



**ISO9001 Quality  
Management System  
Authentication**

# **EN606 series**

Ver. 1.2

**Injection asynchronous servo  
control cabinet**

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**SHENZHEN ENCOM ELECTRIC TECHNOLOGIES CO.,LTD.**

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# 1 Safety information and use notice points

To make ensure personal & equipment safety, this chapter must be read carefully before the cabinet 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. |
| <br><b>Note</b> | Should pay extra cautions when cabinet in use under this symbol                          |



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



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



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

## 1.2 Application range

- (1) This kind of cabinet apply to 3 phase ac asynchronous motor only for general industry.
- (2) It should handle cautiously and consult with manufacturer when cabinet apply to high reliability required equipment which relevant to life, properties and safety device.
- (3) This kind of cabinet is the general motor control device in industry. When cabinet apply to dangerous equipment, safeguard should be considerable in case of cabinet failure.

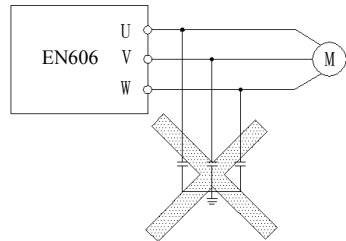
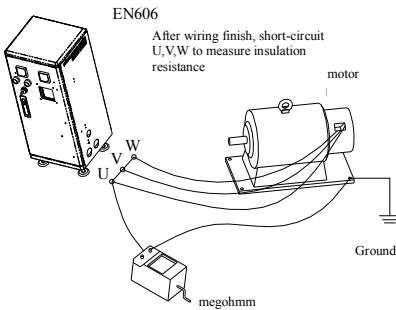
## 1.3 Use notice points

- (1) EN606 series cabinet belong to voltage type cabinet, and it is normal with up temperature, noise and vibration of motor increasing over power frequency run slightly.
- (2) It is required to match cabinet with variable frequency motor running at low speed with constant torque for long time. When match cabinet with general asynchronous motor running at low speed, it should take measures to make motor heat dissipation or monitoring motor temperature in avoid of motor flash.
- (3) It is necessary to take measures in advance for the damage caused for the bad lubrication of the reduction box and wheel gear mechanical devices running at low speed for long time.
- (4) It is necessary to assure at first that the use speed range of motor bearings and mechanical devices, also the increasing of motor vibration and noise should be considered, when motor run over rated frequency.
- (5) It is necessary to select the suitable brake assembly for hoisting device and big inertia load to make sure the normal work when cabinet stripping from power grid for the overcurrent or overvoltage failure.
- (6) cabinet start and stop control through terminal or other normal command channel, otherwise it may cause cabinet damage via connecting cabinet input terminal to big current switch just like contactor direct to start and stop cabinet frequently.
- (7) It is necessary to make sure cabinet cut off from operation without output, when cabinet and motor connect through switch components just like contactor etc. Otherwise it will cause cabinet damage.
- (8) When cabinet output frequency within some range, it may meet mechanical resonance point of load device, through setting jump frequency to avoid it.
- (9) Checking power supply voltage within allowed working range before usage, otherwise, it need to change voltage or custom special voltage cabinet.

(10)When cabinet usage site altitude over1000 meters, cabinet should decrease current to use, output current decrease about 10% of rated current per 1000 meters increase.

(11)Motor should do insulation check before first usage or reuse after lay aside for long time. Checking method show as graph 1-1 below with 500V voltage type megohm meter , insulation resistance should not smaller than 5 MΩ, otherwise cabinet maybe damaged.

(12)Forbid cabinet output side to assemble capacitor to improve power factor or anti-thunder dependent resistor etc, otherwise it may cause cabinet fault trip or component damage show as graph 1-2.



**Fig.1-1 motor insulation check      Fig.1-2 capacitor at output side forbidden**

## 1.4 Scraping handling notice

Notices when handling with scrapped cabinet and components:

- (1) The unit: dispose the cabinet as industrial waste.
- (2) Electrolytic capacitor: It may cause explosion when electrolytic capacitor under burning.
- (3)Plastic: it may result in harmful and poisonous gas when plastic and rubber of cabinet burning, and safeguard preparations should be taken before burning.

## 2 Cabinet Type and Specification

### 2.1 Incoming cabinet inspect

- (1) Check if there is damage during transportation and cabinet 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 cabinet 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

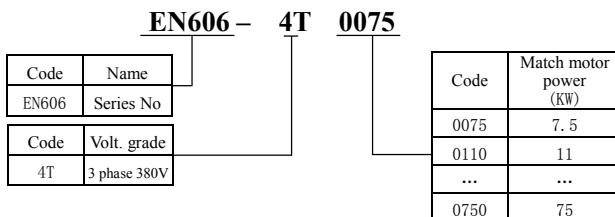


Fig.2-1 Type description

### 2.3 Nameplate explanation

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

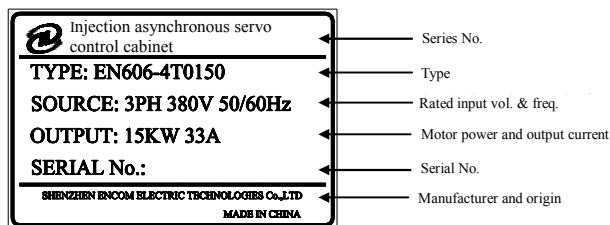


Fig.2-2 Nameplate



### 2.4 cabinet type explanation

| Input Voltage   | cabinet type | Rated output Current(A) | Adaptable motor (KW) |
|-----------------|--------------|-------------------------|----------------------|
| 3 phase<br>380V | EN606-4T0075 | 17                      | 7.5                  |
|                 | EN606-4T0110 | 25                      | 11                   |
|                 | EN606-4T0150 | 33                      | 15                   |
|                 | EN606-4T0185 | 39                      | 18.5                 |
|                 | EN606-4T0220 | 45                      | 22                   |
|                 | EN606-4T0300 | 60                      | 30                   |
|                 | EN606-4T0370 | 75                      | 37                   |
|                 | EN606-4T0450 | 91                      | 45                   |
|                 | EN606-4T0550 | 112                     | 55                   |
|                 | EN606-4T0750 | 150                     | 75                   |

### 2.5 Appearance and parts name explanation

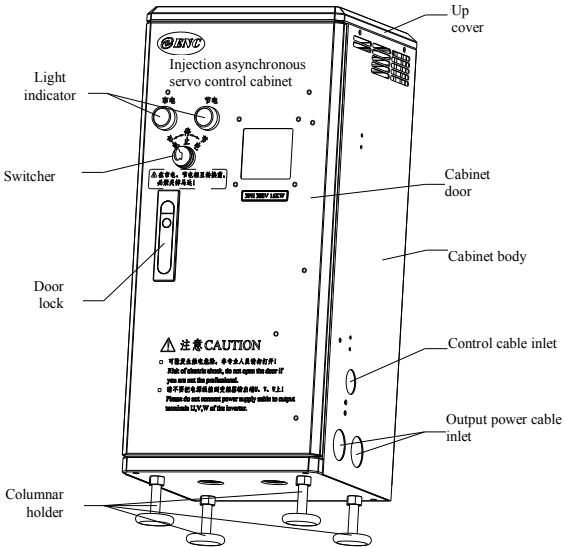


Fig.2-3 Cabinet Parts name sketch

## 2.6 outer size

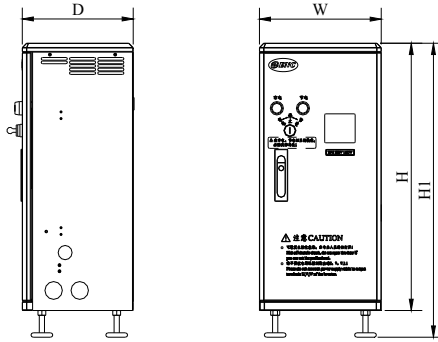


Fig.2-4 outer dimension

Table 2-1 mounting size

| cabinet type | W (mm) | D (mm) | H (mm) | H1 (mm) | G.W. (kg) |
|--------------|--------|--------|--------|---------|-----------|
| EN606-4T0075 | 260    | 255    | 570    | 620     | 19        |
| EN606-4T0110 | 260    | 255    | 570    | 620     | 21        |
| EN606-4T0150 | 280    | 255    | 600    | 660     | 23.5      |
| EN606-4T0185 | 320    | 300    | 675    | 735     | 35        |
| EN606-4T0220 |        |        |        |         |           |
| EN606-4T0300 | 360    | 300    | 770    | 830     | 39        |
| EN606-4T0370 |        |        |        |         |           |
| EN606-4T0450 | 435    | 345    | 895    | 955     | 65        |
| EN606-4T0550 |        |        |        |         |           |
| EN606-4T0750 | 520    | 450    | 1200   | 1250    | 153       |

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

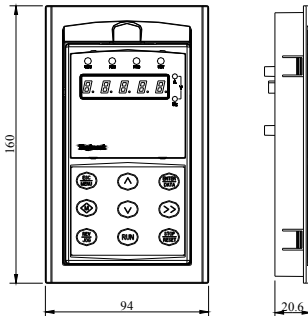


Fig.2-5 KB25 Mounting size of keypad

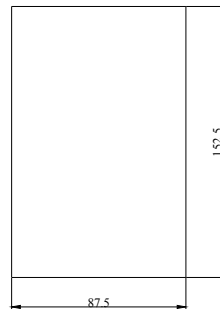


Fig.2-6 KB25 Hole size of keypad

## 2.8 Product technic index and spec

| Item                |   | Item description  |                        |
|---------------------|---|---|------------------------|
| Input               | Rating volt., frequency   | 3 phase 380V Grade: 3 phase 380V, 50Hz/60Hz   |                        |
|                     | Allowed volt. range   | 320~460V  |                        |
| Output              | Voltage   | 0~380V  |                        |
|                     | Frequency   | 0~600Hz   |                        |
|                     | Over loading capacity   | 150% of rated current for 1 minute  |                        |
| Control Performance | Control mode  | vector control, open-loop V/F control   |                        |
|                     | Velocity control precision  | ±0.5% rated synchronous speed (vector control);<br>±1% rated synchronous speed (V/F control);   |                        |
|                     | Speed regulation range  | 1: 100 (vector control);<br>1: 50 (V/F control);  |                        |
|                     | Start-up torque   | 1.0Hz: 150% rated torque (V/F control);<br>0.5Hz: 150% rated torque (vector control);   |                        |
|                     | Speed fluctuation   | ±0.3% rated synchronous speed (vector control);   |                        |
|                     | Torque control precision  | ±10% rated torque (vector control);   |                        |
|                     | Torque response   | ≤20ms (vector control);   |                        |
|                     | Frequency precision   | Digital setting: max. frequency×±0.01%; Analog setting: max. frequency×±0.5%  |                        |
|                     | Freq. resolution  | Analog setting  | 0.1% of max. frequency |
|                     |   | Digital setting   | 0.01Hz                 |
|                     |   | Exterior impulse  | 0.1% of max. frequency |
|                     | Torque boost  | Automatic torque boost; manual torque boost 0.1~12.0%   |                        |
|                     | V/F curve(volt. Frequency characteristic)   | Setting rated frequency at the range of 0.5~650Hz, by choosing constant torque, degressive torque 1, degressive torque 2, degressive torque 3, self-defined V/F total 5 kinds of curve.                             |                        |
|                     | Acceleration Deceleration curve   | Two modes: straight line acceleration and deceleration; S curve acceleration and deceleration; 15 kinds of acceleration and deceleration time, time unit (0.01s, 0.1s, 1s) for option , max. time for 1000 minutes. |                        |
| DC brake            | Start, stop action for option, action frequency 0~15Hz, action current 0~100% of rated current, action time 0~30.0s |   |                        |
| jog                 | Jog frequency range: 0Hz~up limit frequency; jog acceleration and deceleration time 0.1~6000.0 seconds for setting. |   |                        |

|                             |                                     |   |
|-----------------------------|-------------------------------------|---|
|                             | Multi-section speed run             | Realized by inbuilt PLC or control terminal; with 15 section speed, each section speed with separately acceleration and deceleration time; with inbuilt PLC can achieve reserve when power down.  |
|                             | Inbuilt PID controller              | Convenient to make closed-loop control system   |
|                             | Automatic energy saving run         | Optimize V/F curve automatically to achieve power saving run according to the load status.  |
|                             | Automatic voltage regulate(AVR)     | Automatically keep output voltage constant, when the power grid voltage fluctuation   |
|                             | Automatic current limiting          | Current limited automatically under run mode in avoid of cabinet over-current frequently to trip.   |
|                             | carrier wave modulation             | Modulate carrier wave automatically according to the load characteristic.   |
|                             | Speed tracking restart              | Make rotating motor smoothly start without shocking   |
| 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 realize one main adjusting and one fine adjustment 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               | 8 Channels 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                | 2 channels for analog input , AI1 can choose 4~20mA or 0~10V input, AI2 is differential input channel, 4~20mA or -10~10V input for option, I1 or I2 :0~1A input, V1 or V2:0~10V 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               | 2 Channels for analog signal output, AO1 can choose 4~20mA or 0~10V, AO2 can choose 4~20mA or 0~10V to achieve setting frequency, output frequency and other physical quantity output, which can be expanded to 4 channels analog output.                   |
| Unique function             | Rapid current limit                 | Limit cabinet over current to the greatest point, and make it run more stably   |
|                             | Monopulse control                   | Suitable for working site where need one button to control cabinet start and stop, first press to start, then press to stop, and that cycle repeats. Its very simple and reliable.  |
|                             | Fixed length control                | Realize fixed length control  |
|                             | Timing control                      | Timing control function: setting time range 0.1Min ~ 6500.0Min  |
|                             | Virtual terminal                    | Five group virtual input & output IO can realize simply logical control   |

|                     |                         |  |
|---------------------|-------------------------|--|
| keypad              | LED 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 current per 1000 meter high)   |
|                     | Environment temperature | -10℃~+40℃ ( environment temperature between 40℃~50℃, need to reduce volume or strengthen heat sink )   |
|                     | Environment             | Smaller than 95%RH, no drop condenses  |
|                     | Vibration               | Smaller than 5.9 M/S <sup>2</sup> (0.6g)   |
|                     | Storage temperature     | -40℃~+70℃  |
| structure           | Protection grade        | IP20   |
|                     | Cooling mode            | Forced air cooling and natural   |
| Installation mode   |                         | cabinet installation   |



Note

**To get a perfect usage performance of the cabinet, 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 cabinet damage.**

## 3 Installation and wiring of control cabinet

### 3.1 Installation ambient of control cabinet

- (1) Installed in drafty indoor place, the ambient temperature should be within  $-10^{\circ}\text{C}$ ~ $40^{\circ}\text{C}$ , it needs external compulsory heat sink or reduce the volume if temperature is over than  $40^{\circ}\text{C}$ , and preheat if the temperature is lower than  $-10^{\circ}\text{C}$ .
- (2) Avoid installing in places with direct sunlight, much dust, floating fiber and metal powder.
- (3) Don't install in place with corrosive, explosive gas.
- (4) The humidity should be smaller than 95%RH, without condensation water.
- (5) Installed in place of plane fixing vibration smaller than  $5.9\text{m/s}^2$  (0.6g).
- (6) Keep away from electromagnetic disturbance source and other electronic apparatus sensible to electromagnetic disturbance.

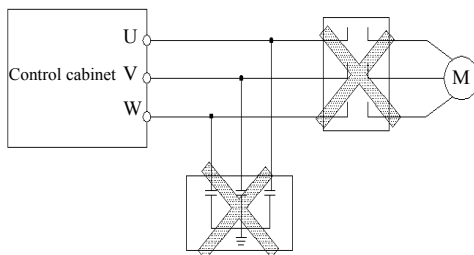
### 3.2 Wiring notice points



- (1) Assure power be cut off completely for above 10 minutes before wiring, otherwise there is danger of getting electric shock.
- (2) Forbid connecting power wire to output U, V, W of the control cabinet.
- (3) There is current leakage inside the control cabinet. For safety, inverter and motor must be earthed safely, whose requirements can be seen in the No.8 of chapter 3.4.1
- (4) Before shipment compression resistance test of the control cabinet is passed, so users should not conduct compression resistance test again.
- (5) Do not assemble electromagnetic contactor and absorbing capacitance or other absorbing device. If magnetic control and other switching elements are needed, please make sure the control cabinet is suspended without output, see fig. 3-6.
- (6) To be convenient for over current protection of input side and power off maintenance, control cabinet should be connected to power supply through air switch and magnetic control.
- (6) Glued wire or shielding wire should be applied for the wire of control signal, one shielding layer end hung in the air, the other connected to ground, connecting wire shorter than 20m.



- (1) Before wiring, assure power supply is cut off completely for 10 minutes and all LED indicator light extinguished.
- (2) Wiring can only be done by professional person trained and qualified.
- (3) Before electrification, check if voltage grade of the inverter is in line with that of power supply voltage, otherwise will cause personnel injured and device damaged.



**Fig. 3-1 Contactor and absorption capacitor are prohibited between control cabinet and motor**

### 3.3 Main loop terminal wiring

#### 3.3.1 Connection between control cabinet and Optional Components

- (1) Must assemble disjunction device such as isolation switch etc. between power source and the control cabinet to assure personal safety when repairing the inverter and compulsory power off.
- (2) To supply power for loop must have breaker or fuse with over current protection function to avoid malfunction expanding caused by failure of device after.
- (3) AC input reactor  
If high-order harmonics between control cabinet and power supply is strong which can't fulfill system requirement or need to improve input side power factor, AC input reactor is needed.
- (4) Contactor is only applied for power supply control, not for the On/Off control of control cabinet.
- (5) Input side EMI filter  
EMI filter can inhibit high-frequency conduction disturbance and emission disturbance from control cabinet power supply wire.
- (6) Output side EMI filter  
EMI filter can inhibit emission disturbance noise and wire leakage current from output side.
- (7) AC output reactor  
Installing AC output reactor is suggested to avoid motor insulation damage, oversize current leakage and control cabinet frequent protection when connecting wire between control cabinet and motor exceeds 50m.
- (8) Complete ground wire  
Control cabinet and motor must be earthed and grounding resistor should be smaller than  $10\Omega$ . Grounding wire should be short and thick enough. About  $3.5\text{mm}^2$  of copper wire is needed.

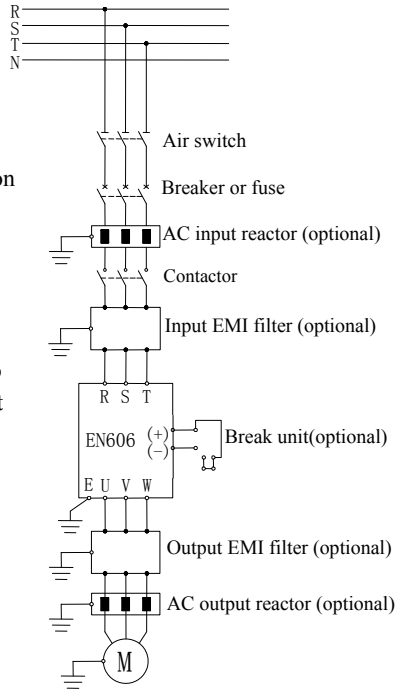


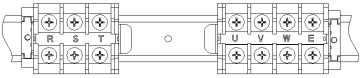
Fig 3-2 connection of control cabinet and fitting parts



### 3.3.2 Main loop terminal wiring

(1) For main loop input output terminal, see table 3-1.

**Table 3-1 main loop input & output terminal description**

| Adapted type                      | Main loop terminal  | Terminal name        | Function description   |
|-----------------------------------|---|----------------------|--|
| EN606-4T0075<br>~<br>EN606-4T0750 |  | R、S、T<br>U、V、W、<br>E | 3 phase AC 380V input terminal<br>3 phase AC output terminal<br>shield earthing terminal |



The wiring of main loop must be right according to the description above. Wrong wiring will cause device damage and people injured.

