Foreword

Thank you very much for purchasing PI7500 Family Frequency Inverters. This family is designed based on the experience of POWTRAN Company in the professional manufacture and sale of the products, and it is with high performance and with simple functions.

This User's Manual provides the users with the instructions on the installation, parameter setting, fault diagnosis, routine maintenance and necessary precautions. Please read the Manual carefully before the installation of the product in order to ensure that it can be correctly installed and operated.

This User's Manual includes the G series:

G: GENERAL LOAD

Please contact the local dealers or directly contact our company.

Please keep this user's manual in good condition, for it will be helpful to the repair, maintenance, and applications in the future.

For information about other product, please visit our website: http://www.powtran.com.
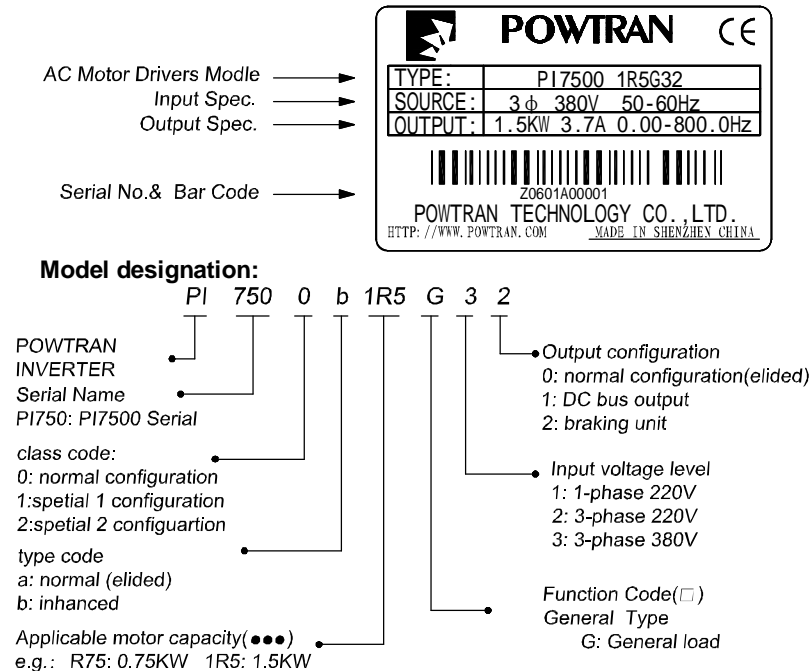
POWTRAN

2007.4

CONTENTS

Section I.   Inspection and Safety Precautions

POWTRAN PI7500 frequency inverters have been tested and inspected before leaving the manufacturer. Before unpacking the product, please check if its package is damaged due to careless transportation, and if the specifications and type of the product complies with the order. Please contact the supplier of POWTRAN products if any problems are found.

1-1. Inspection after Unpacking

※ Inspect that the contents are complete (one PI7500 frequency inverter, one Operation Manual).

※ Check the nameplate on the side of the frequency inverter to ensure that the product you have received is right the one you ordered.

Instructions on name plate: (giving 11.5kW/380V as example)

Model designation:

PI   750   0   b   1R5   G   3   2

POWTRAN INVERTER
Serial Name
PI750: PI7500 Serial

class code:
0: normal configuration
1:spetial 1 configuration
2:spetial 2 configuartion

type code
a: normal (elided)
b: inhanced

Applicable motor capacity(●●●)
e.g.: R75: 0.75KW   1R5: 1.5KW

AC Motor Drivers Modle
Input Spec.
Output Spec.

Serial No.& Bar Code

Output configuration
0: normal configuration(elided)
1: DC bus output
2: braking unit

Input voltage level
1: 1-phase 220V
2: 3-phase 220V
3: 3-phase 380V

Function Code(□)
General Type
    G: General load

1-2. Safety Precautions

※ Never connect the A.C. power supply to the output terminals (U, V, W) of the frequency inverter.

※ Fix and lock the panel before supplying power so as to avoid the danger caused by the poor capacity or other components inside the inverter.

※ After the power supply is switched on, do not perform wiring or check, etc.

※ Don't touch the circuit boards or its parts or components in the inverter when it is powered, so as to avoid danger of electric shock.

※ If the power supply is switched off, do not touch the PCB or other parts inside the inverter within 5 minutes after the keyboard indicator lamp goes off, and you must check by using the instrument that the inverter has completely discharged all its capacity before you start to work inside the inverter. Otherwise, there will be the danger of electric shock.

※ The static electricity in human body will cause serious damage to the MOS field effect transistor in the inverter. Please keep your hands away from the PCB, IGBT and other internal parts before taking actions to prevent static electricity. Otherwise, faults may be caused.

※ In use, the earthing terminal (E or ⏚) of the frequency inverter must be grounded to the earthing connections correctly and securely according to the national electrical safety specifications and other applicable standards.

※ Please don't shut off the unit by turning off the power supply. Turn off the power supply after the motor has stopped its operation.

※ Meet CE standard with EMI filter.

1-3. Application

※ Powtran inverter is generally applied to 3 phase AC asynchronism motors.

※ Powtran inverter is applied to the admisive occasion, the occasion where is not admissive may lead to fire, electric shock, explosion and so on.

※ If the inverter seizes up when it is applied to the equipment which may

lead danger (e.g. lift tools of transportation, aviation system, saftety equipment, etc), it should be managed carefully. Do inquire the factory when it happens.

> **Only the well-trained personnel are allowed to use this unit, and such personnel must read through the parts of this manual relating to the safety, installation, operation and maintenance before using the unit. The safe operation of this unit depends on correct transport, installation, operation and maintenance!**

Section II.   Installation & Standby Circuit

2-1. Conditions for Use

1)   Ambient temperature -10℃~40℃.

2)   Avoid electromagnetic interference and keep the unit away from the interference source.

3)   Prevent dropping water, steam, dust, powder, cotton fiber or fine metal powder from entering it.

4)   Prevent oil, salt and corrosive gas from entering it.

5)   Avoid vibration.

6)   Avoid high temperature and moisture and avoid being wetted due to raining, with the humidity below 90%RH (not dewing).

7)   Prohibit the use in the dangerous environment where inflammable or combustible or explosive gas, liquid or solid exists.

2-2. Installation

The frequency inverter must be installed by wall hooking in the indoor room with adequate ventilation, with enough space left between it and the adjacent objects or damper (walls) surrounding it, as shown in the below figure:
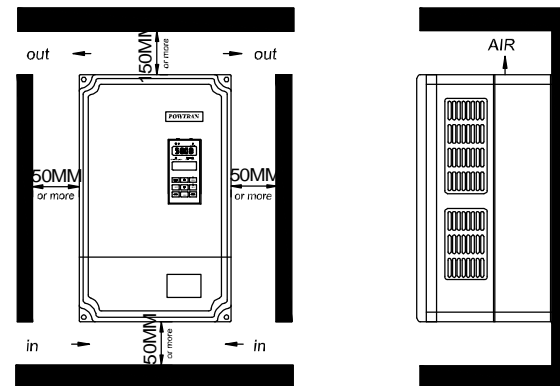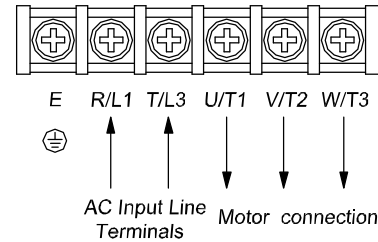
2-3. Wiring

The wiring of frequency inverter includes two parts: main circuit and control circuit. The user must ensure correct connections according to the following connection diagram.
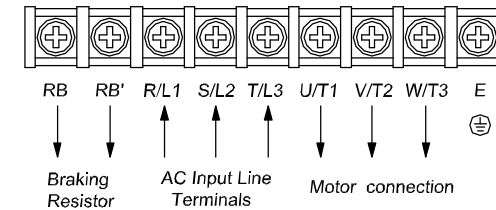

◎ shows main circuit ○ shows control circuit ⊟ indicates shielded leads
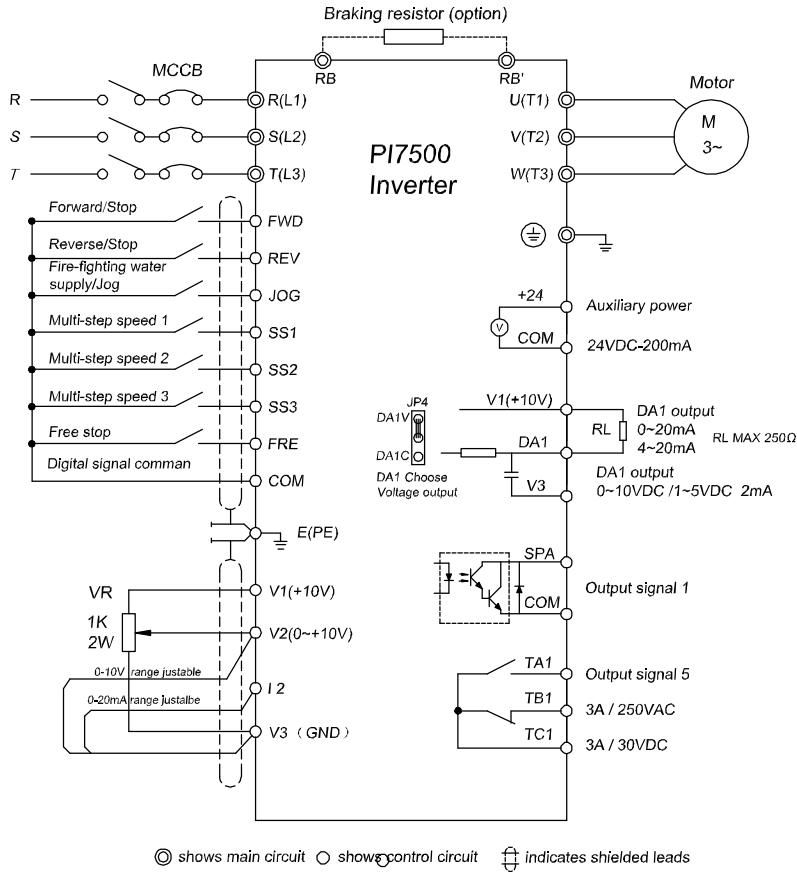
2-4. Main Circuit Terminals:

2-4-1. PI7500 Main Circuit Terminals

(1)0.4~0.75KW G1

(2) Other types of PI7500

2-4-2. Terminal Function

Terminal	Description	Functions
R/L1	Power input for frequency inverter	Connected to 3-phase power (Single input connected to R ,T)
S/L2		
T/L3		
E/PE	Grounding point	Grounded to the earth
RB, RB′	Connection point for braking resistance	
U/T1	3 Phase Output	Connected to 3-phase motor
V/T2		
W/T3		

2-5. Control Circuit Terminals

2-5-1 Control Circuit Terminals distribution.

DA1 V1 V2 I2 V3 REV COM FWD JOG SS1 SS2 SS3 FRE +24 SPA TA1 TC1 TB1

2-5-2 Description to Control Circuit Terminals.

Class	Terminal	Description	Function
Control signal	COM	Common point for control commands	
	FWD	Forward rotation command	F05=1, Edge triggers(F62=0),and runs forward in falling edge, stops in rising edge
			F05=3, Level triggers(F62=0/1/2)
	REV	Reverse rotation command	F05=1, Edge triggers (F62=0), and runs reverse in falling edge, stops in rising edge.
			F05=3, Level triggers(F62=0/1/2)
	JOG	Jog command	Level triggers, and executes JOG command in a lower level stops in a high level
	SS1	Multi-step speed/acceleration	F63=1/2,Short-circuited to COM to compose 7-step speed and acceleration, level triggers, effective in a lower level
		Rising/Falling control	F04=4,for rising control
		Frequency mode switch	Switch the frequency setting mode with SS2, SS3
	SS2	Multi-step speed/acceleration	F63=1/2,Short-circuited to COM to compose 7-step speed and acceleration, level triggers, effective in a lower level
		Rising/Falling control	F04=4,for falling control
		Frequency mode switch	Switch the frequency setting mode with SS1,SS3
	SS3	Multi-step speed/acceleration	Short-circuited to COM to compose 7-step speed and acceleration, level triggers, effective in a lower level
		JOG control	F63=3 COM is short-circuited to SS3 to execute JOG reverse command, to JOG to execute JOG forward command, and the previous JOG direction is invalid.
		Three-line running control	F63=1/2,F62=2 Three-line terminal running for details
		Program running restart	For selecting the program running restart mode
		Rising/Falling control	F04=4,for falling control
		Frequency mode switch	Switch the frequency setting mode with SS1,SS2
	FRE	Free Run	Level triggers, and executes free stop command in a lower level
	RST	Restore	Level triggers, executes restore command in falling edge.
Output signal	TA1/ TB1/TC1	Output signal 5	TA1-TC1 is open and TB1-TC1 is closed (programmable)
	SPA/COM	Output signal 1	Output open set signal when action (24VDC/50Ma)

Analog Input and output signal	V1,V3	Power Supply	+10V, GND
	V2	Voltage Input signal	Range is adjustable in 0~10V
	I2	Current Input signal	Range is adjustable in 0~20mA
	V1	Power Supply of DA1	Used for Power Supply when DA1 selects current output
	DA1	Multi-function analog signal output 1	0~10/1~5VDC 0~20/4~20mA
Auxiliary Power	24V	Power Positive terminal	Maximal output 24V/200mA. COM and V3 could not never be short-circuited.
	COM	Common point	

2-6. Connection Precautions

※ Don't install power factor capacitance or resistance-capacitance absorbing device between the output terminals U, V, W of the frequency inverter.

※ To disassemble or replace the motor, the input power supply must be turned off for the frequency inverter.

※ The motor or power supply can be switched on/off only after the inverter stops its output.

※ In order to minimize the effect of electromagnetic interference, a surge absorbing device should be installed if used electromagnetic contactor and relay, etc. is near to the frequency inverter.

※ For external control of frequency inverter, a isolation device should be used for the control lines or screened cable should be used.

※ A screened cable should be used as the signal connection line for input command and must be routed separately as well, and it had better be installed far from the main circuit.

※ When the carrier frequency is less than 3kHz, the distance between the frequency inverter and motor must not be greater than 50 meters (maximum). When it is above 4kHz, this distance should be reduced. The cable for this connection had better be laid in metal conduit.

※ If the frequency inverter is equipped with peripheral devices (such as filter, reactor), first measure its insulation resistance to the earth with 1000V megohm meter, and ensure the resistance value is not below 4MΩ.

※ If the frequency inverter must be started frequently, don't switch off its

power supply, and the operator must start or stop the inverter by using the COM/FWD of the control terminal or Keyboard, in order to avoid damage to the bridge rectifier.

※   Don't connect A.C. input power to the output terminals U, V, W of the frequency inverter.

※   In order to prevent unexpected accidents, earthing terminal E or ⏚ must be grounded to the earth securely (the grounding resistance should be below 100Ω). The cable size should be greater than half of below- mentioned corresponding cable size; otherwise current leakage will happen possibly.

※   For wiring of main circuit, please refer to national rule.

※   Capacity of the motor should be equal to or smaller than that of the inverter.

2-7. Standby circuit

When the fault or trip of the inverter may cause great loss or accident, please add the standby circuit.

Note: confirm and test the running characteristic of the standby circuit, in order to ensure the industrial phase and the converter phase are in the same direction.
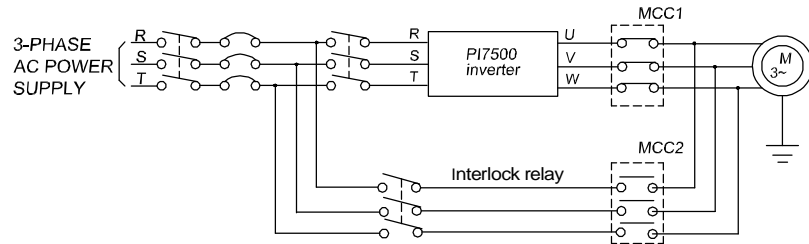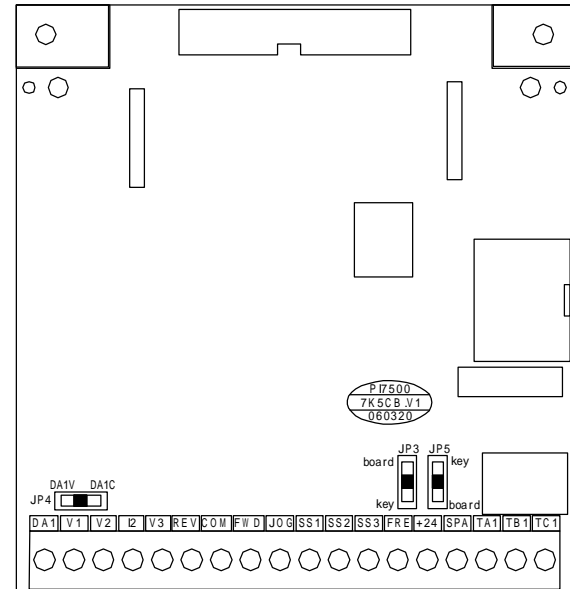

Section III.   Operating keyboard

3-1. Options of internal keyboard and external keyboard.

