ISO9001:2015 Quality Management System Authentication

EN600PV Series

Ver. 1.0

PV Pump Inverter User Manual

SHENZHEN ENCOM ELECTRIC TECHNOLOGIES CO., LTD

Foreword

Thank you for purchasing EN600PV series photovoltaic water pump inverter developed and produced by Shenzhen Encom Electric Technologies CO., LTD.

EN600PV series photovoltaic water pump inverter is a special inverter specially designed for photovoltaic water pump based on the application requirements of photovoltaic water pump. It is built-in maximum power tracking algorithm, can realize the efficient use of solar energy. It has special protection functions, such as weak light sleep and wake up function, low frequency protection, full water protection, dry pumping protection, etc. It's standard configuration with Modbus and supports CAN bus, Profibus-DP bus and other communication functions. At the same time, EN600PV series built-in output default phase protection, short circuit to the ground protection and other hardware protection functions, effectively improve the reliability and safety of the system.

This brochure provides the installation and wiring, settings, fault check and methods, maintenance and other relative issues to customer. To ensure the inverter assemble and operate rightly, and use with its high performance, please read this brochure carefully before installation, keep it well and pass it to the end users.

Please contact our office or dealer anywhere at any moment when you have any doubts or special demands in using these inverters, and you can also contact our after-service center in our Headquarters directly. Sincerely at your service!

You are without prior notice if we change contents of this manual.

Content

1 Safety information and use notice points

To make ensure personal & equipment safety, this chapter must be read carefully before the inverter come into use.

1.1 Safety precautions

There are three kinds of safety warnings in this manual as below:

Symbol	Symbol description
	It may cause human death, serious injury or heavy property loss with wrong operation
	It may result body or device damage with wrong and timeless precautions under operation.
 **Note**	Should pay extra cautions when inverter in use under this symbol.

Forbid to cut off the power source directly when inverter under running, acceleration or deceleration status. Power source could cut off when inverter completely in halt and standby status. Otherwise user should be responsible for inverter and device damage and human injury.

(1) Forbid to connect AC power source to output terminal U, V, W, otherwise it could cause inverter completely damage.
(2) Not allow for short circuit between(-)and(+),Otherwise it could cause inverter damage and power source short circuit.
(3) Forbid to install inverter on flammable objects, otherwise it may cause fire.
(4) Do not install inverter in a environment with explosive gas, it may cause explosion.
(5) Bare connection terminal should be insulation treatment after main loop connection, otherwise it may cause electric shock.
(6) Do not operate inverter with wet hands when inverter power on, otherwise it may cause electric shock.
(7) Inverter earth terminal should be well grounding connection.
(8) Do not open the front cover for wiring when inverter power on. Inverter wiring and check must handle after 10 minutes of inverter power off.
(9) Wiring connection should handle by qualified person and not allow to slip any conductive objects inside inverter, otherwise it may cause a electric shock or inverter damage.
(10) When inverter stocked for more than 6 months, using voltage regulator to boost voltage up and keep inverter in standy status for 1 hour, otherwise it may cause electric shock and explosion.

(1) Forbid to connect control terminals except TA, TB, TC to AC 220V/380V signal, otherwise it may cause inverter completely damage.
(2) Do not install and run inverter when inverter damage or spare part less, otherwise it may cause fire or human injury.
(3) Inverter should install in a place where can accept itself weight, otherwise it may cause inverter drop down or belongings damage.

2 Inverter type and specification

2.1 Incoming inverter inspect

(1) Check if there is damage during transportation and inverter itself has damage or fall-off parts.

(2) Check if parts presented in packing list are all ready.

(3) Please confirm nameplate data of the inverter is in line with your order requirement.

Our product is guaranteed by strict quality system during manufacturing, packing, transportation etc., please contact our company or local agent rapidly if some careless omission or mistake arise, we'll deal with it as soon as possible.

2.2 Type explanation

EN600PV – 4T 0015

Code	Name
EN600PV	Series No.

Code	Volt. grade
2S	1 phase220V
4T	3 phase 380V

Code	motor power (KW)
0004	0.4
0007	0.75
…	…
0220	22
0370	37

Fig.2-1 Type description

2.3 Nameplate explanation

Nameplate presented as Fig.2-2 with type and rating data at the bottom of inverter right side.

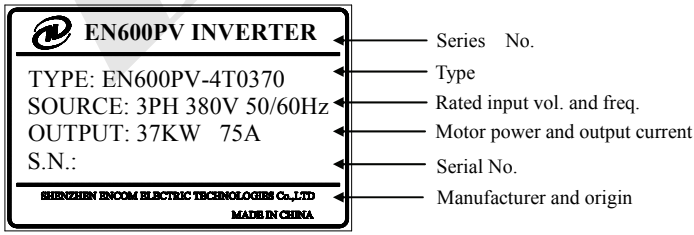


Fig.2-2 Nameplate

2.4 Inverter type explanation

Input Voltage	Inverter type	Rated output Current(A)	Adaptable motor (KW)	Recommended Battery Board Input Power (KW)	Maximum DC Input Voltage (V)	Recommended battery panels Voltage (V)
1 phase 220V	EN600PV-2S0004	2.5	0.4	0.55	410	330～400
	EN600PV-2S0007	4	0.75	1.0	410	330～400
	EN600PV-2S0015	7	1.5	1.95	410	330～400
	EN600PV-2S0022	10	2.2	2.86	410	330～400
	EN600PV-2S0037	15	3.7	4.8	410	330～400
3 phase 380V	EN600PV-4T0007	2.3	0.75	1.0	780	600～750
	EN600PV-4T0015	3.7	1.5	1.95	780	600～750
	EN600PV-4T0022	5	2.2	2.86	780	600～750
	EN600PV-4T0037	8.5	3.7	4.8	780	600～750
	EN600PV-4T0055	13	5.5	7.2	780	600～750
	EN600PV-4T0075	17	7.5	9.75	780	600～750
	EN600PV-4T0110	25	11	14.3	780	600～750
	EN600PV-4T0150	33	15	19.5	780	600～750
	EN600PV-4T0185	39	18.5	24	780	600～750
	EN600PV-4T0220	45	22	28.6	780	600～750
	EN600PV-4T0300	60	30	39	780	600～750
	EN600PV-4T0370	75	37	48	780	600～750

2.5 EN600 Appearance and parts name explanation

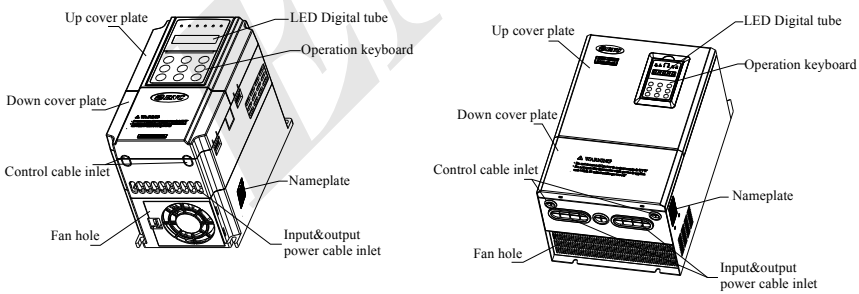


Fig.2-3 Parts name sketch of inverter

2.6 Appearance and parts name explanation

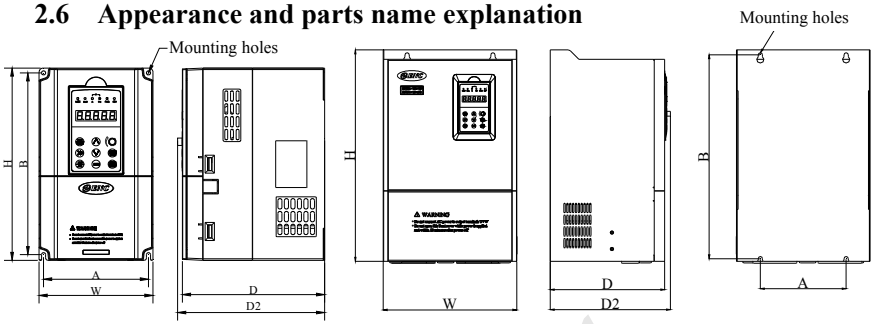


Fig.a **Fig.b**

Fig.2-4 Appearance

Table 2-1 Mounting size

Inverter model	W (mm)	H (mm)	D (mm)	D2 (mm)	A (mm)	A1 (mm)	B (mm)	W1 (mm)	D1 (mm)	Fix Hole (mm)	Fig.No
EN600PV-2S0004	115	200	151	164	104	-	186	-	-	5	Fig.a
EN600PV-2S0007											
EN600PV-2S0015											
EN600PV-2S0022											
EN600PV-2S0037											
EN600PV-4T0007											
EN600PV-4T0015											
EN600PV-4T0022											
EN600PV-4T0037											
EN600PV-4T0055	140	240	175	188	129	-	227	-	-	5	Fig.a
EN600PV-4T0075											
EN600PV-4T0110	180	304	189	202	165	-	281	-	-	6	Fig.a
EN600PV-4T0150											
EN600PV-4T0185	250	398	210	223	180	-	382	-	-	9	Fig.b
EN600PV-4T0220											
EN600PV-4T0300	280	450	240	253	180	-	434	-	-	9	Fig.b
EN600PV-4T0370											

2.7 Outer size of keypad and its fixing box (unit:mm)

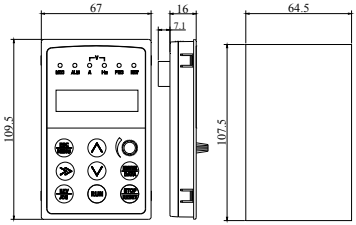


Fig.2-5 Mounting size of keypad

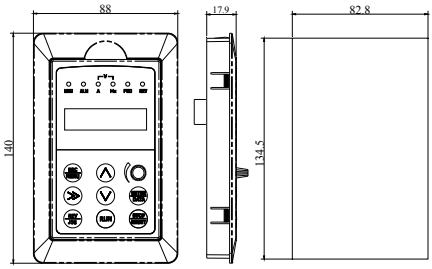


Fig.2-6 Hole size of keypad

Note

(1) EN-LCD2 long-distance keypad outer lead, do not support keypad holder installed, only keypad installed support, mounting size refer to Fig.2-5.
(2) Except EN-LCD2 long-distance keypad, when other keypad outer lead, user can adjust the hole size under actual situation on keypad or keypad holder; thickness of install board between 1.0～1.5mm is suggested.
(3) When installed with keypad holder, it need to buy extra.

2.8 Product technic index and spec

Item		Item description
Input (Ac）	Rating volt., frequency	1 phase 220 Volt class: 1 phase 220V, 50Hz/60Hz; 3 phase 380 Volt class: 3 phase 380V, 50Hz/60Hz.
	Allowed volt. range	1 phase 220 Volt class: 200～260V; 3 phase 380 Volt class: 320～460V.
Input (Ac）	Recommended MPPT operating voltage	1 phase 220 Volt class: 330VDC 3 phase 380 Volt class: 550VDC
	Recommended operating voltage range	1 phase 220 Volt class: 300～400VDC 3 phase 380 Volt class: 600～750VDC
Output	Voltage	0～380V
	Frequency	0～600Hz
	Over loading capacity	150% of rated current for 1 minute
Running function	running command specified channel	Keypad specified, control terminal specified, communication specified can switch through various means
	Running frequency specified channel	Main & auxiliary specified to a realize one main adjusting and one fine control. Digital specified, analog specified, pulse specified,pulse width specified, communication specified and others, which can be switched by many means at any time
	Binding function	Run command channel and frequency specified channel can bind together randomly and switch synchronously
Input output characteristic	Digital input channel	Channel 8 for universal digital input, max. Frequency 1KHz,channel 1 can be used as pulse input channel, max. Input 50KHz,which can be expanded to channel 14 .

	Analog input channel	Channel 2 for analog input channel, AI1 can choose 4～20mA or 0～10V output， AI2 is differential input channel， 4～20mA or -10～10V for option， which can be expanded to channel 4 analog input.
	Pulse output channel	0.1 ～ 20KHz pulse square signal output to achieve setting frequency, output frequency and other physical quantity output
	Analog output channel	Channel 2 for analog signal output, AO1 can choose 4～20mAor 0～10V, AO2 can choose 4～20mA or 0～10Vto achieve setting frequency, output frequency and other physical quantity output,which can be expanded to channel 4 analog output.。
keypad	Keypad display	The parameters as setting frequency, output frequency, output voltage, output current can be displayed.
	Button Locked	Lock all or part of the buttons.
Protection function		Motor power on Shot circuit test, input & output phase loss protection, over-current protection, over voltage protection, under voltage protection, over heat protection, overload protection, under load protection, relay absorption protection, terminal protection and no stop protection under power off
Environment	Application site	Indoor, not bare to sunlight, no dust, no corrosive gas, no flammable gas, no vapor, no water drop or salt etc
	Altitude	Under 1000 meter.（ above 1000 meter require to reduce volume to use, output current reduce about 10% of rated currenvolt per 1000 meter high）
	Environment temperature	-10℃ ～+40 (environment temperature between 40 ℃ ℃ ～50℃ ,Need to reduce volume or strengthen heat sink)
	Environment humidity	Smaller than 95%RH， no drop condenses
	Vibration	Smaller than 5.9 M/S²(0.6g)
	Storage temperature	-40℃～+70℃
Structure	Protection grade	IP20
	Cooling mode	Forced air cooling
Installation		Wall hanging

Note

To get a perfect usage performance of the inverter, Please check and select right type according to this chapter before wiring.

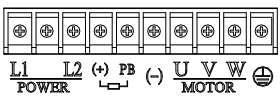
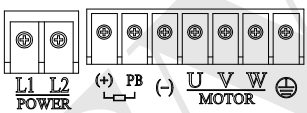
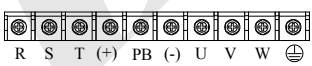
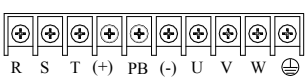
It is necessary to select right type, otherwise it may cause motor abnormal run or inverter damage.

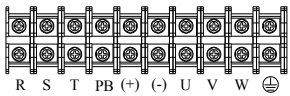
3 Installation and wiring

3.1 Main loop terminal wiring

(1) Main loop input output terminal show as Table 3-1, 3-2.

Table 3-1 EN600 PV main loop input output terminal description

Adapted type	Main loop terminal	Terminal name	Function description
EN600PV-2S0004 ～ EN600PV-2S0022		L1、L2	1 phase AC input terminal, connect power source
		(+)	DC volt. Positive terminal
		PB	External connect to brake resistor reverse terminal
		(-)	DC volt. Negative terminal
		U、V、W	3 phase AC output terminal, connect to motor
		⏚	Grounding terminal
EN600PV-2S0037		L1、L2	1 phase AC input terminal, connect power source
		(+)	DC volt. Positive terminal
		PB	External connect to brake resistor reverse terminal
		(-)	DC volt. Negative terminal
		U、V、W	3 phase AC output terminal, connect to motor
		⏚	Grounding terminal
EN600PV-4T0007 ～ EN600PV-4T0150		R、S、T	3 phase AC input terminal, connect power source
		(+)	DC volt. Positive terminal
		PB	External connect to brake resistor reverse terminal
		(-)	DC volt. Negative terminal
		U、V、W	3 phase AC output terminal, connect to motor
		⏚	Grounding terminal
EN600PV-4T0185 EN600PV-4T0220		R、S、T	3 phase AC input terminal, connect power source
		(+)	External connect to DC reactor
		PB	External connect to brake resistor reverse terminal
		(-)	DC volt. Negative terminal
		(+)、(-)	External connect brake unit
		U、V、W	3 phase AC output terminal, connect to motor
		⏚	Grounding terminal

EN600PV-4T0300 EN600PV-4T0370	 	R、S、T	3 phase AC input terminal, connect power source
		PB	External connect to DC reactor
		(+)	External connect to brake resistor reverse terminal
		(-)	DC volt. Positive terminal
		(+)、(-)	DC volt. Negative terminal
		U、V、W	3 phase AC output terminal, connect to motor
		⏚	Grounding terminal

The wiring of main loop must connect right according to the description above. Wrong wiring will cause device damage and personal injury

3.2 Basic running wiring diagram

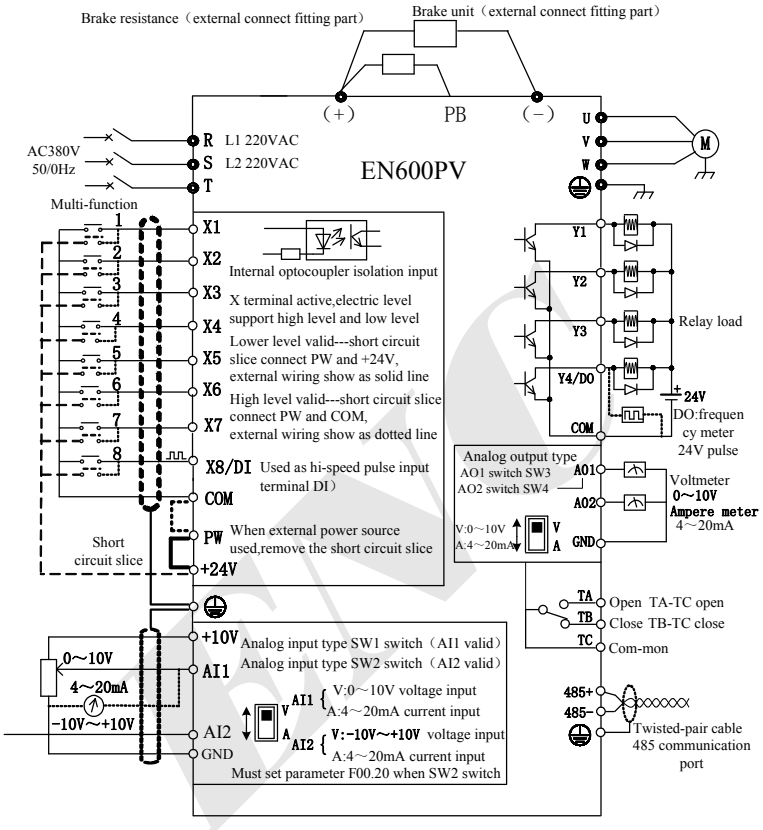


Fig. 3-1 Basic wiring diagram

3.3 Control loop collocation and wiring

3.3.1 Descriptions for control board terminal

(1) CN3 and CN4 terminal layout as following description 3-3

Table 3-3 Function table for control board terminal

Type	Symbol	Description	Terminal Function and specification
Multifunction input terminal	X1	Multifunction input 1	Input voltage range: 15～30V; Opto coupler isolation, Compatible with bipolar input; Input impedance: 4.7KΩ
	X2	Multifunction input 2	
	X3	Multifunction input 3	
	X4	Multifunction input 4	

	X5	Multifunction input 5	max input frequency: 1KHz
	X6	Multifunction input 6	
	X7	Multifunction input 7	
	X8/DI	Multifunction input 8/high-speed pulse input	Except for X1～X7 function, It can be used as hi-speed pulse input. Input impedance: 2.2KΩ max input frequency: 50KHz
Power source	+24V	+24V power source	Provide +24V power to external device（ 24±4V） Max output current: 200mA
	PW	External power source input	factory default connect to +24V； when use external signal to drive X terminal, It need to connect to external power source and cut off with +24V power terminal.
	+10V	+10V power source	Provide +10Vpower to external device (10±0.5V) Max output current:50mA
	COM	Common interface	Reference ground for digital signal and +24V power
	GND	Common interface	Reference ground for analog signal and +10V power
Analog input	AI1	Analog output 1	Input range： DC 0V～10V/4～20Ma, selected by SW1 dial switch on control board. Input impedance： voltage input at 20KΩ；current input at 250Ω. resolution: 1/4000
	AI2	Analog output 2	Input range: DC-10V～10V/4～20mA， selected by the second figure of F00.20 and SW2 dial switch on control board. Input impedance: voltage input at 20KΩ; Current input at 250Ω. Resolution: 1/2000
Analog output	AO1	Analog output 1	Voltage or current output is selected by SW3 (AO1) and SW4(AO2)dial switch on control board. Output voltage range: 0～10V Output current range: 4～20mA
	AO2	Analog output 2	
Multifunction output terminal	Y1	Open circuit collector output 1	Opto coupler isolation output ， unipolar Open circuit collector output Max voltage output: 30V Max current output: 50mA
	Y2	Open circuit collector output 2	
	Y3	Open circuit collector output 3	
	Y4/DO	Open circuit collector output 4/ High-speed impulse output	Function code F00.22 to select terminal output mode When Open circuit collector output, with the same spec as terminal Y. When High-speed impulse output， the max frequency is 20KHz.
RLY1 output	TB—TC	Normal closedterminal	Contact capacity：AC250V/2A（ cosφ=1） AC250V/1A（ cosφ=0.4） DC30V/1A
	TA—TC	Normal open terminal	
Communi cation interface	485+	485 differential signal interface	485 differential signal positive terminal
	485-		485 differential signal negative terminal

Auxiliary interface	CN2	retain	
	CN6	StandardRS485 communication interface	Twisted-pair cable or shield wire to connect

(2)RS485 crystal outlet CN6 layout as following

RS485 terminal CN6 layout								
No.	1	2	3	4	5	6	7	8
Name	485+	485−	−	−	−	−	−	−

4 Run and operation explanation for inverter

4.1 Run mode

EN600PV inverter have 3 kinds of run mode, following is in turn according to their priority, jog run →solar mode→common run. Shown as Fig.4-1.

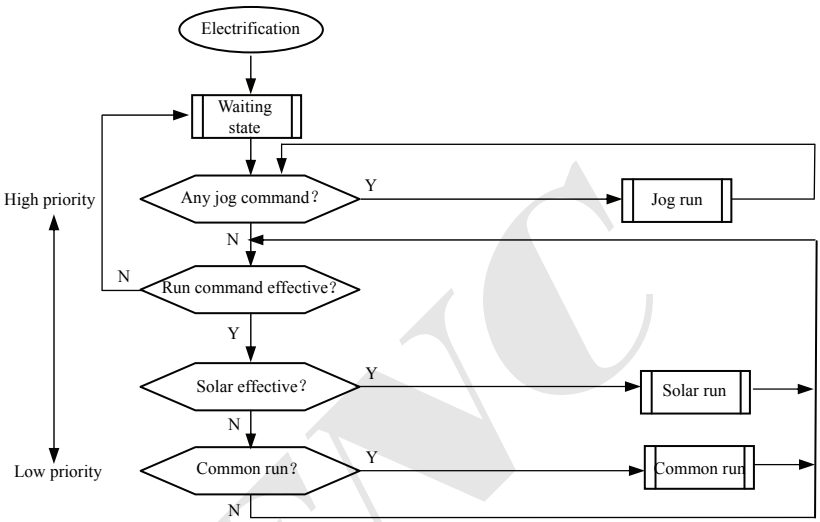


Fig.4-1 Run mode

0: Jog run

Upon receiving jog run command (for instance, press the REV/JOG key on keypad) during waiting state, the inverter run at jog frequency (see function code F01.25~F01.29).