### 3.4 Basic running wiring diagram

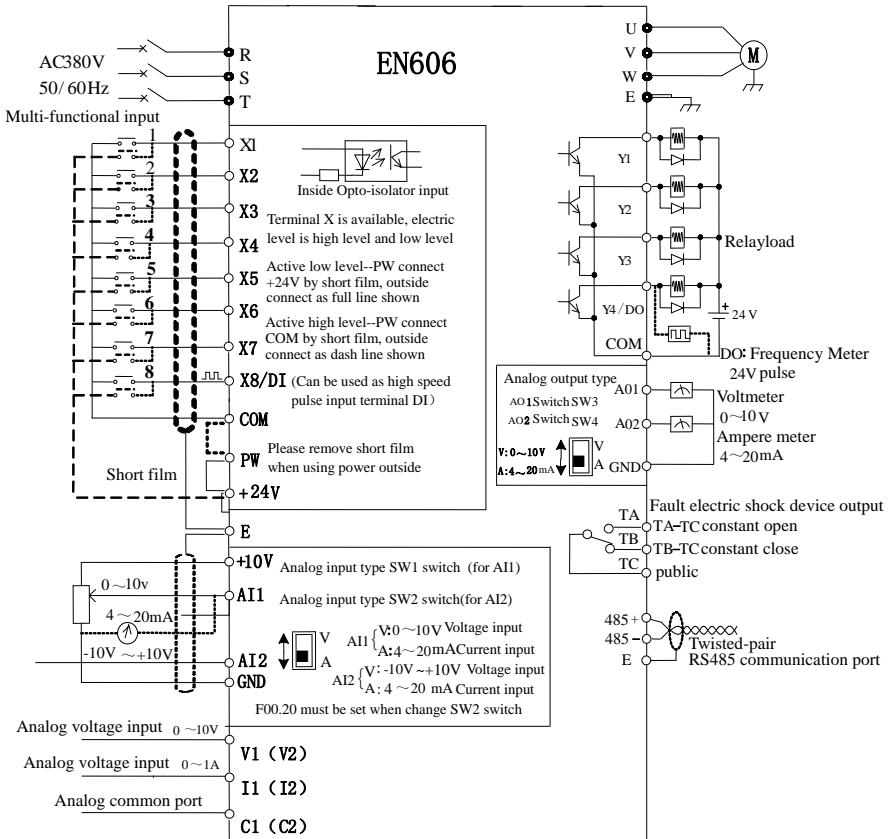


Fig.3-3 basic wiring diagram

### 3.5 Control loop collocation and wiring

#### 3.5.1 Relative location & function of terminal and slide switch:

For location of terminal and slide switch on the control panel CPU board of control cabinet, please see Fig.3-10.

The terminal CN1 and CN7 are used by the manufacturers. CN2 is extended interface. CN5 is for keypad. The CN3, CN4 and CN6 for users can be seen in table 3-2. The description and function of slide switch consult table3-3. Please read the following descriptions carefully before using control cabinet.

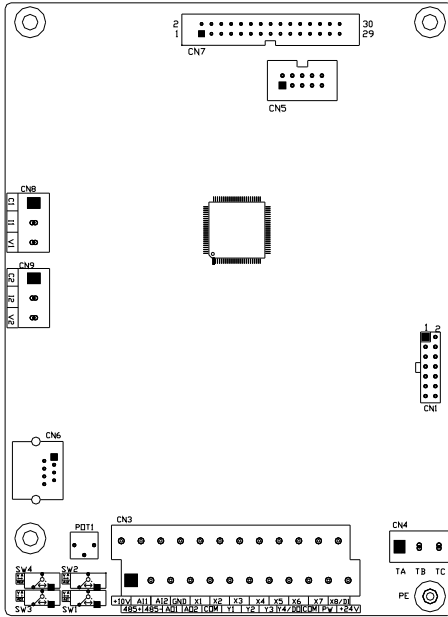








Fig.3-4 Sketch map of CPU board

Table 3-2 Function description of terminal provided for user

| No.     | Function  | Description   |
|---------|---|---|
| CN3     | Input and output control of external terminal     | use when apply external terminal to control the control cabinet running, see 3.5.2                      |
| CN4     | Signal output of relay                            | TA-TC is normally open contact ;TB-TC is normally close contact. See 3.5.2                              |
| CN6     | crystalRS485communication interface               | When use 485 communication to realize control, please see Fig.3.6.2                                     |
| CN8、CN9 | Analog input channel of injection molding machine | Two channels of voltage input V1、C1 and V2、C2; Two channels of current input I1、C1 and I2、C2, see 3.5.2 |

**Table 3-3 Slide switch function description for users**

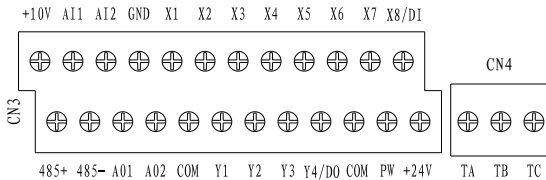
| No. | Function                           | Setting   | Default value                   |
|-----|------------------------------------|---|---------------------------------|
| SW1 | AI1 Analog input signal selection  |  V: Set F00.20 as XXX0<br>0~+10V voltage signal input<br> I: Set F00.20 as XXX1<br>4~20mA current signal input      | Set F00.20 as 0000<br>0~+10V    |
| SW2 | AI2 Analog input signal selection  |  V: Set F00.20 as XX0X.<br>-10V~+10V voltage signal input<br> I: Set F00.20 as XX1X.<br>4~20mA current signal input | Set F00.20 as 0000<br>-10V~+10V |
| SW3 | AO1 Analog output signal selection |  V: Set F00.21 as XX00<br>0~+10V voltage signal output<br> I: F00.21 设为 XX11<br>4~20mA current signal output        | Set F00.21 as 0000<br>0~+10V    |
| SW4 | AO2 Analog output signal selection |   |                                 |



**In the graphic of the toggle switch, the black square shows the position of the toggle switch.**

### 3.5.2 Descriptions for control panel terminals

(1) The terminal CN3 and CN4 on CPU board are arranged as follows:



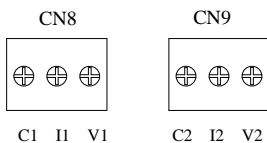
(2) CN3 and CN4 terminal function description as Table 3-4.

**Table 3-4 Control panel terminal function table**

| Item                         | Symbol | Name                           | Function description and Spec of terminals   |
|------------------------------|--------|--------------------------------|--|
| Multifunction input terminal | X1     | Multifunction input terminal 1 | Input voltage range: 15~30V;<br>Optocoupler isolation, Compatible with bipolar input;<br>Input impedance: 4.7KΩ<br>The max input frequency: 1KHz |
|                              | X2     | Multifunction input terminal 2 |  |
|                              | X3     | Multifunction input terminal 3 |  |
|                              | X4     | Multifunction input terminal 4 |  |
|                              | X5     | Multifunction input terminal 5 |  |
|                              | X6     | Multifunction input terminal 6 |  |
|                              | X7     | Multifunction input terminal 7 |  |

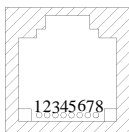
|                                 |       |  |  |
|---------------------------------|-------|--|--|
|                                 | X8/DI | Multifunction input terminal 8/<br>High speed impulse input terminal | Besides the function of X1~X7, can also be used as high-speed pulse input<br>Input impedance: 2.2K $\Omega$<br>The max input frequency: 50KHz.   |
| Power supply                    | +24V  | +24V Power supply  | Provide power of +24V (24 $\pm$ 4V)<br>The max output current: 200mA   |
|                                 | PW    | External power input terminal  | Connecting to +24 is factory default ; connecting external power and cutting off +24V power terminal is needed when using external signal to drive X terminal.   |
|                                 | +10V  | +10V Power supply  | Provide +10V power (10 $\pm$ 0.5V)<br>The max output current:50mA  |
|                                 | COM   | Common end   | Reference ground of digital signal and +24V power  |
|                                 | GND   | Common end   | Reference ground of analog signal and +10V power   |
| Analog value input              | AI1   | Analog value input 1   | Input range: DC 0V~10V/4~20mA , decided by SW1<br>Input impedance : 20K $\Omega$ when voltage input; 250 $\Omega$ when current input.<br>resolution: 1/4000  |
|                                 | AI2   | Analog value input 2   | Input range: DC-10V~10V/4~20mA , decided by second bit on LED of parameter F00.20 and slide switch of SW2<br>Input impedance : 20K $\Omega$ when voltage input; 250 $\Omega$ when current input.<br>resolution: 1/2000 |
| Analog value output             | AO1   | Analog value output 1  | Output of voltage or current is decided by SW3(AO1) and SW4(AO2)<br>Range of voltage output: 0~10V<br>Range of current output: 4~20mA  |
|                                 | AO2   | Analog value output 2  |  |
| Multifunctional output terminal | Y1    | Open collector output terminal 1                                     | Optocoupler isolation output, unipolar open collector output<br>Max voltage output: 30V<br>Max current output: 50mA  |
|                                 | Y2    | Open collector output terminal 2                                     |  |
|                                 | Y3    | Open collector output terminal 3                                     |  |
|                                 | Y4/DO | Open collector output terminal 4/High-speed impulse output           | Decided by the output way of function code F00.22 terminal<br>When select open collector output, the spec is the same as terminal Y<br>When select high-speed impulse output, the max frequency is 20KHz.              |
| Relay output                    | TB—TC | Normally closed terminal   | Contact capacity:<br>AC250V/2A (cos $\phi$ =1)<br>AC250V/1A (cos $\phi$ =0.4)<br>DC30V/1A  |
|                                 | TA—TC | Normally open terminal   |  |
| Communication interface         | 485+  | 485 differential signal interface                                    | 485 differential signal positive end   |
|                                 | 485-  |  | 485 differential signal negative end   |

(3) Control panel terminal of CN8、CN9, arranged as follows:



| Item | Symbol | Name   | Function description and Spec of terminals      |
|------|--------|--|---|
| CN8  | C1     | Injection molding analog channel 1 reference ground  | Current channel: 0~1A<br>Voltage channel: 0~10V |
|      | I1     | Injection molding analog channel 1 current interface |   |
|      | V1     | Injection molding analog channel 1 voltage interface |   |
| CN9  | C2     | Injection molding analog channel 2 reference ground  | Current channel: 0~1A<br>Voltage channel: 0~10V |
|      | I2     | Injection molding analog channel 2 current interface |   |
|      | V2     | Injection molding analog channel 2 voltage interface |   |

(4) RS485 crystal socket CN6, arranged as follows:



| Arrangement of RS485 terminal CN6 |      |      |   |   |   |   |   |   |
|-----------------------------------|------|------|---|---|---|---|---|---|
| Order                             | 1    | 2    | 3 | 4 | 5 | 6 | 7 | 8 |
| Name                              | 485+ | 485- | - | - | - | - | - | - |

### 3.5.3 Wiring of analog input & output terminal

(1) AI1 terminal accepts analog voltage or current signal end input and switchover by SW1, wiring as follows:

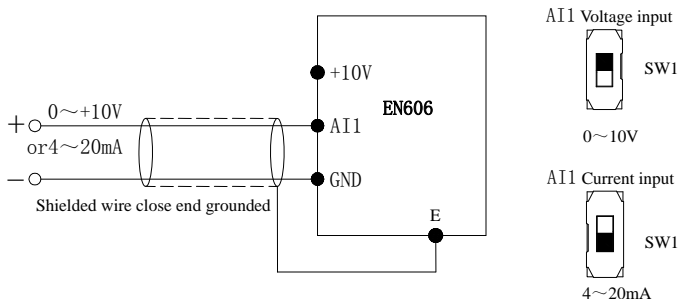
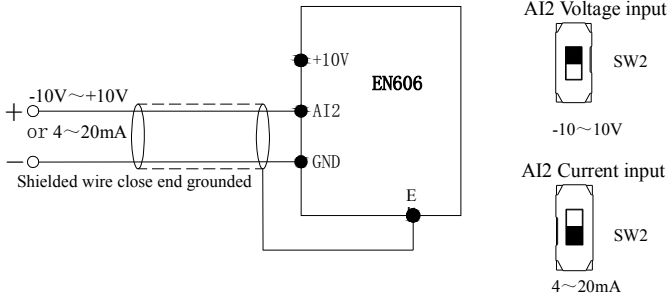


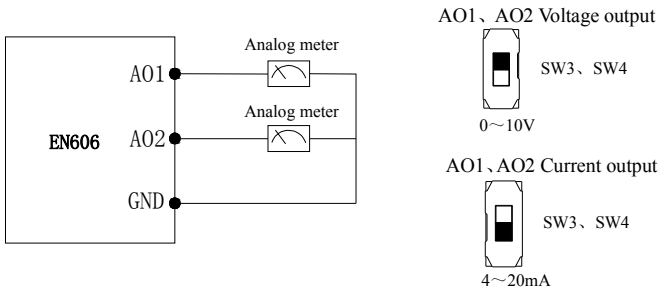
Fig.3-5 AI1 terminal wiring diagram

(2) AI2 terminal accepts analog voltage or current signal end input and switchover by SW2, which must be coordinated with the ten bit on LED when setting parameter F00.20, the wiring as follows:



**Fig.3-6 AI2 terminal wiring diagram**

(3) AO1, AO2 terminal can connect external analog meter, which can indicate several physical quantity, can select output analog voltage or current signal, switchover by SW3 and SW4. wiring mode as follows:



**Fig. 3-7 AO1, AO2 terminal wiring diagram**

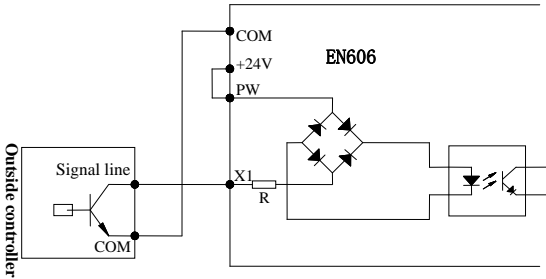


**Note**

1. when use analog input, filter electric or common mode choke can be installed between AI1 and GND or AI2 and GND
2. Analog input, output signal is easily disturbed by the external, Shielding electric cable must be used and earthed when wiring, and the wiring should be short enough.

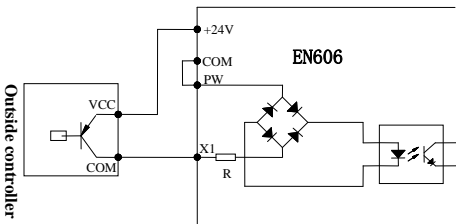
### 3.5.4 Wiring of digital input terminal

- (1) When using the control cabinet inside power of +24V, the connect way of external controller is NPN source type.



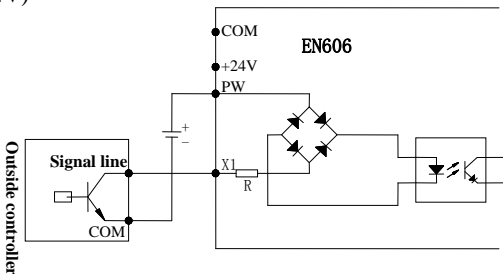
**Fig.3-8 Source electrode connection way when using inside 24V**

- (2) When using the control cabinet inside power of +24V, the connect way of external control is PNP drain electrode.



**Fig.3-9 Drain electrode connection way when using 24V**

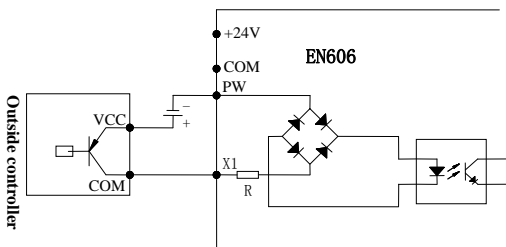
- (3) The connection way when the external DC current is 15~30V and the external controller is NPN type.(please remove the short connection slice between PW and +24V)



**Fig.3-10 The source electrode connection way when using external power**



- (4) The connection way when the external DC current is 15~30V and the external controller is PNP type.(please remove the short connection slice between PW and +24V)



**Fig.3-11 The drain electrode connection way when using external power.**




## 4 Running and operation instruction of cabinet

### 4.1 Cabinet running

#### 4.1.1 Command channel of cabinet running

The cabinet has START, STOP and JOG, etc. command channels.

##### 0: Keyboard operation

Use the , ,  to control (factory settings)

##### 1: Terminal control

Connect COM with two of the terminals among X1 and X8 to realize two line mode control, or use three of terminals among X1 and X8 to realize the tree line mode control.

##### 2: Communication port

Use upper machine or other devices with communication to control the state of cabinet.

Command channel selection is realized by F01.15 setting or multifunction input terminal selection (F08.18~F08.25 choose 49,50,51,52,53), and you can also use



to realize command channel change.



**Before change command channel, please test first to make sure that it can meet the system requirement, or danger will follow.**

#### 4.1.2 Given frequency channel of cabinet

EN606 is classified by principal frequency and auxiliary frequency.

principal frequency:

0: operating keyboard digital set

1: AI1 analog set

2: AI2 analog set

3: terminal UP/DOWN set

4: communication set (Modbus and external BUS share one principal frequency storage.)

5: reserved

6: reserved

7: high speed pulse set (X8 chooses related function)

8: terminal pulse width set(X8 chooses related function)

9: terminal encoder set(X1 and X2 are connected with the orthogonal input of encoder.)

10~14: reserved

Auxiliary set:

0: operating keyboard digital set

1: AI1 analog set

2: AI2 analog set

3: terminal UP/DOWN set

4: communication set (Modbus and external BUS share one principal frequency storage.)

5: reserved

6: reserved

7: terminal pulse set (X8 chooses related function)

8: terminal pulse width set (X8 chooses related function)

9: terminal encoder set(X3 and X4 are connected with the orthogonal input of encoder.)

10~20: reserved

#### **4.1.3 working state of cabinet**

EN606 working state is defined as standby state, running state and parameter auto-tuning state.

standby state: after connecting to power and without start or stop command, the cabinet will be in the standby state.

Running state: the cabinet will be in running state after receiving the command of running.

parameter auto-tuning state: the cabinet will be in the auto-tuning state after receiving the command of parameter identify, after which the cabinet will be in the stop state.

## 4.2 keyboard operation

### 4.2.1 layout of keyboard

Keyboard is the main unit to receive the command and display parameters. The layout of keyboard can be seen in Fig. 4-1

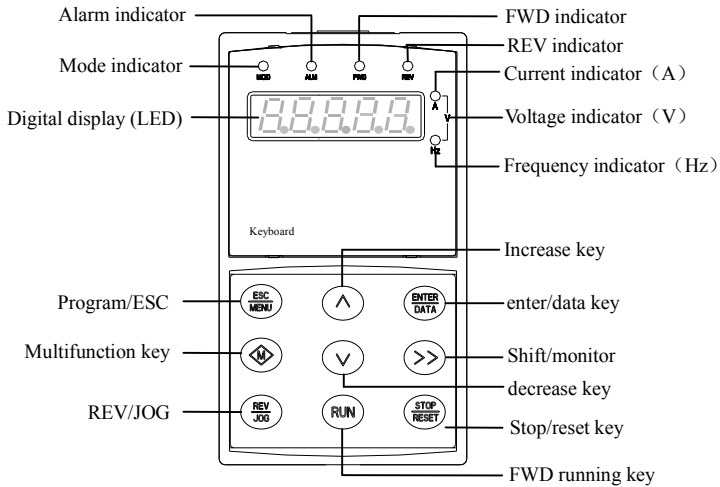






Fig. 4-1 keyboard layout

### 4.2.2 Keyboard function instruction

The keyboard is with 9 keys, and each function is defined as table 4-1.

Table 4-1 keyboard function instruction

| key | name          | Instruction   |
|-----|---------------|---|
|     | Pro/ESC       | Enter or ESE program state.                                   |
|     | Shift/monitor | Shift the data when edit, and shift parameter display.        |
|     | Enter/data    | Enter next menu or data enter.                                |
|     | REV/JOG       | REV or JOG can be realized based on the F00.15 units setting. |
|     | FWD running   | Press the key to realize FWD running                          |

|   |               |   |
|---|---------------|---|
|  | Stop/reset    | When normal running, press the key to stop if the channel is available. When the malfunction, press the key to revert to normal stop state. |
|  | Multifunction | The key is defined by the tens unit of F00.15, the details can be seen by F00.15.   |
|  | increase      | Data or function code increase(speed up can be realized by constant press)  |
|  | decrease      | Data or function code increase(speed adjust fast can be realized by constant press)   |

### 4.2.3 LED and its indicator instruction LED

Four running state indicator are displayed from left to right by MOD, ALM, FWD,REV. The details are seen in the table 4-2.