PI7500 could display on both the internal keyboard and external keyboard
But it could not be operated by the internal keyboard and external keyboard simultaneously. And it could be shifted between these two keyboards by JP3 on the control card.
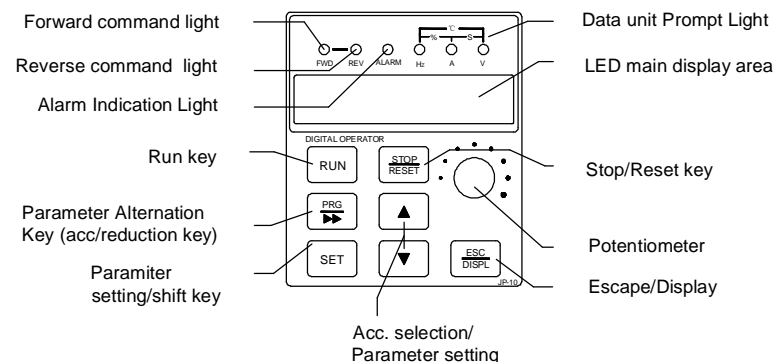The internal keyboard's potentionmeter and external keyboard's potentionmeter could not be operated simultaneously, but it could be shifted between these two potentionmeters by JP5 on the control card.

	Status	Function
JP3	key	Controlled by external keyboard
	board	Controlled by internal keyboard
JP5	key	Controlled by external
	board	Controlled by internal

3-2 PI7500 internal keyboard

? Specification and function description：

Forward command light
Reverse command light
Alarm Indication Light
Run key
Parameter Alternation Key (acc/reduction key)
Paramiter setting/shift key
Acc. selection/ Parameter setting
Data unit Prompt Light
LED main display area
Stop/Reset key
Potentiometer
Escape/Display

This keyboard is the standard one for PI7500 Family inverter.

DATE UNIT PROMPT LIGHT: It is formed up by 3 instruction light on the right upside of the keyboard,different status indicates different unit of the current parameter displayed in the LED .The units for the parameters as blow:

■ ON □ OFF
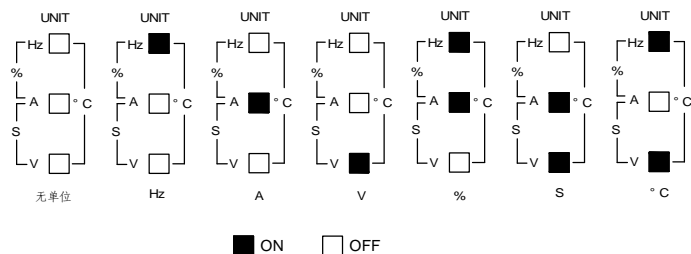
3-3 Optional external keyboard

3-3-1 JP3E7000 keyboard

? Specification and function description：

Run Indication Light
Alarm Indication Light
Paramiter setting/shift key
Acc. selection/ Parameter setting
Escape/Display
Jog key
Data unit Prompt Light
LED main display area
Potentiometer
Parameter Alternation Key (acc/reduction key)
Run key
Stop/Reset key

Function description

Run key:
◇ drive forward.

Stop/Reset key:
◇ Drive stops, resets after abnormity and confirms fault.

Parameter Alternation//Acc./Dec Selection:
◇ When select parameter, press the SET key and add/reduction key, parameter code add/reduce 10
◇ Restore modified value
◇ alternate the monitor object and monitor

Escape/display
◇ Escape modifying the data of function parameters
◇ Escape of submenu or running into menu of status display from function menu
◇ Escape of fault status.

Jog key
◇ On: jog
◇ Off: stop

LED main display area
◇ Anterior 3 digits display the function code
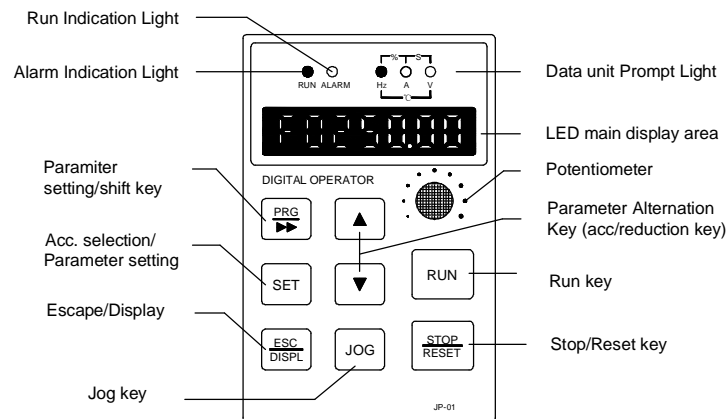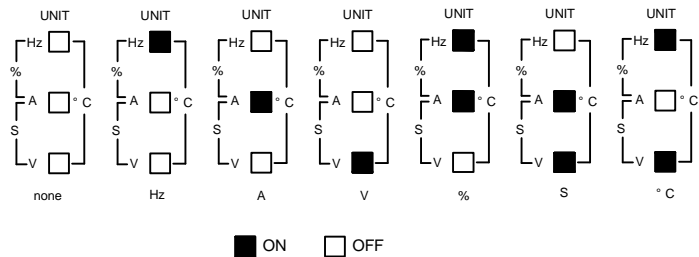◇ Latter 4 digits display the value as per the function code

Data unit prompt Light:
◇ It is formed up by 3 instruction light on the right upside of the keyboard, different status indicates different unit of the current parameter displayed in the LED. The units

for the parameters as blow:

UNIT UNIT UNIT UNIT UNIT UNIT UNIT

none   Hz   A   V   %   S   ° C

■ ON   □ OFF

3-3-2 **JP5E7000 Keyboard**

? Specification and function description：

- Alarm Indication Light
- Reverse command light
- Forward command light
- Run key
- Parameter Alternation Key (acc/reduction key)
- Paramiter setting/shift key
- Acc. selection/ Parameter setting
- Data unit Prompt Light
- LED main display area
- Stop/Reset key
- Potentiometer
- Jog key
- Escape/Display

FWD REV ALARM Hz A V

DIGITAL OPERATOR

RUN   STOP RESET   PRG   ▲   JOG   SET   ▼   ESC DISPL

JP-08

Function description

Run key:
◇ drive forward.

Stop/Reset key:
◇ Drive stops, resets after abnormity and confirms fault.

Parameter Alternation//Acc./Dec Selection:
◇ When select parameter, press the SET key and add/reduction key, parameter code add/reduce 10

◇ Restore modified value
◇ alternate the monitor object and monitor

Escape/display
◇ Escape modifying the data of function parameters
◇ Escape of submenu or running into menu of status display from function menu
◇ Escape of fault status.

Jog key
◇ On: jog
◇ Off: stop

LED main display area
◇ Anterior 3 digits display the function code
◇ Latter 4 digits display the value as per the function code

Data unit prompt Light:
◇ It is formed up by 3 instruction light on the right upside of the keyboard, different status indicates different unit of the current parameter displayed in the LED. The units for the parameters as blow:
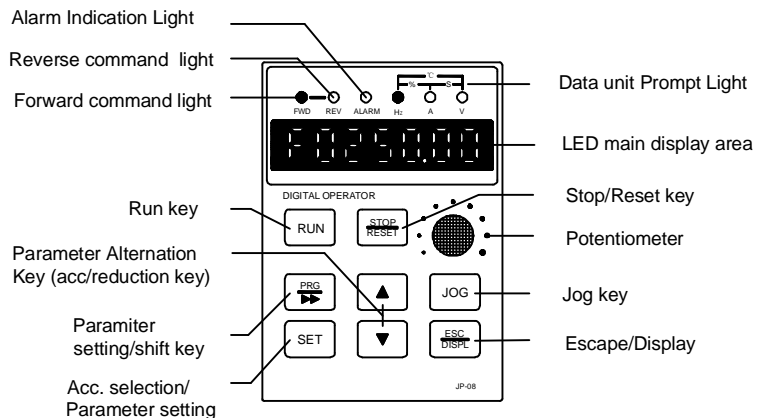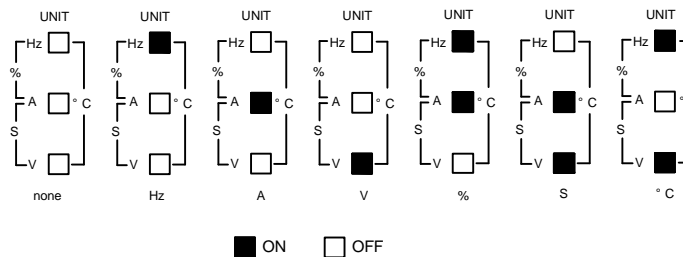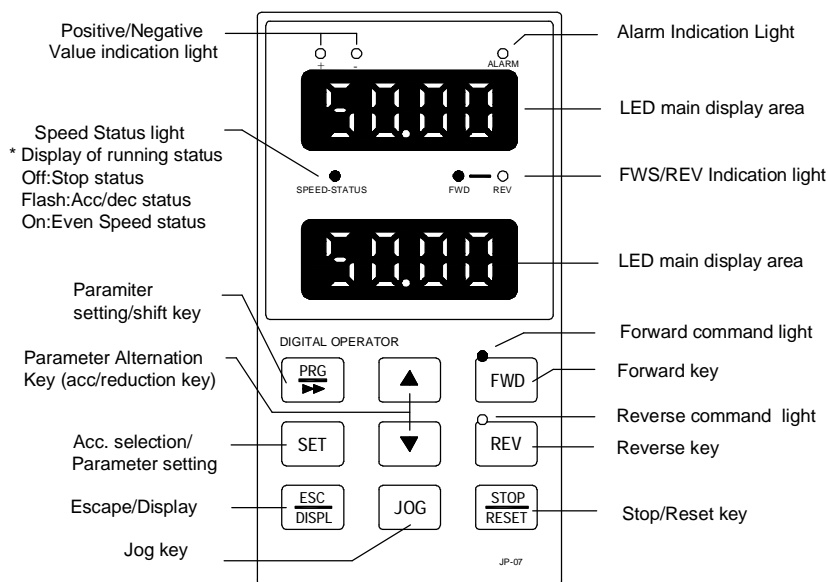

UNIT UNIT UNIT UNIT UNIT UNIT UNIT

none   Hz   A   V   %   S   ° C

■ ON   □ OFF

3-3-3 **JP6E7000, JP6C7000 keyboard**

? Specification and function description：

Positive/Negative Value indication light

Alarm Indication Light

LED main display area

Speed Status light
* Display of running status
Off:Stop status
Flash:Acc/dec status
On:Even Speed status

FWS/REV Indication light

LED main display area

Paramiter setting/shift key

Forward command light

Parameter Alternation Key (acc/reduction key)

Forward key

Acc. selection/ Parameter setting

Reverse command light

Reverse key

Escape/Display

Stop/Reset key

Jog key

DIGITAL OPERATOR

PRG

▲

FWD

SET

▼

REV

ESC DISPL

JOG

STOP RESET

JP-07

function description

Forward key:
◇ Drive forward.

Reverse key:
◇ Drive reverse.

Stop/Reset key:
◇ Drive stops, resets after abnormity and confirms fault.

Acc. Selection /Parameter setting:
◇ When select parameter, press the SET key and add/reduction key, parameter code add/reduce 10
◇ Restore modified value
◇ alternate the monitor object and monitor

Escape/display
◇ Escape modifying the data of function parameters
◇ Escape of submenu or running into menu of status display from function menu
◇ Escape of fault status.

Jog key
◇ On: jog

15

◇ Off: stop

The upper LED main display area
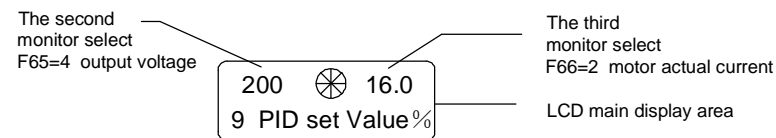◇ Display frequency, current, voltage, etc. Also display fault code, password right

FWD/REV Indication light
◇ Display motor's running state: forward or reverse.

The nether LED main display area
◇ Display function code
◇ Display set frequency during running

JP6E7000 is standard keyboard for PI7000, PI7100 Family inverter.

JP6C7000 keyboard has the same structure and instruction with those of JP6E7000. The difference is that the lower LED display is changed into LCD display which displays the state and parameters in English. JP6C7000 is the optional keyboard for PI7000, PI7100. The following diagram is the description to JP6C7000 LCD display:

The second monitor select F65=4 output voltage

The third monitor select F66=2 motor actual current

200 ⊛ 16.0
9 PID set Value %

LCD main display area

● For the 4 keypads, when the keypad is unlocked, press the [■] and [■] simultaneously for 3 seconds, the keypad is locked, LED displays normally after displaying "LoC" for 2 seconds; when the keypad is locked, press the [■] and [■] simultaneously for 3 seconds, the keypad is unlocked, LED displays normally after displaying "ULoC" for 2 seconds.

3-4 Parameters set mode

e.g. 1 Modify acceleration time F09=5.0 to F09=25.0:
1. With F00 mode, press ▲ selecting F09, upper LED displays 5.0.
2. Press PRG for 3 times, upper LED ten digits "0" flashes.
3. Press ▲ for twice, upper LED ten digits displays "2".
4. Press SET confirming value modification.

16

up LED | down LED display:

15 / F 00 — press ▲ key → 5.0 / F 09 — press PRG key once → 5.0 / F 09 (glitter)

press PRG key once →

25.0 / F 09 (glitter) ← press ▲ key twice — 050 / F 09 (glitter) ← press PRG key once — 5.0 / F 09 (glitter)

press SET key to affirm →

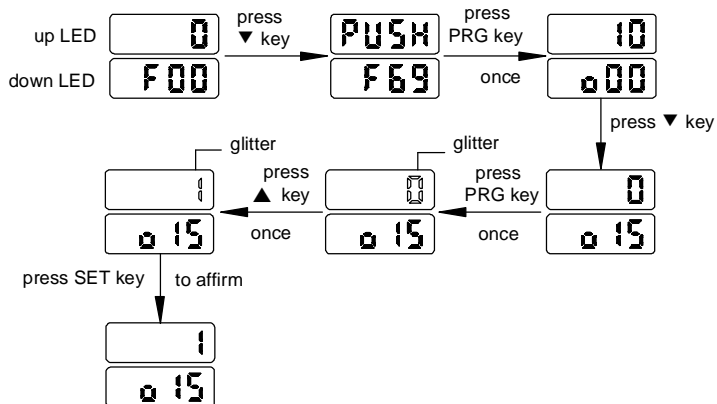25.0 / F 09
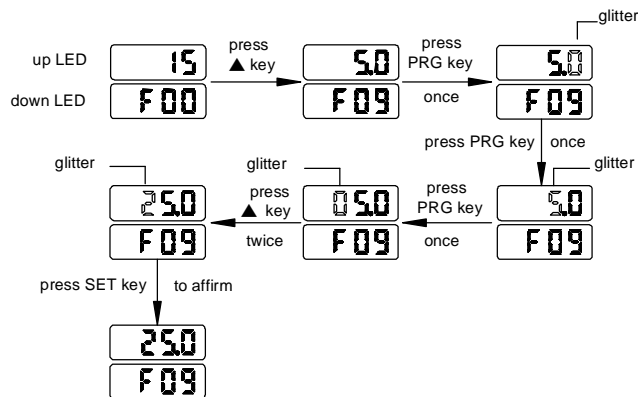
e.g. 2 Modify o15=0 to o15=1
1. With F00, press ▼ selecting F69.
2. Press PRG entering I/O group parameters menu.
3. Press ▼ selecting o15.
4. Press PRG once modifying o15.
5. Press ▲ once, upper LED flashes "1".
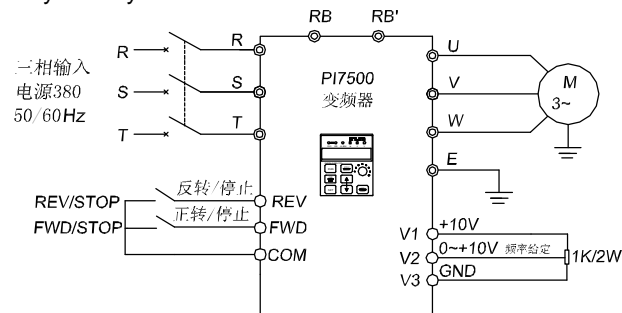6. Press SET confirming value modification.

up LED | down LED:

0 / F 00 — press ▼ key → PUSH / F 69 — press PRG key once → 10 / o 00

press ▼ key →

1 / o 15 (glitter) ← press ▲ key once — 0 / o 15 (glitter) ← press PRG key once — 0 / o 15

press SET key to affirm →

1 / o 15

Section IV. Test running

● Before connecting the power supply with the frequency converter, confirm that the input voltage of AC power is within the rated input voltage of the frequency converter.

● Connect the power supply with the R, S and T terminals of frequency converter (connect with R and S terminals for single-phase input).

● Select the proper operation control method.

e.g.: analog voltage input + keyboard /terminal operating (Pr.F04=1, Pr.F05=1).

The frequency command is controlled by terminal V2, and the operation is controlled by the keyboard and terminal FWD、REV.