1: Photovoltaic operation

Set the PV operation control effective parameter F12.00>0, and the PV terminal prohibition function of input terminal No. 72 is invalid, the inverter will enter the PV operation mode.

2: Common run

Common open loop run mode of general inverter.In above 6 kinds of run mode except “jog run” the inverter can run according to kinds of frequency setting method.

4.2 Operation and use of key board

4.2.1 Keypad layout

The operating keyboard is the main unit of frequency inverter to accept commands,display parameters. Keyboard outline diagram shown in Fig.4-2.

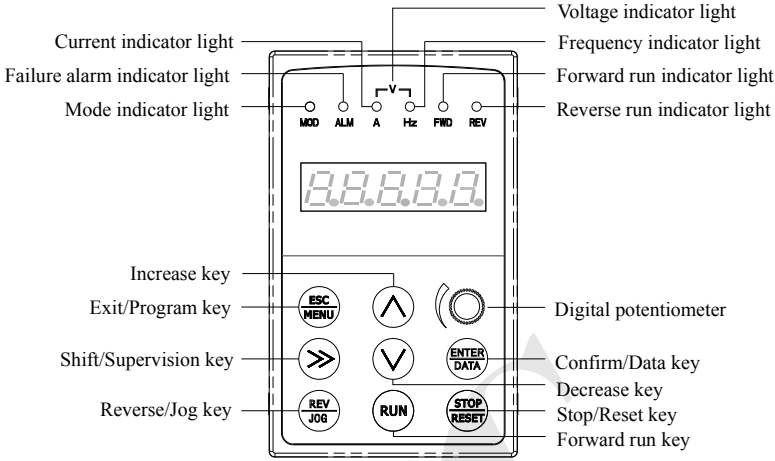


Fig.4-2 Keypad layout sketch

4.2.2 Keypad function description

There are 9 key-presses on inverter keypad, And function definition of each key is as shown in Table 4-1.

Table 4-1 keypad function table

Key	Name	Function description
ESC MENU	Program/Exit key	Enter into or exit programming state
>>	Shift/Supervision key	Can choose modification digit of set data under editor state; can switch display status supervision parameter under other state
ENTER DATA	Function/Data key	Enter into or exit programming state
REV JOG	Rev/Jog key	Under keypad mode: to press this key can set reverse run or Jog run according to the 1st bit of parameter F00.15
RUN	Run key	Enter into forward run under keypad mode
STOP RESET	Stop/reset key	In common run status the inverter will be stopped according to set mode after pressing this key if run command channel is set as keypad stop effective mode. The inverter will be reset and resume normal stop status after pressing this key when the inverter is in malfunction status.
	Digital potentiometer	It is the same as the function of increase and decrease key, rotate to the left means decrease, rotate to the right means increase.
∧	Increasing button	To increase data or function code (to press it continuously can improve increasing speed)

∨	Decreasing button	To decrease data or function code (to press it continuously can improve decreasing speed)

4.2.3 LED and indicator light

4 status indicator light: they are MOD(mode):ALM (alarm):FWD(forward run):REV(Reverse run)from left to right on the LED: their respective indicating meaning is as shown in Table 4-2.

Table 4-2 Status indicator light description

Item			Function description	
Display function	Digital display		Display current run status parameter and set parameter	
	Status indicator light	A, Hz, V	Unit for relevant current digital displayed physical parameter(for current is A:for voltage is V:for frequency is Hz)	
		MOD	This indicator light is lit in non-supervision status and extinguished if no key pressed for a minute: then come back to supervision status	
		ALM	Alarm indicator light: indicate that the inverter is in over current or over voltage suppressing status or failure alarm status currently	
		FWD	Forward run indicator light, indicate that the inverter output forward phase order and the connected motor rotate in forward direction	The inverter work in DC brake status if FWD,REV indicator light is lit at the same time
		REV	Reverse run indicator light: indicate that the inverter output reverse phase order and the connected motor rotate in reverse direction	

4.2.4 Key board display status

EN600PV keypad display status is classified as Waiting status parameter display;Function code parameter editing status display; Malfunction alarm status display; Run status parameter display; Alarm state display in total 5 kinds of status. LED indicator light will all be lit after the inverter electrified. Then enter into set frequency display. As shown in Fig.4-3 a.

(1) Waiting parameter display status

The inverter is in waiting status and waiting status supervision parameter is displayed on keyboard: normally parameter F00.13 decide which status supervision parameter to be displayed. As shown in Fig.4-3 b， the indicator light shows the unit of the parameter.

To press (>>) key, it can display different waiting status supervision parameter circularly: for detail please see C-00 to C-05 group supervision parameter details decide by F00.07~F00.12.

(2) Run parameter display status

The inverter enters into run status when receiving effective run command and normally parameter F00.13 decide which status supervision parameter to be displayed on the keypad. As shown in Fig.4-3 c， the indicator light shows the unit of the parameter.

To press (>>) key can display run status supervision parameter circularly. For detail please see C-00 To C-05 group supervision parameter details decide by F00.01～F00.06 .

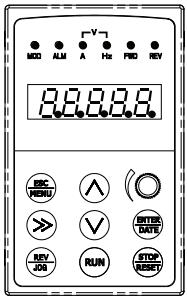


Fig.a Electrification，display 8.8.8.8.8.

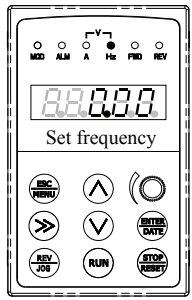


Fig.b waiting status, display waiting status parameter

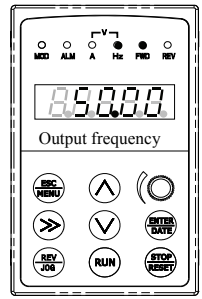


Fig.c run status: display run status parameter

Fig.4-3 Inverter electrification: waiting: run status display

(3) Failure alarm display status

The inverter enters into failure alarm display status upon detecting failure signal and display failure code sparklingly(as shown in Fig.4-4); To press (>>) key can look over relative parameter after stopping running;Can press (ESC MENU) key to enter into program status to see about F26 group parameter if want to search failure information.

Can carry on failure restoration by (STOP RESET) key:control terminal or communication command on the keypad after troubleshooting. Keep displaying failure code if failure exist continuously.

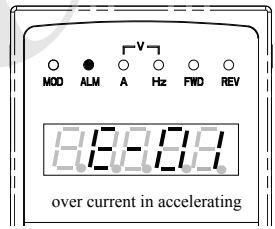


Fig.4-4

For some serious failure, such as The earthing short circuit, Inverter modules protect, over current, over voltage etc., must not carry on failure reset forcibly to make the inverter run again without failure elimination confirmed. Otherwise have danger of damaging the inverter!

(4) Function code editing status

Under waiting, run or failure alarm status, press (ESC MENU) key, can enter into editing status(If user password is set, can enter into editing status after inputting the password, see also F27.00 description)，and editing status is displayed according to three classes menu mode, as shown in Fig. 4-5. To press (ENTER DATA) key can enter into one class by one class. Under function parameter display status, to press (ENTER DATA) key to carry on parameter storage operation; To press (ESC MENU) key can only come back to upper class menu without storing modified parameter.

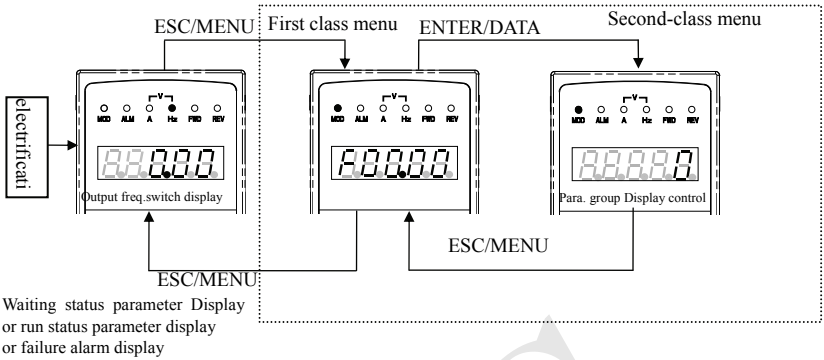


Fig.4-5 Keypad display status switching

(5) Alarm state display

When under running and standby situation:It means enter failure alarm display status upon detecting failure signal and display failure code sparklingly (Fig.4-6） Inverter keeping running state But this alarm display can not be reset button eliminated: After only find the cause of the alarm: in order to eliminate this factor Normal.

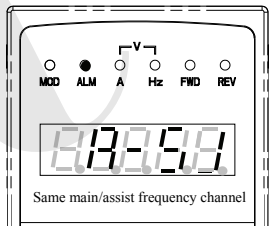


Fig.4-6

4.2.5 User Management Parameters

In order to facilitate the user parameter management: EN600PVcomponent model parameter menu for display management. The parameters do not need to be displayed can be shielded.

Method parameter setting mode display.

By setting F00.00=0,1,2,3 respectively parameter mode is set: Basic menu mode: menu mode Intermediate: Advanced menu mode and user menu mode.

Basic menu	F00,F01,F02,F03,F26
Middle menu	F00,F01,F02,F03,F04,F05,F06,F07,F08,F09,F10,F11,F12,F13,F14, F15,F16,F18,F19,F26
Advance menu	F00,F01,F02,F03,F04,F05,F06,F07,F08,F09,F10,F11,F12,F13,F14, F15,F16,F17,F18,F19,F20,F21,F22,F23,F24,F25,F26,F27
User custom	F00.00 and F25 parameters group

4.2.6 Method for operating keypad

Can carry on various operation to the inverter through keypad, For example:

(1) Status parameter display switching:

After pressing key(>>), Display C group status supervision parameter; after displaying one supervision parameter code for 1 second will display this parameter value automatically. Press key (ENTER DATA) will go back to supervision interface.

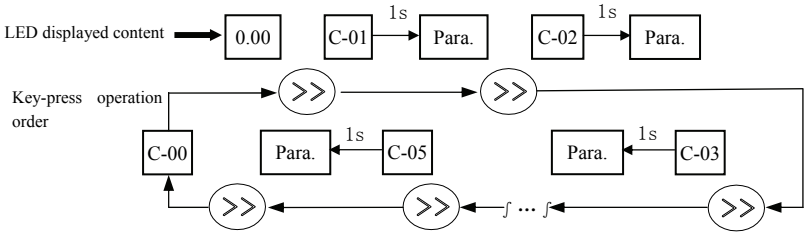


Fig.4-7 Waiting status parameter display operating example

(2) Function code parameter setting

Take function code F01.01 modified from 5.00Hz to 6.00Hz as example.Boldface in Fig.4-8 shows flickering digit.

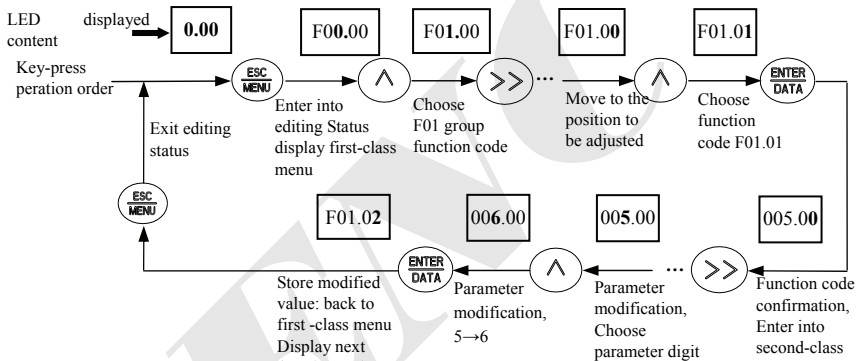


Fig.4-8 Example for parameter setting and modification

Description: under second -class menu: if the parameter has no blinking digit, this function code can't be modified, possible reasons are as follows:

1) This function code shouldn't be modified: for example actual detected status parameter: run record parameter etc;

2) This function code can't be modified under run status and can be changed after stopping running;

3) Parameter protected. All the function code can't be modified when function code F00.14=1 or 2，in order to avoid wrong operation. Need to set the function code F00.14 to 0 if you want to edit function code parameter.

(3) See about failure parameter under failure status：

If press (>>) key under failure status the user can quickly locate to the F26 group function code parameter. Press (>>) can quickly switch value between F26.04 ~ F26.10 parameters and fault alarm, easy to view the fault records.

(4) Keypad key-press locking operation

Under monitoring situation, To press (ENTER DATA) for 5s,the keyboard will display 'LOCH1'，now the buttons on the keyboard are under locked. The detailed locked situation is decided by the value

of hundred unit of F00.14.

(5) Keypad key-press unlocking operation

Under keypad-locked situation, press ESC MENU key for more than 5s to unlock the keypad.

5 Function parameter schedule graph

5.1 Symbol description

× ---- parameter can't be changed in process of running
○ ---- parameter can be changed in process of running
* ---- read-only parameter, unmodifiable

5.2 Function parameter schedule graph

F00-System parameter group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
F00.00	Parameter group display control	0: Basic list mode(Only displayF00~F03 basic control parameter group and F26 fault record parameter group.) 1: Middle list mode. Display all parameter except for extension: virtual and reserve parameter group. 2: Senior list mode. All parameter display. 3: User list mode. Display parameter defined by user: and monitor parameter: F00.00 display all the time.	1	2	○
F00.01	C-00 display parameter selection when operation	0: Main setup frequency(0.01Hz) 1: Auxiliary setup frequency(0.01Hz) 2: Setup frequency(0.01Hz) 3: Output frequency(0.01Hz) 4: Output current(0.1A)(<=11kW show 0.01A) 5: Output voltage(1V) 6: DC busbar voltage(0.1V) 7: Motor speed(1 circle/min) 8: Motor line velocity(1 circle/min) 9: Inverter temperature(1℃) 10: Run time already this time(0.1min) 11: Current accumulate run time(1h) 12: Current accumulate power-on time(1h) 13: Inverter status 14: Input terminal status 15: Output terminal status 16: Extension output terminal status 17: Extension input terminal status 18: Communication virtual input terminal status 19: Internal virtual input node status 20: Analog input AI1(after checkout) (0.01V/0.01mA) 21: Analog input AI2(after checkout) (0.01V/0.01mA) 22: Extension analog input EAI1(After checkout) (0.01V/0.01mA) 23: Extension analog input EAI2(After checkout) (0.01V/0.01mA) 24: Analog AO1 output(after checkout)(0.01V/0.01mA) 25: Analog AO2 output(after checkout)(0.01V/0.01mA) 26: Extension analog EAO1 output(0.01V/0.01mA) 27: Extension analog EAO2 output(0.01V/0.01mA) 28: External pulse input frequency(Before checkout) (1Hz) 29: Reserved 30: Process PID provide (0.01V) 31: Process PID feedback (0.01V)	1	51	○

		32: Process PID deviation (0.01V) 33: Process PID output (0.01Hz) 34: Simple PLC current segment No. 35: External multi-speed current segment No. 36-38: Reserved 39: Current length(m/cm/mm) 40: Accumulate length(m/cm/mm) 41: Current internal count value 42: Current internal time value(0.1s) 43: Run command setup channel (0:keyboard 1: terminal 2: communication) 44: Main frequency provide channel 45: Auxiliary frequency provide channel 46: Rated current(0.1A) 47: Rated voltage (1V) 48: Rated power (0.1KW) 49: Electric torque limit(0.1% Rated torque of motor) 50: Brake torque limit (0.1% motor rated torque) 51: Frequency after Acce/Dece(0.01Hz) 52: Motor rotor frequency(0.01Hz) 53: Current given torque (percentage relative to rated torque, with direction) 54: Current output torque (percentage relative to rated torque, with direction) 55: DC Bus current (0.1A) 56: Flux current speed(0.3 m3/h) 57: Open circuit voltage(0.1V) 58: Output power(active power)(0.1KW) 59: The low digit of Total power consumption(1 kwh 60: The high digit of Total power consumption (1 represents 10000 kwh) 61: Daily power generation (0.1kwh) 62: Daily traffic (0.1 m3) 63: Cumulative flow (low) (1m3) 64: Cumulative Flow (High) (10000m3) 65: Reserved			
F00.02	C-01 display parameter selection when operation	Same as above	1	2	○
F00.03	C-02 display parameter selection when operation	Same as above	1	4	○
F00.04	C-03 display parameter selection when operation	Same as above	1	5	○
F00.05	C-04 display parameter selection when operation	Same as above	1	6	○
F00.06	C-05 display parameter selection when operation	Same as above	1	9	○
F00.07	C-00 display parameter selection when stop	Same as above	1	2	○
F00.08	C-01 display parameter selection when stop	Same as above	1	6	○

F00.09	C-02 display parameter selection when stop	Same as above	1	48	○
F00.10	C-03 display parameter selection when stop	Same as above	1	14	○
F00.11	C-04 display parameter selection when stop	Same as above	1	20	○
F00.12	C-05 display parameter selection when stop	Same as above	1	9	○
F00.13	Power-on fault monitor parameter selection	0 ~ 5	1	0	○
F00.14	Parameter operation control	Units digit: Parameter modification operations 0: All parameters are allowed to be modified 1: Except current parameter, all other parameters are not allowed to modify the 2: ExceptF01.01,F01.04and current parameter, all other parameters are not allowed to be modified Tens digit: Reset to factory defaults 0: No action. 1: All parameters return to default.(not include fault record parameter group (F26 group) parameter). 2: Except for motor parameter: all parameters return to default.(not include F15 and F26 group parameter). 3: Extension parameter return to default.(only F21~F24 group parameter return to default). 4: Virtual parameter return to default.(only F20 group parameter return to default). 5: Fault record return to default.(only fault record parameter group(F26 group)parameter return to default) Hundreds digit: Key operation 0: All locked 1: Except STOP/RESET button: the others locked 2: Except ∧ ∨ 、STOP/RESET button: the others locked 3: Except RUN 、STOP/RESET button: the others locked 4: Except >> 、STOP/RESET button: the others locked	1	000	×
F00.15	Button function selection	Units digit: panel REV/JOG button selection 0: Reversal command action button 1: Jog action button Tens digit: multi-function button function selection 0: Invalid. 1: Jog run. 2: For/rev switching. 3: Free stop. 4: Switching to run command provide mode as the setup order of F00.16. 5: Forward/Reverse Torque Switching 6 ~ 9: Reserved Hundreds digit: terminal run command control 0: Keyboard STOP/RESET button invalid 1: Keyboard STOP/RESET button valid Thousands digit: communication run command control 0: Keyboard STOP/RESET button invalid	1	0001	○

		1: Keyboard (STOP/RESET) button valid			
F00.16	Multi-function key run command channel switching order selection	0: Keyboard control→ terminal control→ communication control 1: Keyboard control←→terminal control 2: Keyboard control←→communication control 3: Terminal control←→communication control	1	0	○
F00.17	Motor speed display coefficient	0.1 ~ 999.9%	0.1%	100.0%	○
F00.18	Line velocity display coefficient	0.1 ~ 999.9%	0.1%	1.0%	○
F00.19	Extended Port Parts set	0: Invalid 1～3: Reserved 4: Analog input output extension card 5: Isolated type TX485 communication expansion card 6～10: Reserved	1	0	×
F00.20	Analog input terminal configuration	Units digit:AI1 configuration 0: 0~10V input 1: 4~20mA input Tens digit: AI2 configuration 0: -10~10V input 1: 4~20mA input Hundreds digit: EAI1 configuration 0: 0~10V input 1: -10~10V input 2: 4~20mA input Thousands digit: EAI2 configuration 0: 0~10V input 1: -10~10V input 2: 4~20mA input	1	1100	×
F00.21	Analog output terminal configuration	Units digit: AO1 configuration 0: 0~10V output 1: 4~20mA output Tens digit: AO2 configuration 0: 0~10V output 1: 4~20mA output Hundreds digit: EAO1 configuration 0: 0~10V output 1: 4~20mA output Thousands digit: EAO2 configuration 0: 0~10V output 1: 4~20mA output 2: 0~20mA output	1	0000	×
F00.22	Y output terminal configuration	Units digit~ Hundreds digit: reserved Thousands digit: Y4 output configuration 0: Open collector output 1: DO output	1	0000	×
F00.24	Motor control mode	0: V/F control(object to torque control) 1: No speed sensor vector control 2、3: Reserved	1	0	×
F00.25	Monitor parameter 2 selection	The same as parameter F00.01	1	4	○
F00.26	Busbar voltage adjustment coefficient	0.900 ~ 1.100	1	1.000	○
F00.27	Parameters copying and Language selection	Units digit: Reserved Tens digit: parameter upload and download 0: Inaction	1	00	×

		1: Parameter upload 2: Parameter download 1 (Without motor parameter) 3: Parameter download 2 (With motor parameter)			