**Table 4-2 state indicator**

| item             |                 | Function instruction                                       |   |  |
|------------------|-----------------|--|---|--|
| Display function | LED display     | Display the present parameter and parameter setting state. |   |  |
|                  | State indicator | A、Hz、V   | Display the present physical quantity(current is A, voltage is V, frequency is Hz)unit  |  |
|                  |                 | MOD  | The indicator is on when no monitor state. The indicator will be off and revert to monitor state when no key input within 1 series minute |  |
|                  |                 | ALM  | When the light is on, the cabinet is fault and alarm state  |  |
|                  |                 | FWD  | FWD indicator refers to motor forwarder   | When the FWD and REV are both on, the cabinet is in the state of DC braking. |
|                  |                 | REV  | REV indicator refers to reversal  |  |

### 4.2.4 Keyboard display state

EN606 keyboard displays five states, they are standby parameter display, functional code parameter edit state, faulty alarm state, running parameter state and alarm state. When power is on, all the LED are on, the standby parameter display state exits after running normally. See Fig.a of Fig 4-2.

#### (1) Standby parameter display state

The keyboard displays standby monitor parameter when the cabinet is in the standby. The primitive monitor parameter is decided by F00.13 after power on. See Fig.b in Fig.4-2. The indicator at the right side is for unit.

press  $\langle \gg \rangle$ , different monitor parameter can be displayed, the monitor parameter from C-0 to C-05 are decided by parameter from F00.07 to F00.12.

## (2) Running parameter display state

The cabinet will run after receiving the valid command. The keyboard displays the monitor parameter that is decided by F00.13. See Fig C in 4-2. The indicator at the right side is for unit.

Press  $\langle \gg \rangle$ , different monitor parameter can be displayed, the monitor parameter from C-0 to C-05 are decided by parameter from F00.01 to F00.06.

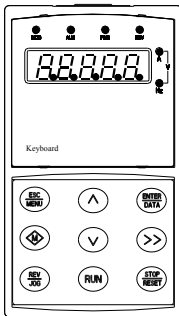


Fig.a Initialization  
Display 8.8.8.8.8.

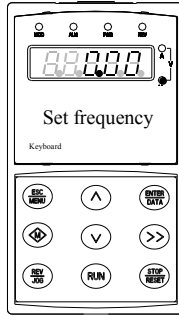


Fig.b Standby, display  
standby parameter

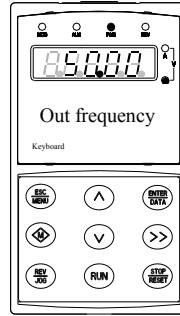


Fig.c Running state,  
display running parameter

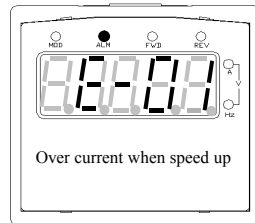
**Fig.4-2 cabinet initialization, standby, running parameter display**

## (3) Faulty alarm state

The alarm will be displayed again with fault code after inspecting the fault signal seen Fig 4-3. Press  $\langle \gg \rangle$  to see the fault parameter. To see the fault data after reset, press  $\langle \text{ESC MENU} \rangle$  to check F26 group.

After solving the fault, reset can be realized

By pressing  $\langle \text{STOP RESET} \rangle$ , terminal or communication reset and power off. The fault code will continue if the fault is not solved.







**Fig.4-3**



**For serious fault like over current etc. Please not reset when the fault is not solved. Or the cabinet will be damaged.**

#### (4) Function code edits display state

When the state is standby, running and fault alarm, press  for editing state.(if password is set, editing is available after typing password. See F27.00 and Fig. F4-10), editing mode is displayed by means of second level menu, seen Fig.4-4. Press  to enter next level. In the state of parameter displaying, press  to store parameter. Press  to go back to last menu.

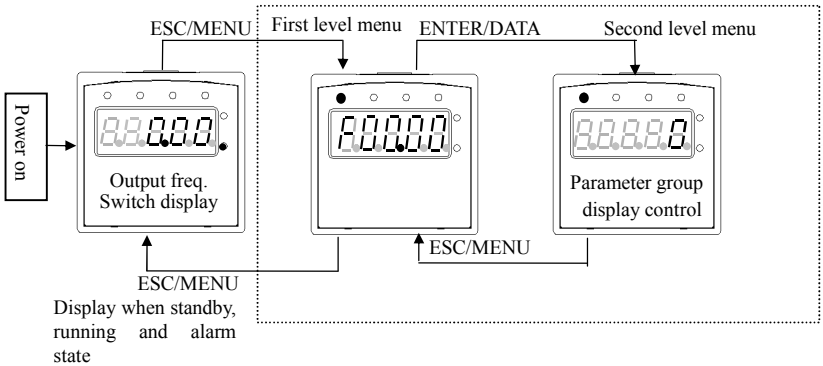


Fig.4-4 switch of keyboard display

#### (5) Alarm state display

In the condition of running and standby, the alarm displayed like Fig 4-5 when faulty occurs. Cabinet will keep current running state. The alarm can't be canceled until the reasons are found, then the cabinet will restore to be normal.

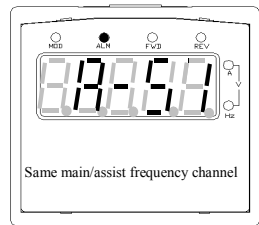


Fig.4-5

#### 4.2.5 Management of user parameter

To make convenient for user parameter management, EN606 first level menu parameter group displays management with different mode. It can shield the unnecessary parameter.

(1) Set method of parameter mode.

By set F00.00=0,1,2,3, the parameter mode can be set as basic menu mode, intermediate menu, senior menu mode and user menu mode.

|                   |   |
|-------------------|---|
| Basic menu        | F00,F01,F02,F03,F26,F27   |
| intermediate menu | Display the contents except expand, virtual and reserve parameter group |

|             |   |
|-------------|---|
| senior menu | F00,F01,F02,F03,F04,F05,F06,F07,F08,F09,F10,F11,F12,F13,F14,<br>F15,F16,F17,F18,F19,F20,F21,F22,F23,F24,F25,F26,F27 |
| User define | F25 group parameter define  |

### 4.2.6 Keyboard operation method

Using keyboard to control cabinet as followings:

#### (1) Display switch of state parameter:

After pressing **>>**, C group parameter will be displayed. The monitor parameter code will be displayed, after 1s the parameter value will be displayed automatically. Press **ENTER DATA** to go back to C-00.

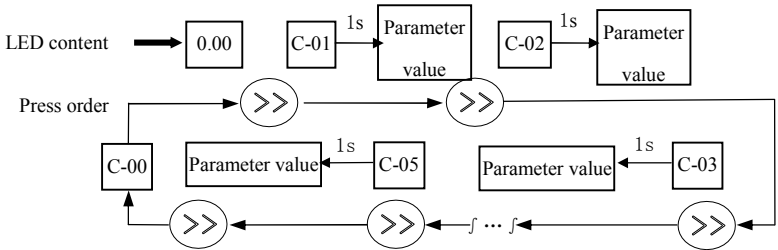


Fig. 4-6 operation example when standby

#### (2) setting of function parameter

Take the example that set F01.01 from 5.00Hz to 6.00Hz, the black bold number in Fig 4-7 is the flicker bit

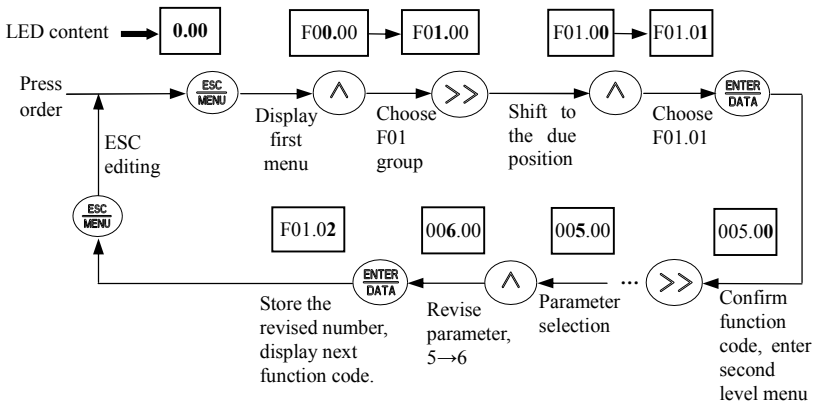


Fig.4-7 parameter setting and revision operation example



Explain: if there is no flicker bit in the second level menu, the function code can't be revised. The following reasons account for it.

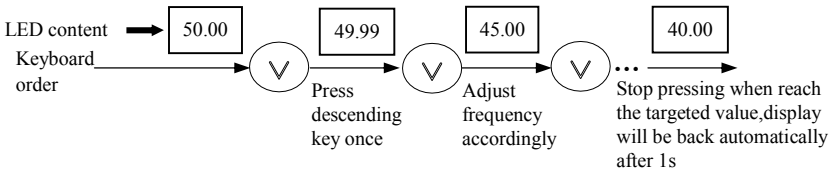
1> this function code is not allowed to revise the parameter, like monitor function parameter group

2> the function code can't be revised when it is running, and it can be revised after stop.

3> the parameter is protected. When the unit digital of F00.14=1 OR 2, the function code can't be revised. To edit function parameter, the F00.14 should be set to 0

**(3) Given frequency adjustment when normal running.**

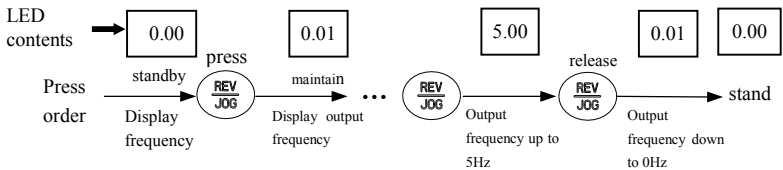
Take examples that change the given frequency from 50Hz to 60Hz when it is running and F01.06=1, F01.03=0



**Fig.4-8 frequency adjustment setting instruction**

**(4) JOG running operation**

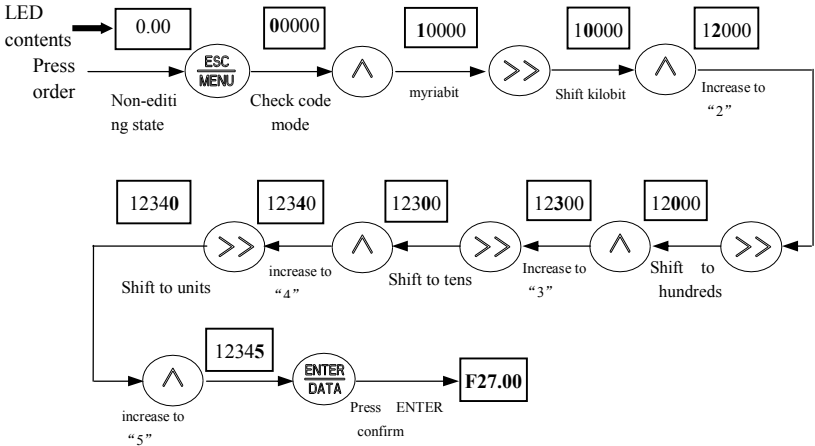
Take the example that setting the current running demand channel as the keyboard, press JOG and run at 5Hz.



**Fig.4-9 JOG running operation**

**(5) Enter function edit operation after setting user code.**

For example: “user code”F27.00 is set as “12345”.the black bold number in the Fig 4-10 is the flicker bit



**Fig.4-10 input code to enter the operation**

**(6) Malfunction checking parameter:**

When meet malfunction, please press >> to F26 quickly, then press >> to check malfunction records with parameter from F26.06~26.10

**(7) Lock the keyboard manual.**

At the state of monitor, please press  for 2s to lock keyboard, the details please check the Hundreds of F00.14.

**(8) Unlock keyboard manual**

At the state of lock, press  for 2S to unlock the keyboard.

## 4.3 Power-on of the cabinet

### 4.3.1 Check before power on

Please refer to the chapter of cabinet installation and diagram.

### 4.3.2 Premiere operation after power on

After checking the connection the cables and power, cover the power switch at the side of input. It will display “8.8.8.8.8.” after power on. Then contactor will close and the running frequency will be displayed. The details are as followings:

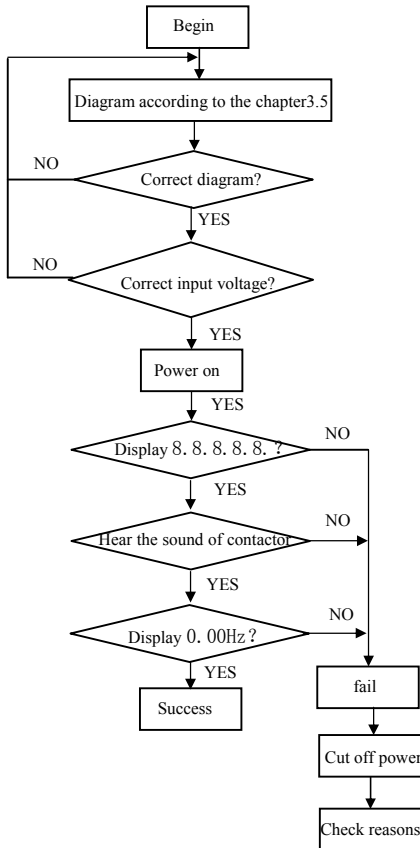


Fig.4-11 premiere operation process after power on

## 5 Debugging guidance

### 5.1 Debugging step

- ① Input motor parameters according to the nameplate of motor:  
F15.01=Motor Rated Power      F15.02=Motor Rated Voltage  
F15.03=Motor Rated Current      F15.04=Motor Rated Frequency  
F15.05=Motor Rated Speed      F15.06=Motor Pole Pairs
- ② Turn the key knob to the Energy saving side, making the motor connect to the inverter. After that Set P15.19=2 and Press“RUN”Button, the keyboard LED will display “TUNE”, at this time, it will start motor parameters auto-tuning. If without any alarms, it means auto-tuning successfully. Please turn the key knob to the Stop position.
- ③ Set frequency provision mode and curve in group F22 and F23.
- ④ Set Acceleration time in F01.17 and Deceleration time in F01.18, thereafter set F01.15=1, Turn the key knob to the energy saving side, at this time, the injection machine will operate well.

### 5.2 Notes

The frequency inverter should auto-tune the motor parameters first. During auto-tuning mode, keep the motor in non-load mode. If “E-32”alarm occur during auto-tuning, please check the motor parameters input correct or not and ensure that the motor connect to the output terminal of the control cabinet well.

## 6 Function parameter schedule graph

### 6.1 Symbol description















- × ---- Parameter can not be changed in process of running
- ---- Parameter can be changed in process of running
- \* ---- Read-only parameter, unmodifiable

### 6.2 Function parameter schedule graph

| F00—System parameter group |   |   |           |                 |              |
|----------------------------|---|---|-----------|-----------------|--------------|
| Function Code              | Name  | Set Range   | Min. Unit | Factory Default | Modification |
| F00.00                     | Display control for parameter group             | 0: Basic menu mode (Only display parameter groups from F00 to F03, and F26)<br>1: Intermediate menu mode (Display all the parameters except virtual parameters or reserved parameters group)<br>2: Senior menu mode (Display all the parameters)<br>3: User menu mode (Display user's customized parameters and monitoring parameters. F00.00 will be displayed at any time.)   | 1         | 2               | ○            |
| F00.01                     | C-00 display parameter selection when operation | 0: Main setting frequency (0.01Hz)<br>1: Auxiliary setting frequency (0.01Hz)<br>2: Setting frequency (0.01Hz)<br>3: Output synchronizing frequency (0.01Hz)<br>4: Output current (0.1A) (It is 0.01A when lower than 11KW)<br>5: Output voltage (1V)<br>6: Current busbar voltage (0.1V)<br>7: Rotate speed of load motor (1 r/min)<br>8: Linear velocity of load motor (1 r/min)<br>9: Control cabinet temperature (1°C)<br>10: run time already this time(0.1min)<br>11: current accumulate run time(1h)<br>12: current accumulate power-on time(1h)<br>13: Control cabinet status<br>14: Input terminal status<br>15: Output terminal status<br>16: Extended output terminal status<br>17: Extended input terminal status<br>18: communication virtual input terminal status<br>19: internal virtual input node status<br>20: Analog input AI1 (after checkout) (0.01V or 0.01mA)<br>21: Analog input AI2 (after checkout) (0.01V or 0.01mA)<br>22: Extended analog input EAI1 (after checkout) (0.01V or 0.01mA)<br>23: Extended analog input EAI2 (after checkout) (0.01V or 0.01mA)<br>24: Analog AO1 output (after checkout) (0.01V or 0.01mA)<br>25: Analog AO2 output (after checkout) (0.01V or 0.01mA)<br>26: Extended analog EAO1 output (0.01V or 0.01mA)<br>27: Extended analog EAO2 output (0.01V or 0.01mA)<br>28: external pulse input frequency(before checkout) (1Hz) | 1         | 2               | ○            |

|        |  |  |   |    |   |
|--------|--|--|---|----|---|
|        |  | 29: Reserved<br>30: process PID provide (0.01V)<br>31: process PID feedback (0.01V)<br>32: process PID deviation (0.01V)<br>33: process PID output (0.01Hz)<br>34: simple PLC current segment No.<br>35: external multi-speed current segment No.<br>36: constant pressure water supply provide pressure (0.001Mpa)<br>37: constant pressure water supply feedback pressure (0.001Mpa)<br>38: constant pressure water supply relay status<br>39: Current length (1M)<br>40: accumulate length (1M)<br>41: current internal count value<br>42: current internal time value<br>43: Running command setting channel (0: Keypad 1; Terminal 2: Communication)<br>44: Main frequency given channel<br>45: Auxiliary frequency given channel<br>46: Rated current of control cabinet (0.1A)<br>47: Rated voltage of control cabinet (1V)<br>48: Rated power of control cabinet (0.1KW)<br>49: Reserved<br>50: Reserved<br>51: Frequency after Acce/Dece (0.01Hz)<br>52: Frequency of motor rotor (0.01Hz)<br>53: The present giving torque (percentage relative to rated torque, with direction)<br>54: The present output torque (percentage relative to rated torque, with direction)<br>55: The present torque current (0.1A)<br>56: The present flux current (0.1A)<br>57~65: Reserved |   |    |   |
| F00.02 | C-01 parameter display selection when running  | The same as above  | 1 | 4  | ○ |
| F00.03 | C-02 parameter display selection when running  | The same as above  | 1 | 9  | ○ |
| F00.04 | C-03 parameter display selection when running  | The same as above  | 1 | 6  | ○ |
| F00.05 | C-04 parameter display selection when running  | The same as above  | 1 | 15 | ○ |
| F00.06 | C-05 parameter display selection when running  | The same as above  | 1 | 2  | ○ |
| F00.07 | C-00parameter display selection when stopping  | The same as above  | 1 | 2  | ○ |
| F00.08 | C-01 parameter display selection when stopping | The same as above  | 1 | 4  | ○ |
| F00.09 | C-02 parameter display selection when stopping | The same as above  | 1 | 14 | ○ |

