000V DC voltage.
3: Analog Output: 0~10V corresponds to 0~510/255V output AC voltage.
4: Pulse Output: 1 Pulse/Hz.
5: Pulse Output: 2 Pulse/Hz.
6: Pulse Output: 3 Pulse/Hz.
7: Pulse Output: 6 Pulse/Hz.

P059 AM Analog Output Gain		
Set Range: 0~100%	Unit: 1%	Factory Setting: 100%

This parameter can be used to adjust the output voltage value of the multi-output AM to suit frequency meter with different measuring range and also used to adjust a frequency meter. For example, for an externally connected frequency meter with the measuring range of 0~5V, a multi-function terminal can be used to display its operation frequency. Then user can set P059=50.

*Note: When selecting a frequency meter please select one with measuring range below 0~10V.

P060 Up-down Mode		
Set Range: 0~1	Unit: 1	Factory Setting: 0

0: Not memorized

1: Memorized

Through the setting of this parameter whether the value changed by UP-DOWN will be memorized after stopping can be selected.

When P060 is set to 1, if restart after stopping, the value at stopping will be memorized. If restart after power off, the values at power off will not be memorized, but the value set by P000 will be memorized. When P060 is set to 0, if restart after stopping, it will return to the value of P000, the value changed by up-down will not be memorized.

P062 Timer 1 Time		
Set Range: 0.0~10.0	Unit: 0.1S	Factory Setting: 0
P063 Timer 2 Time		
Set Range: 0~100	Unit: 1S	Factory Setting: 0

Timer 1 is a timer of 0.1S~10.0S and Timer 2 is a timer of 1S~100S.

When the timer for multi-input terminal is opened or closed the timer starts to count time. When the set time is reached the corresponding multi-output contact will act. When the timer is cut off, the timer for multi-output will reset. During running, if the machine stops due to fault, the timer will counttime normally and not suspend; if the machine stops due to power off, the timer will reset automatically.

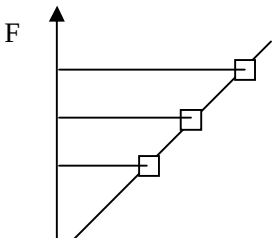
P064 Counter		
Set Range: 0~9999	Unit: 1	Factory Setting: 0

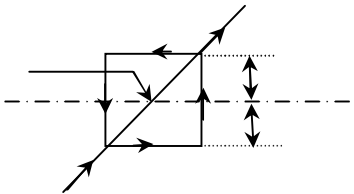
An external terminal of multi-function can be used as a trigger for the counter. When the counter reaches set value P064 the corresponding multi-function output contact will act. After the counter is reset and returns it will start counting again. A proximity switch or optoelectronic switch can be used for the trigger signals.

P065 Intermediate Counter		
Set Range: 0~9999	Unit: 1	Factory Setting: 0

Intermediate Counting Value is one value within counting range. When the counter reachesthis value the corresponding multi-function output contact will act and output one pulse signal. It is valid when the set value of P065 is smaller than P064.

P066 Skip Frequency 1		
P067 Skip Frequency 2		
P068 Skip Frequency 3		
Set Range: 0.00~600.00Hz	Unit: 0.1Hz	Factory Setting: 0.0
P069 Skip Frequency Range		
Set Range: 0.1~10.00Hz	Unit: 0.1Hz	Factory Setting: 0.5





P068Frequency

P067 P069

P066 P069

To avoid a mechanical resonance point three frequency skip points are set. In case of P069=0, all skipping frequencies are invalid. The actual skipping frequency range is 2 times that of P069, as shown in the above diagram.

P070 Random Frequency 1
P071 Random Frequency 2
Set Range: 0.00~600 Unit: 0.1Hz Factory Setting: 0.0

P072 Analog Input Select
Set Range: 0~4 Factory Setting: 0

0: 0~10V 1: 0~5V 2: 0~20mA 3: 4~20mA 4: 0~10V and 4~20mA stacked

This parameter can be set to satisfy different analog input signals.

When P072=4, output frequency =(U/Umax + I/Imax)*50Hz/2

Among which: U: Analog Quantity Voltage Quantity; Umax: Maximum Analog Quant ity Voltage Quant ity; I: Analog Quantity Current Quantity; Imax: Maximum Analog Quantity Current Quantity.

For example, When +10V and 20mA are respectively entered, the output frequency of the inverter is 50Hz.

(In case the max. operation frequency is set to 50Hz)

P073 Analog Low End Frequency
Set Range: 0.0~600.0Hz Unit: 0.1Hz Factory Setting: 0.0
P074 Bias Direction of Low End Frequency
Set Range: 0~1 Factory Setting: 0

0: Forward dirction

1: Reverse direction

P075 Analog High End Frequency
Set Range: 0.0~600.0Hz Unit: 0.1Hz Factory Setting: 51.0
P076 Bias Direction of High End Frequency
Set Range: 0~1 Factory Setting: 0

0: Forward dirction

1: Reverse direction

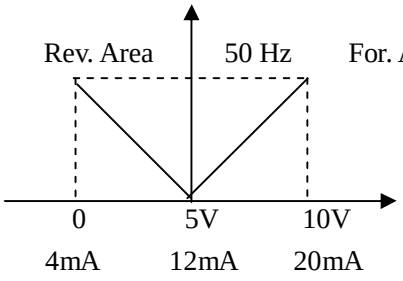
P077 Analog Negative bias Reverse
Set Range: 0~1 Factory Setting: 0

0: Negative bias Rev is not allowable.

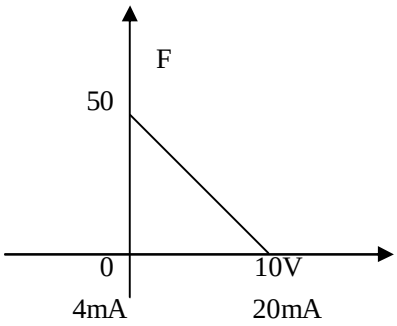
1: Negative bias Rev is allowable.

The parameter is to measure the range and zero point of the external analog terminals and can be combined for any kind of curve to control the operation of the motor.