F01-Basic Run Function Parameter Group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
F01.00	Main frequency input channel selection	0: Operation keyboard digital setup 1: AI1 analog setup 2: AI2 analog setup 3:Terminal UP/DOWN adjusting setup 4:Communication provide(Communication address: 1E01). 5:EAI1 analog setup.(Effective expansion) 6:EAI2 analog setup. (Effective expansion) 7:High speed pulse setup X8 terminal need choose the suitable function) 8:Terminal pulse setup(X8 terminal need choose the suitable function) 9:Terminal encoder setup(X1:X2 connect the encoder punctuation input) 10 ~ 14: Reserved	1	0	○
F01.01	Main frequency digital setup	0.00Hz～upper limit frequency	0.01Hz	50.00Hz	○
F01.02	Main frequency digital control	Only when parameter F01.00=0,3,4 valid. Units digit: power down reserve setup 0:Main frequency power down reserve. 1:Main frequency power down no reserve. Tens digit: halt reserve setup 0:Halt main frequency hold 1:Halt main frequency recovery F01.01 Hundreds digit: Set of communication presetting frequency dimension 0:Preset of absolute frequency mode(preset 5000 represent 50.00Hz). 1:Preset 10000 represent upper limit frequency (F01.11).	1	00	○
F01.03	Auxiliary frequency input channel select	0: Operation keyboard digital setup 1: AI1 analog setup 2: AI2 analog setup 3:Terminal UP/DOWN adjusting setup 4:Communication provide (Communication address: 1E01). 5:EAI1 analog setup. (Effective expansion) 6:EAI2 analog setup.(Effective expansion) 7:High speed pulse setup X8 terminal need choose the suitable function) 8:Terminal pulse setup(X8 terminal need choose the suitable function) 9:Terminal encoder setup(X3:X4 connect the encoder punctuation input) 10: Reserved 11: Process PID Setting 12～20: Reserved	1	20	○
F01.04	Auxiliary frequency digital	0.00Hz～upper limit frequency	0.01Hz	0.00Hz	○

	setup				
F01.05	Auxiliary frequency digital control	Units digit: power down reserve setup 0:Auxiliary frequency power down reserve. 1:Auxiliary frequency power down no reserve. Tens digit: halt reserve setup 0:Halt auxiliary frequency hold. 1:Halt auxiliary frequency recovery parameter F01.04	1	11	○
F01.06	Main and auxiliary provide calculating setup	0:Main frequency (complex frequency of current is main frequency). 1: Auxiliary frequency(complex frequency of current is auxiliary frequency.) 2: Plus(polarity oppose of complex and main frequency,complex frequency is zero). 3:Minus(polarity oppose of complex and auxiliary frequency,complex frequency is zero). 4:Multiplication(polarity opposed of main and auxiliary frequency: complex frequency is zero). 5:Max(the max frequency of main and auxiliary absolute value). 6:Min(the min frequency of main and auxiliary absolute value). 7:Selection no-zero value(auxiliary is not negative, main frequency prior； auxiliary is negative,complex frequency is zero). 8:main frequency×Auxiliary frequency×2/F01.11 (polarity opposed of main and auxiliary frequency, complex frequency is zero)	1	0	○
F01.07	Auxiliary frequency provide coefficient	0.00～10.00	0.01	1.00	○
F01.08	Coefficient after complex of main and auxiliary frequency	0.00～10.00	0.01	1.00	○
F01.09	Auxiliary frequency range selection	0:Relative upper limit frequency. 1:Relative main frequency.	1	0	○
F01.10	Auxiliary frequency source scope	0.00～1.00	0.01	1.00	○
F01.11	Upper limit frequency	Low limit frequency～600.00Hz	0.01Hz	50.00Hz	×
F01.12	Low limit frequency	0.00Hz～upper limit frequency	0.01Hz	0.40Hz	×
F01.13	Low limit frequency run mode	0:As low limit frequency run. 1:As setting frequency run. 2:As zero frequency run. 3:Sleep: PWM clocked at sleep mode.	1	2	×
F01.14	Sleep run hysteresis frequency	0.01Hz～upper limit frequency(This function can be used to finish the sleep mode function, realizing energy-saving operation process, and the hysteresis width can avoid inverter starting frequently in threshold)	0.01Hz	0.01Hz	○
F01.15	Run command channel selection	0:Operation keyboard run control. 1:Terminal run command control 2:Communication run command control.	1	0	○
F01.16	Run direction setup	Units digit: Keyboard command for/rev setup (only	1	1000	○

		valid to keyboard inching command) 0:Forward 1:Reverse Tens digit: for/rev forbid (suitable for all command channel,not include Jog function) 0:For/rev available. 1:Reverse not available (imposing on reverse,stop as the halt mode). 2:Forward not available (imposing on forward,stop as the halt mode) Hundreds digit: Reverse running direction (only valid for keyboard and communication channel) 0:Invalid 1: valid Thousands digit: Terminal multi-section speed acceleration and deceleration time control Respectively, corresponding to acceleration and deceleration 1～15 1: Determined by F01.17 and F01.18			
F01.17	Acceleration time 1	1~60000(Acceleration time is interval accelerate from zero frequency to upper limit frequency)	1	Base on motor type	○
F01.18	Deceleration time 1	1～60000(deceleration time is the interval decelerate from upper limit frequency to zero frequency.)	1	Base on motor type	○
F01.19	Acc/Dece time unit	0: 0.01s 1: 0.1s 2: 1s	1	1	×
F01.20	Acc/Dece mode selection	0:Line acc/Dece mode. 1:S curve acc/Dece mode.	1	0	×
F01.21	S curve acceleration initiation segment time	10.0%～50.0%((Acceleration/deceleration time) S curve deceleration start time+ S curve deceleration raise time ≤90%).	0.1%	20.0%	○
F01.22	S curve Acceleration up segment time	10.0%～70.0%(Acceleration/deceleration time) S curve acceleration start time+ S curve acceleration raise time ≤90%).	0.1%	60.0%	○
F01.23	S curve deceleration initiation segment time	10.0%～50.0%(Acceleration/deceleration time) S curve acceleration start time+ S curve acceleration raise time ≤90%).	0.1%	20.0%	○
F01.24	S curve deceleration up segment time	10.0%～70.0%(Acceleration/deceleration time) S curve acceleration start time+ S curve acceleration raise time ≤90%).	0.1%	60.0%	○
F01.25	Keyboard jog run frequency	0.00Hz～upper limit frequency	0.01Hz	5.00Hz	○
F01.26	Terminal jog run frequency	0.00Hz～upper limit frequency	0.01Hz	5.00Hz	○
F01.27	Jog interval time	0.0～100.0s	0.1s	0.0s	○
F01.28	Jog acceleration time	0.1～6000.0s	0.1s	20.0s	○
F01.29	Jog deceleration time	0.1～6000.0s	0.1s	20.0s	○

F02-Start, stop, forward/reverse, brake function parameter group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
F02.00	Start running mode	0: Start from starting frequency 1: First brake and then start from starting frequency	1	0	×
F02.01	Starting delay time	0.0 ~ 60.0s	0.1s	0.0s	×
F02.02	Starting frequency	0.0 ~ 10.00Hz	0.01Hz	0.00Hz	×
F02.03	Starting frequency duration time	0.0 ~ 60.0s	0.1s	0.0s	×
F02.04	DC braking current when starting	0.0 ~ 100.0%	0.1%	30.0%	×
F02.05	DC braking time when starting	0.0 ~ 30.0s	0.1s	0.0s	×
F02.11	Stop mode	0: Deceleration stop. 1: Free stop 2: Deceleration + DC braking stop.	1	0	○
F02.12	Deceleration stop holding frequency	0.00 ~ upper limit frequency (This parameter is only valid for stop mode 0.)	0.01Hz	0.00Hz	×
F02.13	Deceleration stop holding time	0.00 ~ 10.00s	0.01s	0.00s	×
F02.14	Stop DC braking starting frequency	0.00 ~ 15.00Hz	0.01Hz	0.50Hz	×
F02.15	stop DC braking waiting time	0.00 ~ 30.00s	0.01s	0.00s	×
F02.16	Stop DC braking current	0.0 ~ 100.0%	0.1%	0.0%	×
F02.17	Stop DC braking time	0.0 ~ 30.0s	0.1s	0.0s	×
F02.18	Stop auxiliary braking current	0.0 ~ 100.0%	0.1%	0.0%	×
F02.19	Stop auxiliary braking time	0.0 ~ 100.0s	0.1s	0.0s	×
F02.20	Forward/reverse dead zone time	0.0 ~ 3600.0s	0.1s	0.0s	×
F02.21	Forward/reverse switching mode	0: Over zero frequency switchover 1: Over starting frequency switchover	1	0	×
F02.22	Energy consumption braking selection	0:No energy consumption braking 1:Energy consumption braking 1(No braking while halting). 2:Energy consumption braking 2(Braking while halting).	1	0	○
F02.23	Energy consumption braking voltage	100.0 ~ 145.0%(Rated busbar voltage)	0.1%	125.0%	○
F02.24	Energy consumption braking use rate	0.0 ~ 100.0%	0.1%	100.0%	○
F02.25	Encryption time	0 ~ 65535h	1	0	○
F02.26	Over debugging coefficient	95%~115% (Only when F00.24=1 valid)	1%	100%	○

F03-V/F control parameter group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
F03.00	V/F curve set	0: Constant torque curve 1: Degression torque curve 1 (2.0 power) 2: Degression torque curve 1 (1.7 power)	1	0	×

		3: Degression torque curve 3 (1.2 power) 4: User self-defined setting V/F curve (Confirmed by F03.04~F03.11) 5:V/F Separation control (Voltage channel is determined by F18.22)			
F03.01	Torque boost mode	0: Manual boost. 1: Auto torque boost	1	0	○
F03.02	Torque boost	0.0～12.0%	0.1%	Base on motor type	○
F03.03	Torque boost cut-off frequency	0.0～100.0%(Motor rated frequency)	0.1%	100.0%	○
F03.04	V/F frequency value 0	0.00～V/F frequency value 1	0.01Hz	10.00Hz	×
F03.05	V/F voltage value 0	0.00～V/F voltage value 1	0.01%	20.00%	×
F03.06	V/F frequency value 1	V/F frequency value 0～V/F frequency value 2	0.01Hz	20.00Hz	×
F03.07	V/F voltage value 1	V/F voltage value 0～V/F voltage value 2	0.01%	40.00%	×
F03.08	V/F frequency value 2	V/F frequency value 1～V/F frequency value 3	0.01Hz	25.00Hz	×
F03.09	V/F voltage value 2	V/F voltage value 1～V/F voltage value 3	0.01%	50.00%	×
F03.10	V/F frequency value 3	V/F frequency value 2～upper limit frequency	0.01Hz	40.00Hz	×
F03.11	V/F voltage value 3	V/F voltage value 2～100.00% (motor rated voltage)	0.01%	80.00%	×
F03.12	V/F oscillation suppression factor	0～255	1	10	○

F04-Auxiliary running parameter group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
F04.00	Jump freq. 1	0.00Hz～Upper limit frequency	0.01Hz	0.00Hz	×
F04.01	Jump freq. 1 range	0.00Hz～Upper limit frequency	0.01Hz	0.00Hz	×
F04.02	Jump freq. 2	0.00Hz～Upper limit frequency	0.01Hz	0.00Hz	×
F04.03	Jump freq. 2 range	0.00Hz～Upper limit frequency	0.01Hz	0.00Hz	×
F04.04	Jump freq. 3	0.00Hz～Upper limit frequency	0.01Hz	0.00Hz	×
F04.05	Jump freq. 3 range	0.00Hz～Upper limit frequency	0.01Hz	0.00Hz	×
F04.06	Slip freq. gain	0.0～300.0%	0.1%	0.0%	×
F04.07	Slip compensation limit	0.0～250.0%	0.1%	100.0%	×
F04.08	Slip compensation time constant	0.1～25.0s	0.1s	2.0s	×
F04.09	Carrier freq.	0.5～16.0K	0.1K	Based on motor type	○
F04.10	PWM optimized adjustment	Units digit: Carrier freq. is adjusted automatically according to temperature 0: Banned. 1: Allowed. Tens digit: low speed carrier freq. limit mode 0: No limit. 1: Limit. Hundreds digit: carrier wave modulation system 0: 3 phase modulation. 1: 2 phase and 3 phase modulation. Thousands digit: Asynchronous modulation: synchronization mode (valid under V/F control) 0:Asynchronous modulation. 1:Synchronous modulation (under 85Hz:	1	0010	×

		Asynchronous modulation).			
F04.11	AVR function	0: No action 1: Action all the time 2: No action only during deceleration	1	2	×
F04.13	Automatic energy-saving operation	0: No action 1: Action	1	0	×
F04.14	Acceleration time 2 and 1 switchover frequency	0.00Hz～upper limit frequency	0.01Hz	0.00Hz	×
F04.15	Deceleration time 2 and 1 switchover frequency	0.00Hz～upper limit frequency	0.01Hz	0.00Hz	×
F04.16	Acceleration time 2	1～60000	1	200	○
F04.17	Deceleration time 2	1～60000	1	200	○
F04.18	Acceleration time 3	1～60000	1	200	○
F04.19	Deceleration time 3	1～60000	1	200	○
F04.20	Acceleration time 4	1～60000	1	200	○
F04.21	Deceleration time 4	1～60000	1	200	○
F04.22	Acceleration time 5	1～60000	1	200	○
F04.23	Deceleration time 5	1～60000	1	200	○
F04.24	Acceleration time 6	1～60000	1	200	○
F04.25	Deceleration time 6	1～60000	1	200	○
F04.26	Acceleration time 7	1～60000	1	200	○
F04.27	Deceleration time 7	1～60000	1	200	○
F04.28	Acceleration time 8	1～60000	1	200	○
F04.29	Deceleration time 8	1～60000	1	200	○
F04.30	Acceleration time 9	1～60000	1	200	○
F04.31	Deceleration time 9	1～60000	1	200	○
F04.32	Acceleration time 10	1～60000	1	200	○
F04.33	Deceleration time 10	1～60000	1	200	○
F04.34	Acceleration time 11	1～60000	1	200	○
F04.35	Deceleration time 11	1～60000	1	200	○
F04.36	Acceleration time 12	1～60000	1	200	○
F04.37	Deceleration time 12	1～60000	1	200	○
F04.38	Acceleration time 13	1～60000	1	200	○
F04.39	Deceleration time 13	1～60000	1	200	○
F04.40	Acceleration time 14	1～60000	1	200	○
F04.41	Deceleration time 14	1～60000	1	200	○
F04.42	Acceleration time 15	1～60000	1	200	○
F04.43	Deceleration time 15	1～60000	1	200	○

F05-Terminal correlative function parameter group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi-cation**
F05.00	Protocol selection	0: Modbus protocol . 1: Reserved 2: Profibus protocol .(Extend effective) 3: CANlink protocol .(Extend effective) 4: CANopen protocol .(Extend effective) 5: Reserved 6: Reserved	1	0	×
F05.01	Baud rate configuration	Units digit: Free protocol and Modbus Baud rate selection 0: 300BPS 1: 600BPS	1	005	×

		2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9:115200BPS Tens digit: Profibus_DP Baud rate selection 0: 115200BPS 1: 208300BPS 2: 256000BPS 3: 512000BPS Hundreds digit: CanLink and CANopen Baud rate selection 0: 20K 1: 50K 2: 100K 3: 125K 4: 250K 5: 500K 6: 1M			
F05.02	Data format	Units digit: Modbus protocol data format 0:1-8-1 format,no parity,RTU 1: 1-8-1 format,even parity,RTU 2: 1-8-1 format,odd parity,RTU 3: 1-7-1 format,no parity,ASCII 4: 1-7-1 format,even parity,ASCII 5: 1-7-1 format,odd parity,ASCII Tens digit: Profibus_DP protocol data format 0: PPO1 communication format 1: PPO2 communication format 2: PPO3 communication format 3: PPO5 communication format Hundreds digit: Modbus agreement response selection 0: Respond mainframe demandand respond data package 1: Respond mainframe demand without response(response when write parameter) 2: Respond mainframe demand without response(without response when write parameter) Thousands digit: Communication Sets power down reserve setup 0: No reserve 1: Reserve	1	0000	×
F05.03	Local address	0～247, Modbus protocol 0 is the broadcast address, the broadcast address only receives and executes the upper computer command, does not reply to the upper computer.	1	1	×
F05.04	Communication overtime checkout time	0.0～1000.0s	0.1s	0.0s	○
F05.05	Communication error checkout time	0.0 ~ 1000.0s	0.1s	0.0s	○
F05.06	Local response delay time	0 ~ 200ms (Modbus effective)	1ms	2ms	○
F05.07	Main & sub inverter communication frequency setting percentage	0 ~ 500%	1%	100%	○
F05.08	communication virtual input terminal enabled	00 ~ FFH Bit0 : CX1 virtual input terminal enabled 0: Forbidden 1: Enabled	1	00H	○

		Bit1: CX2 virtual input terminal enabled 0: Forbidden 1: Enabled Bit2: CX3 virtual input terminal enabled 0: Forbidden 1: Enabled Bit3: CX4 virtual input terminal enabled 0: Forbidden 1: Enabled Bit4: CX5 virtual input terminal enabled 0: Forbidden 1: Enabled Bit5: CX6 virtual input terminal enabled 0: Forbidden 1: Enabled Bit6: CX7 virtual input terminal enabled 0: Forbidden 1: Enabled Bit7: CX8 virtual input terminal enabled 0: Forbidden 1: Enabled			
F05.09	Communication virtual input terminal joining node	0: Independent node. 1: Terminal node.	1	0	○
F05.10	Communication virtual terminal CX1 function	0 ~ 90	1	0	○
F05.11	Communication virtual terminal CX2 function	0 ~ 90	1	0	○
F05.12	Communication virtual terminal CX3 function	0 ~ 90	1	0	○
F05.13	Communication virtual terminal CX4 function	0 ~ 90	1	0	○
F05.14	Communication virtual terminal CX5 function	0 ~ 90	1	0	○
F05.15	Communication virtual terminal CX6 function	0 ~ 90	1	0	○
F05.16	Communication virtual terminal CX7 function	0 ~ 90	1	0	○
F05.17	Communication virtual terminal CX8 function	0 ~ 90	1	0	○
F05.18	Input mapping application parameter 1	F00.00 ~ F26.xx	0.01	25.00	○
F05.19	Input mapping application parameter 2	F00.00 ~ F26.xx	0.01	25.00	○
F05.20	Input mapping application parameter 3	F00.00 ~ F26.xx	0.01	25.00	○
F05.21	Input mapping application parameter 4	F00.00 ~ F26.xx	0.01	25.00	○
F05.22	Input mapping application parameter 5	F00.00 ~ F26.xx	0.01	25.00	○
F05.23	Input mapping application parameter 6	F00.00 ~ F26.xx	0.01	25.00	○
F05.24	Input mapping application parameter 7	F00.00 ~ F26.xx	0.01	25.00	○
F05.25	Input mapping application parameter 8	F00.00 ~ F26.xx	0.01	25.00	○
F05.26	Input mapping	F00.00 ~ F26.xx	0.01	25.00	○

	application parameter 9				
F05.27	Input mapping application parameter 10	F00.00 ~ F26.xx	0.01	25.00	○
F05.28	Setting frequency	Display current setting frequency	0.01Hz		○
F05.29	Frequency after current acceleration /deceleration	Display the frequency after current acceleration / deceleration	0.01Hz		○
F05.30	Synchronous frequency	Display the current synchronous frequency	0.01Hz		○
F05.31	Output current	Display the current output current	0.1A		○
F05.32	Output voltage	Display the current output voltage	1V		○
F05.33	DC busbar voltage	Displays the current DC busbar voltage	0.1V		○
F05.34	Load motor speed	Display the current load motor speed	1 r/min		○
F05.35	Set torque	Display the current set torque (>37367, it is negat ive)	0.1%		○
F05.36	Output torque	Display the current output torque (>32767, it is negative)	0.1%		○
F05.37	Torque current	Display the current torque current	0.1A		○
F05.38	Accumulated power-on time	Display the accumulated power-on time of the inverter	1hour		○
F05.39	Accumulated running time	Display the accumulated running time of the inverter	1 hour		○

F06-Setting curve parameter group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
F06.00	Setting curve selection	Units digit: AI1 curve selection 0: Curve 1 1: Curve 2 2: Curve 3 Tens digit: AI2 curve selection: The same as Units digit Hundred digit: rapid pulse curve selection: The same as Units digit Thousands digit: pulse width setting curve selection: The same as Units digit	1	0000	○
F06.01	Curve 1 min. setting	0.0% ~ curve 1 inflexion setting	0.1%	0.0%	○
F06.02	Corresponding physical quantity of curve 1 min. setting	0.0 ~ 100.0%	0.1%	0.0%	○
F06.03	Curve 1 inflexion setting	Curve 1 min. setting ~ curve 1 Max. setting	0.1%	50.0%	○
F06.04	Corresponding physical quantity of curve 1 inflexion setting	0.0 ~ 100.0%	0.1%	50.0%	○
F06.05	Curve 1 Max. setting	Curve 1 inflexion setting ~ 100.0%, 100.0% is corresponding to 5V Input AD terminal	0.1%	100.0%	○
F06.06	Corresponding physical quantity of curve 1 Max. setting	0.0 ~ 100.0%	0.1%	100.0%	○
F06.07	Curve 2 min. setting	0.0% ~ curve 2 inflexion setting	0.1%	0.0%	○
F06.08	Corresponding physical quantity of curve 2 min. setting	0.0 ~ 100.0%	0.1%	0.0%	○
F06.09	Curve 2 inflexion setting	Curve 2 min. setting ~ curve 2 Max. setting	0.1%	50.0%	○
F06.10	Corresponding physical quantity of curve 2 inflexion setting	0.0 ~ 100.0%	0.1%	50.0%	○

F06.11	Curve 2 Max. setting	Curve 2 inflexion setting ~ 100.0%	0.1%	100.0%	○
F06.12	Corresponding physical quantity of curve 2 Max. setting	0.0 ~ 100.0%	0.1%	100.0%	○
F06.13	Curve 3 min. setting	0.0% ~ curve 3 inflexion 1 setting	0.1%	0.0%	○
F06.14	Corresponding physical quantity of curve 3 min. setting	0.0 ~ 100.0%	0.1%	0.0%	○
F06.15	Curve 3 inflexion 1 setting	Curve 3 min.setting~ curve 3 inflexion 2 setting	0.1%	30.0%	○
F06.16	Corresponding physical quantity of curve 3 inflexion 1 setting	0.0 ~ 100.0%	0.1%	30.0%	○
F06.17	Curve 3 inflexion 2 setting	Curve 3 inflexion 1setting~curve 3 Max.setting	0.1%	60.0%	○
F06.18	Corresponding physical quantity of curve 3 inflexion 2 setting	0.0 ~ 100.0%	0.1%	60.0%	○
F06.19	Curve 3 Max. setting	Curve 3 inflexion 1 setting ~ 100.0%	0.1%	100.0%	○
F06.20	Corresponding physical quantity of curve 3 Max. setting	0.0 ~ 100.0%	0.1%	100.0%	○
F06.21	Curve lower than min. input corresponding selection	Units digit: curve 1 setting 0: Corresponds to min. setting corresponding physical quantity. 1: 0.0% of the corresponding physical quantity. Tens digit: curve 2 setting Same as units digit. Hundreds digit: curve 3 setting Same as units digit. Thousands digit: extended curve 1 Same as units digit. Ten thousands digit: extended curve 2 Same as units digit.	1	11111	○

F07 - Analog , Pulse input function parameter group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
F07.00	AI1 input filter time	0.000 ~ 9.999s	0.001s	0.050s	×
F07.01	AI1 setting gain	0.000 ~ 9.999	0.001	1.006	○
F07.02	AI1 setting bias	0.0 ~ 100.0%	0.1%	0.5%	○
F07.03	AI2 input filter time	0.000 ~ 9.999s	0.001	0.050s	×
F07.04	AI2 setting gain	0.000 ~ 9.999	0.001	1.003	○
F07.05	AI2 setting bias	0.0 ~ 100.0%	0.1%	0.1%	○
F07.06	Analog setting bias polarity	Units digit: AI1 setting bias polarity 0: Positive polarity. 1: Negative polarity. Tens digit: AI2 setting bias polarity 0: Positive polarity. 1: Negative polarity.	1	01	○
F07.07	Pulse input filter time	0.000 ~ 9.999s	0.001	0.000s	×
F07.08	Pulse input gain	0.000 ~ 9.999	0.001	1.000	○
F07.09	Pulse input Max. frequency	0.01 ~ 50.00KHz	0.01KHz	10.00KHz	○
F07.10	Pulse width input filter time	0.000 ~ 9.999s	0.001s	0.000s	×
F07.11	Pulse width input gain	0.000 ~ 9.999	0.001	1.000	○