一相输入
电源380
50/60Hz

PI7500 变频器

反转/停止
正转/停止

REV/STOP
FWD/STOP

REV
FWD
COM

+10V
V1
V2 0~+10V 频率给定
V3 GND
1K/2W

e.g.: keyboard adjust speed + keyboard operating (Pr.F04=0, Pr.F05=0)

The frequency command is controlled by the key , and operation is controlled by the key FWD、REV controlling the forward and reverse.
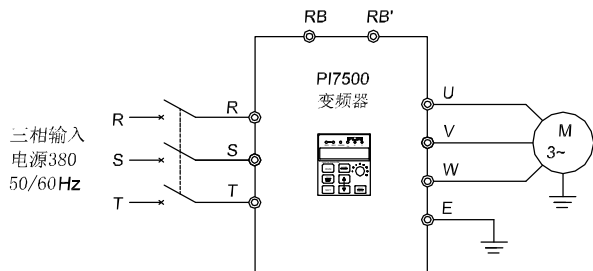
※ Running the unit without load, regulate the speed and check.

※ Confirm the min. and max values of the set output frequency.

※ Check JOG control.

※ Confirm the acceleration and deceleration time.

※ Connect with the motor.

※ Run the motor at low speed and check its rotation direction.

※ Check if all the displays and outputs during the operation are correct.

Section V.   Function parameter table

5-1.   Basic Parameters

Ref	LCD keyboard explanation	Range of set value		Unit	Factory setting	Y/N
F00	monitor select	Set frequency	0	-	0	Y
		Actual frequency	1			
		Motor actual current	2			
		Actual current percent	3			
		DC Bus voltage	4			
		Actual output voltage	5			
		Actual motor speed	6			
		Total running time	7			
		IGBT temperature	8			
		*reserved	9			
		*reserved	10			
		Motor output power	11			
		*reserved	12~15			
F01	control methods	No PG V/F control	0	-	0	N
F02	set frequency	Lower frequency~Upper frequency	F03=0	Hz	50.00	Y
			F03=1		500.0	
F03	fre. multiple set	×1	0	-	0	N
		×10	1			
F04	fre. set mode	Keypad	0	-	0	N
		V2	1			
		I2	2			
		V2+I2	3			
		Ascend/Descend control	4			
		Program running	5			
		Traverse running	6			
		*reserved	7			
		Keypad potentionmeter set	8			
		V2 Forward/Reverse set	9			

		Keypad potentionmeter FWD/REV set	10				
		*reserved	11				
		*reserved	12				
		Up/Down control mode 2	13				
F05	run control mode	Keypad	0	-	0	Y	
		Keypad + terminal	1				
		*reserved	2				
		terminal	3				
		*reserved	4				
F06	waveform mode	Asynchronous space vector PWM	0	-	1	N	
		Stepless & subsection synchronous space vector PWM	1				
		2 phase optimized space vector PWM	2				
F07	auto.torque boost	0~10		%	0	Y	
F08	V/F boost mode	0~61		-	2	N	
F09	accelerate time	0.1~3200.0		s	10.0	Y	
F10	decelerate time	0.1~3200.0		s	10.0	Y	
F11	slip compensate	0~10		%	0	N	
F12	O.P. voltage ratio	50~110		%	100	N	
F13	max. frequency	10.00~300.00	F03=0	Hz	50.00	N	
		100.0~800.0	F03=1		500.0		
F14	basic frequency	5.00~ F13	F03=0	Hz	50.00	N	
		50.0~ F13	F03=1		500.0		
F15	carrier frequency	1.0~16.0		kHz	★	Y	
F16	Lower frequency	0.00~ F17	F03=0	Hz	0.00	N	
		0.0~ F17	F03=1		0.0		
F17	upper frequency	F16~F13	F03=0	Hz	50.00	N	
			F03=1		500.0		
F18	S curve acc. start	0.0~50.0		%	0.0	Y	
F19	S curve acc. stop	0.0~50.0		%	0.0	Y	
F20	S curve dec. start	0.0~50.0		%	0.0	Y	
F21	S curve dec. stop	0.0~50.0		%	0.0	Y	

F22	min. running fre.	0.00~ F13	F03=0	Hz	0.00	N	
		0.0~ F13	F03=1		0.0		
F23	DC brake current	0~135		%	100	Y	
F24	start brake time	0.0~60.0		s	0.0	N	
F25	stop brake time	0.0~60.0		s	0.0	N	
F26	brake start fre.	0.00~F13	F03=0	Hz	0.00	Y	
		0.0~F13	F03=1		0.0		
F27	stopping mode	Deceleration stop	0	-	0	N	
		Free stop	1				
F28	jog acc. time	0.1~3200.0		s	1.0	N	
F29	jog dec. time	0.1~3200.0		s	1.0	N	
F30	jog direction set	Forward	0	-	0	N	
		Reverse	1				
F31	jog frequency set	F16~F17	F03=0	Hz	6.00	Y	
			F03=1		60.0		
F32	traverse fre. 1	F33~F17	F03=0	Hz	40.00	Y	
			F03=1		400.0		
F33	traverse fre. 2	F16~F32	F03=0	Hz	20.00	Y	
			F03=1		200.0		
F34	traverse differ.	0.00~5.00	F03=0	Hz	2.00	Y	
		0.0~50.0	F03=1		20.0		
F35	traverse time T1	0.0~3200.0		s	2.0	Y	
F36	traverse time T2	0.0~3200.0		s	2.0	Y	
F37	skip frequency 1	0.00~F13	F03=0	Hz	0.00	Y	
		0.0~F13	F03=1		0.0		
F38	skip frequency 2	0.00~F13	F03=0	Hz	0.00	Y	
		0.0~F13	F03=1		0.0		
F39	skip frequency 3	0.00~F13	F03=0	Hz	0.00	Y	
		0.0~F13	F03=1		0.0		
F40	skip frequency range	0.00~5.00	F03=0	Hz	0.00	Y	
		0.0~50.0	F03=1		0.0		
F41	auto. Voltage regulation	Invalid	0	-	0	Y	
		Valid	1				
		Valid but invalid when decelerating	2				

F42	OU stall protect	Invalid	0	-	1	Y
		Valid	1			
F43	current limit	Invalid	0	-	0	Y
		Valid	1			
F44	rate track select	Invalid	0	-	0	N
		Pick up mode when power down	1			
		Pick up mode when start	2			
F45	elec. o.h. protect	Invalid	0	-	1	Y
		Valid	1			
F46	protect level	120~250		%	★	N
F47	consumed brake	Invalid	0	-	0	Y
		Safe mode	1			
		General mode	2			
F48	Fault reset times	0~10		-	0	N
F49	Fault reset time	0.5~20.0		s	1.0	N
F50	Program running mode	Single circulation	0	-	0	N
		Continuous circulation	1			
		Single circulation command running	2			
F51	Restart mode	Runs at step 1	0	-	0	N
		Runs at the step before stopping	1			
F52	*reserved	-		-	-	-
F53	*reserved	-		-	-	-
F54	Motor run direction	FWD command,motor forwards	0	-	0	N
		FWD command,motor reverses	1			
F55	Motor reverse forbidden	Reverse allowable	0	-	0	N
		Reverse forbidden	1			

F56	Running time setting	Acc/dec time	Tens digit	Run time	Unit		-	0	N
		*1	0	*1	0				
		*30	1	*10	1				
				*100	2				

F57	% in energy saving energy	30~100		%	100	N
F58	FDT fre. set 1	F59~ F13	F03=0	Hz	0.00	Y
		F59~ F13	F03=1		0.0	
F59	FDT fre. set 2	0.00~ F58	F03=0	Hz	0.00	Y
		0.0~ F58	F03=1		0.0	
F60	Fre. Inspection range	0.00~5.00	F03=0	Hz	0.00	Y
		0.0~50.0	F03=1		0.0	
F61	Load type	General	0		0	N
		Water Pump	1			
		Blower fan	2			
		Plastic jetting mould machine	3			
		Braiding machine	4			
		Hoister	5			
		Pumping jack	6			
		Belt conveyor	7			
		*reserved	8~14			
F62	Terminal control modes	Standard running control	0	-	0	N
		2-point running control	1			
		3-point running control	2			
F63	MSS terminal function selection	Invalid	0	-	0	N
		MSS multi-step speed control	1			
		MSS multi-step acceleration control	2			
		JOG forward/ reverse control	3			
		Frequency set mode shift	4			
		*reserved	5			
		MSS time running	6			
		*reserved	7			
F64	Polarity of input terminal	0~127		-	0	N
F65	Monitor sel. 1	Set frequency	0	-	1	Y
F66	Monitor sel. 2	Actual frequency	1	-	2	Y
		Actual motor current	2			
		Current percentage	3			

		DC bus voltage	4			
		Output voltage	5			
		Actual motor rotating speed	6			
		Accumulated running time	7			
		IGBT temperature	8			
		*reserved	9			
		*reserved	10			
		Motor output power	11			
		*reserved	12~15			
F67	V/F curve set					
F68	MSS speed control					
F69	I/O group select					
F70	CUR group select	Press [PROG/ENT]		-		Y
F71	SPD group select					
F72	PID group select					
F73	SYS group select					
F74	MOT group select					

5-2. Other Parameters
5-2-1. F67 V/F curve [V/F]

Ref	LCD keyboard explanation	Range of set value		Unit	Factory setting	Y/N
U00	V/F set fre 1	0.00~U02	F03=0	Hz	5.00	N
		0.0~U02	F03=1		50.0	
U01	V/F set voltage 1	0~U03		%	5	N
U02	V/F set fre. 2	U00~U04	F03=0	Hz	10.00	N
			F03=1		100.0	
U03	V/F set voltage 2	U01~U05		%	10	N
U04	V/F set fre. 3	U02~U06	F03=0	Hz	15.00	N
			F03=1		150.0	
U05	V/F set voltage 3	U03~U07		%	15	N
U06	V/F set fre. 4	U04~U08	F03=0	Hz	20.00	N
			F03=1		200.0	
U07	V/F set voltage 4	U05~U09		%	20	N
U08	V/F set fre. 5	U06~U10	F03=0	Hz	25.00	N

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			F03=1		250.0	
U09	V/F set voltage 5	U07~U11		%	25	N
U10	V/F set fre. 6	U08~U12	F03=0	Hz	30.00	N
			F03=1		300.0	
U11	V/F set voltage 6	U09~U13		%	30	N
U12	V/F set fre. 7	U10~U14	F03=0	Hz	35.00	N
			F03=1		350.0	
U13	V/F set voltage 7	U11~U15		%	35	N
U14	V/F set fre. 8	U12~F13	F03=0	Hz	40.00	N
			F03=1		400.0	
U15	V/F set voltage 8	U13~100		%	40	N

5-2-2. F68 MSS group [MSS]

Ref	LCD keyboard explanation	Range of set value		Unit	Factory setting	Y/N
H00	1 step speed 1X	F16~F17	F03=0	Hz	5.00	Y
			F03=1		50.0	
H01	2 step speed 2X	F16~F17	F03=0	Hz	30.00	Y
			F03=1		300.0	
H02	3 step speed 3X	F16~F17	F03=0	Hz	20.00	Y
			F03=1		200.0	
H03	4 step speed 4X	F16~F17	F03=0	Hz	30.00	Y
			F03=1		300.0	
H04	5 step speed 5X	F16~F17	F03=0	Hz	40.00	Y
			F03=1		400.0	
H05	6 step speed 6X	F16~F17	F03=0	Hz	45.00	Y
			F03=1		450.0	
H06	7 step speed 7X	F16~F17	F03=0	Hz	50.00	Y
			F03=1		500.0	
H07	1 step time T1	0.0~3200.0		s	2.0	Y
H08	2 step time T2	0.0~3200.0		s	2.0	Y
H09	3 step time T3	0.0~3200.0		s	2.0	Y
H10	4 step time T4	0.0~3200.0		s	2.0	Y
H11	5 step time T5	0.0~3200.0		s	2.0	Y
H12	6 step time T6	0.0~3200.0		s	2.0	Y

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H13	7 step time T7	0.0~3200.0		s	2.0	Y
H14	acc. time at1	0.1~3200.0		s	10.0	Y
H15	dec. time dt1	0.1~3200.0		s	10.0	Y
H16	acc. time at2	0.1~3200.0		s	10.0	Y
H17	dec. time dt2	0.1~3200.0		s	10.0	Y
H18	acc. time at3	0.1~3200.0		s	10.0	Y
H19	dec. time dt3	0.1~3200.0		s	10.0	Y
H20	acc. time at4	0.1~3200.0		s	10.0	Y
H21	dec. time dt4	0.1~3200.0		s	10.0	Y
H22	acc. time at5	0.1~3200.0		s	10.0	Y
H23	dec. time dt5	0.1~3200.0		s	10.0	Y
H24	acc. time at6	0.1~3200.0		s	10.0	Y
H25	dec. time dt6	0.1~3200.0		s	10.0	Y
H26	acc. time at7	0.1~3200.0		s	10.0	Y
H27	dec. time dt7	0.1~3200.0		s	10.0	Y
H28	Multi-step speed 1 running direction	Forward	0	-	0	Y
		Reverse	1			
H29	Multi-step speed 2 running direction	Forward	0	-	0	Y
		Reverse	1			
H30	Multi-step speed 3 running direction	Forward	0	-	0	Y
		Reverse	1			
H31	Multi-step speed 4 running direction	Forward	0	-	0	Y
		Reverse	1			
H32	Multi-step speed 5 running direction	Forward	0	-	0	Y
		Reverse	1			
H33	Multi-step speed 6 running direction.	Forward	0	-	0	Y
		Reverse	1			
H34	Multi-step speed 7 running direction	Forward	0	-	0	Y
		Reverse	1			

5-2-3. F69 I/O group [I/O]

Ref	LCD keyboard explanation	Range of set value	Unit	Factory setting	Y/N
o00	V2 input filter time	2~200	ms	10	Y

o01	V2 min. input voltage	0.00~o02		V	0.00	Y
o02	V2 max. input voltage	o01~10.00		V	10.00	Y
o03	I input filter time	2~200		ms	10	Y
o04	I input min. current	0.00~o05		mA	0.00	Y
o05	I input max. current	o04~20.00		mA	20.00	Y
o006 *o07	DA1 Ouput Reserved	No Function	0	- -	0 -	Y -
		Set frequency	1			
		Actual frequency	2			
		Actual current	3			
		Output voltage	4			
		Bus voltage	5			
		IGBT temperature	6			
		Output power	7			
		Output speed	8			
		*reserved	9			
o08	DA1 output lower adjustment	0~o09		%	0.0	Y
o09	DA1 output upper adjustment	o08~100.0		%	100.0	Y
*o10	reserved	-		-	-	-
*o11	reserved	-		-	-	-
*o12	reserved	-		-	-	-
o13 *o14 *o15 *o16 o17 *o18	O.P. signal sel. 1 *reserved *reserved *reserved O.P. signal sel. 5 * reserved	No function	0	- - - - - -	0 - - - 0 -	Y - - - Y -
		Fault alarm	1			
		Over current inspection	2			
		Over load inspection	3			
		Over voltage inspection	4			
		Lack voltage inspection	5			
		Low load inspection	6			
		Over heat inspection	7			
		Running state with command	8			
		*reserved	9			
		Motor reverse	10			

		Set frequency arrival	11			
		Upper limit frequency	12			
		Lower limit frequency	13			
		FDT frequency 1 arrival	14			
		FDT frequency level inspection	15			
		0 speed running	16			
		Position arrival	17			
		*reserved	18			
		Program running 1 cycle finished	19			
		Speed pursue mode inspection	20			
		Running state without command	21			
		Inverter reverse command	22			
		Deceleration running	23			
		Acceleration running	24			
		* reserved	25			
		* reserved	26			
		Inverter's rated current arrival	27			
		Motor's rated current arrival	28			
		Set fre. arrives lower fre.	29			
		FDT frequency set 2 arrives	30			
		* reserved	31			
		* reserved	32			
o19	Minimum input frequency	0.00~F13	F03=0	-	0.00	Y
		0.0~F13	F03=1		0.0	
o20	Maximum input frequency	0.00~F13	F03=0	-	50.00	Y
		0.0~F13	F03=1		500.0	

*5-2-4. F70 CUR group [CUR], reserved

*5-2-5. F71 SPD group [SPD], reserved

*5-2-6.F72 PID group [PID], reserved

5-2-7. F73 SYS group [SYS]

Ref	LCD keyboard explanation	Range of set value			Unit	Factory setting	Y/N
y00	Restore factory setting	No reset		0	-	0	N
		Instant reset		1			
y01	fault record 1						
y02	fault record 2	Press [PRG] and [▲], the frequency, current and running state of fault time can be known.			-	-	N
y03	fault record 3						
y04	fault record 4						
y05	fault record 5						
y06	Fault record reset	No activity		0	-	0	Y
		Reset		1			
y07	rated O.P. current	0.1~1000.0			A	★	N
y08	rated I.P. voltage	100~380			V	★	N
y09	product series	75	1	3	-	★	N
		Family serial	Function code	Input voltage level			
y10	software version	-			-	-	N
*y11	Reserved	-			-	-	-
*y12	Reserved	-			-	-	-
y13	total time set	Clear automatically after starting		0	-	1	Y
		Continuous accumulation after starting		1			
y14	total time unit	Hour		0	-	0	Y
		Day		1			
y15	Manufacture date	YYYY			-	-	N
y16	making month/day	MMDD			-	-	N
y17	decode input	0~9999		set range	-	-	Y
		Record of times of wrong decode		display content			
y18	password input	0~9999		set range	-	-	Y
		No setting password or Input decode correct	deco	display content			
		Parameters locked	code				

5-2-8. MOT group [MOT]

Ref	LCD keyboard explanation	Range of set value		Unit	Factory setting	Y/N
b00	motor poles	1~8		-	2	N
b01	motor rated cur.	y07×(30%~120%)		A	★	N
b02	motor rated vol.	100~380		V	★	N
b03	motor rated speed	500~5000		rpm	1500	N
b04	motor rated frequency	0.00~F13	F03=0	%	50.00	N
		0.0~F13	F03=0		500.0	
b05	Motor un-load cur.	0~b01		A	★	N
b06	stator resistor	0.000~30.000		ohm	★	N
b07	rotor resistor	0.000~30.000		ohm	★	N
b08	leakage inductance	0.0~3200.0		mH	★	N
b09	mutual inductance	0.0~3200.0		mH	★	N
*b10	reserved	-		-	-	-
*b11	reserved	-		-	-	-
*b12	reserved	-		-	-	-
*b13	reserved	-		-	-	-
b14	Rotate speed display plus	0.1~2000.0		%	100.0	Y
*b15	reserved	-		-	-	-
b16	reserved	0		-	0	N
b17	reserved	0		-	0	N

NOTE:

1) Y/N means the parameter is adjustable or not during running, Y means it is adjustable, N means it is not.