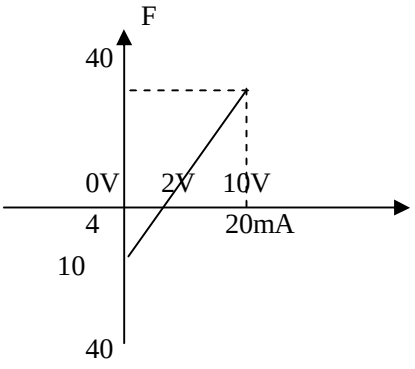
Examples:



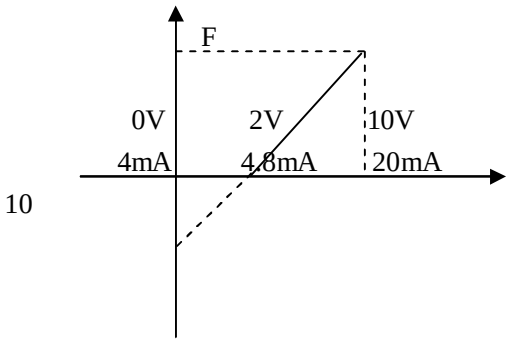
Setting： P073=50
P074=1
P075=50
P076=0
P077=1



P073=50
P074=0
P075=0
P076=0



P073=10
P074=1
P075=40
P076=0
P077=1



P073=10
P074=1
P075=40
P076=0
P077=0

P078 Analog Filtering Constant		
Set Range: 0~50	Unit: 1	Factory Setting: 20

The setting of this parameter is related to the responding speed of analog commands. The higher the value of P078 is set, the slower the responding speed of analog commands. Too low

setting of P078 may cause the instability of frequencywith fluctuation.

P079Overvoltage Stall Prevention		
Set Range: 0~1	Unit: 1	Factory Setting: 1

0: Overvoltage stall prevention function is invalid.

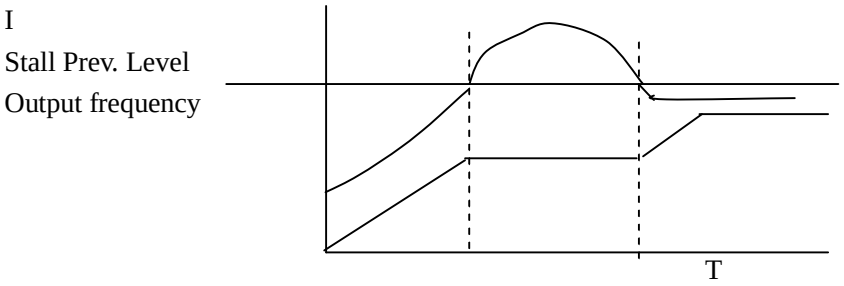
1: Overvoltage stall prevention function is valid.

When the inverter is in decelerating, due to the effect of load inertia, the motor will produce a return energy to the inverter and cause the DC voltage of the inverter to increase. So when the function of overvoltage stall prevention is set valid and the DC voltage of the inverter becomes too high, the inverter will stop decelerating till the DC side voltage decreases to its rated value, then the inverter will go on to execute deceleration and the deceleration time will be extended automatically.

* Note: When the output voltage is higher the inverter will become abnormal or turn to protection. In such case P079 can be set to 0 (Invalid), which is easy to cause overvoltage protection.

P080Stall Prevention Level during Acceleration		
Set Range: 0~200%	Unit: 1%	Factory Setting: 150

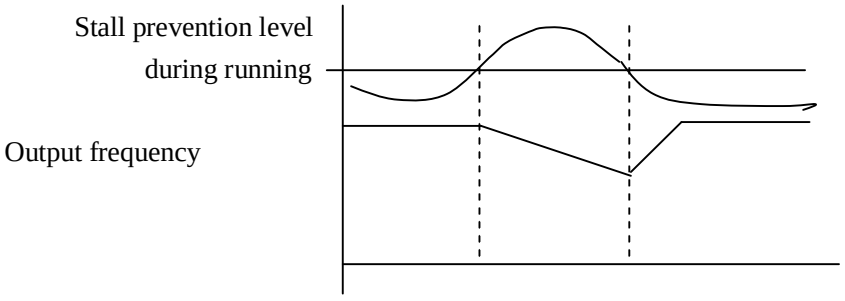
When the inverter is in accelerating, due to over load or too short acceleration time, the output current of the inverter will go up quickly and exceed the rated standard level. When this happens, the inverter will stop accelerating until the current returns under its rated value, will the inverter go on to accelerate. When using the frequency track function the value of P080 should be lowered properly. The greater the load initia quantity is, the smaller the value of P080 should be set. Otherwise it is extremely easy to cause overcurrent protection.



100% current is the rated current of the motor. When this parameter is set to 0, the stall prevention function is invalid.

P081Stall Prevention Level at Constant Speed		
Set Range: 0~200%	Unit: 1	Factory Setting: 0

When the inverter is in constant running, due to load fuctuation and other reasons, the current will go up. When the current exceeds its rated value, the inverter will lower the output frequency. When the output current returns to its normal range the inverter will accelerate again to its set frequency.



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100% current is the rated current of the motor. When this parameter is set to 0, the stall prevention function is invalid.

P082Stall Prevention Level during Deceleration		
Set Range: 0~200%	Unit: 1	Factory Setting: 180

When this parameter is set to 0, the stall prevention function is invalid.

P083Overtorque Detect Level		
Set Range: 0~200%	Unit: 1%	Factory Setting: 0

When the output current exceeds the over torque detection level and also exceeds half of the set over torque detection time (factory setting: 1.0s), the over torque detection will begin to indicate, and the corresponding multi-function contact will act. When it exceeds the set time value, the inverter will turn into self-protection. But when this parameter is set to 0, the over torque detection will be invalid.

P084Overtorque Detect Time		
Set Range: 0.1~20.0S	Unit: 0.1S	Factory Setting: 1.0

When the inverter detects that the output current has exceeded the motor current set value, the inverter begins to calculate the over torque time. When the over torque time has exceeded half of the over torque detection time, the corresponding multi-function output contact will act, the over torque alarm will be produced, while the inverter will continue running. When the over torque time has exceeded the set detection time (set by P083), the inverter will turn into self-protection, display the fault signal and stop output.

P085 Rated Motor Voltage

It is set according to the rated voltage value of the namplate. For 230V class inverters the default is 220, while for 400 V class inverters the default is 380V.

P086 Rated Motor Current

It is set according to the rated value of the namplate. This parameter can be used to restrict output current of the inverter to prevent overcurrent and protect the motor. If the current of the motor has exceeded this value the inverter of AC motor will turn into self-protection.

P087 Motor Poles		
Set Range: 02~10	Unit: 1	Factory Setting: 04

This parameter is set for the pole number of the motor according to the namplate of the motor.

P088Rated Motor Revolution		
Set Range: 0~9999	Unit: rpm	Factory Setting: 1440

This should be set according to the actual revolution of the motor. The displayed value is the same as this parameter. It can be used as monitoring parameter, which is convenient to the user. This parameter set value corresponds to the revolution speed at 50Hz.