F07.12	Pulse width input logic setting.	0: Positive logic 1: Negative logic	1	0	○
F07.13	Max pulse input width	0.1 ~ 999.9ms	0.1ms	100.0ms	○
F07.14	Analog input disconnection detection threshold	0.0% ~ 100.0%	0.1%	10.0%	○
F07.15	Analog input disconnection detection time	0.0 ~ 500.0s	0.1s	3.0s	○
F07.16	Analog disconnection protection option	Units digit: disconnection detection channel choice 0: Invalid 1: AI1 2: AI2 Tens digit: Disconnection protection way 0: Stop according to stop mode 1: Fault, free stop 2: Continue operation	1	10	○
F07.17	Reserved				

F08-On-off input function parameter group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
F08.00	Input terminal positive and negative logic setting	0000～FFFF (Include extend input terminal)	1	0000	○
F08.01	Input terminal filter time	0.000～1.000s (Suitable for extend input Terminal)	0.001s	0.010s	○
F08.02	X1 Input terminal closed time	0.00 ~ 99.99s	0.01s	0.00s	○
F08.03	X1 Input terminal opened time	0.00 ~ 99.99s	0.01s	0.00s	○
F08.04	X2 Input terminal closed time	0.00 ~ 99.99s	0.01s	0.00s	○
F08.05	X2 Input terminal opened time	0.00 ~ 99.99s	0.01s	0.00s	○
F08.06	X3 Input terminal closed time	0.00 ~ 99.99s	0.01s	0.00s	○
F08.07	X3 Input terminal opened time	0.00 ~ 99.99s	0.01s	0.00s	○
F08.08	X4 Input terminal closed time	0.00 ~ 99.99s	0.01s	0.00s	○
F08.09	X4 Input terminal opened time	0.00 ~ 99.99s	0.01s	0.00s	○
F08.10	X5 Input terminal closed time	0.00 ~ 99.99s	0.01s	0.00s	○
F08.11	X5 Input terminal opened time	0.00 ~ 99.99s	0.01s	0.00s	○
F08.12	X6 Input terminal closed time	0.00 ~ 99.99s	0.01s	0.00s	○
F08.13	X6 Input terminal opened time	0.00 ~ 99.99s	0.01s	0.00s	○
F08.14	X7 Input terminal closed time	0.00 ~ 99.99s	0.01s	0.00s	○
F08.15	X7 Input terminal opened time	0.00 ~ 99.99s	0.01s	0.00s	○
F08.16	X8 Input terminal closed time	0.00 ~ 99.99s	0.01s	0.00s	○
F08.17	X8 Input terminal opened time	0.00 ~ 99.99s	0.01s	0.00s	○
F08.18	Input terminal X1 function selection	0: Leave control terminal unused 1: Forward running FWD terminal 2: Reverse running REV terminal 3: External forward jogging control 4: External reverse jogging control 5: Multi-step speed control terminal 1 6: Multi-step speed control terminal 2 7: Multi-step speed control terminal 3 8: Multi-step speed control terminal 4 9: Acceleration/deceleration time selection terminal 1 10: Acceleration/deceleration time selection terminal 2 11: Acceleration/deceleration time	1	1	×

		selection terminal 3 12: Acceleration/deceleration time selection terminal 4 13: Main and auxiliary frequency operational rule selection terminal 1 14: Main and auxiliary frequency operational rule selection terminal 2 15: Main and auxiliary frequency operational rule selection terminal 3 16: Frequency ascending command(UP) 17: Frequency descending command (DOWN) 18: Frequency ascending/descending frequency resetting 19: Multi-step closed loop terminal 1 20: Multi-step closed loop terminal 2 21: Multi-step closed loop terminal 3 22: External equipment failure input 23: External interruption input 24:External resetting input 25: Free stop input 26: External stop instruction—Stop according to the stop mode 27: Stop DC braking input command DB 28: Inverter running prohibited—Stop according to the stop mode 29:Acceleration/deceleration prohibited command 30: Three-wire running control 31: Process PID invalid 32: Process PID stop 33: Process PID integral holding 34: Process PID integral resetting 35: Process PID function negation (Closed loop adjustment feature negation) 36: Simple PLC invalid 37: Simple PLC halted 38: Simple PLC stop state resetting 39: Main frequency switchover to digit (keypad) 40: Main frequency switchover to AI1 41: Main frequency switchover to AI2 42: Main frequency switchover to EAI1 43: Main frequency switchover to EAI2 44: Main frequency setting channel selection terminal 1 45: Main frequency setting channel selection terminal 2 46: Main frequency setting channel selection terminal 3 47: Main frequency setting channel selection terminal 4 48: Auxiliary frequency reset 49: Command switchover to panel 50: Command switchover to terminal 51: Command switchover to communication 52:Running command Channel selection			

		terminal 1 53:Running command Channel selection terminal 2 54:Forward prohibited command (Stop according to the stop mode: invalid for jogging command) 55:Reverse prohibited command (Stop according to the stop mode: invalid for jogging command) 56:Swinging frequency input 57:Resetting state of swinging frequency 58:Interior counter reset end 59:Interior counter input end 60:Internal timer resetting 61:Internal timer triggering 62:Length count input 63:Length reset 64:Reset this operation time 65:Speed/torque control switching 66-69: Reserved 70:Water full detection alarm (A-46) 71:Full water alarm reset 72:Photovoltaic function is prohibited 73～90: Reserved 91:Pulse frequency input (X8 VALID) 92:Pulse width PWM INPUT (X8 VALID) 93～96: Reserved			
F08.19	Input terminal X2 function selection	Same as above	1	2	×
F08.20	Input terminal X3 function selection	Same as above	1	0	×
F08.21	Input terminal X4 function selection	Same as above	1	0	×
F08.22	Input terminal X5 function selection	Same as above	1	0	×
F08.23	Input terminal X6 function selection	Same as above	1	0	×
F08.24	Input terminal X7 function selection	Same as above	1	0	×
F08.25	Input terminal X8 function selection	Same as above	1	0	×
F08.26	FWD/REV operating mode selection	0: Two-wire control mode 1 1: Two-wire control mode 2 2: Two-wire control mode 3(Mono pulse control Mode) 3: Three-wire control mode 1 4: Three-wire control mode 2	1	0	×
F08.27	Set internal count value to setting	0 ~ 65535	1	0	○
F08.28	Specify internal count to setting	0 ~ 65535	1	0	○
F08.29	Internal timer timing setting	0.1 ~ 6000.0s	0.1s	60.0s	○
F08.30	Terminal pulse encoder frequency rate	0.01 ~ 10.00Hz (Only be effective by given X1:X2 encoder)	0.01Hz	1.00Hz	○
F08.31	Special function selection	Units digit: jogging priority level selection 0: The highest priority level	1	00	○

		1: The lowest priority level Tens digit: Keypad adjustment of display setting (under speed control mode) 0: Display setting frequency 1: Display setting rotation speed			

F09-On-off , Analog output function parameter group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
F09.00	Open collector output terminal Y1 output setup	0:Terminal unused 1:Operation(RUN) 2:Inverter running forward 3: Inverter running reverse 4:DC brake 5:Run prepare finish (Busbar voltage normal, fault free, no run forbid,receival of run command's status) 6:Stop command indication 7:No current arrived 8:Overcurrent arrived 9:Current1 arrived 10:Current2 arrived 11:No frequency output 12:Frequency arrival signal(FAR) 13:Frequency level detect signal 1(FDT1) 14:Frequency level detect signal 2(FDT2) 15:Output frequency arrival upper limit(FHL) 16:Output frequency arrival low limit(FLL) 17:Frequency 1 arrival output 18:Frequency 2 arrival output 19:Overload pre-alarm signal(OL) 20:Undervoltage lockout stop (LU) 21:External fault stop(EXT) 22:Fault 23:Alarm 24:Simple PLC operation 25:Simple PLC section operation finish 26:Simple PLC circle operation finish 27:Simple PLC operation stop 28:Traverse frequency high and low limit 29:Setup length arrival 30:Internal counter final value arrival 31:Internal counter designated value arrival 32:Internal timer arrival---output 0.5s valid signal on arrival 33:Operation stop time finish 34:Operation arrival time finish 35:Setup run time arrival 36:Setup power on time arrival 37-40: Reserved 41:Communication provision 42: Torque control speed limiting 43:Torque arriving output 44: Reserved 45: The brake logic 1(Brake in the process of switching forward and reverse) 46: The brake logic 2(not brake in the process of	1	0	×

		switching Forward and reverse) 47: Frequency inverter running 1(not jog running) 48: Analog input disconnection signal output 49: X1 Terminal closed valid 50: X2 Terminal closed valid 51~60: Reserved			
F09.01	Open collector output terminal Y2 output setup	Same as above	1	0	×
F09.02	Open collector output terminal Y3 output setup	Same as above	1	0	×
F09.03	Open collector output terminal Y4 output setup	Same as above	1	0	×
F09.04	PLY1 output setting	Same as above	1	22	×
F09.05	Detection amplitude of Frequency arrival(FAR)	0.00～50.00Hz	0.01Hz	5.00Hz	○
F09.06	FDT1 (Frequency level) level	0.00Hz ~ upper limit frequency	0.01Hz	10.00Hz	○
F09.07	FDT1 lag	0.00 ~ 50.00Hz	0.01Hz	1.00Hz	○
F09.08	FDT2(frequency level) level	0.00Hz ~ upper limit frequency	0.01Hz	10.00Hz	○
F09.09	FDT2 lag	0.00 ~ 50.00Hz	0.01Hz	1.00Hz	○
F09.10	Zero frequency signal detection value	0.00Hz ~ upper limit frequency	0.01Hz	0.40Hz	○
F09.11	Zero frequency backlash	0.00Hz ~ upper limit frequency	0.01Hz	0.10Hz	○
F09.12	Zero-current detection amplitude	0.0 ~ 50.0%	0.1%	0.0%	○
F09.13	Zero-current detection time	0.00 ~ 60.00s	0.01s	0.1s	○
F09.14	Over-current detection value	0.0 ~ 250.0%	0.1%	160.0%	○
F09.15	Over-current detection time	0.00 ~ 60.00s	0.01s	0.00s	○
F09.16	Current 1 arrival detection value	0.0 ~ 250.0%	0.1%	100.0%	○
F09.17	Current 1 width	0.0 ~ 100.0%	0.1%	0.0%	○
F09.18	Current 2 arriving the detection value	0.0 ~ 250.0%	0.1%	100.0%	○
F09.19	Current 2 width	0.0 ~ 100.0%	0.1%	0.0%	○
F09.20	Frequency 1 arriving the detection value	0.00Hz ~ upper limit frequency	0.01Hz	50.00Hz	○
F09.21	Frequency 1 arriving the detection width	0.00Hz ~ upper limit frequency	0.01Hz	0.00Hz	○
F09.22	Frequency 2 arriving the detection value	0.00Hz ~ upper limit frequency	0.01Hz	50.00Hz	○
F09.23	Frequency 2	0.00Hz ~ upper limit frequency	0.01Hz	0.00Hz	○

	arriving the detection width				
F09.24	positive and negative logic setup of Output terminal	0000 ~ FFFF(extension valid)	1	0000	○
F09.25	Y1 output closed delay time	0.000 ~ 50.000s	0.001s	0.000s	○
F09.26	Y1 output disconnected delay time	0.000 ~ 50.000s	0.001s	0.000s	○
F09.27	Y2 output closed delay time	0.000 ~ 50.000s	0.001s	0.000s	○
F09.28	Y2 output disconnected delay time	0.000 ~ 50.000s	0.001s	0.000s	○
F09.29	Y3 output closed delay time	0.000 ~ 50.000s	0.001s	0.000s	○
F09.30	Y3 output disconnected delay time	0.000 ~ 50.000s	0.001s	0.000s	○
F09.31	Y4 output closed delay time	0.000 ~ 50.000s	0.001s	0.000s	○
F09.32	Y4 output disconnected delay time	0.000 ~ 50.000s	0.001s	0.000s	○
F09.33	RLY1 output closed delay time	0.000 ~ 50.000s	0.001s	0.000s	○
F09.34	RLY1 output disconnected delay time	0.000 ~ 50.000s	0.001s	0.000s	○
F09.35	Analog output(AO1) selection	0: Output frequency before slip compensation (0.00Hz~upper limit frequency) 1: Output frequency after slip Compensation (0.00Hz~upper limit frequency) 2: Setup frequency(0.00Hz~upper limit frequency) 3: Main setting frequency(0.00Hz~upper limit frequency) 4: Auxiliary setting frequency(0.00Hz~upper limit frequency) 5: Output current 1(0 ~2×inverter rated current) 6: Output current 2(0 ~3×motor rated current) 7: Output voltage(0 ~1.2×load motor rated voltage) 8: Busbar voltage(0 ~1.5×rated busbar voltage) 9: Motor speed(0~3 rated speed) 10: PID provision(0.00~10.00V) 11: PID feedback(0.00~10.00V) 12: AI1(0.00~10.00V or 4~20mA) 13: AI2(-10.00~10.00V or 4~20mA) 14: Communication provision 15: Motor rotor revolving speed(0.00Hz ~ upper limit frequency) 16: Present setting torque(0 ~ 2 times rated Torque) 17: Present output torque(0 ~ 2 times rated Torque) 18: Present torque current (0 ~ 2 times motor rated current) 19: Present flux current(0 ~ 1 times motor rated	1	0	○

		flux current) 20 ~ 25: Reserved			
F09.36	Analog output(AO2) selection	Same as above	1	0	○
F09.37	DO function selection (with Y4 reuse)	Same as above	1	0	○
F09.39	Analog output (AO1) filter time	0.0 ~ 20.0s	0.1s	0.0s	○
F09.40	Analog output (AO1) gain	0.00 ~ 2.00	0.01	1.00	○
F09.41	Analog output (AO1) bias	0.0 ~ 100.0%	0.1%	0.0%	○
F09.42	Analog output (AO2) filter time	0.0 ~ 20.0s	0.1s	0.0s	○
F09.43	Analog output (AO2) gain	0.00 ~ 2.00	0.01	1.00	○
F09.44	Analog output (AO2) bias	0.0 ~ 100.0% (AO2 output terminal with Y3 Reuse)	0.1%	0.0%	○
F09.45	DO filter time	0.0 ~ 20.0s	0.1s	0.0s	○
F09.46	DO output gain	0.00 ~ 2.00	0.01	1.00	○
F09.47	DO maximum pulse output frequency	0.1 ~ 20.0KHz	0.1KHz	10.0KHz	○
F09.48	Torque reaches to the detection time	0.02 ~ 200.00s	0.01s	1.00s	○

F10-Simple PLC/Multi-speed Function Parameter Group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
F10.00	Simple PLC operate setting	Units digit: Run mode selection 0: Inaction 1: Stop after single cycle 2: Final value keep after single cycle 3: Continuous cycle Tens digit: Interrupt run restart mode selection 0: Restart from first phase 1: Continuous run from phase frequency at interruption 2: Continuous run from run frequency at interruption Hundreds digit: PLC run time unit 0: Second 1: Minute Thousands digit: Power-down memory selection 0: No memory 1: Phase of reserve power down, frequency power down recording PLC run status: contain power down phase, run frequency, time have run.	1	0000	×
F10.01	Step 1 setting	000H ~ E22H Units digit: frequency setup 0: Multi-section frequency i (i=1 ~ 15) 1:Frequency determined by complex frequency of main and auxiliary 2: Reserved Tens digit: The selection of running direction for	1	020	○

		PLC and multi-speed. 0:Forward 1:Reversal 2:Determine by run command Hundreds digit:ACC/DEC time selection 0: ACC/DEC time 1 1: ACC/DEC time 2 2: ACC/DEC time 3 3: ACC/DEC time 4 4: ACC/DEC time 5 5: ACC/DEC time 6 6: ACC/DEC time 7 7: ACC/DEC time 8 8: ACC/DEC time 9 9: ACC/DEC time 10 A: ACC/DEC time 11 B: ACC/DEC time 12 C: ACC/DEC time 13 D: ACC/DEC time 14 E: ACC/DEC time 15			
F10.02	Step 2 setting	000H ~ E22H	1	020	○
F10.03	Step 3 setting	000H ~ E22H	1	020	○
F10.04	Step 4 setting	000H ~ E22H	1	020	○
F10.05	Step 5 setting	000H ~ E22H	1	020	○
F10.06	Step 6 setting	000H ~ E22H	1	020	○
F10.07	Step 7 setting	000H ~ E22H	1	020	○
F10.08	Step 8 setting	000H ~ E22H	1	020	○
F10.09	Step 9 setting	000H ~ E22H	1	020	○
F10.10	Step 10 setting	000H ~ E22H	1	020	○
F10.11	Step 11 setting	000H ~ E22H	1	020	○
F10.12	Step 12 setting	000H ~ E22H	1	020	○
F10.13	Step 13 setting	000H ~ E22H	1	020	○
F10.14	Step 14 setting	000H ~ E22H	1	020	○
F10.15	Step 15 setting	000H ~ E22H	1	020	○
F10.16	Step 1 running time	0 ~ 6000.0	0.1	10.0	○
F10.17	Step 2 running time	0 ~ 6000.0	0.1	10.0	○
F10.18	Step 3 running time	0 ~ 6000.0	0.1	10.0	○
F10.19	Step 4 running time	0 ~ 6000.0	0.1	10.0	○
F10.20	Step 5 running time	0 ~ 6000.0	0.1	10.0	○
F10.21	Step 6 running time	0 ~ 6000.0	0.1	10.0	○
F10.22	Step 7 running time	0 ~ 6000.0	0.1	10.0	○
F10.23	Step 8 running time	0 ~ 6000.0	0.1	10.0	○
F10.24	Step 9 running time	0 ~ 6000.0	0.1	10.0	○
F10.25	Step 10 running time	0 ~ 6000.0	0.1	10.0	○
F10.26	Step 11 running time	0 ~ 6000.0	0.1	10.0	○
F10.27	Step 12 running time	0 ~ 6000.0	0.1	10.0	○
F10.28	Step 13 running time	0 ~ 6000.0	0.1	10.0	○
F10.29	Step 14 running time	0 ~ 6000.0	0.1	10.0	○
F10.30	Step 15 running time	0 ~ 6000.0	0.1	10.0	○
F10.31	Multi- frequency 1	0.00Hz～upper limit frequency	0.01Hz	5.00Hz	○
F10.32	Multi- frequency 2	0.00Hz～upper limit frequency	0.01Hz	10.00Hz	○
F10.33	Multi- frequency 3	0.00Hz～upper limit frequency	0.01Hz	20.00Hz	○
F10.34	Multi- frequency 4	0.00Hz～upper limit frequency	0.01Hz	30.00Hz	○
F10.35	Multi- frequency 5	0.00Hz～upper limit frequency	0.01Hz	40.00Hz	○
F10.36	Multi- frequency 6	0.00Hz～upper limit frequency	0.01Hz	45.00Hz	○
F10.37	Multi- frequency 7	0.00Hz～upper limit frequency	0.01Hz	50.00Hz	○

F10.38	Multi- frequency 8	0.00Hz～upper limit frequency	0.01Hz	5.00Hz	○
F10.39	Multi- frequency 9	0.00Hz～upper limit frequency	0.01Hz	10.00Hz	○
F10.40	Multi- frequency 10	0.00Hz～upper limit frequency	0.01Hz	20.00Hz	○
F10.41	Multi- frequency 11	0.00Hz～upper limit frequency	0.01Hz	30.00Hz	○
F10.42	Multi- frequency 12	0.00Hz～upper limit frequency	0.01Hz	40.00Hz	○
F10.43	Multi- frequency 13	0.00Hz～upper limit frequency	0.01Hz	45.00Hz	○
F10.44	Multi- frequency 14	0.00Hz～upper limit frequency	0.01Hz	50.00Hz	○
F10.45	Multi- frequency 15	0.00Hz～upper limit frequency	0.01Hz	50.00Hz	○

F11-Close loop PID run function parameter group

Function code	Name	Set range	Min. unit	Factory default	Modifi -cation
F11.00	Closed-loop running control selection	0:PID close loop run control invalid 1:PID close loop run control valid	1	0	×
F11.01	Provision channel selection	0:Digital provision 1:AI1 analog provision 2:AI2 analog provision 3:EAI1 analog provision(Extend effective) 4:EAI2 analog provision(Extend effective) 5:Pulse provision 6:Communication provision(Communication address:1D00). 7: Reserved	1	0	○
F11.02	Feedback channel selection	0: AI1 analog input 1: AI2 analog input 2: EAI1 analog input(Extend effective) 3: EAI2 analog input(Extend effective) 4: AI1+AI2 5: AI1-AI2 6: Min { AI1,AI2 } 7: Max { AI1,AI2 } 8: Pulse input 9:Communication feedback (address is 1DOC, 4000 stands for 10.00V)	1	0	○
F11.03	Provision channel filtering time	0.00 ~ 50.00s	0.00s	0.00s	×
F11.04	Feedback channel filtering time	0.00 ~ 50.00s	0.00s	0.00s	×
F11.05	PID output filtering time	0.00 ~ 50.00s	0.01s	0.00s	○
F11.06	Provision digital setting	0.00 ~ 10.00V	0.01V	1.00V	○
F11.07	Proportion gain Kp	0.000 ~ 6.5535	0.0001	0.0500	○
F11.08	Integral gain Ki	0.000 ~ 6.5535	0.0001	0.0500	○
F11.09	Differential gain Kd	0.000 ~ 9.999	0.001	0.000	○
F11.10	Sample cycle T	0.01 ~ 1.00s	0.01s	0.01s	○
F11.11	Deviation limit	0.0 ~ 20.0% correspond to provide value percentage	0.1%	1.0%	○
F11.12	PID differential amplitude limit	0.00 ~ 100.00%	0.01%	0.10%	○
F11.13	Closed-loop regulation characteristic	0:Action 1:Reaction	1	0	○
F11.14	Feedback channel Positive-Negative characteristic	0:positive characteristic 1:Negative characteristic	1	0	○
F11.15	PID regulation upper limit frequency	0.00Hz ~ upper limit frequency	0.01Hz	50.00Hz	○