2) ★ means the parameter's factory setting is affected by the power and type. The value refers to the parameters description.

3) *means the function is invalid but reserved.

Section VI. Function Parameter Description

6-1. Basic parameter:

F00: **Monitor selection**   **factory setting: 0**
The value range is 0~15 monitoring 0~15 different objects under running.

Monitor objects under running
0: Set frequency
   Set frequency under frequency setting mode.
1: Actual frequency
   Current output frequency.
2: Motor actual current
   Detected value of motor's current.
3: Actual current percentage
   Percentage of motor's actual current and rated current.
4: DC bus voltage
   Detected voltage of DC bus.
5: Output voltage
   Actual output voltage of inverter.
6: Actual motor speed rpm
   During running, the display of the adjusted motor's actual rotate speed=60 × Actual output frequency × Rotate speed display plus/Motor poles
   e.g. Actual output frequency50.00Hz, Rotate speed display plus b14=100.0%, Motor poles b00=2, the display of the adjusted motor's actual rotate speed=1500rpm.
   During stopping state, checking the motor speed according to residual stress, renewed speed 500ms.
   The display of the adjusted motor's actual rotate speed=60 × residual stress frequency × rotate speed display plus/Motor poles
7: Total running time
   This parameter indicates the total running time, and the unit is hour or day.
   e.g. If led display value is 10.31, y14 is 0, the actual running time of the machine is 10 hours,18 minutes and 36 seconds; if led display value is 20.03 and y14 is 1, the actual running time of the machine is 20 days,43 minutes and 12 seconds.
8: IGBT temperature
   Detected IGBT temperature inside inverter.

*9~15: Reserved.

F01: **Control mode**   **factory setting: 0**
This parameter values 0.
0: Without PG V/F control. V/F space voltage vector control.

F02: **Set frequency**   **factory setting: 50.00/500.0Hz**
Setting running frequency can be from lower frequency to upper frequency.

F03: Frequency multiple setting   **factory setting: 0**
0: Set frequency display accuracy is 0.01Hz. With this accuracy, F13
   maximum frequency range is 10.00~300.00Hz.
1: Set frequency display accuracy is 0.1Hz. With this accuracy, F13
   maximum frequency range is 100.0~800.0Hz.

F04: Frequency setting mode   **factory setting: 0**
Frequency setting modes can be set by the value 0~10, as following:
0: Keypad set
1: Set frequency by analog input V2
2: Set frequency by analog input I2
3: By analog input V2 and I2 simultaneity
4: Ascend/Descend control

SS1,SS2 valid in high level
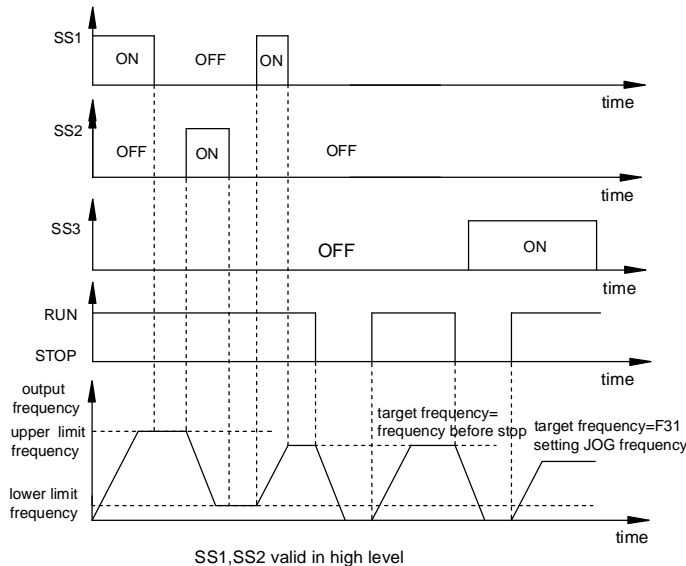
This function is to control ascend/descend and target frequency with the terminals SS1,SS2,SS3.
It is OFF when SS1, SS2, SS3 are disconnected with COM, ON when they are short-circuited.

SS1	Ascend control is to change the frequency increased	
SS2	Descend control is to change the frequency reduced, has precedence over SS1.	
SS3	ON	During stopping state, change the frequency caused by SS1/SS2and turn it to F31 jog frequency.
	OFF	During stopping state, keep the frequency caused by SS1/SS2

5: Program Running
   No limitation of the reverse forbidden. Its running direction is set by multi-step speed running direction.
6: Traverse running
   Running by setting traverse.
*7:Reserved.
8: Keypad potentiometer set
   Frequency set by the potentiometer on the keypad.
9: V2 Forward/Reverse set
   Anolog input signal V2 is to the signal to forward/reverse frequency, when V2 is larger than o01 (V2 minimum input voltage), it is the signal to forward frequency; when V2 is smaller than o01, it is the signal to reverse frequency.
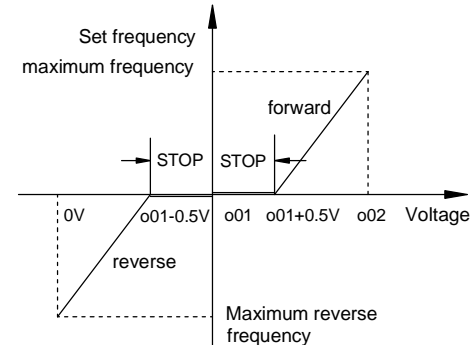
10. Keypad potentionmeter FWD/REV set
*11~12: Reserved.
13. Up/Down control mode 2

F05: Running control mode   **factory setting: 0**
0: Keypad control
1: Keypad + terminal control control
   To terminal control, edge triggers. Execute FOR/REV command in falling edge and execute STOP command in rising edge.
   Note: F62=0 is valid.
*2: Reserved.

3: Terminal, level triggers. F62=0/1/2 is valid.
*4: Reserved.

F06: Waveform occurrence mode   **factory setting: 1**
PWM waveform occurrence mode
0: PWM Asynchronous space vector.
1: Step less & subsection synchronous space vector PWM, harmonic wave
  minimized, symmetric output waveform.
2: 2 phase optimized space vector PWM, switch loss minimized, asymmetry
  output waveform.

F07: Auto torque boost   **factory setting: 0%**
The parameter is used to improve the inverter characteristic in lower
frequency, and boost output voltage when the inverter is running in low
frequency.
The calculating form is:

boost voltage =motor rated voltage × (inverter actual output current / 2 times
of motor rated current) × F07

torque boost in drop torque curve   torque boost in constant torque curve
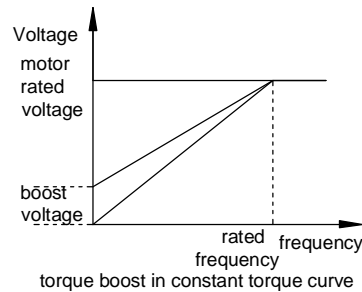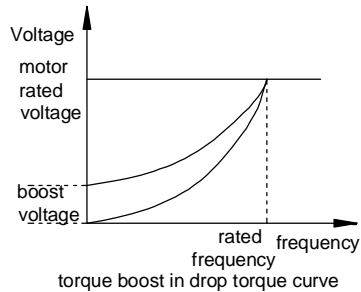
F08: V/F boost mode   **factory setting: 2**
T Totally 62 V/F boost modes, there into 0~20 for constant torque load,
21~40 for 1.5 power descending torque load, 41~50 for square descending
torque load, 51~60 for cube descending torque load, 61 is user-defined.

0~10   11~20

21~30   31~40

41~50   51~60
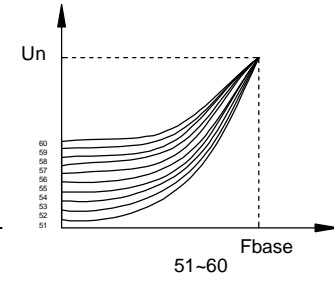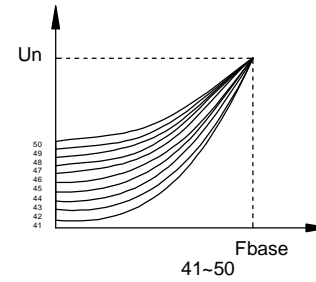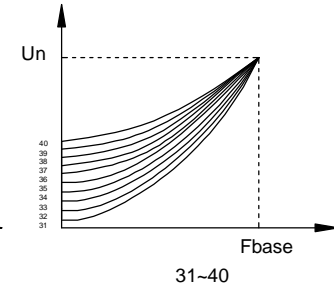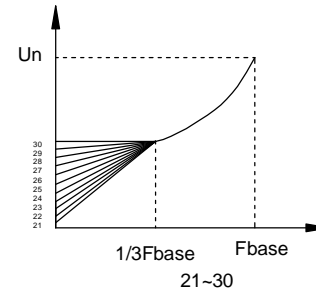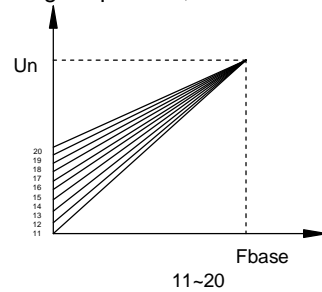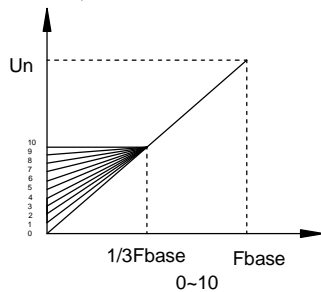
F09: Acceleration time   **factory setting: 5.0s**
Acceleration time is the time from 0Hz to maximum frequency, as below:

F10: Deceleration time   **factory setting: 5.0s**
Deceleration time is the time from maximum frequency to 0Hz, as below:
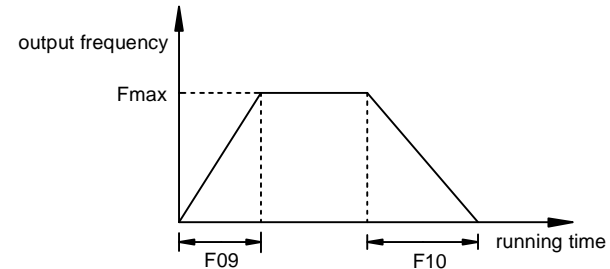
Actual acc/dec time equals to the set acc/dec time multiples a time
multiple which is decided by the tens digit of F56. Please refer to F56.

F11: Slip compensate   **factory setting: 0%**
When drives drive the asynchronous motor, the load is added, slip
enhanced, this parameter can set compensate frequency, reduce slip, so
that the motor runs much closer to the synchronous speed under rated

current. If the value set to 0, no slip compensation functions.
This function is based on correctly setting b01 motor's rated current, b05 motor's current without load.
The calculating form is:
Compensate frequency=Slip compensate × Rated frequency

$$\times (I_{MX} - I_{M0}) / (I_{MN} - I_{M0})$$

I_{MX}: Motor actual working current
I_{MN}: Motor rated current
I_{M0}: Motor current without load

F12: Output voltage percentage　　　　factory setting: 100%
Percentage of actual output voltage and rated output voltage
This parameter is for adjusting output voltage, output voltage=inverter rated output voltage × output voltage percentage.

F13: Maximum frequency　　　　factory setting: 50.00/500.0Hz
Allowable maximum frequency by Inverter's adjusting speed, also the base for setting acceleration/deceleration time.
Setting this parameter should consider the characteristic and ability of motor.

F14: Basic frequency　　　　factory setting: 50.00/500.0Hz
This function is for motors with different base frequency.
Basic V/F feature curve:
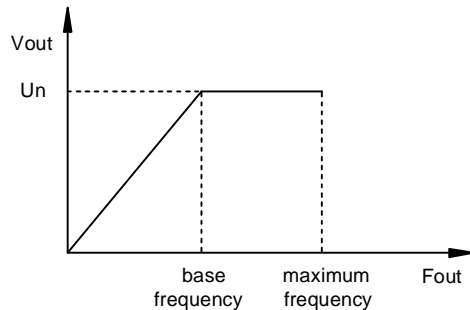
F15: Carrier frequency　　　factory setting: refer to following table
This function is chiefly used to improve the possible noise and vibration during the operation of frequency converter. When carrier frequency is higher, the output current has better wave, the torque is great at lower frequency and the motor produces light noise. So it is very suitable for use in the applications where great torque is output at low frequency quietly. But in these applications, the damage to the switches of main components and the heat generated by the inverter are great, the efficiency is decreased and

the output capacity is reduced. At the same time, more serious radio interference is resulted and special attention must be paid for application where very low EMI is needed, and filter option can be used if necessary. Another problem for application of high carrier frequency is the increase of capacitance-leakage current. The protector for leakage current may invalidate function, and over current is also possibly caused.
When low carrier frequency is applied, the case is almost contrary to the above-mentioned one.
Different motor has different reflection to the carrier frequency. The best carrier frequency is gained after regulation according to actual conditions. The higher the motor capacity is, the lower the carrier frequency should be selected.

The company reserves the right to limit maximum carrier frequency as following:

Carrier frequency	Motor noise		Electric disturbance		Switch dissipation	
1.0kHz	Great		Small		Small	
8.0kHz		↕		↕		↕
16.0kHz	Small		Great		Great	

The relation between carrier frequency and the power is expressed as following:

Power (kW)	0.4~18.5	22~30	37~55	75~110	132~200	220 above (including 220)
Carrier frequency (Hz)	8.0k	7.0k	4.0k	3.6k	3.0k	2.5k

**Note:** The higher carrier frequency causes the higher converter heat.

F16: Lower limit frequency　　　　factory setting: 0.00/0.0Hz
Lower limit of output frequency.

F17: Upper limit frequency　　　　factory setting: 50.00/500.0Hz
Upper limit of output frequency.
When the frequency setting command is greater than upper limit, the operation frequency is the upper limit. When the frequency setting command is below the lower limit, the operation frequency is the lower limit. When starting the standstill motor, the frequency converter's output is accelerated towards the lower limit or set value from 0Hz according to the acceleration time 1. When the motor stops, the running frequency starts to decelerate towards 0Hz according to the deceleration time.
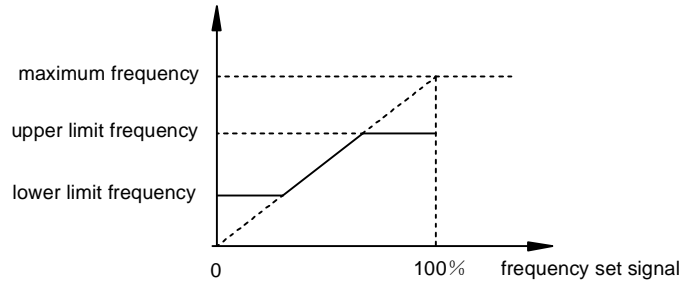
F18: S curve start time at the acceleration step　　factory setting: 0.0%
F19: S curve stop time at the acceleration step　　factory setting: 0.0%
F20: S curve start time at the deceleration step　　factory setting: 0.0%
**F21: S curve stop time at the deceleration step　　factory setting: 0.0%**

S curve acceleration/deceleration
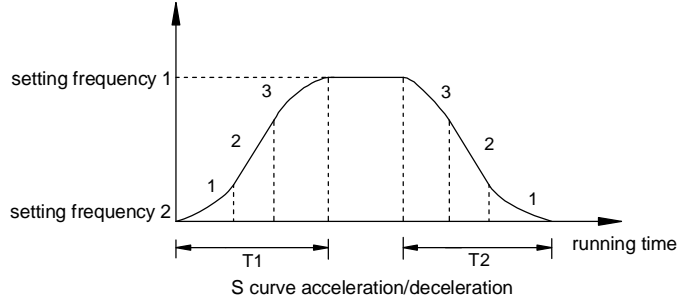
1. Slope of output frequency is enhanced from 0 to maximum level.
2. Slope of output frequency at the constant level.
3. Slope of output frequency is reduced from maximum level to 0.
If setting S curve acceleration/deceleration, the acceleration/deceleration time is calculated as:

Acceleration time=Selected acceleration time+〔S feature time at the beginning of acceleration + S feature time at the end of acceleration〕×2
That is: Acceleration timeT1=F09+〔(F09×F18)+(F09×F19)〕×2

Deceleration time=Selected deceleration time+〔S feature time at the beginning of deceleration + S feature time at the end of deceleration〕×2
That is: Deceleration timeT2=F10+〔(F10×F20)+(F10×F21)〕×2

F22: Minimum running frequency　　　　factory setting: 0.00/0.0Hz
Inverter stops when the set frequency is lower than the minimum running frequency, that is: set frequency is 0.0Hz when set frequency is lower than the minimum running frequency.