P089Motor No-load Current			
Set Range: 0~100	Unit: 1	Factory Setting: 40	

The setting of Motor no-load current will affect the quantity of slip compensation. 100% current is the rated current of the motor.

P090 Slip Compensation		
Set Range: 0~1.0	Unit: 1	Factory Setting: 0.0

When the inverter drives the motor, the slip will become bigger due to the increase of load. This parameter can be set for slip compensation to decrease the slip and make the running speed of the motor closer to synchronous speed of revolution.

P091 DC Braking Voltage			
Set Range: 0.0~20.0%	Unit: 0.1%	Factory Setting: 2.0	

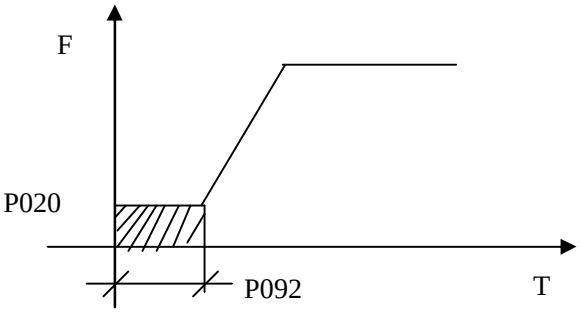
This parameter is set for the DC brake voltage to of the motor at starting and stopping. It can be adjusted for different brake voltage. When adjusting the parameter it must be increased slowly from lower values to high values until the suffcient brake torque is achieved.

100% voltage is the voltage at maximum frequency.

P092 DC Braking Time at Starting			
Set Range: 0.0~25.0S	Unit: 0.1S	Factory Setting: 0.0	

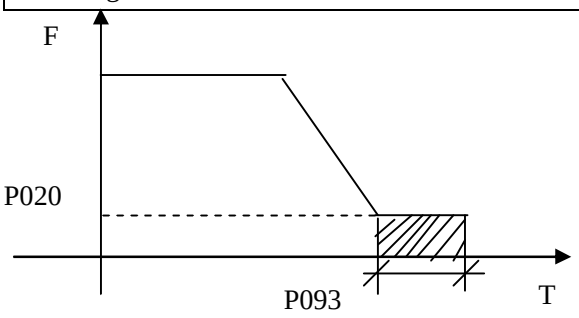
This parameter is set for DC Brake at starting and giving the lasting time of DC Brake current of the motor at starting. If it is set to 0 it means DC brake is invalid.

DC braking before running is normally applied in the cases in which the load is movable in the “stop” state, such as windmill and other machines. Because of the load existing before the inverter drives, the motor is always in a free running state, with an uncertain running direction. So the DC braking can be executed before starting the motor to prevent the inverter from tripping.



Th is setting is valid only when P014 is set to 0. Related introduction refer to P014.

P093 DC Braking Time at Stopping Set			
Set Range: 0.0~25.0S	Unit: 0.1S	Factory Setting: 0.0	



This parameter is valid when P015 is set to 0. The relatedparameters see P015.

P094 Frequency track Time		
Set Range: 0.0~20.0S	Unit: 0.1S	Factory Setting: 2.0

This parameter is set as frequency track time when the inverter restarts by the frequency track method after the external errors or temporary power off. For the starting and stopping of some large inertia load, because of its large inertia, if restarting the machine after its complete stop, it will waste much time. But if the frequency track function is started, it is not necessary to wait for the machines to come to a full stop for restart. The inverter will search the speed from high to low with the setfrequency.

After tracking it it will continue to accelerate to reach the set frequency.

P095 Frequency track Current Level		
Set Range: 0~200%	Unit: 1%	Factory Setting: 150

When the inverter search speed this set value sould be taken as the level for output current. When the output current is higher than this level the inverter will suspend searching. When the current is restored below the current level it will then execute the frequency track again.

After starting the frequency track please decrease properly the frequency track current level according to the actual conditionof load. Otherwise it is extremely easy to cause overcurrent protection.

P096 Restart after Instantaneous Stop	
Set Range: 0~1	Factory Setting: 0

0: Invalid, i.e. the inverter will not restart after an instantaneous stop.

1: Frequency track Start. Refer to P094.

P097 Allowable Power-off Time		
Set Range: 0.1~5.0S	Unit: 0.1S	Factory Setting: 0.5

This parameter is set for the maximum allowable power off time. If exceeding the set time the inverter will continue to stop input after power on. To execute the restart it needs to follow the general starting procedures.

*Attention: When using this function special attention should be paid to the safety. During the process of instantaneous power off and power on the inverter may restart. It is easy to produce danger. Be careful to use this function.

P098 Number of Abnormal Restart		
Set Range: 00~10	Unit: 1	Factory Setting: 00

After the abnormal conditions (such as overcurrent, overvoltage) happen the invrter will automatically reset and restart. If the starting mode is set for general mode it will start according to the general mode. If it is set for frequency track start it will start in the frequency track mode. After start it will restore the set number again if there is not anything unusual happened within 60 seconds. If there is any error and it reaches the set number the inverter will not have input. It can only be started after reset. If P098 is set to 0 the inverter will not carry out the functions of automatic reset and restart.

P099 Auto Voltage Regulation

Set Range: 0~1	Unit: 1	Factory Setting: 1

0: Invalid

1: Valid

When the input power supply is not stable and if the voltage is over high the operation of the motot with the power of exceeding the rated voltage will cause the temperature of the motor increasing, the insulation damaged and the output torque unstable. This auto voltage regulation can automatically stablize the output voltage within the rated voltage range of the motor under the condition of unstable output power supply

When this function is set to invalid the output voltage will fluctuate.

P100 Auto Torque Compensation		
Set Range: 0.1~10.0%	Unit: 0.1%	Factory Setting: 2.0

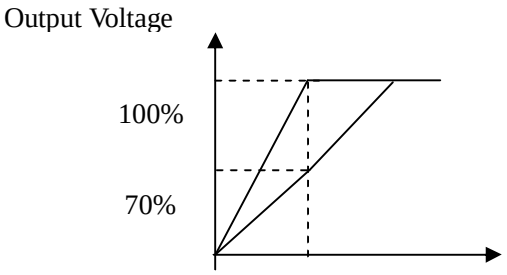
This parameter can be set for the auto output of extra voltage when the inverter is running for higher torque, which can compensate for the insuffcient torque at lower frequency. The torque compensation should not be too big and it should be set slowly from low to high according to the actual situation.

Insufficient compensation will result in the insufficient torque of the motor at low frequency. And over compensation will lead to too bigger torque, which will produce a shock to the machine and even result in a trip of the inverter under serious situation.