F11.16	PID regulation lower limit frequency	0.00Hz ~ upper limit frequency	0.01Hz	0.00Hz	○
F11.17	Integral regulation selection	0:When integral arrival separate PID threshold value,stop integral adjusting 1:When integral arrival separate PID threshold value,continue threshold value adjusting	1	0	○
F11.18	PID threshold of the integral separation	0.0 ~ 100.0%	0.1%	100.0%	○
F11.19	Preset closed-loop frequency	0.00Hz ~ upper limit frequency	0.01Hz	0.00Hz	○
F11.20	Holding time of preset closed-loop frequency	0.0 ~ 6000.0s	0.1s	0.0s	○
F11.21	Closed-loop output reversion selection	0:Close-loop output minus,low limit frequency run. 1:Close-loop output minus,reverse run(effect by run direction setting) 2:Determined by running demand	1	2	○
F11.22	Closed-loop output Reversion frequency upper limit	0.00Hz ~ upper limit frequency	0.01Hz	50.00Hz	○
F11.23	Multiple closed-loop provision 1	0.00 ~ 10.00V	0.01V	0.00V	○
F11.24	Multiple closed-loop provision 2	0.00 ~ 10.00V	0.01V	0.00V	○
F11.25	Multiple closed-loop provision 3	0.00 ~ 10.00V	0.01V	0.00V	○
F11.26	Multiple closed-loop provision 4	0.00 ~ 10.00V	0.01V	0.00V	○
F11.27	Multiple closed-loop provision 5	0.00 ~ 10.00V	0.01V	0.00V	○
F11.28	Multiple closed-loop provision 6	0.00 ~ 10.00V	0.01V	0.00V	○
F11.29	Multiple closed-loop provision 7	0.00 ~ 10.00V	0.01V	0.00V	○

F12-Solar Functional Parameter Table

Function code	Name	Set range	Min. unit	Factory default	Modifi -cation
F12.00	Solar water supply mode selection	0: Invalid 1: MPPT Valid 2: CVT Valid	1	1	×
F12.01	Upper limit voltage	80.0～100.0%	0.1%	90.0%	○
F12.02	Lower limit voltage	50.0～80.0%	0.1%	50.0%	○
F12.03	Search interval	0～100.0s	0.1S	1.0S	○
F12.04	Voltage increase threshold	0.5～30.0%	0.1%	0.5%	○
F12.05	Proportional gain	0.00～100.00	0.01	Based on motor type	○
F12.06	Integral gain	0.01～10.00	0.01	Based on motor type	○
F12.07	Differential gain	0.00～10.00	0.01	Based on motor type	○
F12.08	CVT target voltage	50.0～100.0%	0.1%	80.0%	○
F12.09	Protection stop mode	00～1F BIT0:Low frequency protection (A-42) BIT1:Dry pumping protection (A-43) BIT2:Over current protection (A-44)	1	0000	○

		BIT3:Minimum power protection (A-45) BIT4:Water full protection (A-46) 0:Free stop 1:Deceleration stop			
F12.10	Photovoltaic time constant	1～100	1	10	○
F12.11	Sleep voltage	0～600.0V	0.1V	200.0V	○
F12.13	Awakening voltage	0～600.0V	0.1V	200.0V	○
F12.14	Awakening time	0～6000.0s	0.1S	10.0S	○
F12.15	Low frequency protection frequency	0～50.00hz	0.01Hz	10.00Hz	○
F12.16	Low frequency protection detection time	0～6000.0s	0.1S	10.0S	○
F12.17	Low frequency protection recovery time	0～6000.0s	0.1S	10.0S	○
F12.18	Minimum power protection value	0～100.00kw	0.01KW	0.00KW	○
F12.19	Minimum power protection time	0～6000.0s	0.1S	10.0S	○
F12.20	Minimum power protection recovery time	0～6000.0s	0.1S	10.0S	○
F12.21	Overcurrent protection detection current	0.0A～199.9A	0.1A	0.0A	○
F12.22	Overcurrent protection detection time	0.0s～6000.0s	0.1s	10.0s	○
F12.23	Overcurrent protection automatic recovery time	0.0s～6000.0s	0.1s	10.0s	○
F12.24	Alarm recovery mode	Unit: Low Frequency Protection (A-42) 0: Automatic recovery 1: Manual recovery Ten places: Dry pumping protection (A-43) 0: Automatic recovery 1: Manual recovery Set sequence switching Hundreds: Overcurrent protection (A-44) 0: Automatic recovery 1: Manual recovery Thousands: Minimum Power Protection (A-45) 0: Automatic recovery 1: Manual recovery	1	0000	○
F12.25	Dry pumping protection detection current	0.0A～199.9A	0.1A	0.0A	○
F12.26	Dry pumping protection checkout time	0.0s～6000.0s	0.1s	10.0s	○
F12.27	Dry pumping protection automatic recovery time	0.0s～6000.0s	0.1s	10.0s	○
F12.28	Water full protection checkout time	0.0s～6000.0s	0.1s	10.0s	○
F12.29	Water full protection exit time	0.0s～6000.0s	0.1s	10.0s	○
F12.30	DC current correction offset	0.0A～999.9A	0.1A	0.0A	○
F12.31	DC current correction ratio	0.0%～500.0%	0.1%	100.0%	○
F12.32	Power curve 0	0.0kw～999.9kw	0.1Kw	0.5kw	○
F12.33	Power curve 1	0.0kw～999.9kw	0.1Kw	1.0kw	○
F12.34	Power curve 2	0.0kw～999.9kw	0.1Kw	1.5kw	○

F12.35	Power curve 3	0.0kw～999.9kw	0.1Kw	2.0Kw	○
F12.36	Power curve 4	0.0kw～999.9kw	0.1Kw	2.5Kw	○
F12.37	Flow curve 0	0.0m3/h～999.9m3/h	0.1m3/h	0.0m3/h	○
F12.38	Flow curve 1	0.0m3/h～999.9m3/h	0.1m3/h	5.0m3/h	○
F12.39	Flow curve 2	0.0m3/h～999.9m3/h	0.1m3/h	10.0m3/h	○
F12.40	Flow curve 3	0.0m3/h～999.9m3/h	0.1m3/h	15.0m3/h	○
F12.41	Flow curve 4	0.0m3/h～999.9m3/h	0.1m3/h	20.0m3/h	○
F12.42	Flow correction bias	0.0～999.9m3/h	0.1m3/h	0.0m3/h	○
F12.43	Flow correction gain	0.0%～999.9%	0.1%	100.0%	○
F12.44	Daily flow/day power is cleared	0h～24h	1h	7h	○

F13-Traverse/ Fixed Length Control Function Parameter Group

Function code	Name	Set range	Min. unit	Factory default	Modifi -cation
F13.00	Traverse function selection	0: Traverse invalid 1: Traverse valid	1	0	×
F13.01	Traverse operating mode	Units digit: Enter mode 0: Automatically enter 1: Terminal enter manually Tens digit: 0: Variable swing 1: Fixed swing Hundreds digit: Traverse halt start mode selection 0: Restart 1: Start as previous halt record Thousands digit: Traverse status reserve selection 0: No reserve 1: Reserve	1	0000	×
F13.02	Traverse frequency swing value	0.0 ~ 50.0%	0.1%	10.0%	○
F13.03	Sudden-Jump frequency	0.0 ~ 50.0%	0.1%	2.0%	○
F13.04	Traverse cycle	0.1 ~ 999.9s	0.1s	10.0s	○
F13.05	Triangular wave rising time	0.0 ~ 98.0% (Traverse cycle)	0.1%	50.0%	○
F13.06	preset frequency of Traverse	0.00 ~ 400.00Hz	0.01Hz	0.00Hz	○
F13.07	Traverse preset frequency waiting time	0.0 ~ 6000.0s	0.1s	0.0s	○
F13.08	Setting length	0 ~ 65535(m\cm\mm)	1	0	○
F13.09	Number of pulses for axis per circle	1 ~ 10000	1	1	○
F13.10	Axis perimeter	0.01 ~ 655.35cm	0.01cm	10.00cm	○
F13.11	Percentage of remaining length	0.00% ~ 100.00%	0.01%	0.00%	○
F13.12	Length correction coefficient	0.001 ~ 10.000	0.001	1.000	○
F13.13	After length arrival : record length manage	Units digit: Reserved Tens digit: Sets the unit of length 0: Meter(m) 1: Centimeter(cm) 2: Millimeter(mm) Hundreds digit: Actions when the length is reached	1	0000	○

		0: Continue running 1: Shut down according to stopping mode 2: Loop length control Thousands digit: Software reset length (could be cleared by communication) 0: No operation 1: The current length is cleared 2:The current length and total length both cleared			
F13.14	Record length manage	Units digit: Stops the current length 0: Automatically cleared 1: Length is maintained Tens digit: Power-down length memory setting 0: Not stored 1: Stored Hundreds digit: length calculation at shutdown 0: The length is not calculated 1: Calculate the length	0	011	○

F14-Vector Control Parameter Group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
F14.00	Speed/torque control selection	0: Speed control 1: Torque control (This parameter is valid when F00.24=1 or 2)	1	0	○
F14.01	Speed loop high speed proportional gain	0.1 ~ 40.0 (This parameter is valid when F00.24=1 or 2)	0.1	20.0	○
F14.02	Speed loop high speed integral time	0.001 ~ 10.000s (This parameter is valid when F00.24=1 or 2)	0.001s	0.040s	○
F14.03	Speed loop low speed proportional gain	0.1 ~ 80.0 (This parameter is valid when F00.24=1 or 2)	0.1	20.0	○
F14.04	Speed loop low speed integral time	0.001 ~ 10.000s (This parameter is valid when F00.24=1 or 2)	0.001s	0.020s	○
F14.05	Speed loop parameter switching frequency	0.00Hz～20.00Hz (This parameter is valid when F00.24=1 or 2)	0.01Hz	5.00Hz	○
F14.06	Low frequency power generation stability coefficient	0 ～ 50 (This parameter is valid when F00.24=1)	1	25	○
F14.07	Current loop proportional gain	1～500 (This parameter is valid when F00.24=1 or 2)	1	70	○
F14.08	Current loop integral time	0.1～100.0ms (This parameter is valid when F00.24=1 or 2)	0.1ms	4.0ms	○
F14.09	Motor-driven torque current limit value	0.0 ～250.0% (This parameter is valid when F00.24=1 or 2 or 3)	0.1%	160.0%	○
F14.10	Braking torque current limit value	0.0 ～250.0% (This parameter is valid when F00.24=1 or 2)	0.1%	160.0%	○
F14.11	Asynchronous motor flux-weakening control coefficient	20.0～100.0%(This parameter is valid when F00.24=1 or 2)	0.1%	80.0%	○
F14.13	Torque reference and limit channel selection	Units digit: Torque provision channel selection 0: Digital setting 1: AI1 Analog setting 2: AI2 Analog setting 3: Terminal UP/DOWN adjustment setting 4: communication provision(Communication address:1D01)	1	000	○

		5: EAI1 Analog setting(Expansion effective) 6: EAI2 Analog setting(Expansion effective) 7: Rapid pulse setting (X8 terminal needs to choose the corresponding function) 8:Terminal pulse width setting (X8 terminal needs to choose the corresponding function) Tens digit: Electric torque limit channel selection 0: Digital setting (Determined by F14.09) 1: AI1 analog setting 2: AI2 analog setting 3: Terminal UP / DOWN adjustment setting 4: Reserved 5: EAI1 analog Setting (Extended Valid) 6: EAI2 analog setting (Extended Valid) 7: High-speed pulse setting (X8 terminals need to select the appropriate function) 8: Terminal pulse width setting (X8 terminals need to select the appropriate function) Note: The maximum value of 1 ~ 8 channels corresponds to F14.09 Hundreds digit: Braking torque limit channel selection 0: Digital setting (Determined by F14.10) 1: AI1 analog setting 2: AI2 analog setting 3: Terminal UP/DOWN adjustment setting 4: Reserved 5: EAI1 analog Setting (Extended Valid) 6: EAI2 analog setting (Extended Valid) 7: High-speed pulse setting (X8 terminals need to select the appropriate function) 8: Terminal pulse width setting (X8 terminals need to select the appropriate function) Note: The maximum value of 1 ~ 8 channels corresponds to F14.10			
F14.14	Torque polarity setting	0000 ~ 2112 Units digit: torque setting polarity 0: Positive 1: Negative 2: Defined by running command Tens digit: Torque compensation polarity 0: The same as setting direction of torque 1: Opposite the setting direction of torque Hundreds digit: F14.21 Compensation weakened when the motor locked rotor 0: Invalid 1: Enable. Thousands digit: Torque control anti-reverse function 0: Invalid 1: Anti-reverse function is active continuously 2: Anti-reversal function enabled at startup.	1	2000	○
F14.15	Torque digital setting value	0.0 ～200.0% (This parameter is valid when F00.24=1 or 2)	0.1%	0.0%	○

F14.16	Forward speed limit channel selection in Torque control mode	0: Digital setting 1: AI1 Analog setting 2: AI2 Analog setting 3: Terminal UP/DOWN adjustment setting 4:Communication provision(Communication address: 1D0A). 5: EAI1 Analog setting(expansion effective) 6: EAI2 Analog setting(expansion effective) 7: Rapid pulse setting(X8 terminal needs to choose the corresponding function) 8: terminal pulse width setting(X8 terminal needs to choose the corresponding function) Note:This parameter is valid when F00.24=1.	1	0	×
F14.17	Reverse speed limit channel selection in Torque control mode	0: Digital setting 1: AI1 Analog setting 2: AI2 Analog setting 3: Terminal UP/DOWN adjustment setting 4: Communication provision(Communication address: 1D0B). 5: EAI1 Analog setting (Expansion effective) 6: EAI2 Analog setting (Expansion effective) 7:Rapid pulse setting (X8 terminal needs to choose the corresponding function) 8: Terminal pulse width setting (X8 terminal needs to choose the corresponding function) Note：This parameter is valid when F00.24=1.	1	0	×
F14.18	Forward speed limit value in Torque control mode	0.00Hz ~ upper limit frequency (This parameter is valid when F00.24=1.)	0.01Hz	50.00Hz	○
F14.19	Reverse speed limit value in Torque control mode	0.00Hz ~ upper limit frequency (This parameter is valid when F00.24=1.)	0.01Hz	50.00Hz	○
F14.20	Torque Accelerate/Decelerate time setting	0.000 ~ 60.000s (This parameter is valid when F00.24=1.)	0.001s	0.100s	○
F14.21	Torque compensation	0.0 ～100.0% (This parameter is valid when F00.24=1.)	0.1%	0.0%	○
F14.22	Positive torque gain regulation coefficient	50.0 ~ 150.0%(This parameter is valid when F00.24=1.)	0.1%	100.0%	○
F14.23	Negative torque gain regulation coefficient	50.0 ~ 150.0%(This parameter is valid when F00.24=1.)	0.1%	100.0%	○
F14.24	Flux braking coefficient	0.0 ~ 300.0%(This parameter is valid when F00.24=1.)	0.1%	0.0%	○
F14.25	Pre-excitation start-up time constant	0.1 ~ 3.0 (This parameter is valid when F00.24=1)	0.1	0.5	×
F14.30	Torque compensation limit frequency	0.00Hz ~ upper limit frequency(This parameter is valid when F00.24=1.)	0.01Hz	20.00 Hz	○

F15-Asynchronous Motor Parameter Group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
F15.01	Asynchronous motor rated power	0.1 ~ 6553.5KW	0.1KW	Base on motor type	×
F15.02	Asynchronous motor rated voltage	1 ~ 690V	1V	Base on motor type	×
F15.03	Asynchronous motor	0.1 ~ 6553.5A	0.1A	Base on	×

	rated current			motor type	
F15.04	Asynchronous motor rated frequency	0.00 ~ 600.00Hz	0.01Hz	Base on motor type	×
F15.05	Asynchronous motor rated rotational speed	0 ~ 60000r/min	1r/min	Base on motor type	×
F15.06	Asynchronous motor pole pairs No.	1 ~ 7	1	2	×
F15.07	Asynchronous motor stator resistance	0.001～65.535Ω (Inverter power＜7.5KW)	0.001Ω	Base on motor type	×
		0.0001～6.5535Ω(Inverter power≥7.5KW)	0.0001Ω		
F15.08	Asynchronous motor rotor resistance	0.001～65.535Ω (Inverter power＜7.5KW)	0.001Ω	Base on motor type	×
		0.0001～6.5535Ω(Inverter power≥7.5KW)	0.0001Ω		
F15.09	Asynchronous motor leakage inductance	0.01～655.35mH (Inverter power＜7.5KW)	0.01mH	Base on motor type	×
		0.001～65.535mH (Inverter power≥7.5KW)	0.001mH		
F15.10	Asynchronous motor mutual inductance	0.1～6553.5mH (Inverter power＜7.5KW)	0.1mH	Base on motor type	×
		0.01～655.35mH (Inverter power≥7.5KW)	0.01mH		
F15.11	Asynchronous motor no load current	0.01～655.35A	0.01A	Base on motor type	×
F15.19	Motor parameter self-tuning selection	0: Inaction 1: Asynchronous motor stop to self-adjusting 2: Asynchronous motor rotate no-load to self-adjusting 3: Reserved Note： ① Before adjustment,The nameplate data should be setting directly. ② Motor parameter group can have special default values, or can be modified by users, or can be self-adjusted. ③ when parameter F15.01 is modified, the other parameters of the motor will turn into default values automatically.	1	0	×

F18-Enhance Control Parameter Group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
F18.00	Operation panel control frequency binding	0: No binding 1: Operation keyboard digital setup 2:AI1 analog setup 3:AI2 analog setup 4: Terminal UP/DOWN adjusting setup 5: Communication provide (Modbus and external bus use the same main frequency storage) 6:EAI1 analog setup(extension valid) 7:EAI2 analog setup(extension valid) 8:High speed pulse setup(X8 terminal need choose the relative function) 9:Terminal pulse width setup(X8 terminal need choose the relative function) 10:Terminal encoder provide(decide by X1,X2) 11 ~ 15: Reserved	1	0	○
F18.01	Terminal control frequency binding	Same as above	1	0	○
F18.02	Communication control frequency binding	Same as above	1	0	○

F18.03	Digital frequency integral function selection	Units digit: Keyboard UP/DW integral control 0: Integral function 1: No integral function Tens digit: Terminal UP/DW integral control 0: Integral function 1: No integral function Hundreds digit: Keyboard shuttle knob enable (shuttle keyboard effective) 0: The shuttle knob is valid in the monitoring interface 1: The shuttle knob is invalid in the monitoring interface Thousands digit: keypad adjustment of frequency classic mode selection 0: Invalid 1: Valid, adjustment range decided by F18.05	1	0000	○
F18.04	Keyboard UP/DOWN integral rate	0.01 ~ 50.00Hz	0.01Hz	0.10Hz	○
F18.05	Keyboard no integral single step's size setup	0.01 ~ 10.00Hz	0.01Hz	0.01Hz	○
F18.06	Terminal UP/DOWN integral rate	0.01 ~ 50.00Hz	0.01Hz	0.20Hz	○
F18.07	Terminal no integral single step's size setup	0.01 ~ 10.00Hz	0.01Hz	0.10Hz	○
F18.08	Droop control decline frequency	0.00 ~ 10.00Hz	0.01Hz	0.00Hz	○
F18.09	Setup accumulate power on time	0 ~ 65535 hours	1	0	○
F18.10	Setup accumulate run time	0 ~ 65535 hours	1	0	○
F18.11	Timing run function enable	0: Invalid 1: Valid	1	0	○
F18.12	Timing run stop time	0.1 ~ 6500.0Min	0.1Min	2.0Min	○
F18.13	Currently run arrival time	0.0 ~ 6500.0Min	0.1Min	1.0Min	○
F18.14	Keyboard UP/DOWN selection under monitor mode	0: keyboard frequency provide value adjusting 1:PID digital provide value adjusting 2 ~ 6: Reserved	1	0	○
F18.15	V/F vibration restrain end frequency	0.00Hz ~ upper limit frequency	0.01Hz	50.00Hz	○
F18.16	Advanced control functions	Units digit : The function of torque closed-loop control 0: Torque open-loop control 1: Torque closed-loop control Tens digit: Torque limit mode 0: Torque limit according to rated current of frequency converter 1: Torque limit according to rated torque current Hundreds digit :fast through function when less than the lower limit frequency	1	0001	○

		0: Invalid 1: Valid Thousands digit ; in torque control mode,Low torque given PWM blocking function (Thousands digit is valid when F00.24=1) 0: Invalid			
F18.17	cooling fan control selection	Units digit: Fan control mode 0: Smart fan 1: Inverter is running all the time after power on 2: No running for fan, but it starts automatically when the temperature is higher than 75 degree. Tens digit: Speed regulation fan control mode. 0: Smart PWM Speed regulation 1: Running at highest speed.	1	00	○
F18.18	No speed vector slip gain	50% ~ 200% (When F00.24=1,this function is Valid)	1%	100%	○
F18.19	Low-order of total power consumption	0～9999	1kwh	0	○
F18.20	High-order of total power consumption	0～65535 (1represent 10000kwh)	10000 kwh	0	○
F18.21	Correction factor of power consumption calc ulation	50.0% ~ 200.0%	0.1%	100.0%	○
F18.22	V/F separate control voltage reference channel	0: Digital setting (Determined by 18.23) 1: AI1 analog setting 2: AI2 analog setting 3: Terminal UP / DOWN adjustment setting 4: Reserved 5: EAI1 analog Setting (Extended Valid) 6: EAI2 analog setting (Extended Valid) 7: High-speed pulse setting (X8 terminals need to select the appropriate function) 8: Terminal pulse width setting (X8 terminals need to select the appropriate function) Note: The maximum value of 0 ~ 8 channels correspond to the motor rated voltage.	1	1	○
F18.23	V/F separate control voltage digital reference	0.0% ~ 100.0%	0.1%	0.0%	○
F18.24	Low frequency slip gain	30 ~ 300%	1%	100%	○

F19-Protective Relevant Function Parameter Group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
F19.00	Power off restart waiting time	0.0 ~ 20.0s (0 means no start function)	0.1s	0.0s	×
F19.01	Fault self-recovery times	0 ~ 10 (0 means no automatic reset function)	1	0	×
F19.02	Fault self-recovery interval time	0.5 ~ 20.0s	0.1s	5.0s	×
F19.03	Motor overload protection action selection	0: Alarm: continuous run 1: Alarm,stop run as halt mode 2: Fault,free halt	1	2	○

F19.04	Motor overload protection coefficient	10.0 ~ 2000.0%(motor rated current)	0.1%	100.0%	○
F19.05	Inverter overload pre-alarm detection selection	0: Detection all the time 1: Detection as constant velocity	1	0	○
F19.06	Inverter overload pre-alarm detection level	20 ~ 180% (Inverter rated current)	1%	130%	○
F19.07	Inverter overload pre-alarm delay time	0.0 ~ 20.0s	0.1s	5.0s	○
F19.08	Motor underload alarm detection level	0.0 ~ 120.0% (Motor rated current)	0.1%	50.0%	○
F19.09	Motor underload alarm detection time	0.1 ~ 60.0s	0.1s	2.0s	○
F19.10	Motor underload alarm detection action	Units digit: Detection selection 0: No detection 1: Detection all the time when run 2: Detection only when constant velocity Tens digit: Action selection 0:Alarm,continuous run 1:Alarm,stop run as halt mode 2:Fault,free halt	1	00	○
F19.11	Input& output phase loss, short circuit detection action	Units digit: Input phase loss 0:No detection 1:Fault,free halt Tens digit: Output phase loss 0:No detection 1:Fault,free halt Hundreds digit: Power-on on earth short circuit protect detection enable 0:No detection 1:Fault,free halt Thousands digit: Operation on earth short circuit protect detection enable 0:No detection 1:Fault,free halt	1	1111	○
F19.12	Over voltage stall selection	0:Forbid 1:Allowed	1	1	×
F19.13	Over voltage stall protection voltage	100 ~ 150% (Rated busbar voltage)	1%	125%	×
F19.14	Automatic current limit level	50 ~ 230% (G type rated current)	1%	170%	×
F19.15	Frequency decline rate of automatic current limit	0.00 ~ 99.99Hz/s	0.01Hz/s	10.00Hz/s	×
F19.16	Automatic current limit action selection	0:Constant velocity invalid 1:Constant velocity valid	1	0	×
F19.17	Rapid current-limiting coefficient	150% ~ 250% (G type rated current)	1%	230%	×
F19.18	Motor run section selection when instant power off	0:Forbid 1:Allowed	1	0	×