Function parameter schedule graph

|        |  |  |   |      |   |
|--------|--|--|---|------|---|
| F00.10 | C-03 parameter display selection when stopping | The same as above  | 1 | 6    | ○ |
| F00.11 | C-04 parameter display selection when stopping | The same as above  | 1 | 48   | ○ |
| F00.12 | C-05 parameter display selection when stopping | The same as above  | 1 | 3    | ○ |
| F00.13 | Power-on fault monitor parameter selection     | 0~5  | 1 | 0    | ○ |
| F00.14 | Parameter operation control                    | <p>LED first bit: Parameters modification operation</p> <p>0: All parameters are allowed to be modified.</p> <p>1: Except F00.14, all other parameters are not allowed to be modified.</p> <p>2: Except F01.01, F01.04 and F00.14, all other parameters are not allowed to be modified.</p> <p>LED second bit: Reset to factory default</p> <p>0: No action.</p> <p>1: All parameters return to default.(not include fault record parameter group(F26 group) parameter).</p> <p>2: Except for motor parameter: all parameters return to default.(not include F15 and F26 group parameter).</p> <p>3: Extension parameter return to default.(only F21~F24 group parameter return to default).</p> <p>4: Virtual parameter return to default.(only F20 group parameter return to default).</p> <p>5: Fault record return to default.(only fault record parameter group(F26 group)parameter return to default)</p> <p>LED third bit: Buttons operation.</p> <p>0: All buttons locked.</p> <p>1: Except  the other buttons are all locked.</p> <p>2: Except , ,  the other buttons are all locked.</p> <p>3: Except ,  the other buttons are all locked.</p> <p>4: Except ,  the other buttons are all locked.</p> | 1 | 000  | × |
| F00.15 | Button function selection                      | <p>LED 1st: Panel  button selection</p> <p>0: Reversal command action button</p> <p>1: Jog action button</p> <p>LED 2nd :  multi-function button function selection</p> <p>0: Disabled</p> <p>1: Jog run</p> <p>2: For/rev switching.</p> <p>3: Free stop.</p> <p>4: Switching to run command provide mode as the setup order of F00.16.</p> <p>5: Forward/Reverse Torque Switching</p> <p>6~9: Reserved</p> <p>LED 3rd : terminal run command control</p> <p>0: Keyboard  button invalid</p> <p>1: Keyboard  button valid</p> <p>LED 4th : communication run command control</p> <p>0: Keyboard  button invalid</p> <p>1: Keyboard  button valid</p>   | 1 | 0001 | ○ |

|        |  |  |      |        |   |
|--------|--|--|------|--------|---|
| F00.16 | Multi-function key Run command channel switching order selection | 0:Keyboard control→ Terminal control→ Communication control<br>1: Keyboard control←→Terminal control<br>2: Keyboard control←→Communication control<br>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 | Reserved   |  |      |        |   |
| F00.20 | Analog input interface configuration                             | LED 1st bit: AI1 configuration<br>0: 0~10V Voltage Input<br>1: 4~20mA Current Input<br>LED 2nd bit: AI2 configuration<br>0: -10~10V Voltage Input<br>1: 4~20mA Current Input<br>LED 3rd bit: EA11 configuration<br>0: 0~10V Input<br>1: -10~10V Input<br>2: 4~20mA Current Input<br>LED 4th bit: EA12 configuration<br>0: 0~10V Input<br>1: -10~10V Input<br>2: 4~20mA Current Input | 1    | 0000   | × |
| F00.21 | Analog output interface configuration                            | LED 1st bit: AO1 configuration<br>0: 0~10V Voltage Output<br>1: 4~20mA Current Output<br>LED 2nd bit: AO2 configuration<br>0: 0~10V Voltage Output<br>1: 4~20mA Current Output<br>LED 3rd bit: EA01 configuration<br>0: 0~10V Voltage Output<br>1: 4~20mA Current Output<br>LED 4th bit: EA02 configuration<br>0: 0~10V Voltage Output<br>1: 4~20mA Current Output                   | 1    | 0000   | × |
| F00.22 | Y output interface configuration                                 | LED 1st bit ~LED 2nd bit: Reserved<br>LED 3rd bit: Y4 output configuration<br>0: Open collector output<br>1: DO Output   | 1    | 0000   | × |
| F00.23 | Reserved   |  |      |        |   |
| F00.24 | Motor control mode   | 0: V/F Control<br>1: Speedless sensor vector control<br>2: Reserved  | 1    | 1      | × |
| F00.25 | Reserved   |  |      |        |   |
| F00.26 | Busbar voltage adjustment coefficient                            | 0.500~2.000  | 1    | 1.000  | ○ |
| F00.27 | Reserved   |  |      |        |   |



| F01—Basic running functions parameters group |  |  |           |                 |              |
|--|--|--|-----------|-----------------|--------------|
| Function Code                                | Name   | Set Range  | Min. Unit | Factory Default | Modification |
| F01.00                                       | Main frequency input channel selection       | 0: Keypad digital setting<br>1: AI1 analog setting<br>2: AI2 analog setting<br>3: Terminal UP/DOWN adjustment setting<br>4: Communication provide.<br>5: EA11 analog setting (Extension is effective)<br>6: EA12 analog setting (Extension is effective)<br>7:High speed pulse setup X8 terminal need choose the suitable function)<br>8:Terminal pulse setup(X8 terminal need choose the suitable function)<br>9:Terminal encoder setup(X1:X2 connect the encoder punctuation input)<br>10~14: Reserved | 1         | 0               | ○            |
| F01.01                                       | Main frequency digital setting               | 0.00Hz~Upper limiting frequency  | 0.01Hz    | 50.00Hz         | ○            |
| F01.02                                       | Main frequency digital control               | Only when parameter F01.00=0:3:4 valid.<br>Units digit: power down reserve setup<br>0:Main frequency power down reserve.<br>1:Main frequency power down no reserve.<br>Tens digit: halt reserve setup<br>0:Halt main frequency hold<br>1:Halt main frequency recovery F01.01   | 1         | 11              | ○            |
| F01.03                                       | Auxiliary frequency input channel selection  | 0: Keypad digital setting<br>1: AI1 analog setting<br>2: AI2 analog setting<br>3: Terminal UP/DOWN adjustment setting<br>4: Communication provide.<br>5: EA11 analog setting (Extension is effective)<br>6: EA12 analog setting (Extension is effective)<br>7:High speed pulse setup X8 terminal need choose the suitable function)<br>8:Terminal pulse setup(X8 terminal need choose the suitable function)<br>9:Terminal encoder setup(X1:X2 connect the encoder punctuation input)<br>10~20: Reserved | 1         | 1               | ○            |
| F01.04                                       | Auxiliary frequency digital setting          | 0.00Hz~Upper limiting frequency  | 0.01Hz    | 0.00Hz          | ○            |
| F01.05                                       | Auxiliary frequency digital control          | Units digit: power down reserve setup<br>0:Auxiliary frequency power down reserve.<br>1:Auxiliary frequency power down no reserve.<br>Tens digit: halt reserve setup<br>0:Halt auxiliary frequency hold.<br>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).<br>1: Auxiliary frequency(complex frequency of current is auxiliary frequency.)<br>2: Plus(polarity oppose of complex and main frequency, complex frequency is zero).<br>3:Minus(polarity oppose of complex and auxiliary frequency, complex frequency is zero).  | 1         | 0               | ○            |

|        |   |  |        |                      |   |
|--------|---|--|--------|----------------------|---|
|        |   | 4:Multiplication(polarity opposed of main and auxiliary frequency: complex frequency is zero).<br>5:Max(the max frequency of main and auxiliary absolute value).<br>6:Min(the min frequency of main and auxiliary absolute value).<br>7:Selection no-zero value(auxiliary is not negative, main frequency prior; auxiliary is negative, complex frequency is zero).                  |        |                      |   |
| 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.<br>1:Relative main frequency.  | 1      | 0                    | ○ |
| F01.10 | Auxiliary frequency source scope                          | 0.00~1.00  | 0.01   | 1.00                 | ○ |
| F01.11 | Upper limiting frequency                                  | Lower frequency~600.00Hz   | 0.01Hz | 50.00Hz              | × |
| F01.12 | Lower frequency   | 0.00Hz~Upper limiting frequency  | 0.01Hz | 0.50Hz               | × |
| F01.13 | Lower frequency running mode                              | 0:As low limit frequency run.<br>1:As setting frequency run.<br>2:As zero frequency run.<br>3:Sleep: PWM clocked at sleep mode.  | 1      | 3                    | × |
| F01.14 | Sleep 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: Keypad run control<br>1: Terminal run command control<br>2: Communication run command control   | 1      | 0                    | ○ |
| F01.16 | Run direction setting                                     | Units digit: Keyboard command for/rev setup(only valid to keyboard inching command)<br>0:Forward<br>1:Reverse<br>Tens digit: for/rev forbid(suitable for all command channel, not include inching function)<br>0:For/rev available.<br>1:Reverse not available( imposing on reverse, stop as the halt mode).<br>2:Forward not available( imposing on forward, stop as the halt mode) | 1      | 00                   | ○ |
| F01.17 | Acceleration time 1                                       | 1~60000(Acceleration time is interval accelerate from zero frequency to upper limit frequency)   | 1      | Base on machine type | ○ |
| F01.18 | Deceleration time 1                                       | 1~60000(deceleration time is the interval decelerate from upper limit frequency to zero frequency.)  | 1      | Base on machine type | ○ |
| F01.19 | Accelerate/Decelerate time Unit                           | 0: 0.01s<br>1: 0.1s<br>2: 1s   | 1      | 1                    | × |

Function parameter schedule graph

|        |  |  |        |        |   |
|--------|--|--|--------|--------|---|
| F01.20 | Acce/dece mode selection                     | 0: Straight line acce/dece mode<br>1: S curve acce/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 limiting frequency  | 0.01Hz | 5.00Hz | ○ |
| F01.26 | Terminal jog run frequency                   | 0.00Hz~Upper limiting 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 | Modification |
|---------------|--|---|-----------|-----------------|--------------|
| F02.00        | Start-up running mode                    | 0: Start from starting frequency<br>1: First brake and then start from starting frequency<br>2: Start by revolving speed tracking | 1         | 2               | ×            |
| F02.01        | Delay time for start up                  | 0.0~60.0s   | 0.1s      | 0.0s            | ×            |
| F02.02        | Starting frequency                       | 0.0~10.00Hz   | 0.01Hz    | 0.00Hz          | ×            |
| F02.03        | Duration time for starting frequency     | 0.0~60.0s   | 0.1s      | 0.0s            | ×            |
| F02.04        | DC braking current when starting         | 0.0~100.0% (G type inverter rated current)  | 0.1%      | 30.0%           | ×            |
| F02.05        | DC braking time when starting            | 0.0~30.0s   | 0.1s      | 0.0s            | ×            |
| F02.06        | Speed track starting frequency selection | 0: Current setting frequency.<br>1: Running frequency before power down.<br>2:Speed track auxiliary starting frequency.           | 1         | 2               | ×            |
| F02.07        | Speed track auxiliary starting frequency | 0.00Hz~Upper limiting frequency   | 0.01Hz    | 5.00Hz          | ×            |
| F02.08        | Speed track starting waiting time        | 0.00~10.00s   | 0.01s     | 0.10s           | ×            |
| F02.09        | Speed track current control coefficient  | 1~20  | 1         | 2               | ×            |
| F02.10        | Speed track searching speed time         | 0.1~30.0 (V/F control unit Unit1s; SVC control 0.1s)  | 0.1       | 4.00            | ×            |

|        |  |   |        |                      |   |
|--------|--|---|--------|----------------------|---|
| F02.11 | Stop mode  | 0: Decelerating stop<br>1: Free stop<br>2: Decelerating+DC brake stop         | 1      | 0                    | × |
| F02.12 | Deceleration stop holding frequency                              | 0.00~Upper limiting frequency (This parameter is only valid for stop mode 0.) | 0.01Hz | 0.00Hz               | × |
| F02.13 | Deceleration stop holding time<br>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 | 0.00Hz               | × |
| 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% (G type machine rated current)                                     | 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% (G type machine rated current)                                     | 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 switchover<br>1: Over starting frequency switchover              | 1      | 0                    | × |
| F02.22 | Dynamic braking selection  | 0: With dynamic braking<br>1: Without dynamic braking                         | 1      | Base on machine type | ○ |
| F02.23 | Energy consumption braking voltage                               | 115.0~145.0% (Rated busbar voltage)   | 0.1%   | 125.0%               | ○ |
| F02.24 | Energy consumption braking use rate                              | 0.0~100.0%  | 0.1%   | 50.0%                | ○ |
| F02.25 | Reserved   |   |        |                      |   |
| F02.26 | Reserved   |   |        |                      |   |

## F03—V/F control parameter group

| Function Code | Name                           | Set Range   | Min. Unit | Factory Default     | Modification |
|---------------|--------------------------------|---|-----------|---------------------|--------------|
| F03.00        | V/F curve setting              | 0: Constant torque curve<br>1: Decreasing torque curve 1 (2 <sup>nd</sup> power)<br>2: Decreasing torque curve 2 (1.7 <sup>th</sup> power)<br>3: Decreasing torque curve 3 (1.2 <sup>nd</sup> power)<br>4: User's customized V/F curve(Please set parameters from F03.04 to F03.11) | 1         | 0                   | ×            |
| F03.01        | Torque boost mode              | 0: Manual operation<br>1: Automatic   | 1         | 0                   | ○            |
| F03.02        | Torque boost                   | 0.0~12.0%   | 0.1%      | Every model differs | ○            |
| F03.03        | Torque boost cut-off frequency | 0.0~100.0% (Motor rated frequency)  | 0.1%      | 20.0%               | ○            |
| 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%              | ×            |

Function parameter schedule graph

|        |   |   |        |         |   |
|--------|---|---|--------|---------|---|
| F03.10 | V/F frequency value 3                   | V/F frequency value 2 ~ Upper limiting frequency  | 0.01Hz | 40.00Hz | × |
| F03.11 | V/F voltage value 3                     | V/F voltage value 2 ~ 100.0%(Motor rated voltage) | 0.01%  | 80.00%  | × |
| F03.12 | V/F oscillation suppression coefficient | 0~255   | 1      | 10      | ○ |

**F04—Auxiliary running parameter group**

| Function Code | Name   | Set Range  | Min. Unit | Factory Default     | Modification |
|---------------|--|--|-----------|---------------------|--------------|
| F04.00        | Jumping frequency 1                                | 0.00Hz~Upper limiting frequency  | 0.01Hz    | 0.00Hz              | ×            |
| F04.01        | Range for Jumping frequency 1                      | 0.00Hz~Upper limiting frequency  | 0.01Hz    | 0.00Hz              | ×            |
| F04.02        | Jumping frequency 2                                | 0.00Hz~Upper limiting frequency  | 0.01Hz    | 0.00Hz              | ×            |
| F04.03        | Range for Jumping frequency 2                      | 0.00Hz~Upper limiting frequency  | 0.01Hz    | 0.00Hz              | ×            |
| F04.04        | Jumping frequency 3                                | 0.00Hz~Upper limiting frequency  | 0.01Hz    | 0.00Hz              | ×            |
| F04.05        | Range for Jumping frequency 3                      | 0.00Hz~Upper limiting frequency  | 0.01Hz    | 0.00Hz              | ×            |
| F04.06        | Slip frequency 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 frequency                                  | 0.5~16.0K  | 0.1K      | Every model differs | ○            |
| F04.10        | PWM optimization and adjustment                    | Units digit: Carrier freq. is adjusted automatically according to temperature<br>0: Banned.<br>1: Allowed.<br>Tens digit: low speed carrier freq. limit mode<br>0: No limit.<br>1: Limit.<br>Hundreds digit: carrier wave modulation system<br>0: 3 phase modulation.<br>1: 2 phase and 3 phase modulation.<br>Thousands digit: Asynchronous modulation: synchronization mode (valid under V/F control)<br>0:Asynchronous modulation.<br>1:Synchronous modulation (under 85Hz: Asynchronous modulation). | 1         | 0110                | ×            |
| F04.11        | AVR Function                                       | 0: No action<br>1: Action all the time<br>2: Keep action EXCEPT during decreasing  | 1         | 0                   | ×            |
| F04.12        | Reserved   |  |           |                     |              |
| F04.13        | Automatic energy saving operation                  | 0: No action<br>1: Action  | 1         | 0                   | ×            |
| F04.14        | Switch frequency between acceleration time 2 and 1 | 0.00Hz~Upper limiting frequency  | 0.01Hz    | 0.00Hz              | ×            |
| F04.15        | Switch frequency between deceleration time 2 and 1 | 0.00Hz~Upper limiting 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                 | ○            |

## Function parameter schedule graph

|        |                      |         |   |     |   |
|--------|----------------------|---------|---|-----|---|
| 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—Communication control parameters group

| Function Code | Name                | Set Range  | Min. Unit | Factory Default | Modification |
|---------------|---------------------|--|-----------|-----------------|--------------|
| F05.00        | Protocol selection  | 0: Modbus protocol<br>1: Reserved<br>2: Profibus protocol (Extension is effective)<br>3: CanLink protocol (Extension is effective)<br>4: CANopen protocol (Extension is effective)<br>5: Free protocol 1 (It can modify all the function parameters of EN606)<br>6: Free protocol 2 (It can only modify PART of the function parameters of EN606)  | 1         | 0               | ×            |
| F05.01        | Baud rate selection | LED 1 <sup>st</sup> bit: Free-protocol and Modbus baud rate selection<br>0: 300BPS<br>1: 600BPS<br>2: 1200BPS<br>3: 2400BPS<br>4: 4800BPS<br>5: 9600BPS<br>6: 19200BPS<br>7: 38400BPS<br>8: 57600BPS<br>LED 2 <sup>nd</sup> bit: Profibus_DP baud rate selection<br>0: 115200BPS<br>1: 208300BPS<br>2: 256000BPS<br>3: 512000BPS<br>LED 3 <sup>rd</sup> bit: CanLink and CANopen baud rate selection | 1         | 005             | ×            |

|        |  |   |      |      |   |
|--------|--|---|------|------|---|
|        |  | 0: 20K<br>1: 50K<br>2: 100K<br>3: 125K<br>4: 250K<br>5: 500K<br>6: 1M   |      |      |   |
| F05.02 | Data format  | LED 1 <sup>st</sup> bit: Free-protocol and Modbus protocol data format<br>0: 1-8-1 format, No parity check, RTU<br>1: 1-8-1 format, Even-parity check, RTU<br>2: 1-8-1 format, Odd-parity check, RTU<br>3: 1-7-1 format, No parity check, ASCII<br>4: 1-7-1 format, Even-parity check, ASCII<br>5: 1-7-1 format, Odd-parity check, ASCII<br>LED 2 <sup>nd</sup> bit: Profibus_DP protocol data format<br>0: PPO1 communication format<br>1: PPO2 communication format<br>2: PPO3 communication format<br>3: PPO5 communication format |      | 00   | × |
| F05.03 | Local address  | 0~247,<br>this function code is used to identify inverter's address: among which 0 is broadcast address.<br>When setting broadcast address: it can only receive and execute upper computer broadcast command: while cannot respond to 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 valid)  | 1ms  | 5ms  | ○ |
| F05.07 | Main & sub inverter communication frequency setting percentage | 0~500%  | 1%   | 100% | ○ |
| F05.08 | communication virtual input terminal enabled                   | 00~FFH<br>Bit0: CX1 analog input terminal enable<br>0: Prohibition<br>1: Enable<br>Bit1: CX2 analog input terminal enable<br>0: Prohibition<br>1: Enable<br>Bit2: CX3 analog input terminal enable<br>0: Prohibition<br>1: Enable<br>Bit3: CX4 analog input terminal enable<br>0: Prohibition<br>1: Enable<br>Bit4: CX5 analog input terminal enable<br>0: Prohibition<br>1: Enable<br>Bit5: CX6 analog input terminal enable<br>0: Prohibition<br>1: Enable<br>Bit6: CX7 analog input terminal enable<br>0: Prohibition<br>1: Enable | 1    | 00H  | ○ |

|        |   |   |      |       |   |
|--------|---|---|------|-------|---|
|        |   | Bit7: CX8 analog input terminal enable<br>0: Prohibition<br>1: Enable |      |       |   |
| F05.09 | Communication virtual input terminal joining node | 0: Independent node.<br>1: Terminal node.                             | 1    | 0     | ○ |
| F05.10 | Communication analog terminal CX1 function        | 0~90  | 1    | 0     | ○ |
| F05.11 | Communication analog terminal CX2 function        | 0~90  | 1    | 0     | ○ |
| F05.12 | Communication analog terminal CX3 function        | 0~90  | 1    | 0     | ○ |
| F05.13 | Communication analog terminal CX4 function        | 0~90  | 1    | 0     | ○ |
| F05.14 | Communication analog terminal CX5 function        | 0~90  | 1    | 0     | ○ |
| F05.15 | Communication analog terminal CX6 function        | 0~90  | 1    | 0     | ○ |
| F05.16 | Communication analog terminal CX7 function        | 0~90  | 1    | 0     | ○ |
| F05.17 | Communication analog 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 application parameter 9             | F00.00~F26.xx   | 0.01 | 25.00 | ○ |
| F05.27 | Input mapping application parameter 10            | F00.00~F26.xx   | 0.01 | 25.00 | ○ |
| F05.28 | Reserved  |   |      |       |   |
| F05.29 | Reserved  |   |      |       |   |
| F05.30 | Reserved  |   |      |       |   |
| F05.31 | Reserved  |   |      |       |   |
| F05.32 | Reserved  |   |      |       |   |
| F05.33 | Reserved  |   |      |       |   |
| F05.34 | Reserved  |   |      |       |   |
| F05.35 | Reserved  |   |      |       |   |
| F05.36 | Reserved  |   |      |       |   |
| F05.37 | Reserved  |   |      |       |   |
| F05.38 | Reserved  |   |      |       |   |
| F05.39 | Reserved  |   |      |       |   |



| F06—Setting curve parameter group |  |   |           |                 |              |
|-----------------------------------|--|---|-----------|-----------------|--------------|
| Function Code                     | Name   | Set Range   | Min. Unit | Factory Default | Modification |
| F06.00                            | Setting curve selection  | LED 1 <sup>st</sup> bit: All Curve selection<br>0: Curve 1<br>1: Curve 2<br>2: Curve 3<br>LED 2 <sup>nd</sup> bit: All2 curve selection: The same as 1 <sup>st</sup> bit.<br>LED 3 <sup>rd</sup> bit: Rapid pulse curve selection: The same as 1 <sup>st</sup> bit.<br>LED 4 <sup>th</sup> bit: Pulse width setting curve selection: The same as 1 <sup>st</sup> bit. | 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 2 inflexion setting                                      | Curve 3 inflexion 1 setting ~ 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%          | ○            |