"Minimum running frequency" is in priority rather than "Lower frequency". "Lower frequency" is in priority only with the set minimum running frequency 0Hz.

Minimum frequency<lower frequency　　　　Minimum frequency>lower frequency
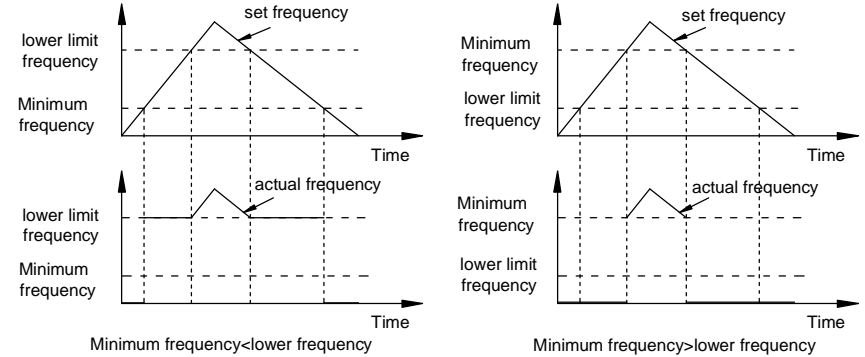
F23: DC braking current　　　　　　factory setting: 100%
This parameter set the percentage of DC braking current at DC braking. It is based on the rated current (inverter's rated current percentage). When setting it, do increase the value gradually until it provides enough braking torque.

F24: DC braking time when starting　　factory setting: 0.0s
Standing time of DC braking voltage when starting.

F25: DC braking time when stopping　　factory setting: 0.0s
Standing time of DC braking voltage when stopping.

F26: Braking start up frequency　　　factory setting: 0.00/.00Hz
When the frequency converter decelerates to this frequency, it stops the output of PWM waves, and then starts to output the D.C. brake wave.

stop braking (RUN→STOP)

stop braking (forward and reverse rotate)

stop braking (run state)

start up braking
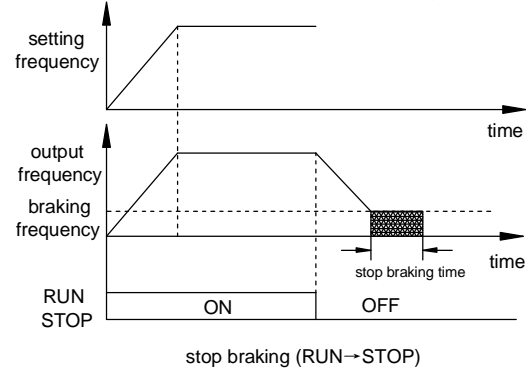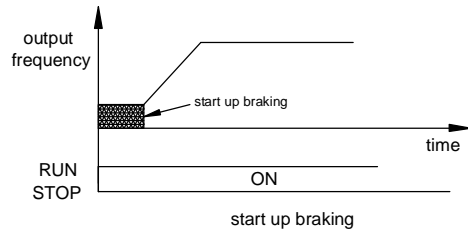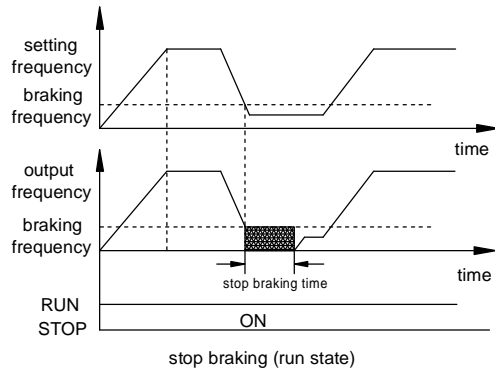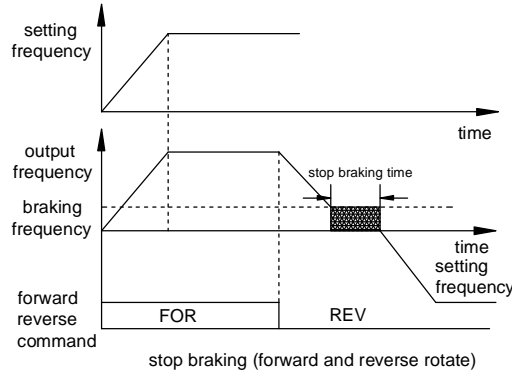
F27: Stop mode set   **factory setting: 0**

When receiving "stop" command, it sets the stop mode according to this parameter.

0: Deceleration stop mode, according to the deceleration time set by this parameter, inverter decelerates to the lowest frequency and stops.

1: Free stop mode. "Stop" command to the inverter, it stops output, motor runs free until stops due to the effects of load inertia.

F28: Jog acceleration time   **factory setting: 1.0s**

F29: Jog deceleration time   **factory setting: 1.0s**

Jog acceleration time defines the same step acceleration/deceleration.
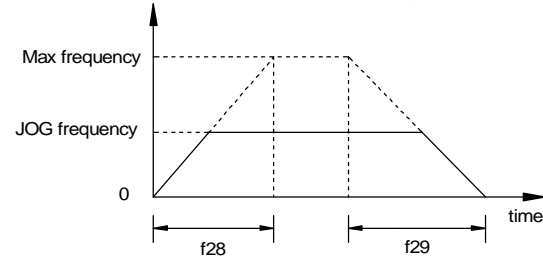
Actual jog time equals to the set acc/dec time multiples a time multiple which is decided by the tens digit of F56. Please refer to F56.

F30: Jog direction set   **factory setting: 0**

0: Forward

1: Reverse

F31: Jog frequency set   **factory setting: 6.00/60.0Hz**

Jog frequency setting range is from lower limit frequency to upper limit frequency.

F32: Traverse running frequency f1   **factory setting: 40.00/400.0Hz**

F33: Traverse running frequency f2   **factory setting: 20.00/200.0Hz**

F34: Traverse running difference △f   **factory setting: 2.00/20.0Hz**

F35: Traverse running timing T1   **factory setting: 2.0s**

F36: Traverse running timing T2   **factory setting: 2.0s**

Calculating acceleration/deceleration time with f1、f2、△f、T1、T2.
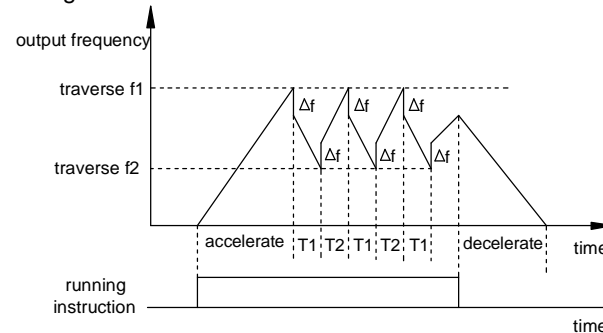
F37: Skip frequency 1   **factory setting: 0.00/0.0Hz**

F38: Skip frequency 2   **factory setting: 0.00/0.0Hz**

F39: Skip frequency 3   **factory setting: 0.00/0.0Hz**

F40: Skip frequency range   **factory setting: 0.00/0.0Hz**

During running, to skip resonance produced by the immanent resonance point in the machine system, skip mode can do this.

At most 3 resonance points can be set to skip.
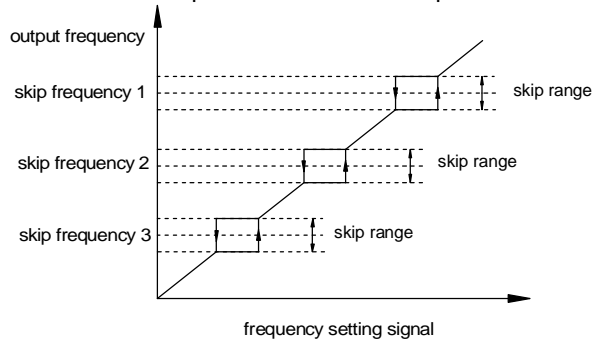
Skip frequency range is the up and down frequency range on the base of skip frequency.

During acc/dec, the output frequency could normally go through the skip frequency area.

F41: Automatic voltage regulation   **factory setting: 0**

CPU automatically inspects the DC bus voltage and deal with it at the real time, when electric network voltage fluctuates, output voltage fluctuation is very small, and the V/F feature always is close to the setting state with rated input voltage.

0: Invalid

1: Valid

2: Invalid but useless when deceleration

F42: Over voltage stall protection   **factory setting: 1**
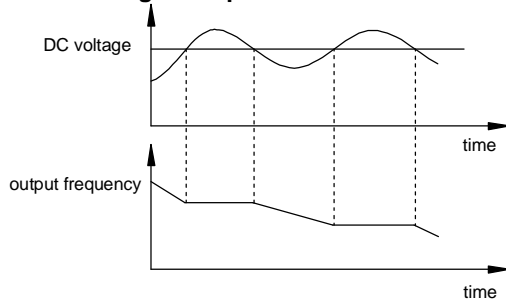
0: Invalid

1: Valid

When this function is valid and the frequency converter decelerates, the motor generates voltage back to the inside of frequency converter due to the effects of load inertia. This will lead the voltage on direct current side to rise above the allowable max. Value, therefore, at this time the inverter will stop deceleration (output frequency remains unchanged) and will not decelerate until the voltage is below the set value.

This function should be set to 0 for B type frequency converter or frequency converter with external braking unit.

F43: current limit function   **factory setting: 0**

0: Invalid

1: Valid

When this function is valid and the frequency converter accelerates, its output current will rise very quickly due to too fast acceleration or too heavy load of the motor. When the current exceeds the limited value (G/S: 140% of the rated current; F: 120% of the rated current; Z/M/T: 170% of the rated current; H: 230% of the rated current), the frequency converter will stop acceleration while when the current is below the limited value, the converter will continue acceleration.

When this function is valid and the frequency converter runs steadily, its output current will rise very quickly due to too fast acceleration or too heavy load of the motor. When the current exceeds the limited value (G/S: 140% of the rated current; F: 120% of the rated current; Z/H/T: 170% of the rated current; H: 230% of the rated current), the frequency converter will reduce the output frequency, and when the current is below the limited value, the converter will accelerate again to the setting value.
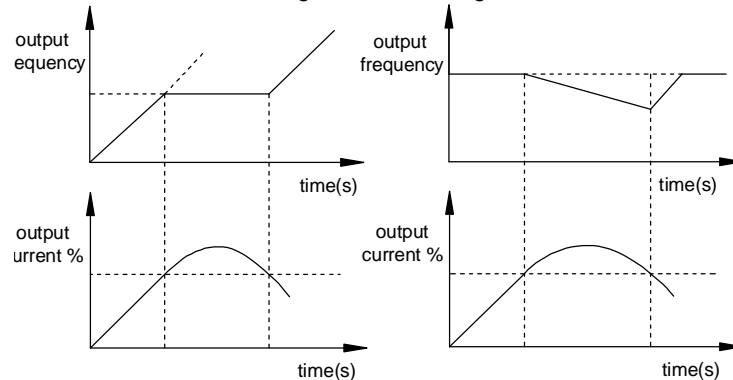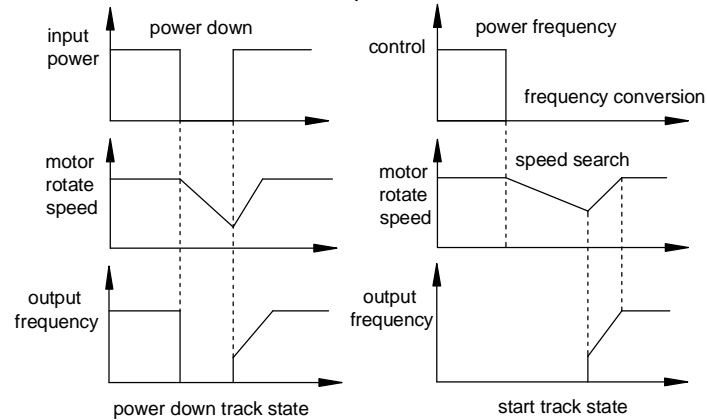
F44: Pick up selection   factory setting: 0
This parameter is used for selecting pick up mode.
0: Invalid. Start from 0Hz or starting frequency.
1: Pick up when power down. When inverter power down instantly and restarts, motor keeps running at the current speed and direction.
2: Pick up when start. When power on, inspects the motor speed and direction, runs at the current speed and direction.

F45: Electronic thermal relay protection selection   factory setting: 1
This function is to protect the motor when overheat happens to the motor without other thermal relays. Inverter's some parameters calculate the motor's high temperature, meanwhile estimating whether the current would make the motor overheat or not. Inverter stops output and display the protection information when electronic thermal relay protection function is valid.
0: Invalid
1: Valid

F46: Electronic thermal relay protection level   factory setting: refer to the below

45
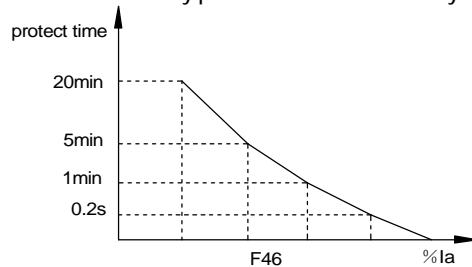
The current is set by the inverter when diagnosing the over heat of the motor. The protection takes effect in 1 minute when the current equals to the product of the motor's rated current multi-pled the value of F46, that is the actual current is F46 times of rated current.
The factory value is 150% for type G.

F47: Power consuming braking selection   factory setting: 0
0: Invalid
1: Safe mode
Only during the deceleration and inspection of DC bus voltage higher than the set value, this function takes effect.
2: General mode
Under any status, it takes effect only inspecting DC bus voltage higher than the set value.
Over voltage or over current probably occurs when inverter instantly decelerates or the load's fluctuation is big. This phenomenon occurs much easily when the load inertia is relatively big. Inside inverter DC high voltage is inspected over certain value, power consuming brake can be realized by output brake signal via external brake resistor.

F48: Fault reset times   factory setting: 0
During running, if over current (OC) or over voltage (OU) occurs, this function makes inverter automatically reset and run at the setting state when there was no fault. Reset times are based on this parameter, at most 10 times can be set. When it is "0", automatic reset function is invalid after fault occurrence. But if DC main circuit's main relay fault MCC or lack voltage LU fault occurs, the automatic reset is not limited by this.
Restart and runs normally after fault for over 36s, the previous fault rest times is set.
Fault last for over 10s then the fault reset function could not be executed.

F49: Fault reset time   factory setting: 1.0s
This function is for setting time interval of fault auto-reset. Inverter stops after fault, it takes more time.
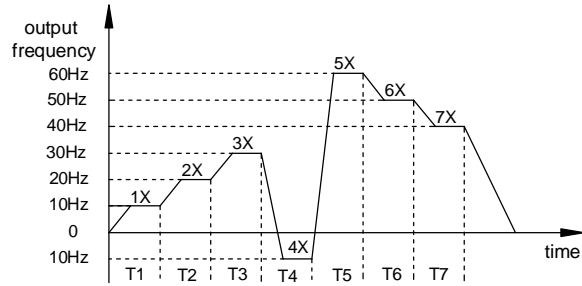For no-fault inspection than fault reset time, then fault auto-resets.