F19.19	Frequency droop rate when instant power off	0.00 ~ 99.99Hz/s	0.01Hz/s	10.00Hz/s	×
F19.20	Voltage rebound estimate time when instant power off	0.00 ~ 10.00s	0.01s	0.10s	×
F19.21	Action estimate voltage when instant power off	60 ~ 100% (Rated busbar voltage)	1%	80%	×
F19.22	Allowed the longest off time when instant power off	0.30 ~ 5.00s	0.01s	2.00s	×
F19.23	Terminal external device fault action selection	0:Alarm,continuous run 1:Alarm,stop run as halt mode 2:Fault,free halt	1	2	×
F19.24	Power on terminal protection selection	0:Invalid 1:Valid	1	0	×
F19.25	Provide lost detection value	0 ~ 100%	1%	0%	○
F19.26	Provide lost detection time	0.0 ~ 500.0s	0.1s	0.5s	○
F19.27	Feedback lost detection value	0 ~ 100%	1%	12%	○
F19.28	Feedback lost detection time	0.0 ~ 500.0s	0.1s	0.5s	○
F19.29	Deviation magnitude abnormal detection value	0 ~ 100%	1%	50%	○
F19.30	Deviation magnitude abnormal detection time	0.0 ~ 500.0s	0.1s	0.5s	○
F19.31	Protection action selection 1	Units digit: PID provide loss detection act 0:No detection 1:Alarm, Continue run 2:Alarm, Stop run as halt mode 3:Fault, Free halt Tens digit: PID feedback loss detection act 0:No detection 1:Alarm, Continue run 2:Alarm, Stop run as halt mode 3:Fault, Free halt Hundreds digit: PID error value abnormal detect action 0:No detection 1:Alarm, Continue run 2:Alarm, Stop run as halt mode 3:Fault, Free halt	1	000	○
F19.32	Protection action selection 2	Units digit: communication abnormal action: include communication time out and error 0:Alarm, Continue run 1:Alarm, Stop run as halt mode 2:Fault, Free halt Tens digit: E^2PROM abnormal action selection 0:Alarm, Continue run 1:Alarm, Stop run as halt mode	1	0200	×

		2:Fault, Free halt Hundreds digit: Contactor abnormal action 0:Alarm,Continue run 1:Alarm,Stop run as halt mode 2:Fault,Free halt Thousands digit: Running lack-Voltage fault display action selection. 0: No detection 1:fault,free halt			
F19.35	Fault indication and clock during the period of recovery	Units digit: fault indication selection during the period of fault reset automatically 0:Action 1:No action Tens digit: Fault clock function selection: to achieve fault display before power down: etc. 0:Forbid 1:Open	1	00	×
F19.36	Continuous run frequency selection when alarm	Match up with protect action 0:Run at the frequency setup by now 1:Run at the frequency of upper limit 2:Run at the frequency of low limit 3:Run at the frequency of abnormal for standby	1	0	×
F19.37	Abnormal standby frequency	0.00Hz～upper limit frequency	0.01Hz	10.00Hz	×
F19.39	Over speed (OS) detection time	0.0～120.0%(equals upper limit frequency)	0.1%	120.0%	○
F19.40	Over speed (OS) detection time	0.00～20.00s(No detection when value is 0)	0.01s	0.00s	○
F19.41	Detection value when speed deviation (DEV) is too large	0.0～50.0%(equals upper limit frequency)	0.1%	10.0%	○
F19.42	Detection time when speed deviation (DEV) is too large	0.00～20.00s(No detection when value is 0)	0.01s	0.00s	○
F19.43	Overvoltage suppression coefficient	0.0～100.0%	0.1%	90.0%	○
F19.44	Fans start temperature	0～100℃	1	45℃	○

F20 - Internal Virtual Input Output Node Parameter Group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
F20.00	Virtual input VDI1 function selection	0 ~ 90	1	0	○
F20.01	Virtual input VDI2 function selection	0 ~ 90	1	0	○
F20.02	Virtual input VDI3 function selection	0 ~ 90	1	0	○
F20.03	Virtual input VDI4 function selection	0 ~ 90	1	0	○
F20.04	Virtual input VDI5	0 ~ 90	1	0	○

	function selection				
F20.05	Virtual output VDO1 function selection	0 ~ 60	1	0	○
F20.06	Virtual output VDO2 function selection	0 ~ 60	1	0	○
F20.07	Virtual output VDO3 function selection	0 ~ 60	1	0	○
F20.08	Virtual output VDO4 function selection	0 ~ 60	1	0	○
F20.09	Virtual output VDO5 function selection	0 ~ 60	1	0	○
F20.10	Virtual output VDO1 open delay time	0.00 ~ 600.00s	0.01s	0.00s	○
F20.11	Virtual output VDO2 open delay time	0.00 ~ 600.00s	0.01s	0.00s	○
F20.12	Virtual output VDO3 open delay time	0.00 ~ 600.00s	0.01s	0.00s	○
F20.13	Virtual output VDO4 open delay time	0.00 ~ 600.00s	0.01s	0.00s	○
F20.14	Virtual output VDO4 open delay time	0.00 ~ 600.00s	0.01s	0.00s	○
F20.15	Virtual output VDO1 close delay time	0.00 ~ 600.00s	0.01s	0.00s	○
F20.16	Virtual output VDO2 close delay time	0.00 ~ 600.00s	0.01s	0.00s	○
F20.17	Virtual output VDO3 close delay time	0.00 ~ 600.00s	0.01s	0.00s	○
F20.18	Virtual output VDO4 close delay time	0.00 ~ 600.00s	0.01s	0.00s	○
F20.19	Virtual output VDO5 close delay time	0.00 ~ 600.00s	0.01s	0.00s	○
F20.20	Virtual input VDI enable control	00 ~ FF	1	00	○
F20.21	Virtual input VDI status digital setup	00 ~ FF	1	00	○
F20.22	Virtual input/output connection	00~FF Bit0:VDI1 and VDO1 connection 0:Positive logic 1:Negative logic Bit1:VDI2 and VDO2 connection 0:Positive logic 1:Negative logic Bit2:VDI3 and VDO3 connection 0:Positive logic 1:Negative logic Bit3:VDI4 and VDO4 connection 0:Positive logic 1:Negative logic Bit4:VDI5 and VDO5 connection 0:Positive logic	1	00	○

		1:Negative logic			

F21 - Extended AI parameter group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
F21.00	EAI1 Filter time	0 ~ 9.999s	0.001s	0.050s	○
F21.01	EAI1 Gain	0 ~ 9.999	0.001s	1.003	○
F21.02	EAI1 Bias	0.0 ~ 100.0%	0.10%	0.00%	○
F21.03	EAI2 Filter time	0 ~ 9.999s	0.001s	0.050s	○
F21.04	EAI2 Gain	0 ~ 9.999	0.001	1.003	○
F21.05	EAI2 Bias	0.0 ~ 100.0%	0.10%	0.00%	○
F21.06	Extension analog reference bias polarity	Units digit: EAI1 reference bias polarity 0: Positive 1: Negative Tens digit: EAI2 reference bias polarity 0: Positive 1: Negative	1	00	○

F24-Extended AO parameter group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
F24.00	EAO2 Function selection	0 ~ 25	1	0	○
F24.01	EAO1 Function selection	0 ~ 25	1	0	○
F24.02	EDO1 Function selection	0 ~ 25	1	0	○
F24.03	EAO2 Filter time	0 ~ 20.0s	0.1s	0.0s	○
F24.04	EAO2 Gain	0 ~ 2.00	0.01	1.00	○
F24.05	EAO2 Bias	0 ~ 100.0%	0.10%	0.00%	○
F24.06	EAO1 Filter time	0 ~ 20.0s	0.1s	0.0s	○
F24.07	EAO1 Bain	0 ~ 2.00	0.01	1.00	○
F24.08	EAO1 Bias	0 ~ 100.0%	0.10%	0.00%	○
F24.09 ~ F24.13	Reserved				

F25-User Definition Display Parameter Group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
F25.00	User Function Code 1	F00.00 ~ F25.xx	0.01	25.00	○
F25.01	User Function Code 2	F00.00 ~ F25.xx	0.01	25.00	○
F25.02	User Function Code 3	F00.00 ~ F25.xx	0.01	25.00	○
F25.03	User Function Code 4	F00.00 ~ F25.xx	0.01	25.00	○
F25.04	User Function Code 5	F00.00 ~ F25.xx	0.01	25.00	○
F25.05	User Function Code 6	F00.00 ~ F25.xx	0.01	25.00	○
F25.06	User Function Code 7	F00.00 ~ F25.xx	0.01	25.00	○
F25.07	User Function Code 8	F00.00 ~ F25.xx	0.01	25.00	○
F25.08	User Function Code 9	F00.00 ~ F25.xx	0.01	25.00	○
F25.09	User Function Code 10	F00.00 ~ F25.xx	0.01	25.00	○
F25.10	User Function Code 11	F00.00 ~ F25.xx	0.01	25.00	○
F25.11	User Function Code 12	F00.00 ~ F25.xx	0.01	25.00	○
F25.12	User Function Code 13	F00.00 ~ F25.xx	0.01	25.00	○

F25.13	User Function Code 14	F00.00 ~ F25.xx	0.01	25.00	○
F25.14	User Function Code 15	F00.00 ~ F25.xx	0.01	25.00	○
F25.15	User Function Code 16	F00.00 ~ F25.xx	0.01	25.00	○
F25.16	User Function Code 17	F00.00 ~ F25.xx	0.01	25.00	○
F25.17	User Function Code 18	F00.00 ~ F25.xx	0.01	25.00	○
F25.18	User Function Code 19	F00.00 ~ F25.xx	0.01	25.00	○
F25.19	User Function Code 20	F00.00 ~ F25.xx	0.01	25.00	○
F25.20	User Function Code 21	F00.00 ~ F25.xx	0.01	25.00	○
F25.21	User Function Code 22	F00.00 ~ F25.xx	0.01	25.00	○
F25.22	User Function Code 23	F00.00 ~ F25.xx	0.01	25.00	○
F25.23	User Function Code 24	F00.00 ~ F25.xx	0.01	25.00	○
F25.24	User Function Code 25	F00.00 ~ F25.xx	0.01	25.00	○
F25.25	User Function Code 26	F00.00 ~ F25.xx	0.01	25.00	○
F25.26	User Function Code 27	F00.00 ~ F25.xx	0.01	25.00	○
F25.27	User Function Code 28	F00.00 ~ F25.xx	0.01	25.00	○
F25.28	User Function Code 29	F00.00 ~ F25.xx	0.01	25.00	○
F25.29	User Function Code 30	F00.00 ~ F25.xx	0.01	25.00	○

F26 - Fault Record Function Parameter Group

Function code	Name	Set range	Min. unit	Factory default	Modification
F26.00	The last fault record	0:No fault 1:Overcurrent at acceleration 2:Overcurrent at deceleration 3:Overcurrent at constant speed 4:Overvoltage at acceleration 5:Overvoltage at deceleration 6:Overvoltage at constant speed 7:Overvoltage at motor halt 8:Undervoltage at run 9:Drive overload protection 10:Motor overload protection 11:Motor underload protection 12:Input phase loss 13:Output phase loss 14:Inverter module protection 15:Short circuit to earth at run 16:Short circuit to earth when power on 17:Drive overheat 18:External device fault 19:Current detect circuit fault 20:External interference 21:Internal interference—main clock etc 22:PID provide lost 23:PID feedback lost 24:PID error value abnormal 25:Terminal protection activate 26:Communication fault 27~29:Reserved 30:E^2EROM read-write error 31:Temperature detection disconnection 32:Auto-tunning fault 33:Contactor abnormal 34:Factory fault 1 35:Factory fault 2	1	0	*

		36:Capacitor overheat(few mode with overheat protection) 37:Reserved 38:Over-speed protection 39:Protection when speed deviation is too large 40:Reserved 41:Analog channel disconnected protection 42 ~ 50: Reserved			
F26.01	The last two fault records	Same as above	1	0	*
F26.02	The last three fault records	Same as above	1	0	*
F26.03	The last four fault records	Same as above	1	0	*
F26.04	Setup frequency at the last one fault	0.00Hz ~ upper limit frequency	0.01Hz	0.00Hz	*
F26.05	Output frequency at the last one fault	0.00Hz ~ upper limit frequency	0.01Hz	0.00Hz	*
F26.06	Output current at the last one fault	0.0 ~ 6553.5A	0.1A	0.0A	*
F26.07	DC busbar voltage at the last one fault	0.0 ~ 6553.5V	0.1V	0.0V	*
F26.08	Module temperature at the last one fault	0 ~ 125℃	1℃	0℃	*
F26.09	Input terminal status at the last one fault			0	*
F26.10	Accumulated run time at the last one fault	0 ~ 65535min	1min	0min	*
F26.11	Setup frequency at the last two fault	0.00Hz ~ upper limit frequency	0.01Hz	0.00Hz	*
F26.12	Output frequency at the last two fault	0.00Hz ~ upper limit frequency	0.01Hz	0.00Hz	*
F26.13	Output current at the last two fault	0.0 ~ 6553.5A	0.1A	0.0A	*
F26.14	DC busbar voltage at the last two fault	0.0 ~ 6553.5V	0.1V	0.0V	*
F26.15	Module temperature at the last two fault	0 ~ 125℃	1℃	0℃	*
F26.16	Input terminal status at the last two fault			0	*
F26.17	Accumulated run time at the last two fault	0 ~ 65535min	1min	0min	*

F27-Password and Manufacturer Function Parameter Group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
F27.00	User password	00000 ~ 65535	1	00000	○
F27.01	Manufacturer password	00000 ~ 65535	1	00000	○

C-Monitor Function Parameter Group					
Function code	**Name**	**Set range**	**Min. unit**	**Factory default**	**Modifi -cation**
C-00	Display the parameter of F00.01,F00.07 definition				
C-01	Display the parameter of F00.02,F00.08 definition				
C-02	Display the parameter of F00.03,F00.09 definition				
C-03	Display the parameter of F00.04,F00.10 definition				
C-04	Display the parameter of F00.05,F00.11 definition				
C-05	Display the parameter of F00.06,F00.12 definition				

6 Debugging specification

6.1 Detailed function description of Solar inverter

Code NO.	Description	Setup Range/explanation	Factory set up

6.1.1 System Parameter Group:F00

F00.01	C-00 display parameter selection when operation	Range:0～65	51
F00.02	C-01 display parameter selection when operation	Range:0～65	2
F00.03	C-02 display parameter selection when operation	Range:0～65	4
F00.04	C-03 display parameter selection when operation	Range:0～65	5
F00.05	C-04 display parameter selection when operation	Range:0～65	6
F00.06	C-05 display parameter selection when operation	Range:0～65	9

The above parameter display when inverter run by C-00~C-05 parameter groups,Pressing (>>) to switch between these parameters.Pressing (ENTER DATA) and then return to C-00 parameter monitor.For example: pressing (>>) parameter switch from C-00 to C-01: continuous pressing the same button: parameter switch from C-01 to C-02: then pressing (ENTER DATA) return to C-00 parameter monitor.

55:DC busbar current（0.1A）
56:Flow speed (0.1 m3/h)
57:Open-circuit voltage (0.1 V)
58:Output Power（active power）(0.1Kw)
59:Cumulative power（low position）(1Kwh)
60:Cumulative power（high position）(10000Kwh)
61:Daily output (0.1kwh)
62:Daily flow (0.1 m3)
63:Cumulative flow（low position）(1m3)
64:Cumulative flow（low position）(10000m3)
65:Reserved

F00.07	C-00 display parameter selection when stop	Range:0～65	2
F00.08	C-01 display parameter selection when stop	Range:0～65	6
F00.09	C-02display parameter selection when stop	Range:0～65	48
F00.10	C-03 display parameter selection when stop	Range:0～65	14
F00.11	C-04 display parameter selection when stop	Range:0～65	20
F00.12	C-05 display parameter selection when stop	Range:0～65	9

The above parameter display when inverter stop by C-00~C-05 parameter group, pressing (>>) to switch between these parameters. Pressing (ENTER DATA) and then return to C-00 parameter monitor. For example: pressing (>>) parameter switch from C-00 to C-01, continuous pressing the same button: parameter switch from C-01 to C-02: then pressing (ENTER DATA) return to C-00 parameter monitor. Monitor contents various as different monitor parameter: refer to parameter F00.01.

Note

Monitor parameter group C-00~C-05 have run and stop modes. For example C-00 display different physical value under run and stop two modes.

6.1.2 On-off input function parameter group: F08

F08.18	**Input terminal X1 function selection**	**Range:0～96**	**1**
F08.19	**Input terminal X2 function selection**	**Range:0～96**	**2**
F08.20	**Input terminal X3 function selection**	**Range:0～96**	**0**
F08.21	**Input terminal X4 function selection**	**Range:0～96**	**0**
F08.22	**Input terminal X5 function selection**	**Range:0～96**	**0**
F08.23	**Input terminal X6 function selection**	**Range:0～96**	**0**
F08.24	**Input terminal X7 function selection**	**Range:0～96**	**0**
F08.25	**Input terminal X8 function selection**	**Range:0～96**	**0**

The function No. 70,71,72 of Multi-functional input terminal X1 ~ X8 can be selected according to site needs.Detailed parameters and functions please see table 6-1

Table 6-1 Multi-functional input selection function table

Content	Function	Content	Related Function
70	Full-water inspection alarm（A-46）	72	function prohibition on solar inverter
71	Reset of full water alarm	-	-

70:Full-water alarm(A-46). During the operation of the frequency converter, this function is effective, and after maintaining F12.28 time, it enters the standby state of full water, and at the same time, the keyboard warns "A-46".

71:Reset with full-water alarm. When the pump is full-water standby, the terminal NO.70 is invalid, and terminal No. 71 is effective and the holding time is longer than F12.29, the frequency converter will automatically resume operation. If F12.28=0, terminal No. 70 and No. 71 will be invalid.

72:Photovoltaic function prohibite. When the terminal is effective, the photovoltaic parameter group is invalid, and the inverters enter into debugging mode. Can only determine whether the terminal function is effective when When the inverter is stopped. The changing the terminal state is invalid during the inverter is running. The change of the terminal in operation will not take effect until the next shutdown.

6.1.3 Photovoltaic special function parameter group:F12

F12.00	Photovoltaic water supply model	Range: 0～2	1

0:Pv parameter set is invalid, frequency conversion enters debugging mode.

1:Mppt Mode

2:CVT Mode. When F12.00=1 and 2, the frequency converter runs in photovoltaic mode, and when F12.00=2, the frequency converter runs in CVT mode. After running, the voltage of the converter maintains the target voltage which is determined by F12.04.When F12.00=1, the frequency converter will automatically track the maximum power point of photovoltaic panels within the range which is determined by F12.01 and F12.02.

F12.01	Ceiling voltage	Range:80.0～100.0%	90.0%

This parameter defines Mppt mode search upper limit voltage =F12.01* open circuit voltage.

F12.02	Ceiling voltage	Range:50.0～80.0%	50.0%

This parameter defines Mppt mode search Lower limit voltage =F12.02* open circuit voltage.

F12.03	Search interval	Range:0.0～100.0s	1.0s

This parameter defines the search interval time in Mppt mode.If the value is too high, the inverter will take a long time to track to the maximum power point of photovoltaic panel.

F12.04	Voltage increase threshold	Range:0.5～30.0%	0.5%

This parameter defines the varying voltage within the search interval in Mppt mode.

F12.05	Proportional gain Kp	Range:0.00～100.00	Determine by VFD type
F12.06	Integral gain Ki	Range:0.01～10.00	Determine by VFD type
F12.07	Differential gain Kd	Range:0.00～10.00	Determine by VFD type

F12.05 ~ F12.07 define PID coefficients in photovoltaic mode.

The bigger the Kp, the faster the response, but if it is too bigger, the more likely to oscillate.

The bias cannot be completely eliminated by only using proportional gain Kp. In order to eliminate residual bias, integral gain Ki can be adopted to form PI control.The larger the Ki, the faster the deviation response, but the larger the Ki is, the more likely it is to produce oscillation.

F12.08	CVTtarget voltage	Range:50.0～100.0%	80.0%

This parameter define target voltage =F12.08* open circuit voltage under photovoltaic CVT mode.

F12.09	Ways to protect downtime	Range:00～1F BIT0:Low-frequency protection（A-42） BIT1:Dry pumping protection（A-43） BIT2:Overcurrent protection（A-44） BIT3:Minimum power protection（A-45） BIT4:Full-water protection（A-46）	0000

This parameter defines the low-frequency protection, dry pumping protection, overcurrent protection, minimum power protection, water full protection alarm and other ways of stopping.

0:Free stop.
1:Slowing down

F12.10	**Photovoltaic time constant**	**Range:1～100**	**10**
F12.11	**Sleep voltage**	**Range:0.0～600.0V**	**200.0V**
F12.13	**Wake-up voltage**	**Range:0.0～600.0V**	**200.0V**
F12.14	**Wake-up time**	**Range:0.0～6000.0s**	**10.0s**

Sleep function: when the dc bus voltage is less than F12.11, the frequency converter will enter the sleep state and the operating frequency will be reduced to 0.00Hz to achieve the purpose of energy saving and motor protection, and A-47 warning will be displayed.

Function of waking pressure threshold: when the system is in sleep state, when the dc bus voltage is bigger than F12.13 and remains F12.14 for a period of time, it will exit the sleep state.

F12.15	**Low frequency protection frequency**	**Range:0.00～50.00Hz**	**10.00Hz**
F12.16	**Low frequency protection detection time**	**Range:0.0～6000.0s**	**10.0s**
F12.17	**Low frequency protection recovery time**	**Range:0.0～6000.0s**	**10.0s**

Low frequency protection function: under photovoltaic mode, when the output frequency of inverter is less than the corresponding frequency of F12.15 and maintained for F12.16 times, the inverter will enter the low-frequency protection state, the operating frequency will be reduced to 0.00Hz, and A-42 warning will be displayed.The system is in the low-frequency protection state, and after maintaining F12.14 times, it will exit the low-frequency protection state and start running again.