Function parameter schedule graph

|        |   |  |      |        |   |
|--------|---|--|------|--------|---|
| 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<br>0: Corresponds to min. setting corresponding physical quantity.<br>1: 0.0% of the corresponding physical quantity.<br>Tens digit: curve 2 setting<br>Same as units digit.<br>Hundreds digit: curve 3 setting<br>Same as units digit.<br>Thousands digit: extended curve 1<br>Same as units digit.<br>Ten thousands digit: extended curve 2<br>Same as units digit. | 1    | 11111  | ○ |

**F07—Analog , Pulse input function parameter group**

| Function Code | Name                             | Set Range   | Min. Unit | Factory Default | Modification |
|---------------|----------------------------------|---|-----------|-----------------|--------------|
| F07.00        | A11 input filter time            | 0.000~9.999s  | 0.001s    | 0.050s          | ×            |
| F07.01        | A11 setting gain                 | 0.000~9.999   | 0.001     | 1.004           | ○            |
| F07.02        | A11 setting bias                 | 0.0~100.0%  | 0.1%      | 0.5%            | ○            |
| F07.03        | A12 input filter time            | 0.000~9.999s  | 0.001     | 0.050s          | ×            |
| F07.04        | A12 setting gain                 | 0.000~9.999   | 0.001     | 1.003           | ○            |
| F07.05        | A12 setting bias                 | 0.0~100.0%  | 0.1%      | 0.1%            | ○            |
| F07.06        | Analog setting bias polarity     | Units digit: A11 setting bias polarity<br>0: Positive polarity.<br>1: Negative polarity.<br>Tens digit: A12 setting bias polarity<br>0: Positive polarity.<br>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<br>1: Negative logic  | 1         | 0               | ○            |
| F07.13        | Max pulse input width            | 0.1~999.9ms   | 0.1ms     | 100.0ms         | ○            |
| F07.14        | Reserved                         |   |           |                 |              |
| F07.15        | Reserved                         |   |           |                 |              |
| F07.16        | Reserved                         |   |           |                 |              |
| F07.17        | Reserved                         |   |           |                 |              |

**F08—On-off input function parameter group**

| Function Code | Name   | Set Range                                      | Min. Unit | Factory Default | Modification |
|---------------|--|--|-----------|-----------------|--------------|
| F08.00        | input terminal positive and negative logic setting | 0000~FFFF (Include extended input terminal)    | 1         | 0000            | ○            |
| F08.01        | Input terminal filter time                         | 0.000~1.000s (Include extended input terminal) | 0.001s    | 0.010s          | ○            |
| F08.02        | X1 input terminal turn-on time                     | 0.00~99.99s                                    | 0.01s     | 0.00s           | ○            |

Function parameter schedule graph

|        |                                      |  |       |       |   |
|--------|--------------------------------------|--|-------|-------|---|
| F08.03 | X1 input terminal turn-off time      | 0.00~99.99s  | 0.01s | 0.00s | ○ |
| F08.04 | X2 input terminal turn-on time       | 0.00~99.99s  | 0.01s | 0.00s | ○ |
| F08.05 | X2 input terminal turn-off time      | 0.00~99.99s  | 0.01s | 0.00s | ○ |
| F08.06 | X3 input terminal turn-on time       | 0.00~99.99s  | 0.01s | 0.00s | ○ |
| F08.07 | X3 input terminal turn-off time      | 0.00~99.99s  | 0.01s | 0.00s | ○ |
| F08.08 | X4 input terminal turn-on time       | 0.00~99.99s  | 0.01s | 0.00s | ○ |
| F08.09 | X4 input terminal turn-off time      | 0.00~99.99s  | 0.01s | 0.00s | ○ |
| F08.10 | X5 input terminal turn-on time       | 0.00~99.99s  | 0.01s | 0.00s | ○ |
| F08.11 | X5 input terminal turn-off time      | 0.00~99.99s  | 0.01s | 0.00s | ○ |
| F08.12 | X6 input terminal turn-on time       | 0.00~99.99s  | 0.01s | 0.00s | ○ |
| F08.13 | X6 input terminal turn-off time      | 0.00~99.99s  | 0.01s | 0.00s | ○ |
| F08.14 | X7 input terminal turn-on time       | 0.00~99.99s  | 0.01s | 0.00s | ○ |
| F08.15 | X7 input terminal turn-off time      | 0.00~99.99s  | 0.01s | 0.00s | ○ |
| F08.16 | X8 input terminal turn-on time       | 0.00~99.99s  | 0.01s | 0.00s | ○ |
| F08.17 | X8 input terminal turn-off time      | 0.00~99.99s  | 0.01s | 0.00s | ○ |
| F08.18 | Input terminal X1 function selection | 0: Leave control terminal unused<br>1: Forward running FWD terminal<br>2: Reverse running REV terminal<br>3: External forward jogging control<br>4: External reverse jogging control<br>5: Multi-step speed control terminal 1<br>6: Multi-step speed control terminal 2<br>7: Multi-step speed control terminal 3<br>8: Multi-step speed control terminal 4<br>9: Accelerate/Decelerate time selection terminal 1<br>10: Accelerate/Decelerate time selection terminal 2<br>11: Accelerate/Decelerate time selection terminal 3<br>12: Accelerate/Decelerate time selection terminal 4<br>13: Main and auxiliary frequency operational rule selection terminal 1<br>14: Main and auxiliary frequency operational rule selection terminal 2<br>15: Main and auxiliary frequency operational rule selection terminal 3<br>16: Frequency ascending command (UP)<br>17: Frequency descending command (DOWN)<br>18: Frequency ascending/descending frequency resetting | 1     | 0     | × |

|  |  |   |  |  |  |
|--|--|---|--|--|--|
|  |  | <p>19: Multi-step closed loop terminal 1<br/> 20: Multi-step closed loop terminal 2<br/> 21: Multi-step closed loop terminal 3<br/> 22: External equipment failure input<br/> 23: External interruption input<br/> 24: External resetting input<br/> 25: Free stop input<br/> 26: External stop instruction—Stop according to the stop mode<br/> 27: stop DC braking input command DB 28: inverter running prohibited—Stop according to the stop mode<br/> 29: Acceleration/deceleration prohibited command<br/> 30: Three-wire running control<br/> 31: Process PID invalid<br/> 32: Process PID stop<br/> 33: Process PID integral holding<br/> 34: Process PID integral resetting<br/> 35: Process PID function negation(Closed loop adjustment feature negation)<br/> 36: simple PLC invalid<br/> 37: simple PLC halted<br/> 38: simple PLC stop state resetting<br/> 39: main frequency switchover to digit (keypad)<br/> 40: main frequency switchover to AI1<br/> 41: main frequency switchover to AI2<br/> 42: main frequency switchover to EAI1<br/> 43: main frequency switchover to EAI2<br/> 44: main frequency setting channel selection terminal 1<br/> 45: main frequency setting channel selection terminal 2<br/> 46: main frequency setting channel selection terminal 3<br/> 47: main frequency setting channel selection terminal 4<br/> 48: Auxiliary frequency reset<br/> 49: Command switchover to panel<br/> 50: Command switchover to terminal<br/> 51: Command switchover to communication<br/> 52: Running command Channel selection 1<br/> 53: Running command Channel selection 2<br/> 54: Forward prohibited command(Stop according to the stop mode: invalid for jogging command)<br/> 55: Reverse prohibited command (Stop according to the stop mode: invalid for jogging command)<br/> 56: Swinging frequency input<br/> 57: Resetting state of swinging frequency<br/> 58: Interior counter reset end<br/> 59: Interior counter input end<br/> 60: Internal timer resetting<br/> 61: Internal timer triggering<br/> 62: Length count input<br/> 63: Length reset<br/> 64: Reset this operation time<br/> 65: speed/torque control switching<br/> 66~90: Reserved</p> |  |  |  |
|--|--|---|--|--|--|

Function parameter schedule graph

|        |                                       |   |        |        |   |
|--------|---------------------------------------|---|--------|--------|---|
|        |                                       | 91: Pulse frequency input (X8 Valid)<br>92: Pulse width PWM input (X8 Valid)<br>93~96: Reserved   |        |        |   |
| F08.19 | Input terminal X2 function selection  | The same as above   | 1      | 2      | × |
| F08.20 | Input terminal X3 function selection  | The same as above   | 1      | 0      | × |
| F08.21 | Input terminal X4 function selection  | The same as above   | 1      | 0      | × |
| F08.22 | Input terminal X5 function selection  | The same as above   | 1      | 0      | × |
| F08.23 | Input terminal X6 function selection  | The same as above   | 1      | 0      | × |
| F08.24 | Input terminal X7 function selection  | The same as above   | 1      | 1      | × |
| F08.25 | Input terminal X8 function selection  | The same as above   | 1      | 0      | × |
| F08.26 | FWD/REV running mode selection        | 0: 2-wire control mode 1<br>1: 2-wire control mode 2<br>2: 2-wire control mode 3 (Monopulse control mode)<br>3: 3-wire control mode 1<br>4: 3-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 | Reserved                              |   |        |        |   |

**F09—On-off output function parameter group**

| Function Code | Name   | Set Range  | Min. Unit | Factory Default | Modification |
|---------------|--|--|-----------|-----------------|--------------|
| F09.00        | Open collector output terminal Y1 output setup | 0:terminal unused<br>1:operation(RUN)<br>2:CW run<br>3:CCW run<br>4:DC brake<br>5:run prepare finish(busbar voltage normal, fault free, no run forbid, receipt of run command's status)<br>6:stop command indication<br>7:no current detected<br>8:overcurrent detected<br>9:current1 arrival<br>10:current2 arrival<br>11:no frequency output<br>12:frequency arrival signal(FAR)<br>13:frequency level detect signal 1(FDT1)<br>14:frequency level detect signal 2(FDT2)<br>15:output frequency arrival upper limit(FHL)<br>16:output frequency arrival low limit(FLL) | 1         | 0               | ×            |

|        |  |  |        |         |   |
|--------|--|--|--------|---------|---|
|        |  | 17:frequency 1 arrival output<br>18:frequency 2 arrival output<br>19:overload pre-alarm signal(OL)<br>20:undervoltage lockout stop (LU)<br>21:external fault stop(EXT)<br>22:fault<br>23:alarm<br>24: simple PLC operation<br>25:simple PLC section operation finish<br>26:simple PLC circle operation finish<br>27:simple PLC operation stop<br>28:traverse frequency high and low limit<br>29:setup length arrival<br>30:internal counter final value arrival<br>31:internal counter designated value arrival<br>32:internal timer arrival---output 0.5s valid signal on arrival<br>33:operation stop time finish<br>34:operation arrival time finish<br>35:setup run time arrival<br>36:setup power on time arrival<br>37:1st pump variable frequency<br>38:1st pump power frequency<br>39:2nd pump variable frequency<br>40:2nd pump power frequency<br>41:communication provision<br>42: torque control speed limiting<br>43~60: Reserved |        |         |   |
| F09.01 | Open collector output terminal Y2 output setup | The same as above  | 1      | 0       | × |
| F09.02 | Open collector output terminal Y3 output setup | The same as above  | 1      | 0       | × |
| F09.03 | Open collector output terminal Y4 output setup | The same as above  | 1      | 0       | × |
| F09.04 | Programmable relay output setting              | The 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 limiting 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 limiting 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 limiting frequency  | 0.01Hz | 0.00Hz  | ○ |
| F09.11 | Zero frequency backlash                        | 0.00Hz~Upper limiting frequency  | 0.01Hz | 0.00Hz  | ○ |
| 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%  | ○ |

Function parameter schedule graph

|        |  |   |        |              |   |
|--------|--|---|--------|--------------|---|
| 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 limiting frequency   | 0.01Hz | 50.00Hz<br>z | ○ |
| F09.21 | Frequency 1 arriving the detection width             | 0.00Hz~Upper limiting frequency   | 0.01Hz | 0.00Hz       | ○ |
| F09.22 | Frequency 2 arriving the detection value             | 0.00Hz~Upper limiting frequency   | 0.01Hz | 50.00Hz<br>z | ○ |
| F09.23 | Frequency 2 arriving the detection width             | 0.00Hz~Upper limiting frequency   | 0.01Hz | 0.00Hz       | ○ |
| F09.24 | positive and negative logic setup of Output terminal | 0000~FFFF (Extend effective)  | 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 | Relay output closed delay time                       | 0.000~50.000s   | 0.001s | 0.000s       | ○ |
| F09.34 | Relay output disconnected delay time                 | 0.000~50.000s   | 0.001s | 0.000s       | ○ |
| F09.35 | Analog output(AO1) selection                         | 0: Frequency after Acce./Dece. (0.00Hz~Upper limiting frequency)<br>1: Output synchronous frequency (0.00Hz~Upper limiting frequency)<br>2: Setting frequency (0.00Hz~Upper limiting frequency)<br>3: Main setting frequency (0.00Hz~Upper limiting frequency)<br>4: Auxiliary setting frequency (0.00Hz~Upper limiting frequency)<br>5: Output current 1 (0~2×control cabinet rated current)<br>6: Output current 2 (0~3×motor rated current)<br>7: Output voltage (0~1.2×loading motor's rated voltage)<br>8: Busbar voltage (0~1.5×rated busbar voltage)<br>9: Motor rotate speed (0~3×rated rotate speed) | 1      | 0            | ○ |

|        |                                       |  |        |         |   |
|--------|---------------------------------------|--|--------|---------|---|
|        |                                       | 10: PID provision (0.00~10.00V)<br>11: PID feedback (0.00~10.00V)<br>12: AI1 (0.00~10.00V or 4~20mA)<br>13: AI2 (-10.00~10.00V or 4~20mA)<br>14: communication provision<br>15: Motor rotor rotate speed (0.00Hz~Upper limiting frequency)<br>16: present setting torque (0~2×rated torque)<br>17: The present output torque (0~2×rated torque)<br>18: The present torque current(0~2×motor rated current)<br>19: The present flux current (0~1×motor rated flux current)<br>20~25: Reserved |        |         |   |
| F09.36 | Analog output (AO2) selection         | The same as above  | 1      | 0       | ○ |
| F09.37 | DO function selection (with Y4 reuse) | The same as above  | 1      | 0       | ○ |
| F09.38 | Reserved                              |  |        |         |   |
| F09.39 | Analog output (AO1) filtering 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)offset             | 0.0~100.0%   | 0.1%   | 0.0%    | ○ |
| F09.42 | Analog output (AO2) filtering 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)offset             | 0.0~100.0% (AO2 output terminal with Y3 reuse)   | 0.1%   | 0.0%    | ○ |
| F09.45 | DO filtering 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 | Reserved                              |  |        |         |   |
| F09.49 | Reserved                              |  |        |         |   |
| F09.50 | Reserved                              |  |        |         |   |

### F10—Simple PLC/Multi-speed Function Parameter Group

| Function Code | Name                       | Set Range  | Min. Unit | Factory Default | Modification |
|---------------|----------------------------|--|-----------|-----------------|--------------|
| F10.00        | Simple PLC running setting | LED 1st bit: running mode selection<br>0: no action<br>1: stop after single circulation<br>2: keep final value after single circulation<br>3: consecutive circulation<br>LED 2nd bit: interrupt run restart mode selection<br>0: start from first step<br>1: continuous run from phase frequency at interruption<br>2: continuous run from run frequency at interruption<br>LED 3rd bit: PLC run time unit | 1         | 0000            | ×            |



|        |                        |   |     |      |   |
|--------|------------------------|---|-----|------|---|
|        |                        | 0: second<br>1: minute<br>LED 4th bit: power-down memory selection<br>0: no memory<br>1: phase of reserve power down, frequency power down recording PLC run status: contain power down phase, run frequency, time have run.  |     |      |   |
| F10.01 | Section 1 setting      | 000H~E22H<br>LED first bit: Frequency setting<br>0: Multi-section frequency i (i=1~15)<br>1: frequency determined by complex frequency of main and auxiliary<br>2: Reserved<br>LED second bit: Run direction options<br>0: Forward run<br>1: Reverse run<br>2: Determined by run command<br>LED third bit : Accelerate/Decelerate time options<br>0: Accelerate/Decelerate time 1<br>1: Accelerate/Decelerate time 2<br>2: Accelerate/Decelerate time 3<br>3: Accelerate/Decelerate time 4<br>4: Accelerate/Decelerate time 5<br>5: Accelerate/Decelerate time 6<br>6: Accelerate/Decelerate time 7<br>7: Accelerate/Decelerate time 8<br>8: Accelerate/Decelerate time 9<br>9: Accelerate/Decelerate time 10<br>A: Accelerate/Decelerate time 11<br>B: Accelerate/Decelerate time 12<br>C: Accelerate/Decelerate time 13<br>D: Accelerate/Decelerate time 14<br>E: Accelerate/Decelerate time 15 | 1   | 000  | ○ |
| F10.02 | Section 2 setting      | 000H~E22H   | 1   | 000  | ○ |
| F10.03 | Section 3 setting      | 000H~E22H   | 1   | 000  | ○ |
| F10.04 | Section 4 setting      | 000H~E22H   | 1   | 000  | ○ |
| F10.05 | Section 5 setting      | 000H~E22H   | 1   | 000  | ○ |
| F10.06 | Section 6 setting      | 000H~E22H   | 1   | 000  | ○ |
| F10.07 | Section 7 setting      | 000H~E22H   | 1   | 000  | ○ |
| F10.08 | Section 8 setting      | 000H~E22H   | 1   | 000  | ○ |
| F10.09 | Section 9 setting      | 000H~E22H   | 1   | 000  | ○ |
| F10.10 | Section 10 setting     | 000H~E22H   | 1   | 000  | ○ |
| F10.11 | Section 11 setting     | 000H~E22H   | 1   | 000  | ○ |
| F10.12 | Section 12 setting     | 000H~E22H   | 1   | 000  | ○ |
| F10.13 | Section 13 setting     | 000H~E22H   | 1   | 000  | ○ |
| F10.14 | Section 14 setting     | 000H~E22H   | 1   | 000  | ○ |
| F10.15 | Section 15 setting     | 000H~E22H   | 1   | 000  | ○ |
| F10.16 | Section 1 running time | 0~6000.0  | 0.1 | 10.0 | ○ |
| F10.17 | Section 2 running time | 0~6000.0  | 0.1 | 10.0 | ○ |
| F10.18 | Section 3 running time | 0~6000.0  | 0.1 | 10.0 | ○ |
| F10.19 | Section 4 running time | 0~6000.0  | 0.1 | 10.0 | ○ |
| F10.20 | Section 5 running time | 0~6000.0  | 0.1 | 10.0 | ○ |
| F10.21 | Section 6 running time | 0~6000.0  | 0.1 | 10.0 | ○ |
| F10.22 | Section 7 running time | 0~6000.0  | 0.1 | 10.0 | ○ |
| F10.23 | Section 8 running time | 0~6000.0  | 0.1 | 10.0 | ○ |