F50: Program running mode   factory setting: 0
0: Single circulation.
1: Continuous circulation.
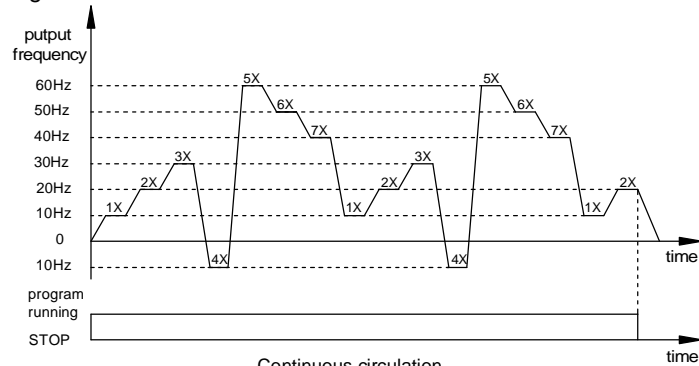2: Single circulation, continuous running at step 7 speed, and stop when receiving STOP command.
The 3 program running modes are as below:
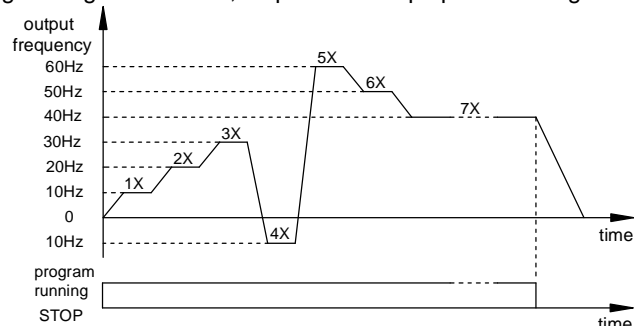e.g. 1 Single ciruculation

46

Single circulation

e.g. 2 Continuous circulation

Continuous circulation

e.g. 3 Single circulation, as per the 7 step speed running mode

Single circulation, continuous running at step 7 speed
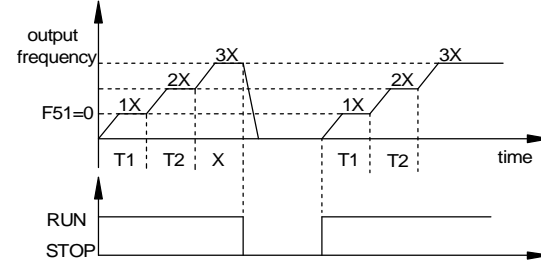
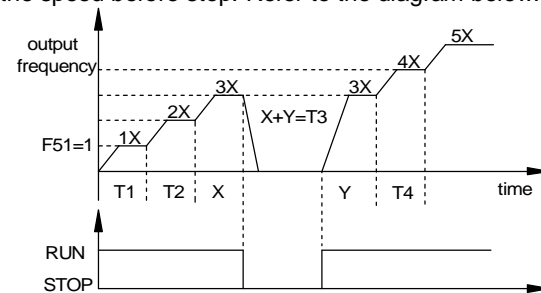**F51: Restart mode**   **factory setting: 0**

Stop during program running and reset restart mode. (Including normal stop

and fault reset)

0: Runs at the step 1 speed. Refer to the diagram below:

1: Runs at the speed before stop. Refer to the diagram below:

*F52: Reserved

*F53: Reserved

F54: Motor running direction   **factory setting: 0**

0: Forward command, motor forwards.
1: Forward command, motor reverses.

F55: Motor reverse forbidden   **factory setting: 0**

0: Reverse is allowable.
1: Reverse is forbidden.

F56: Running time setting   **factory setting: 0**

Adjustment unit of actual running time. The unit describes the running time(multi step run time), the tens digit describes the acc/dec time(line acc/dec time, jog acc/dec time, multi step acc/dec time), the describtion is as below:

| Acc/dec time	Tens digit	Run time	Unit
×1	0	×1	0
×30	1	×10	1
		×100	2

F57: Percentage in energy saving running   factory setting: 100%
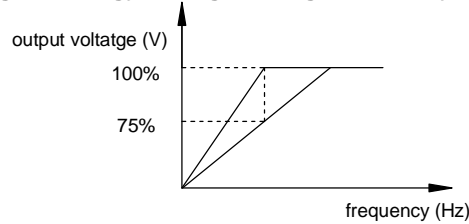
This parameter is for minimum output voltage percentage in energy saving running For constant torque running, inverter can calculate the optimized output voltage to the load according to the load state. Calculation is invalid during acceleration or deceleration. This function is to save energy by lower the output voltage and enhance the frequency factors, this parameter confirms the minimum reduced output voltage; if the parameter is set 100%, the energy saving running mode is closed.

If energy saving is effective, inverter's actual voltage output value=inverter's rated output voltage × output voltage percentage × energy saving output voltage percentage.

F58: FDT frequency set 1   factory setting: 0.00/0.0Hz
F59: FDT frequency set 2   factory setting:0.00/0.0Hz
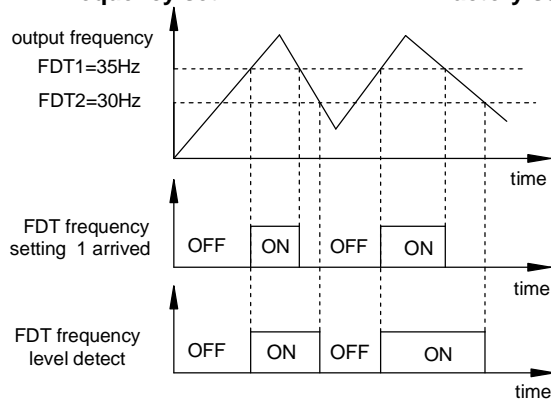
ON express signal action; OFF express no signal action

When output signal select(o13-o17) 14, inverter's output frequency arrives or accesses FDT frequency set 1, output signal terminal actions; inverter's output frequency is lower than the set frequency, output signal does not action.

When output signal select(o13-o17) 15，firstly FDT frequency set 1 inspected, inverter's output frequency arrives or accesses FDT frequency

set 1, output signal terminal actions; after terminal action, FDT frequency set 2 inspected, inverter's output frequency is lower than FDT frequency set 2, output signal terminal does not action.

e.g. FDT frequency set 1 is 35Hz, FDT frequency set 2 is 30Hz, output signal terminal actions as above:

F60: Frequency inspection range   factory setting: 0.00/0.0Hz
This parameter defines frequency inspection range for adjusting I/O output function: 11 set frequency reaching the inspection range.
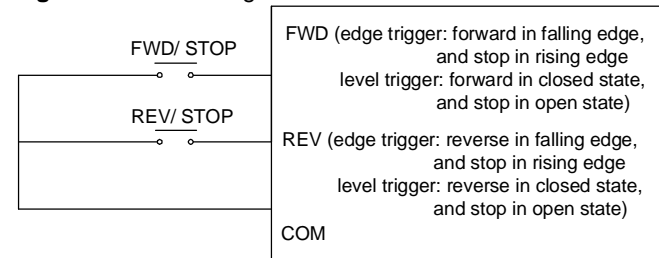
F61: Load type   factory setting: 0
The parameter defines the load type, the system automatically adjust the parameters according to the load type to satisfy different requirement of different load. Please inquir Powtran technician to select the right load type. Wrong load type may damage the equipment.

0: general
1: pump
2: Blower fan
3: Plastic jetting mould machine
4: Braiding machine
5: Hoister
6: Pumping jack
7: Belt conveyor
*8~14: Reserved
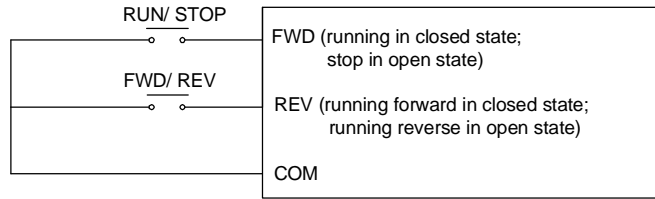
F62: Terminal control modes   factory setting: 0
0: standard running control
1: 2-point running control
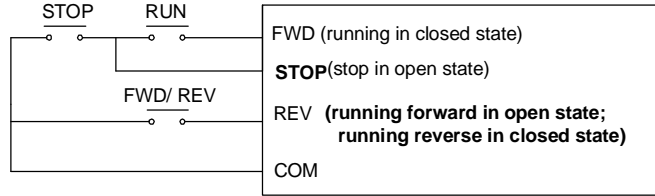2: 3-point running control

e.g.: Standard running control

e.g.: 2-point running control

RUN/ STOP

FWD (running in closed state;
      stop in open state)

FWD/ REV

REV (running forward in closed state;
     running reverse in open state)

COM

e.g.: 3-point running control

STOP   RUN

FWD (running in closed state)

STOP(stop in open state)

FWD/ REV

REV **(running forward in open state;
     running reverse in closed state)**

COM

MSS terminal distribution:

F62 terminal control mode	Value	STOP terminal	F63=1/2	F63=3
3-point running control 1	2	SS3	SS1 and SS2 realize speed 3/acceleration	Jog reverse invalid
3-point running control 2	3	SS2	Multi-speed /acceleration invalid	SS3 jog reverse
3-point running control 3	4	SS1	Multi-speed /acceleration invalid	SS3 job reverse

Note: When terminal running control select 3-point running control (F62=2), if. F63 is1 or 2, SS1/SS2 executes 3-step speed/acceleration running, SS3 is only for 3-point running control; if.F63 is 3, SS3 is for jog reverse control in priority.

F63: MSS terminal function selection   **factory setting: 0**
This parameter can control MSS multi-step speed or MSS multi-step acceleration.

0: Invalid.

1: MSS multi-step speed control. It is valid only when F04=0/1/2/3, multi-step speed in priority.
   Level triggers, valid in low level.

2: MSS multi-step acceleration control. It is valid only when F04=0/1/2/3/8.
   Level triggers, valid in low level.

3: Jog forward/reverse control.
   Jog reverse running with SS3 and COM short circuited, Jog forward

running with JOG and COM short circuited, previous set JOG direction is invalid.
Level triggers, valid in low level.
Note: F62=2 Terminal control mode is 3-point running control, SS3 is for jog forward/reverse control in priority.

4: Frequency setting mode switch
   OFF when SS1, SS2, SS3 open to COM; ON when SS1,SS2,SS3 short circuited to COM.

| SS3	SS2	SS1	Frequency setting mode switch
OFF	OFF	OFF	Program running (F04=5) Run at spped 1(F51=0)
OFF	OFF	ON	I2 (F04=2)
OFF	ON	OFF	V2(F04=1)
OFF	ON	ON	*Reserved
ON	OFF	OFF	Program running(F04=5) Running at the speed before
ON	OFF	ON	V2+I2(F04=3)
ON	ON	OFF	Keyboard
ON	ON	ON	Keyboard petentionmeter

*5: Reserved

6: MSS time running function.

Running time is set by MSS terminal pulse signal. Running time is refreshed with the last terminal pulse signal, and is not cumulative. running time includes accelerate time, barring decelerate time. PRI is SS3>SS2>SS1.

	Running parameter		SS1	SS2	SS3
F04	Keyboard and RS485	0	H00	H01	H02
	V2	1	V2	V2	V2
	I2	2	I2	I2	I2
	V2+I2	3	V2+I2	V2+I2	V2+I2
	Keypad potentionmeter	8	Keypad potentionmeter setting		
	V2 Forward/Reverse	9	V2 Forward/Reverse setting		
	Keypad potentionmeter FWD/REV	10	Keypad potentionmeter setting		
	Accelerate/decelerate time		H14/H15	H16/H17	H18/H19
	Running time		H07	H08	H09
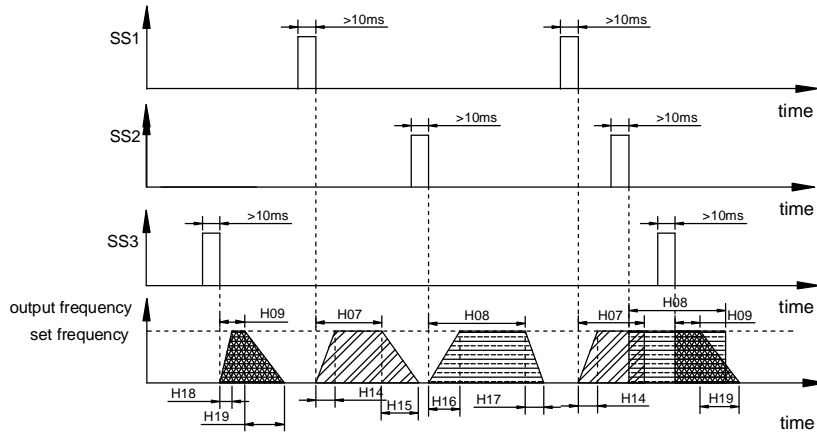
*7: Reserved

F64: Selection of input terminal's polarity   factory setting: 0
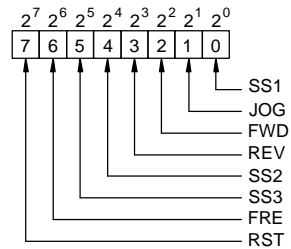
Set	Polarity of Input Terminal	
0	Low level valid(close)	Low level valid(close)
	Falling edge valid, rising edge invalid	Falling edge valid, rising edge invalid
1	High level valid(open)	High level valid(open)
	Rising edge valid, falling edge invalid	Rising edge valid, falling edge invalid
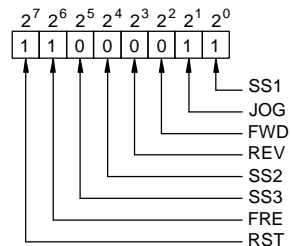
$$F64 = bit7*2^7 + bit6*2^6 + \cdots\cdots + bit1*2^1 + bit0*2^0$$
$$= 1*2^7 + 1*2^6 + 0*2^5 + 0*2^4 + 0*2^3 + 0*2^2 + 1*2^1 + 1*2^0$$
$$= 128 + 64 + 2 + 1$$
$$= 195$$

F65: Monitor selection 2   factory setting: 1
Monitor the second objects, range from 0~15 (same as F00), valid when using keyboards JP6E7000 and JP6C7000. Please refer to the keyboard operation in the section III.

F66: Monitor selection 3   factory setting: 2
F65, F66 respectively select the first monitored object and the second monitored object which range from 0~15(the same as F00 monitored objects). They are valid when it is operated by JP6E7000 and JP6C7000. Refer to the section III: Operating keyboard.

F67: V/F curve set

F68: MSS speed control

F69: I/O group select

F70: CUR group select

F71: SPD group select

F72: PID group select

F73: SYS group select

F74: MOT group select
Selecting one of these above groups as expected, press PRG running into the relative group.

6-2. Other parameters

6-2-1. F67 V/F curve set [V/F]

U00: V/F set frequency 1   factory setting: 5.00/50.0Hz
User set the first frequency of V/F curve corresponding with V1.

U01: V/F set voltage 1   factory setting: 5%
User set the first voltage percentage of V/F curve corresponding with F1, by the reference of inverter's rated output voltage 100%.

U02: V/F set frequency 2   factory setting: 10.00/100.0Hz
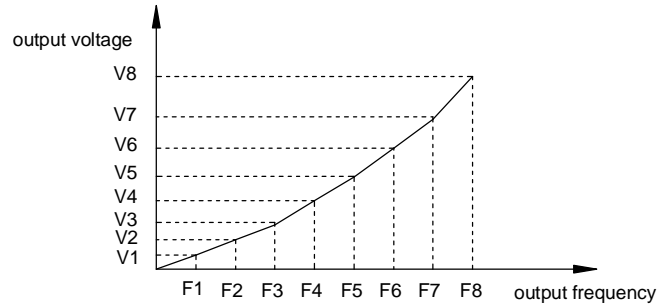User set the second frequency of V/F curve corresponding with V2.

U03: V/F set voltage 2   factory setting: 10%
User set the second voltage percentage of V/F curve corresponding with F2, by the reference of inverter's rated output voltage 100%.

U04: V/F set frequency 3   factory setting: 15.00/150.0Hz
User set the third frequency of V/F curve corresponding with V3.

U05: V/F set voltage 3   **factory setting: 15%**
User set the third voltage percentage of V/F curve corresponding with F3, by the reference of inverter's rated output voltage 100%.

U06: V/F set frequency 4   **factory setting: 20.00/200.0Hz**
User set the fourth frequency of V/F curve corresponding with V4.

U07: V/F set voltage 4   **factory setting: 20%**
User set the fourth voltage percentage of V/F curve corresponding with F4, by the reference of inverter's rated output voltage 100%.

U08: V/F set frequency 5   **factory setting: 25.00/250.0Hz**
User set the fifth frequency of V/F curve corresponding with V5.

U09: V/F set voltage 5   **factory setting: 25%**
User set the fifth voltage percentage of V/F curve corresponding with F5, by the reference of inverter's rated output voltage 100%.

U10: V/F set frequency 6   **factory setting: 30.00/300.0Hz**
User set the sixth frequency of V/F curve corresponding with V6.

U11: V/F set voltage 6   **factory setting: 30%**
User set the sixth voltage percentage of V/F curve corresponding with F6, by the reference of inverter's rated output voltage 100%.

U12: V/F set frequency 7   **factory setting: 35.00/350.0Hz**
User set the seventh frequency of V/F curve corresponding with V7.

U13: V/F set voltage 7   **factory setting: 35%**
User set the seventh voltage percentage of V/F curve corresponding with F7, by the reference of inverter's rated output voltage 100%.

U14: V/F set frequency 8   **factory setting: 40.00/400.0Hz**
User set the eighth frequency of V/F curve corresponding with V8.

U15: V/F set voltage 8   **factory setting: 40%**
User set the eighth voltage percentage of V/F curve corresponding with F8, by the reference of inverter's rated output voltage 100%.

6-2-2. F68 MSS speed control [MSS]
H00: 1X Multi-step speed 1X   **factory setting: 5.00/50.0Hz**
H01: 2X Multi-step speed 2X   **factory setting: 30.00/300.0Hz**
H02: 3X Multi-step speed 3X   **factory setting: 20.00/200.0Hz**
H03: 4X Multi-step speed 4X   **factory setting: 30.00/300.0Hz**
H04: 5X Multi-step speed 5X   **factory setting: 40.00/400.0Hz**
H05: 6X Multi-step speed 6X   **factory setting: 45.00/450.0Hz**
H06: 7X Multi-step speed 7X   **factory setting: 50.00/500.0Hz**
Set the frequency of program running and the 7-step speed respectively. Achieve 7-step speed by short-circuit the terminal SS1, SS2, SS3 with COM combinatorially.