P101 Auto Energy Saving		
Set Range: 0.0~20.0%	Unit: 1%	Factory Setting: 0

When it is set to 0 this function is invalid. When Auto energy saving function is opened the inverter will run at the full voltage during acceleration and deceleration. During the operationa at constant speed the inverter can automatically calculate the optimum voltage value according to the power of load to supply it to the load in order to meet the the goal of energy saving.

The output voltage can be regulated automatically and it can be decreaed by max.30% of normal output voltage.



P102 PID Constant P F		
Set Range: 0.0~1000%	Unit: 1	Factory Setting: 100

This proportional constant is set for the error value gain. If I=0, D=0, it is only for proportional control.

P103 PID Constant I		
Set Range: 0.1~3600	Unit: 1	Factory Setting: 5.0

The integral time (I) is set for the reaction speed for PID. The larger the I value is the slower the reaction speed is. But if the integral time value is set too small, it will cause vibration.

P104 PID Constant D		
Set Range: 0.01~10.0	Unit: 0.01	Factory Setting: 0

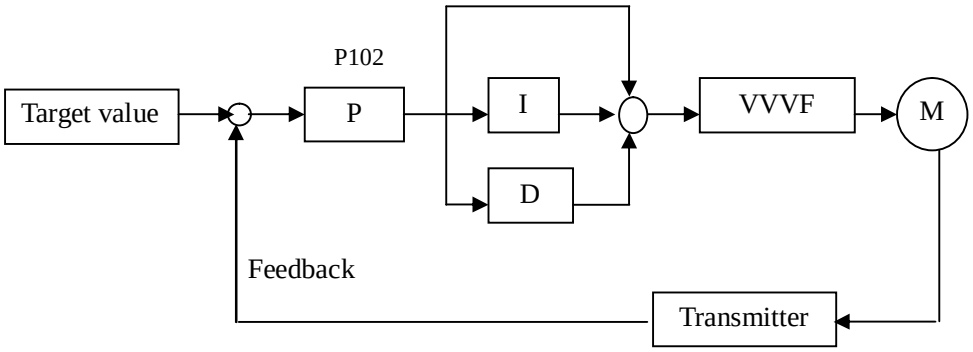
This didderential time (D) is set for the depression operation of PID. The larger the D value is, the more obvious the depression operation is. When D is set to 0, it means this function invalid.

P105 PID Constant Target Value		
Set Range: 0.0~100.0	Unit: 0.1	Factory Setting: 0.0

This target value can be set through external voltage signal or the digital operator.100% target value is corresponding to the frequency quantity at +10V.

PID closed-loop control is usually used in the process control of no fast physical quantity changes, such as pressure control, temperature control, etc. The feedback signal is usually taken from temperature, or pressure transmitter, etc. When under PID control, the feedback signal input path is the analog current signal 4-20mA.

PID Control Block Diagram:



General operating methods of PID control:

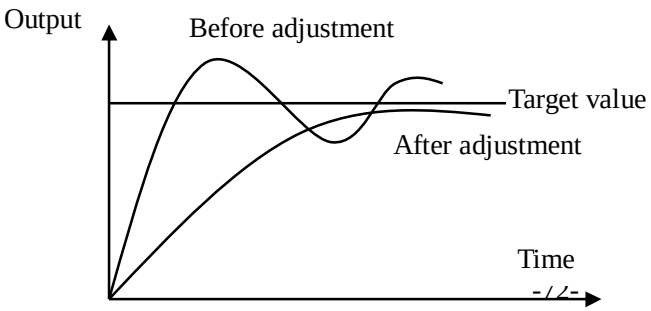
⑴ Choose the correct transmitter (with the output specifcation of standard current signal 4-20mA)

⑵ Set the right target value.

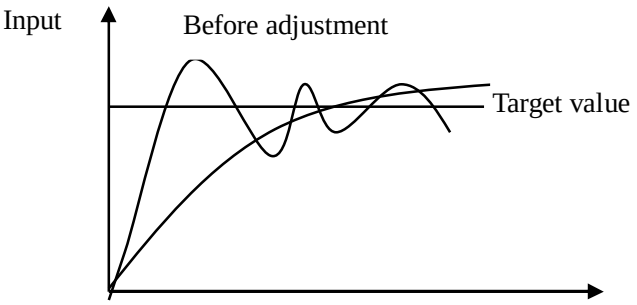
⑶ If the output doesn' t have oscillation, increase the proportional constant (P);

⑷ If the output doesn' t have oscillation, decrease the integral time (Ti);

⑸ If the output doesn' t have oscillation, increase the differential time (Td).



1.Decrease the Over Output
a：Decrease the differential time (D)
b：Increase the integral time (I)



2.Decrease the oscillation
a：Decrease the differential time (D)
b：Increase the integral time （P）

After adjustment

Time

PID closed-loop control is valid only when the multi-function inputs PID are open.

P106 PID Constant Target Value selection		
Set Range: 0~1	Unit: 1	Factory Setting: 0

The selection of target value can be set through the selection of the panel or external analog quantity. The external analog quantity is 0~10V signal or control of the potentiometer.

When P106=0,the target value of PID is set by P105.

When P106=1,the target value of PID is set by external analog signal 0-10V(corresponding 0-100%), the setting of P105 is invalid.

It should be noticed that in using PID control PID is only valid when P013 is set to 0.

P107PID Upper Limit		
Set Range: 0~100%	Unit: 1	Factory Setting: 100%

When PID feedback value is more than the set value of P107 the corresponding multi-output terminal will act and the machine will not stop.

P108PID Lower Limit		
Set Range: 0~100%	Unit: 1	Factory Setting: 0

When PID feedback value is less than the set value of P108 the corresponding multi-output terminal will act and the machine will not stop.

P109 Communication Addresses		
Set Range: 00~250	Unit: 1	Factory Setting: 00

When the inverter is set to have RS-485 Communication interface control, each of the inverters will be set for its individual identifcation number through P109.

00: No communication function

01~250: Individual identifcation number for the inverters

P110 Communication Band Rate			
Set Range: 0~3	Unit: 1	Factory Setting: 1	

0: 4800 b/s 1: 9600 b/s

2: 19200 b/s 3: 34800 b/s

P111 Communication Protocol		
Set Range: 0~7	Unit: 1	Factory Setting: 1

0: 8N1 FOR ASCII 1: 8E1 FOR ASCII

2: 8O1 FOR ASCII 3: 8N1 FOR RTU

4: 8E1 FOR RTU 5: 8O1 FOR RTU

P120 Parameter lock		
Set Range: 0~1	Unit: 1	Factory Setting: 0

0: Invalid. The parameter can be set.