F12.15=0 or F12.16=0, this function is invalid.

F12.18	**Minimum power protection value**	**Range:0.00～100.00Kw**	**0.00Kw**
F12.19	**Minimum power protection time**	**Range:0.0～6000.0s**	**10.0s**
F12.20	**Minimum power recovery time**	**Range:0.0～6000.0s**	**10.0s**

Minimum power protection function: Under the photovoltaic mode, when the inverter output power is less than F12.18 and maintained for F12.19 times, the inverter will enter the minimum power protection state, the operating frequency will be reduced to 0.00Hz, and A-45 warning will be displayed.The system is in the minimum power protection state, and after maintaining F12.20 time, exit the minimum power protection state and restart operation.

F12.18=0 or F12.19=0, this function is invalid.

F12.21	**Overcurrent protection detection current**	**Range:0.0～199.9A**	**0.0A**
F12.21	**Overcurrent protection detection time**	**Range:0.0～6000.0s**	**10.0s**
F12.23	**Automatic recovery time for overcurrent protection**	**Range:0.0～6000.0s**	**10.0s**

Overcurrent protection function: Under the photovoltaic mode, when the output current of the inverter is bigger than F12.21 and maintained for F12.22 times, the inverter will enter the overcurrent protection state, the operating frequency will be reduced to 0.00Hz, and A-44 warning will be displayed.The system is in the overcurrent protection state, and after maintaining F12.23 times, it will exit the overcurrent protection state and start running again.

F12.21=0 or F12.22=0, this function is invalid.

F12.24	**Alarm recovery mode**	**Range: Ones:0、1 Tens:0、1 Hundereds:0、1 Thousands:0、1**	**0000**

This parameter defines the frequency converter action type under the condition of low frequency protection, dry pumping protection, overcurrent protection and minimum power protection.

0: Warning, automatic recovery.

1: Fault, Free stop.

F12.25	**Dry pumping protection detection current**	**Range:0.0～199.9A**	**0.0A**
F12.26	**Dry pumping protection detection time**	**Range:0.0～6000.0s**	**10.0s**
F12.27	**Automatic recovery time for dry pumping protection**	**Range:0.0～6000.0s**	**10.0s**

Overcurrent protection function: Under the photovoltaic mode, when the output current of the inverter is less than F12.25 and remains for F12.26 times, the inverter will enter into the state of draining protection, the operating frequency will be reduced to 0.00Hz, and A-43 warning will be displayed. After the system is in the protection state of pumping out and maintained for F12.27 times, it exits the overcurrent protection state and starts running again.

F12.25=0 or F12.26=0, this function is invalid.

F12.28	**Full-Water protection detection time**	**Range:0.0～6000.0s**	**10.0s**
F12.29	**full-water protection exit time**	**Range:0.0～6000.0s**	**10.0s**

When the photovoltaic inverter is in operation, function terminal No. 70 is effective, and after maintaining F12.28 times, it enters the full-water standby state, and the keyboard display warns "A-46";

under the full-water standby state,when the function terminal No. 70 is invalid, and the function terminal No. 71 is valid and remains longer than F12.29 times, the inverter will resume operation automatically

When F12.28=0, this function is invalid.

F12.30	**DC current correction bias**	**Range:0.0～999.9A**	**0.0A**
F12.31	**DC current correction ratio**	**Range:0.0～500.0%**	**100.0%**

F12.30 and F12.31 are used to adjust the display DC bus current;

Display DC bus current = output DC bus current *F12.31+F12.30.F12.30、F12.31

F12.32	**Power curve 0**	**Range :0.0～999.9Kw**	**0.5Kw**
F12.33	**Power curve 1**	**Range :0.0～999.9Kw**	**1.0Kw**
F12.34	**Power curve 2**	**Range :0.0～999.9Kw**	**1.5Kw**
F12.35	**Power curve 3**	**Range :0.0～999.9Kw**	**2.0Kw**
F12.36	**Power curve 4**	**Range :0.0～999.9Kw**	**2.5Kw**
F12.37	**Flow curve 0**	**Range :0.0～999.9m^3/h**	**0.0m^3/h**

F12.38	**Flow curve 1**	**Range :0.0～999.9m^3/h**	**5.0m^3/h**
F12.39	**Flow curve 2**	**Range :0.0～999.9m^3/h**	**10.0m^3/h**
F12.40	**Flow curve 3**	**Range :0.0～999.9m^3/h**	**15.0m^3/h**
F12.41	**Flow curve s4**	**Range :0.0～999.9m^3/h**	**20.0m^3/h**

F12.32 ~ F12.41 defines the PQ curve, which can be used for users to set 5 groups of PQ corresponding points according to the water pump situation to realize real-time flow rate, daily flow rate and cumulative flow rate calculation.

F12.42	**Flow correction bias**	**Range :0.0～999.9m^3/h**	**0.0m^3/h**
F12.43	**Flow correction gain**	**Range :0.0～999.9%**	**100.0%**

F12.42 and F12.43 are used to adjust the display flow speed;

Display flow speed = real-time calculation flow speed *F12.43+F12.42.

F12.44	**Daily flow/daily electricity reset**	**Range:0～24h**	**7h**

According to F12.44, determine the daily flow and daily power generation calculation cycle.

6.2 Ooperation instructions for asynchronous motor pumps

(1) Wiring

① Confirm whether the type of frequency converter and solar panels match.

② Connect the solar panel "+", "-" terminals to the inverter "R", "T" or "+", "-" bus.Please note that the "+" and "-" connected to the frequency converter cannot be reversed, otherwise it will blow up the plane.

③ Connect the inverter's U, V, W to the motor, and ground of inverters connection motor ground wire.

(2) Parameter setting and trial run

① Set F00.24=0 V/F mode operation, F01.15=0 keyboard operation, reasonable set F01.11 upper limit frequency, F01.12 lower limit frequency.

② Set the F15 group of motor parameters

③ F12.00 is set to 1 or 2. Photovoltaic function enables, and set PV protection function parameters F12.11~F12.29 according to requirements.

④ press the keyboard (REV JOG) , Jog test run, check whether the motor running direction is correct.

(2) Common problems

① Water pump operation at good light,inverters reported A42 ~ A47 frequently ?

Answer: check the relevant function codes of F12 to see whether the protection value and time of relevant functions are set reasonably.

② Incorrect DC current display?

Answer: adjust F12.30 and F12.31 for calibration.

③ Inverter running at good light, but the frequency change quickly?

Answer: adjust the parameters of F12.05 and F12.06 reasonably. It is recommended to adjust them near the default value.

6.3 Introduction of protection function of photovoltaic inverter

(1) Sleep function

Under the photovoltaic mode, when the dc bus voltage is less than F12.11, the frequency converter will enter the sleep state and the operating frequency will be reduced to 0.00Hz to achieve the purpose of energy saving and motor protection, and A-47 warning will be displayed. During the sleep state, when the dc bus voltage is bigger than F12.13 and maintained for F12.14 times, it will exit sleep state.

(2) low-frequency protection function

Under the photovoltaic mode, when the output frequency of the inverter is less than the frequency of F12.15, and the frequency is maintained for F12.16 times, the inverter will enter the low-frequency protection state, and the operating frequency will be reduced to 0.00Hz, and A-42 warning will be displayed.The system is in the low-frequency protection state, and after maintaining F12.14 times, it will exit the low-frequency protection state and start running again. F12.15=0 or F12.16=0, this function is invalid.

(3) Minimum power protection function

In photovoltaic mode, when the output power of the inverter is less than F12.18 and maintained for F12.19, the inverter will enter the state of minimum power protection. The operating frequency will be reduced to 0.00Hz, and A-45 warning will be displayed.The system is in the minimum power protection state, and after maintaining F12.20, it will exit the minimum power protection state and restart operation.F12.18=0 or F12.19=0, this function is invalid.

(4) Overcurrent protection function

Under the photovoltaic mode, when the output current of the inverter is bigger than F12.21 and maintained for F12.22 time, the inverter will enter the overcurrent protection state.The operating frequency will be reduced to 0.00Hz, and A-44 warning will be displayed.The system is in the overcurrent protection state, and after maintaining F12.23, it will exit the overcurrent protection state and start running again.F12.21=0 or F12.22=0, this function is invalid.

(5) Dry pumping protection function

Under the photovoltaic mode, when the output current of the inverter is less than F12.25 and maintained for F12.26 time, the inverter will enter the protection state of pumping out. The operating frequency will be reduced to 0.00Hz, and A-43 warning will be displayed. After the system is in the protection state of pumping out and maintained for F12.27 time, it exits the overcurrent protection state and starts running again. F12.25=0 or F12.26=0, this function is invalid.

(6) Water full protection function

When the photovoltaic inverter is in operation, terminal No. 70 is effective, and after maintaining F12.28 time, it enters the standby state of full water, and the keyboard warns "A-46". When No. 70 terminal is invalid, and No. 71 terminal is effective and keeps longer than F12.29 time, the inverter will resume operation automatically.When F12.28=0, this function is invalid.

(7) Alarm mode

Select the alarm mode for low-frequency protection function, dry pumping protection function, over-current protection function and minimum power function according to F12.24.

0: warning, automatic recovery.

1: fault, free stop.

(8) power curve / flow curve

Users can set parameters of F12.32 ~ F12.43 to realize display functions of real-time flow, daily flow and cumulative flow.

The daily flow and daily generating capacity are calculated by default as 7h for one day, and the time can be set by changing F12.44.

7 Troubleshooting

7.1 Failure and countermeasure

Possible failure types in EN600PV are shown in Table 7-1, the fault types including fault and alarm two kinds. Such as if inverter fault display E-XX, while the corresponding alarm is displayed in A-XX. Once the inverter failure , fault types are stored in the F26 fault recording parameter group, and if alarm, alarm status has been revealed, until the alarm source release, alarm status are not logged to the F26 parameter group. Some failure code is reserved for intelligent automatic diagnosis function which will be executed continuously in future. When failure takes place in the inverter, the user should check according to note of these table first and record failure phenomena detailedly. Please contact our after-sale service and technical support Department or agent in your local place when technical service is needed.

Table 7-1 Failure type and the countermeasure

Failure code	Failure type	Possible reason	Countermeasure
E-01	Over current during accelerating process	Accelerating time is too short	Prolong accelerating time
		Improper V/F curve	Adjust V/F curve setting，adjust manual torque boost or change to automatic torque boost
		Restart rotating motor	Set speed checking restart function
		Low power source voltage	Check input power supply
		Too small power of the inverter	Choose inverter with high-power
		Output phase lose under vector control	Check whether the motor wiring is in good condition
E-02	Overcurrent during decelerating process	Decelerating time is too short	Prolong decelerating time
		Have potential energy load or big Inertia load	Have potential energy load or big Inertia load
		Power of inverter is a bit small	Choose inverter with high-power
E-03	Overcurrent during constant speed process	Load change suddenly or have unwonted phenomena	Check or reduce saltation of the load
		Acc./Dec. time is set to too short	Prolong accelerating /decelerating time properly
		Low power source voltage	Check input power supply
		Power of inverter is a bit small	Choose inverter with high-power
E-04	Overvoltage during accelerating process	Unwonted input voltage	Check input power supply
		Acc. time is set to too short	Prolong accelerating time properly
		Restart rotating motor	Set speed checking restart function
E-05	Overvoltage during Decelerating process	Decelerating time is too short	Prolong decelerating time
		Have potential energy load or big inertia load	Increase braking power of external energy consumption braking subassembly
E-06	Overvoltage during constant speed process	Unwonted input voltage	Check input power supply
		Acc/Dec time is set to too short	Prolong accelerating decelerating time properly
		Input voltage change abnormally	Assemble reactor
		Load inertia is a bit big	Use energy consumption subassembly

E-07	Inverter control power supply overvoltage	Unwonted input voltage	Check input power supply or look for service
E-08	Low-voltage when running	Input voltage is too low	Check the input voltage
E-09	Inverter overload protection	Acc time is set to too short	Prolong accelerating time
		DC injection braking is too big	Reduce DC injection braking current，prolong braking time
		Improper V/F curve	Adjust V/F curve and torque boost
		Restart rotating motor	Set speed checking restart function
		power source voltage is too low	check power source voltage
		Load is too big	Choose inverter with high-power
E-10 （A-10）	Motor overload protection	Improper V/F curve	Adjust V/F curve and torque boost
		Power source voltage is too low	check power source voltage
		General motor run at low speed with big load	Can choose frequency conversion motor for long time low speed run
		Motor overload protection factor set incorrectly	to set motor overload protection factor correctly
		Motor blocked up or load change too suddenly and quickly	Check the load
E-11 （A-11）	Motor underload protection	The operating current of inverter less than underload threshold	Confirm whether the parameters F19.08, F19.09 setting are reasonable
		load divorced from motor	Checking whether the load divorced from motor
E-12	The input phase lose	The three-phase input power supply is abnormal	Check the three-phase input power line is off or poor contact
		Power supply board anomaly	Look for service from manufacturer or agent
		The control board anomaly	Look for service from manufacturer or agent
E-13	Output phase loss	The lead from the inverter to the motor is abnormal.	Check motor leads
		Inverter three-phase output is unbalanced while the motor is running	Check if the three-phase winding of the motor is balanced
		The power board is abnormal.	Look for the service from manufacture
		The main control board is abnormal.	Look for the service from manufactur
E-14	Inverter module protection	Inverter transient overcurrent	Refer to countermeasures for overcurrent
		Output three phase has phase-to-phase short circuit or ground short circuit	Rewiring
		Air duct blockage or fan damage	Clean the air duct or replace the fan
		Ambient temperature is too high	Reduce ambient temperature
		Control panel connection or plug-in loose	Check and reconnect
		The output waveform is	Check wiring

		abnormal and the current waveform is abnormal.	
		Auxiliary power supply is damaged, drive voltage is under voltage	Look for the service from manufactur
		The control board is abnormal	Look for the service from manufactur
E-15	Short circuit to ground when operation	Motor short circuit to ground	The replacement of cable or motor
		Hall component is damaged or the hall wiring is poor or the current detection circuit is abnormal	Look for service from manufacturer or agent
E-16	Short circuit to ground when power on	Motor short circuit to ground	Change the cable or motor
		The power supplier of the inverter and the motor wiring are reversed	Change the cable or motor wiring
		Hall component is damaged or the hall wiring is poor	Look for service from manufacturer or agent
E-17 （A-17）	Inverter overheat	Continuous alarm on A-17 for more than 30 minutes	Clean up the air duct or improve ventilation
		Duct blockage	Clean up the air duct or improve ventilation
		The ambient temperature is too high	Improve ventilation and reduce carrier frequency
		Fan damage	Replace the fan
E-18 （A-18）	External device failure	External fault emergency stop, terminal closed	Disconnect external fault terminals after handling external faults
E-19	Current detecting circuit failure	The connection or the plug-in of the control board is loose.	Check and connect the wire again
		Assistant power supply damaged	Look for service from manufacturer or agent
		Hall component damaged	Look for service from manufacturer or agent
		Amplifying circuit abnormal	Look for service from manufacturer or agent
E-20	External interference failure	The interruption protection of CPU is triggered, but none of the actual overcurrent, overvoltage and short circuit signals have been detected	Press the “STOP/RESET” button to reset or add a power filter to the power input side.
E-21	Internal interference failure	Internal disturbance serious	Power off and restart, if the failure persists, seek the manufacturer or dealer service
E-22 (A-22)	PID given loss	PID given loss threshold setting is unreasonable	To reset the relevant parameters
		External given disconnection	Check external given wiring
		The main control board is abnormal.	Look for service from manufacturer or agent
E-23 (A-23)	PID feedback loss	PID feedback loss threshold setting is unreasonable	To reset the relevant parameters

		Feedback signal disconnection	Check external feedback signal wiring
		The main control board is abnormal.	Look for service from manufacturer or agent
E-24 （A-24）	PID error amount abnormal	PID error amount abnormal detect threshold setting is unreasonable	To reset the relevant parameters
		The main control board is abnormal	Look for service from manufacturer or agent
E-25	Start terminal protection	Terminal command effective when power on .	Check the external input terminal state
E-26 （A-26）	Communication failure	Improper baud rate setting	Set the baud rate appropriately
		Serial port communication error	Press the "STOP/RESET" button to reset and seek service
		Improper setting of fault alarm parameters	Modify the settings of F05.04 and F05.05
		The host computer is not working	Check if the host computer works or not, and the wiring is correct
E-30 （A-30）	E^2PROM read and write wrongly	Error in reading and writing control parameters	Press the “STOP/RESET” button to reset and seek the service from the manufacturer or dealer.
E-31	Temperature detecting disconnection	Temperature sensor failure	Look for service from manufacturer or agent
		Temperature detection circuit is abnormal	Look for service from manufacturer or agent
E-32	Self tuning failure	Motor parameters are not set according to the nameplate	set parameter correctly according to the motor nameplate
		Abnormal current during tuning	Select inverter match the motor
		Motor wiring is incorrect	Check the motor three-phase wiring
E-33 （A-33）	Contactor is abnormal	The power board is abnormal	Look for service from manufacturer or agent
		Contactor is abnormal	Replace contactor
E-34	The factory fault 1	Debugging use in factory	
E-35	The factory fault 2	Debugging use in factory	
E-36 （A-36）	The bus capacitor overheating	Poor cooling environment	Improve the inverter heat dissipation environment
		The inverter capacity is too small	Select inverter match motor
		Bus capacitance cooling fan is damaged	Replace the bus capacitor cooling fan
E-38	Overspeed protection	Short acceleration time	Prolong the acceleration time
		Low inverter power	Select high-power inverter
		Overspeed detect parameter F19.39 and F19.40 is set improperly	Set the parameter properly according to the situation
E-39	Large speed deviation protection	Short Acceleration/ deceleration time	Prolong the acceleration time
		Low inverter power	Select high-power inverter
		Speed deviation is too large Parameter F19.41 and F19.42 is set improperly	Set the parameter properly according to the situation

E-41	Analog channel disconnection	The physical quantity detected by AI1 or AI2 is not within the reasonable range, or the circuit of AI1 or AI2 is in poor contact.	Reasonably control the physical quantity measured by AI1 or AI2 and check the wiring of AI1 or AI2.
E-42 (A-42)	Low frequency protection	The light is too weak or the F12.15, F12.16, F12.17 are improperly set.	Set parameters according to actual conditions
E-43 (A-43)	Dry pumping protection	The load is too small or F12.25, F12.26, F12.27	Set parameters according to actual conditions
E-44 (A-44)	Overcurrent protection	Load is too large or overcurrent protection F12.21, F12.22, F12.23 is improperly set	Set parameters according to actual conditions
E-45 (A-45)	Minimum power protection	The load is too small or the minimum power protection value F12.18 is set too large.	Set parameters according to actual conditions
A-46	Water full warning	Function terminal function No. 71 is invalid, or the function of 70 terminal is always valid.	Check the signal status of terminals 70 and 71;
A-47	Sleep protection	The light is too weak or F12.11, F12.13, F12.14;	Set parameters according to actual conditions
A-51	The main and auxiliary given frequency channel exclusiveness alarm	Parameter setting error	F01.00 and F01.03 cannot be set to the same channel (9: terminal encoder given except)
A-52	Terminal function exclusiveness alarm	Terminal function parameters setting repeatedly	Check the terminal function settings
A-53	Operation limit alarm	Limit run time	Please contact the superior supplier
LOCH1.	Keypad lock	Keypad lock	Press ESC MENU key for more than 2s to unlock the keypad.

Note

(1) Alarm fault of E-16, the inverter must be power off for reset.
(2) For the faults of over-current, short-circuit to ground while running, inverter can reset after 2s's delay

7.2 Failure record lookup

This series inverter can record latest 4 failure code and inverter run parameter of thelast 2 times failure, refer to these information can redound to finding out reason ofthe failure.

Failure information is all stored in F26 group parameter , please enter into F26 groupparameter to see about information by referring to keypad operation method.

Code	Content	Code	Content
F26.00	Previous one failure record	F26.09	Input terminal state at previous failure
F26.01	Previous two failure record	F26.10	Running time at previous failure
F26.02	Previous three failure record	F26.11	Set freq. at previous 2 failure
F26.03	Previous four failure record	F26.12	Output freq. at previous 2 failure
F26.04	Set freq. at previous failure	F26.13	Output current at previous 2 failure
F26.05	Output freq. at previous failure	F26.14	DC bus volt. at previous 2 failure

F26.06	Output current at previous failure	F26.15	Module temp. at previous 2 failure
F26.07	DC bus volt. at previous failure	F26.16	Input terminal state of previous 2 failure
F26.08	Module temp. at previous failure	F26.17	Running time of previous 2 failure

7.3 Failure reset

(1) Before reset you must find out reason of failure downright and eliminate it,otherwise may cause permanent damage to the inverter.
(2) If can't reset or failure takes place again after resetting, should look for reason and continuous resetting will damage the inverter
(3) Reset should take place 5 minutes later after overload, overheat protection action.
(4) For the fault of E-14, the reset is invalid, the motor wiring should be checked after power off, and restart the inverter.
(5) When there is a fault of E-16 after power on, do not directly run the inverter after reset, and need to check whether the input,outwiring are reversed.

To resume normal running when failure takes place in the inverter, you can choose following any kind of operation:

(1) After you set any terminal of X1~X8 to be inputted by external RESET, it will be reset after connected to COM.

(2) When failure code is displayed，press key after confirmed that it can be restoration.

(3) Communication reset. Please refer to annex description.

(4) Cut off power supply.

7.4 Alarm reset

When an alarm occurs, must eliminate alarm source which cause alarm, otherwise the alarm cannot be eliminated, also cannot be reset by reset button.

8 Maintenance

8.1 Routine maintenance

When you use this series you must assemble and operate it according to demand listed in this "service manual" strictly. During run state, temperature, humidity, vibration and aging parts will affect it, which may cause failure of the inverter. To void this, it is recommended to perform routine inspections and maintenance.

Table 8-1 Daily inspection and maintenance items

Period		Inspection item
Daily	Periodic	
√		Daily cleaning: (1)Inverter should be maintained in a clean state (2)Clean up the dust on the surface of inverter, prevent the dust into the inverter internal (especially metal dust) (3)Clean up the oil stain of cooling fan
	√	Check the air duct, and clean regularly.
	√	Check whether the screws is loose
	√	Check whether the inverter is corrode
√		Whether inverter installation environment changes
√		Whether the inverter cooling fan is working properly
√		Whether the inverter is overheating
√		When motor running whether the voice changes abnormally
√		Whether abnormal vibration occur when motor running
	√	Check whether wiring terminals have arc trace
	√	The main circuit insulation test

Recommend to inspect with following instrument:

Input voltage: electric voltmeter; output voltage: rectifying voltmeter; input output current: pincers ammeter.