The definition of terminal multi-step speed is as follow:
ON=connect with COM   OFF=disconnect with COM

Speed / Terminal	1X	2X	3X	4X	5X	6X	7X
SS1	ON	OFF	ON	OFF	ON	OFF	ON
SS2	OFF	ON	ON	OFF	OFF	ON	ON
SS3	OFF	OFF	OFF	ON	ON	ON	ON

When SS1, SS2, SS3 is open to COM at the same time:

F04	Setting frequency	Accelerate time	Decelerate time
0	Keyboard setting	F09	F10
1	V2 setting	F09	F10
2	I2 setting	F09	F10
3	V2/I2 setting	F09	F10

H07: T1 Multi-step speed 1 running time T1   **factory setting: 2.0s**
H08: T2 Multi-step speed 2 running time T2   **factory setting: 2.0s**
H09: T3 Multi-step speed 3 running time T3   **factory setting: 2.0s**
H10: T4 Multi-step speed 4 running time T4   **factory setting: 2.0s**
H11: T5 Multi-step speed 5 running time T5   **factory setting: 2.0s**
H12: T6 Multi-step speed 6 running time T6   **factory setting: 2.0s**
H13: T7 Multi-step speed 7 running time T7   **factory setting: 2.0s**
Actual acc/dec time equals to the set acc/dec time multiples a time multiple which is decided by the tens digit of F56. Please refer to F56.

H14: Acceleration time at1	**factory setting: 10.0s**
H15: Deceleration time dt1	**factory setting: 10.0s**
H16: Acceleration time at2	**factory setting: 10.0s**
H17: Deceleration time dt2	**factory setting: 10.0s**
H18: Acceleration time at3	**factory setting: 10.0s**
H19: Deceleration time dt3	**factory setting: 10.0s**
H20: Acceleration time at4	**factory setting: 10.0s**
H21: Deceleration time dt4	**factory setting: 10.0s**
H22: Acceleration time at5	**factory setting: 10.0s**
H23: Deceleration time dt5	**factory setting: 10.0s**
H24: Acceleration time at6	**factory setting: 10.0s**
H25: Deceleration time dt6	**factory setting: 10.0s**
H26: Acceleration time at7	**factory setting: 10.0s**
H27: Deceleration time dt7	**factory setting: 10.0s**

Set the Acc/Dec time of 7 steps respectively. They determine the time needed to reach the speed, respectively depending on the acceleration time for acceleration or on the deceleration time for deceleration, but the time is not the actual time needed. Actual acc/dec time equals to the set acc/dec time multiples a time multiple which is decided by the tens digit of F56. Please refer to F56.

Definite acceleration and deceleration time for multi-step speed.
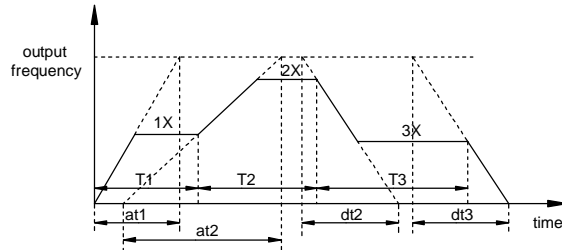
Definition of multi-step speed acceleration/deceleration time

at1: Step 1 acceleration time   at2: Step 2 acceleration time
dt2: Step 2 deceleration time   dt3: Step 3 deceleration time

H28: Multi-step speed 1 running direction	**factory setting: 0**
H29: Multi-step speed 2 running direction	**factory setting: 0**
H30: Multi-step speed 3 running direction	**factory setting: 0**
H31: Multi-step speed 4 running direction	**factory setting: 0**
H32: Multi-step speed 5 running direction	**factory setting: 0**

H33: Multi-step speed 6 running direction	**factory setting: 0**
H34: Multi-step speed 7 running direction	**factory setting: 0**

In program multi-speed I running, these parameters decide the direction of each speed.

The running direction	Setting value
forward	0
backward	1

In terminal multi-speed running:
When running control mode F05＝0/1/2, these parameters decide the direction of each speed.
When running control mode F05＝3, these parameters and terminal FWD/REV decide the direction of each speed together.

FWD=1 running direction	FWD=1 running direction	Setting value
forward	backward	0
backward	forward	1

6-2-3. F69 Input/output parameter [I/O]

o00: filter time of V2 signal input   **factory setting: 10ms**
It may be 2~200ms. If the time is too long, setting frequency change is steady, but response speed will become bad; if the time is too short, setting frequency stability become badly, but response speed will be rapider.

o01: V2 minimum input voltage   **factory setting: 0.00V**
The minimum input voltage of input terminal V2, may be any value between 0~V2 maximum input voltage.

o02: V2 maximum input voltage   **factory setting: 10.00V**
The maximum input voltage of input terminal V2, may be any value between V2 minimum input voltage to 10V.

o03: I input filter time   **factory setting: 10ms**
It may be 2~200ms. If the time is too long, setting frequency change is steady, but response speed will become bad; if the time is too short, setting frequency stability become badly, but response speed will be rapider.

o04: I input minimum current   **factory setting: 0.00mA**
The minimum input current of input terminal I2, may be any value between 0~I2 maximum current.

o05: I input maximum current   **factory setting: 20.0mA**
The maximum input current of input terminal I2, may be any value between I2 minimum current to 20.00 mA.
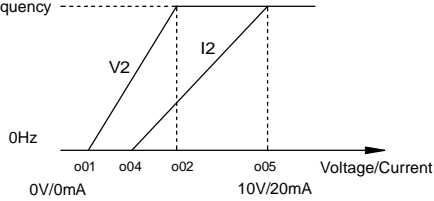e.g. V2 input 1~5V, o01=1V, o02=5V; I2 input 4-20mA, o04=4mA,

o05=20mA

o06:DA1 output terminal　　　　　　**factory setting: 0**

*o07: Reserved

| Value	Output	Output signal range
0	No Function	No output
1	Set frequency	0~max frequency
2	Actual frequency	0~max frequency
3	Actual current	G:2 times of rated current
4	Output voltage	0~1.35 times of rated output
5	Bus voltage	0~1.35 times of bus voltage
6	IGBT temperature	0~80.0℃
7	Output power	0~200%
8	Output speed	0~max rotating speed
9	*Reserved	-

o08: DA1 output lower adjustment　　　**factory setting: 0.0%**

o09: DA1 output upper adjustment　　　**factory setting: 100.0%**

*o10~o11: Reserved
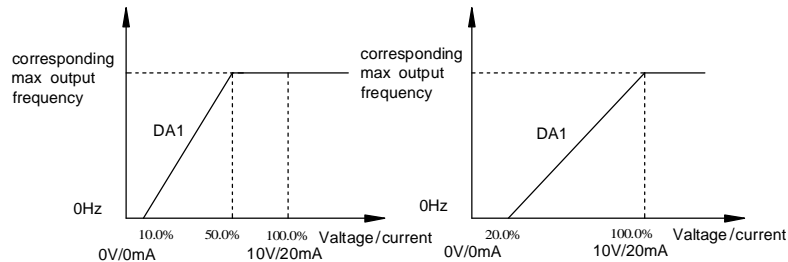
It is to set lower and upper DA1/DA2 output signal.

e.g. DA1 1-5V Output voltage o08=10.0%, o09=50.0%

　　DA2 4-20mA Output current o10=20.0%, o11=100.0%

Note: Each output terminal with 2 selection: voltage output (0~10V) and current output (0~20mA), the default selection is voltage output. Selecting voltage output, short circuit DA1V of JP4 (on the control card); selecting current output, short circuit DA1C of JP4 (on the control card).
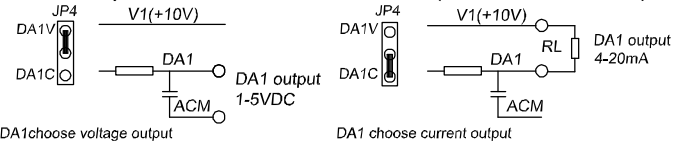
*o12: Reserved.

o13: Output signal selection 1　　　　**factory setting: 0**

*o14~ o16: Reserved

o17: Output signal selection 5　　　　**factory setting: 0**

*o18: Reserved

Display	LED set value
0	No function
1	Fault alarm
2	Over current inspection
3	Over load inspection
4	Over voltage inspection
5	Lack voltage inspection
6	Low load inspection
7	Over heat inspection
8	Running state with command
9	*Reserved
10	Motor reverse
11	Set frequency arrival
12	Upper limit frequency
13	Lower limit frequency
14	FDT frequency 1 arrival
15	FDT frequency level inspection
16	0 speed running
17	Position arrival
18	*Reserved
19	Program running 1 cycle finished
20	Speed pursue mode inspection

21	Running state without command
22	Inverter reverse command
23	Deceleration running
24	Acceleration running
25	*Reserved
26	*Reserved
27	Inverter's rated current arrival
28	Motor's rated current arrival
29	Input lower frequency arrival
30	FDT frequency set 2 arrival
31	*Reserved
32	*Reserved

o19: Minimum input frequency   factory setting: 0.00/0.0Hz

o20: Maximum input frequency   factory setting: 50.00/500.0Hz

Define the connection of analog input and frequency, o19 is anolog V2, I2 sets the frequency to minimum voltage/current; o20 is V2, I2 sets the frequency to maximum voltage/current, the connection is effective when F04 is 1, 2, and 3.
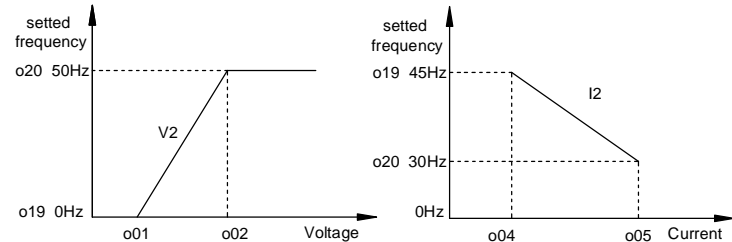
If o19<o20, it is positive input, if o19>o20, it is negative input.

If V2 inputs 1~5V voltage, 0.00~50.00Hz, parameters are set as below:

O01=1V, o02=5V, O19=0.00Hz, o20=50.00Hz.

If V2 inputs 4~20mA current, 45.00~30.00Hz, the parameters are set as below:

O04=4mA,o05=20Ma, o19=45.00Hz, o20=30.00Hz

*6-2-4. F70 Current loop parameters [CUR] Reserved

*6-2-5. F70 speed-loop parameter [SPD] Reserved

*6-2-6. F72 PID parameter [PID] Reserved

6-2-7. F73 System parameter [SYS]

y00: restore factory setting   factory setting: 0

0: not restore

1: restore

When the parameter is valid, all the parameters will restore the setting value before factory.

Those parameters which have no factory value will reserve the setting value.

y01: Fault record 1

y02: Fault record 2

y03: Fault record 3

y04: Fault record 4

y05: Fault record 5

These parameters register fault which happen in the last several times, and can inquire about the value of monitor object at the time of fault by 'PRG' and "plus or minutes" key.

The monitor object of fault state:

0: fault style

The fault code is expressed as following:

Serial number	LED display	Fault message
0	OC_C	Over current signal from current inspected circuit
1	OCFA	Over current signal from drive circuit.
2	OC_2	Output over current, OC protection when current exceeds motor's 2 times of rated current
3	OU	over voltage
4	OL	over load
5	-	*Reserved
6	OH	over heat
7	LU	under voltage
8	UL	under load
9	EEPr	EEPROM error
10	OC_P	System is disturbed or impacted by instant over current
11	E_FL	external fault
12	-	*Reserved
13	-	*Reserved
14	DATE	Time limit fault

1: output frequency at the time of fault
  The output frequency of the inverter at the time of fault
2: output current at the time of fault
  The actual output current at the time of fault
3: output voltage at the time of fault
  The actual output voltage at the time of fault
4: running state at the time of fault
  The running state at the time of fault

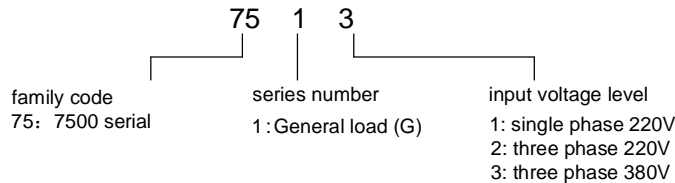LED display expresses the running state, and explains as following:

The first bit of LED		The second bit of LED		The third bit of LED	The fourth bit of LED	
F	forward command	F	forward state	compartmentation code	A	accelerate
R	reverse command	R	forward state		D	decelerate
S	stop command	S	stop state		E	running in a even speed
					S	stop state

y06: fault record reset　　　　　　　　　　**factory setting: 0**
0: no action, the fault records retains
1: the fault records resets

y07: rated output current
The rated output current of the inverter.

y08: rated input voltage
The rated input voltage of the inverter. It would be set as per inverter input voltage level before leaving factory.

y09: product series (only can be inquired)

75　1　3

family code
75：7500 serial

series number
1：General load (G)

input voltage level
1: single phase 220V
2: three phase 220V
3: three phase 380V

y10: software version (only can be inquired)

*y11~y12: Reserved

y13: total running time setting　　　　**factory setting: 1**
It sets whether add the using time of the machine every time or not.
0: automatically clear after start

1: accumulate the time after start.

y14: total time unit　　　　　　　　　　**factory setting: 0**
It sets the unit of the total time.
0: the unit is hour
1: the unit is day

y15: Manufacture Date - year　　　　　factory setting: leaving factory date
The parameter only can be inquired.

y16: Manufacture Date-month-day　　　factory setting: leaving factory date
The parameter only can be inquired.

y17: decode input
In the state of locked parameter, LED displays the times of error input. There are three times input limit, if input is wrong in continuous three times, the systems will prohibit input of the password. It can prevent testing password in an illegal way, and need restart the machine to input again.
Once the input is right in any time during three times input limit, the parameter is unlocked.

y18: password input
The parameter sets the password, and the range is 0~9999. After setting the password, parameter locks and keyboard displays "code"; if the password is unlocked or password input is right, the keyboard will display "deco".

6-2-8. F74 motor parameter [MOT]

b00: motor poles　　　　　　　　　　**factory setting: 2**
It is the half of the magnet poles of the motor.

b01: motor rated current　　　　　　**factory setting: (y07) A**
The rated current can be set, but can't be more than the rated current of the inverter. The parameter confirms the OL protection capability of the motor and energy-saving running.
To prevent self-cooled motor form overheat when running in a low speed , and the motor capacity change when motor character change little, the user can correct the parameter to protect the motor.
The factory value is decided by power and default value is y07.

b02: motor rated voltage
The voltage in the rated state. If the rated voltage is lower than the voltage of the supply power, it is necessary to check the insulated intension.

b03: motor rated speed　　　　　　**factory setting: 1500rpm**
The speed when motor works in the rated power.

b04: motor rated frequency　　　　**factory setting: 50.00/500.0Hz**

Motor's output frequency under rated state.

b00~b04 are the motor's nameplate parameters which touch the precision.Set the parameters according to the motor's nameplate.

Excellent vector control performance requires exact motor parameters. Exact parameters are base on the correct setting of motor's rated parameters.

To assure the control performance, please match the right motor as per the inverter's standard, motor rated currentis limited between 30%~120% of inverter rated current.

b05: motor un-load current   factory setting: (y07×40%)A

The un-load current, and affects the degree of the slip compensation directly.

The factory value is decided by power and default value is y07×40%.

b06: stator resistor   factory setting: 0.000ohm

The stator resistor, when b13 is 1,the system scales automatically.

b07: rotor resistor   factory setting: 0.000ohm

The rotor resistor, when b13 is 1, the system scales automatically.

b08: leakage inductance   factory setting: 0.0mH

The leakage inductance of motor's coil winding, when b13=1, system measures automatically.

b09: mutual inductance   factory setting: 0.0mH

The mutual inductance of motor's coil winding, when b13=1, system measures automatically.

b05~b09 is the motor's basic electric parameters, these parameters is essential to achieve vector control calculation.

When b01 is set, b05~b09 would automatically reset to the defaulted standard Y series 4 poles asynchronism motor's parameters. Inverter could get the motor parameters without automatic parameters setting.

If the inverter could not meet with the requirement, use b13 motor parameters setting to get the exact motor parameter. If the right motor parameters are available, it could be input manually.

*b10~b13: Reserved

b14: **Rotate speed display plus   factory setting: 100.0%**

Adjust the display of motor's actual running speed, refer to F00 monitor select: 6 Actual motor speed.

b15: Reserved   factory setting: 0

b16: Reserved   factory setting: 0

b17: Reserved   factory setting: 0

Section VII. Fault Diagnosis and Solutions

Problems	Possible causes	Solutions
Keyboard can not control	Control mode setting is wrong	Check F05.
	Frequency setting is wrong	Check F04.
Potentiometer can't regulate speed	Control mode setting is wrong	Check F05.
	Frequency setting is wrong	Check F04.
The motor does not rotate	LED monitor indicates error message	
	No voltage exists between terminals P and N.	Check the voltage at R，S or T and charging circuit.
	U, V or W terminals produce no output or abnormal output.	Check the control mode and frequency parameter. Check the terminal condition if it is operated by an external terminal.
	Re-start after powering down or free run	Remember the set operating state.
	Too much load on the motor	Check and lower the load.
Over current OC	fault display OC-P	System is disturbed or instant over current
	fault display OC-C	OC signal from current self-inspected citcuit impact
	fault display OC-FA	OC signal from drive circuit
	fault display OC-2	Output over current, and current exceed 2 times of motor's rated current.
	Over current during acceleration	Reset or modify the parameters of the functions F09, F18, F19.
	Over current during deceleration	Reset or modify the parameters of the functions F10, F20, F21.
	Over current during operation	Check the load change and eliminate it.
	Over current during starting or operation from time to time	Check if there is slight short circuit or grounding.