1: Valid, i.e. parameter lock. Except this parameter and P000

This parameter can be used to prevent any wrong setting of other values by non maitenance persons.

P121 Display Contents		
Set Range: 0~255	Unit: 1	Factory Setting: 00

Normally we can see directly output frequency, set frequency, output current, output voltage, but temperatue, DC voltage, counter, PID feedback and revolution speed can only be monitored and displayed in sequence through switching keys after the setting of P121.

Set the corresponding code for P121. For example: when asking for displaying the temperature and revolution, then P121=2+16=18，just set P121to 18.

P122 Inverter Model	Factory Setting: *

Factory Setting. It can be monitored, but not modified.

P123 Inverter Rated Voltage	Factory Setting: *

Factory Setting. Depending on the model. It can be monitored, but not set.

P124 Inverter Rated Current	Factory Setting: *

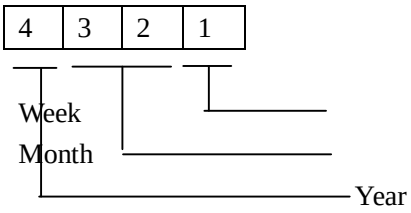
Factory Setting. Depending on the model. It can’t be changed.

P125 Grid power frequency 50/60Hz	
Set Range: 0~1	Factory Setting: 0

0: 50Hz

1: 60Hz

P126 Inverter manufacture date	Factory Setting: ****



P127 Manufacture Serial No.	Factory Setting: *

Factory Setting. It can be monitored, but not set.

Through the manufacture serial number the manufavtury date, number as well as the information about the inverter such as the numbers of main circuit board and base plate, etc. can be checked.

P128 Parameter & fault Reset		
Set Range: 0~12	Unit: 1	Factory Setting: 0

0: Software Version No. 1~4: Fault record
6: Fault clear up 8: Restore factory settings
10: Input frequency at fault 11: Input current at fault
12: Bus voltage at fault

P129 Voltage Up Time during Frequency track		
Set Range: 0.1~10.0S	Unit: 0.1	Unit: 0.5

Whenfrequency trackis set, there is a process of voltage increase during the frequency track.

When the voltage is increasing rapidly the current will be high and the searching process will be fast. When the voltage is up slowly the current will be low and the searching process will be slow.

P130 Stall & Decel Time during Running		
Set Range: 0.1~25.5S	Unit: 0.1S	Factory Setting: 2.5S

Set the speed of frequency decrease for stall prevention at constant speed.

P131 Fault Reset Time		
Set Range: 0.2~25.0S	Unit: 0.1	Factory Setting: 1.0

When the inverter is set to fault restart and if theinverter has fault trip and the time exceeds the setting of P131, the inverter will restart. Pay attention to the safety when using this function.

P132 Counter Memory for Power-off		
Set Range: 0~1	Unit: 1	Factory Setting: 0

0: not memorized. 1: memorized.

P133Drawing memory function		
Set Range: 0~1	Unit: 1	Factory Setting: 0

0: not memorized. 1: memorized.

P134Foced fan operation		
Set Range: 0~1	Unit: 1	Factory Setting: 0

0: not forced. 1: forced.

Appendix 1: Function List

Parameter and Function List (Part 1)

Code	Function	Set Range	FactorySetting
P000	Main Frequency	0.0~600.00 Hz	0.00
P001	Accel Time	0.1~6500.0S	5.0
P002	Decel Time	0.1~6500.0S	5.0
P003	V/F Curve	0~16	00
P004	Max. Output Voltage	0.1~255/510V	220/380
P005	Base Frequency	0.01~600.0 Hz	50/60
P006	Intermediate Voltage	0.1~255/510V	*
P007	Intermediate Frequency	0.01~600.00 Hz	*
P008	Min. Voltage	0.1V~*	*
P009	Min. Frequency	0.1~20.00 Hz	*
P010	Max. Frequency	10.00~600.00 Hz	50.00
P011	Frequency lower limit	0.00~600.00 Hz	0
P012	Operation command source	0~2	0
P013	Operation Frequency Source	0~2	0
P014	Starting mode	0~1	0
P015	Stopping Mode	0~1	0
P016	Rev rotation selection	0~1	1
P017	STOP key selection	0~1	1
P018	S-curve time	0~6500S	0
P019	Carrier frequency	0~15	9
P020	Starting frequency	0.1~10.0 Hz	0.5
P021	Stopping frequency	0.1~10.0 Hz	0.5
P022	Jog Frequency	0.00~600.00 Hz	5.00
P023	Jog Accel/Decel Time	0.1~25S	1.0
P024	PLC operation	0~5	0
P025	Auto PLC operation (internal multi-speed)	0~3	0

Parameter and Function List (Part 2)

Code	Function	Set Range & Function Explanation	FactorySetting
P026	PLC rotation Direction	0~255	0
P027	PLC accel/decel time 1	0~255	0
P028	PLC accel/decel time 2	0~255	0
P029	Accel Time 2	0.1~6500.0S	16
P030	Decel Time 2	0.1~6500.0S	16
P031	Accel Time 3	0.1~6500.0S	32
P032	Decel Time3	0.1~6500.0S	32
P033	Accel Time 4	0.1~6500.0S	64
P034	Decel Time 4	0.1~6500.0S	64
P035	Frequency 2	0.00~600.00 Hz	15.00
P036	Frequency 3	0.00~600.00 Hz	20.00
P037	Frequency 4	0.00~600.00 Hz	25.00
P038	Frequency 5	0.00~600.00 Hz	30.00
P039	Frequency 6	0.00~600.00 Hz	35.00
P040	Frequency 7	0.00~600.00 Hz	40.00
P041	Frequency 8	0.00~600.00 Hz	0.50
P042	PLC Timer 1	0.0~6500.0S	10.0
P043	PLC Timer 2	0.0~6500.0S	10.0
P044	PLC Timer 3	0.0~6500.0S	0.0
P045	PLC Timer 4	0.0~6500.0S	0.0
P046	PLC Timer 5	0.0~6500.0S	0.0
P047	PLC Timer 6	0.0~6500.0S	0.0
P048	PLC Timer 7	0.0~6500.0S	0.0
P049	PLC Timer 8	0.0~6500.0S	0.0

Parameter and Function List (Part 3)