8.2 Inspection and replacement of damageable parts

Some component parts in the inverter will be abraded or bear descending performance for long-term usage, To assure that the inverter can run stably and reliably, it is recommended to perform defending maintenance and replace corresponding parts if necessary.

(1) Cooling fan

Abnormal noise, even oscillation may take place if the fan have wearing bearing,aging blade, here replacement of the fan should be considered.

(2) Filter electrolyte capacitance

When frequent-changing load causes increasing pulsant current and aging electrolyte under high ambient temperature, the electrolyte capacitance may be damaged and here should replace it.

8.3 Repair guarantee

(1) We provide the free maintenance within warranty time if any failure or damage under normal usage, the warranty time can be seen in the warranty card,we will charge some when exceed warranty time.

(2) We will take some upkeep if one of following situations takes place within period of repair guarantee.

a. If did not use the inverter according to service manual strictly or did not use it under ambient demanded in service manual, which cause failure.

b. Failure caused by applying the inverter to non-normal function;

c. Failure caused by self-repair, refit which is not already allowed;

d. Damage caused by bad keeping, falling down from high place or other extrinsic factor after purchasing the inverter;

e. Failure caused by natural disaster or its reason such as unwonted voltage, thunderbolt, water fog, fire, salt corroding, gas corroding, earthquake and storm etc.;

f. Make bold to tear up product logo (such as: nameplate etc.); Body serial number don't accord with that in repair guarantee card.

(3) We calculate service fee based on actual cost, which is subject to contract if any.

(4) You can contact the agent and also our company directly if you have questions.

After repair guarantee period, we shall also provide lifetime charged repair service for our products.

Note

Our company will also provide lifetime repair service with fee for inverter which is not within period of repair guarantee.

8.4 Storage

The user must pay attention to following points for temporary storage and long-term storage after purchasing the inverter:

(1) Avoid storing the inverter in high temperature, moist place and place of dust, metal powder and assure good ventilation.

(2) Longtime storage will cause low quality of electrolyte capacitance, so must assure that it's electrified for one time within 1 year and electrification time is not shorter than 1 hour and input voltage must be increased to rated value gradually by voltage regulator of 250w, meanwhile the inverter should be cut off from the motor.

Appendix A Modbus Communication Protocol

A.1 Summary

We provide general RS485 communication interface in our inverters for the user. Through this communication interface upper device (such as HMI, PC, PLC controller and etc.) can perform centralized monitor to the inverter (such as to set inverter parameter, control run of inverter, read work state of the inverter).

This communication protocol is interface criterion file designed for realizing above-mentioned function, please read it earnestly and program according to it so that realize long-distance and network control to the inverter.

A.2 Communication networking mode

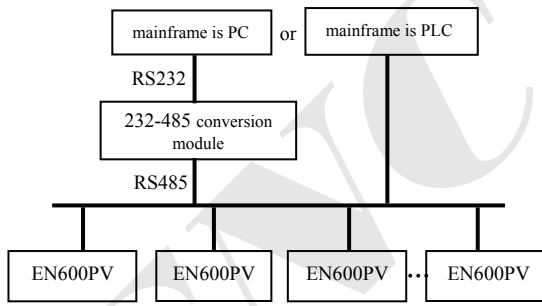


Fig.A-1 Networking graph

A.3 Communication mode

At present,EN600PV inverter can be used only as Slave device in RS485 net. Can realize communication between inverters through PC, PLC or HMI if it needed. Specific communication mode is as mentioned below:

(1) PC or PLC as mainframe， inverter as Slave device, point-to-point communication between mainframe and Slave device.

(2) Slave device don't response when mainframe send out command by broadcast address.

(3) User can set local address, baud rate and data format of the inverter through Slave device keypad or serial communication mode.

(4) EN600PV provides the RS485 interface.

(5) Default mode: Asynchronous serial， semiduplex transport mode. There are RTU and ASCII two mode . Default format and transport rate: 8-N-1, 9600bps.

A.4 Transmission mode

Asynchronous serial, semiduplex transport mode. Default format and transport rate: 8-N-1, 9600bps. The detail setting parameter, please refer to the F05 group function mode.(Remark: the parameter is valid under the Modbus communication, the other parameter comply with the original service manual)

F05.00	Protocol selection	0:Modbus protocol 1:Reserved 2:Profibus protocol(expansion is valid) 3:CanLink protocol(expansion is valid) 4:CANopen protocol(expansion is valid) 5:free protocol 1(revision all the parameter of EN600PV is valid) 6: free protocol 2(only revising part Parameter of EN600PV is valid) Remark: expansion card is needed when Select 2,3,4 communication	1	0	×
F05.01	Baud rate setting	Units digit: free protocol and Modbus Baud rate selection 0:300BPS 1:600BPS 2:1200BPS 3:2400BPS 4:4800BPS 5:9600BPS 6:19200BPS 7:38400BPS 8:57600BPS	1	005	×
F05.02	Data format	Units digit: free protocol and Modbus protocol Data format 0:1-8-1 format, no checkout， RTU 1:1-8-1 format, Even Parity， RTU 2:1-8-1 format, Odd Parity， RTU 3:1-7-1 format, no checkout， ASCII 4:1-7-1 format, Even Parity， ASCII 5:1-7-1 format, Odd Parity， ASCII		00	×
F05.03	Local address	0～247，00 is broadcast address	1	1	×

A.5 Data communication structure

A.5.1 Data frame format

Using RTU mode, messages are sent at least 3.5 character time interval pause.The first transmitted field is device address, the character you can transfer is hexadecimal 0x00 ~ 0xFF. Network equipment Continuously monitor the bus,including pauses. When the address field is received, all equipment determine whether it is sent to their own. when the last character of the packet transfer is complete, at least a 3.5 character times pause mean the end of the message. A new message can begin after this pause.

The entire message frame must be transmitted as a continuous flow. If a new message start transmitting in less than 3.5 character times after a message and then receiving device will consider it a continuation of the previous message. This will cause an error, because in the final CRC field value can not be right.

RTU frame format as the table below:

Frame Header	3.5 characters time pause
Slave address	Slave address:0~247
Communication command code	03H:read slave parameter 06H:write slave parameter
Data content DATA	The contents of packet: Parameter address(16bit); Number of parameter or bytes of parameter value; Parameter value(16bit)
Data content DATA	
……	
……	
CRC check value low byte	16bit Unsigned check value

CRC check value high byte	
Closing Flag	3.5 characters time pause

Regarding generation method of CRC check value, please refer to check mode Section.

ASCII frame format as the table below:

Frame Header	':'（0x3A）
Slave address Hi	Slave address: Combined by 2 ASCII code
Slave address Lo	8 bit slave address 0~247
Command code Hi	Command code: 8 bit command code combined by 2 ASCII code
Command code Lo	03H:read slave parameter 06H:write slave parameter
Data content DATA	The contents of data packet
Data content DATA	N pieces of 8bit data content combined by 2*N pieces of ASCII code
……	
……	
LRC CHK Hi	LRC check value includes 2 pieces of ASCII code
LRC CHK Lo	
Closing Flag Hi	Closing Flag Hi = CR（0x0D）
Closing Flag Lo	Closing Flag Lo = LF（0x0A）

A.5.2 Host read slave parameter

Command code 03H. Host can read one or more parameter (up to ten) by initiating a communication transaction. E.g., read 2 contiguous inverter parameter values from the address 0000H of inverter whose address is 01, the contents of host command:

ADR	01H
CMD	03H
Parameters initial address high byte	00H
Parameters initial address low byte	00H
Number of parameter high byte	00H
Number of parameter low byte	02H
CRC check value low byte	C4
CRC check value high byte	0B

The contents of slave reply:

ADR	01H
CMD	03H
Parameter value bytes	04H
Address 0000H content high byte	00H
Address 0000H content low byte	00H
Address 0001H content high byte	00H
Address 0001H content low byte	03H
CRC check value low byte	BA
CRC check value high byte	F2

A.5.3 Host write slave parameter

Command code 06H. Host can write an parameter by initiating a communication transaction .

E.g.,The decimal system 5000 (1388H) written to the inverter 0101H address whose slave address is 02， host command including:

ADR	02H
CMD	06H
Parameter address high byte	01H
Parameter address low byte	01H
Parameter value high byte	13H
Parameter value low byte	88H
CRC check value low byte	D4
CRC check value high byte	93

The contents of slave reply:

ADR	02H
CMD	06H
Parameter address high byte	01H
Parameter address low byte	01H
Address 0101H content high byte	13H
Address 0101H content low byte	88H
CRC check value low byte	D4
CRC check value high byte	93

A. 6 Data communication address allocation

A.6.1 Function code F00-F26 group communication address

Inverter function parameter's MODBUS communication address addressing process follows PPnn way: PP means high byte of the address, corresponding to function parameter's group number; nn means low byte of the address,corresponding to function code parameter's group internal code. For example:F3.21 function code's communication address is 0315H, 03H is the hex form of group number 3, 15H is the hex form of group internal code 21.F00.00~F26.17 communication address is 0000H~1A11H, F26 group fault record parameter start address is 1A00H.

A.6.2 Control command and status word communication address

Variable Name	Communication address	Reading-writing attribute	Command data or response value meaning
Run command word	1E00H	Reading and writing	1:reserved
			2:jog stop command
			3:forward jog run
			4:reversal jog run
			5:run
			6:stop
			7:forward run
			8:reversal run
			9:fault reset
			10:reserved
Serial port value	1E01H	Reading and	F01.02 hundreds=0:5000represents50.00Hz

set		writing	F01.02 hundreds=1:10000representsF01.11
Inverter status	1E02H	Reading only	BIT0:bus volt. set up BIT1:common run command valid BIT2:jog run command valid BIT3:running BIT4:current running direction is reverse BIT5:operating instruction is reverse BIT6:decelerating & braking BIT7:accelerating BIT8:decelerating BIT9:alarm BIT10:fault BIT11:current limiting BIT12:fault self-recovery BIT13:self tuning BIT14:free stop status BIT15:rotated speed tracking start
Alarm code	1E03H	Reading only	0:no alarm 1～50:current alarm code

Note

Modbus communication address: 1E01 is the given address of Frequency-Communication mode; 1D01 is the given address of Torque-Communication mode; 1D00 is the given address of PID-Communication mode.

A.6.3 Monitor parameter communication address

Variable name	Communication address	Read-write attribute	Command data or response value
C-00	1C00H	reading only	Monitoring parameters 1
C-01	1C01H	reading only	Monitoring parameters 2
C-02	1C02H	reading only	Monitoring parameters 3
C-03	1C03H	reading only	Monitoring parameters 4
C-04	1C04H	reading only	Monitoring parameters 5
C-05	1C05H	reading only	Monitoring parameters 6

A.6.4 Inside hidden parameters

Variable name	Communication address	Read-write attribute	Means of command data or response value
PID Communication presetting value	1D00H	Read-write	Range:0～1000（1000 represents 10.00V）
Torque communication presetting value	1D01H	Read-write	Range:0～2000（2000 represents 200.0% rated motor torque）
Communication AO1 given value	1D02H	Read-write	Range:0～4000（4000 represents 10.00V or 20.00mA）
Communication AO2 given value	1D03H	Read-write	Range:0～4000（4000 represents 10.00V or 20.00mA）
Communication EAO1	1D04H	Read-write	Range:0～4000（4000 represents 10.00V or 20.00mA）

given value			
Communication EAO2 given value	1D05H	Read-write	Range:0～4000（4000 represents 10.00V or 20.00mA）
Communication DO given value	1D06H	Read-write	Range:0～4000（4000 represents 10.00V or 20.00mA）
Communication EDO given value	1D07H	Read-write	Range:0～4000（4000 represents 10.00V or 20.00mA）
The communication output terminal given value	1D08H	Read-write	BIT0:Y1 BIT1:Y2 BIT2:Y3 BIT3: Y4 BIT4: RLY1 BIT5: EY1 BIT6: EY2 BIT7: EY3 BIT8: EY4 BIT9: ERLY1 BIT10: ERLY2
Communication virtual input terminal given value	1D09H	Read-write	BIT0:CX1 … BIT7: CX8
Positive toque limited frequency	1D0AH	Read-write	Range:0～60000 （60000 represents 600.00Hz）
Negative toque limited frequency	1D0BH	Read-write	Range:0～60000 （60000 represents 600.00Hz）
PID feedback voltage	1D0CH	Read-write	Range:0～4000 （4000 represents 10.00V）
Reserved	1D0DH	/	

A.7 Communication error processing

Inverter receiving data packet detection error, it finds reading&writing parameter address or parameter value invalid, so reply to the host with communication error response packet. Communication error response packet (host command code+80H) as command code, with 1 byte error code.

Format for communication error response packet as follows:

ADR	01H
CMD	83H/86H
Communication error code	01H~06H (for details, please check below table)
Low byte of CRC checksum	Obtain by calculating
High byte of CRC checksum	Obtain by calculating

Meaning for each communication error code value as follows:

Communication error code value	Communication error type	Priority
0x01	CRC checksum error	1
0x02	Command code illega	2
0x03	Register address visited illegal	3
0x04	Value to write register illegal	4

0x05	Not allow to modify parameters	5
0x06	Register number read illegal	6

A.8 Data frames examples

A.8.1 RTU Mode

1. Start #1 inverter running

Data Field	Slave Address	Order code	Register address High byte	Register address Low byte	Data High byte	Data Low byte	CRC low bit	CRC high bit
host command frames	01	06	1E	00	00	05	4F	E1
Slave respond frames	01	06	1E	00	00	05	4F	E1

2. Stop #1 inverter running

Data Field	Slave Address	Order code	Register address High byte	Register address Low byte	Data High byte	Data Low byte	CRC low bit	CRC high bit
host command frames	01	06	1E	00	00	06	0F	E0
Slave respond frames	01	06	1E	00	00	06	0F	E0

3. Set #1 inverter given value to 50.00Hz

Data Field	Slave Address	Order code	Register address High byte	Register address Low byte	Data High byte	Data Low byte	CRC low bit	CRC high bit
host command frames	01	06	1E	01	13	88	D3	74
Slave respond frames	01	06	1E	01	13	88	D3	74

4. Read #1 inverter running state

Data Field	Slave Address	Order code	Register address High byte	Register address Low byte	Data High byte	Data Low byte	CRC low bit	CRC high bit
host command frames	01	03	1E	02	00	01	23	E2
Slave respond frames	01	03	(Respond value byte quantity) 02		00	01	79	84

A.8.2 ACSII Mode

Host read Slave, Command code: 03

The host frame

The host frame format																	
	Frame begin symbol	Slave address	Slave address	Command code	Command code	Register addres	Register addres	Register addres	Register addres	Register number	Register number	Register number	Register number	Checkout	Checkout	Ending symbo	
Send byte	1	2		2		4				4				2		2	

Remark:

- **Begin symbol:**
  The lower computer judge the frame header of ASCII based on this. It is:':'
- **Slave address:**
  Single inverter ID code， range:0~247.
  Thereinto, 0 is broadcast address. Broadcast address can control all the lined Slave simultaneously， and the Slave will not send back any Data to the host. That means the Slave only accept and do not send.
  Modbus protocol without host address.
- **Command code:**
  Reading the command of parameter or data from inverter ， the value is:'0''3'.
- **Register address**:
  The internal memory address of inverter function parameter is of 4 byte, which is ASCII mode transformed from Hexadecimal. Corresponding relation between specific parameters and memory address can be seen in the later table.
- **Register number:**
  The number of parameters read by a frame, it is 4 byte. It is ASCII mode transformed from Hexadecimal.
- **Checksum:**
  From "slave address" to the character before checksum, the LRC checksum of the character string. Function terminal can be seen on the end of the text.
- **Ending code:** enter， line break. is:0x0D,0x0A

Response frame

Response frame format											
	Frame begin symbol	Slave address	Slave address	Command code	Command code	Data byte	Data byte	Data string value	checksum	checksum	Ending code
Send byte	1	2		2		2		N*2	2		2

Remark:

- **Begin code:**
  The lower computer judge the frame of ASCII frame. This is :':'
- **Slave address:**
  Single inverter ID code， range:0～247.
  Thereinto, address 0 is broadcast address. Broadcast address can control all the lined Slave simultaneously， and the Slave will not send back any Data to the host. That means the Slave only accept and do not send.
  Modbus protocol is without host address.
- **Command code:**
  The command of reading parameter or data from inverter, the value is:'0''3'.
- **Data byte:**
  The number of parameters read by a frame. It is 4 byte, which is ASCII mode transformed from hexadecimal.
- **Data string value**:
  The detail return Data， the length of Data string is the register address "Data byte", which is ASCII mode transformed from hexadecimal. Range: 4~40 byte
- **Checksum:**
  From "slave address" to the character before checksum, the LRC checksum of the character string.
  The function terminal can be seen in the later text.
- **Ending symbol:** enter, line break. Is 0x0D,0x0A
  The followings are the example of command frame and return frame, all the Data are ASCII character.
- **Inquiry frame:**
  : 0 1 0 3 0 0 0 1 0 0 0 1 F A \n\r
  (The detail introduction of every byte)
  ":": beginning symbol
  0 1: Slave address
  0 3:read the command
  0 0 0 1:storage address of reading parameter
  0 0 0 1:the number of reading the parameter
  F A:{ 0 1 0 3 0 0 0 1 0 0 0 1} for LRC checksum.
  0xFA = 0x100 - (0x01 + 0x03 + 0x00 + 0x01 + 0x00 + 0x01)
- **Response frame:**
  : 0 1 0 3 0 2 0 0 3 3 C 7 \n\r
  (The detail introduction of every byte)
  ":": beginning symbol
  0 1: Slave address
  0 3:read the command
  0 2:The byte length of return parameter Data.
  0 0 3 3:return parameter， current storage value
  C 7:{ **0 1 0 3 0 2 0 0 3 3**} for LRC checksum.
  0xC7 = 0x100 – (0x01 + 0x03 + 0x02 + 0x00 + 0x33)

The main frame writes slave address single register, command code: 06

The host frame

The host frame format																
	Frame begin symbol	Slave address	Slave address	Command code	Command code	Register address	Register address	Register address	Register address	Data	Data	Data	Data	Checkout	Checkout	Ending symbol
Send byte	1	2		2		4				4				2		2

Remark:

- **Slave address**:
  Single inverter ID code， range:0～247.
  Thereinto, address 00 is broadcast address.
- **Command code**:
  Read parameter from inverter or command of Data, the value is:06
- **Register address**:
  The storage address of inverter function parameter, is double byte.
  The high byte is in the front and the low byte is in the back.
  The detail relation between parameter and storage address can be seen in the later excel.
- **Data**:
  The new value of revised parameter.
- **Checksum:**
  From “slave address” to the character before checksum, the LRC checksum of the character string.

Response frame

Response frame format																
	Frame begin symbol	Slave address	Slave address	Command code	Command code	Register address	Register address	Register address	Register address	Data	Data	Data	Data	Checkout	Checkout	Ending symbol
Send byte	1	2		2		4				4				2		2

Remark:

- **Slave address**:
  Single inverter ID code， range:0～247.
  Thereinto, address 00 is broadcast address.
- **Command code**:
  Read parameter from inverter or command of Data, the value is:06
- **Register address**:
  The storage address of inverter function parameter, is double byte.
  The high byte is in the front and the low byte is in the back.
  The detail relation between parameter and storage address can be seen in the later excel.
- **Data**:

The new value of revised parameter.

- **Checksum**:
  From "slave address" to the character before checksum, the LRC checksum of the character string.
  The followings are the example of command frame and return frame, all the Data are ASCII character.
- **Inquiry frame:**
  : 0 1 0 6 0 1 0 1 1 3 8 8 5 C \n\r

(The detail introduction of every byte)
":": beginning symbol
0 1: Slave address
0 6:write command
0 1 0 1:storage address of writing parameter
1 3 8 8:the value of writing parameter
5 C:{ **0 1 0 6 0 1 0 1 1 3 8 8**} for LRC checksum.
0x5C = 0x100 - (0x01 + 0x06 + 0x01 + 0x01 + 0x13 + 0x88)
¬ **Response frame:**
: 0 1 0 6 0 1 0 1 1 3 8 8 5 C \n\r
(Detail introduction of every byte)
":": beginning symbol
0 1: Slave address
0 6:write command
0 1 0 1:storage address of writing parameter
1 3 8 8:the value of writing parameter
5 C:{ **0 1 0 6 0 1 0 1 1 3 8 8**} for LRC checksum.
0x5C = 0x100 - (0x01 + 0x06 + 0x01 + 0x01 + 0x13 + 0x88)

Note

(1) ASCII frame realizes transform by that 8Bit hexadecimal is divided as different 2 character of 4, and then grouped ashexadecimal of one 8Bit when reaching the destination.
(2) Frame header, add":", frame footer adds"\n\r" the enter line break character.
(3) The valid character in the protocol is:,0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,Fand hexadecimal 0DH, lower case ASCII letter a, b, c, d, e, f is invalid
(4) The subject data volume is the 2 times as RTU, checksum adopt LRC check.
(5) For the other information, please refer to the official standard

A.9 CRC checkout mode

CRC checkout value calculating function written by C language is as follows:

```
unsigned int cal_crc_value (unsigned char *pval, unsigned char len)
{
  unsigned int crc_value=0xFFFF;
  unsigned int i;

  while(len--)
  {
        crc_value ^= *pval++;
        for(i=0; i<8; i++)
        {
              if(crc_value & 0x0001)
              {
```

```
                        crc_value >>= 1;
                        crc_value ^= 0xA001;
                }
                else
                {
                        crc_value >>= 1;
                }
        }
  }
  return(crc_value);
}
```

Appendix B Accessories Selection

B.1 Selection for communication expansion card：

At present, our company can provide our customers with the following several kinds of communication expansion cards.

NO.	Model NO.	Description	Remark
1	EN-PRO1	PROFIBUS-DP expansion card（for machine which power range of 15KW and below）	Optional
2	EN-PRO2	PROFIBUS-DP expansion card（for machine which power range of 18.5KW and above）	Optional
3	EN-CAN1	CANopen expansion card	Optional
4	EN-CAN2	CANlink expansion card	Optional

B.2 Selection for isolated form of 485 communication extension card：

It is specially developed to provide 485 communication functions for inverters, adopting isolated solution, the electrical parameters meet international standards. Users can choose according to their needs, to control operation and parameter settings and other functions of the inverter via remote serial port.

NO.	Model NO.	Description
1	EN-TX485	Isolated form 485 communication card, 485 communication signals isolated by optical coupler, stronger anti-interference ability.

Shenzhen Encom Electric Technologies CO., LTD.
Address: 5F, Bldg.4, Minqi Technology Park, Lishan Rd.,
Nanshan Area, Shenzhen 518055, China
Website: www.encvfd.com
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encvfd@enc.net.cn
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