	Disturbance	Check the earthing wire, screened cable grounding and terminals.
overload OL	Too much load	Lower the load.or enlarge b01 in the allowable load range or enlarge F46 to raise the protection level.
	Inappropriate parameter is set	Modify the parameters of the functions b01.
Over voltage OU	Power voltage exceeds the limit	Checking voltage is right or not. Frequency inverter rated voltage setting is right or not.
	Too fast deceleration	Modify the parameters of the functions F10.
	The load has too much inertia	Reduce the load inertia, or raise the capacity of frequency converter, or use B type converter or add a braking unit.
Low voltage LU	Too low power voltage	Checking voltage is right or not. Frequency inverter rated voltage setting is right or not.
	The power is off transiently	Add options of capacitor boxes.
	The line has too small capacity or great rush current exists on the lines.	Make renovation on power supply system.
Overheat OH	Too high ambient temperature	Improve ambient conditions.
	The carrier frequency is too high	Check the setting value of function F15.

Note:

※ Switch off the power supply, and do not touch the PCBs and any parts inside in five minutes after the charging indicator light (！CHARGE) goes off. Ensure the capacitance has been discharged completely by measuring with the instrument before work inside. Otherwise, there is a danger of electric shock.

※ Do not touch the PCB or IGBT and other internal parts unless actions have been taken to prevent the static electricity. If not, the components may be damaged.

Section VIII. Standard Specifications

8-1. Specification

Voltage	220V 1Φ	220V (240V)	380V (415V)
(KW)	(A)	(A)	(A)
0.4	2.5	2.5	-
0.75	4	4	2.5
1.5	7	7	3.7
2.2	10	10	5

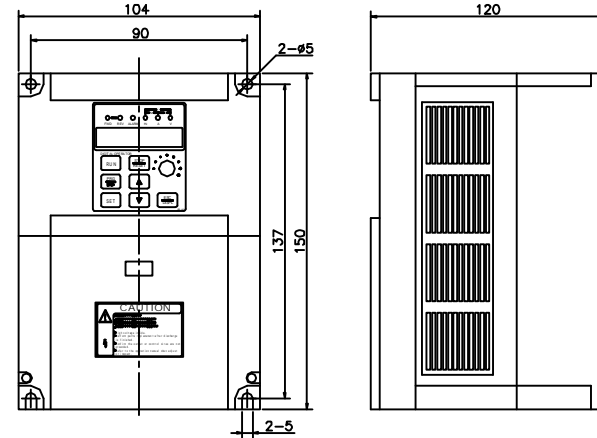## 8-2. Standard specification

	items	specifications
power	Voltage and frequency	Single-phase 200~240V,50/60Hz Three-phase 200~240V,50/60Hz Three-phase 380~415V,50/60Hz
	Allowable Fluctuation range	voltage: ±15% frequency: ±5%
control	Control system	high performance vector control inverter based on DSP
	Output frequency	G:0.00~800.0Hz,the maximum frequency range is 10.00~800.0Hz
	control method	V/F control, V/F+ PG control, vector + PG control
	waveform produce methods	asynchronous space vector PWM, step less and subsection synchronous space vector PWM,2 phase optimized vector PWM
	Auto torque boost function	Realize low frequency (1Hz) and large output torque control under the v/f control mode.
	Accelerate /decelerate control	Acceleration/Deceleration S curve subsection set mode. The maximum running time is 26 hours.
	Program running control	7 step speed program running, the maximum running time is 88 hours.
	frequency setting accuracy	Digital references:0.01Hz(300 Hz and below),0.1 Hz(above 300 Hz) Analog references:0.05Hz/60Hz
	frequency accuracy	Speed control tolerance 0.01%(25℃±10℃)
	V/F curve mode	Linear,square,8 V/F curve set by user
	Over load capability	G:150% for one minute, 200% for 0.1 second
	slip compensation	0~10% automatic slip compensation
running	signal	running method	Keypad/Terminal
		frequency setting	There are 10 frequency setting modes, including DC 0~10V, DC 0~20mA, DC 4~20mA, potentiometer on the keyboard.
	Input	start signal	forward, reverse
		Multi-segment speed	can set 7 steps speed at most(using multi-function or program running)

|			
running		Multi-segment acceleration	At most 8 steps acceleration can be set (using multi function terminals or program running.)
		instant stop	Interrupt controller's output.
		traverse running	Program control running
		jog	running in low speed
		fault reset	When the protection function is affective, system can reset fault state automatically.
		PID feedback signal	DC 0~10V, DC 1~5V, DC 0~20mA, DC 4~20mA
	Output signal	running state	motor state display, stop, accelerate/decelerate, seven-speed, program running state
		fault output	relay fault output: AC125V 3A, DC 30V 3A
		analog output	1 analog output, 8 signals could be selected: frequency, current, voltage, temperature, etc, the output signal range is 0~10V/0~20mA.
		output signal	6 output signals, each one with 20 signals for option.
	running function		Limit frequency, skip frequency, torque difference compensate, reverse protection, automatic adjustment
	DC brake		On base of non-OC, internal PID can regulate braking current to ensure enough braking torque.
Protection function	inverter protection		Over voltage, under voltage, over current, over load, overheat, over current stall, over voltage stall, external fault.
	IGBT temperature display		Display of current IGBT temperature
	inverter fan control		Temperature of starting the fan can be set.
	restart after momentary power loss		less than 15ms:continue running More than 15ms:automatic inspection of motor's speed, restart after transient power down.
	speed starting pursue mode		inverter pursue motor speed automatically before starting
	parameter protection function		protect inverter's parameter by setting password and decode
display	LCD English Display + LED keyboard	running message	set frequency, actual frequency, actual current, actual current percentage, DC bus voltage, actual output voltage, actual motor's speed, total running time, IGBT temperature, motor output power percentage. Display of 3parameters simultaneity at most: F00,F65 and F66.
		fault message	Store 5 fault messages at most, and can inquire about fault style, voltage, current, frequency and the work state at the same time
environment	environment temperature		-10 ℃ ~ 40 ℃
	storage temperature		-20 ℃ ~65 ℃
	environment humidity		Less than 90 % RH
	Height / libration		less than 1,000 m, less than 5.9m/s^2(=0.6g)
	application place		where there is no rust gas, no flammability gas, no grease and dust
	cooling methods		Forced air cooling and natural cooling

8-3 Sharp Size

8-4 External Keyboard size

JP6E7000/ JP6C7000：
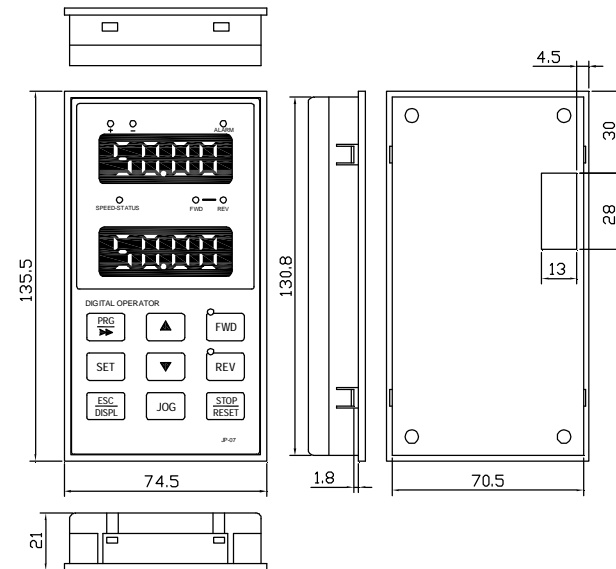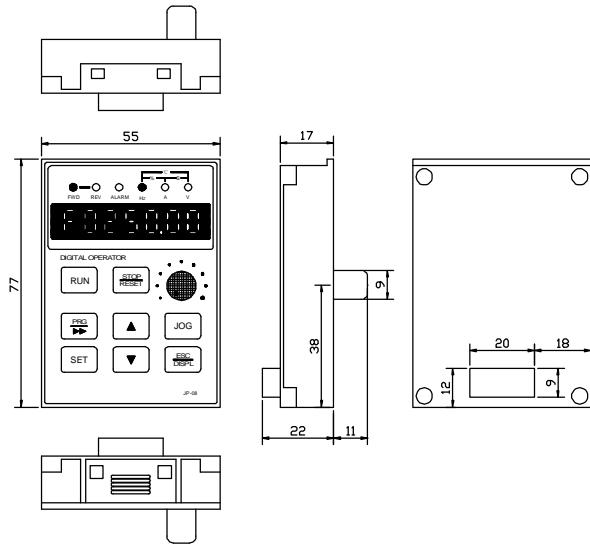

Fixed on the panel，hole's dimension：(131±0.1)×(70.8±0.1)
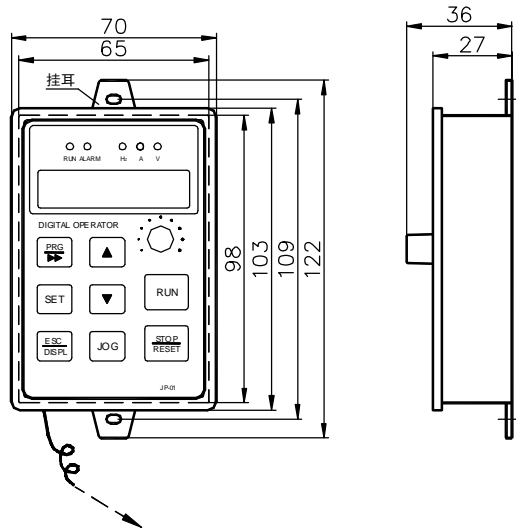
JP3E7000：

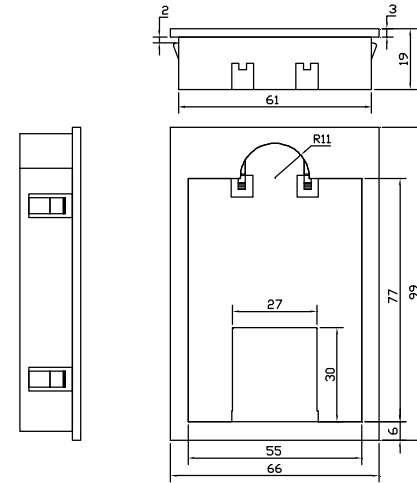Small Keyboard boxJP5D7000：

Fixed on the panel，hole's dimension：(94.5±0.1)×(61.3±0.1)

JP5E7000：

Section IX.   Maintenance

9-1 Inspection and Maintenance

Under normal working conditions, in addition to daily inspection, the frequency converter should be subject to regular inspection (for example inspection for overhaul or as specified but at an interval of six months at most). Please refer to the following table in order to prevent faults.

Check time D	Check time R	Check point	Check item	Check to be done	Method	Criterion
√		Display	LED and LCD display	If there is any abnormal display	Visual check	As per use state
√	√	Cooling system	Fan	If abnormal noise or vibration is produced.	Visual and audible check	No abnormal sound or vibration
√		Body	Surrounding conditions	Temperature, humidity, dust content, harmful gas, etc.	Check visually, by smelling and feeling	As per Section 2-1
√		Input/ output terminal	Voltage	If input, output voltage is abnormal	Measure at R, S, T and U, V, W terminals	As per standard specifications
	√	Main circuit	Overall conditions	If the fastenings come loose, if any signs show overheat, discharging, or too high dust content, or the air piping is blocked	Check visually, tighten the fastenings, and clean the related parts	No abnormal conditions
			Electrolytic capacitance	If there is abnormal appearance	Check visually	No abnormal condition
			Current-conducting leads or blocks	If the parts come loose	Check visually	No abnormal condition
			Terminals	If the screws or bolts come loose	Tighten the loose screws or bolts	No abnormal condition

"D" means daily check and "R" means regularly check.
"√" means need daily check or regularly check

For inspection, do not disassemble or shake the parts without reason, and still less pull off the plug-in-parts at random. Otherwise, the unit will not operate normally, or can not enter the mode of fault display, or causes faults of components or even parts of the main switch components IGBT module

is damaged.

If measuring is necessary, the user should note that much different results will be gained possibly if the measuring is performed with different instruments. It is recommended that the input voltage be measured with pointer-type voltmeter, output voltage with rectification voltmeter, input and output current with tong-test ammeter, and power with electrically-driven wattmeter.

9-2. Periodically-Replaced Parts

In order to ensure the operation reliability of the frequency converter, in addition to regular maintenance and inspection, all the parts suffering long-term mechanical wear should be replaced at a regular interval, which includes all cooling fans and the filtering capacitors of main circuits for energy buffer and interchange and PCBs. For continuous use under normal conditions, these parts can be replaced according to the following table and the operating environment, loads and the current state of frequency converter.

Part name	Interval for replacement
Cooling fan	1~3 years
Filtering capacitor	4~5 years
PCB (printed circuit board)	5~8 years

9-3. Storage

The following actions must be taken if the frequency converter is not put into use immediately after delivery to the user and need to keep well for the time being or stored for a long time:

※   Stored in a dry and adequately-ventilated place without dust and metal powder at the temperature specified in the specifications.

※   If the frequency converter is not put into use after one year, a charge test should be made, so as to resume the performance of the filtering capacitor of main circuit in it. For charging, a voltage regulator should be used to slowly increase the input voltage of the frequency converter until it reaches the rating, and the charge should last more than 1~2 hours. This test should be made at least once a year.

※   Don't perform breakdown test at random, for this test will cause shorter life of the frequency converter. The insulation test must be performed after the insulation resistance is measured with a 500-volt mega ohm and this value must not be less than 4MΩ.

9-4. Measuring and Judgment

※ If the current is measured with the general instrument, imbalance will exists for the current at the input terminal. Generally, differing by not more than 10% is normal. If it differs by 30%, inform the factory to replace the rectification bridge, or check if the error of three-phase input voltage is above 5V.

※ If the three-phase output voltage is measured with a general multi-meter, the reading is not accurate due to the interference of carrier frequency and only for reference.

Section X.   Options

The series can acquire the peripheral equipment by user because of the different using condition and requirement. See the wiring diagram as below:
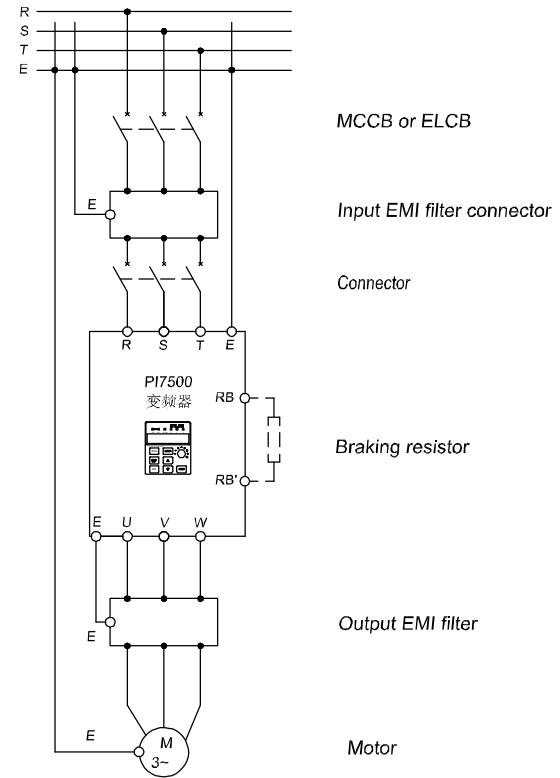
10-1.   MCCB OR ELCB
As power switch of the inverter, MCCB or ELCB can protect supply power, but can't control inverter to run or stop.

10-2.   Noise filter
The filter is used to restrain the conduction of electrical magnetic wave interference noise produced by the converter or shock the interferential form

radio or momentary concussion. The common size of 3-phase EMI noise filter is shown as following: confirm the power supply is 3-phase three lines or 3-phase four lines or single phase. Earthling wire is as short as possible, try to place the filter near the converter.

Please choose EMI filter when the converter is used in residential area, commercial area, science area or other. Please need to prevent magnetic interference, or need meet CE, UL, and CSA standard.
Note: If needing the filter, please connect with our company.

10-3.   Connector
It can cut off the supply power in action of the system protection function, to prohibit fault enlarging. But can't control the motor start or stop by connector.

10-4.   Braking Unit & braking resistor
There is braking unit inside when using "B" type frequency converter, the maximum braking torque is 50%. Please choose braking resistor according to the following table:

Inverter (V)	Inverter (KW)	Brake resistor (Ω)	Brake resistor (W)
220V	0.75	200	120
	1.5	100	300
	2.2	70	300
380V	0.75	750	120
	1.5	400	300
	2.2	250	300