Code	Function	Set Range & Function Explanation	FactorySetting
P050	Multi-input FWR	0: Inval id; 1: Run; 3: For. rotation; 4: Rev.rotation; 5: For/Rev.; 6: Jog; 7: Jog For rotation; 8: Jog RevRotation; 9: Emergency stop; 10: Reset ; 12: Overheat of radiator or motor; 13: Timer 1start; 14: Timer 2 start; 17: High speed ; 18: middle speed; 19: Low speed; 20: Multi-Speed 1; 21: Multi-Speed2; 22: Multi-Speed 3; 23: Accel/Decel select 1; 24: Accel /Decel select2; 25: UP function ; DOWN function; 27: Counter; 28: Counter reset; 29: Drawing start; 31: AutoPLC Reset suspend; 32: PID valid	02
P051	Multi-input REV		03
P052	Multi-input RST		10
P053	Multi-input SPH		17
P054	Multi-input SPM		18
P055	Multi-input SPL		19

Parameter and Function List (Part 4)

Code	Function	Set Range & Function Explanation	FactorySetting
P056	Multi-input DRV	0: Invalid; 1: Run; 2: Fault Signal ; 3: Zero Speed; 4: DC Braking indication ; 5 : Set Frequency reach; 6: Random Frequency 1 reach; 7: Random Frequency 2 reach; 8: In Accel.; 9: In Decel.; 10: Inverter Overload alarm; 11: Motor Over loadalarm; 12: Over torquedetect; 13: Undervoltage alarm ; 14 : Single stage end; 15: Processend; 16: Set Counter reach; 17: Intermediate Counter reach ; 18: Externally controlled Timer 1 reach ; 19 : Externally controlled Timer 2 reach ; 204~20mA disconnected; 27:Drawing reach ; 28: PID Down Limitalarm; 29: PID Up Limitalarm; 30: Fan run; 31: Electromagnetic Relayact; 32: Braking Resistoract	01
P057	Multi-input FABC		05
P058	Multi output AM	0~7	0
P059	AM Analog Output Gain	0.0~100.0%	100
P060	UP-DOWN mode	0~1	0
P061	Reserved		
P062	Timer 1 time	0.0~10S	00.0
P063	Timer 2 time	0~100S	000
P064	Counter	0~9999	00
P065	Intermediate Counter	0~9999	0
P066	Skip Frequency 1	0.00~600.00 Hz	0.00
P067	Skip Frequency 2	0.00~600.00 Hz	0.00

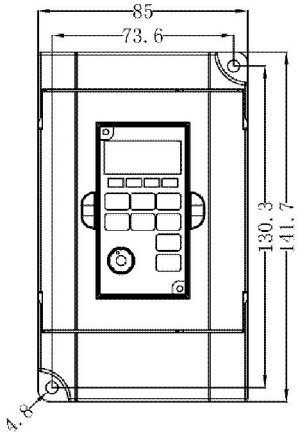
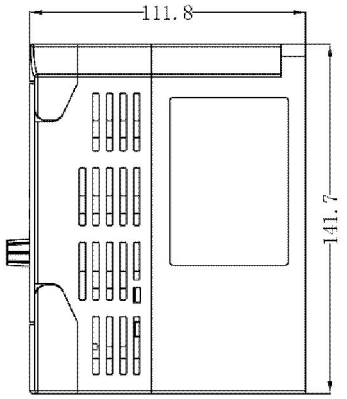
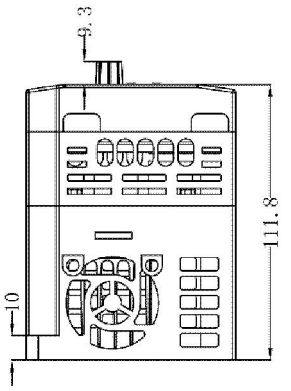
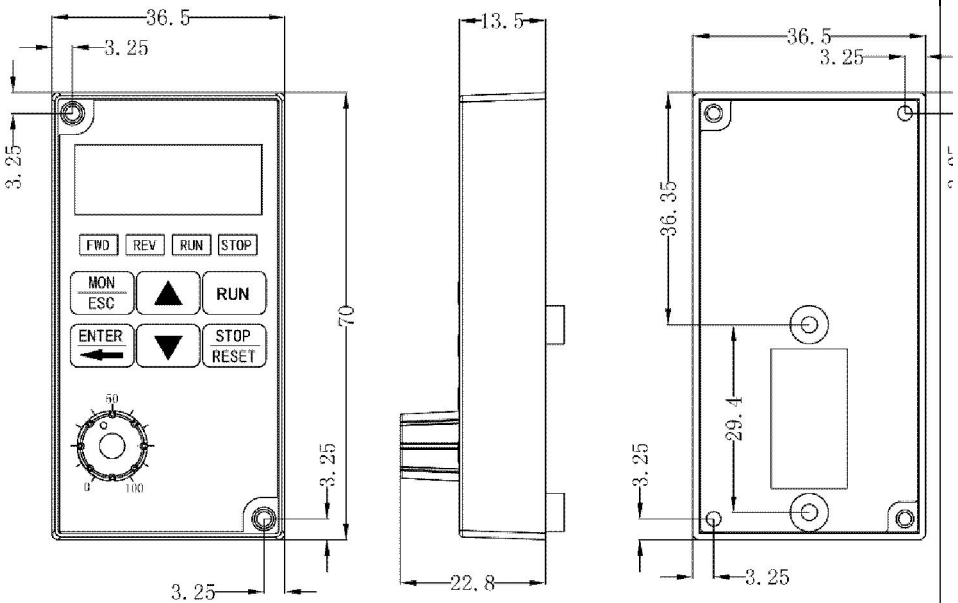
Parameter and Function List (Part 5)

Code	Function	Set Range & Function Explanation	FactorySetting
P068	Skip Frequency 3	0.00~600.00 Hz	0.00
P069	Skip Frequency Range	0.1~10.00 Hz	0.5
P070	Random frequency 1	0.00~600.00 Hz	0.00
P071	Random frequency 2	0.00~600.00 Hz	0.00
P072	Analog input select	0~4	0
P073	Analog Low End Frequency	0.00~600.00 Hz	0
P074	Bias Direction at Lower Frequency	0~1	0
P075	Analog High End Frequency	0.00~600.00 Hz	50.00
P076	Bias direction ofhigh end frequency	0~1	0
P077	Analog negative bias reverse	0~1	0
P078	Analog FilteringConstant	0~50	20
P079	Overvoltage stall prevention	0~1	0
P080	Stall prevention level during accel.	0~200%	150
P081	Stall prevention level during running	0~200%	0
P082	Stall prevention level during decel.	0~200%	150
P083	Overtorque detect level	0~200%	0
P084	Overtorque detect time	0.1~20.0S	1.0
P085	Rated motor voltage	*	*
P086	Rated motor current	*	*
P087	Motor poles	02~60	04
P088	Rated motor revolution	0~9999r/min	1440
P089	Motor no-load current	0~100%	40
P090	Slip compensation	0~1.0	0.000
P091	DC braking voltage	0.0~20.0	2.0
P092	DC brake time at starting	0.0~25.0S	0.0
P093	DC brake time at stopping	0.0~25.0S	0.0
P094	Frequency track time	0.0~20.0S	5.0
P095	Frequency track current level	0~200%	150
P096	Restart after instantanuous stop	0~1	0