## Function parameter schedule graph

|        |                            |                                 |        |         |   |
|--------|----------------------------|---------------------------------|--------|---------|---|
| F10.24 | Section 9 running time     | 0~6000.0                        | 0.1    | 10.0    | ○ |
| F10.25 | Section 10 running time    | 0~6000.0                        | 0.1    | 10.0    | ○ |
| F10.26 | Section 11 running time    | 0~6000.0                        | 0.1    | 10.0    | ○ |
| F10.27 | Section 12 running time    | 0~6000.0                        | 0.1    | 10.0    | ○ |
| F10.28 | Section 13 running time    | 0~6000.0                        | 0.1    | 10.0    | ○ |
| F10.29 | Section 14 running time    | 0~6000.0                        | 0.1    | 10.0    | ○ |
| F10.30 | Section 15 running time    | 0~6000.0                        | 0.1    | 10.0    | ○ |
| F10.31 | Multi-section frequency 1  | 0.00Hz~Upper limiting frequency | 0.01Hz | 5.00Hz  | ○ |
| F10.32 | Multi-section frequency 2  | 0.00Hz~Upper limiting frequency | 0.01Hz | 10.00Hz | ○ |
| F10.33 | Multi-section frequency 3  | 0.00Hz~Upper limiting frequency | 0.01Hz | 20.00Hz | ○ |
| F10.34 | Multi-section frequency 4  | 0.00Hz~Upper limiting frequency | 0.01Hz | 30.00Hz | ○ |
| F10.35 | Multi-section frequency 5  | 0.00Hz~Upper limiting frequency | 0.01Hz | 40.00Hz | ○ |
| F10.36 | Multi-section frequency 6  | 0.00Hz~Upper limiting frequency | 0.01Hz | 45.00Hz | ○ |
| F10.37 | Multi-section frequency 7  | 0.00Hz~Upper limiting frequency | 0.01Hz | 50.00Hz | ○ |
| F10.38 | Multi-section frequency 8  | 0.00Hz~Upper limiting frequency | 0.01Hz | 5.00Hz  | ○ |
| F10.39 | Multi-section frequency 9  | 0.00Hz~Upper limiting frequency | 0.01Hz | 10.00Hz | ○ |
| F10.40 | Multi-section frequency 10 | 0.00Hz~Upper limiting frequency | 0.01Hz | 20.00Hz | ○ |
| F10.41 | Multi-section frequency 11 | 0.00Hz~Upper limiting frequency | 0.01Hz | 30.00Hz | ○ |
| F10.42 | Multi-section frequency 12 | 0.00Hz~Upper limiting frequency | 0.01Hz | 40.00Hz | ○ |
| F10.43 | Multi-section frequency 13 | 0.00Hz~Upper limiting frequency | 0.01Hz | 45.00Hz | ○ |
| F10.44 | Multi-section frequency 14 | 0.00Hz~Upper limiting frequency | 0.01Hz | 50.00Hz | ○ |
| F10.45 | Multi-section frequency 15 | 0.00Hz~Upper limiting frequency | 0.01Hz | 50.00Hz | ○ |

## F14—Vector control parameter group

| Function Code | Name   | Set Range                             | Min. Unit | Factory Default | Modification |
|---------------|--|---------------------------------------|-----------|-----------------|--------------|
| F14.00        | Speed/Torque control selection                       | 0: Speed control<br>1: Torque control | 1         | 0               | ×            |
| F14.01        | Speed loop high speed proportional gain              | 0.1~40.0                              | 0.1       | 20.0            | ○            |
| F14.02        | Speed loop high speed integral time                  | 0.001~10.000s                         | 0.001s    | 0.040s          | ○            |
| F14.03        | Speed loop low speed proportional gain               | 0.1~80.0                              | 0.1       | 20.0            | ○            |
| F14.04        | Speed loop low speed integral time                   | 0.001~10.000s                         | 0.001s    | 0.020s          | ○            |
| F14.05        | Speed loop parameter switching frequency             | 0.00Hz~20.00Hz                        | 0.01Hz    | 5.00Hz          | ○            |
| F14.06        | Low frequency power generation stability coefficient | 0~50 (Valid under open-loop control)  | 1         | 16              | ○            |
| F14.07        | Current loop proportional gain                       | 0~500                                 | 1         | 70              | ○            |
| F14.08        | Current loop integral time                           | 0.1~100.0ms                           | 0.1ms     | 4.0ms           | ○            |
| F14.09        | Motor-driven torque current limit value              | 10.0~300.0%                           | 0.1%      | 180.0%          | ×            |
| F14.10        | Braking torque current limit value                   | 10.0~300.0%                           | 0.1%      | 180.0%          | ×            |

Function parameter schedule graph

|        |  |  |        |              |   |
|--------|--|--|--------|--------------|---|
| F14.11 | Asynchronous motor flux-weakening control coefficient        | 20.0~100.0%  | 0.1%   | 80.0%        | ○ |
| F14.12 | Asynchronous motor Min. flux coefficient                     | 10.0~80.0% (Valid under closed-loop control)   | 0.1%   | 10.0%        | ○ |
| F14.13 | Torque provision channel selection                           | 0: Digital setting<br>1: AI1 analog setting<br>2: AI2 analog setting<br>3: Terminal UP/DOWN adjustment setting<br>4: communication provision<br>5: EAI1 analog setting (Extend effective)<br>6: EAI2 analog setting (Extend effective)<br>7: High-speed pulse setting<br>( X8 terminal needs to choose the corresponding function )<br>8: Terminal pulse width setting<br>( X8 terminal needs to choose the corresponding function )       | 1      | 0            | × |
| F14.14 | Torque polarity setting                                      | 00~11<br>1st bit: torque setting polarity<br>0: Positive<br>1: Negative<br>2nd bit: torque compensation polarity<br>0: Positive<br>1: Negative   | 1      | 00           | ○ |
| F14.15 | Torque digital setting value                                 | 0.0~200.0%   | 0.1%   | 0.0%         | ○ |
| F14.16 | Forward speed limit channel selection in Torque control mode | 0: Digital setting<br>1: AI1 analog setting<br>2: AI2 analog setting<br>3: Terminal UP/DOWN adjustment setting<br>4: communication provision<br>5: EAI1 analog setting (expansion effective)<br>6: EAI2 analog setting (expansion effective)<br>7: High-speed pulse setting<br>( X8 terminal needs to choose the corresponding function )<br>8: Terminal pulse width setting<br>( X8 terminal needs to choose the corresponding function ) | 1      | 0            | × |
| F14.17 | Reverse speed limit channel selection in Torque control mode | 0: Digital setting<br>1: AI1 analog setting<br>2: AI2 analog setting<br>3: Terminal UP/DOWN adjustment setting<br>4: communication provision<br>5: EAI1 analog setting (expansion effective)<br>6: EAI2 analog setting (expansion effective)<br>7: High-speed pulse setting<br>( X8 terminal needs to choose the corresponding function )<br>8: Terminal pulse width setting<br>( X8 terminal needs to choose the corresponding function ) | 1      | 0            | × |
| F14.18 | Forward speed limit value in Torque control mode             | 0.00Hz~Upper limiting frequency  | 0.01Hz | 50.00Hz<br>z | ○ |
| F14.19 | Reverse speed limit value in Torque control mode             | 0.00Hz~Upper limiting frequency  | 0.01Hz | 50.00Hz<br>z | ○ |

|        |   |               |        |        |   |
|--------|---|---------------|--------|--------|---|
| F14.20 | Torque Accelerate/Decelerate time setting   | 0.000~60.000s | 0.001s | 0.100s | ○ |
| F14.21 | Torque compensation                         | 0.0~100.0%    | 0.1%   | 0.0%   | ○ |
| F14.22 | Positive torque gain regulation coefficient | 50.0~150.0%   | 0.1%   | 100.0% | ○ |
| F14.23 | Negative torque gain regulation coefficient | 50.0~150.0%   | 0.1%   | 100.0% | ○ |
| F14.24 | Flux braking coefficient                    | 0.0~300.0%    | 0.1%   | 0.0%   | ○ |
| F14.25 | Pre-excitation start-up time constant       | 0.1~3.0       | 0.1    | 0.5    | × |
| F14.26 | Reserved                                    |               |        |        |   |
| F14.27 | Reserved                                    |               |        |        |   |
| F14.28 | Reserved                                    |               |        |        |   |
| F14.29 | Reserved                                    |               |        |        |   |
| F14.30 | Reserved                                    |               |        |        |   |

## F15—Motor parameter group

| Function Code | Name                                      | Set Range      | Min. Unit | Factory Default         | Modification |
|---------------|---|----------------|-----------|-------------------------|--------------|
| F15.00        | Reserved                                  |                |           |                         |              |
| F15.01        | Asynchronous motor's rated power          | 0.1~999.9KW    | 0.1KW     | Depend on machine type  | ×            |
| F15.02        | Asynchronous motor's rated voltage        | 1~690V         | 1V        | Depend on machine type  | ×            |
| F15.03        | Asynchronous motor's rated current        | 0.1~6553.5A    | 0.1A      | Depend on machine stype | ×            |
| F15.04        | Asynchronous motor's rated frequency      | 0.00~400.00Hz  | 0.01Hz    | Depend on machine type  | ×            |
| F15.05        | Asynchronous motor's rated speed          | 0~60000r/min   | 1r/min    | Depend on machine type  | ×            |
| F15.06        | Asynchronous motor's number of pole-pairs | 1~7            | 1         | 2                       | ×            |
| F15.07        | Asynchronous motor's stator resistance    | 0.0001~6.5535Ω | 0.0001Ω   | Depend on machine type  | ×            |
| F15.08        | Asynchronous motor's rotor resistance     | 0.0001~6.5535Ω | 0.0001Ω   | Depend on machine type  | ×            |
| F15.09        | Asynchronous motor's leakage inductance   | 0.001~65.535mH | 0.001mH   | Depend on machine type  | ×            |
| F15.10        | Asynchronous motor's mutual inductance    | 0.01~655.35mH  | 0.01mH    | Depend on machine type  | ×            |
| F15.11        | Asynchronous motor's no-load current      | 0.01~655.35A   | 0.01A     | Depend on machine type  | ×            |
| F15.12        | Reserved                                  |                |           |                         |              |

## Function parameter schedule graph

|        |                                       |  |   |   |   |
|--------|---------------------------------------|--|---|---|---|
| F15.13 | Reserved                              |  |   |   |   |
| F15.14 | Reserved                              |  |   |   |   |
| F15.15 | Reserved                              |  |   |   |   |
| F15.16 | Reserved                              |  |   |   |   |
| F15.17 | Reserved                              |  |   |   |   |
| F15.18 | Reserved                              |  |   |   |   |
| F15.19 | Motor parameter self-tuning selection | <p>0: Inaction</p> <p>1: asynchronous motor stop to self-adjusting</p> <p>2: asynchronous motor rotate no-load to self-adjusting</p> <p>3: Reserved</p> <p>Note:</p> <p>① Before adjustment, The nameplate data should be setting directly.</p> <p>② Motor parameter group can have special default values, or can be modified by users, or can be self-adjusted.</p> <p>③ when parameter F15.01 is modified, the other parameters of the motor will turn into default values automatically.</p> | 1 | 0 | × |
| F15.20 | Reserved                              |  |   |   |   |
| F15.21 | Reserved                              |  |   |   |   |
| F15.22 | Reserved                              |  |   |   |   |

### F18—Enhance Control Parameter Group

| Function Code | Name  | Set Range  | Min. Unit | Factory Default | Modification |
|---------------|---|--|-----------|-----------------|--------------|
| F18.00        | Operation panel control frequency binding     | <p>0:no binding</p> <p>1:operation keyboard digital setup</p> <p>2:A11 analog setup</p> <p>3:A12 analog setup</p> <p>4:terminal UP/DOWN adjusting setup</p> <p>5:communication provide(Modbus and external bus use the same main frequency storage)</p> <p>6:EAI1 analog setup(extension valid)</p> <p>7:EAI2 analog setup(extension valid)</p> <p>8:high speed pulse setup( X8 terminal need choose the relative function)</p> <p>9:terminal pulse width setup(X8 terminal need choose the relative function)</p> <p>10:terminal encoder provide(decide by X1, X2)</p> <p>11~15: Reserved</p> | 1         | 0               | ○            |
| F18.01        | Terminal control frequency binding            | The same as above  | 1         | 0               | ○            |
| F18.02        | Communication control frequency binding       | The same as above  | 1         | 0               | ○            |
| F18.03        | Digital frequency integral function selection | <p>Units digit: keyboard UP/DW integral control</p> <p>0:integral function</p> <p>1:no integral function</p> <p>Tens digit: terminal UP/DW integral control</p> <p>0:integral function</p> <p>1:no integral function</p>   | 1         | 00              | ○            |
| 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 hour   | 1      | 0      | ○ |
| F18.10 | Setup accumulate run time                     | 0~65535 hour   | 1      | 0      | ○ |
| F18.11 | Timing run function enable                    | 0: Invalid<br>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<br>1: PID digital provide value adjusting<br>2~6: Reserved | 1      | 0      | ○ |
| F18.15 | Reserved                                      |  |        |        |   |
| F18.16 | Reserved                                      |  |        |        |   |
| F18.17 | Reserved                                      |  |        |        |   |
| F18.18 | Reserved                                      |  |        |        |   |
| F18.19 | Reserved                                      |  |        |        |   |
| F18.20 | Reserved                                      |  |        |        |   |
| F18.21 | Reserved                                      |  |        |        |   |
| F18.22 | Reserved                                      |  |        |        |   |
| F18.23 | Reserved                                      |  |        |        |   |
| F18.24 | Reserved                                      |  |        |        |   |

### F19—Protective Relevant Function Parameter Group

| Function Code | Name   | Set Range  | Min. Unit | Factory Default | Modification |
|---------------|--|--|-----------|-----------------|--------------|
| 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, keep working<br>1: Alarm, stop run as halt mode<br>2: Failure, freely stopping | 1         | 2               | ×            |
| F19.04        | Motor overload protection coefficient                  | 20.0~200.0% (Motor rated current)  | 0.1%      | 180.0%          | ×            |
| F19.05        | Control cabinet overload pre-alarm detection selection | 0: Keep detecting<br>1: detection as constant velocity                                   | 1         | 1               | ×            |
| F19.06        | Control cabinet overload pre-alarm detection level     | 20~180% (Control cabinet rated current)  | 1%        | 150%            | ○            |
| F19.07        | Control cabinet 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%           | ○            |

Function parameter schedule graph

|        |  |  |          |           |   |
|--------|--|--|----------|-----------|---|
| F19.09 | Motor underload alarm detection time                     | 0.1~60.0s  | 0.1s     | 2.0s      | ○ |
| F19.10 | Motor underload alarm detection action                   | 1 <sup>st</sup> bit: Detection selection<br>0: No detection<br>1: Keep detecting when working<br>2: detection only when constant velocity<br>2 <sup>nd</sup> bit: action selection<br>0: Alarm, keep working<br>1: Alarm, stop run as halt mode<br>2: Failure, freely stopping   | 1        | 00        | ○ |
| F19.11 | Input& output phase loss, short circuit detection action | 1 <sup>st</sup> bit: Input phase loss<br>0: No detection<br>1: Failure, freely stopping<br>2 <sup>nd</sup> bit: Output phase loss<br>0: No detection<br>1: Failure, freely stopping<br>3 <sup>rd</sup> bit: power-on on earth short circuit protect detection enable<br>0: No detection<br>1: Failure, freely stopping<br>4 <sup>th</sup> bit: operation on earth short circuit protect detection enable<br>0: No detection<br>1: Failure, freely stopping | 1        | 1101      | ○ |
| F19.12 | Over voltage stall selection                             | 0: Prohibition<br>1: Allow   | 1        | 1         | × |
| F19.13 | Over voltage stall protection voltage                    | 120~150%   | 1%       | 125%      | × |
| F19.14 | Automatic current limit level                            | 110~200%, G type rated current   | 1%       | 220%      | × |
| 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<br>1:constant velocity valid   | 1        | 0         | × |
| F19.17 | Reserved   |  |          |           |   |
| F19.18 | Motor run section selection when instant power off       | 0: Prohibition<br>1: Allow   | 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, keep working<br>1: Alarm, stop run as halt mode<br>2: Alarm, freely stopping   | 1        | 2         | × |
| F19.24 | Power on terminal protection selection                   | 0: Invalid<br>1: Valid   | 1        | 0         | × |
| F19.25 | Provide lost detection value                             | 0~100%   | 1%       | 0%        | ○ |
| F19.26 | Provide lost detection time                              | 0.0~20.0s  | 0.1s     | 0.5s      | ○ |

|        |  |   |      |      |   |
|--------|--|---|------|------|---|
| F19.27 | Feedback lost detection value                            | 0~100%  | 1%   | 12%  | ○ |
| F19.28 | Feedback lost detection time                             | 0.0~20.0s   | 0.1s | 0.5s | ○ |
| F19.29 | Deviation magnitude abnormal detection value             | 0~100%  | 1%   | 50%  | ○ |
| F19.30 | Deviation magnitude abnormal detection time              | 0.0~20.0s   | 0.1s | 0.5s | ○ |
| F19.31 | Protection action selection 1                            | Units digit: PID provide loss detection act<br>0:no detection<br>1:alarm, continue run<br>2:alarm, stop run as halt mode<br>3:fault, free halt<br>Tens digit: PID feedback loss detection act<br>0:no detection<br>1:alarm, continue run<br>2:alarm, stop run as halt mode<br>3:fault, free halt<br>Hundreds digit: PID error value abnormal detect action<br>0:no detection<br>1:alarm, continue run<br>2:alarm, stop run as halt mode<br>3:fault, free halt   | 1    | 000  | ○ |
| F19.32 | Protection action selection 2                            | Units digit: communication abnormal action: include communication time out and error<br>0:alarm, continue run<br>1:alarm, stop run as halt mode<br>2:fault, free halt<br>Tens digit: E2PROM abnormal action selection<br>0:alarm, continue run<br>1:alarm, stop run as halt mode<br>2:fault, free halt<br>Hundreds digit: contactor abnormal action<br>0:alarm, continue run<br>1:alarm, stop run as halt mode<br>2:fault, free halt<br>Thousands digit: running lack-Voltage fault display action selection.<br>0:no detection<br>1:fault, free halt | 1    | 1200 | × |
| F19.33 | Reserved   |   |      |      |   |
| F19.34 | Reserved   |   |      |      |   |
| F19.35 | Fault indication and clock during the period of recovery | Units digit: fault indication selection during the period of fault reset automatically<br>0:action<br>1:no action<br>Tens digit: fault clock function selection: to achieve fault display before power down: etc.<br>0:forbid<br>1:open   | 1    | 00   | × |
| F19.36 | Continuous run frequency selection when alarm            | Match up with protect action<br>0:run at the frequency setup by now<br>1:run at the frequency of upper limit  | 1    | 0    | × |



Function parameter schedule graph

|        |   |   |        |         |   |
|--------|---|---|--------|---------|---|
|        |   | 2:run at the frequency of low limit<br>3:run at the frequency of abnormal for standby |        |         |   |
| F19.37 | Abnormal standby frequency                        | 0.00Hz~Upper limiting frequency   | 0.01Hz | 10.00Hz | × |
| F19.38 | Reserved  |   |        |         |   |
| F19.39 | Over speed (OS) detection value                   | 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 is too large | 0.0~50.0% (equals upper limit frequency)  | 0.1%   | 10.0%   | ○ |
| F19.42 | Detection time when speed deviation is too large  | 0.00~20.00s (No detection when value is 0)  | 0.01s  | 0.00s   | ○ |
| F19.43 | Reserved  |   |        |         |   |
| F19.44 | Reserved  |   |        |         |   |

**F21—Injection molding machine analog input parameter group**

| Function Code         | Name                           | Set Range  | Min. Unit | Factory Default | Modification |
|-----------------------|--------------------------------|--|-----------|-----------------|--------------|
| F21.00                | I1/V1 filter time              | 0.000~9.999s   | 0.001s    | 0.020s          | ○            |
| F21.01                | I1/V1 provision gain           | 0.000~9.999  | 0.001     | 1.000           | ○            |
| F21.02                | I1/V1 provision bias           | 0.0~100.0%   | 0.1%      | 0               | ○            |
| F21.03                | I2/V2 filter time              | 0.000~9.999s   | 0.001s    | 0.020s          | ○            |
| F21.04                | I2/V2 provision gain           | 0.000~9.999  | 0.001     | 1.000           | ○            |
| F21.05                | I2/V2 provision bias           | 0.0~100.0%   | 0.1%      | 0               | ○            |
| F21.06                | Analog provision bias polarity | LED 1 <sup>st</sup> bit: I1/V1 provision bias polarity<br>0: Positive polarity<br>1: Negative polarity<br>LED 2 <sup>nd</sup> bit: I2/V2 provision bias polarity<br>0: Positive polarity<br>1: Negative polarity | 1         | 00              | ○            |
| F21.07<br>~<br>F21.21 | Reserved                       |  |           |                 |              |