Parameter and Function List (Part 6)

Code	Function	Set Range & Function Explanation	FactorySetting
P097	Allowable power off time	0.1~5.0S	0.5
P098	Number of abnormal restart	0~10	00
P099	Auto voltage regulation function	0~1	1
P100	Auto torque compensation	0.0~10.0%	2.0
P101	Auto energy savings	0~20.0%	0.0
P102	PID parameter P value	0~1000%	100
P103	PID parameter I value	0~3600S	5.0
P104	PID parameter D value	0.01~10.00S	0
P105	PID parameter target value	0.0~100.0%	0
P106	PID parameter target valueselection	0~1	0
P107	PID Upper Limit	0~100%	100
P108	PID Lower Limit	0~100%	0
P109	Communication address	0~250	1
P110	Communication band rate	0~3	1
P111	Communication protocol	0~5	3
P112~ P119	Reserved		
P120	Parameter lock	0~1	0
P121	Display content	0~255	00
P122	Inverter model	*	*
P123	Inverter Rated Voltage	Depending on type	*
P124	Inverter Rated Current	Depending on type	*
P125	Grid power frequency	0: 50Hz 1: 60Hz	0
P126	Inverter manufacture date	FactorySetting	*
P127	Manufacture Serial No.		*
P128	Parameter & fault Reset	00~12	00
P129	Voltage up time during Frequency track	0.1~10.0S	0.5
P130	Stall & decel time during running	0.1~25.5S	2.5
P131	Fault reset time	0.2~25.0S	1.0
P132	Counter memery for power-off	0~1	0
P133	Drawing memory function	0~1	0
P134	Forced fan operation	0~1	0

Appendix 2: Installation Dimensions

Series	External Appearance and Installation Dimensions
DLM1-0D40S2G DLM1-0D75S2G DLM1-01D5S2G	   单位mm
Digital operator	 Unit: mm

Appendix 3: MODBUS Communication Protocol

When using the RS485 communication interface, each of the inverters must set its own address so that the computer can use this individual address to carry out the control.

1: Communication port terminal setting

The communication protocol

has two modes: RS485Communication Port

⑴ RTU mode (Remote Terminal Unit)

⑵ASCII mode(American Standand Code for imformation interchange)

Information of code.

RTU mode: Each of 8-bit data is composed of two 4-bit (hexadecimal), for example: 64H

ASCII mode: Each of 8-bit data is composed of two ASCⅡ byte, for example:

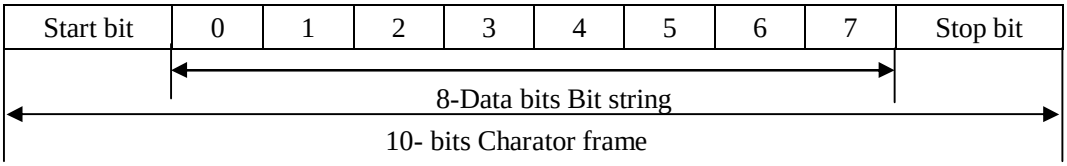
One 1-bit data 64H (hexadecimal) is composed of ASCⅡ byte“64”, included“6”(36H) and “4”(34H).

Byte	0	1	2	3	4	5	6	7
ASCII Code	30H	31H	32H	33H	34H	35H	36H	37H

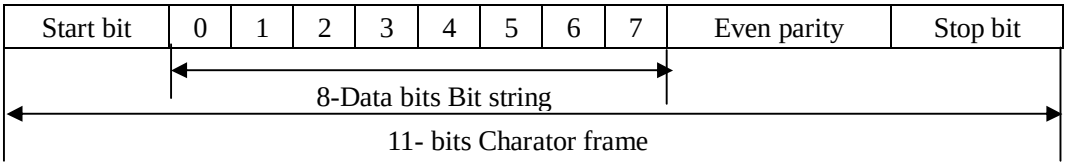
Byte	8	9	A	B	C	D	E	F
ASCII Code	38H	39H	41H	42H	43H	44H	45H	46H

2: Communication Data Method

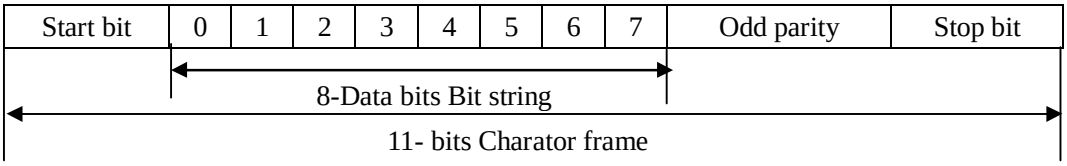
(1)8N1 For ASCII P111=0



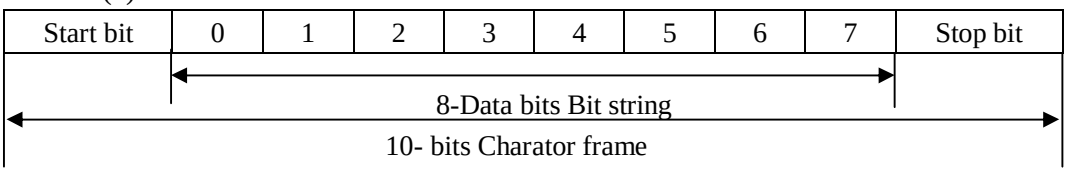
(2)8E1 For ASCII P111=1



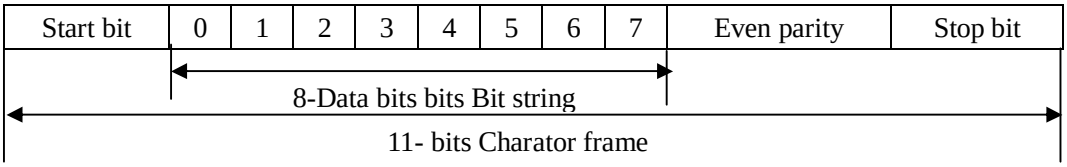
(3)8O1 For ASCII P111=2



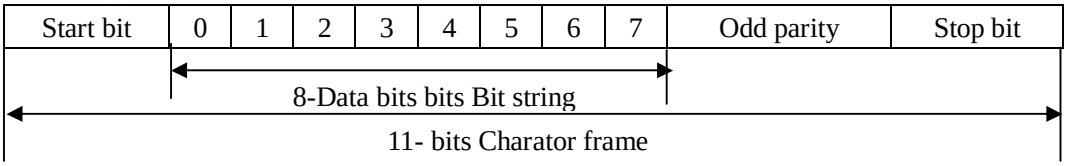
(4)8N1 For RTU P111=3



(5)8E1 For RTU P111=4



(6)8O1 For RTU P111=5



3: Communication Document Formats

3.1 ASCII Mode

Communication Document Forms

STX “: ” (3AH)	ADDR	FUNC	LEN	$DATA_{(n-1)}$ 。。。 $DATA_0$	CRC	END CR(0DH) LF(0AH)

⑴ STX: Starting unit“: ”(3AH)

⑵ ADDR communication address,8-bit data is composed of two ASCⅡ byte.

00: Broadcast mode is MODBUS

01~250: the addresses of corresponding inverters.

⑶ FUNC: Function code 8-bit data is composed of two ASC Ⅱ byte.

01: FUNC READ, Read the data of function code

02: FUNC WRIT, write the data of function code

03: write control data

04: read control status data

05: write inverter frequency data

06: Reserved

07: Reserved

08: Loop test

a: Read function code data

format:

ADDR 01 LEN FUNC Data

ADDR=0 means no answer

ADDR≠0 means a reply from inverter of this address

When inverter reply normal, the format as follows:

ADDR 01 LEN FUNC Data

If DATA is one word, the LEN=3, If DATA is one byte, the LEN=2 .

When inverter has no this function code or reply no effect, the format as follows:

ADDR 81H 01 FUNC

b: Write function code data

Format:

ADDR 02 LEN FUNC Data

ADDR=0 for broadcast, it write to all inverter, but no reply.

ADDR≠0, set data and reply from inverter of this address.

When inverter has no this function code or reply of no effect, the format as follows:

ADDR 81H 01 FUNC

c: Control commands

Format:

ADDR 03 LEN CNTR

ADDR=0 for broadcast, it write to all inverter, but no reply

ADDR≠0, reply and return.

CNTR

7	6	5	4	3	2	1	0
jogr	jogf	jog	r/f	stop	rev	for	run

When the setting is correct return to present control status.

Format: ADDR 03 LEN CNST

CNST

7	6	5	4	3	2	1	0
Search start	Braking	r/f	joging	running	r/f	jog	run

When check is not correct,

ADDR 83H 01 CNST

d: Read status value

Format:

ADDR 04 01 CFG

ADDR=0, no reply

ADDR≠0, reply.

CFG=0~7, reply single data

0: Set F 1: Out F 2: Out A 3: RoTT

4: DCV 5: ACV 6: Cout 7: Tmp

For example: read set frequency

Send: 01 04 03 00 41 89

Return: 01 04 03 13 88 89 A6 2D

13 88 are data

13 is high order, 88 is low order.

⑷ LEN: data length, It means the length of D(n-1)…D0,

Length set: when one word, LEN=3， when one byte or ＜1byte, LEN=2。

⑸ DATA: <Data characters> data content. 2n ASCII composen bytes, it have ffty ASCII at most.

⑹ LRC: longitudinal redundancy check

ASCII mode: Get LRC methods is that add ADDR to the last data, if the result is more than 256,then the result subtract 256 until the result is less then 256 (if the result is 128H, take 28H), then 100H subtract the result get LRC.

⑺ For example: write 30.00Hz to inverter of 01(write to P000)

STX	ADDR	FUNC	LEN	DATA	LRC	END

":"	"0" "1"	"0" "2"	"0" "2"	"0""0""0" "B""HB""8"	"3" "7"	"CR" "LF"
3AH	30H 31H	30H 32H	30H 33H	30H 30H 30H 42H 42H 38H	33H 37H	0DH 0AH

Calculate LRC: 01H+02H+03H+00H+0BH+B8H=C9H

C9H subtracted from 100H: 37H

So the sent data is following:

3AH 30H 31H 30H 32H 30H 33H 30H 30H 30H 42H 42H 38H 33H 37H 0DH 0AH

3.2 RTU Mode

Quiet	ADDR	FUNC	LEN	D(n-1)~D(0)	CRC	Quiet
>50ms						>50ms

⑴ Quiet: the time of no data is more than 50 ms

⑵ ADDR: Communication address, 8-bit data

⑶ FUNC: Function code, 8-bit data, refers to 3.1-3

⑷ LEN: Data length, the length of D(n-1)~D0

⑸ DATA: data content, n*8-bit

⑹ LRC: Longitudinal Redundancy Check

RTU mode: get CRC(cyclical Redundancy Check).

The CRC calculation method is following:

⑴ make a 16-bit register and set value 0FFFFH(call CRC register)

⑵ done frst byte of data Exclusive OR with low byte of 16-bit CRC register and save the result to CRC register

⑶ done 1 bit right shift with CRC register and fll zero to left bit, then check low bit of CRC register.

⑷ if the low bit is zero, then do repeat setp3, else CRC register do Exclusive OR with 0A001H.

⑸ done repeat step 3 and 4,until CRC register done right shift 8 times,then the byte is fully done.

⑹done repeat step 2 to 5 for the next byte of data, until process completely all data. The last data of CRC register is CRC value.

When send CRC value in command data, low bytes must change the sequence with high bytes, i.e. low bytes will be sent frst.

⑺for example 1: Write 30.00Hz to inverter of 01

Command data

ADDR	FUNC	LEN	DATA	CRC
01H	02H	03H	00H 0BH B8H	7FH 0CH

Sent data: 01H 02H 03H 00H 0BH B8H 7FH 0CH

⑻ for example 2:

The following is that get CRC value with C language. The function has two parameters:

Unsigned char data ← the point of data buffer

Unsigned char lengh ← number of data buffer

This function will send back the CRC value with unsigned integer format.

```
unsigned int crc_chk(unsigned char data,unsigned char lengh)
    {
```

```
int j;
unsigned int reg_crc=0xffff;
while (lengh--){
reg_crc^=*data=++;
for(j=0; j<8; j++={
      if(reg_crc&0×01){/*LSB(b0)=1*/
         reg_crc=(reg_crc>>1)^0xa001;
         }else{
         reg_crc=reg_crc>>1;
      }
         }
 }
  return reg_crc;
 }
```