**F22—Injection molding machine energy saving parameter group 1**

| Function Code | Name   | Set Range  | Min. Unit | Factory Default | Modification |
|---------------|--|--|-----------|-----------------|--------------|
| F22.00        | Injection molding machine frequency provision mode | 0: Nonuse machine frequency provision user customized mode<br>1: Choose machine frequency provision user customized mode 1<br>2: Choose machine frequency provision user customized mode 2<br>3: Choose machine frequency provision user customized mode 3                     | 1         | 1               | ×            |
| F22.01        | Machine frequency provision user customized mode 1 | LED 1 <sup>st</sup> bit: flow and pressure input selection<br>0: flow and pressure signal are all valid<br>1: only flow signal is valid<br>2: only pressure signal is valid<br>LED 2 <sup>nd</sup> bit: Flow provision curve selection<br>0: Molding machine frequency curve 1 | 1         | 0001            | ×            |

|        |  |  |      |        |   |
|--------|--|--|------|--------|---|
|        |  | 1: Molding machine frequency curve 2<br>2: Molding machine frequency curve 3<br>LED 3 <sup>rd</sup> bit: Pressure provision curve selection<br>0: Molding machine frequency curve 1<br>1: Molding machine frequency curve 2<br>2: Molding machine frequency curve 3<br>LED 4 <sup>th</sup> bit: selection of relationship between flow and pressure<br>0: $K1 \cdot \text{flow} + K2 \cdot \text{pressure}$<br>1: Max (pressure, flow) |      |        |   |
| F22.02 | User 1 flow coefficient K1   | 0.0%~100.0%  | 0.1% | 50.0%  | ○ |
| F22.03 | User 1 pressure coefficient K2   | 0.0%~100.0%  | 0.1% | 50.0%  | ○ |
| F22.04 | Machine frequency provision user customized mode 2                                 | Same as F22.01   | 1    | 0000   | × |
| F22.05 | User 2 flow coefficient K1   | 0.0%~100.0%  | 0.1% | 50.0%  | ○ |
| F22.06 | User 2 pressure coefficient K2   | 0.0%~100.0%  | 0.1% | 50.0%  | ○ |
| F22.07 | Machine frequency provision user customized mode 3                                 | Same as F22.01   | 1    | 0000   | × |
| F22.08 | User 3 flow coefficient K1   | 0.0%~100.0%  | 0.1% | 50.0%  | ○ |
| F22.09 | User 3 pressure coefficient K2   | 0.0%~100.0%  | 0.1% | 50.0%  | ○ |
| F22.10 | Molding machine frequency curve 1 input point A0                                   | 0.0%~100.0%  | 0.1% | 0.0%   | ○ |
| F22.11 | Molding machine frequency curve 1 input point A0's corresponding per unit value B0 | 0.0%~100.0%  | 0.1% | 0.0%   | ○ |
| F22.12 | Molding machine frequency curve 1 input point A1                                   | 0.0%~100.0%  | 0.1% | 25.0%  | ○ |
| F22.13 | Molding machine frequency curve 1 input point A1's corresponding per unit value B1 | 0.0%~100.0%  | 0.1% | 25.0%  | ○ |
| F22.14 | Molding machine frequency curve 1 input point A2                                   | 0.0%~100.0%  | 0.1% | 50.0%  | ○ |
| F22.15 | Molding machine frequency curve 1 input point A2's corresponding per unit value B2 | 0.0%~100.0%  | 0.1% | 50.0%  | ○ |
| F22.16 | Molding machine frequency curve 1 input point A3                                   | 0.0%~100.0%  | 0.1% | 100.0% | ○ |
| F22.17 | Molding machine frequency curve 1 input point A3's corresponding per unit value B3 | 0.0%~100.0%  | 0.1% | 100.0% | ○ |

| F23—Injection molding machine energy saving parameter group 2 |  |             |           |                 |              |
|---|--|-------------|-----------|-----------------|--------------|
| Function Code   | Name   | Set Range   | Min. Unit | Factory Default | Modification |
| F23.00  | Molding machine frequency curve 2 input point A0                                   | 0.0%~100.0% | 0.1%      | 0.0%            | ○            |
| F23.01  | Molding machine frequency curve 2 input point A0's corresponding per unit value B0 | 0.0%~100.0% | 0.1%      | 0.0%            | ○            |
| F23.02  | Molding machine frequency curve 2 input point A1                                   | 0.0%~100.0% | 0.1%      | 25.0%           | ○            |
| F23.03  | Molding machine frequency curve 2 input point A1's corresponding per unit value B1 | 0.0%~100.0% | 0.1%      | 25.0%           | ○            |
| F23.04  | Molding machine frequency curve 2 input point A2                                   | 0.0%~100.0% | 0.1%      | 50.0%           | ○            |
| F23.05  | Molding machine frequency curve 2 input point A2's corresponding per unit value B2 | 0.0%~100.0% | 0.1%      | 50.0%           | ○            |
| F23.06  | Molding machine frequency curve 2 input point A3                                   | 0.0%~100.0% | 0.1%      | 100.0%          | ○            |
| F23.07  | Molding machine frequency curve 2 input point A3's corresponding per unit value B3 | 0.0%~100.0% | 0.1%      | 100.0%          | ○            |
| F23.08  | Molding machine frequency curve 3 input point A0                                   | 0.0%~100.0% | 0.1%      | 0.0%            | ○            |
| F23.09  | Molding machine frequency curve 3 input point A0's corresponding per unit value B0 | 0.0%~100.0% | 0.1%      | 0.0%            | ○            |
| F23.10  | Molding machine frequency curve 3 input point A1                                   | 0.0%~100.0% | 0.1%      | 25.0%           | ○            |
| F23.11  | Molding machine frequency curve 3 input point A1's corresponding per unit value B1 | 0.0%~100.0% | 0.1%      | 25.0%           | ○            |
| F23.12  | Molding machine frequency curve 3 input point A2                                   | 0.0%~100.0% | 0.1%      | 50.0%           | ○            |
| F23.13  | Molding machine frequency curve 3 input point A2's corresponding per unit value B2 | 0.0%~100.0% | 0.1%      | 50.0%           | ○            |
| F23.14  | Molding machine frequency curve 3 input point A3                                   | 0.0%~100.0% | 0.1%      | 100.0%          | ○            |

Function parameter schedule graph

|                       |  |             |      |        |   |
|-----------------------|--|-------------|------|--------|---|
| F23.15                | Molding machine frequency curve 3 input point A3's corresponding per unit value B3 | 0.0%~100.0% | 0.1% | 100.0% | ○ |
| F23.16<br>~<br>F23.17 | Reserved   |             |      |        |   |

**F25—User's customized display parameter group**

| Function Code | Name                    | Set Range     | Min. Unit | Factory Default | Modification |
|---------------|-------------------------|---------------|-----------|-----------------|--------------|
| F25.00        | User's Function Code 1  | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.01        | User's Function Code 2  | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.02        | User's Function Code 3  | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.03        | User's Function Code 4  | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.04        | User's Function Code 5  | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.05        | User's Function Code 6  | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.06        | User's Function Code 7  | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.07        | User's Function Code 8  | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.08        | User's Function Code 9  | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.09        | User's Function Code 10 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.10        | User's Function Code 11 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.11        | User's Function Code 12 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.12        | User's Function Code 13 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.13        | User's Function Code 14 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.14        | User's Function Code 15 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.15        | User's Function Code 16 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.16        | User's Function Code 17 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.17        | User's Function Code 18 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.18        | User's Function Code 19 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.19        | User's Function Code 20 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.20        | User's Function Code 21 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.21        | User's Function Code 22 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.22        | User's Function Code 23 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.23        | User's Function Code 24 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.24        | User's Function Code 25 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.25        | User's Function Code 26 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.26        | User's Function Code 27 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.27        | User's Function Code 28 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.28        | User's Function Code 29 | F00.00~F25.xx | 0.01      | 25.00           | ○            |
| F25.29        | User's Function Code 30 | F00.00~F25.xx | 0.01      | 25.00           | ○            |

**F26—Failure record function parameter group**

| Function Code | Name                  | Set Range  | Min. Unit | Factory Default | Modification |
|---------------|-----------------------|--|-----------|-----------------|--------------|
| F26.00        | The last fault record | 0:no fault<br>1:overcurrent at acceleration<br>2:overcurrent at deceleration<br>3:overcurrent at constant speed<br>4:overvoltage at acceleration | 1         | 0               | *            |

|        |   |  |        |        |   |
|--------|---|--|--------|--------|---|
|        |   | 5: overvoltage at deceleration<br>6: overvoltage at constant speed<br>7: overvoltage at motor halt<br>8: undervoltage at run<br>9: drive overload protection<br>10: motor overload protection<br>11: motor underload protection<br>12: input phase loss<br>13: output phase loss<br>14: inverter module protection<br>15: short circuit to earth at run<br>16: short circuit to earth when power on<br>17: drive overheat<br>18: external device fault<br>19: current detect circuit fault<br>20: external interference<br>21: internal interference—main clock etc<br>22: PID provide lost<br>23: PID feedback lost<br>24: PID error value abnormal<br>25: terminal protection activate<br>26: communication fault<br>27~29: reserve<br>30: EEROM read-write error<br>31: temperature detection disconnection<br>32: auto-tuning fault<br>33: contactor abnormal<br>34: factory fault 1<br>35: factory fault 2<br>36: capacitor overheat (few mode with overheat protection)<br>37: encoder disconnection<br>38: over-speed protection<br>39: protection when speed deviation is too large<br>40~50: Reserved |        |        |   |
| F26.01 | The last two fault records                  | The same as above  | 1      | 0      | * |
| F26.02 | The last three fault records                | The same as above  | 1      | 0      | * |
| F26.03 | The last four fault records                 | The same as above  | 1      | 0      | * |
| F26.04 | Setup frequency at the last one fault       | 0.00Hz~Upper limiting frequency  | 0.01Hz | 0.00Hz | * |
| F26.05 | Output frequency at the last one fault      | 0.00Hz~Upper limiting 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 | 0000~FFFF  | 1      | 0000   | * |
| F26.10 | Accumulated run time at the last one fault  | 0~65535h   | 1h     | 0h     | * |
| F26.11 | Setup frequency at the last two fault       | 0.00Hz~Upper limiting frequency  | 0.01Hz | 0.00Hz | * |
| F26.12 | Output frequency at the last two fault      | 0.00Hz~Upper limiting frequency  | 0.01Hz | 0.00Hz | * |
| F26.13 | Output current at the last                  | 0.0~6553.5A  | 0.1A   | 0.0A   | * |

|        |   |             |      |      |   |
|--------|---|-------------|------|------|---|
|        | two fault                                   |             |      |      |   |
| 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 | 0000~FFFF   | 1    | 0000 | * |
| F26.17 | Accumulated run time at the last two fault  | 0~65535h    | 1h   | 0h   | * |

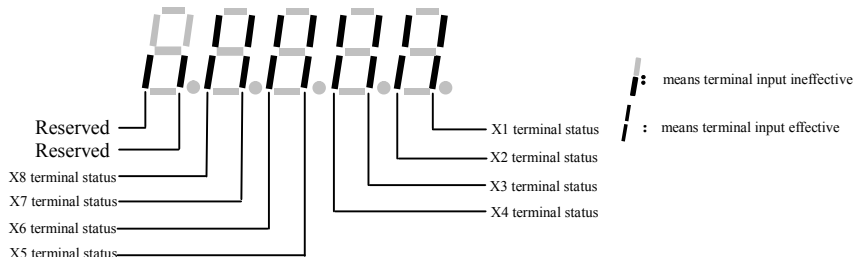
### F27—Password and manufacturer function parameter group

| Function Code | Name                  | Set Range   | Min. Unit | Factory Default | Modification |
|---------------|-----------------------|-------------|-----------|-----------------|--------------|
| F27.00        | User password         | 00000~65535 | 1         | 00000           | ○            |
| F27.01        | Manufacturer password | 00000~65535 | 1         | 00000           | ○            |

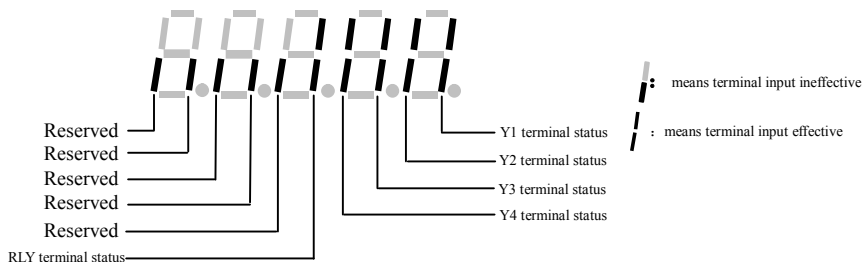
### C—Monitor Function Parameter Group

| Function Code | Name   | Explanation | Min. Unit | Factory Default | Modification |
|---------------|--|-------------|-----------|-----------------|--------------|
| 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 |             |           |                 |              |

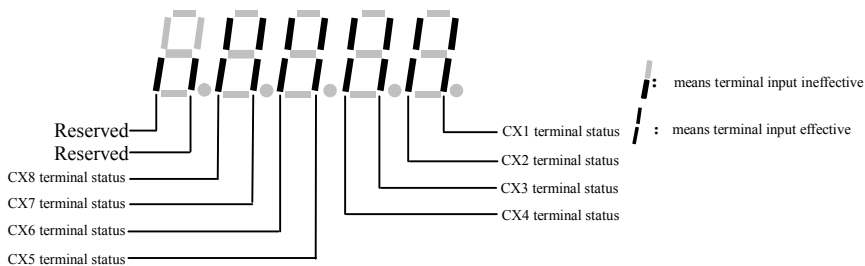
(1)corresponding relationship of input terminal status as below:



(2)Corresponding relationship of standard output terminal status as below:



(3)Corresponding relationship of communication virtual input terminal status as below:



(4) Control cabinet status:

- BIT0: 1= busbar voltage setup
- BIT1: 1= common run command valid
- BIT2: 1= jog run command valid
- BIT3: 1= control cabinet is running
- BIT4: 1= current run direction to reverse
- BIT5: 1= run command direction to reverse
- BIT6: 1= deceleration brake period
- BIT7: 1= motor acceleration period
- BIT8: 1= motor deceleration period
- BIT9: 1= control cabinet alarm
- BIT10: 1= control cabinet fault
- BIT11: 1= current limited period
- BIT12: 1= fault self-recovery period
- BIT13: 1= self-adjusting period
- BIT14: 1= free halt status
- BIT15: 1= speed tracking start

## 6.3 Detailed function specification for F22 and F23 group

### 6.3.1 Machine energy saving parameter group 1: F22

The parameter function code of this chapter listed content as below:

| Code   | Name   | Set range or explanation | Factory Default |
|--------|--|--------------------------|-----------------|
| F22.00 | Injection molding machine frequency provision mode | Range: 0~3               | 1               |

Please confirm the frequency provision mode under energy saving work-status, users can set different machine frequency-provision user customized mode according to different ambient or mould.

#### 0: Nonuse machine frequency provision user customized mode

If the machine's flow or pressure signal is outputted by 0~10V or 0~20mA, using the ordinary AI terminal is OK, F06 group parameters can realize the function of frequency provision.

#### 1: Choose machine frequency provision user customized mode 1

If the machine's flow or pressure signal is outputted by 0~10V or 0~1A, and is inputted by analog input terminal, then the machine frequency will be set by the definition of F22.01.

#### 2: Choose machine frequency provision user customized mode 2

If the machine's flow or pressure signal is outputted by 0~10V or 0~1A, and is inputted by analog input terminal, then the machine frequency will be set by the definition of F22.04.

#### 3: Choose machine frequency provision user customized mode 3

If the machine's flow or pressure signal is outputted by 0~10V 或 0~1A, and is inputted by analog input terminal, then the machine frequency will be set by the definition of F22.07.

|        |  |  |      |
|--------|--|--|------|
| F22.01 | Machine frequency provision user customized mode 1 | Range:<br>LED units digit: 0~2<br>LED tens digit: 0~2<br>LED hundreds digit: 0~2<br>LED thousands digit: 0,1 | 0001 |
|--------|--|--|------|

LED units digit: flow and pressure input selection

#### 0: flow and pressure signal are all valid

#### 1: only flow signal is valid

#### 2: only pressure signal is valid

The units digit of this parameter decides if the flow and pressure signals can be acted as frequency provision. When you choose either flow signal or pressure signal to act as frequency provision, the other signal will no more have effect on the frequency.



LED tens digit: Flow provision curve selection

**0: Molding machine frequency curve 1**

**1: Molding machine frequency curve 2**

**2: Molding machine frequency curve 3**

The tens digit of this parameter decides the frequency curve for amending flow signal. The frequency curve turns the flow signal into analog quantity inside the machine. The product by this per unit value and upper limiting frequency F01.11 decide the corresponding setting frequency component of flow signal.

LED hundreds digit: Pressure provision curve selection

**0: Molding machine frequency curve 1**

**1: Molding machine frequency curve 2**

**2: Molding machine frequency curve 3**

The hundreds digit of this parameter decides the frequency curve for amending pressure signal. The frequency curve turns the pressure signal into analog quantity inside the machine. The product by this per unit value and upper limiting frequency F01.11 decide the corresponding setting frequency component of pressure signal.

LED thousands digit: selection of relationship between flow and pressure

**0:  $K1 \cdot \text{flow} + K2 \cdot \text{pressure}$**

**1: Max (Pressure, Flow)**

The thousands digit of this parameter chooses the flow signal and pressure signal to act as the frequency provision at the same time. If only choosing either flow signal or pressure signal to act as the frequency provision, this setting will be invalid.

|        |                                |                    |       |
|--------|--------------------------------|--------------------|-------|
| F22.02 | User 1 flow coefficient K1     | Range: 0.0%~100.0% | 50.0% |
| F22.03 | User 1 pressure coefficient K2 | Range: 0.0%~100.0% | 50.0% |

When set F22.00=1, and the units digit of F22.01 is 0, flow signal and pressure signal will act as the proportion coefficient of frequency provision.

|        |  |  |       |
|--------|--|--|-------|
| F22.04 | Machine frequency provision user customized mode 2 | Range:<br>LED units digit: 0~2<br>LED tens digit: 0~2<br>LED hundreds digit: 0~2<br>LED thousands digit: 0、1 | 0000  |
| F22.05 | User 2 flow coefficient K1                         | Range: 0.0%~100.0%   | 50.0% |
| F22.06 | User 2 pressure coefficient K2                     | Range: 0.0%~100.0%   | 50.0% |

When set F22.00=2, and the units digit of F22.01 is 0, flow signal and pressure signal will act as the proportion coefficient of frequency provision.

|        |  |  |       |
|--------|--|--|-------|
| F22.07 | Machine frequency provision user customized mode 3 | Range:<br>LED units digit: 0~2<br>LED tens digit: 0~2<br>LED hundreds digit: 0~2<br>LED thousands digit: 0、1 | 0000  |
| F22.08 | User 3 flow coefficient K1                         | Range: 0.0%~100.0%   | 50.0% |
| F22.09 | User 3 pressure coefficient K2                     | Range: 0.0%~100.0%   | 50.0% |

When set F22.00=3, and the units digit of F22.01 is 0, flow signal and pressure signal will act as the proportion coefficient of frequency provision.

|        |  |                    |        |
|--------|--|--------------------|--------|
| F22.10 | Molding machine frequency curve 1 input point A0                                   | Range: 0.0%~100.0% | 0.0%   |
| F22.11 | Molding machine frequency curve 1 input point A0's corresponding per unit value B0 | Range: 0.0%~100.0% | 0.0%   |
| F22.12 | Molding machine frequency curve 1 input point A1                                   | Range: 0.0%~100.0% | 25.0%  |
| F22.13 | Molding machine frequency curve 1 input point A1's corresponding per unit value B1 | Range: 0.0%~100.0% | 25.0%  |
| F22.14 | Molding machine frequency curve 1 input point A2                                   | Range: 0.0%~100.0% | 50.0%  |
| F22.15 | Molding machine frequency curve 1 input point A2's corresponding per unit value B2 | Range: 0.0%~100.0% | 50.0%  |
| F22.16 | Molding machine frequency curve 1 input point A3                                   | Range: 0.0%~100.0% | 100.0% |
| F22.17 | Molding machine frequency curve 1 input point A3's corresponding per unit value B3 | Range: 0.0%~100.0% | 100.0% |

F22.10~F22.17 can define the frequency curve 1. Frequency curve turns the external analog signal into analog quantity inside the machine. The product by this per unit value and upper limiting frequency F01.11 decides the corresponding setting frequency component of signal.

**6.3.2 Machine energy saving parameter group 2: F23**

|               |   |                           |               |
|---------------|---|---------------------------|---------------|
| <b>F23.00</b> | <b>Molding machine frequency curve 2 input point A0</b>                                   | <b>Range: 0.0%~100.0%</b> | <b>0.0%</b>   |
| <b>F23.01</b> | <b>Molding machine frequency curve 2 input point A0's corresponding per unit value B0</b> | <b>Range: 0.0%~100.0%</b> | <b>0.0%</b>   |
| <b>F23.02</b> | <b>Molding machine frequency curve 2 input point A1</b>                                   | <b>Range: 0.0%~100.0%</b> | <b>25.0%</b>  |
| <b>F23.03</b> | <b>Molding machine frequency curve 2 input point A1's corresponding per unit value B1</b> | <b>Range: 0.0%~100.0%</b> | <b>25.0%</b>  |
| <b>F23.04</b> | <b>Molding machine frequency curve 2 input point A2</b>                                   | <b>Range: 0.0%~100.0%</b> | <b>50.0%</b>  |
| <b>F23.05</b> | <b>Molding machine frequency curve 2 input point A2's corresponding per unit value B2</b> | <b>Range: 0.0%~100.0%</b> | <b>50.0%</b>  |
| <b>F23.06</b> | <b>Molding machine frequency curve 2 input point A3</b>                                   | <b>Range: 0.0%~100.0%</b> | <b>100.0%</b> |
| <b>F23.07</b> | <b>Molding machine frequency curve 2 input point A3's corresponding per unit value B3</b> | <b>Range: 0.0%~100.0%</b> | <b>100.0%</b> |

F23.00~F23.07 can define the frequency curve 2. Frequency curve turns the external analog signal into analog quantity inside the machine. The product by this per unit value and upper limiting frequency F01.11 decides the corresponding setting frequency component of signal.

|               |   |                           |              |
|---------------|---|---------------------------|--------------|
| <b>F23.08</b> | <b>Molding machine frequency curve 3 input point A0</b>                                   | <b>Range: 0.0%~100.0%</b> | <b>0.0%</b>  |
| <b>F23.09</b> | <b>Molding machine frequency curve 3 input point A0's corresponding per unit value B0</b> | <b>Range: 0.0%~100.0%</b> | <b>0.0%</b>  |
| <b>F23.10</b> | <b>Molding machine frequency curve 3 input point A1</b>                                   | <b>Range: 0.0%~100.0%</b> | <b>25.0%</b> |

|               |   |                           |               |
|---------------|---|---------------------------|---------------|
| <b>F23.11</b> | <b>Molding machine frequency curve 3 input point A1's corresponding per unit value B1</b> | <b>Range: 0.0%~100.0%</b> | <b>25.0%</b>  |
| <b>F23.12</b> | <b>Molding machine frequency curve 3 input point A2</b>                                   | <b>Range: 0.0%~100.0%</b> | <b>50.0%</b>  |
| <b>F23.13</b> | <b>Molding machine frequency curve 3 input point A2's corresponding per unit value B2</b> | <b>Range: 0.0%~100.0%</b> | <b>50.0%</b>  |
| <b>F23.14</b> | <b>Molding machine frequency curve 3 input point A3</b>                                   | <b>Range: 0.0%~100.0%</b> | <b>100.0%</b> |
| <b>F23.15</b> | <b>Molding machine frequency curve 3 input point A3's corresponding per unit value B3</b> | <b>Range: 0.0%~100.0%</b> | <b>100.0%</b> |

F23.08~F23.15 can define the frequency curve 3. Frequency curve turns the external analog signal into analog quantity inside the machine. The product by this per unit value and upper limiting frequency F01.11 decides the corresponding setting frequency component of signal.

## 7 Troubleshooting

### 7.1 Fault Alarm and Troubleshooting

EN606 series control cabinet's fault contents and troubleshooting is shown in Table 7-1, including fault and alarm two main types. For example when fault occurs in the control cabinet, it will display E-XX. For alarm type, it will show A-XX. After fault occurs, fault type should be recorded in group F26 in detail, and if alarm occurs, alarm status will keep displaying until alarm cause solved, alarms status will not be stored to group F26. Some reserved fault codes are prepared for the continuous upgrading of intelligent automatic diagnosis function. Fault occurs during operating of the control cabinet, it should be processed according to Table 7-1. Fault phenomenon should be recorded in detail. For technical assistance, please contact our after-sale service and technical support Department or local agent.

**Table7-1 Fault Alarms and troubleshooting**

| Failure code | Failure type                          | Possible reasons  | Troubleshooting  |
|--------------|---------------------------------------|---|--|
| E-01         | Acc overcurrent                       | Too short Acc time                                      | Prolong accelerating time  |
|              |                                       | Improper V/F curve                                      | Adjust V/F curve or torque boost                                     |
|              |                                       | Restart the motor in running when momentary stop occurs | Set up start mode as speed tracking restart                          |
|              |                                       | Low power voltage                                       | Check the input power supply   |
|              |                                       | Control cabinet capacity is too low                     | Select Control cabinet with proper capacity.                         |
| E-02         | Dec overcurrent                       | Dec time is too short                                   | Please prolong Dec time  |
|              |                                       | Potential load or load inertia is too big               | Add suitable braking unit and increase the power of braking resistor |
|              |                                       | Low power range of control cabinet                      | Select control cabinet with large capacity                           |
| E-03         | Overcurrent at constant speed running | Load change suddenly or abnormal                        | Check or reduce the load   |
|              |                                       | Acc or Dec time are short                               | Prolong Acc or Dec time properly                                     |
|              |                                       | Low power voltage                                       | Check the input power supply   |
|              |                                       | Low power range of control cabinet                      | Select control cabinet with large capacity                           |
| E-04         | Acc over voltage                      | Input voltage abnormal                                  | Check input power supply   |
|              |                                       | Acc time is too short                                   | Prolong Acc time properly  |

|                |  |  |  |
|----------------|--|--|--|
|                |  | Restart the motor in running when momentary stop occurs            | Set up start mode as speed tracking restart                            |
| E-05           | Dec over voltage                       | Dec time is too short  | Prolong Dec time   |
|                |  | Potential load or load inertia is too big                          | Add suitable braking unit and increase the power of braking resistor   |
| E-06           | Over voltage at constant speed running | Input voltage abnormal   | Check input power supply   |
|                |  | Acc or Dec time are short  | Prolong Acc or Dec time properly                                       |
|                |  | Abnormal change of input voltage                                   | Add ac input reactor   |
|                |  | load inertia is too big  | Add braking unit   |
| E-07           | Over voltage when stop                 | Input voltage abnormal   | Check input power supply or ask for service                            |
| E-08           | Low voltage when operating             | Input voltage is too low   | Check input power supply   |
| E-09           | Control cabinet overload               | Too short Acc time   | Prolong Acc time   |
|                |  | DC injection braking is too large                                  | Reduce DC injection braking current, prolong braking time              |
|                |  | Improper V/F curve   | Adjust V/F curve or torque boost                                       |
|                |  | Restart the motor in running when momentary stop occurs            | Set up start mode as speed tracking restart                            |
|                |  | Input voltage is too low   | Check input power supply   |
|                |  | Load is too heavy  | Select control cabinet with large capacity                             |
| E-10<br>(A-10) | Motor overload protection              | Improper V/F curve   | Adjust V/F curve or torque boost                                       |
|                |  | Input voltage is too low   | Check input power supply   |
|                |  | General motor runs with heavy load at low speed for long term      | Select special motors for long term low speed running                  |
|                |  | Wrong setting of Motor overload protection factor                  | Setup motor overload protection factor right                           |
|                |  | Motor choked or sudden change of load                              | Check load   |
| E-11<br>(A-11) | Motor underload protection             | Operating current of control cabinet less than underload threshold | Confirm whether the parameters F19.08 and F19.09 are reasonable or not |
|                |  | Load divorced from motor   | Check whether the load divorced from the motor or not                  |
| E-12           | Phase losing at input side             | The three phase input power abnormal                               | Check the three phase input power line are break or poor contact       |

|             |                                       |  |   |
|-------------|---------------------------------------|--|---|
|             |                                       | Power board abnormal   | Ask for service from manufacturer or agent                                |
|             |                                       | Control board abnormal   | Ask for service from manufacturer or agent                                |
| E-13        | Phase losing at output side           | The cable between control cabinet and motor abnormal             | Check the motor cable   |
|             |                                       | Three phase load are highly unsymmetric when operating           | Check the three phase coil are symmetric or not                           |
|             |                                       | Power board abnormal   | Ask for service from manufacturer or agent                                |
|             |                                       | Control board abnormal   | Ask for service from manufacturer or agent                                |
| E-14        | Inverting module protection           | Instantaneous overcurrent inside                                 | Refer to overcurrent solutions  |
|             |                                       | Short circuits in output 3 phase or earthing                     | Re-wiring   |
|             |                                       | Blocked air duct or broken fan                                   | Clear air duct or replace fan   |
|             |                                       | Ambient temperature is too high                                  | Lower the ambient temperature   |
|             |                                       | Connecting wire or insert on control board loose                 | Check and connect the wire again  |
|             |                                       | Abnormal current wave caused by missing phase at output etc.     | Check wiring  |
|             |                                       | Assistant power supply damaged and drive voltage lacking         | Ask for service from manufacturer or agent                                |
|             |                                       | Control board abnormal   | Ask for service from manufacturer or agent                                |
| E-15        | Short circuit to earth when operation | Motor short circuit to earth                                     | Replace cable or motor  |
| E-16        | Short circuit to earth when power on  | Motor short circuit to earth                                     | Replace cable or motor  |
|             |                                       | Wrong connection of control cabinet power supply and motor cable | Replace cable or motor  |
| E-17 (A-17) | Control cabinet overheat              | Alarm A-17 last over 30mins                                      | Clear air doctor improve the ventilation conditions                       |
|             |                                       | Air duct blocked   | Clear air doctor improve the ventilation conditions                       |
|             |                                       | Too high ambient temperature                                     | Improving the ventilation conditions and decreasing the carrier frequency |
|             |                                       | Fans broken  | Replace fans  |
|             |                                       | External fault emergency stop terminal closed                    | Open the terminal after external fault solved                             |

|                |                                 |  |  |
|----------------|---------------------------------|--|--|
| E-18<br>(A-18) | External device failure         | External fault emergency stop terminal closed                    | Open the terminal after external fault solved  |
| E-19           | Current detecting circuit fault | Loose wiring or terminal connections on control board            | Check and connect the wire again   |
|                |                                 | Damaged auxiliary power source                                   | Ask for service from manufacturer or agent   |
|                |                                 | Damaged Hall component   | Ask for service from manufacturer or agent   |
|                |                                 | Abnormal amplifier circuit                                       | Ask for service from manufacturer or agent   |
| E-20           | External interference fault     | External disturbance serious                                     | Press“STOP/RESET”Button to reset or add external EMC filter                                      |
| E-21           | Internal interference fault     | Internal disturbance serious                                     | Ask for service from manufacturer or agent if the fault still occurs after power off and restart |
| E-22<br>(A-22) | PID provision loss              | PID Provision loss threshold setting is                          | Reset relevant parameters  |
|                |                                 | PID provision disconnection                                      | Check PID external provision wiring  |
|                |                                 | Abnormal control board   | Ask for service from manufacturer or agent   |
| E-23<br>(A-23) | PID feedback loss               | PID Feedback loss threshold setting is                           | Reset relevant parameters  |
|                |                                 | PID feedback disconnection                                       | Check PID external feedback wiring   |
|                |                                 | Abnormal control board   | Ask for service from manufacturer or agent   |
| E-24<br>(A-24) | PID error amount abnormal       | PID error abnormal detection threshold setting is not reasonable | Reset relevant parameters  |
|                |                                 | Abnormal control board   | Ask for service from manufacturer or agent   |
| E-25           | Start terminal protection       | Terminal command effective when power on                         | Check the external input terminal  |
| E-26<br>(A-26) | Communication failure           | Baud rate set improperly   | Set baud rate properly   |
|                |                                 | Serial port communication error                                  | Press“STOP/RESET”Button to reset or ask for service  |
|                |                                 | Failure and Alarm parameters set improperly                      | Modify F05.04、F05.05   |
|                |                                 | Upper device doesn't work  | Check whether upper device work and wiring is correct or not                                     |
| E-27           | Reserved                        |  |  |



|                   |  |   |  |
|-------------------|--|---|--|
| E-28              | Reserved   |   |  |
| E-29              | Reserved   |   |  |
| E-30<br>(A-30)    | E <sup>2</sup> PROM read and write incorrect                           | Read and write control parameters mistake       | Press“STOP/RESET”Button to reset or ask for service  |
| E-31              | Temperature detecting disconnection                                    | Temperature sensor fault                        | Ask for service from manufacturer or agent   |
|                   |  | Temperature detection circuit abnormal          | Ask for service from manufacturer or agent   |
| E-32              | Auto-tuning error  | Improper setting of motor rated parameters      | Set rated parameters according to the motor’s nameplate  |
|                   |  | Current abnormal during auto-tuning             | Choose proper control cabinet for motor  |
|                   |  | Wrong motor wiring                              | Check motor three phase connection   |
| E-33<br>(A-33)    | Contactor abnormal   | Power board abnormal                            | Ask for service from manufacturer or agent   |
|                   |  | Contactor abnormal                              | Replace contactor  |
| E-34              | Internal fault1  | Debugging use in factory                        |  |
| E-35              | Internal fault2  | Debugging use in factory                        |  |
| E-36<br>(A-36)    | Bus capacitor overheating  | Poor cooling environment                        | Improve the ventilation conditions   |
|                   |  | Control cabinet capacity too low                | Choose proper control cabinet for motor  |
|                   |  | Bus capacitor cooling fan damaged               | Replace Bus capacitor cooling fan  |
| E-37              | Encoder error  | Encoder broken or signal line problem           | Check encoder and wiring   |
| E-38              | Over speed protection  | Acc time too short                              | Prolong Acc time   |
|                   |  | Control cabinet power is too low                | Select control cabinet with large capacity   |
| E-39              | Speed error too large protection                                       | Acc time too short                              | Prolong Acc time   |
|                   |  | Control cabinet power is too low                | Select control cabinet with large capacity   |
| E-40<br>~<br>E-50 | Reserved   |   |  |
| A-51              | The main and auxiliary frequency provision channel exclusiveness alarm | Parameters setting error                        | F01.00 and F01.03cannot be set to choosing the same channel (9: Except for terminal encoder provision) |
| A-52              | Terminal function exclusiveness alarm                                  | Terminal function parameters setting repeatedly | Check the terminal function settings   |

## 7.2 Failure record lookup

This series control cabinet can record latest 4 failure codes and operating parameters of the latest two failures. Looking for these information can do good to finding out the failure reason.

Failure information store in Group F26.Please enter into F26 Group to look for information.


| Code   | Content                                  | Code   | Content                                    |
|--------|--|--------|--|
| F26.00 | Previous 1 failure record                | F26.09 | Input terminal state at Previous           |
| F26.01 | Previous 2 failure record                | F26.10 | Total running time at Previous 1           |
| F26.02 | Previous 3 failure record                | F26.11 | Set Freq. at Previous 2 failure            |
| F26.03 | Previous 4 failure record                | F26.12 | Output Freq. at Previous 2                 |
| F26.04 | Set Freq. at Previous 1 failure          | F26.13 | Output current at Previous 2               |
| F26.05 | Output Freq. at Previous 1 failure       | F26.14 | DC Bus voltage at Previous 2 failure       |
| F26.06 | Output current at Previous 1 failure     | F26.15 | Module temperature at Previous 2 failure   |
| F26.07 | DC Bus voltage at Previous 1 failure     | F26.16 | Input terminal state at Previous 2 failure |
| F26.08 | Module temperature at Previous 1 failure | F26.17 | Total running time at Previous 2 failure   |

### 7.3 Fault Reset



- (1) Before reset you must find out reason of failure downright and eliminate it, otherwise may cause permanent damage to the control cabinet.
- (2) Please look for failure reason if it cannot be reset or occurs again after resetting, otherwise it will cause control cabinet damage due to continuous resetting.
- (3) Please delay 5mins to reset fault when overload and overheat fault occur.
- (4) For E-14 fault, Reset button is invalid. Please check the motor wiring after power off and restart the control cabinet.
- (5) E-16 occurs when power on, Please not operate it directly after resetting. Should confirm the input and output cable are in correct connection.

To resume normal operating when failure occurs in control cabinet, please choose the following operations:

- (1) Select one of X1~X8 terminals as External Reset terminal, Connect it to COM and disconnect.
- (2) When failure code occurs, Press  Button to reset after confirming that it can be reset.
- (3) Communication Reset. Please refer to annex communication descriptions.
- (4) Cut off power supply.

### 7.4 Alarm Reset

When alarm occurs, it should eliminate alarm causes firstly, otherwise the alarm cannot be eliminated or reset by Reset button.

## 8 Preservation and maintenance

### 8.1 Routine maintenance

Please assemble and operate the control cabinet according to instructions in the “Service Manual” strictly. Potential hazards exist due to aging, wear and tear of inverter internal components as well as environmental influences to the control cabinet, such as temperature, humidity, vibration etc. Therefore, daily inspection, periodic preservation and maintenance must be performed to the control cabinet which ensure that the stable operation with high performance for a long time.

**Table 8-1 Daily inspections and maintenance items**

| Inspect period |          | Inspections  |
|----------------|----------|--|
| Daily          | periodic |  |
| √              |          | Daily cleaning:<br>(1) Inverter should be maintained in a clean state<br>(2) Clean up the dust on the surface of the control cabinet, to prevent the dust into the control cabinet internal (especially metal dust). |
|                | √        | Check the air duct, and regularly clean.   |
|                | √        | Check whether the screws is loose  |
|                | √        | Check whether the control cabinet is corrode   |
| √              |          | Whether the control cabinet installation environment changes   |
| √              |          | Whether the control cabinet cooling fan is working properly  |
| √              |          | Whether the control cabinet is overheating   |
| √              |          | When running whether voice of motor abnormal change.   |
| √              |          | Whether occur abnormal vibration when motor running  |
|                | √        | Check 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 Replacement of control cabinet Consumable Parts

Some component parts in the Control cabinet will be abraded or wear descending performance for long-term usage, to assure that the Control cabinet 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 has wearing and tearing of the bearing, aging of the fan vanes. Replacing cooling fan should be considered.

### (2) Filter Electrolyte capacitors

High ambient temperature and aging of electrolyte due to large pulse current induced by frequent leaping changes of loads may cause electrolyte capacitors broken. At this time, please replace the electrolyte capacitors.

## 8.3 Warranty Of the Control Cabinet

(1) Free maintenance will be provided within warranty time if failure caused by control cabinet itself takes place under normal conservation and usage. Warranty time please check warranty card. Maintenance will be charged when exceeding warranty time.

(2) Even though within warranty time, maintenance will also be charged in the following situations:

1>If did not use the control cabinet according to 《service manual》 strictly or did not use it under ambient demanded in 《service manual》, which cause failure;

2>Failure caused by applying the inverter to non-normal function;

3> Failure caused by self-repair, refit which is not already allowed;

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

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

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

(3)The service fee will be charged according to the actual costs. If there is any contract, the contract prevails.

(4) Any questions please feel free contact local agent or our company directly.



Note

**Lifetime repair service with fee will be provided even though exceeds warranty time.**

## **8.4 Storage of Control Cabinet**

Please pay attention to following points for temporary storage and long-term storage after purchasing the control cabinet.

- (1) Avoid storing the inverter in high temperature, moist, dust and metal powder place, assuring in good ventilation condition.
- (2) Long term storage can result in performance deterioration of electrolyte capacitor. Electrolyte capacitor shall be energized once per year. Energized time of the control cabinet should not less than 1 hour. Input voltage shall be increased to rated value by voltage regulator slowly and gradually. 250W voltage regulator is enough.

The control cabinet can running without load.

Pursuing forever powerful technology

**SHENZHEN ENCOM ELECTRIC TECHNOLOGIES CO.,LTD.**

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